ATTUNE STUDY

Assessing the evidence and impact of the UNICEF UK Baby Friendly Initiative across maternity, neonatal and community services

November 2026







University of Lancashire

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The Baby Friendly Initiative
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Key abbreviations

ATTUNE	Assessing the evidence and impact of the UNICEF UK Baby Friendly Initiative
AME	Antenatal breastmilk expression
BFI	Baby Friendly Initiative
BFHI	Baby Friendly Hospital Initiative
BLW	Baby-led weaning
BSE	Breastfeeding self-efficacy
CBF	Cue based feeding
CMF	Commercial milk formula
DHSC	Department of Health and Social Care
FNP	Family Nurse Partnership
FCC	Family centred care
FICare	Family integrated care
FNP	Family Nurse Partnership
HCP	Healthcare professional
IFL	Infant Feeding Lead (also referred to as Infant Feeding Advisors in Scotland)
IFS	Infant Feeding Survey
IFT	Infant Feeding Team
KC	Kangaroo care
LBW	Low birth weight
MSW	Maternity support worker
MBRRACE-UK	Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK
MNVP	Maternity and Neonatal Voices Partnership
MSW	Maternity support worker
NEC	Necrotizing enterocolitis
NHS	National Health Service
NICU	Neonatal intensive care unit
NNU	Neonatal unit
PPIE	Patient and Public Involvement and Engagement
PSMNVP	Peer supporter/Maternity and Neonatal Voices Partnership
RCT	Randomised Controlled Trial
ROP	Retinopathy of prematurity
SSC	Skin-to-skin contact

The Code	International Code of Marketing of Breast-milk Substitutes
UNICEF	United Nations Children's Fund
UNCRC	United Nations Convention on the Rights of the Child
UK	United Kingdom
UPFs	Ultra processed foods
VLBW	Very low birth weight
WHO	World Health Organization

Consideration of language

This report draws on the UNICEF UK Baby Friendly Initiative's principles for inclusive language[1], which seek to recognise and respect the diversity of identities, experiences and family structures encountered across maternity, neonatal, hospital-based children's services, community services and universities. Where appropriate, terms such as parent and primary caregiver are used alongside additive language to acknowledge a range of lived experiences. Other terms have been used within the report, particularly when reflecting the language used by study participants or when referencing research (such as woman or mother) to ensure accuracy and consistency with source materials. Consistent with a person-centred approach, the report seeks to respect individual preferences, avoid assumptions, and recognise the diversity of experiences associated with pregnancy, birth, infant feeding and parenting.

Equality and diversity lens

An equality and inclusion lens has been applied throughout the report, recognising that families' experiences of pregnancy, birth, infant feeding and early parenting may differ depending on their circumstances, identities and access to support. Rather than attempting to provide an exhaustive list of groups, the report aims to avoid unintentionally excluding others, while recognising diversity within communities and highlighting recurring themes where inequalities or inequities are identified.

Acknowledgments

Special thanks to Annabelle Poppy Farman, Ashima Ahlawat and Ammarah Patel, who all worked as student interns on the study, to our Advisory Group (see Appendix 1) for their expertise, guidance and encouragement, and to all the participants who generously gave their time and shared their experiences to contribute to this study.

How to cite the report

Thomson, G., Moran, V. H., Crossland, N., Hives, L., Ceballos Rasgado, M., Harris, C., & Atkinson, P. (2026). *ATTUNE Study: Assessing The evidence and impacT of the UNICEF UK Baby Friendly InitiativE*. University of Lancashire. https://doi.org/10.17030/LANCASHIRE.LOK.00060001

[1] Inclusivity and language - Baby Friendly Initiative

Executive Summary

Headline finding

The UNICEF UK Baby Friendly Initiative (BFI) provides a comprehensive framework for promoting, supporting and enabling evidence-based care for babies, parents and families. Overall, the evidence reviewed through ATTUNE strongly supports the UNICEF UK BFI standards and the practices and principles that underpin them – the central recommendation from this work is to continue to invest in the UNICEF UK BFI. The strength of BFI lies not only in individual standards, but in the way they work together across the care pathway to integrate infant feeding with responsive, relationship-centred care, workforce development and continuous quality improvement.

Executive overview

The UNICEF UK Baby Friendly Initiative (BFI) forms part of a global WHO/UNICEF programme established to protect, promote and support breastfeeding and improve care for babies and families. Introduced in the UK in 1994, BFI has developed from its origins in the WHO/UNICEF Ten Steps to Successful Breastfeeding into a wider quality improvement programme spanning maternity, neonatal, health visiting, community, hospital-based children's services and university education. Its principles also align with a child-rights approach, including the United Nations Convention on the Rights of the Child and the right of every child to the highest attainable standard of health. The BFI provides a staged accreditation process aligned with a set of interlinking and evidence-based standards for maternity, neonatal, community and hospital-based children's services and universities. Services implement the standards in stages over several years and are externally assessed at each stage by UNICEF UK. When all stages are passed, the service is accredited as Baby Friendly.

Over more than three decades, BFI has contributed to substantial changes in UK maternity and infant-feeding practice. Breastfeeding initiation has increased considerably, while practices such as skin-to-skin contact, keeping mothers and babies together, responsive feeding and skilled infant-feeding support have become increasingly embedded within routine care. For newer generations of maternity professionals, many of these practices are now simply understood as normal care.

The ATTUNE study was undertaken to evaluate the evidence for, and impact of, the UNICEF UK Baby Friendly Initiative. It examined the contemporary evidence underpinning the practices reflected within BFI standards and explored how those standards are implemented, experienced and sustained in current services. The work was undertaken in a context of persistent breastfeeding inequalities, major workforce and service pressures, increasingly complex family needs, growing maternal health challenges associated with increasing age, obesity and morbidity, increasing caesarean rates and growing digital and commercial influences on infant feeding. These challenges sit within a maternity system undergoing significant change, with continuing concerns about safety, inequalities, fragmented care, workforce capacity, communication and women's experiences of care. In this context, maintaining investment in an established programme that supports evidence-based practice, workforce development, organisational culture and continuous quality improvement is particularly important.

ATTUNE combined a series of rapid integrative evidence reviews with exploratory case studies in four UK NHS Trusts/Health Boards. The reviews covered motivations and challenges of infant feeding; antenatal preparation; skin-to-skin contact and kangaroo care; early hospital and community infant feeding support; keeping parents and infants close; responsive feeding; infant sleep, feeding and safety; care in the neonatal unit; close and loving relationships; commercial influences and International Code of Marketing of Breast-milk Substitutes implementation; and workforce education. The case studies examined staff (health care professionals including midwives, Infant Feeding Leads/Advisors, maternity support workers, health visitors, and university staff who were leading on BFI implementation) and parent experiences of BFI-accredited care across maternity, neonatal, community services and university contexts.

Overall, the findings demonstrate the value of BFI as a comprehensive framework that can help services maintain consistent, evidence-based and relationship-centred care across complex systems. The evidence supports the principles of informed decision-making, responsive feeding, skin-to-skin contact, parent–infant closeness, skilled and ongoing feeding support, close and loving relationships, Code compliance and workforce education. The findings strongly reinforce the direction of the BFI Achieving Sustainability standards, demonstrating the importance of leadership, organisational culture, monitoring and continuous progression in embedding Baby Friendly practice over time. An overview of the process and findings of the ATTUNE study is reflected in Figure 1 below.

The findings also highlight the potential value of BFI as a model for wider maternity service improvement. The ATTUNE study has demonstrated how evidence-based standards can be translated into routine practice through a combination of workforce education, leadership, organisational ownership, parent involvement, monitoring, accreditation and continuous quality improvement. These principles extend beyond infant feeding and may offer learning for other national maternity improvement programmes seeking to achieve and sustain changes in care across complex systems.

The findings also show why BFI needs to continue to evolve. Families experience infant feeding within wider social, cultural, economic, digital and commercial environments. A consistent evidence-based framework is therefore essential, but consistency should not mean uniformity: the standards and principles should be applied in ways that respond to individual families, their circumstances and their decisions.

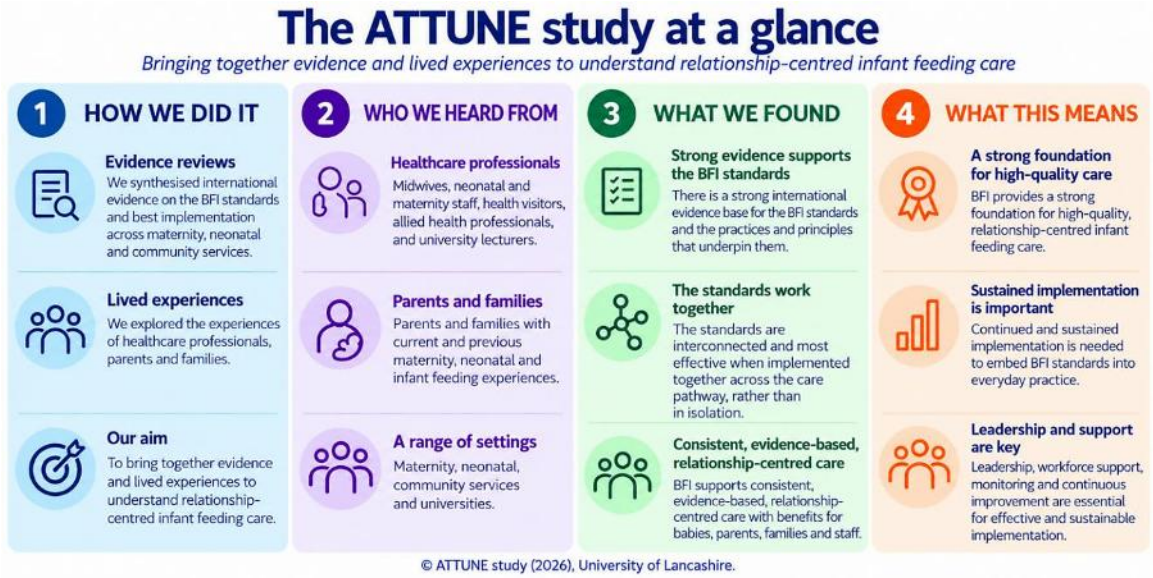


Figure 1: Overview of the process and findings from the ATTUNE study

ATTUNE: aim and approach

The study aim was to evaluate the evidence for and impact of the UNICEF UK BFI. Its objectives were to synthesise evidence underpinning the standards; identify how the BFI is influencing outcomes for parents, infants and professionals; explore stakeholder experiences; understand implementation challenges across service settings; identify best practice and gaps; and produce a digitally enabled report to support ongoing improvement.

Work Package 1 used rapid integrative reviews. Searches of major health and social science databases were undertaken from 2012 onwards to update the UNICEF UK BFI evidence review published in 2013. The pragmatic approach prioritised systematic reviews, meta-analyses and randomised trials where available, while also incorporating qualitative evidence and selected primary studies to understand experiences, mechanisms and context. The evidence base is substantial but not exhaustive, and the strength and maturity of evidence varies between topic areas.

Work Package 2 comprised exploratory case studies at four UK sites. Maternity services had achieved the BFI Achieving Sustainability (Gold) Award, while neonatal, community and other services could be at different stages of accreditation. Staff interviews included 40 participants across maternity, neonatal, health visiting/community, peer supporters/Maternity and Neonatal Voices Partnership (MNVPs) representatives, university BFI leads and public health roles. Parent data included interviews with 35 mothers and online surveys completed by 180 mothers. A Patient and Public Involvement and Engagement (PPIE) group and a multidisciplinary Advisory Group contributed to study design, interpretation and recommendations.

What ATTUNE tells us about BFI

The standards work as an integrated framework

The evidence supports the BFI standards and the practices and principles on which they are based. Importantly, those practices are complementary and mutually reinforcing rather than discrete interventions. Antenatal preparation, skin-to-skin contact, keeping parents and babies together, responsive feeding, skilled feeding support, Code implementation, workforce competence and close and loving relationships work together to optimise infant feeding support, build parental confidence and responsiveness, and support parent-infant relationships.

This integrated model is one of the major strengths of the UNICEF UK BFI. Breastfeeding remains central, but the framework extends beyond breastfeeding protection, promotion and support to encompass responsive formula feeding, responsive caregiving, parental wellbeing, informed decision-making, emotional connection, and support for all families. The contemporary evidence broadly supports this wider relationship-centred direction.

Effective care is relational, practical and continuous

Across the evidence reviews and case studies, how support is provided is often as important as the information or intervention itself. Parents value realistic preparation, skilled practical help, empathy, reassurance and non-judgemental communication. Support is more effective when it is proactive rather than reactive, when practical skills are demonstrated rather than communicated through information alone, and when parents know where and how to access further help.

Continuity and consistency are recurrent findings. Parents may move between maternity, neonatal, health visiting, specialist infant feeding, peer and community services. Fragmented pathways and contradictory information undermine confidence, whereas trusted relationships, coordinated referrals, consistent evidence-based messaging and accessible specialist or peer support help parents navigate difficulties and sustain feeding decisions.

Informed choice and individualisation are central

ATTUNE reinforces the BFI emphasis on informed decision-making and parental autonomy. Families need clear, independent and evidence-based information, but they also need their decisions and circumstances to be respected. Feeding difficulties, fatigue, mental wellbeing, birth experiences, socioeconomic circumstances, culture, housing, employment, neurodiversity, disability and wider family dynamics can all shape feeding experiences. A consistent framework should therefore establish consistent principles and quality, not identical care for every family.

The findings identify opportunities to strengthen inclusivity. Parents and staff highlighted needs relating to formula and mixed feeding, different family structures, LGBTQ+ parents, neurodivergent parents, language and cultural needs, complex health and social circumstances, and the role of partners and wider family members. Equity within BFI should be understood as responding appropriately to different needs rather than assuming that universal provision automatically produces equitable experiences.

Workforce and organisational systems determine whether standards become practice

A knowledgeable and confident workforce is fundamental. Education generally improves knowledge and confidence, but practical, skills-based and reflective approaches are more likely to support translation into practice than theory alone. In line with existing BFI requirements, staff and students also need ongoing updates, opportunities to consolidate skills in practice, clear referral pathways and access to specialist expertise.

Education alone is insufficient. Staffing shortages, workload, competing priorities, limited protected time and workforce turnover constrain both training and the delivery of relationship-centred support. Staff case studies showed that BFI is most sustainable when it is embedded within leadership, organisational culture, governance and quality improvement rather than depending on a small number of passionate infant feeding leads or champions.

Audit, monitoring and quality improvement are important mechanisms for sustainability. When used constructively, audit data can identify variation, reinforce good practice, target training, support reflection and provide evidence for service improvement. Staff were clear that the purpose should be continuous learning and improvement rather than a compliance or tick-box exercise.

These findings strongly reinforce the BFI Achieving Sustainability standards, particularly their emphasis on leadership, organisational culture, monitoring and progression as the foundations for embedding and sustaining Baby Friendly practice.

BFI provides protection within a changing social and commercial environment

Parents make feeding decisions within a rapidly changing information environment. Social media can offer reassurance, peer connection and accessible practical information, but can also expose families to misinformation, unrealistic comparisons and commercial influence. Commercial milk formula marketing remains widespread, increasingly sophisticated and heavily digitalised, using emotional messaging, health claims, cross-promotion, influencers and personalised advertising. Evidence indicates that BFI-accredited settings demonstrate greater Code compliance, reinforcing the importance of the programme in protecting independent, evidence-based information within healthcare.

BFI therefore has a wider system role: shared standards for practice, education, organisational responsibility and independent information can help protect consistency and quality of care in the face of workforce pressures, fragmented services, inequalities and changing digital and commercial influences.

Key findings from the evidence reviews

Antenatal preparation and support

- Evidence on antenatal education alone is mixed: isolated education does not consistently improve breastfeeding initiation or longer-term duration.
- A key message is antenatal preparation is most useful when it is interactive, realistic, practical, culturally responsive and connected to ongoing postnatal support.

- Multiple contacts and integrated antenatal-to-postnatal approaches appear more effective than one-off classes.
- Parents value preparation that builds confidence without presenting breastfeeding as automatically easy, and that explains where support can be obtained if difficulties occur.
- The review also highlights a need to strengthen the relationship component of antenatal preparation. Evidence on antenatal interventions specifically designed to promote early emotional connection remains less developed, although approaches that encourage parents to focus on and interact with their unborn baby including through touch, attention to fetal movements, music or singing show promise.
- Antenatal breastmilk expression is increasingly used in practice and can enhance confidence-building and be acceptable particularly for some higher-risk groups, but the evidence is not sufficiently strong to present it as universally beneficial. Clear explanation of purpose, realistic expectations and consistent practical support are needed where it is offered.

Skin-to-skin contact and kangaroo care

- This is one of the strongest areas of evidence. Immediate and ongoing skin-to-skin contact supports newborn physiological adaptation, temperature and cardio-respiratory stability, breastfeeding initiation and continuation, parental confidence and parent-infant connection.
- Kangaroo care has particular benefits for preterm and low-birthweight infants, with evidence suggesting benefits for brain development, reductions in mortality, hypothermia and sepsis, and shorter hospital stays in relevant populations.
- The benefits are relational as well as physiological. Parents describe skin-to-skin contact and kangaroo care as calming, empowering and important for feeling like a parent. However, implementation is affected by staffing, policies, privacy, parental anxiety, clinical routines and culture.
- Services need to make skin-to-skin contact and kangaroo care the expected practice while providing individualised, safe and practical support, including opportunities for fathers/partners where appropriate.

Early hospital and community infant feeding support

- The evidence strongly supports BFI requirements for timely, skilled, individualised and compassionate infant feeding support.
- Early contact matters: interventions delivered promptly and through sufficient repeated contacts are more effective than delayed or low-intensity support.
- Practical hands-off support, including observing feeds, supporting positioning and attachment, hand expression, assessment of milk transfer and development of a plan of care, is more useful than information alone.
- Support needs to continue after discharge through clear pathways between maternity, neonatal, health visiting, specialist and community services.
- Peer support can provide relatable, flexible and non-judgemental help and can improve breastfeeding outcomes when sufficiently intensive and integrated with professional care.
- Digital technologies may usefully complement care but should not replace skilled face-to-face support.
- Parents using formula or mixed feeding also require respectful, practical and responsive support.

Keeping parents and infants close

The evidence supports the BFI principle that parents and babies should remain together wherever clinically possible.

In maternity care:

- Routinely keeping parents and babies together (rooming-in) provides more opportunities for skin-to-skin contact, responsive feeding, recognition of infant cues and instinctive behaviour, to enhance the parent-infant relationship and parental confidence.
- Avoidable separation can delay feeding initiation and disrupt relationship-building.
- Routinely keeping parents and infants together must be accompanied by practical help, attention to maternal recovery and fatigue, safe sleep guidance and culturally responsive care.

In neonatal care:

- Minimise separation and recognise parents as partners in their infant's care rather than visitors.
- Enable open access for parents, adapting physical spaces to allow parents to remain with their infant, alongside changes to organisational culture, staffing, communication and family facilities.
- Promote zero separation as an organising principle, whereby separation occurs only when clinically necessary and closeness is restored as soon as safely possible.
- Support models of care that enable parental presence and involvement, including family-integrated care, single-family rooms, couplet care and transitional care, to promote parental confidence, breastfeeding, bonding and readiness for discharge.

Responsive feeding

- The evidence strongly supports responsive feeding as a core BFI principle, while recognising that responsive breastfeeding, responsive bottle feeding and introducing solids require different approaches and support.
- Responsive breastfeeding involves responding to the needs of both mother and baby, including responding to feeding cues and offering the breast for comfort and reassurance, while also taking account of the mother's needs and wishes.
- Responsive bottle feeding involves recognising and responding to feeding cues, pacing feeds, allowing pauses and stopping when the baby shows signs of fullness, rather than encouraging them to finish the bottle.
- When introducing solids, recognising and responding to hunger and satiety cues supports infant self-regulation and enables infants to become increasingly involved in feeding. Evidence for baby-led approaches is promising for responsive feeding behaviours, although nutritional and growth evidence remains mixed and professional guidance is needed to address safety and nutrient concerns.
- Across feeding approaches, responsive feeding provides opportunities for comfort, communication and relationship-building. Responsive feeding is influenced by parental knowledge, stress, mental health, infant temperament, socioeconomic conditions and cultural beliefs. Interventions can reduce controlling feeding practices and improve some dietary and growth outcomes, although longer-term effects are not consistently established.

Infant sleep, feeding and safety

- Infant sleep and feeding are closely interconnected. Bed-sharing is common and may be planned or occur reactively because of feeding, fatigue or infant settling.
- The review supports BFI's harm-reduction approach rather than total prohibition of bed-sharing. The greatest risks occur in hazardous circumstances, including sofa-sharing, smoking, alcohol or drug use and particular infant vulnerabilities.
- Open, realistic and non-judgemental conversations are important because stigma can lead parents to conceal bed-sharing and lose opportunities for safer-sleep information.
- The evidence also suggests that parental stress is often related to a mismatch between expectations and normal infant sleep behaviour.
- Supporting realistic expectations, discussing safer sleep within the context of feeding and family circumstances, and ensuring consistent messages across services are therefore important components of relationship-centred care.

Care in the neonatal unit

- The neonatal evidence strongly aligns with BFI standards that services should support close and loving relationships, enable breastmilk feeding and breastfeeding where possible, and value parents as partners in care.
- Kangaroo care, cue-based feeding, avoidance of bottles during breastfeeding establishment, structured parental education, psychosocial support and family-integrated care can improve feeding, confidence and a range of infant and parental outcomes.
- Mother's own milk remains the priority. When it is unavailable or insufficient, donor human milk is associated with lower risk of necrotising enterocolitis and other feeding benefits compared with formula, although growth outcomes and the relative effects of mother's own and donor milk require further study. The findings support consideration of donor milk within neonatal standards while maintaining a clear focus on protecting and sustaining maternal milk production.
- Family-integrated approaches including the BFI's focus on parents as partners in care are an important enabler of skin-to-skin contact and breastfeeding, can reduce parental stress and strengthen involvement, but require adequate facilities, privacy, equipment, skilled staff and policies that actively enable parents to participate.

Close and loving relationships

- The evidence provides a strong rationale for making close, loving and responsive parent-infant relationships central across BFI settings.
- Touch, gaze, voice, skin-to-skin contact, feeding, comforting and emotional attunement provide repeated opportunities for co-regulation and relationship development.
- Responsive caregiving supports infant neurological, emotional and social development, while parental mental health, trauma, fatigue and stressful circumstances can affect bonding and responsiveness.
- The findings support proactive guidance on everyday relationship-building behaviours while recognising that bonding is not always immediate and may develop gradually. This is especially important in neonatal care, where illness, separation and technology can disrupt the expected transition to parenthood.

- Emerging evidence on parental smartphone absorption suggests possible effects on sensitivity and responsiveness, but findings remain mixed and require more ecologically valid longitudinal research.

Commercial influences and the International Code of Marketing of Breastmilk Substitutes

- Commercial milk formula marketing remains pervasive across retail, healthcare and digital environments. Violations of the Code include advertising, price promotions, gifts and samples, misleading claims, cross-promotion and increasingly targeted social media and influencer activity.
- Parents can find it difficult to distinguish independent health information from commercial promotion, and marketing frequently exploits parents' concerns about milk supply, infant sleep, allergies, development and behaviour.
- The evidence supports continued and strengthened implementation of the Code within BFI. Accredited settings show higher levels of Code compliance, and workforce education can improve adherence.
- The review also identifies emerging concerns about commercial baby and toddler foods, including ultra-processed products and marketing practices. BFI cannot regulate the wider commercial environment alone, but it has an important role in protecting healthcare services from commercial influence and ensuring families can access trusted, independent information.

An educated workforce

- Workforce and student education is fundamental to the BFI model. Evidence shows improvements in knowledge and confidence after education, but fewer studies objectively assess competence, practical skills or sustained changes in practice. This makes the BFI emphasis on competency-based education, skills review and audit particularly important.
- Effective education should combine knowledge with practical skills, communication, emotional sensitivity and opportunities for experiential learning.
- The evidence also positions education as a system-level responsibility rather than a standalone training event. Ongoing updates, role-specific preparation, multidisciplinary consistency and alignment between university education and clinical practice are needed.
- Organisational leadership, staffing and culture influence whether learning can be applied.
- The staff case study strongly reinforces the value of practical, interactive and reflective training and the need for protected time to undertake it.

Key findings from the case studies

Staff perspectives

- Staff across maternity, neonatal, community and university settings generally viewed BFI as a valuable framework for consistent, evidence-based and relationship-centred care.
- They described accreditation as helping to standardise practice, improve communication and create a culture in which infant feeding and parent-infant relationships are shared responsibilities rather than dependent on individual enthusiasts.

- Infant Feeding Leads were central to delivering and leading training, providing clinical expertise and visible leadership and supporting problem-solving.
- Staff also described the work needed to sustain BFI. Implementation varied within and between services, and examples of inconsistent information remained around supplementation, expressing, tongue-tie, skin-to-skin contact and breastfeeding support.
- Workforce shortages, high workloads, limited protected time and increasing clinical complexity were major barriers. There was concern about over-reliance on small specialist teams and about accreditation becoming overly administrative or experienced as a tick-box exercise.
- Leadership, governance, multidisciplinary collaboration and organisational ownership were repeatedly associated with stronger implementation.
- Staff valued audit when it generated learning, positive feedback and quality improvement, but found it burdensome when experienced primarily as assessment.
- Training was widely valued, particularly when practical and experiential, although staff called for more flexible delivery, stronger content on inequalities and diverse families, and greater support for longer-term feeding challenges beyond the early postnatal period.

Parent perspectives

- Many mothers described respectful, compassionate and evidence-based care that supported informed decisions and helped them manage feeding difficulties.
- Specialist infant feeding teams, peer supporters and knowledgeable professionals were particularly valued.
- Parents emphasised kindness, being listened to and believed, reassurance, practical demonstrations and accessible follow-up. Positive relationships with professionals often shaped confidence and feeding experiences as much as individual interventions.
- Parents nevertheless reported inconsistency. Information varied between professionals and services, particularly around breastfeeding difficulties, mixed feeding, expressing, infant weight, bed-sharing, tongue-tie and formula feeding.
- Some parents felt antenatal education emphasised breastfeeding benefits without adequately preparing them for common difficulties or for feeding journeys that changed over time. Formula and mixed feeding information was sometimes perceived as limited.
- Parents' experiences were strongly shaped by family, peers, housing, employment, culture and digital environments.
- Partners and wider family members could provide essential practical and emotional support but could also introduce conflicting information. Social media was a major source of information and connection, particularly where formal services felt inaccessible, but it also created comparison, pressure, misinformation and exposure to marketing.
- Some families with specific language, cultural, neurodivergent, health or family-structure needs experienced gaps in inclusive support, information and resources.
- The parent findings reinforce the need for practical and realistic preparation, proactive support, continuity, inclusive information, emotional wellbeing within feeding care, partner/family involvement, peer and community support, and clearer guidance around specific areas such as mixed feeding and antenatal breastmilk expression.

Implications for the Baby Friendly Initiative

ATTUNE demonstrates that BFI is more than a set of standards of care. It provides a comprehensive evidence-based framework through which organisations can integrate infant feeding, responsive caregiving, close and loving relationships, workforce competence, governance and quality improvement. This is particularly important in a health system experiencing workforce shortages, fragmentation, financial pressure and increasing complexity, and in a social environment where parents encounter large volumes of conflicting and commercially influenced information.

The evidence also indicates that the BFI programme should remain dynamic. The core principles are well supported, but the way standards, resources, training and assessment are expressed should continue to evolve in response to emerging evidence and family needs. This includes greater visibility of emotional wellbeing, equity and inclusion, partner/family involvement, digital environments, mixed and formula feeding support, and the longer-term feeding journey.

Sustainability is central. Accreditation can initiate and reinforce change, but lasting impact depends on BFI principles becoming part of everyday organisational culture. Gold accreditation's focus on leadership, culture, monitoring and progression is therefore highly relevant to the contemporary evidence. The programme should support organisations to move beyond periodic compliance towards continuous learning, shared ownership and quality improvement.

Recommendations

Overarching recommendation

ATTUNE strongly supports the continuation and sustained implementation of the UNICEF UK BFI across maternity, neonatal, hospital-based, community services and universities. The evidence supports both the BFI standards and the value of BFI as a comprehensive framework for integrating infant feeding and relationship-centred care with workforce development and continuous quality improvement.

Continued investment is important to maintain consistency across services, reduce fragmentation and variation in practice, and sustain improvements in care and outcomes for infants and families. The programme should continue to evolve in response to emerging evidence, changing family needs and contemporary care contexts, while retaining clear and consistent core principles. Changes should be clearly communicated and supported by appropriate guidance and resources to facilitate sustainable implementation.

Overarching recommendations for the Baby Friendly programme

The following recommendations are directed at UNICEF UK and identify overarching priorities for the continued development and strengthening of the BFI programme.

1. Strengthen relationship-centred and emotionally sensitive care

- Continue to make relationship-building and emotional wellbeing more visible across standards, training, resources and assessment.
- Develop the programme to further recognise the interrelationship between infant feeding, parental and infant mental health, parental confidence and close and

loving relationships, and support staff to recognise distress and avoid reinforcing guilt or judgement.

2. Embed equity, diversity and inclusion

- Make equity and inclusion more explicit throughout standards, training, assessment and resources.
- Enhance the programme to support services to tailor care for cultural and language needs, disability and neurodiversity, different family structures, socioeconomic disadvantage and families facing additional barriers or stigma.

3. Strengthen family-focused care and wider support networks

- Ensure the programme more explicitly recognises partners, fathers, grandparents, significant caregivers and peer networks.
- Where appropriate, these supporters should be included in education, feeding discussions and opportunities for caregiving and relationship-building, while protecting the parent–infant relationship and respecting family preferences.

4. Strengthen continuity and consistency across the care pathway

- Position infant feeding support as a continuous pathway across antenatal, hospital, neonatal, community and early-years services, with clear referral routes, shared evidence-based messages, multiple contacts and effective communication between services and university programmes.

5. Strengthen evidence-informed communication in changing digital environments

- Support staff and families to identify trustworthy, independent and evidence-based information, address misinformation and navigate social media and digital commercial influence. Trusted digital resources should complement rather than replace relationship-based support.

Recommendations for BFI implementation

Effective BFI implementation requires more than delivery of individual standards. It depends on how Baby Friendly principles are embedded, supported and sustained across organisations and the wider care system, while remaining responsive to the changing context in which care is delivered.

1. Respond to contemporary and evolving challenges

- Implementation should remain adaptable to workforce and service pressures, digital and social media influences, commercial marketing, increasingly complex family circumstances and persistent health inequalities.

2. Strengthen and extend the focus on sustainable culture change

- The ATTUNE findings strongly support the principles underpinning the BFI Achieving Sustainability standards and their focus on leadership, culture, monitoring and progression.
- These should remain central to BFI implementation, supporting organisations to embed Baby Friendly principles within everyday practice and organisational systems, build ownership beyond infant feeding teams, reduce reliance on individual champions and sustain standards despite workforce turnover and service pressures.

3. Strengthen leadership and strategic commitment

- Establish visible executive and service-level accountability, integrate BFI into organisational strategies and align it with quality, safety, inequalities, early-years and family-centred care priorities.

4. Take a whole-system approach

- Strengthen integration across maternity, neonatal, hospital-based children's services, community services and universities workforce education so families experience coherent Baby Friendly principles across their journey.

5. Strengthen workforce capacity, capability and wellbeing

- Ensure protected time for Infant Feeding Leads/Advisors and adequate staffing to provide infant feeding and relationship-centred care, access to specialist expertise, ongoing competency development, reflective practice and attention to staff wellbeing.
- Training and education should include practical skills, communication, emotional support, cultural competence, trauma-informed care and responsive relationships.

6. Improve consistency and continuity of information and care

- Promote consistent evidence-based messaging, multidisciplinary training, better cross-service communication, continuity and timely specialist support.
- Consistency should not mean identical care: delivery should remain responsive to individual needs.

7. Embed equity, inclusion and responsiveness

- Require implementation and evaluation to assess whether care is accessible, acceptable and responsive across population groups, with proactive attention to families who experience structural, cultural, language, disability or socioeconomic barriers.

8. Strengthen parent, family and community involvement

- Use parent experience and co-production to shape services and quality improvement, proactively engage underserved communities, work with peer and community organisations and recognise partners and wider families.

9. Strengthen monitoring, evaluation and continuous quality improvement

- Continue to embed sustainability within the programme by utilising outcome measures including parent experience and staff knowledge/confidence; assess organisational culture; use audit, breastfeeding data and other service data actively for improvement; and strengthen management information and quality assurance systems.

Priorities for future research

Detailed research recommendations are embedded throughout the review chapters. At programme level, ATTUNE identifies five broader priorities.

1. Evaluate BFI as a programme and system-wide approach

- Examine the impact of accreditation and different accreditation stages, the added value of the Achieving Sustainability Award, how standards work

together, mechanisms of impact, implementation and sustainability across settings, leadership/workforce factors, costs and cost-effectiveness, and variation in outcomes across populations and contexts.

2. Strengthen the quality of the wider evidence base

- Use large, multicentre and well-powered studies where appropriate; improve reporting of interventions, implementation and fidelity; standardise definitions and outcomes; and use objective measures alongside self-report.

3. Examine longer-term and broader outcomes

- Extend follow-up beyond early breastfeeding outcomes to sustained feeding, parent-infant relationships, parental wellbeing and mental health, child development and wider infant and family outcomes.

4. Address inequalities and inclusion

- Recruit and co-produce research with underserved and underrepresented populations, including families experiencing deprivation, minoritised ethnic communities, neurodivergent and LGBTQ+ parents, young parents, disabled parents and families facing language or complex needs.

5. Understand care in current systems and contexts

- Use theory-informed, longitudinal and implementation-focused research to understand how infant feeding, relationships, wellbeing, workforce capacity, organisational culture, inequalities, digital environments and commercial determinants interact, and what works, for whom, how and under what circumstances.

Conclusion

ATTUNE provides a contemporary synthesis of a large and diverse evidence base alongside direct accounts from staff and parents in BFI-accredited services. Overall, the evidence supports the BFI standards and the practices and principles underpinning them. The findings demonstrate that infant feeding, responsive caregiving, parent-infant relationships, parental confidence and wellbeing are interconnected, and that the strongest care is practical, compassionate, individualised and continuous.

The study also demonstrates that standards do not implement themselves. Their impact depends on workforce capacity, leadership, organisational culture, cross-service collaboration, inclusive practice, independent information, and systems for monitoring and improvement. BFI provides an important structure through which these elements can be brought together and sustained.

The central recommendation from ATTUNE is therefore to continue and invest in the UNICEF UK BFI, while supporting it to remain evidence-responsive and capable of adapting to changing family needs and care contexts. The next phase of BFI should build on its established strengths while deepening its focus on sustainability, equity, family inclusion, emotional wellbeing, continuity, digital and commercial environments, and continuous quality improvement. In doing so, BFI can continue to provide a coherent system-wide framework for improving infant feeding and relationship-centred care and for supporting better experiences and outcomes for infants, parents and families.

ATTUNE STUDY



Chapter One: Background

The UNICEF UK Baby Friendly Initiative (BFI) is a globally recognised quality improvement programme that supports the implementation of evidence-based practices to promote infant health, wellbeing, and early parent–infant relationships, helping babies to receive the best possible start in life. The programme also aligns with a child-rights approach, including the United Nations Convention on the Rights of the Child (UNCRC), which recognises every child's right to the highest attainable standard of health. BFI supports this through promoting evidence-based care, appropriate nutrition, responsive caregiving and environments that support infant health and development. The BFI standards provide a framework for maternity, neonatal, hospital-based children's services, community services and universities to deliver consistent, high-quality care that places babies and their families at the centre of service provision. Key areas of focus include promoting responsive caregiving and feeding practices, supporting parents to develop close and loving relationships with their babies, facilitating skin-to-skin contact, enabling parents and babies to remain together whenever possible, and ensuring that parents receive the information and support needed to care for their infant. The programme also emphasises workforce development, leadership, and organisational culture change to embed partnership working with parents and create environments in which parents feel informed, supported and empowered in their parenting journey. Please see Table 1 for an overview of the BFI standards:

Table 1: *Overview of the UNICEF UK BFI standards (2026)*

Overview of the UNICEF UK BFI standards

Building a firm foundation

1. Have written policies and guidelines to support the standards.
2. Plan an education programme that will allow staff to implement the standards according to their role.
3. Have processes for implementing, auditing and evaluating the standards.
4. Ensure that there is no promotion of breastmilk substitutes, bottles, teats or dummies in any part of the facility or by any of the staff.

An educated workforce

Educate staff to implement the standards according to their role and the service provided.

Parents' experiences of…

Maternity services

1. Support those who are pregnant to recognise the importance of breastfeeding and early relationships for the health and wellbeing of their baby.
2. Support all mothers and babies to initiate a close relationship and feeding soon after birth.
3. Enable mothers to get breastfeeding off to a good start.
4. Support mothers to make informed decisions regarding the introduction of food or fluids other than breastmilk.
5. Support parents to have a close and loving relationship with their baby.

Neonatal units

1. Support parents to have a close and loving relationship with their baby.
2. Enable babies to receive breastmilk and to breastfeed when possible.
3. Value parents as partners in care.

Community services

1. Support those who are pregnant to understand the evidence for breastfeeding and early relationships and their influence on the health and wellbeing of them and their baby.
2. Protect and support breastfeeding in all aspects of the service and enable mothers to continue breastfeeding for as long as they wish.
3. Support parents to make informed decisions regarding the introduction of food or fluids other than breastmilk.
4. Support parents to have a close and loving relationship with their baby.

Hospital-based children's services

1. Enable babies to continue to breastfeed and/or receive breastmilk when possible.
2. Implement evidence-based practices related to giving foods or fluids other than breastmilk.
3. Support close and loving relationships and value parents as partners in care.

Universities

1. Make a written commitment to adhere to the Baby Friendly standards.
2. Ensure all students are equipped with the knowledge and skills to implement the Baby Friendly learning outcomes in the relevant healthcare settings.
3. Provide teaching without involvement, sponsorship or promotional materials from companies covered by the International Code of Marketing of Breastmilk Substitutes (the Code).

While the UNICEF UK BFI encompasses wider aspects of infant feeding, responsive care and early parent–infant relationships, breastfeeding remains a core component of the programme and was the foundation on which both the original Baby Friendly Hospital Initiative (BFHI) and the subsequent UNICEF UK BFI were developed. For this reason, the following section first outlines the evidence relating to breastfeeding

and its implications for infant, maternal and public health before considering the historical development and evolution of the Baby Friendly standards.

Importance of breastfeeding

Breastfeeding is widely recognised as an important public health intervention with benefits for infants, mothers, health and social care systems and the wider society (1). For infants, the strongest evidence relates to nutrition, immune protection and reduced risk of infectious illness (2). Human milk contains immunological and anti-inflammatory properties, as well as other bioactive components, that support infant health and development (3). These components also contribute to the establishment and maturation of the infant gut microbiome, which plays a key role in immune function, protection against infection and metabolic regulation. Such properties make human milk particularly important for vulnerable infants, including those born preterm or requiring specialist care, where it helps protect against infection and serious complications while supporting longer-term developmental outcomes and reduces risk of hospitalisation and overall morbidity (2). Human milk, particularly mother's own milk, is associated with reduced morbidity including necrotising enterocolitis (NEC), late-onset sepsis and retinopathy of prematurity (ROP) in very low-birthweight infants (4). Donor human milk also reduces the risk of NEC compared with formula when mother's own milk is unavailable or insufficient, although evidence for effects on late-onset infection and other morbidities is less consistent (5)

Breastfeeding has also been associated with lower risks of obesity (6) and type 2 diabetes (7) in later life. The evidence regarding the protective effect of breastfeeding on allergic disease is less certain; whilst there is some evidence that breastfeeding is protective for asthma in children up to 18 years, evidence for a protective effect for eczema and allergic rhinitis is weaker (2, 8). Emerging evidence suggests that breastfeeding may also provide opportunities for physiological and emotional co-regulation through close and responsive mother–infant interaction, recognised as important for early infant development and self-regulation (9). Research suggests an association between breastfeeding and improved cognitive, neurological and behavioural outcomes (3). However, longitudinal research has shown that these associations may be substantially reduced after adjustment for socioeconomic position and maternal cognitive ability, suggesting that breastfeeding may have only modest independent effects on cognitive development (10). Furthermore, although maternal diet appears to influence specific components of breast milk, particularly fatty acids and selected micronutrients, evidence that these compositional differences substantially alter the overall nutritional adequacy of breast milk or lead to meaningful improvements in infant health outcomes remains limited (11, 12). This is due to much of the evidence base being observational, heterogeneous, and subject to confounding variables. Breastfeeding is consistently associated with a reduced risk of SIDS, with evidence of a duration-response relationship and greater reductions in risk associated with longer breastfeeding duration (13).

For mothers, breastfeeding is associated with a range of health benefits. Epidemiological evidence links breastfeeding with lower risks of hypertension (14), cardiovascular disease and cardiovascular risk factors (15), type 2 diabetes (16), breast cancer (17), and ovarian cancer (18). Breastfeeding stimulates the release of oxytocin in both mother and infant, a hormone associated with caregiving behaviours, stress reduction, and social bonding. Although breastfeeding is not necessary for the

development of secure parent–infant attachment, it provides valuable opportunities for sensitive, responsive caregiving that can support relationship building (19). Similarly, responsive bottle feeding has potential benefits for maternal sensitivity to infant cues (20).Overall, the relationship between breastfeeding and parental mental health is complex and bidirectional (21). Some evidence suggests that positive breastfeeding experiences may contribute to maternal wellbeing, bonding and reduced stress, whereas difficulties with breastfeeding can negatively affect emotional wellbeing such as increased postnatal depression (21). Maternal mental health may also influence breastfeeding initiation and continuation, with factors such as depression, trauma and social support shaping both feeding experiences and psychological outcomes (22). As sensitive, responsive caregiving is considered the key determinant of healthy parent–infant attachment, regardless of feeding method (23-25), this highlights the importance of providing responsive, individualised infant feeding support that promotes both parental wellbeing and feeding goals. Breastfeeding difficulties, particularly when expectations are not met and support is inadequate, can negatively affect maternal mental health (26). Low breastfeeding rates also have economic implications with UK modelling estimating that increasing breastfeeding rates could generate significant NHS savings through reductions in the incidence of five maternal and infant illnesses (27).

Changing breastfeeding practices and the emergence of the Baby Friendly Initiative

Breastfeeding was the norm in the UK until the late 19th and early 20th centuries. However, throughout the 20th century breastfeeding rates declined substantially due to a combination of factors, including increasing medicalisation of childbirth and infant care, the growing availability and marketing of infant formula, changing social norms, changes in women's participation in paid employment and working patterns, and reduced opportunities for women to breastfeed within increasingly hospital-based maternity services. By the 1970s, breastfeeding initiation and duration rates in the UK were among the lowest in Europe (28).

In response to a global reduction in breastfeeding rates, the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI) was launched in 1991. This is a global accreditation programme with maternity services externally assessed against evidence-based standards - BFHI accreditation is achieved when services demonstrate that the required policies, training, and practices are in place. The BFHI was built around the Ten Steps to Successful Breastfeeding, first outlined in the joint WHO/UNICEF statement Protecting, Promoting and Supporting Breastfeeding[2]. The original Ten Steps focused on ensuring that healthcare organisations had policies and practices in place to support breastfeeding, including staff training, antenatal education, early initiation of breastfeeding, exclusive breastfeeding, routinely keeping parents and babies together (rooming-in), feeding on demand, and post-discharge support. Compliance with the International Code of Marketing of Breast-milk Substitutes (referred to as the Code)[3] was also incorporated to reduce the influence of infant formula marketing on infant feeding decisions[4]. Since its introduction, the BFHI has been implemented in more than 150 countries and is one of the most influential global public health initiatives that supports infant feeding. Over the following three decades,

[2] Protecting, promoting and supporting breast-feeding
[3] International Code of Marketing of Breast-Milk Substitutes
[4] Marketing of breast-milk substitutes: national implementation of the International Code, status report 2026

practices promoted through Baby Friendly, including skin-to-skin contact, keeping mothers and babies together and responsive feeding, have become increasingly embedded within routine maternity care.

In the UK, the UNICEF UK Baby Friendly Initiative was established in 1994 and initially adopted the WHO/UNICEF Ten Steps framework. While the BFHI was originally designed for hospitals, in the UK it has been expanded to enable system change across the wider health system structure, extending across maternity, neonatal, hospital-based children's services, community services[5] and universities - hence why it was named the BFI, rather than the BFHI. Following a major review undertaken by the UNICEF UK BFI team in 2012 (29), the BFI standards have evolved beyond the original BFHI model. While the Ten Steps still underpin the award, the UNICEF UK standards place greater emphasis on relationship-building, responsive feeding, parental wellbeing, and support for all families (an overview of key differences is presented in Table 2).

Table 2: *Summary of key differences between the global BFHI and the UNICEF UK BFI standards*

Global BFHI	**UNICEF UK BFI**
Primary focus on breastfeeding protection, promotion and support	Broader focus on infant feeding and parent-infant relationships
Based on Ten Steps and Code compliance	Retains Code compliance and Ten Steps but extends them considerably
Mainly maternity and hospital settings	Maternity, neonatal, hospital-based children's services, community services and universities
Breastfeeding-centred	Supports breastfeeding and also supports the needs of parents who use infant formula
Limited explicit focus on attachment and bonding	Strong emphasis on relationship building, attachment and responsiveness
Focus on breastfeeding practices	Includes responsive feeding, emotional wellbeing and personalised conversations

This transformational change in the BFI standards broadened the scope of infant feeding support by adopting a relationship-centred approach that places parent–infant relationships at its core. Although breastfeeding remains a key focus, the standards also emphasise providing appropriate guidance for families who use infant formula, ensuring that feeding is undertaken responsively and as safely as possible.

The UNICEF UK BFI 2012 review highlighted three factors. First, the importance of positive and reciprocal social interactions between mother and infant recognised as fundamental to infant mental health, stimulating infant neural pathways, supporting brain development and promoting secure attachment. Second, how person-centred communication can optimise infant feeding practices while supporting maternal mental health. Third, there is a need to engage service-users and staff in a participatory and collaborative approach when implementing the BFI. Collectively, these changes extended the original Baby Friendly philosophy beyond breastfeeding alone,

[5] Community services encompass health visiting, family hubs, children's centres and other early years provision.

strengthening the emphasis on early relationships, responsive care, and informed, safe feeding support for all families.

Another defining feature of the UNICEF UK BFI is the Achieving Sustainability (also referred to as Gold) Award, which recognises services that have moved beyond implementing the BFI standards to embed them within organisational systems, culture and leadership so that high-quality care can be sustained over time (see Table 3). Rather than focusing solely on clinical practice, the Gold Award assesses whether organisations have established the infrastructure needed to maintain and continually improve BFI care in the face of workforce changes, service pressures and evolving evidence. The standards are organised around four interdependent themes: Leadership, ensuring clear accountability and strategic commitment; Culture, fostering an organisational environment that values and supports BFI practices; Monitoring, using robust audit, data and quality improvement processes to drive ongoing improvement; and Progression, demonstrating continuous learning, innovation and integrated working to improve outcomes for babies and families (see Table 3). These themes are designed to ensure that BFI principles become embedded as routine practice rather than relying on individual champions or periodic accreditation activities. This approach may also offer wider learning for maternity service improvement, demonstrating how evidence-based standards can be translated into practice and sustained through leadership, workforce development, organisational ownership, monitoring and continuous quality improvement.

Table 3: *Overview of the Achieving Sustainability standards for general services and universities (2026)*

Overview of the Achieving Sustainability standards	
GENERAL SERVICES	**UNIVERSITIES**
Theme 1: Leadership | Develop a leadership team that promotes the standards 1. There is a named Baby Friendly Lead / team with sufficient knowledge, skills and hours to meet their objectives 2. There is a mechanism for the Baby Friendly Lead / team to remain up-to-date with their education and skills. 3. A Baby Friendly Guardian with sufficient seniority and engagement is in post 4. The leadership structures support proportionate responsibility and accountability 5. All relevant managers are educated to support the maintenance of the standards.	**Theme 1: Leadership | There is a whole team approach to embedding the Baby Friendly learning outcomes** 1. There is a named Baby Friendly project lead lecturer 2. All lecturers are educated to deliver the Baby Friendly learning outcomes 3. All relevant senior staff are educated to support the Baby Friendly process 4. Leadership structures support proportionate responsibility and accountability 5. A Baby Friendly Guardian with sufficient seniority and engagement is in post 6. Within the department, staff and students adhere to the International Code of Marketing of Breastmilk Substitutes (The Code).
Theme 2: Culture | Foster an organisational culture that protects the standards	**Theme 2: Culture | Foster an organisational culture that protects the standards and learning outcomes**

1. There is support for ongoing staff learning 2. There are mechanisms in place to support a broad positive culture, e.g. staff recognition schemes, mechanisms for staff to feedback concerns, and systems to enable feedback from parents and families to be heard and acted upon.	1. The university has a process for ongoing staff learning 2. There are mechanisms in place to support a positive culture for staff and students, e.g. recognition schemes, collaboration with student unions, mechanisms for feedback concerns, and systems to enable feedback to be heard and acted upon as well as support for staff/students returning to work/study. 3. There is collaboration and interprofessional learning with other programmes/departments 4. There are good working relationships with practice learning partners and service users.
Theme 3: Monitoring | Construct robust monitoring processes to support the standards Mechanisms exist to ensure that: 1. Baby Friendly audits are carried out regularly according to service needs 2. All relevant data is available and is accessed 3. Data is analysed effectively and collectively to give an overall picture 4. Action plans are developed in response to findings 5. Relevant data is routinely reported to the leadership team 6. Relevant data is routinely reported to UNICEF UK.	**Theme 3: Monitoring | Construct robust monitoring processes to support the Baby Friendly learning outcomes** Mechanisms exist to ensure that: 1. Baby Friendly audits are carried out regularly according to need 2. Audit results are analysed to identify gaps in teaching, learning and assessment 3. Student evaluation includes the Baby Friendly learning outcomes 4. Action plans are developed in response to findings 5. Relevant data is routinely reported to UNICEF UK.
Theme 4: Progression | Continue to develop the service in order to sustain the standards 1. The service demonstrates innovation and progress 2. There is evidence to demonstrate that outcomes have improved 3. The needs of babies, their mothers and families are met through effective integrated working.	**Theme 4: Progression | Sustain and develop the Baby Friendly Initiative within the university** 1. The university demonstrates innovation in order to enhance the teaching, learning and assessment related to the Baby Friendly learning outcomes 2. The university demonstrates innovation in order to improve outcomes for students and staff.

Current landscape of infant feeding and health care in the UK

Breastfeeding rates in the UK have increased over the decades. For example, in Great Britain, breastfeeding initiation rates increased from 64% in 1985 to 81% in 2010, while the proportion of mothers continuing to breastfeed from one to six weeks increased from 70% to 80% over the same period (30, 31) The most recent Infant Feeding Survey

(IFS)[6] in England reported that more than 4 in 5 mothers (86%) initiated breastfeeding[7], and that 80% of mothers were still breastfeeding at 2 weeks, and 71% at six weeks[8]. Overall, however, data across the four UK nations indicate that breastfeeding continuation and exclusive breastfeeding rates remain well below levels required to meet World Health Organisation recommendations for exclusive breastfeeding during the first six months of life [9]. While differences in data collection methods limit direct comparisons between the four nations, in England, the 2024 IFS[10] reported that 26% of infants were exclusively breastfed at six months. The most recent data for Wales[11] and Northern Ireland[12] report *any* breastfeeding at six months, with rates of approximately 32% and 22.4%, respectively. Scotland[13] does not routinely report breastfeeding prevalence at six months; however, 34% of infants were exclusively breastfed at the 2025 6–8-week review. These data sets as well as wider evidence highlights persistent socioeconomic and geographical variations, with older mothers, those living in less deprived areas, and mothers from Black, Asian and other minority ethnic backgrounds being more likely to initiate and continue breastfeeding (32).

Many women continue to experience difficulties that affect breastfeeding continuation, including pain, concerns about milk supply, challenges with positioning and attachment, fatigue, and balancing breastfeeding alongside family, employment, and caring responsibilities (33). A recent study exploring associations of mixed feeding and lactation problems with early breastfeeding cessation amongst 1,974 mothers (34) found that lactation problems <2 weeks post-birth were common (65%) and strongly associated with breastfeeding cessation. Furthermore, mothers who planned to mixed feed or to introduce infant formula were more likely to report perceived milk insufficiency and to stop breastfeeding before 6-8 weeks (34). Findings from the recent IFS[14] highlight that around 7 in 10 mothers (72%) who stopped breastfeeding by the time their baby was 4 to 6 months old said they would have liked to breastfeed for longer. Parents also continue to report variable experiences of infant feeding support across services (33, 35), and concerns have been raised regarding the ongoing influence of commercial milk formula marketing practices, particularly through digital and social media platforms, which can undermine parental confidence and informed decision-making (36, 37).

Currently, maternity, neonatal and health visiting services across the UK are facing significant workforce shortages, increasing service demand, and ongoing financial pressures[15,16]. Services are caring for a population with increasingly complex needs, including rising rates of maternal obesity, advanced maternal age, multiple long-term

[6] The UK Infant Feeding Survey (IFS), conducted every five years until 2010, was the principal source of comparable infant feeding data across the UK. Since then, no equivalent UK-wide survey has been undertaken, with each nation using different routine surveillance systems to monitor infant feeding. In England, a new national Infant Feeding Survey was commissioned in 2023 (with findings published in 2026); however, it is not directly comparable with the earlier UK-wide surveys and does not provide equivalent data for the other UK nations
[7] Assessed as putting their baby to the breast or gave expressed breast milk at least once.
[8] Infant feeding survey 2024: summary of main findings - GOV.UK
[9] Exclusive breastfeeding for the first 6 months of life (no other food or drink, except medicines or vitamins if needed). Continued breastfeeding alongside appropriate complementary foods until 2 years of age or beyond. WHO (2023) Infant and young child feeding
[10] Infant feeding survey 2024: summary of main findings - GOV.UK
[11] Breastfeeding data: 2024 GOV.WALES
[12] Health Intelligence Briefing Breastfeeding 2024 FINAL.pdf
[13] Infant feeding statistics - Financial year 2024 to 2025 - Infant feeding statistics - Publications - Public Health Scotland
[14] Infant feeding survey 2024: summary of main findings - GOV.UK
[15] Royal College of Midwives - State of Maternity Services 2023
[16] NHS Long Term Workforce Plan

health conditions, mental health difficulties, and socioeconomic disadvantage (38, 39). Rising caesarean section rates have increased the number of women requiring enhanced postnatal support for physical recovery, infant care, and feeding (40). There has also been growing recognition of birth trauma and its longer-term psychological consequences, increasing demand for postnatal mental health support (41). Despite strong evidence supporting continuity of care models (42), workforce shortages and service pressures have led to the reduction or suspension of many continuity programmes[17,18]. Within health visiting services, workforce reductions and increasing caseloads have similarly constrained opportunities for relationship-based care, early intervention, and personalised support[19].

Since the National Maternity Review report - Better Births: Improving outcomes of maternity services in England - in 2016[20], maternity and neonatal services have been subject to numerous national reviews, investigations and improvement programmes, including the Morecambe Bay Investigation (2015)[21], the Ockenden Review of maternity services at Shrewsbury and Telford (2022)[22], the East Kent Maternity and Neonatal Services Investigation (2022)[23], review of maternity services in Northern Ireland (2024)[24], the Nottingham Maternity Review (2026)[25], the National Maternity and Neonatal Investigation (2026)[26] and the Thirlwall Inquiry (2026)[27], alongside repeated national inspections by the Care Quality Commission, Healthcare Improvement Scotland, and successive MBRRACE-UK confidential enquiries into maternal deaths and morbidity. Together, these reports have highlighted recurring concerns relating to safety, communication failures, women not being listened to, fragmented care, inadequate staffing, poor continuity, and a lack of compassionate, person-centred care. MBRRACE-UK has also consistently highlighted persistent inequalities in maternity care, with women from Black and Asian ethnic backgrounds and those living in the most deprived areas experiencing disproportionately poorer maternal outcomes, emphasising the need for equitable, personalised and culturally responsive care alongside improved communication, continuity and multidisciplinary working (43).

These wider system pressures provide important context for understanding how the BFI standards are implemented and experienced in practice. It is also important to reflect that these challenges exist despite policy initiatives that aim to improve maternity and infant outcomes. The NHS Long Term Plan[28] represented a significant milestone for the UNICEF UK Baby Friendly Initiative, recommending that maternity services implement an accredited, evidence-based infant feeding programme, such as BFI. This provided important national recognition of the programme and strengthened support for services working towards accreditation. Subsequently, the NHS England Three-Year Delivery Plan for Maternity and Neonatal Services[29], reaffirmed commitments to personalised care, continuity, equity, safety, infant feeding support,

[17] Royal College of Midwifery - Continuity of carer
[18] NHS England » Continuity of carer
[19] Health Visiting in England - A vision for the future
[20] NHS England - Better Births National Maternity Review
[21] Morecambe Bay Investigation: Report - GOV.UK
[22] Final report of the Ockenden review - GOV.UK
[23] Maternity and neonatal services in East Kent: 'Reading the signals' report - GOV.UK
[24] Enabling Safe Quality Midwifery Services and Care In Northern Ireland | Department of Health
[25] Ockenden review into maternity services at Nottingham University Hospitals NHS Trust: final report - GOV.UK
[26] Final Reports - National Maternity and Neonatal Investigation
[27] The Report | The Thirlwall Inquiry
[28] NHS Long Term Plan
[29] NHS England - Three year delivery plan for maternity and neonatal services

and enhanced postnatal care. Similarly, the Women's Health Strategy for England[30], subsequently renewed in 2026[31], emphasises the importance of listening to women's experiences and improving access to postnatal services and support. These ambitions are also reflected within the NICE Postnatal Care Guideline[32] and the Healthy Child Programme[33], both of which advocate for evidence-based infant feeding support, informed decision-making, continuity of care, and early intervention for women and families. Across the devolved nations, similar commitments are evident within national policy. Scotland's Breastfeeding and Infant Feeding Strategic Framework 2025–2030[34] identifies the UNICEF UK BFI as the national framework for improving infant feeding support. In Wales, BFI principles are embedded within national maternity and neonatal standards and wider maternity policy. In Northern Ireland, the Breastfeeding – A Great Start[35] reaffirmed the importance of maintaining and building on progress made through BFI implementation.

The ATTUNE study was undertaken within this context to examine the ongoing relevance, effectiveness and contribution of the UNICEF UK BFI to systems change and improvements in parent and infant health. The study aimed to understand the evidence underpinning the BFI standards, as well as how the standards are interpreted, implemented, experienced and sustained within complex healthcare systems. It sought to identify opportunities to strengthen and sustain good practice while identifying the contextual factors that shape both care provision and families' experiences of support. The study comprised two interconnected workstreams: (a) a series of rapid integrative literature reviews and (b) exploratory case studies examining the implementation of, and experiences with, the programme in practice.

It is also important to note that this work extends beyond simply aligning evidence with the existing BFI standards. Specifically, it involved:

- examining the evidence relating to practices promoted within the BFI standards (e.g. skin-to-skin care, Code implementation, antenatal education and infant feeding support, etc);
- identifying the experiences and impacts of these practices on infants, parents and healthcare professionals; and
- exploring the contextual factors that influence implementation.

Because the BFI operates within a wider system of infant feeding support, this work adopted a broader perspective. While the BFI provides an evidence-based framework that can contribute to the culture, conditions and consistency needed to support responsive evidence-based care, its implementation and impact are shaped by policy, leadership, workforce, organisational, sociocultural and community contexts. Although case study sites were selected on the basis that their maternity services had achieved the UNICEF UK BFI Achieving Sustainability (also referred to as the Gold Award), recognising their commitment to embedding Baby Friendly principles within organisational systems and culture, other areas of practice (including neonatal, health visiting and community services) were not required to have achieved the same level of accreditation and were at varying stages of implementation. This reflects the reality

[30] Women's Health Strategy for England - GOV.UK
[31] The Renewed Women's Health Strategy for England
[32] NICE - Postnatal care guidance
[33] Department of Health and Social Care - Healthy child programme
[34] Scottish Government - Breastfeeding and infant feeding: strategic framework 2025-2030
[35] Department of Health - Strategy for breastfeeding in Northern Ireland

that infant feeding support is delivered across multiple services with differing organisational contexts, priorities and levels of Baby Friendly implementation. Therefore, this study examines the evidence relating to practices reflected within the standards and their associated outcomes, as well as the organisational, environmental, sociocultural and economic factors that influence infant feeding support. The review chapters also identify key limitations within the current evidence base and priorities for future research. As such, the findings have implications not only for the implementation and delivery of care, but also for service planning, policy development, quality improvement and future research, making them relevant to commissioners, infant feeding leads, clinicians, researchers and academics.

ATTUNE STUDY

2

Chapter Two: Methodology

Research aim and objectives

Aim: To evaluate the evidence for and impact of the UNICEF UK Baby Friendly Initiative.

Objectives:

1. To synthesise existing evidence that underpins the UNICEF UK BFI standards
2. To identify the impact of UNICEF UK BFI standards on outcomes for parents, health care/community professionals, and infants in the early years.
3. To explore stakeholders' (health care/community professionals and parents) views and experiences of the UNICEF UK BFI.
4. To understand the challenges of implementing UNICEF UK BFI in maternity, neonatal, hospital-based children's services, community services and universities.
5. To identify best practice, gaps, and recommendations within each of the areas underpinning BFI standards as appropriate.
6. To produce a digitally enabled report linked to other relevant sector's improvement tools to support others to adopt a child rights focus.

Methods

An overview of the two work packages is detailed as follows:

Work Package one: Series of integrative literature reviews

A series of literature reviews using systematic searching methods were undertaken. Due to the time restrictions of the study, and the wealth of literature identified, a pragmatic approach evolved over time to ensure that key literature was being captured. The approach adopted constitutes a rapid evidence review (44, 45) while recognising that the included literature was not exhaustive. This approach is also in line with the digitally enabled nature of the report designed to be amended and adapted overtime. These pragmatic decisions mean that the review should be interpreted as a broad contemporary evidence synthesis rather than an exhaustive systematic review

Search strategy

The following databases were searched between 30th September and 4th October 2024: Medline (Ovid), Embase (Ovid), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), SocINDEX (EBSCOhost), Cochrane Library all databases (via Wiley). Initially, separate searches were conducted for the following key topics:

- Antenatal Care
- Early/hospital-based or community-based infant feeding support
- Skin-to-skin contact

- Rooming-in
- Neonatal
- Responsive feeding
- International Code of Marketing of Breast-milk Substitutes
- Workforce Education

Following screening of the search results it became apparent that some key search terms for baby-led weaning and couplet care had not been included and therefore two supplementary searches were conducted for these topics on 21st March 2025 and 9th April 2025 respectively.

A further search for the topic of infant feeding and attachment was subsequently conducted on 11th June 2025 to capture evidence related to the UNICEF UK BFI close and loving relationships standards.

We also captured literature on parents lived experiences of practices underpinning the BFI standards, including infant feeding support. We did not undertake a separate search for this literature, as qualitative studies were captured through the existing searches across the different review topics. Qualitative findings relevant to specific BFI standards were included and synthesised within the corresponding chapters. In addition, qualitative evidence identified across the reviews was brought together in a separate review chapter exploring parents' motivations and experiences of infant feeding. This synthesis helped to situate the challenges parents face and contextualise the role of the UNICEF UK Baby Friendly Initiative in addressing these challenges.

Subject headings and keywords relevant to each topic were identified by the review team using the PEO (Population; Exposure; Outcomes/themes) structure. To ensure we included evidence that was relevant to the UK context, search terms for each topic were combined with an adapted version of the NICE OECD countries' geographic search[36] filter to identify literature from high-income countries. The search filter was modified to exclude any countries not classified as high-income by the World Bank and to include other high-income countries that are not part of the OECD. The search strategies were developed by an Information Specialist (CH) and supported by the study leads (GT, VM) and were adapted for each database. Searches were limited by date to 2012 onwards to capture literature published since the 2012 evidence review of the BFI standards[37]. The searches were not restricted by language or any other limiters. The full search strategies for each topic and each database are detailed in Appendix 2.

Other search methods involved drawing on available expertise, such as consulting with Professor Helen Ball, a known expert in the field of bed-sharing, and members of the Healthy Children's Faculty in America, known experts in the field of skin-to-skin contact (and authors of the most recent Cochrane review on the topic) to help identify relevant and methodologically robust literature in their expert fields.

As the work progressed, the UNICEF UK-BFI team asked for additional evidence on related issues such as donor milk and other relevant emerging issues (which supported, but were not a standard *per se*), such as the influence of the digital

[36] The NICE OECD countries' geographic search filters: Part 1—methodology for developing the draft MEDLINE and Embase (Ovid) filters | Journal of the Medical Library Association
[37] UNICEF UK BFI - Evidence and rationale for the Baby Friendly Initiative

environment and social media and how mobile phone use may interfere with infant feeding. As there were limited resources for this additional work, the searches were restricted to using keyword search strings on Google Scholar and screening the first 500 retrieved results for any relevant papers.

Inclusion criteria

Only studies involving parents of live infants or maternity care professionals that investigated an intervention or exposure underpinning the UNICEF UK Baby Friendly Initiative (BFI) standards were included. The full inclusion and exclusion criteria are listed below according to the PEO (Population; Exposure; Outcomes/themes) framework:

Population	Parents of a live infant(s) aged up to 12 months. Maternity care staff including medical doctors (e.g. obstetricians, anaesthetists, physicians, family doctors), midwives, nurses, health visitors, peer supporters, academic staff, students.
Exposure	Exposures or interventions which underpin the UNICEF UK Baby Friendly Initiative (BFI) best practice standards, such as antenatal infant feeding support, early or hospital-based or community-based infant feeding support, skin-to-skin contact, rooming-in, responsive feeding, baby-led weaning, adherence to or implementation of the International Code of Marketing of Breast-milk Substitutes, workforce education.
Outcomes	Outcomes included breastfeeding initiation and continuation rates, exclusive/any breastfeeding rates, infant health outcomes, lived experiences of parents or staff, parent and infant relationships, parent and staff confidence and wellbeing, staff confidence, knowledge and attitudes towards breastfeeding, barriers and facilitators, organisational culture and practices, competence.
Context	Studies conducted in the UK or high-income settings.
Study type	Published papers of any study design were included. Conference abstracts, editorials, book chapters, dissertations or theses, and grey literature were excluded.

Study selection

Results from each database search were downloaded into EndNote software which was used to remove duplicates before importing the deduplicated records into Rayyan software for screening. Titles and abstracts of most of the records were independently screened by two reviewers working in pairs. Any disagreements were discussed and resolved with a third reviewer. However, for the attachment topic, 60% of the records were independently screened by two reviewers with the remaining records screened by a single reviewer due to constraints on time and capacity. Papers included at the title and abstract stage were labelled according to the topic and systematic reviews were labelled separately.

Risk of bias (quality) assessment

Due to time constraints and the volume of included literature, papers were assessed for *relevance* and *rigour* by the reviewers during the full text screening process rather than using a standard quality appraisal framework:

> Relevance refers to the extent to which a study, finding, or piece of evidence meaningfully addresses the research question, context, population, or phenomenon under investigation.
>
> Rigour refers to the quality, thoroughness, transparency, and methodological soundness of the research process, ensuring that findings are credible, trustworthy, and well-supported.

Studies with insufficient methodological detail or limited rigour were generally excluded (e.g., systematic reviews that did not include a PRISMA[38] flowchart, case studies, quality improvement studies[39], qualitative studies that contained limited methodological detail).

Review caveats

The original intention was to conduct forward and backward citation checking on included studies to identify further relevant papers. However, given the very large number of studies identified through the database searches, it was felt neither practical nor feasible to do so. We were also unable to retrieve some non-open access full text papers published in certain journals (e.g., Breastfeeding Medicine), despite dedicated requests being made directly to the journals and/or individual authors. Additional relevant papers were also identified through expert recommendation from members of the wider project team, the Advisory Group (see below), and informal browsing of websites such as ResearchGate (and direct author requests) or Google Scholar.

In line with a pragmatic, rapid review approach, if there were areas where a high number of systematic reviews had been undertaken, our synthesis focused on these reviews only (e.g., skin-to-skin contact). We also adopted this approach for more peripheral but related areas, such as peer support. In other areas we drew on systematic reviews and prioritised higher quality methodologies such as randomised controlled trials. Overall, therefore, while the approach was flexible and iterative, the aim was to:

- Be as comprehensive as possible within the available time and resources.
- Prioritise the best available evidence, particularly systematic reviews, meta-analyses and randomised controlled trials, while acknowledging that the included evidence would not be exhaustive.
- Provide an overview of contemporary and high-quality research published from 2012 onwards.
- Identify important limitations and gaps in the current evidence base.
- Make evidence-informed recommendations for future research

[38] Preferred Reporting Items for Systematic reviews and Meta-Analyses

[39] The exceptions would be if they were UK quality improvement studies or were reporting on an area with very limited evidence.

Data extraction and synthesis

Data extraction and synthesis were supported by AI (ChatGPT and Copilot). This involved the AI tools providing summaries of individual papers, which were then manually checked against the original papers to ensure that key information had been accurately captured. The summaries were synthesised and written up by team members (GT, VM, LH, NC).

Similarly, AI was used to produce the table of characteristics for the included literature in each of the review areas, and this information was then checked by the team for accuracy and completeness against the original studies. AI was also used to help produce summary sections and to create infographics of the evidence base.

Work package 2: Case Studies

The second strand of work involved case studies being undertaken at four sites (i.e., NHS Trusts or Health Boards) in different geographical areas in the UK that were agreed with the UNICEF UK-BFI team. The intention was that the maternity service at each site would hold Achieving Sustainability (Gold) BFI status, while other services (e.g., neonatal, community services, universities) could be at different stages of BFI accreditation. This approach enabled exploration of parents' and staff's experiences of care within services implementing the BFI standards across different organisational and accreditation contexts.

The aim was to collect experiential-based accounts detailing the impact that the UNICEF UK BFI standards had on parents, infants, families, and healthcare/community professionals**.** This work constituted 'explanatory case studies' (46) to focus on identifying factors that impacted upon key outcomes (e.g., breastfeeding initiation and continuation, parent-infant relationships, parenting self-efficacy, staff confidence in providing support) to occur. We adopted a multi-faceted approach to data collection, detailed as follows:

Parent perspectives

Various approaches were used to capture parents' stories and experiences, with efforts made to ensure inclusivity by representing the views of those underserved in the wider literature. This work involved:

a) **Surveys***:* Posters and social media flyers/adverts were distributed that included a QR code and link to an online form (Survey Monkey). These were also translated into different languages, i.e. Arabic, Urdu, Polish, and Romanian. (See Appendix 3).

Participants were asked to answer one key question, as follows: "*We want you to tell us about your experiences of infant feeding support – you can do this by writing in the text box below and/or uploading files to share poems, drawings, photographs, or voice recordings. You can tell us as little or as much as you'd like, in whichever ways you like."*

As indicated above, we encouraged parents to provide their stories in multiple ways, such as using drawings, photographs, poems, words and voice notes, in their own language if they chose to. It was felt that these methods may help encourage parents to contribute based on personal preference, and without feeling pressured to provide long or detailed narratives, particularly for those with limited English skills. Basic and

pseudonymised demographics were also recorded including age (using age brackets), ethnicity (using top level classifications), parity, age of youngest child, whether they have (and are currently) breastfed their children, and postcode. Those who completed a survey were able to enter their name for a prize draw to win a £100 voucher.

b) ***Interviews****:* By working with the infant feeding leads (IFLs) and specialist maternity and health visiting teams, our plan was to purposively sample a group of parents (n=8-10) from each site to take part in an individual in-depth interview. We drew on stratified sampling to include the voices of those underrepresented in research and those more likely to experience structural inequalities, such as those who are younger, neurodivergent, live in areas of high deprivation, have complex needs, and from global majority backgrounds.

Interviews were held online (Microsoft Teams) and a detailed interview schedule (see Appendix 3) was used to explore parents lived experience of infant feeding support, and the meaning of this experience for parents, infants and their families. All parents were offered a £25 voucher to thank them for taking part.

Health care/community professionals

In discussion with the IFLs (at each case study site), group and individual online (via Microsoft Teams) interviews were held with different health care/community staff with the intention of recruiting and interviewing approximately 8-10 participants per site. Participants included commissioners, midwives (including student midwives), health visitors, neonatal staff, Family Hubs/Children Centre staff, Maternity & Neonatal Voice Partnership (MNVP) representatives, peer supporters, breastfeeding champions and BFI guardians, who had responsibility for and/or aware of UNICEF UK BFI implementation. We also actively recruited health/community staff who were not directly involved in BFI implementation to understand the impact of the standards on their professional practice and wider service provision.

Based on experience and conversations with Research & Development teams at different NHS Trusts, and to encourage participation (particularly when it is difficult to find time to be released for research-related activities), all staff were offered a £25 voucher to take part. Interviews explored health care/community professionals' experiences of the BFI standards, perceived impact on staff as well as parents, how inequalities are addressed, barriers and facilitators to implementation and any suggestions or recommendations to change or adapt the BFI (see Appendix 4).

Existing infant feeding/evaluation/audit data

To help contextualise the case studies, we liaised with IFLs and relevant maternity staff to capture any existing feedback from parents, such as local and anonymous peer support evaluations, and any relevant data capture as part of the BFI audits (see Appendix 5).

Participant recruitment and eligibility

Parent recruitment

a) Surveys - posters (with a link/QR code to the survey) were displayed in key locations, such as antenatal and postnatal clinics, neonatal unit, Family Hubs/Children's Centres (e.g., breastfeeding groups, baby massage), and shared by

MNVPs. Social media adverts/flyers were posted on Trust-based service user groups and wider parenting forums (as appropriate).
b) Parent interviews - parents were approached by health care staff, provided with a short information sheet, and asked if they were happy for an electronic agreement to contact form (via a link or QR code) to be completed that provided their name, eligibility questions and contact details. Once this information was received, the research team contacted the parent to: a) inform them that they were not eligible to take part; or b) provide a detailed information sheet and consent form, asking the parent to respond within 7 days if they were willing to participate. Two reminders were issued at fortnightly intervals as necessary.

Health/community staff recruitment

We worked closely with IFLs at the case study sites to identify suitable staff (and dissemination approaches). Staff members were sent an invitation email, information sheet and consent form, and the staff member asked to respond within a week if they were willing to participate. Two reminders were issued at fortnightly intervals as necessary.

Inclusion Criteria

Parents

- Had a live baby within the previous 24 months.
- Received infant feeding support from one of four identified NHS Trust/community facilities.
- Aged 16+ years.

Staff

- Healthcare/community staff who work in the case study area and had been directly involved in BFI implementation.
- Healthcare/community/academic staff who work in the case study area who were aware of BFI implementation.

An overview of the ATTUNE study design is presented in Figure 2.

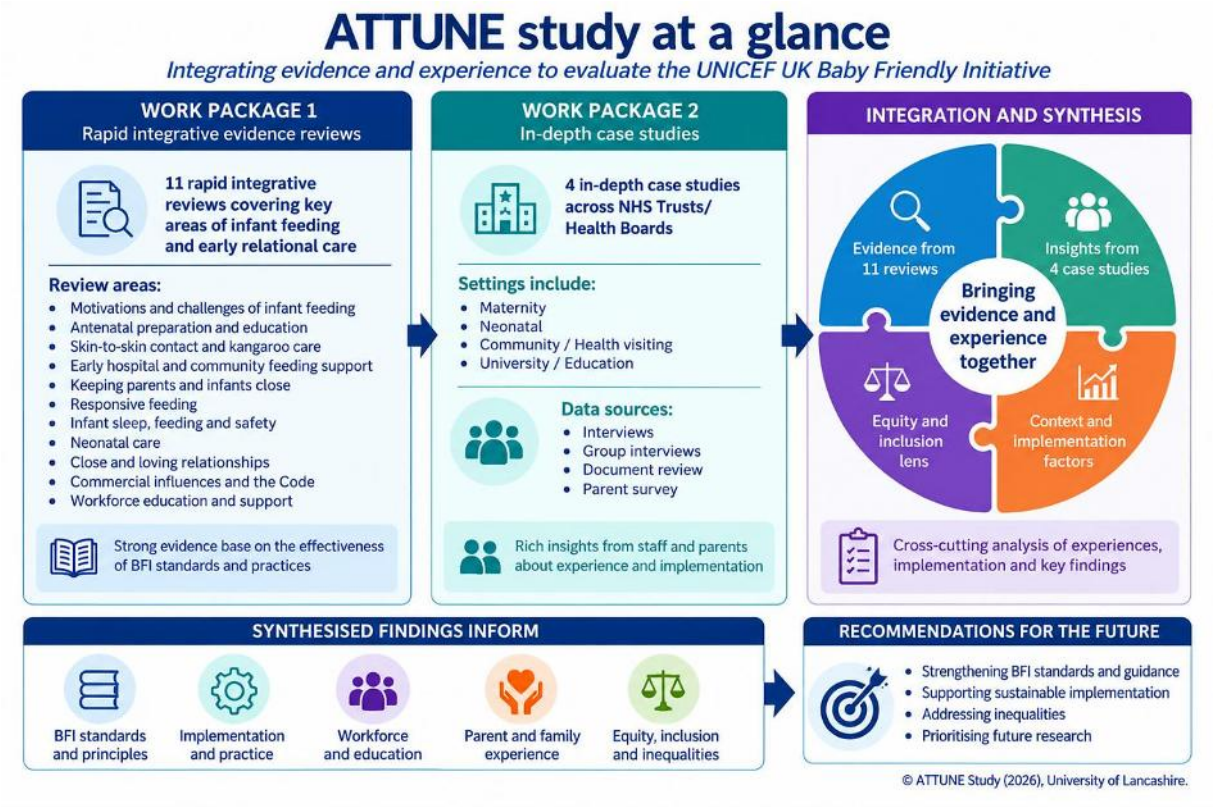


Figure 2: ATTUNE study design

Data transcription and analysis

Interview data was transcribed using Microsoft Team functionality and then checked and verified by the research staff. All the qualitative-based data (interviews, evaluation data, voice notes, poems, photos) was analysed using Nowell et al.'s (2017) thematic approach (47). This involved six phases: familiarisation with the data through repeated reading of transcripts; generation of initial codes; searching for patterns and themes across the dataset; reviewing and refining themes in relation to the coded extracts and overall dataset; defining and naming themes; and finally producing the written report.

Ethical and regulatory considerations

As we were collecting data within the NHS, ethics approval via the Integrated Research Application System (IRAS) was sought (project number 348668). R&D approval at each of the participating NHS Trusts was obtained. All research staff were fully aware of their obligations under the Data Protection Act and UK General Data Protection Regulations. Information as to how the University processes data was provided to all participants (in the participant information sheet). All members of the research team had accessed relevant training including Good Clinical Practice, Information Governance (April 2024) and Safeguarding Essentials (April 2024).

Participants were made aware that all information shared was confidential unless there were any disclosures of potential harm to themselves or their families, in which the research team had a duty of care to take further action (e.g., reporting to relevant statutory providers). Any account of poor practice or complaints were to be followed up (and in discussion with the participant), e.g., parents signposted to Parent Advisory Liaison service at the Trust, reports made to the heads of service, etc. If parents required additional infant feeding support, they were directed to relevant infant feeding staff and local support services. If any parents had become upset by their experience

and required additional emotional support, they would have been advised to contact their health visitor or GP.

Consent was obtained on all occasions. Participants who completed the survey were asked to check consent statements as part of the online form. Participants who took part in an online individual interview were sent an electronic version of the consent form. At the start of the interview, the consent statements were read out by the researcher, and participants were asked to provide agreement to each. On occasions where a group meeting was possible, an online consent form was issued for individuals to complete ahead of the meeting.

All data management and processing complied with requirements of the Data Protection Act 1998. All personal data (i.e., names and contact details of interview participants) were kept in university secure IT folders and stored separately from interview data, with all data files linked by a participant code. All interview recordings were downloaded from Microsoft Teams and stored in secure University of Lancashire folders and the recording deleted from Microsoft Teams. Once the transcript had been checked, the audio (and video) recording was deleted. Survey monkey was used as the online survey platform. Once data collection ceased, the data was downloaded and stored on excel files, and the QR codes/IT links deleted. All personal data (i.e., names, contact details, consent forms) were destroyed at the end of the study. Anonymised interview and survey data are to be stored for 7 years from the end of the study and then destroyed in line with university data sharing policy/requirements.

PPIE/Advisory groups

Patient & Public Involvement & Engagement (PPIE)

A PPIE group of parents (n=6) with recent maternity experiences was formed. The group met three times over the course of the project to provide input on issues such as helping to make sense of the systematic review evidence; offered suggestions to promote recruitment such as easy to read language and visual appeal; making sure the information shared with parents was clear and understandable; what questions we should ask parents and professionals; interpreting the evidence collected as part of the impact case studies; and how to disseminate the findings.

Advisory Group

An Advisory Group comprising individuals from academic, healthcare, and third-sector backgrounds was formed and included expertise in all contexts of BFI implementation (i.e., hospital, community, neonatal, and University settings). Members of the UNICEF UK-BFI team were also included in this group (see Appendix 1).

The group was formed to provide expert guidance over the course of the project. The group met three times over the duration of the project (as well as being asked to respond to information requests remotely). They were asked to provide input and guidance on the remit and boundaries of the systematic reviews, sector relevant information, selection of case study sites, interpretation, and dissemination of the key findings, and to provide critical feedback on the final recommendations. Members of the Advisory Group also reviewed and provided feedback on the review chapters.

Introducing the findings

Rapid integrative reviews

A total of 35,319 de-duplicated records from database searches were screened. Across the evidence review chapters (Chapter Three to Chapter Thirteen), there were 636 study entries, representing 569 unique publications after accounting for duplication across chapters.

The rapid reviews are presented over 11 chapters that cover:

- Motivations and challenges of infant feeding
- Antenatal education (Preparing and supporting parents during the antenatal period)
- Skin-to-skin and kangaroo care (Impacts, experiences and challenges of skin-to-skin and kangaroo care)
- Early hospital and community infant feeding support (Supporting infant feeding across the perinatal period)
- Rooming-in (Keeping parents and infants close)
- Responsive feeding (Feeding responsively)
- Bedsharing (Infant sleep, feeding and safety)
- Neonatal care (Care in the neonatal unit)
- Close and loving relationships
- The International Code of Marketing of Breastmilk Substitutes (Impact of commercial influences on infant feeding)
- Workforce education (An educated workforce)

Each chapter generally follows a similar format of providing:

- An introduction to the topic area.
- A short synthesis of relevant findings from the UNICEF 2012 (29) review[40] and a summary of how the updated review both supports and extends these findings.
- A description of the UNICEF UK BFI standards related to that area of practice and how they align with wider national and international policies and guidance.
- A summary describing how the included evidence supports the relevant UNICEF UK BFI standards. This is presented before the detailed findings to illustrate how the evidence relates to the practices and aspects of care promoted by the BFI. Recommendations for the continued review, development and strengthening of the UNICEF UK BFI programme are detailed.
- A detailed overview of the included evidence.
- Limitations of the evidence base.
- Recommendations for research.

The decision to report the evidence relating to the practices that underpin the UNICEF UK BFI standards separately was to enable each component to be examined in relation to its specific evidence base. However, it is important to recognise that these components are not implemented or experienced in isolation. Rather, they are

[40] As the remit of this work was to update the evidence from the landmark 2012 review, it was important to first contextualise the main findings before drawing conclusions about what the newer evidence adds over and above the original review.

complementary and mutually reinforcing, with antenatal education, skin-to-skin contact, keeping parents and babies together, responsive infant feeding support, implementation of the International Code of Marketing of Breast-milk Substitutes, staff knowledge and skills, and the provision of consistent, evidence-based information working together to optimise infant feeding, build parental confidence and responsiveness, and support the development of close and loving parent-infant relationships. To acknowledge these interdependencies, hyperlinks have been included throughout the report to direct readers to related sections as appropriate. When using the hyperlinks, you can use Alt + Left Arrow (←) to return to your previous location (depending on your version of Adobe) .

Quotes from the case studies have also been integrated within the review chapters to foreground parents' and staff members' views of BFI implementation and infant feeding support in practice.

Case studies

The case studies are presented in one chapter, reporting the findings from the staff (Chapter Fourteen - staff case studies) and parents (Chapter Fourteen - parent case studies) separately. These sections examine both organisational and individual experiences of BFI-accredited care. Staff accounts provide insight into the opportunities and challenges associated with implementing and sustaining the standards, including the role of leadership, resources, training and multidisciplinary collaboration. Parents' accounts explore how infant-feeding decisions are shaped by personal circumstances, social and commercial influences, professional support and the quality of relationships with healthcare staff.

These findings offer a detailed understanding of how BFI standards influence infant feeding practices and parent-infant relationships, while highlighting the broader social, cultural and organisational factors that shape families' experiences of care. At the end of each of the staff and parent case study write-ups, overarching emergent recommendations are provided that identify areas where BFI implementation could be strengthened and refined. They highlight opportunities to enhance the implementation, sustainability and inclusivity of the programme, and to support services in delivering consistent, compassionate and evidence-informed care. Finally specific recommendations for the BFI programme have been detailed.

Summary and recommendations

The concluding chapter (Chapter Fifteen) draws together the key findings from across the evidence reviews and case study chapters and presents recommendations in three areas: the future development of the UNICEF UK BFI programme, including both overarching and standard-specific recommendations; recommendations for BFI implementation; and future research.

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3

Chapter Three: Motivations and challenges of infant feeding

This chapter synthesises primarily qualitative evidence identified across the reviews to explore the factors shaping infant feeding choices, the role of self-efficacy in initiating and sustaining breastfeeding, and the biopsychosocial and structural influences that can support or undermine breastfeeding practices. Throughout this chapter we use the term 'women' to reflect the language used in the research literature to describe the participants studied. We acknowledge that not all people who are pregnant, give birth, or breastfeed identify as women (see our consideration of language section).

It should be noted that the evidence reported here was not necessarily conducted within UK BFI accredited settings or international BFHI settings. Furthermore, the synthesis may convey a predominantly negative perspective, as it highlights the challenges that women face in relation to infant feeding. However, the intention is not to portray breastfeeding experiences solely in terms of the challenges encountered, but rather to illustrate and reinforce the importance of the UNICEF UK BFI in fostering environments in which parents are supported to make informed feeding decisions, develop confidence in feeding their infants, and build close and responsive relationships with their infants.

We present this evidence in the opening findings chapter to ensure that women's lived realities remain at the forefront of the discussion when considering the wider evidence. In doing so, we aim to emphasise the continuing need for, and value of, the BFI in improving experiences and outcomes for women and families, while also highlighting areas where further reflection and evidence is needed.

Summary of the evidence in relation to UNICEF UK BFI standards

Evidence on what motivates women to breastfeed aligns closely with the UNICEF UK BFI standards, particularly their focus on fostering close and loving relationships and supporting responsive, individualised care. Many mothers viewed breastfeeding as a natural act that strengthens emotional connection, identity, and a sense of maternal competence. These findings reinforce the BFI's focus on breastfeeding as both a nutritional and relational experience. However, the studies also show how moral and social expectations, such as the idea that 'good mothers breastfeed', can create pressure, guilt, and distress when feeding does not go as planned. This highlights the BFI's emphasis on non-judgemental, emotionally attuned care that values the parent-infant relationship irrespective of how the baby is fed.

The included evidence also demonstrates how the BFI standards can help address or mitigate some of the biopsychosocial and structural barriers that may undermine a mother's self-efficacy to breastfeed. Self-efficacy theory emphasises that confidence develops through mastery experience, vicarious learning, verbal encouragement, and the reduction of emotional distress. The BFI's standards, which include a focus on organisational leadership and staff competence, create the conditions for these mechanisms to operate. Consistent, skilled, and sensitive support can help mothers translate their motivation and intention into effective practice, particularly during the early stages of feeding.

Evidence from the lived experiences literature highlights the damaging effects of inconsistent or contradictory infant feeding information from professionals,

judgemental attitudes, and reactive rather than proactive support. Such experiences reduce trust, create confusion and undermine mothers' sense of control and capability. In contrast, BFI training aims to equip staff with the knowledge to provide evidence-based, empathetic guidance that validates women's efforts and recognises their individual circumstances.

Self-efficacy does not develop in isolation. It is influenced by interpersonal relationships, cultural expectations, and the broader social environment. The literature reveals how family opposition, partner attitudes, stigma, and isolation can erode confidence and contribute to early breastfeeding cessation. For migrant and minority women, cultural traditions and intergenerational advice may conflict with professional recommendations. Similarly, some mothers encounter additional challenges linked to socioeconomic disadvantage, mental health, or neurodiversity - groups that report feeling excluded or misunderstood within healthcare settings. BFI provides a protective framework that promotes shared decision-making, ensuring that women's choices are respected and that they receive affirmation rather than coercion. Such supportive encounters can potentially transform negative experiences into positive, empowering ones that reinforce breastfeeding self-efficacy and trust in care. While the BFI provides guidance to tailor care to individual needs, the included evidence highlights the need for further consideration of the wider family within the standards. It highlights the importance of looking beyond the mother herself and considering family dynamics, cultural context and wider social factors.

Many of the difficulties identified across the literature, from inconsistent support and staff shortages to societal stigma and public breastfeeding discomfort, highlight the need for system-wide cultural change. BFI helps to address these issues by equipping staff with consistent, evidence-based skills ensuring sensitive and person-centred care, and promoting closeness and responsive relationships. The BFI works to help mothers navigate physical, emotional, and social challenges, and to provide empowering, compassionate, and contextually sensitive support.

Recommendations for the BFI programme

- **Develop clearer programme support for partners, fathers, wider family members and peer networks** so that families receive consistent, constructive messages and are better equipped to support feeding decisions and early relationships.
- **Use the Achieving Sustainability standards and leadership assessment process to strengthen attention to structural and workforce pressures,** including staffing capacity, continuity of care, staff wellbeing and the practical conditions needed for high-quality infant feeding support.
- **Review Baby Friendly standards to better support women experiencing common but challenging breastfeeding concerns**, including pain, perceived insufficient milk, mixed feeding, and the challenges of sustaining breastfeeding beyond initiation.
- **Strengthen guidance for families with more complex clinical or personal circumstances**, including preterm or neonatal experiences, medically complex births, obesity and neurodivergence.

Detailed overview of included evidence

This section draws exclusively on evidence from systematic reviews to explore women's motivations and experiences of infant feeding. The findings consider why women choose to breastfeed and the range of factors that can influence their experiences and ability to meet their feeding intentions. Full details of the included reviews are provided in the Appendices.

Why do women breastfeed?

One of the key reasons why women breastfeed (or provide breastmilk) relates to promoting closeness and bonding with their infants (26, 33, 48-56). In Schmied et al.'s review of migrant women's experiences, women described breastfeeding as 'a gift' to the child and as a beautiful, peaceful and rewarding shared experience (55).

Some mothers perceive breastfeeding to be the natural or *'best way'* to feed a newborn (33, 51, 54-59), conferring physiological benefits for mothers (48, 49, 54, 58, 60) and infants (26, 33, 49-55, 57-60) such as through strengthening the infant's immune system (33, 54). The value of breast milk is particularly reinforced for mothers of sick or premature infants, who witness the positive impact of their milk on their infants' health and survival (52).

Further reasons relate to how breastfeeding personified and reinforced the maternal identity (50, 61) and mother's self-worth (26, 33, 61, 62). Breastfeeding is often perceived as an inherent responsibility of motherhood (52, 55, 62), encapsulated in the notion that a 'good mother' breastfeeds (63). Breastfeeding is also perceived to enhance maternal mental health (26, 51, 56), create opportunities for rest for both mothers (50, 51) and infants (54), and provide mothers with a sense of control that was often lacking in other aspects of motherhood (26).

Women who continue to breastfeed despite experiencing adversities often describe a sense of pride[41] and achievement (64, 65). In Odeniyi et al.'s (54) review of Black African women's experiences, breastfeeding was described as both emotionally taxing, associated with exhaustion, loneliness, and depression, and simultaneously as a source of encouragement and strength. Some breastfeeding mothers, in a review of UK qualitative research about emotions and breastfeeding, support reported feeling selfish for choosing to exclusively breastfeed, as this limited others' involvement in infant feeding (64). Conversely, others describe feeling that choosing not to provide breast milk was 'selfish' (48).

It is important to note that some mothers are content with their decision not to breastfeed (57, 66). Others justify breastfeeding cessation as a means of promoting their infants (64) or their own (52, 63) well-being[42]. One review, however, found that women who did not breastfeed were far less likely than breastfeeding mothers to provide positive descriptions of infant feeding (57). For many mothers, the pressure to breastfeed and the perception that breastfeeding equates to being a 'good mother'

[41] Although these feelings could be dismissed as 'silly' or 'inappropriate', as breastfeeding was perceived as something ordinary or expected

[42] This could be related to mothers' perceptions that their infants are adequately nourished and content, and, for themselves, the desire to alleviate the stress and difficulties associated with breastfeeding and to regain a sense of bodily autonomy.

were thought to foster judgement and instil feelings of anxiety, disappointment, guilt and failure when breastfeeding did not go as planned (26, 33, 49, 52, 56, 57, 61, 63, 64, 66, 67). Such emotional distress has been associated with postpartum depression (33) and negative impacts on the mother-infant relationship (63).

The importance of self-efficacy and motivation for breastfeeding

The positive mutually reinforcing influence of maternal self-efficacy and motivation on breastfeeding initiation, continuation, and exclusivity is well-established in the literature (48, 49, 51, 53, 57, 60, 63, 65, 66, 68). Consistent with self-efficacy theory, confidence in one's ability to breastfeed strengthens through mastery experiences: as mothers gain familiarity with breastfeeding or milk expression, both proficiency and self-assurance increase (53). For some women, strong self-efficacy also manifests as a determination to breastfeed 'at any cost', motivating them to proactively and reactively seek solutions to emerging challenges (48, 49, 69). However, as Tangahnito et al. (63) note in their review of women with postnatal depression, intense commitment to breastfeeding may lead some to persist despite adverse effects on mental health, such as avoiding antidepressant use.

Conversely, when women's breastfeeding experiences are less positive than anticipated (due to pain, complications, lifestyle challenges, etc.), this can undermine their self-efficacy. Women with low self-efficacy are more likely to feel demoralised and discontinue breastfeeding prematurely (49, 52, 56, 59, 65-67), even despite holding positive attitudes towards breastfeeding (65, 66). Both internal coping resources (e.g., determination, self-efficacy) and interpersonal supports (e.g., skilled professional and partner support) are believed to be essential for maintaining breastfeeding (57, 65, 66). Although across some of the reviews, notably those focusing on Black African women, intrinsic rather than extrinsic motivation[43] emerged as central to sustaining breastfeeding (60, 70).

Next, we discuss several areas that can challenge and undermine self-efficacy and women's motivations to breastfeed.

Individual circumstances and breastfeeding challenges

> *A lot of my family were very, 'you don't need to breastfeed for a long time. You should get them on a bottle, even with expressed milk'. There was a lot of pressure to introduce bottles to him. And I think it was more so because my family or my husband's family wanted to take him. More like, 'we'll take the baby for you. So, get him on a bottle so you can rest'.* (Site 2 Mother7)

Individual-level factors: Various individual level factors can influence women's self-efficacy and breastfeeding goals. These range from women's previous negative experiences of breastfeeding (49, 71) to clinical, psychological or lifestyle challenges. Women with obesity tend to have lower body satisfaction, which in turn mediates the relationship between weight status and breastfeeding confidence (71)[44]. The lack of guidance, support, myths or misinformation about medication use (psychotropic or antibiotics) can create barriers to breastfeeding (26, 68). Whereas for socially disadvantaged women, breastfeeding

[43] Intrinsic factors come from within the individual - they are internal motivations, emotions, beliefs, and personal characteristics that drive behaviour. Extrinsic factors are external influences - things outside the individual that affect their behaviour or decisions, such as sociocultural norms, partner or family support.

[44] This is a growing concern with ~20-25% of pregnant women now classified as obese in the UK. RCP warns maternal obesity is an urgent and growing threat to women and babies | RCP

can be considered as an additional stressor in an already complex and challenging home life situation (65).

Family opposition and contradictory advice: Across multiple reviews, women described family members and friends being opposed to exclusive or continued breastfeeding. These individuals could question the sufficiency of breast milk and encourage early cessation or mixed feeding (48): with mixed feeding emerging as a compromise between cultural expectations and professional guidance for some women (72).

Similar pressures were noted among migrant mothers, who felt torn between cultural traditions and medical information (51, 55, 58). In some cultures, elders and mothers-in-law hold more authority than healthcare professionals, which caused difficulties when they promoted traditional practices that conflict with health guidance (58). These practices could include discarding colostrum[45], inappropriate introduction of solid foods, or what and how often women should eat. When women attempted to follow professional recommendations, this could cause tension and emotional strain within the family unit (49, 57).

Leeming et al. (64) highlight the emotional challenges that some mothers can face when confronted with negative or undermining comments about their infant feeding practices (such as remarks that question their milk supply or feeding frequency). The authors describe the significant 'emotion work' mothers perform to reinterpret such remarks, preserve self-confidence, and sustain a positive maternal identity while breastfeeding.

Infant feeding challenges

Complications and challenges encountered during breastfeeding could undermine mothers' intentions and self-efficacy, disrupting their ability to maintain exclusive or continued breastfeeding. Across the included literature, many women faced breastfeeding complications such as difficulties positioning and attaching their baby at the breast, breast pain, thrush, mastitis, engorgement and breast trauma (33, 48-50, 54-56, 59, 60, 63, 66, 70, 73).

Many women found breastfeeding physically exhausting (33, 48, 49, 54, 56, 63, 65, 68, 69, 72-74), which could undermine or exacerbate poor mental health (63, 74). Other physical symptoms expressed by mothers of multiple births (49), or those with high BMIs (71) included physical strain such as lower back pain. Women with obesity were reported to face more breastfeeding difficulties compared with women with a healthy range BMI (71). These include a lack of belief in their ability to feed discreetly, and fears of their larger breasts and bodies smothering their infant (75). Women with high BMI are also more likely to face clinical-related complications associated with a medicalised birth, infections, longer hospital stays, delayed skin-to-skin contact and even periods of mother-infant separation (75). Autistic women's interoceptive differences could mean that they experience sensations such as pain or engorgement

[45] For example, some Hindu and Muslim mothers do not want to express their milk because of worries about the Evil Eye making the milk bad and causing disease.

in different ways to neuro-typical women (50)[46]. Whereas, women who have a premature infant experience unique infant feeding challenges[47] (53).

Expressing breastmilk is associated with several practical obstacles (also see Chapter Six for reflections and motivations related to expressing) related to nipple pain, being time-consuming, physically uncomfortable, and logistic difficulties, especially when transporting milk to neonatal units (52, 69). These challenges could undermine confidence and continuation, particularly for mothers with fewer resources, such as limited social support (48, 53).

Psychosocial factors

Various psychosocial factors that could impact upon a mother's decision to initiate and continue to breastfeed were discussed in the literature. Some women do not want to breastfeed (52). This could be due to personal reasons such as finding breastfeeding 'disgusting' (48) or disliking the sensation of infants sucking on their breasts (66).

> *I don't think the challenges come from the BFI standards. I think the challenges come from the patients themselves, people's perspectives of breastfeeding and what they expect it to be versus the reality of what breastfeeding actually entails.* (Site 4 maternity HCP2)

Lifestyle incompatibility was a key factor in breastfeeding cessation. Some women felt that breastfeeding caused disruptions to their relationships with their older children (64) and with their partner (64, 66). Some women complained about breastfeeding being 'too tying' (48, 55, 65, 70, 73), feeling being burdened by the frequency of breastfeeds (48, 49, 72), and their infant's continued dependency on them for nutrition (26, 33, 68). This could be further complicated by infants refusing to drink breast milk out of a bottle during periods of maternal separation (such as social occasions or employment) (48). Breastfeeding interfered with women's social lives, and what they drank and ate (66), which for some women with eating disorders related to them wanting to stop breastfeeding to resume control over their weight (such as via purging or strenuous exercise) (26)[48]. In these situations, formula could be perceived as an easier, more convenient and flexible option (54, 55, 59, 60, 65, 66, 70).

Some women held misconceptions that infant formula was equal (55, 65, 70) or even nutritionally superior (66) to breastmilk, which for immigrant women could be associated with the normalisation of formula feeding in their host countries (58, 59). Beliefs about mixed-feeding contributing to improved infant sleep, and social flexibility

[46] Emerging evidence suggests a potential link between neurodiversity and experiences resembling breastfeeding aversion, although this remains under-researched. While autistic mothers often experience breastfeeding as overstimulating and overwhelming due to heightened sensory sensitivity. This aligns with wider evidence that neurodivergent individuals may have increased sensitivity to tactile input, making sustained physical contact more difficult to tolerate. These sensory experiences closely mirror descriptions of breastfeeding aversion and agitation, which include discomfort, irritability, and an urge to stop feeding. While this suggests a plausible relationship mediated by sensory overload, current evidence is largely qualitative and does not establish a clear causal link.

[47] Premature babies often struggle to breastfeed because their suck-swallow-breathe coordination, muscle tone, and neurological maturity are underdeveloped, making it difficult to latch and feed effectively. They also tire easily, may be separated from their mothers in neonatal care, and have limited energy and physiological stability, all of which hinder breastfeeding until they mature and receive skilled, supportive care.

[48] Despite growing qualitative research on eating disorders in the perinatal period, there is currently no comprehensive qualitative synthesis specifically examining breastfeeding experiences among women with eating disorders. Wider available evidence suggests that the relationship between eating disorders and breastfeeding is complex and heterogeneous: for some women, breastfeeding may be emotionally difficult or intersect with weight-control concerns, while for others it may support recovery, improve body connection, or reduce disordered eating behaviours.

were also reported to be key drivers to introducing infant formula (72). Other lifestyle challenges to maintaining breastfeeding related to returning to work and wider home and family responsibilities (54-56).

Overall, therefore the perceived physical, social and emotional burdens associated with breastfeeding could lead women to want to return to a sense of normality (in terms of routines and relationships) by changing to formula feeding.

Family, social and sociocultural influences

Influence of partners: Partners' attitudes had a major impact on breastfeeding initiation and continuation, whereby unsupportive or uninformed partners often contributed to early cessation (59, 62, 71). Some women reported that their partners urged them to stop breastfeeding when difficulties arose (71) or interpreted frequent feeding as problematic rather than normal infant behaviour (64), adding further stress and pressure for mothers.

Absence of support networks and isolation: Migration, resettlement, or lack of family nearby led many women to feel isolated and unsupported (55, 58). Women from collectivist cultures, accustomed to strong female support after birth, could struggle in Western contexts where care was individualised (54, 55). The absence of practical and emotional help could lead to increased reliance on infant formula, with bottle feeding perceived as easier to manage alone (55, 58). A lack of visible breastfeeding role models was also reported to limit initiation, particularly among younger and low-income women (33, 64).

Social pressure, stigma, and emotional impact: Conflicting advice from relatives could cause emotional distress, guilt, and confusion. Women frequently reported feeling judged for their feeding choices, whether they continued breastfeeding or chose infant formula (33, 63, 64). For some family members, continuing breastfeeding beyond six months was viewed as deviant or self-indulgent (64). Teenage mothers and women from marginalised groups could also encounter negative peer attitudes, reinforcing discomfort with breastfeeding (76). Emotional strain was intensified when family disapproval intersected with inconsistent professional support, contributing to anxiety, self-doubt, and depression (26, 63).

Support from healthcare professionals

Several recurring areas of complaint related to inconsistent, inadequate, or insensitive infant feeding support from healthcare professionals. The key problem being those negative experiences of care eroded women's trust and discouraged help-seeking, contributing to early breastfeeding cessation. The key areas are summarised below:

Inconsistent or contradictory information: A dominant theme across multiple studies was the inconsistency of breastfeeding information provided by healthcare professionals. Some women reported receiving mixed messages on positioning, attachment, feeding frequency and supplementing with infant formula (26, 33, 51, 57, 65, 76). Such contradictions could occur between different staff within the same institution, creating confusion and undermining mothers' confidence (51, 68).

Insufficient and reactive support: Mothers frequently described inadequate or superficial breastfeeding support. Postnatal staff were often perceived as being too busy to provide one-to-one assistance, with support limited to the initial feed and little

follow-up thereafter (52, 76, 77). Rather than proactively guiding women, professionals often responded only when asked for help (48). This lack of sustained support led women to feel abandoned in the postnatal or neonatal wards (65, 69). Some women who had a premature or sick infant also complained that as breastfeeding, rather than breastmilk, was prioritised in the neonatal unit, this could undermine the value and practice of expressing breast milk (53).

Lack of individualised and culturally sensitive care: A rules-based approach which implied only one way to feed, i.e., breastfeed, could be linked to distress and blame (64). Furthermore if women felt that professionals would disagree or disapprove of their decisions, such as introducing formula or solids earlier than recommended, they may avoid disclosing such practices (64). Women were noted to engage in subterfuge where they concealed their non-adoption of healthcare professionals' information, such as through non-disclosure of difficulties or hiding bottles (61, 64).

Many women also felt that the information they received from healthcare professionals was generic and failed to recognise individual, cultural, or medical differences. Trans, non-binary, autistic, migrant, and global majority parents reported that staff often lacked understanding of their specific needs or used communication styles that were alienating or exclusionary (50, 51, 57, 70, 78). Cultural practices such as 'confinement' and family caregiving were disrupted in hospital settings (58). Furthermore, hospital policies like 'rooming-in' (also see Chapter Seven) sometimes conflicted with cultural expectations (e.g., of a laying in period and extended support from family members), leading to early formula use (55, 58).

Negative or judgmental attitudes: Judgemental behaviour and negative comments from professionals were widely reported, particularly towards women with mental illness, obesity, autism, or lower socioeconomic status (50, 65, 68, 71). Some Black African women in high income countries were reported to highlight feelings of vulnerability and discrimination when interacting with health professionals, due to their minority status (54). Whereas autistic mothers felt they were judged and not heard or believed by health professionals, and found it difficult to assert their needs (50). Some women could feel stigmatised or infantilised during their feeding journey (64). Other women complained about health professionals' lack of support for formula feeding (58), or feeling patronised or unfairly criticised by staff for making the decision to not breastfeed (64). Some women could also find clinics or breastfeeding groups undermining and judgemental, particularly for those who were struggling to breastfeed (26, 64).

Pressure and surveillance: Several studies noted that women felt pressured to breastfeed exclusively by healthcare professionals, with little room for personal choice. Health professionals' strong pro-breastfeeding stance, though well-intentioned, sometimes led women to feel judged, coerced, or guilty for choosing mixed or formula feeding (26, 61, 77). Others reported feeling 'watched' or 'monitored' (e.g., by healthcare professionals observing not just the baby and feed, but their performance as a mother/breast feeder), leading to anxiety and avoidance of professional help (64). Mothers of premature infants who were exclusively expressing wanted privacy at the infant's bedside (53); healthcare staff disrupting this experience (i.e., entering the mother-infant environment) or controlling infant's care and feeding schedules, could be detrimental to breastmilk feeding (53).

Lack of continuity and relational care: A recurring issue was fragmented care due to women encountering multiple professionals with differing information, making it difficult to build trust (65, 76). Where relational continuity existed (e.g., the same midwife through the antenatal period, birth, and postnatal care), women reported more positive experiences and better breastfeeding outcomes (76).

Turning elsewhere for support: Because of inconsistent or unsupportive professional input, women often turned to informal networks, social media (see insights into the value and challenges of social media in the case studies from staff and from parents and evidence on use of social media in Chapter Six), and peer groups for information and support (26, 49, 57, 76). While these alternative methods could offer community and reassurance, they also had the potential to expose mothers to misinformation and contradictory guidance.

Structural barriers and staff constraints: Mothers recognised the implications of healthcare professionals' heavy workloads, time pressures, and limited breastfeeding training (also see Chapter Fourteen), identifying these as systemic barriers to the provision of effective and consistent breastfeeding support (53, 69, 77). Healthcare professionals' limited personal experience or education in breastfeeding also reduced their confidence in providing instrumental or emotional-based support (53, 76) (also see importance of building confidence in Chapter Fourteen).

The danger of the good mother narrative: Some women struggled to seek out help and rather waited for it to be offered (66) or did not want to raise concerns for fear of retributions, such as being perceived an unfit mother (26, 50). A key complication of the 'good mother' narrative was that women appeared less likely to seek support when facing breastfeeding difficulties or complications (64, 69), often due to fear of judgement or reprisal.

Perceived breastmilk insufficiency

Women's concerns about their ability to produce sufficient breast milk were evident across many of the included reviews (26, 33, 49, 50, 52, 54, 56, 57, 60, 71, 73, 75, 79) and identified as a key factor that undermined women's self-efficacy to breastfeed. While there is evidence to suggest that maternal psychological distress may impair lactation and breastfeeding outcomes (also see Chapter Eleven), it is often difficult to discern whether the perception of insufficiency has a physiological or psychological[49] basis.

Some women attributed breast milk insufficiency to additional challenges, such as feeding multiple infants (49), managing complications related to infant prematurity and immature feeding abilities (49), or experiencing obesity as an independent risk factor for delayed onset of lactation (71, 75). Some women attributed breast milk insufficiency to not experiencing a 'milk let down' sensation (53), or concerns over infant weight and size (72). For women who expressed breast milk, the volume of milk operated as a means of gauging bodily competence as well as reassuring themselves that their infants were receiving adequate nutrition (59, 72). When expression failed to provide this reassurance, some women turned to formula feeding as a more controllable and visible measure of intake (49, 53, 59).

[49] Whereby perceived breastmilk sufficiency is a psychological construct as it reflects a mother's beliefs, confidence, and interpretations of her breastfeeding experience rather than objective milk volume.

For many women, the introduction of infant formula was based on persistent fears about being unable to determine how much milk their infants had consumed (33, 59), and concerns that their bodies might not meet infants' nutritional needs (26, 57, 64, 75). Women expressed fears about infants being left hungry (26, 49, 56), particularly when breastfeeding did not appear to soothe infant distress (56).

Public breastfeeding

Public breastfeeding, including within the postnatal hospital environment (56, 71), is widely known as a key barrier for women who breastfeed, associated with social isolation, shame, guilt, humiliation and embarrassment (33, 57, 59, 60, 64, 66, 67, 70, 71, 73, 76, 80). Whilst breastfeeding publicly was perceived as normal in some cultures, for example for some Black African women from high income countries (54), immigrant women from various countries (e.g., South America, China, South Africa, India, Vietnam, Hmong, etc) (51, 55), or Aboriginal and Torres Strait Islander women (59), the lack of visibility of public breastfeeding within the host country or colonised areas led to feelings of shame or discomfort when continuing to breastfeed. While 'breastfeeding welcome' schemes have been in operation for several years, there is limited formal evaluation of their effectiveness.

> *Maybe just to do with my confidence, but if I was out somewhere, I would maybe have fed them in the car beforehand. So then I was OK, they've been fed, you know, then I don't have to worry… And if I was at somebody's house, I maybe would have asked to go to a different room, because it was difficult to latch properly and then I felt like I had to have more of me on show*. (Site 3 Mother8)

Returning to work

Women also highlighted that returning to work was a significant barrier to initiating and sustaining breastfeeding, particularly exclusive breastfeeding. While some participants benefitted from paid maternity leave and flexible employment, which enabled time to rest and breastfeed, many described substantial difficulties once they resumed work (48). Across studies, returning to work was repeatedly associated with reduced breastfeeding duration, driven by time constraints, competing responsibilities, and lack of support (33, 54, 55, 72, 73).

In conclusion, the evidence demonstrates that infant-feeding experiences cannot be understood through individual motivation or intention alone. Feeding journeys emerge through the interaction of parental confidence, expectations and wellbeing; infant and feeding factors; relationships and social influences; healthcare experiences; and the wider structural environment. These influences can both enable and constrain feeding journeys and may change over time as families' circumstances and needs evolve. Figure 3 brings these interacting influences together, illustrating the complexity of the journey from feeding intentions to experiences and outcomes.

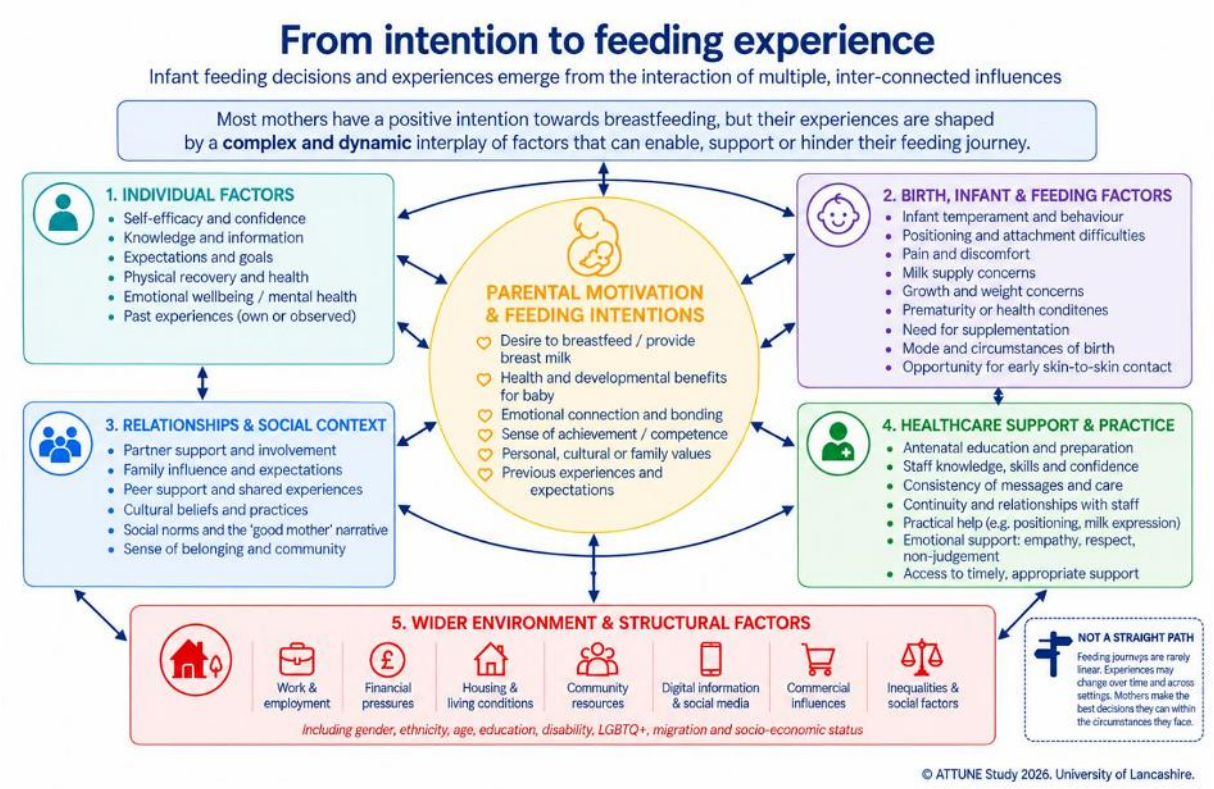


Figure 3: Interacting influences shaping infant-feeding intentions, experiences and outcomes

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4

Chapter Four: Preparing and supporting parents during the antenatal period

Antenatal education provides an important opportunity to prepare women and families for infant feeding and early parenthood, supporting knowledge, confidence, realistic expectations and informed decision-making. During pregnancy, women are provided with information that includes the benefits of breastfeeding, responsive feeding practices, relationship-building, and available support services. This education is designed to help women develop knowledge, confidence, and realistic expectations regarding infant feeding before birth. Early discussions during antenatal care also provide opportunities to address concerns, challenge misconceptions, and support informed decision-making.

Evidence from the 2012 review highlighted that antenatal education provides an important opportunity to support parents' understanding of infant feeding and early parenthood. NICE recommends interactive, participant-led and learner-centred approaches, including breastfeeding education. Evidence suggests that receiving information about the benefits of breastfeeding during pregnancy increases breastfeeding initiation. Parents value information that is timely, consistent, evidence-based, tailored to their circumstances and delivered by trusted sources, alongside opportunities to learn from and share experiences with others in similar situations.

Conversations about infant feeding should be personalised and grounded in parents' individual circumstances and realities. While evidence on the most effective methods of delivering antenatal education remains limited, group-based programmes focusing on relationships, bonding and emotional adjustment can improve parental confidence, wellbeing and parent-infant relationships.

Tailored, ongoing support from trained professionals or peer supporters can improve breastfeeding initiation and continuation, although evidence for peer support in the UK remains mixed, with targeted approaches appearing most beneficial.

Evidence from the updated review is consistent with the earlier evidence regarding women valuing antenatal education that is interactive, personalised, evidence-based and delivered by trusted sources, alongside opportunities to share experiences with others. The newer evidence also reinforces the importance of ongoing support from professionals and peer supporters rather than isolated educational interventions.

The evidence extends the previous review by highlighting the importance of continuity across the antenatal and postnatal pathway, with multifaceted interventions that combine professional, peer and family support appearing most effective. Greater emphasis is also placed on maternal confidence and self-efficacy as key mechanisms underpinning breastfeeding outcomes. In addition, the evidence identifies a need for more inclusive and tailored support for diverse groups of women and highlights a theory-reality gap, whereby some women feel unprepared for common breastfeeding challenges despite receiving antenatal education.

The evidence on antenatal breastmilk expression represents an additional area of evidence not considered in the 2012 review. While findings suggest potential benefits for confidence and breastfeeding continuation, they also highlight the need for clear guidance, consistent messaging and appropriate staff training.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

The BFI antenatal standard is part of a broader set of 'Baby Friendly' accreditation standards and is in place to help those who are pregnant to recognise the importance of breastfeeding and early relationships for their baby's health and well-being. These antenatal conversations aim to be person-centred, inclusive, non-judgmental and grounded in evidence. Components typically required under the antenatal part of the standard include:

- Every person should be offered at least one structured conversation about feeding, developing a relationship with their unborn baby and responding to baby's needs (which may be delivered face-to-face, virtual or in group settings).
- Topics include the value of breast milk, skin-to-skin contact, getting breastfeeding off to a good start including responsive feeding and the importance of exclusive breastfeeding for health and milk production, building close and loving relationships and previous infant feeding experiences. For mothers who intend to formula feed, this information is provided.
- For parents whose baby may need neonatal care, information about the importance of breastmilk for preterm or sick babies.
- Conversations should be sensitive to each person's background, language, culture, previous feeding experiences, and circumstances.

The UNICEF UK BFI antenatal education standards are grounded in both international and national frameworks promoting holistic, rights-based maternity and child health. Globally, they align with the WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience (2016)[50] and the International Code of Marketing of Breast-milk Substitutes (1981)[51], which advocate respectful, informed, and equitable care during pregnancy. The Baby Friendly Hospital Initiative (WHO/UNICEF)[52] further reinforces antenatal counselling on the benefits and support for breastfeeding as part of high-quality care. In the UK, the Healthy Child Programme (2023)[53] sets the framework for antenatal education as part of a continuum of early life support, while NICE NG201: Antenatal Care (2021)[54] and CG110: Pregnancy and Complex Social Factors (2010)[55] establish statutory expectations for inclusive, personalised, and accessible information provision. Underpinning all of this is the UK's commitment to the United Nations Convention on the Rights of the Child (1989), which recognises every child's right to the highest attainable standard of health, including through quality antenatal and postnatal care. These policies provide a coherent legal, ethical, and

[50] WHO recommendations on antenatal care for a positive pregnancy
[51] WHO - International Code of Marketing of Breast-milk Substitutes.
[52] World Health Organization & UNICEF - Implementation guidance: Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services
[53] Department of Health and Social Care - Delivery of the healthy child programme
[54] NICE - Antenatal care guidelines (NG201)
[55] NICE - Pregnancy and complex social factors guidelines (CG110)

professional foundation for implementing the BFI's antenatal education standards, to ensure that antenatal conversations and education promote informed choice, equality, and the best start in life for every child.

Introducing the findings

When reviewing the evidence for antenatal education, it is important to note that:

- Most of the included research focuses on the evaluation and impact of antenatal interventions designed to influence infant feeding practices and related outcomes, such as breastfeeding self-efficacy. Very little research has been undertaken in the UK. Currently, there are few studies that evidence the impact of antenatal interventions on parent-infant relationships[56]. The available evidence identified within the timeframes of the review is reported under Section I (also refer to Chapter Eleven on close and loving relationships).
- There has been little focused research specifically examining women's preferences for antenatal education on infant feeding. However, several broader lived experience reviews included in the ATTUNE study (see Chapter Three) and two recent primary studies identified aspects of women's needs and expectations regarding infant feeding education. These insights have been synthesised and integrated into Section II below.
- A separate synthesis of reviews on antenatal breastmilk expression (AME) (n=3) was also undertaken. This decision was informed by findings from the case studies component of the ATTUNE study, which identified AME as common practice in some settings. While the UNICEF UK BFI does not specifically require staff to discuss routine antenatal breastmilk expression[57], its guidance emphasises informed, individualised discussions within antenatal care. However, given its apparent prevalence in clinical practice, it was considered prudent to examine the evidence of its impact, explore parents' and healthcare professionals' views, and identify areas requiring further research and guidance (see Section III).

Summary of the evidence in relation to UNICEF UK BFI standards

Section I: Evidence of antenatal interventions on breastfeeding is mixed but demonstrates several key alignments with the UNICEF UK BFI standards, which emphasise informed, relationship-centred, and consistent antenatal preparation. Overall, Cochrane and other reviews show that antenatal education alone does not consistently improve breastfeeding initiation or duration. However, structured, theory-based, and interactive interventions, particularly those combining practical skills, emotional support, and cultural sensitivity, can enhance breastfeeding uptake, exclusivity, and continuation during the early postpartum months. This aligns with the BFI focus on empowering parents with compassionate infant feeding conversations based on evidence to ensure parents and their families feel heard and valued.

[56] Evidence from the *Close and Loving Relationships* chapter (see 'breastfeeding and attachment' in Chapter Eleven) found that mothers who intended to breastfeed during pregnancy demonstrated greater responsiveness to their infants postnatally, highlighting the importance of providing high-quality information and education during the antenatal period.

[57] In the UNICEF UK BFI standards the emphasis is on hand expression and mothers being aware of how to do this antenatally in case they are faced with challenges in the early days.

Multifaceted and continuous approaches, integrating antenatal and postnatal support, spanning hospital and community settings, and combining professional and peer components, were found to be the most effective. These approaches reflect the BFI's emphasis on coordinated systems of care and sustained, ongoing support. The frequency and quality of contact were also critical: programmes offering multiple, interactive sessions or home visits achieved better outcomes than one-off educational classes. Family-inclusive and partner-focused interventions further reinforced sustained breastfeeding, consistent with BFI standards to involve key supporters in antenatal care and decision-making. The evidence highlights that culturally tailored education and sensitivity to diverse needs can improve outcomes, and this is reflected in the BFIs commitment to responsive practice to meet individual needs. Interventions underpinned by behavioural or self-efficacy theories were particularly successful in enhancing maternal confidence and breastfeeding rates. While these align closely with the BFI standards, they also potentially provide a stronger theoretical foundation for how these standards might be effectively operationalised in practice.

While there is a lack of midwifery-led antenatal interventions to promote early emotional connection and responsive parenting, available studies suggest that encouragement of fetal awareness, reflective and culturally grounded practices, and creative and relaxation-based activities, such as singing or mindfulness, could help promote maternal wellbeing and postnatal bonding.

In summary, while isolated antenatal education has limited impact, holistic, relational, and theory-informed approaches that build confidence, provide practical and emotional support, and extend into the postnatal period are most effective in promoting breastfeeding success. Further development should focus on the integration of theoretical frameworks to strengthen intervention design and impact, and further evidence to explore the impact of antenatal conversations on relational outcomes.

Section II: When reviewing the wider evidence on **women's views of antenatal infant feeding education** the findings across the included reviews demonstrate alignment with the UNICEF UK BFI standards. Women consistently valued receiving antenatal information and training, reporting that it enhanced confidence, social support, and breastfeeding initiation and continuation. This reflects the BFI aim of ensuring that parents are informed, supported, and emotionally prepared for infant feeding.

However, the evidence highlights substantial variation in the relevance, accessibility, and sensitivity of information provided. Some women, such as those expecting multiple infants, those with eating disorders, autistic women, and mothers of premature infants, described receiving information that was poorly tailored to their needs. Socially disadvantaged and global majority women also reported limited or inconsistent education and practical support from professionals, emphasising a need for equitable and inclusive support. While the BFI foundation standards promote person-centred and responsive care for all families; the findings from the included evidence suggest that some groups of women continue to experience information as poorly tailored to their specific circumstances. This indicates a need for stronger guidance, resources or assessment processes to ensure that the diversity of families lived experiences is consistently recognised and addressed.

Wider evidence highlights a recurring theory-reality gap, with antenatal information often portraying breastfeeding as 'natural' or 'easy', leaving some women unprepared for common challenges such as engorgement, soreness and early feeding difficulties. This highlights the importance of providing realistic, experience-based information. However, care is needed in how potential challenges are discussed. While women value honest and practical information that prepares them for the realities of infant feeding, communication should avoid inadvertently creating uncertainty or undermining confidence in their ability to breastfeed. Consistent with the BFI conversation guides, infant feeding discussions should be person-centred, compassionate and responsive to individual needs, helping to build trust while ensuring women and families feel informed, heard, valued and supported.

Finally, there is some evidence (although importantly in the wider literature, rather than within the case studies) of a lack of awareness about where and how to access support, particularly among immigrant and first-time mothers. These findings strengthen the value of communicating about available services and normalising help-seeking behaviour aligned with the BFI vision of accessible, continuous, and compassionate breastfeeding support.

Overall, therefore, these findings emphasise the relevance of the UNICEF UK-BFI standards; they highlight how antenatal education needs to move beyond generic information to offer tailored, realistic, and emotionally supportive communication that acknowledges diverse experiences and challenges. Embedding these principles across services may strengthen maternal confidence, promote equitable access to support, and ensure that all women receive compassionate, evidence-based guidance throughout their infant feeding journey.

Section III: Regarding **antenatal breastmilk expression** (AME), evidence of the variations in the timing of AME highlights the need for clear professional information. Women frequently described AME as reassuring and empowering, fostering confidence in their bodies and readiness for breastfeeding, echoing the BFI focus on preparing parents for responsive, nurturing relationships.

However, several challenges were identified, including physical discomfort, embarrassment, disappointment over low milk volumes, and culturally informed misconceptions about colostrum. While AME was generally found to be safe, occasional concerns around technique, the length of time involved, and inconsistent staff engagement highlight the ongoing need for skilled, consistent professional input, an essential BFI requirement.

Some evidence suggested that AME enhanced maternal self-efficacy and confidence, leading to greater exclusivity and continuation of breastfeeding postpartum. This was particularly evident among women with gestational diabetes or other pregnancy complications. Gaps in staff knowledge and inconsistent messaging about AME further emphasise that, if AME is to be introduced, then comprehensive training and clear communication should be provided.

Recommendations for the BFI programme

- **Strengthen the antenatal conversation so it is realistic, individualised and relationship-centred. This should include awareness of instinctive newborn behaviour,** the realities of feeding and caring for a baby, the impact of birth and birth interventions on feeding, previous feeding experiences where relevant, getting breastfeeding off to a good start, common breastfeeding challenges, sleep, emotional preparation, and clear signposting to support.
- **Move beyond one-off information giving towards layered, ongoing continuity of support and information for parents and families**. The evidence suggests that repeated, interactive contact across pregnancy and the early postnatal period is more likely to build confidence and support feeding outcomes than a single antenatal class or conversation. Information should be provided in multiple formats to suit the needs of individual families and provided at key points to prevent information overload.
- **Continue to foster self-efficacy, practical skills and emotional support** within Baby Friendly so staff are equipped to translate BFI standards into conversations that build parental confidence, address concerns honestly, develop practical infant feeding skills, and support informed decision-making across the perinatal period.
- **Ensure antenatal support is equitable, inclusive and tailored to local populations,** including supporting services to evidence how they meet the needs of diverse groups.
- **Review whether and how antenatal milk expression (AME) should be reflected in Baby Friendly standards, guidance and training.** While AME has potential benefits for confidence and preparedness, there is a need for consistent information, clear language, staff training and careful consideration of the evidence base.

Detailed overview of included evidence

In this chapter, evidence relating to the effectiveness of antenatal breastfeeding education, including the influence of intervention format, frequency, theoretical underpinning, and the use of multifaceted approaches that span the antenatal and postnatal periods are reported. It considers the contribution of family and peer support, cultural and individual factors that may influence intervention effectiveness, and the impact of antenatal interventions on breastfeeding knowledge, confidence and maternal wellbeing. In addition, women's experiences and perceptions of antenatal infant feeding education are explored. A summary of *what does effective antenatal preparation look like* is reported in Table 4. Finally, evidence relating to antenatal breastmilk expression, including its perceived benefits, challenges, safety and influence on breastfeeding outcomes are described. Full details of the included reviews and empirical studies are provided in the Appendices.

Section I: Antenatal interventions

Effectiveness of antenatal interventions on breastfeeding

Overall, the evidence base about the impact of antenatal education interventions on breastfeeding is variable. A Cochrane review found that antenatal breastfeeding education did not significantly improve breastfeeding initiation rates. The duration of any breastfeeding or exclusive breastfeeding at 3 or 6 months was also not significantly different between women who received antenatal education and those who had standard antenatal care (81).

Later reviews reported that some structured antenatal education interventions can increase breastfeeding uptake, particularly in the first six months postpartum (82-84). This is reflected in the evaluation of the Baby Talk antenatal education program for Hispanic women; those who accessed the intervention were significantly more likely to initiate breastfeeding than non-participants (85). Other reviews found limited overall impact of antenatal education alone on breastfeeding initiation (86) or breastfeeding beyond two months (87, 88). The lack of evidence for antenatal education alone was also identified in several primary studies (89-94).

Both group and individual professional antenatal breastfeeding education interventions showed some effectiveness in extending the duration of exclusive and any breastfeeding, but the evidence is mixed (95). Four out of 6 studies investigating individual education reported significant improvements in breastfeeding outcomes, compared to 4 out of 12 studies for group education (95). The research studies exploring group education, however, were generally of poor quality (95). Furthermore, most studies (group or individual) showed significant improvements only within the first three months postpartum (95).

There was no strong evidence from randomised controlled trials on the effectiveness of breastfeeding education and support specifically for women with twins or higher-order multiples (96).

Utility of multiple approaches

Spanning the antenatal and postnatal period: Antenatal breastfeeding education, especially when combined interpersonal support (from health care providers or antenatal counselling sessions), was found to be effective in increasing breastfeeding initiation, duration, and exclusivity (84, 88). Evidence highlights that while beginning breastfeeding promotion activities in the antenatal period is important, antenatal education alone was less effective than interventions that spanned both antenatal and postpartum periods (84, 86-88, 97-99). This is confirmed within the findings of a Cochrane review who reported that education alone was not enough to ensure long-term breastfeeding success, suggesting that postpartum support and community involvement may be more important (81) (also see evidence reported in Chapter Six).

The positive impacts of antenatal education combined with postnatal support on breastfeeding rates (initiation, duration and/or exclusivity) are also reported in many primary studies (100-112). Although it is important to note that, while not all studies that offered a combined approach were wholly effective (113-115), this variation may, in part, be attributable to participant characteristics (also see section below).

Multifaceted interventions: Some evidence indicates that multifaceted interventions, e.g., combining hospital settings, home visits, and group and individual education formats (including group education, peer support and lactation staff), may be more effective than single-component interventions (82-84, 99). The review by Wong et al. (99) found that educational and supportive interventions (offered face to face and remotely) were effective in increasing exclusive breastfeeding rate at ≤2 months and 6 months and enhanced breastfeeding self-efficacy at ≤2 months. In the review by Oliveira et al. (98) the most effective intervention, conducted in Belarus, involved hospital-based breastfeeding support groups and trained professionals, increasing exclusive breastfeeding odds by over 14 times. Another study that included antenatal and postpartum breastfeeding education (Ghana), using adapted UNICEF materials, increased breastfeeding rates nearly tenfold. In the review by Huda et al. (116) participants who received a breastfeeding educational intervention involving a combination of lectures and practical skills had decreased odds of breast engorgement, breast pain and increased odds of exclusive breastfeeding at 1-6 weeks postpartum.

Frequency of intervention components

Frequent and interactive education sessions were generally found to be more effective than single, one-off interventions. Several primary studies reported that brief or short interventions were less likely to produce positive outcomes (91, 92, 94, 111). In the review by Huda et al. (116), more than five education sessions were found to improve exclusive breastfeeding and reduce breast pain and engorgement. Whereas in the review by Wong et al. (99), effectiveness was associated with >3 support sessions.

McGinnis et al. (117) undertook a secondary analysis of data from an intervention that offered antenatal and postnatal breastfeeding education and support via home visits to 3,521 at-risk (of poor child health and developmental outcomes) pregnant mothers in the US. The study found that breastfeeding initiation increased by 1.5% for every 1% increase in antenatal visits that included breastfeeding discussions; an additional home visit in the third postpartum month increased 6-month breastfeeding likelihood by 11%. In contrast a short telenovela[58] intervention delivered antenatally was found to have no significant impact on breastfeeding attitudes (91).

Theory based approaches

Theory-based interventions (e.g., Breastfeeding Self-Efficacy Theory[59] and Theory of Planned Behaviour[60]) have been reported to help boost maternal confidence and breastfeeding rates (82, 83, 88, 99): in one review, interventions informed by Theory of Planned Behaviour (compared to Self-Efficacy theory) had a greater impact on maintaining breastfeeding beyond the early months (82). Oggero et al. (88) reported that antenatal education interventions were only effective in improving breastfeeding

[58] A telenovela intervention is a communication or therapeutic strategy that uses storytelling to teach, influence, or support change in audiences.
[59] Self-efficacy refers to an individual's belief in their capability to organise and execute the actions required to achieve a desired outcome. It influences motivation, behaviour, effort, persistence, and emotional responses.
[60] The Theory of Planned Behaviour proposes that a person's intention to perform a behaviour is the strongest predictor of whether they will carry it out. Intentions are shaped by their attitudes toward the behaviour, perceived social pressures (subjective norms), and the extent to which they feel capable of performing it (perceived behavioural control).

duration if they integrated psychological components, such as coping planning and behaviour change strategies[61].

The positive impacts of a theory-driven approach are also reported in other primary studies. For example, the study by Reno et al. (118) evaluated the Dynamic Breastfeeding Assessment Process (D-BAP) with 25 low-income African American women. The D-BAP was developed following community-based participatory research comprising structured activities to identify breastfeeding motivations, facilitators and barriers to breastfeeding. The women who received D-BAP had significant increases in breastfeeding self-efficacy (p=0.04), with no difference between mothers who had and had not breastfed. Two studies also found that brief motivational interviewing antenatal interventions helped improve breastfeeding rates (119, 120). A more prolonged motivational interviewing approach had significant impacts on exclusive breastfeeding rates at four months (but not at six months) (121).

The Otsuka et al. (122) study evaluated a breastfeeding self-efficacy intervention in Baby-Friendly (BFHI) and non-Baby-Friendly Hospitals (non-BFHI) in Japan. The study found that women who gave birth in BFHI hospitals had improved self-efficacy, and exclusive breastfeeding rates increased at 4 weeks (but not at 12 weeks) post-partum compared to those who gave birth in non-BFHI hospitals (where high rates of infant formula supplementation and mother-infant separation was noted), thereby demonstrating the added value of the BFHI intervention.

Impact on knowledge and health-related issues

Antenatal education interventions have been found to:

- Reduce breast engorgement at 3 days, 4 days and 5-7 days and breast pain at 14 days (116).
- Improve breastfeeding self-efficacy (86), although not consistently (83).
- Improve breastfeeding knowledge (e.g., breastfeeding techniques, benefits, problem-solving) (83, 86) and attitudes towards breastfeeding (106, 123-127).
- In some trials, interventions were effective in demonstrating improvements on breastfeeding attitudes (83), breastfeeding satisfaction, rooming in, mixed feeding rates, the risk of baby infections, gastrointestinal tract infection, and atopic eczema (86).
- The review by da Silva (97) found that antenatal educational interventions were associated, in some studies, with reductions in prematurity and low birth weight. Evidence for reduced prematurity was most apparent in group-based antenatal care models, although this outcome was evaluated in only two studies, one of which demonstrated a significant effect.

Role of family and peer support

Two reviews reported that educational interventions incorporating partner and family support resulted in higher breastfeeding rates (83, 84). A randomised controlled trial by Abbass-Dick et al. (128) found that a coparenting intervention for first-time parents (including a 15-minute in-hospital session with a lactation specialist, a coparenting and breastfeeding information booklet, a video and online resources, follow-up emails, and

[61] In this review they highlight that Health Action Process Approach principles, such as goal setting, problem-solving, and visualising success scenarios, can help improve mothers' ability to continue breastfeeding, despite difficulties.

phone calls postpartum) prompted greater partner support and significantly improved breastfeeding duration rates (but not exclusivity).

Regarding peer support, the Cochrane review by Lumbiganon et al. (81) reported that phone-based education and peer support interventions in a limited number of studies showed slight improvements in breastfeeding rates but these were not consistently significant. The review by Wong et al. (95) found that interventions that used peer counsellors to offer antenatal and postpartum breastfeeding education and support had no significant increases in breastfeeding initiation rates. This lack of evidence for peer counsellors delivering antenatal education on breastfeeding rates is also supported in primary research (111, 129).

In contrast, one review found that peer support, particularly when combined with professional guidance, increased breastfeeding initiation and continuation rates (84). Further, the findings of two primary studies (Rempel et al. (130), Awosemusi et al. (129)) on peer-led antenatal education, suggested that peer supporters can impact on breastfeeding intentions (130) and exclusive breastfeeding rates (129). These findings suggest that peer-led antenatal education may help motivate women who are already intending to breastfeed.

Individual, cultural and regional differences in intervention effectiveness

Evidence indicates that Western countries showed more variability in breastfeeding outcomes following antenatal education interventions compared to Eastern countries, possibly due to differences in hospital policies and maternal support systems (84, 116). For example, while Eastern countries (e.g., China) report higher exclusive breastfeeding rates and greater reduction in engorgement following breastfeeding education compared to Western countries (116), the authors acknowledge that this may be due to integrating complementary interventions (i.e. breast massage) with hospital-based practices (116).

Variations in usual care may also be responsible for the lack of positive outcomes seen across studies. For instance, 13/20 studies contributing data to a Cochrane review had breastfeeding education or support as part of the standard care comparator (81). Furthermore, while O'Reilly (115) found no impact of a multicomponent perinatal breastfeeding support intervention on breastfeeding prevalence at 3 months postpartum among women with BMI >25 in Ireland, the authors highlight that more women in the control group sought private lactation support.

> *You're not going to know everything about a certain person's culture, but I think it's worthwhile finding out more by asking questions such as 'in your culture, how is breastfeeding perceived?' Or 'in your culture, what do you do?' That type of thing. So, just a couple of basic questions and then from that they might be able to understand a little bit better and if there is an issue, or some sort of concern, then they'll be able to address it better.* (Site 1 PSMNVP HCP5)

The need for culturally relevant interventions has been reported (108, 131) and there is some evidence that interventions developed for specific cultural groups are effective. For example, Lau et al. (104) evaluated a bilingual and culturally tailored breastfeeding programme in a Chinese American community using a quasi-experimental study. The intervention comprised perinatal education, hospital breastfeeding support, and postpartum follow-ups, with data collected from 1,475 women. The

intervention group experienced increases in both any and exclusive breastfeeding rates.

The review by Wong et al. (95) reported that interventions were more effective among minority groups, low-income populations, and women with lower education levels. Studies targeting low-risk, highly educated women did not show significant effects (95). The review by Kehinde et al. (83) also found that mothers involved in antenatal interventions who are knowledgeable about breastfeeding and hold a positive approach towards breastfeeding have the tendency to initiate breastfeeding and continue for a lengthened period.

Variations in outcomes based on participant or service-related characteristics were also highlighted in several of the primary studies (85, 90, 104, 120). For example, in the study by Karp et al. (113), women with higher education, lower BMI, lower levels of depressive symptoms and higher levels of antenatal stress[62] were associated with higher rates of breastfeeding initiation.

Antenatal interventions to promote maternal-fetal attachment and pre-natal bonding (also see Chapter Eleven - Close and loving relationships*)*
Stoodley et al. (132) conducted a scoping review to identify and summarise antenatal interventions aimed at enhancing maternal-fetal attachment and antenatal bonding. Three main categories of interventions were identified:

- ***Fetal awareness and sensory connection:*** Interventions such as abdominal palpation and monitoring fetal movements were shown to increase maternal awareness of the fetus and strengthen maternal-fetal attachment. Women who engaged in conscious perception of fetal movements over 24 hours demonstrated significantly stronger antenatal attachment.

- ***Education-based interventions:*** Antenatal education promoting communication with the fetus, reflective practices, and cultural traditions, such as *Taegyo* (a Korean practice emphasising antenatal mindfulness and bonding), were effective in improving maternal-fetal attachment. These interventions encouraged reflection, emotional expression, and symbolic gestures of affection (e.g., writing letters to the unborn baby).

- ***Creative and relaxation-based interventions:*** Activities such as maternal singing or mindfulness exercises did not always enhance antenatal attachment but improved postnatal bonding, maternal relaxation, and emotional wellbeing.

[62] The authors suggested this may reflect participants acknowledging the numerous stressors they are facing, as part of a positive adaptive response, helping them begin to prepare for the transition of a new infant being born.

Section II: Women's views of antenatal education and support

Meeting women's information and support needs

Women valued receiving antenatal education and support on infant feeding, and perceived it was helpful for breastfeeding initiation and continuation (33, 49) and exclusive breastfeeding (48), as well as for social support (60). Women valued hearing about the benefits (48) and 'science of breastmilk' (53). In a primary study by Stein et al. (133), the factors that helped them feel prepared to breastfeed included the skills and knowledge of the educators and watching a live breastfeeding demonstration with a mother and baby, as it offered practical positioning techniques and reassurance. They also appreciated information on available breastfeeding support services, the role of partners and family, and guidance on antenatal colostrum expression, and found the group environment supportive.

> *They had the crocheted breasts, and they showed you the anatomy of it – like all the ducts and I'd never seen that before either so that was pretty cool. They then showed us how to express using the baby doll. They also showed us the size of the baby's belly, like a little marble and then up to an egg so you could see how much they can manage in the first week… It was good. It was good information.* (Site 2 Mother4)

As highlighted in Chapter Three, other evidence raised concerns that the information provided during antenatal care was not always tailored to women's specific needs. For instance, women expecting multiple births reported that antenatal education lacked relevant guidance for their circumstances (49). Women with eating disorders expressed the need for more targeted information to alleviate anxiety about potential overfeeding of their infants (68). Similarly, autistic women found the advice that 'breastfeeding should not hurt if done correctly' distressing, as it failed to acknowledge their heightened sensitivity to touch (50). Mothers of premature infants also reported missing key opportunities for infant feeding education (53).

In several of the reviews, some women felt that the information they received was insufficient to help them understand the differences between breast milk and infant formula (53, 65, 79). In primary studies, mothers complained about the predominant focus on labour and birth, rather than the practicalities of infant feeding (133), as well as a lack of acknowledgement and preparation for the emotional impact of breastfeeding (133, 134). Some of the mothers in Stein et al.'s study (133) also complained about the focus on breastfeeding, rather than alternative infant feeding methods (infant formula, mixed feeding). Women who were socially disadvantaged (65) and women from global majority groups (60) also complained about limited education and support from healthcare providers in the community and in the hospital.

Some of the participants in Kehinde et al.'s (134) study recommended enhancing antenatal breastfeeding education by incorporating more interactive and personalised support, including opportunities for Q&A sessions, small-group discussions, anonymous feedback, realistic accounts from other mothers, partner involvement, guidance on the legal and practical aspects of breastfeeding in public, and tailored information for both first-time parents and those with previous experiences.

The theory-reality gap

A recurring information gap concerned the disparity between the theoretical and experiential realities of breastfeeding. Women's perceptions of breastfeeding and feeding choices were influenced by the information they received from healthcare providers. Therefore, messages about the importance and relative simplicity of breastfeeding (such as breastfeeding being 'natural' and 'enjoyable') were believed to position breastfeeding as idealistic rather than realistic (26, 33, 63, 64, 66, 76).

> *Before you have the baby, it sounds like they sugar coat it a bit, like it's really good for bonding. It's really good for this. It's really good for that. And they have all these benefits. However, they should say it's going to be painful. It's going to be tiring.* (Site 4 Mother1)

Across the included research, these views contributed to misalignment between women's expectations and their actual experiences (26, 33, 65), with women facing unexpected and unexplained situations that they were unprepared for (65, 76, 79). These situations could include frequency of feeding, breast engorgement, sore nipples and breast refusal (26, 53, 54), and were associated with feelings of isolation, a reduced sense of confidence and uncertainty about breastfeeding continuation (134). Healthcare professionals in the Kehinde (134) study reported how emphasising the positives was a premeditated strategy intended to motivate initiation (133, 134).

Access to wider support

Women complained of being unaware about where to find and how to access breastfeeding support (58, 76, 79). For immigrant women, their reasons for non-access to support related to a lack of awareness as well as concerns of judgement associated with their cultural beliefs (58). Some women did not want to access available support (such as breastfeeding clinics or groups) due to a misconception that these groups were only for those facing breastfeeding complications, or for social support (26, 64, 75). These insights highlight the need for clearer information that explains *why* such services are important and communicates their broader focus and purpose. Table 4 summaries the evidence to present an overview of key factors for effective antenatal preparation.

Table 4: *What does effective antenatal preparation look like?*

Evidence identifies	**Implication for antenatal preparation**
Women value honest and realistic information	Prepare families for both benefits and potential challenges
Practical demonstrations and interactive learning are valued	Combine information with practical preparation
Self-efficacy is important	Build confidence as well as knowledge
One-off education is less effective	Provide multiple opportunities for support
Support extending into the postnatal period is beneficial	Link antenatal preparation clearly with postnatal support
Generic information may not meet individual needs	Tailor preparation to individual circumstances, needs and feeding intentions

Section III: Antenatal breastmilk expression

Antenatal breastmilk expression (AME) refers to the manual expression of colostrum during the final weeks of pregnancy, with the intent to collect, store, and later feed the expressed colostrum to the newborn after birth. AME is usually initiated in the late third trimester (36-37 weeks) as this is considered safe and close to term. It is generally performed by hand expression to gently stimulate colostrum flow, and the colostrum is typically stored in small sterile syringes or containers and frozen until needed postnatally. While AME can build maternal confidence, its purpose is to have colostrum readily available in the early postpartum period, especially if direct breastfeeding is delayed or supplementation is needed. AME is a common intervention to support neonates at higher risk of hypoglycaemia or feeding difficulties (e.g., infants of diabetic mothers). Since 2012 there have been three systematic reviews published. An overview of the evidence reported in these reviews is outlined as follows:

Timing of AME

While participants in most studies were expressing at, or after, 37 weeks (135, 136), some included women expressing at, or after, 20 weeks' gestation or between 32- and 36-weeks' gestation (136).

Challenges of AME (also see parents views about AME in the case study findings)

- Extent of the challenges: In Ablett et al.'s (135) review, quantitative assessments indicated that between 4-31% of women found AME difficult, while between 0-31% experienced discomfort (e.g., in breast, nipple, abdomen, back, shoulder, hand and wrist). Similar experiences of pain and discomfort were identified in the review by Foudil-Bey et al. (136).

- Cultural challenges: Some African women in the lived experiences reviews by Odeniyi et al. (54) and immigrant women in the review by Schmied et al. (55), expressed an aversion to breastfeeding due to human milk (i.e., colostrum) being perceived as dirty or having a 'fishy smell'. Their view of colostrum being perceived as dirty or 'spoiled' was related to spending too much time in the breasts (54, 55). Schmied et al. also found that differences in perspectives on colostrum (i.e., being perceived as 'dirty' or nutritiously valuable) tended to occur within rather than between cultures (55).

- Physical and psychological challenges: Pregnant women reported a time and energy burden associated with AME in Foudil-Bey et al.'s (136) review. Pregnant women described feelings of embarrassment or awkwardness about AME or felt uncertain about its value, particularly when only small volumes of colostrum were obtained. Concerns over a lack of volume led to disappointment, self-blame, and a sense of failure (135, 136). Perinatal participants and healthcare professionals voiced concerns that AME could be an over-medicalisation of breastfeeding, leading to increased concerns over the adequacy of postnatal milk supply (135, 136).

- Waste of resources: Some participants in the included studies in Ablett et al.'s (135) and Foudil-Bey et al. (136) reviews were dissatisfied because their antenatally

expressed colostrum was not utilised appropriately, or was wasted by healthcare staff. In several cases, their stored colostrum was not offered to their baby, was misplaced, discarded, or left unused due to staff being unaware of it, unclear protocols, or differing clinical priorities.

Safety and risk

Healthcare professionals and pregnant women expressed concerns about not using the correct technique during AME or incorrectly using manual or electric pumps when performing AME, which could pose a health risk[63] (135). Overall, two reviews reported AME to be safe, with no significant increase in preterm labour, neonatal unit admissions, or adverse maternal/neonatal outcomes reported (135, 137).

There were variations regarding the impact of AME on infants' glycaemic status. The findings of a pilot study undertaken in Australia by Forster et al. (138) was reported in Juntereal & Spatz's (137) review, and found that a greater proportion of neonates who received AME became hypoglycaemic (21%) compared to those who did not (9%). In the follow up larger RCT, Forster et al. (139) found that a slightly lower proportion of neonates of participants who practiced AME became hypoglycaemic (42%) after birth compared to the proportion of neonates (46%) of participants who did not practice AME.

> *When I were trying, I was like, oh God, I'm not getting anything out. I'm just getting a drop here and there and that's it. But then when I went to the hospital for a growth scan, I saw one of the midwives, she's like, have you been trying to colostrum harvest? I said, 'yeah, been trying to do it'. And I said 'I'm not really getting much though'. I said, like 'some of my friends are getting syringes full'. The midwife then told me 'oh you might just get a drop. That's normal. You might not get anything. It doesn't mean that it's going to affect your breastfeeding'. So, yeah, I found that quite difficult until I got that information really, because I didn't know if I was doing it right.*
> (Site 4 Mother4)

The risk of hypoglycaemia is elevated for infants of mothers with diabetes because of their likely exposure to elevated maternal glucose, which stimulates fetal pancreatic secretion of insulin in utero. Two non-randomised pilot studies (138, 140) on AME among pregnant women with diabetes were included in Juntereal & Spatz's (137) review. These two studies found a greater proportion of infants being admitted to neonatal care following AME (30% and 33%, respectively) compared to infants of participants who did not practice AME (17% and 12%, respectively).

Impact on maternal self-efficacy

In some of the included evidence, pregnant women who performed AME had higher breastfeeding self-efficacy compared to those who did not: this was thought to be related to improved dexterity, commitment, resilience and familiarity with their breasts and with breastfeeding (135, 137). Some of the participants who performed AME felt reassured about having a sufficient milk supply postnatally (135, 137). Many participants described feeling reassured that their bodies were 'working properly', excited when they saw colostrum, and felt proud to be doing something beneficial for their infants (135-137).

[63] Such as preterm labour or uterine contractions, breast or nipple trauma, infection risk or ineffective expression

Impact on breast milk production and breastfeeding

Studies in the reviews by Ablett et al. (135), Foudil-Bey et al. (136) and Juntereal & Spatz (137) reported that participants believed AME to have encouraged a greater volume or a faster onset of mature milk production postnatally. AME was positively correlated to exclusive breastfeeding and breastfeeding continuation postpartum, although heterogeneity of the evidence was highlighted (135-137).

Perinatal participants and healthcare professionals believed that AME may prevent the use of human milk substitutes, but this relationship is still unclear (135). While some of the evidence included in Juntereal & Spatz's (137) review found no difference in infant formula use between participants who practiced AME compared to those who did not, others found AME to be independently associated with a reduced risk of infant formula use during the early postnatal period.

While there was a belief that AME can be of value to all pregnant women, specific groups that attained the most breastfeeding-related benefit from AME were those with gestational diabetes, hypertensive disorders, elective caesarean section births, and obesity during pregnancy (135).

Education-related issues

Some of the studies included in the review by Albett et al. (135) identified concerns over healthcare professionals not always being aware of how to support AME. The authors state that pertinent educational information should include the realistic volume of colostrum one can expect to attain from AME, how to store colostrum safely, and reassurance that AME does not deplete nutrients from the fetus or from breast milk (135).

Educational videos provided to pregnant participants to be able to undertake AME were reported to be beneficial (135). Participants also appreciated learning from real people's past experiences with AME (135), and ongoing technical and emotional support from healthcare professionals was believed to be important (135).

Limitations of the evidence base

Generalisability of findings

- Most studies were small, single-centre, or geographically limited, reducing the generalisability of findings. Sample diversity was often poor, with underrepresentation of women from global majority backgrounds and limited inclusion of women with multiple births. These groups can face distinct challenges, such as prematurity, NICU admission, and complex feeding coordination, which currently remain underexplored.

Study design and methodological quality

- The evidence base is constrained by a predominance of small, heterogeneous studies with high or unclear risk of bias. Challenges in blinding participants and research staff were common, compromising internal validity. Only a few studies employed robust randomised controlled designs, and follow-up durations were often short, typically restricted to the first two weeks postpartum, limiting understanding of sustained breastfeeding or infant outcomes.

Heterogeneity in interventions

- Interventions varied widely in content, delivery mode, duration, and follow-up period, making cross-study comparison difficult. Differences in AME frequency, timing, and technique were particularly pronounced, with many studies failing to describe expression methods (e.g., hand expression, nipple massage, or rolling) in detail. The lack of uniform clinical guidelines for implementing and evaluating AME further complicates interpretation.

Inconsistent control conditions and outcome measures

- Many trials lacked clear definitions of standard care in control groups, making it difficult to assess intervention effects. Outcome measures were inconsistent, particularly regarding breastfeeding intentions, which were not systematically assessed. Reliance on self-reported data rather than objective indicators (e.g., milk volume or biomarkers of lactogenesis) further limits confidence in conclusions about effectiveness.

Limited scope and duration of evaluation

- Most studies focused on short-term outcomes, such as early breastfeeding initiation or attachment within the first fortnight postpartum. There is a scarcity of evidence on longer-term maternal-infant bonding, sustained breastfeeding, or child development outcomes, leaving the continuing benefits of antenatal interventions uncertain.

Areas for future research

Need for robust, high-quality evidence

- The current evidence base remains constrained by small sample sizes, heterogeneous study designs, and limited follow-up. There is a pressing need for large-scale, well-designed RCTs to evaluate antenatal and breastfeeding interventions. These trials should determine the optimal format, timing, intensity, and frequency of education and support programmes, using consistent and validated outcome measures.

Standardisation and methodological rigour

- Future studies should employ standardised protocols for intervention delivery and evaluation to enable comparability and synthesis across studies. Consistent definitions, clearly defined control conditions, and objective outcome measures are essential to strengthen the evidence and guide clinical practice.

Longitudinal evaluation of outcomes

- Few studies have examined the sustained impacts of antenatal interventions beyond the immediate postpartum period. Longitudinal research is required to assess long-term effects on maternal wellbeing, parent-infant bonding, breastfeeding duration, and infant development, thereby clarifying lasting benefits and mechanisms of change.

Theoretical and conceptual grounding

- Many interventions (focused on attachment and parent-infant relationships) lack a clear theoretical framework. Future research should be theory-informed, drawing on attachment theory, behavioural science, and psychological models to understand how and why antenatal practices foster maternal-fetal attachment and successful transition to parenthood.

Cultural, social, and contextual diversity

- Most existing studies have been conducted in limited geographical and cultural contexts. Research must be expanded to include diverse populations across racial, ethnic, socioeconomic, and gender identities, and in low-resource or marginalised communities, to enhance relevance and equity of outcomes.

Comprehensive and inclusive intervention design

- Future research should test integrated antenatal and postnatal support strategies, combining education with community-based approaches. This includes the involvement of fathers, partners, and extended family members in breastfeeding and bonding interventions, ensuring culturally sensitive and inclusive models of care.

Translation into routine practice

- Further investigation is needed into how antenatal interventions, particularly those enhancing fetal awareness, emotional connection, and reflective practice, can be effectively embedded into routine maternity and primary care pathways. Implementation research should explore feasibility, accessibility, and professional training requirements to support adoption.

ATTUNE STUDY

5

Chapter Five: Impacts, experiences and challenges of skin-to-skin and kangaroo care

Skin-to-skin contact (SSC) immediately after birth supports newborn adaptation and promotes successful breastfeeding. Babies naturally show feeding behaviours during SSC, such as moving towards the breast and self-attaching. SSC should be offered to all mothers and babies as soon as possible after birth, ideally within the first two hours when babies are most alert. Undisturbed babies progress through important behavioural phases that support feeding and bonding. SSC also increases oxytocin levels in mothers, helping reduce stress, strengthen bonding, and improve breastfeeding confidence. Research shows SSC improves breastfeeding rates and duration, reduces infant crying, and improves temperature, blood glucose, and cardio-respiratory stability, particularly in preterm infants. Kangaroo Mother Care is also linked to reduced illness and mortality in low birthweight babies. Overall, SSC has important benefits for breastfeeding, infant health, and parent-infant bonding and should be encouraged immediately after birth.

Skin-to-skin contact and kangaroo care are closely related practices, but they differ in scope and purpose. **Skin-to-skin contact (SSC)** refers to placing the newborn baby directly on the bare chest of the mother or caregiver. This contact typically begins immediately after birth, can be done with any newborn and is often used for short periods, such as during the first hour or more after birth or during feeding, and is continued in the days and weeks following birth. **Kangaroo care (KC)**, on the other hand, is a broader and more structured form of care that includes sustained skin-to-skin contact, and may involve using a sling[64], which may last for many hours a day over several weeks, continuing after the infant is discharged home. It is considered a key intervention in improving the survival and health outcomes of vulnerable newborns. KC is especially recommended for preterm or low birth weight infants because of physiological (e.g., thermal regulation, reducing infections) as well as emotional based (e.g., bonding and attachment) reasons. Both SSC and KC are recommended for all babies regardless of feeding method, and both emphasise the importance of continuous, long-term closeness between the baby and the mother, father or other close caregiver.

Alongside promoting SSC and KC, it is essential that appropriate safety measures are maintained. UNICEF UK highlights several important safety considerations[65] when undertaking skin-to-skin contact, particularly in the first few hours and early days after birth and when the baby is preterm or unwell.

[64] The safest method of baby wearing is in a carrier that keeps the baby solidly against the parent's body, in an upright position. Parents should ensure that they keep their baby's chin off their chest, thereby keeping the airway free for breathing. https://www.rospa.com/home-safety/product-safety/baby-sling

[65] Skin-to-skin contact - Baby Friendly Initiative

Evidence from the UNICEF 2012 review found strong evidence that immediate SSC after birth supports newborn physiological adaptation and promotes successful breastfeeding. The review reported that, during SSC, babies naturally display feeding behaviours such as moving towards the breast and self-attaching, and that when left undisturbed they progress through a series of instinctive behavioural phases that facilitate feeding initiation and parent-infant bonding. The evidence suggested that SSC should be offered to all mothers and babies as soon as possible after birth, ideally within the first two hours postpartum.

The review also found that SSC increases maternal oxytocin levels, which may reduce maternal stress, strengthen parent-infant bonding, and enhance maternal confidence in breastfeeding. Furthermore, SSC was associated with improved breastfeeding initiation, higher breastfeeding rates, and longer breastfeeding duration.

Additional benefits included reduced infant crying and improved neonatal physiological stability, such as better temperature regulation, blood glucose control, and cardiorespiratory stability, particularly among preterm infants. The review also highlighted evidence that KC was associated with reduced morbidity and mortality among low birthweight infants.

Evidence from the updated review expands upon the findings of the 2012 review by broadening understanding of the benefits of SSC and KC beyond newborn physiological adaptation and breastfeeding outcomes. Newer studies highlight the positive impact of SSC/KC on parent–infant attachment, parental confidence, emotional wellbeing, and the development of responsive caregiving behaviours.

The updated literature also places greater emphasis on the organisational and contextual factors that influence the successful implementation of SSC/KC in clinical practice. Key factors identified include staff education and training, effective leadership, multidisciplinary collaboration, adherence to BFI standards, and the adoption of family integrated care models that support parental involvement.

The newer evidence also provides a more detailed exploration of barriers to implementation. These include staff pressures, inconsistent policies and practices, limited privacy within healthcare settings, cultural beliefs and expectations, parental anxiety, and inequalities in access to care. It also highlights the importance of promoting equitable and culturally sensitive care, as well as ensuring the inclusion of fathers and other family members in SSC/KC practices where appropriate.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

UNICEF UK-BFI standards define SSC and KC as follows, these practices are required for all mother/parents and babies:

Skin-to-skin contact

- SSC is defined as a baby being dried and laid prone, directly on the mother's bare chest (or bare chest of another caregiver) immediately after birth with both covered by a warm blanket.
- The baby may be wearing just a nappy when placed on the mother's chest.
- The baby and mother (or another caregiver, e.g. partner) should be supported, kept warm, and uninterrupted for at least one hour or until after the first feed, and for as long as they wish.
- The contact should not be interrupted by non-urgent procedures (e.g., weighing, bathing) before the baby has had the chance to feed and settle.
- If mothers and babies are unable to have SSC straight after the birth this should be commenced as soon as possible.
- Continuous or prolonged SSC is encouraged beyond the initial hour and into the early days and weeks.
- Safety considerations: It is important to make sure the baby cannot fall to the floor, become trapped in bedding or by the mothers' body. The baby's airway must remain clear, and the baby's position must be supported so that the airway does not become obstructed. In the acute setting monitoring should continue as would occur if baby were in a cot.

Kangaroo care[66]

KC is regarded by the UNICEF UK-BFI as a form of care for preterm and low-birth-weight babies that is built around prolonged SSC and support for exclusive breastfeeding/breast milk feeding. It is seen as a continuation and extension of SSC, but used specifically to support the stability, growth, and survival of smaller or more vulnerable babies. KC is described as:

- The baby is held in continuous or prolonged SSC against the mother's (or sometimes father's or surrogate caregiver's) bare chest, typically wearing only a nappy and sometimes a hat for warmth.
- Breastfeeding is encouraged and supported, with SSC during kangaroo care used to enhance milk production, support the infant's ability to feed, and strengthen bonding.
- KC is recommended for babies when mothers are not directly breastfeeding, offering benefits for bonding, stress reduction, and thermal regulation. KC is recognised not only as a comfort measure, but as a clinical intervention associated with benefits for thermal and physiological stability and, particularly among preterm and low-birth-weight infants, reduced infection risk and improved growth.

[66] Also important to note that UNICEF UK-BFI uses the term Kangaroo Care (KC), aligned with its focus on integrating parents into neonatal care, using KC as an accessible and familiar clinical term. Kangaroo Mother Care (KMC) is more often used in global public health, low-resource settings, and WHO guidance, referring to more of a structured clinical programme. There is, however, significant heterogeneity in the definition of KMC and development of a global standardised definition of KMC has been recommended.

- It is delivered as often and for as long as possible, including in transitional care and neonatal units, and may continue after discharge.

UNICEF UK BFI's standards for SSC/KC align closely with various wider national and international policy and clinical guidance. First, the NICE Postnatal Care guideline (NG194)[67] recommends that SSC begin as soon as possible after birth to support breastfeeding and parent-infant attachment. The Royal College of Midwives position statement on SSC and breastfeeding support[68] also emphasises that services should make every effort to enable SSC within the first hour of life and continue to support frequent physical closeness thereafter. In neonatal care, the NHS England Neonatal Critical Care Service Specification[69] advocates for parents to remain closely involved in caregiving and to provide prolonged SSC where clinically appropriate. This aligns directly with the BFI's neonatal standards, which position parents as central to their baby's care, even in high-dependency or intensive settings. On a global level, the World Health Organisation strongly recommends KC for all clinically stable preterm and low birth weight (LBW) infants[70], and in its 2022[71] update advises initiating KC as soon as possible after birth, rather than waiting for a period in an incubator unless the baby requires acute stabilisation. This reflects the same principles embedded in the BFI approach: continuity of contact, parental involvement, and breastfeeding support as first-line care rather than optional enrichment. SSC and KC uphold the UN Convention on the Rights of the Child[72] by protecting newborns' rights to survival, development, health, and parental care, ensuring that babies receive evidence-based, nurturing, and lifesaving support from the moment of birth.

Summary of the evidence in relation to UNICEF UK BFI standards

The evidence reviewed strongly supports the principles and standards of the UNICEF UK BFI standards, particularly those relating to close and loving relationships, responsive infant feeding, parent-infant attachment, and family-centred care. A central standard within the BFI is the promotion of uninterrupted SSC immediately after birth. The evidence consistently demonstrates that SSC supports newborn physiological adaptation, thermoregulation, cardiorespiratory stability, blood glucose regulation, reduced stress responses, and improved breastfeeding initiation and duration. These findings directly reinforce BFI standards requiring mothers and babies to remain together after birth and receive support to initiate feeding responsively and safely.

The BFI also places significant emphasis on helping parents recognise and respond to their infant's cues and develop close emotional relationships. The evidence strongly supports this approach, showing that SSC and KC improve parent-infant bonding, attachment, parental confidence, and responsiveness to infant behaviours. Parents described SSC/KC as empowering, calming, and confidence-building, with many reporting a greater understanding of their infant's feeding cues, sleep patterns, and behavioural needs.

[67] NICE - Postnatal care (NG194)
[68] Royal College of Midwives - Position statement on skin-to-skin contact
[69] NHS England - Neonatal critical care service specification
[70] WHO -Kangaroo mother care: A practical guide
[71] WHO recommendations for care of low or preterm infants
[72] United Nations convention on the rights of the child

The BFI standards also emphasise breastfeeding support as part of responsive relationship-building. The included evidence demonstrates that SSC/KC improves breastfeeding initiation, exclusivity, feeding behaviours, maternal self-efficacy, and breastfeeding duration in both term and preterm infants. These findings align closely with BFI recommendations to support breastfeeding through evidence-based practices and uninterrupted early contact.

A further key aspect of the BFI is family-centred and inclusive care (referred to as 'partners in care'). The reviewed evidence supports the inclusion of fathers and wider family involvement, demonstrating benefits for paternal attachment, parental mental wellbeing, and infant regulation. However, the evidence also highlights inequalities and barriers that may limit implementation, including cultural beliefs, staffing pressures, lack of privacy, inadequate staff training, inconsistent organisational support, and parental anxiety. These findings are important in the context of the BFI standards because they reinforce the need for skilled staff support, culturally sensitive care, effective communication, and environments that enable parents to remain close to their babies.
The literature also reflects the BFI's focus on organisational leadership, staff education, and multidisciplinary working. Successful implementation of SSC/KC was associated with strong leadership, BFI accreditation, family-centred care models, flexible parental access, mentorship, and collaborative working across teams. Conversely, inconsistent staff knowledge, unclear policies, and inadequate staffing were identified as barriers to maintaining BFI standards in practice.

Overall, the evidence strongly validates the UNICEF UK BFI standards by demonstrating that SSC and KC improve infant health, breastfeeding outcomes, emotional wellbeing, attachment, and parental confidence. The findings reinforce the importance of implementing evidence-based, relationship-centred, and family-focused care across maternity, neonatal, hospital-based children's services and community services.

Recommendations for the BFI programme

- **Clarify the relationship between SSC and KC across maternity and neonatal standards,** using language that reflects UK practice while recognising the international evidence base for prolonged, repeated and continuous contact.
- **Build on current awareness and understanding of the benefits of SSC and KC** for feeding and maternal, parental and infant relationships and wellbeing**.**
- **Strengthen expectations around continuity of closeness,** so that SSC is understood not only as an immediate post-birth practice but as a relational and where required clinical intervention across maternity, neonatal, hospital-based children's services, transitional care and into the community.
- **Enable consistent, sustained and safe SSC and KC within all care environments and in complex situations,** including neonatal units, hospital-based children's services, theatres, transitional care and where equipment, monitoring or clinical vulnerability exists**.**
- **Raise knowledge and awareness about SSC and KC** as a mother, parent and child rights priority, emphasising rights to closeness, comfort and responsive care advocating for zero separation.
- **Improve monitoring of SSC and KC** including timing of initiation, prevalence, duration and provider, in all clinical settings and environments.

Detailed overview of included evidence

Given the large number of systematic reviews published since 2012, this chapter synthesises the findings from review only. For evidence supporting SSC in healthy full-term or late preterm newborns (≥ 34 weeks' gestation) we draw mainly on an updated Cochrane review of immediate or early SSC for mothers and their healthy newborn infants. This review included 69 RCTs (7290 mother-infant dyads), with most studies (43/69) comparing immediate SSC with standard hospital care[73] (141). As the Cochrane review on KC in LBW infants was published in 2016, we draw upon more recently published systematic reviews and meta-analyses in our evidence review.

It is important to note that the terms SSC and KC are frequently used synonymously in published studies, which can lead to ambiguity regarding which practice is being referred to. For example, the reviews by Vittner et al. (142) and Anderzén-Carlsson et al. (143, 144) focus on SSC, while including literature relating to KC. Stefani et al., (145) acknowledge this confusion, drawing on wider literature to argue that the challenge in differentiation is not helped by NHS guidelines using these terms interchangeably (146).

The findings are presented across a series of interrelated themes, covering the impact of SSC/KC on infant and parent outcomes and the factors influencing its

[73] It is important to note that the "standard care" comparator within the SSC review varied considerably across studies and often reflected historical maternity practices, including delayed or minimal mother–infant contact. As many of the included studies were conducted before SSC became widely embedded within BFI and breastfeeding-supportive care pathways, the comparison conditions may not reflect contemporary maternity care standards.

implementation in practice. These include infant survival, physiological stability, growth, breastfeeding and developmental outcomes; parent–infant relationships, parenting confidence and parental wellbeing; and the individual, social, environmental and organisational factors that can facilitate or constrain SSC/KC. A summary of key outcomes associated with SSC and KC is reported in Table 5 below. Full details of the included reviews are included in the Appendices.

Mortality

There is strong evidence that KC improves the chances of survival for preterm and low birth weight (LBW) infants. A meta-analysis of 24 studies (19,980 preterm and LBW infants) found that KC significantly reduced neonatal mortality compared with conventional care. This effect was evident in both the short term (reduced by approximately 35% within the first 2 months of life) and the longer term (3–12 months of age) (147). Similarly, a systematic review and meta-analysis of 31 RCTS (15,559 preterm and LBW infants) found strong evidence that KC reduces neonatal mortality compared with conventional care, with a 32% relative reduction in death by discharge or 28 days of life (148). The authors highlight a probable dose-response relationship, with ≥8 hours/day of KC associated with greater mortality reduction than shorter durations. Importantly, the review found that early initiation of KC within 24 hours offers additional survival benefits and may reduce clinical sepsis compared with later initiation (148). A further review of 17 RCTs (17,668 preterm and LBW infants) also supported the benefit of KC in reducing neonatal mortality and incidence of sepsis (149).

Hospitalisation

The evidence supporting KC in reducing the length of hospital stays is conflicting. A systematic review and meta-analysis of 12 RCTs (1,636 preterm and LBW infants) showed that KC significantly shortened hospital stay compared with conventional neonatal care (mean difference −1.75 days) (150). Subgroup analyses revealed that infants receiving less than six hours per day of KC experienced a larger and statistically significant reduction in hospital stay (MD -4.66 days), while those receiving more than six hours per day showed no statistically significant difference, which the review authors claim is likely due to substantial heterogeneity in study discharge criteria and infant characteristics (150). Another review also reported significantly shorter hospital stays in preterm and LBW infants following KC (149).

In contrast, a meta-analysis of 24 studies (19,980 preterm and LBW infants) found no significant effect of KC on length of hospital stay (147). Although some of the individual studies included in the review reported shorter hospitalisation with KC, pooled analyses showed no overall statistically significant effect (147). Similarly, while an earlier review reported a mean reduction of approximately 0.9 days shorter hospital stay after KC compared with conventional care, with an even greater reduction in length of stay for very low birthweight (VLBW) infants, these reductions did not reach statistical significance (151). In both reviews heterogeneity for this outcome was high due to differences in discharge criteria, baseline infant weight, and health-system practices. Jafari et al. (151) also considered readmission to hospital, reporting pooled results that indicated a lower readmission rate in the KC group, but this difference was not statistically significant.

Physiological stability

A Cochrane review found that SSC, compared with standard care, resulted in a slight increase in infant axillary temperature with moderate-certainty evidence (141). Although the authors highlighted that the mean infant axillary temperature difference of 0.28 °C was not clinically meaningful (infants in most of the included studies had temperatures between 36 ºC and 37.1 ºC), the findings highlight that infants who receive SSC are not at greater risk for hypothermia (141). Other reviews have also reported that SSC/KC effectively supports thermoregulation in the newborn, particularly in those born prematurely or LBW, supporting its role in stabilising thermal regulation outside incubator-based- care (148, 149, 152-154).

SSC in mother-infant pairs is associated with higher blood glucose levels, and potentially improved cardiorespiratory stability[74] in term infants, although the latter outcome was supported by low-certainty evidence due to small sample sizes (141)[75]. Paternal SSC is also associated with greater infant physiological stability (e.g. regulation of heart rate and higher body or forehead temperature), reduced crying, earlier initiation of feeding behaviours, and enhanced behavioural regulation compared to infants not placed SSC (155). A systematic review of KC in 25 studies (1,039 premature infants) found no clinically significant differences in heart rate, arterial oxygen saturation, regional cerebral oxygen saturation, and fractional tissue oxygen extraction when comparing pre-KC, during KC, and post-KC periods (156). Importantly, the review concluded that KC does not compromise cardiorespiratory or cerebral oxygenation, even in infants receiving respiratory support, reinforcing KC as a safe practice in stable preterm infants (156).

Systematic reviews have reported that SSC/KC, used either therapeutically in conjunction with phototherapy or prophylactically, may have a beneficial role in reducing bilirubin burden and improving treatment efficiency, although results were not entirely consistent across studies (154, 157). The mixed findings reflect variation in study populations (term, late preterm, and preterm infants), duration and intensity of KC exposure, and methods of bilirubin measurement.

KC has been found to significantly reduce pain scores[76] during painful procedures such as BCG vaccination[77] in term and later preterm infants, often performing as well as or better than breastfeeding or swaddling alone (154). No clear differences were observed between the SSC and standard contact group in the rate of infant transfer of healthy full-term or late preterm newborns to the NICU in studies investigating women having vaginal birth nor caesarean sections (141).

Qualitative evidence also provides evidence for the perceived positive impact of KC on physiological outcomes. Parents and staff believed that KC helped to improve infant physiology (142, 158, 159), through keeping infants warm, reducing infections, regulating heart and respiration rates and promoting infant sleep (142, 160). Many

[74] As measured by Stability of the Cardiorespiratory System in the Preterm (SCRIP) scores
[75] Although the review reported higher neonatal blood glucose levels following SSC, comparator infants generally remained within physiologically normal transitional glucose ranges. Furthermore, the finding was based on only three small studies and comparator "standard care" varied considerably, often reflecting older maternity practices involving maternal–infant separation rather than contemporary Baby Friendly care pathways.
[76] Often assessed using validated neonatal pain scales based on behavioural and physiological indicators
[77] The BCG (Bacillus Calmette-Guérin) vaccine is a live, weakened bacterial vaccine used to prevent tuberculosis (TB), particularly severe forms like TB meningitis in infants and young children.

parents reported improved infant temperature and respiratory and cardiac stability, improved growth, improved preterm sleep, feeding tolerance, and infants becoming calmer during KC (158, 161, 162).

Behavioural and cognitive outcomes

A meta-analysis of 13 studies (2310 premature and LBW infants) highlighted that infants who received KC demonstrated significantly better self-regulation[78] than those receiving conventional care (163). Although no significant overall effects were observed for cognitive or motor development, moderation analyses showed that the effects of KC on cognitive and motor development depended on its duration: as the number of days in the KC intervention increased, the association between KC and children's cognitive and motor skills also increased (163).

Growth

KC has been significantly associated with increased weight gain in clinically stable preterm and LBW infants during hospitalisation, with longer daily duration of KC associated with greater weight gain (164). A similar finding was also demonstrated in very low birth weight (VLBW) infants, with KC demonstrating a positive effect on infant growth in most included trials, including improvements in weight gain, head circumference, and length (165). A systematic review and meta-analysis of 13 RCTs (1,461 LBW infants) confirmed a clear dose-response relationship between KC duration and growth outcomes: infants who received ≥6 hours per day of KC showed significantly greater daily weight gain, while those receiving ≤2 hours per day showed little or no benefit (166). When weight gain was expressed relative to body weight (g/kg/day), the largest effects were observed with ≥8 hours per day of KC. In addition, improvements in length and head circumference were seen only when KC was provided for at least 6 hours daily, suggesting that sustained SSC contact is critical for optimal linear and cranial growth (166).

Breastfeeding

Following SSC: A Cochrane review synthesising evidence from 69 RCTs involving 7,290 mother-infant dyads concluded that immediate SSC probably increases exclusive breastfeeding rates at hospital discharge to one month postpartum and from six weeks to six months postpartum, based on moderate-certainty evidence (141). Among women who had a caesarean birth, SSC was also associated with higher rates of exclusive breastfeeding from hospital discharge to one month postpartum and any breastfeeding from one to four months postpartum. However, there was little to no difference in exclusive breastfeeding rates from six weeks to six months following caesarean birth, although evidence for this outcome was limited (141). The review by Stevens and colleagues, focusing on SSC following a caesarean section, found that SSC increased breastfeeding initiation, reduced the time to first breastfeed, and reduced in-hospital formula supplementation (167).

These findings are also reflected in qualitative accounts, with some women following caesarean section associating early initiation of breastfeeding and fewer breastfeeding problems with SSC (168). While two of the included studies in Dey et al.'s (168) review found no difference in breastfeeding rates for women who had SSC following a caesarean, the authors suggested this could relate to studies only

[78] The infant's ability to maintain stable physiological and behavioural functioning, particularly through calmer sleep, reduced stress responses, and improved physiological adaptation.

assessing exclusive breastfeeding, and both intervention and control groups experiencing early SSC (168). One study in the Cochrane review found that mothers providing SSC after a vaginal birth reported more breastfeeding confidence, with a mean Breastfeeding Self-efficacy Scale score of 53.42 compared with 49.85 in the control group (141).

Some of the findings reported in the latest Cochrane review concur with an earlier systematic review of full-term, healthy newborns. This review reported that SSC was consistently associated with higher rates of breastfeeding initiation, exclusivity, and duration, in infants born either vaginally or by caesarean section (152). In addition, there was evidence that SSC impacted infant feeding behaviours, notably a better overall ability to suckle at the breast, more organised rooting and pre-feeding behaviours, and able to more readily recognise their own mother's milk scent than newborns who received no SSC after birth (152).

Findings from the Infant Feeding Survey (IFS) 2024[79] provide further support for the association between SSC and breastfeeding outcomes. Although the survey data are observational and therefore cannot establish a causal relationship, breastfeeding was initiated within the first hour after birth considerably more often among mothers who experienced SSC than among those who did not (62% versus 11%). In addition, 93% of mothers reported having SSC with their baby within 24 hours of birth. These findings are consistent with the published evidence that identifies SSC as an important facilitator of early feeding behaviours and breastfeeding initiation.

Following KC: Overall evidence from systematic reviews reveals a positive impact of KC on breastfeeding outcomes in preterm and LBW infants. A systematic review and meta-analysis of 8 RCTs (1,900 preterm and LBW) found that infants receiving KC initiated breastfeeding significantly earlier than those receiving conventional care with radiant warmers or incubators, with a pooled mean reduction of 2.6 days in time to breastfeeding initiation (169). Similarly, a systematic review and meta-analysis of 20 RCTs (2,842 term and preterm infants) found that KC was associated with earlier initiation of breastfeeding and improved breastfeeding behaviour assessed by the Infant Breast-Feeding Assessment Tool (IBFAT)[80], indicating better infant readiness, latching, and suckling patterns during breastfeeding (170). A systematic review of VLBW infants found that KC substantially increased breastfeeding rates, enhancing both exclusive and sustained breastfeeding during hospitalisation and at one to three months' follow-up, with several studies reporting significantly higher breastfeeding prevalence in KC groups relative to controls (165). In addition, Cunningham et al. (164) reported that exclusive and earlier breastfeeding was more frequent among preterm and LBW infants receiving KC across most studies included in their review. Evidence from a qualitative review also found that KC was associated with improved breastfeeding self-efficacy (143).

Other systematic reviews, however, have yielded less conclusive results. A meta-analysis synthesising evidence from 17 RCTs (17,668 LBW and preterm infants) found that, although KC was associated with higher rates of exclusive breastfeeding,

[79] Infant feeding survey 2024: full report - GOV.UK

[80] The Infant Breastfeeding Assessment Tool (IBFAT) is a 12-point, 5-factor scale developed by Matthews in 1988 to evaluate infant feeding behaviour in the early neonatal period. It assesses rooting, alertness, latching, sucking, and maternal perception of the feed, providing a total score of 0-12 to indicate feeding efficiency.

these increases were not statistically significant (149). Similarly, a review of 31 trials (15,559 preterm and LBW infants) reported that, despite an increase in exclusive breastfeeding at discharge, the corroborating evidence was variable and sometimes low-certainty, and no difference was noted at 1-3 months of age (148). Inconsistency on breastfeeding outcomes in systematic reviews may relate to variation among included studies with regards to the heterogeneity of control groups ('standard care' varies widely), timing of initiation, duration, implementation settings and quality of evidence.

Third stage of labour

Systematic reviews are conflicting regarding the impact of SSC on placental separation time/length of the third stage of labour. Whilst a Cochrane review found little to no effect of SSC on placental separation time/length of the third stage of labour (141), an earlier review of 6 studies reported that SSC significantly shortened the third stage of labour compared with routine care, with a pooled mean difference of -1.33 minutes (171). Both reviews found high levels of heterogeneity for this outcome, inconsistencies in how expulsion or separation was defined, and key confounding factors, such as length of labour, prior uterine surgery, infection rates, cord-clamping times, and third-stage clinical actions (e.g., active management, oxytocin use), were often unreported. Moore et al.(141) conclude that the lack of clear effects is likely attributed to inconsistent measurement, small study numbers, and methodological limitations rather than evidence of harm.

Postpartum haemorrhage

Evidence is conflicting regarding the impact of SSC on postpartum blood loss. A Cochrane review did not find evidence that SSC decreases postpartum blood loss, but cautioned against misinterpretation due to very limited data (2 studies; 143 participants), inconsistency, imprecision, and high risk of attrition bias in one trial (141). In contrast, a scoping review that included evidence from quasi-experimental, cohort and cross-sectional studies as well as RCTs (172) reported that SSC was consistently associated with reduced maternal blood loss (4 of 5 included studies), higher rates of complete placental delivery (3 of 4 studies), better uterine and involution contractility (3 studies), lower incidence of uterine atony (2 studies), and reduced erythrocyte and haemoglobin decline, fewer numbers of absorbent pad changes, and decreased need for synthetic oxytocin or ergometrine to control bleeding (1 study). Methodological limitations and small sample sizes across studies however limit conclusions.

Maternal pain

Mothers providing SSC reported less pain during the two hours after episiotomy or perineal laceration repair compared to women in a control group on average, but there was substantial heterogeneity (141).

Parent-infant relationships

SSC has been associated with positive mother-newborn experiences, such as feelings of bonding (also see evidence in Chapter Eleven), a sense of naturalness, and overall satisfaction with the birth experience. Mothers and newborns who engaged with SSC experienced more quality interactions with one another one year after birth (152).

KC/SSC was found to significantly improve mother-attachment scores compared to control in term, preterm and LBW infants (171, 173). Despite wide variation in the duration and frequency of KC/SSC exposure across trials (between 2.5 to 540 hours), mother-child attachment scores consistently favoured KC (171). A Cochrane review, however, found no evidence of an impact of SSC on maternal perceptions of bonding at 12 months postnatally. This review included a single study of 61 mothers and, although SSC dyads exhibited greater mutuality and reciprocity compared to those separated immediately after birth and subsequently reunited for rooming-in, the magnitude of the difference was not thought to be clinically significant (141). SSC following a caesarean section was found to improve bonding and maternal satisfaction (167).

> *And I always make sure to mention skin-to-skin contact is not just for breastfeeding, it's obviously for bonding with the baby. There's a lot of other issues that skin-to-skin that can help with, you know, just regulating babies breathing, it can calm mum down, things like that. I always mention it to dads as well, skin-to-skin is really important.* (Site 3 maternity 7)

From a qualitative perspective, some healthcare professionals believed that KC could promote bonding (161) and a 'special attachment' between parents/carers and their infants (161). This was echoed in parents' accounts (160, 174), with some mothers describing an instant and overwhelming love during SSC/KC (143, 168). KC enabled a reciprocal process of parents and infants getting to know one another, through which a strong parent-infant attachment was formed (144, 160, 162), and parents who were invested in KC visited their infants more frequently than those who were not (143). One of the studies included in Louis & White's (160) review found no correlation between KC and bonding at one week postpartum, but by 6 to 8 weeks, there was a positive correlation between more time spent performing KC and higher ratings of affectionate touch and mother-infant attachment.

Paternal touch has demonstrated beneficial biophysiological, behavioural, and psychological effects for both infants and fathers (155). In fathers, SSC and spontaneous touch were associated with changes in oxytocin and testosterone, reduced anxiety and depressive symptoms, improved paternal role attainment, and stronger father-infant attachment. Fathers who engaged in more tactile interaction, especially playful or stimulatory touch, tended to show higher oxytocin levels, although this may be influenced by other hormonal factors, particularly testosterone. Spontaneous affectionate stroking by fathers increased infants' parasympathetic regulation, indicating improved autonomic calming. Comparisons between mothers and fathers suggested that paternal and maternal touch are similarly regulatory for infants, though they often differ in style: maternal touch tends to be more affectionate and breastfeeding-oriented, whereas paternal touch is more stimulatory and arousing (155).

Parenting role

> *I had him in skin-to-skin for ages… all the way back from theatre and then when we got back to the ward, I kept him there just until we'd phoned friends and family… The midwives were supportive with that because obviously I couldn't move from the spinal, so a midwife came in just to support* [dad's name] *with getting him in the right position.* (Site 4 Mother6)

Some parents, including women following a caesarean and those with a preterm infant, felt that SSC/KC had helped them transition to the parenting role (143, 144, 161, 168). The physiological benefits associated with KC also contributed to parents valuing their active participation in their infant's recovery (144). SSC/KC helped parents develop confidence, as well as a sense of control and responsibility in caring for their infants (143, 144, 160, 161, 168). Parents described feeling more able to respond, observe and to communicate with their newborns while in SSC/KC (143, 168), whereas separation post-birth was described as traumatising (168). Mothers reflected on how KC helped them to understand and interpret their infant's behaviour, such as signs of hunger, body temperature and sleep patterns (143), thereby reducing their sense of their infant's fragility and increasing their confidence to care for their infant (143, 144, 160, 162). Some fathers felt SSC/KC contributed to their parenting role through positive actions that benefited the baby and had helped develop the fathers' identity (143, 162).Through KC, parents developed skills and confidence that supported their transition to caring for their infant at home after discharge (144, 161). One of the studies in Louis & White's (160) review found that 91% of parents performing KC, versus 66% of parents not performing KC, reported being very or highly confident in their ability to care for their infant at discharge.

Parenting health and well-being

A Cochrane review reported that SSC was associated with a marginal reduction in maternal anxiety, as measured by the state anxiety scale, at three days postpartum (SMD -0.50, 4 studies; 490 mothers) (141). An earlier systematic review, including observational and controlled trials, found an association between SSC and reduced maternal and neonatal stress reactivity, with lower salivary cortisol levels and reduced infant crying during SSC (152). Dey et al.'s (168) review included a study which suggested a dose-response relationship between the duration of SSC and maternal satisfaction following a caesarean section. Women in the intervention group who maintained SSC for five hours reported significantly higher satisfaction scores, particularly in relation to opportunities to touch, hold, bond with, and to breastfeed their baby.

A systematic review and meta-analysis of 30 trials (7,719 preterm or LBW infants) found that KC significantly improved maternal mental health, with high-certainty evidence showing a substantial reduction in moderate-to-severe postpartum depressive symptoms and low-certainty evidence indicating reductions in maternal stress and anxiety (173). Limited but promising evidence suggested enhanced father-infant interactions following KC, though no significant effects were detected for paternal depression or stress, and no studies reported parental physical health outcomes (173). Studies that evaluated parents' vital signs before and after KC found statistically significant reductions in parents' initial heart rate, respiratory rate, blood pressure and cortisol levels, indicating that KC has powerful stress-reducing effects (160). Thirteen studies included in Louis & White's (160) review found that KC had

the potential to make a positive impact on caregiver mental health (via reduced stress, anxiety or depression), although other included evidence was not as conclusive. Moreover, some studies suggested that parents who performed KC reported lower spousal relationship problems than those who did not, with more noticeable results when both caregivers participated in continuous KC (160).

In qualitative research, the terms that parents used to describe SSC/KC included empowering, reassuring, happy, joyful, natural or restorative (143, 158, 168). SSC following a caesarean helped some women feel they had experienced childbirth rather than a surgical procedure (168), while also alleviating feelings of pain, discomfort and anxiety (168). SSC/KC helped some parents resolve any negative emotions associated with the birth (143, 168). Additionally, some mothers believed, the relaxing, calming, and stress-relieving effects of KC aided their physical and emotional recovery post-birth (158), including recovery from postpartum depression (161).

Knowledge, awareness and attitudes

Healthcare professionals: Positive and encouraging attitudes among healthcare professionals towards KC (142-144, 158, 161), together with their motivation, confidence, willingness to implement KC, and belief in its benefits (142, 162, 175), are key facilitators of KC. In contrast, healthcare professionals with limited knowledge or experience of supporting KC (159, 175), who consider it unsafe, and who lack beliefs in its efficacy or importance (142, 158, 175), can restrict its use. Negative staff attitudes towards KC are one of the most reported barriers to the uptake of KC in different international settings (158). In Almutairi et al.'s (161) review, one multi-site European study reported ambivalent attitudes towards KC among healthcare professionals, with differing views as to whether KC should be regarded as an element of holistic care or as a medical component of treatment. Similarly, healthcare professionals involved in post-caesarean care reported reservations about implementing SSC, citing safety concerns related to insufficient staffing and the need to adequately monitor infant health (167).

One key challenge in performing KC was associated with the clinical stability of the infant (161). If nurses were uncertain about the infant's health status, they were less inclined to encourage KC (158). However, the authors noted that it was unclear whether these staff concerns were related to the need for improved training, staffing, or support to implement KC safely (158). There were also tensions (from a staff perspective) about whether to encourage KC for critically ill infants (142). Other healthcare professionals raised concerns that providing support for KC could reduce the time available to care for other critically ill patients (158, 175). Although other staff members held mixed views as to whether KC did (142, 175) or did not (158, 159) impose an additional workload for staff.

The importance of education and training for healthcare staff to support KC and SSC following a caesarean implementation, including its benefits and diffusing perceived burdens, is well reported (142, 145, 158, 167, 175). However, some healthcare professionals were reported to still have inadequate understanding of KC, even after training had been accessed (158, 161). A review by Moran et al. on interventions designed to improve SSC found that, while all interventions had a positive impact on SSC rates, this was for a restricted period only (e.g., typically <15 minutes), suggesting that more education and support was needed (159).

Parents: Similar to the healthcare professionals' views, parents could hold ambivalent attitudes towards KC, associated with feelings of incompetence, unfamiliarity, fears of hurting their infant or uncertainty about KC's effectiveness (144, 145, 158, 161, 175). Following initiation of KC, however, some parents reported feeling more positive about its use (161). Parents were more likely to initiate and sustain KC when they had a good understanding of its efficacy and had received sufficient guidance and support to implement it effectively (142, 145, 158, 162). Furthermore, antenatal education about SSC was cited as a key facilitator to implement SSC following a caesarean section (167).

Psychosocial barriers

Several psychosocial factors that influenced KC implementation were reported. These included parents' language skills to communicate with staff (142), work or family commitments (158, 175). Parents could face physical and economic challenges of lengthy commutes from home to the neonatal unit, and/or costs associated with renting accommodation when they were unable to spend prolonged periods on the neonatal unit (144, 158, 175).

While some staff spoke of 'persuading' parents to perform KC, others expressed the need to be sensitive to the parents' perspective and to not impose feelings of guilt (142). Some parents cited in the review by Gill et al. (158) complained about not being able to see their infant in a KC position[81]. For other parents, the level of postnatal pain, fatigue associated with undertaking KC, and feeling depressed were key deterrents (158, 162, 175). Some mothers experienced isolation and loneliness during KC (158), and interrupted SSC in the immediate post-natal period was associated with anger, sadness and loss (168). Stigma and shame associated with preterm birth were reported as additional barriers, influencing parents' beliefs about the appropriateness of KC[82] (158, 175).

Uptake of KC has been found to be shaped by sociocultural context, including prevailing norms around gender and the roles of parents, men within the household, and extended family members in childcare (176). Cultural norms that prioritise close physical contact, breastfeeding, maternal-infant proximity, and family involvement in caregiving may support the uptake of SSC/KC, as these practices align closely with its core principles. Conversely, cultural traditions may conflict with SSC/KC, such as parents wanting to bath the infant immediately after birth or mothers having a period of postnatal confinement[83], limiting their presence in the neonatal unit (158). Other barriers included reluctance to expose the body in front of family members and feelings of partner jealousy regarding the mother-infant relationship, both of which may discourage mothers from engaging in SSC/KC (145). Gender inequality in the division of labour between fathers and mothers may also hinder implementation of KC: in some

[81] In Gill et al.'s review they refer to an approach that allows mothers/parents to see their infant while performing KC. This is the diagonal flexion position where infants are held higher on the chest, with body flexed around the mother's nipple and head between the nipple and clavicle.
[82] For example, due to assuming KC is only for healthy infants, or that their situation is too fragile.
[83] Postnatal confinement is a traditional period of rest and recovery (generally between 30-40 days) for the mother (and sometimes the newborn) after childbirth. It is common in many cultures, especially in parts of Asia, Africa, and Latin America.

contexts, KC was regarded as the mothers' role and fathers were not allowed to participate (158, 175).

Environmental and practical issues

A comfortable environment, such as a quiet and warm setting, good food, cleanliness and access to watch television (143, 175), with kangaroo chairs or furniture to facilitate KC (145, 158, 174) and access to a suitable private space/privacy screen (175), are key facilitators for KC. Conversely, a lack of beds, discomfort associated with maintaining prolonged sitting or sleeping positions during KC (145, 158, 161, 174, 175), and lack of privacy (161, 175) are key barriers. Parents described feeling exposed when performing KC in a public area, particularly when feeling uncertain about their KC skills (144). Practical constraints of implementing SSC following a caesarean regarding theatre location, and the distance from the postnatal ward were also highlighted (167).

A barrier relating to KC stemmed from the challenge of transferring an infant reliant on medical equipment from incubator to parent (158, 161). This was compounded by the associated fears of staff and parents dislodging the equipment (142, 158). The technology and equipment required for the infant's care also meant that additional personnel were needed to support KC (145), thereby creating barriers when staffing was limited.

Support from social networks

Attitudes of family members towards KC were noted as important. In the review by Gill et al.(158), parents described how opposition to KC from grandmothers or mothers-in-law reduced their likelihood of participating. Whereas positive support from partners, family members, wider social networks, such as neighbours, members of local churches, or from peers with similar situations, encouraged mothers to undertake KC (143, 158, 175). This support included practical help in caring for older children, undertaking home-related activities, and providing opportunities for rest (such as through their partner also providing KC), and emotional support through reassurance, encouragement and confidence-building (144, 158, 162).

Organisational-related issues

Various organisational-related issues influenced the uptake of SSC following caesarean and KC. For instance, strong leadership, KC supportive policies, flexible parental access, and suitable staffing are key facilitators of KC (142, 144, 145, 158, 159, 175). Whereas facilitators for SSC following a caesarean involved supportive hospital policies, staff training, sufficient staffing, and awareness of SSC benefits (167, 177).

Nurses who had mentorship and support from more experienced nurses were more likely to support KC implementation (158). Whereas inexperienced staff, poor staff communication and inadequate handovers inhibited its uptake (158). Fathers could be prevented from providing KC due to inflexible routines and staff prioritising the mother (144). Furthermore, while there was general agreement that infants needed to be clinically stable to be eligible for SSC/KC, in practice there could be variability and sometimes disagreement over the definition of clinical stability among healthcare staff (142, 145).

Successful implementation of KC is believed to require a cultural shift among healthcare teams (142, 145), requiring robust policies together with a multidisciplinary approach in which trained staff work collaboratively with parents and involve them in discussions. Organisational-level interventions that can enable this shift include BFI accreditation and the Bliss Baby Charter audit tool[84] (145). A Scandinavian study included in Vittner et al.'s (142) review reported on how adopting family-centred care principles (through the implementation, and associated training, of the NIDCAP[85] programme) encouraged healthcare professionals to value parent involvement and infant experiences more highly, resulting in greater KC implementation.

An overview of the key outcomes of SSC and KC are reported in Table 5:

Table 5: *Key outcomes associated with SSC and KC*

Outcome area	**What the evidence shows**
Physiological stability	Supports newborn adaptation, including thermoregulation, cardiorespiratory stability and glucose regulation; reduces pain responses.
Mortality and morbidity	For preterm and low-birthweight infants, KC reduces neonatal mortality and complications including sepsis; earlier and longer KC may offer greater benefit.
Infant feeding	Improves breastfeeding initiation, duration and exclusivity, as well as feeding behaviours.
Parent wellbeing and confidence	Can reduce stress and enhance parental confidence; parents describe SSC/KC as calming and empowering.
Parent–infant relationships	Supports attachment, bonding and responsive caregiving, particularly where neonatal care might otherwise disrupt closeness.
Implementation	Benefits depend on staff education, leadership, organisational support, facilities within the unit, family-centred care and consistent practice.

In conclusion the evidence demonstrates that the benefits of SSC and KC are well established, but their consistent implementation depends on the conditions in which care is provided. Parents' and infants' individual circumstances interact with workforce

[84] Bliss charity (a UK wide charity dedicated to improving neonatal care for parents and infants) developed the Bliss Baby Charter Audit Tool. This tool is a self-assessment framework designed for neonatal units to evaluate and improve how they deliver family-centred care (especially supporting parents and carers) around neonatal service.

[85] NIDCAP (Newborn Individualized Developmental Care and Assessment Program) is a developmental care model used in NICUs to support the healthy growth of premature and medically fragile infants by tailoring care to each infant's individual behavioural cues and developmental needs.

capability, organisational support, the care environment, and wider family and sociocultural influences. Practical factors, including staffing pressures, clinical complexity, medical equipment and competing demands, can further enable or constrain opportunities for closeness. Figure 4 demonstrates these interacting influences, illustrating the multilevel conditions required to make SSC and KC possible in everyday care.



Figure 4: Factors that can facilitate SSC and KC

Limitations of the evidence base

Short follow-up periods

- A major limitation across the literature is the predominant focus on short-term outcomes, with most studies assessing effects only during hospitalisation, the neonatal period, or the first year of life. As a result, there is insufficient evidence on whether early SSC or KC has sustained effects on neurodevelopment, socioemotional functioning, attachment, mental health, or educational outcomes. Where longer-term follow-up has been attempted, attrition has often been substantial-, raising concerns about selection bias and representativeness.

Small sample sizes and limited statistical power

- Many included studies, particularly RCTs, were conducted with small samples, sometimes fewer than 50 participants. This limits statistical power, increases uncertainty around effect estimates, and reduces the ability to detect clinically meaningful differences, especially for secondary outcomes or subgroup analyses.

High heterogeneity across studies

- Populations vary widely in gestational age, birthweight, illness severity, and stability at the time of SSC/KC initiation. Interventions differ substantially in timing, daily duration, total exposure, continuity (continuous vs intermittent), caregiver involvement (maternal, paternal, or shared), and care context. Outcome measures are similarly diverse, spanning physiological stability, growth, breastfeeding, neurodevelopment, mental health, and relational outcomes. This heterogeneity complicates synthesis, limits confidence in pooled estimates, and makes it difficult to identify optimal models of care.

Methodological weaknesses and risk of bias

- Across reviews, the overall quality of evidence is frequently rated as low to moderate. Common limitations include unclear randomisation procedures, inadequate allocation concealment, incomplete reporting of missing data, and selective outcome reporting. Blinding of caregivers and participants is rarely feasible due to the nature of SSC/KC, but compensatory strategies (e.g. blinded outcome assessment) are inconsistently applied or reported, increasing the risk of performance and detection bias.

Inconsistent definition and reporting of skin-to-skin/KC exposure

- Many studies fail to report SSC/KC exposure in sufficient detail. Key parameters such as hours per day, cumulative duration, timing of initiation, interruptions, positioning, and caregiver role are often poorly described or not measured systematically. This lack of precision limits dose-response analyses and obscures whether null findings reflect inadequate exposure rather than true absence of effect.

Limited standardisation of outcome measures

- Outcome measurement lacks standardisation, with studies using different tools, thresholds, and time points for assessing similar constructs. Some measures, particularly in early infancy, may lack sensitivity to detect subtle developmental or relational effects. For example, dichotomised breastfeeding outcomes may obscure qualitative improvements, and short-term physiological measures may not capture broader regulatory or developmental benefits.

Restricted populations and limited generalisability

- The evidence base is strongest for clinically stable preterm or LBW infants, while extremely preterm, clinically unstable, or ventilated infants are underrepresented. Similarly, most research focuses on mothers, with relatively few studies examining paternal SSC or broader family involvement, and there are limited studies undertaken in the operating theatre. Many studies are conducted in a limited number of countries or healthcare systems, constraining generalisability across cultural, socioeconomic, and health system contexts.

Underexplored mechanisms of action

- Although benefits of SSC/KC are often attributed to mechanisms such as oxytocin release, stress reduction, improved autonomic regulation, and enhanced parent-infant interaction, direct mechanistic investigation is rare. Few studies integrate biological, physiological, and behavioural measures to test these pathways explicitly.

Areas for future research

Longer-term longitudinal studies

- There is a need to explore the continuity of SSC/KC beyond discharge and the hospital environment, including how families are supported to maintain closeness at home and the longer-term implications for infant and family wellbeing. Future studies should prioritise longitudinal designs with repeated assessments extending into childhood and adolescence. This would allow examination of developmental trajectories and clarify whether early SSC/KC influences later cognition, mental health, attachment security, and family functioning.

Larger, well-designed randomised controlled trials

- There is a clear need for adequately powered multicentre randomised controlled trials with transparent reporting of randomisation, allocation concealment, and outcome assessment. Stronger methodology is essential to reduce bias and improve confidence in causal inference. More transparent reporting aligned with CONSORT/PRISMA standards is needed.

Standardisation of SSC and KC terminology and definitions

- Research should use clear, standardised definitions of SSC and KC, including timing of initiation, daily duration, total exposure, and caregiver involvement. This would enable meaningful comparison across studies and support dose-response analyses.

Harmonisation of outcome measures

- Agreement on core outcome sets, particularly for neurodevelopment, breastfeeding, parental mental health, and physiological regulation, would improve comparability and synthesis. Use of sensitive, validated tools and consistent assessment time points is essential.

Dose–response and optimisation studies

- Future research should explicitly examine how much SSC/KC is needed, for whom, and under what conditions. This includes stratification by gestational age, birthweight, illness severity, infant sex, caregiver characteristics, and care context.

Inclusion of under-studied populations

- More research is needed on paternal SSC, shared caregiving models, and diverse family forms to better reflect contemporary family structures and inform inclusive, family centred care. More research is needed with extremely preterm or clinically unstable infants, and for SSC immediately after caesarean births.

Mechanistic research

- Studies integrating biological, physiological, and behavioural measures are needed to clarify mechanisms underpinning observed effects. This knowledge would strengthen theoretical models and inform targeted interventions.

Contextual, implementation, and health systems research

- To support scaleup, future work should examine feasibility, cost-effectiveness, staff training, NICU design, and contextual barriers and facilitators across different healthcare settings.

Expanded outcome scope

- There is limited research on the impact of SSC/KC on intraventricular haemorrhage (IVH) risk. Emerging work in Sweden suggests the risk of IVH is not increased when an extremely or very preterm infant is exposed to early SSC[86] but more work is needed.
- More research is needed on the impact of babywearing and the use of slings or wraps to support prolonged KC in the neonatal unit and in the longer term.
- There is also a need to move beyond short-term clinical outcomes to include long-term neurodevelopment, parental physical and mental health, family wellbeing, health-system impacts.

Improve monitoring of SSC and KC

- This should include the timing of initiation, prevalence, duration and provider, in all clinical settings and environments.

[86] Johansson, M.W., Lilliesköld, S., Jonas, W., Thernström Blomqvist, Y., Skiöld, B. and Linnér, A., 2024. Early skin-to-skin contact and the risk of intraventricular haemorrhage and sepsis in preterm infants. *Acta Paediatrica*, *113*(8), pp.1796-1802.

ATTUNE STUDY



Chapter Six: Supporting infant feeding across the perinatal period

Early and continued tailored infant-feeding support across hospital and community settings is essential to help parents achieve their feeding goals, support breastfeeding where this is desired, and promote positive feeding experiences and parent-infant relationships. In this chapter we specifically focus on infant feeding support, with evidence on other interlinking issues regarding close and loving relationships (Chapter Eleven), responsive feeding (Chapter Eight), skin-to-skin contact (Chapter Five), Code implementation (Chapter Twelve), and care in a neonatal context (Chapter Ten) discussed elsewhere. This section is designed to provide specific evidence for how infant feeding care and support should be provided across the hospital and community periods. The evidence identified for this chapter predominantly relates to breastfeeding and breastmilk feeding support. Evidence specifically addressing support for parents who formula or mixed feed was more limited and is considered where available, with related evidence on responsive feeding discussed in Chapter Eight.

Evidence from the UNICEF 2012 review highlighted how Infant feeding outcomes are influenced by labour and birth experiences, including care environment and postnatal support. Evidence suggests that breastfeeding duration and exclusivity are improved through personalised, proactive, face-to-face support delivered by trained professionals, peers, or volunteers, particularly when support is ongoing and tailored to individual needs.

Effective support should be relationship-based, empowering, non-judgemental, and responsive to mothers' biological, psychosocial, and cultural circumstances. Practical support should include recognising feeding cues, positioning and attachment, milk production and transfer, responsive feeding, expressing breast milk, and managing common feeding challenges. Parents who formula feed should also receive individualised, non-judgemental support to minimise risks and promote parent–infant bonding.

Additional targeted support may be required for disadvantaged families, including peer support, home-based support, language-appropriate services, and assistance for women with additional needs. Infant well-being should be monitored through regular feeding assessments, growth monitoring, and access to ongoing support when required.

Evidence from the updated review largely supports and extends the earlier UNICEF (2012) evidence, with little direct contradiction. Both emphasise that effective infant feeding support should be timely, personalised, relationship-based, practical, culturally responsive, and delivered by trained supporters across hospital and community settings. Both also highlight the importance of ongoing support, targeted provision for vulnerable groups, and monitoring infant wellbeing.

The newer evidence strengthens these earlier recommendations by demonstrating that support is most effective when delivered early, proactively, and through multiple contacts extending from pregnancy into the postnatal period. It also provides stronger evidence for competency-based, hands-off skilled support, integrated

hospital-community pathways, specialist referral systems, and whole-system implementation through staff training and Baby Friendly-aligned organisational approaches.

It also extends the earlier evidence by highlighting the role of peer support, digital technologies as adjuncts to care, and the importance of continuity, contact intensity, and coordinated services. Mothers lived experiences further reinforce the value of consistent, empathetic, non-judgemental, and culturally sensitive support.

Overall, more recent evidence confirms the principles identified in the previous review and provides greater specificity regarding how infant feeding support should be organised and delivered to optimise outcomes.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

Baby Friendly standards require that mothers are supported to get breastfeeding off to a good start within maternity settings, that babies in neonatal services are enabled to have breastmilk and to breastfeed where possible, and moving forwards into the community setting, to continue to breastfeed for as long as they wish. Key aspects of the standards across services include:

In maternity:

- Mothers are supported to achieve effective breastfeeding to include effective positioning and attachment and hand expression, to understand responsive feeding, how to recognise effective milk transfer and how to gain support as and when this is needed.
- Breastfeeding assessments are carried out to ensure effective feeding and the well-being of mothers and babies.
- Mothers are informed of how to access ongoing support.

In neonatal:

- Breastmilk is always the first choice of feed for the baby
- Mothers are enabled to express breastmilk including support to express early and frequently and to hand express and use a pump effectively.
- Assessments of expressing are carried out to support optimum expressing and milk supply.
- Mothers are supported to transition to breastfeeding, prepared for discharge from hospital and informed about ongoing support.

In community:

- Services work together to provide effective support and a welcoming environment is created throughout.
- Mothers are supported to sustain breastfeeding, including proactive contact and assessments of feeding with appropriate care planning and effective support.
- Options for continued breastfeeding are discussed to support mothers to achieve their individual goals.

In hospital-based children's services:

- A feeding history is taken to enable an individual feeding plan to be created so that mothers are supported to continue breastfeeding and maximise breastmilk use as much as possible, or to express as appropriate.
- Effective support including referral pathways are in place.

Within the UK context, the BFI standards for early postnatal and community-based infant feeding support align with several key ambitions of the NHS Long Term Plan, including strengthening postnatal and community support for families[87]. The standards are underpinned by, and consistent with, key NICE guidance, particularly NICE PH11 on improving breastfeeding initiation and duration and NICE N194 on postnatal care, both of which specify the use of trained staff, evidence-based feeding support and improved coordination between maternity and community services[88,89]. The BFI standards also support the maternity transformation agenda established in Better Births, which calls for personalised, safe and seamless postnatal care[90]. Internationally, the UNICEF UK BFI standards are underpinned by the WHO/UNICEF Ten Steps to Successful Breastfeeding[91], which form the global framework for safe and effective early feeding support. The UNICEF UK BFI has extended this framework to encompass broader aspects of infant feeding, parent-infant relationships, and family-integrated care (also see Chapter Ten). These alignments demonstrate that the BFI standards contribute to wider public health priorities, including supporting early parent-infant relationships, improving maternal and infant mental health, and reducing health inequalities across the early years.

Infant feeding support in the hospital and the community occur in two distinct settings, each of which can face their own unique challenges. However, the evidence base does not always distinguish between early and later postnatal support, and some interventions span both hospital and community settings. Here we have synthesised the evidence together rather than report it separately, while highlighting any contextual differences where relevant. Information in this section is reported across six key areas: Section I - **Breastfeeding interventions and support** (which includes support from healthcare professionals and lactation consultants as well as evidence of interventions for specific population groups); Section II: **Peer support**; Section III - **Psychosocial interventions** (including evidence that draws on a theory-based approach to intervention development); Section IV – **Breast pumps** (focusing on evidence for term infants – see Chapter Ten for neonatal related studies); Section V – **E-technologies;** and Section VI – **Women's values and needs** (drawing on evidence from the lived experiences reviews to focus on positive aspects of care – with challenges reported in Chapter Three).

Summary of the evidence in relation to UNICEF UK BFI standards

The UNICEF UK BFI maternity standards require that all parents receive effective support immediately after birth to help to initiate breastfeeding, formal breastfeeding assessments of full feeds, support with positioning and attachment and hand

[87] NHS England - Long term plan
[88] NICE - Maternal and child nutrition: nutrition and weight management in pregnancy (NG247)
[89] NICE - Postnatal care (NG194)
[90] NHS England - Better Births.
[91] WHO guidelines - 10 steps to successful breastfeeding

expression, compassionate care and kind conversations, and consistent, evidence-based information delivered by trained staff. The included evidence strongly supports these requirements.

Across the studies, the timing of support emerges as critical. Interventions delivered within the first 24-48 hours were associated with better breastfeeding outcomes, whereas delays or fewer-than-planned contacts had little impact on breastfeeding outcomes[92]. This reflects BFI's emphasis on timely support, rather than reactive or delayed assistance. Evidence supports skilled, hands-off practical support over information-only approaches: structured, competency-based skilled support can improve breastfeeding exclusivity and duration. This directly aligns with BFI expectations that staff should provide practical, individualised guidance rather than relying on leaflets or brief information. System-level evidence also supports BFI's whole-system approach. For example, BFI-aligned interventions, standardised staff training and multicomponent programmes demonstrate improvements in initiation and continuation, reinforcing the value of embedding Baby Friendly principles throughout maternity services.

Available evidence also aligns closely with the BFI community standards emphasising ongoing and accessible needs-based support after discharge, continuity of care, clear referral pathways to specialist help, and partnership with peer support organisations. A consistent theme across the evidence is the importance of continuity and intensity of support. Interventions with multiple postnatal contacts, often four or more, achieve higher rates of any breastfeeding and exclusive breastfeeding. Programmes starting in late pregnancy and continuing into the postnatal period further demonstrate the value of sustained contact for engagement and breastfeeding continuation. These findings reinforce the BFI requirement for a comprehensive service that includes mothers knowing how to access ongoing support, mothers being supported to maximise the amount of breastmilk their baby receives, and mothers having access to specialist support for persistent and complex breastfeeding challenges, with an appropriate referral pathway. The included evidence highlights the value of integrated hospital-community pathways that show stronger and more sustained effects than standalone community activities. This supports the BFI principle that effective infant feeding support requires coordinated working across maternity, neonatal, hospital-based children's services and community services.

The evidence on peer support aligns with BFI's emphasis on partnership with local and national services to provide support and encouragement to continue breastfeeding. Mothers value peer supporters for empathy, relatability and encouragement, and intensive, well-integrated peer programmes can improve breastfeeding duration. However, mixed results, particularly in high-income settings, highlight the importance of integration, supervision and adequate contact levels.

[92] Emerging evidence from Family Hubs suggests that service integration, visibility and coordinated referral pathways may enhance the ability of community-based support services to engage families earlier, potentially enabling concerns to be addressed before more intensive intervention is required. Evaluation of the shared outcomes fund

E-technologies (e.g. telehealth, SMS programmes, apps) and remote-based support including by text or telephone can provide additional avenues for support, increasing maternal confidence and sometimes improving exclusivity. While the BFI advocates for pregnant women receiving evidence-based information in a digital or written format, the findings suggest that digital tools can complement BFI-aligned care when information is high-quality, non-commercial and integrated with skilled support. The findings also highlight the need to address digital inequalities.

Finally, the lived-experience evidence strongly reinforces core BFI principles. Mothers frequently report valuing consistent, empathetic, non-judgemental support, clear and practical guidance, timely help after birth, and accessible community options. They also highlight the importance of individualised, culturally sensitive care, reflecting BFI's emphasis on care and support being provided to meet women's individual goals.

Collectively, the evidence strongly supports the UNICEF UK BFI standards for early hospital and community-based infant feeding support. Interventions that align most closely with BFI principles, such as proactive early contact, skilled practical help, individualised feeding support, multiple postnatal contacts, integrated pathways, access to specialist and peer support and relationship-centred communication, show the most consistent evidence of improved breastfeeding outcomes and positive maternal experiences. Evidence related to other associated practices such as skin-to-skin contact and close and loving relationships are reported elsewhere. The evidence included here also highlights opportunities to enhance BFI implementation, including ensuring adequate contact intensity, addressing digital and social inequalities, and tailoring support for specific groups.

However, as the evidence is fragmented, methodologically uneven, and skewed towards advantaged populations, findings should be interpreted with caution. Furthermore, the effectiveness of infant feeding interventions cannot be considered independently of the service contexts in which they are delivered, including commissioning arrangements, resource constraints, workforce capacity, and service stability, all of which may influence implementation and outcomes. Future research therefore needs to be larger and more rigorous, encompass more diverse populations, draw more explicitly on theory, examine underlying mechanisms of change, and pay greater attention to implementation, equity, safety, and system-level factors.

Recommendations for the BFI programme

- **Strengthen early, proactive and skilled breastfeeding support** in the first 24–48 hours for initiating breastfeeding, to avoid unnecessary supplementation and later breastfeeding challenges.
- **Strengthen the provision of timely, accessible, individualised, multi-component, skilled and ongoing infant feeding support** that responds to parents' changing needs. This should include practical assistance, emotional reassurance, tailored information and appropriate follow-up, with continuity of support across professionals, services and care transitions.
- **Enhance collaborative evidence informed infant feeding conversations** between parents and staff that respect parents' feeding choices. For parents who mix feed, this should include protecting the establishment and continuation of breastfeeding.
- **Ensure focused breastfeeding support that addresses both practical feeding skills and interpretation of newborn instinctive behaviour and emotional wellbeing** to enhance parents' confidence.
- **Integrate professional and peer support within coordinated local service models,** with clear role boundaries and supervision to support culturally safe approaches.

Detailed overview of included evidence

This section integrates available evidence on breastfeeding interventions and support provided during the postnatal period. It considers professional and lactation consultant support, peer support, psychosocial and behavioural interventions, breast milk expression and e-technologies, alongside evidence on women's values and needs. Full details of the included reviews and empirical studies are provided in the Appendices.

Section I: Breastfeeding interventions and support

In this section we report on evidence of interventions and support provided by healthcare professionals and lactation consultants, as well as interventions targeting specific population groups.

Professional led support

Factors that facilitate:

Across the evidence base, several common features of professional-led support appear to underpin effective breastfeeding support. First, **timing** of support emerged as critical. Interventions delivered very early in the postnatal period, particularly within the first 24-48 hours were associated with marked reductions in breastfeeding cessation at three months postpartum, largely because they allow skilled practitioners to identify and resolve problems before they escalate (178). In contrast, delayed

> *Getting the baby on right and making sure that the baby's latched, not just assuming that the baby's latched right. You know, previously we might see them on day three or five and the nipples were in absolute shreds. But it does seem to be less… it does seem to have improved I think.* (Site 4 maternity HCP1)

contact reduced effectiveness; for example, McLachlan et al. (179) in a three-arm cluster randomised controlled trial found no improvements in breastfeeding rates when the planned home visits to provide proactive breastfeeding support (designed to be provided as early as possible in the first postnatal period, ideally soon after hospital discharge) were delivered later and less frequently than intended[93].

A second key feature was the provision of **skilled support** by professionals with expertise in breastfeeding support. The PROLACT intervention (180) comprised six weekly, face-to-face group sessions delivered in primary care. Each session integrated theoretical breastfeeding education covering topics such as the benefits of exclusive breastfeeding, practical techniques, common challenges, and planning for return to work, with direct breastfeeding practice and facilitated problem-solving discussions, including peer sharing. Sessions lasted approximately two hours and were designed to enhance maternal confidence, skills, and social support. The intervention was significantly more effective than usual primary care at helping mothers sustain exclusive breastfeeding for up to 6 months. This aligns with the broader finding that practical, active skill-building of mothers to breastfeed is more influential than information alone. The Cochrane review by Balogun et al. (181) supports this conclusion: among 28 trials assessing interventions for promoting breastfeeding initiation, five showed significant improvements when healthcare professionals provided intensive support[94] (including counselling and education), particularly when spanning both antenatal and postnatal periods. Hannula et al. (182) further demonstrated that women receiving long-term intensified counselling via web-based resources before birth, support in maternity settings, and continued input after childbirth, were more likely to exclusively breastfeed than those receiving usual care. Nilsson et al. (183) similarly implemented a detailed programme encouraging extensive skin-to-skin contact during the first three days postpartum, frequent breastfeeding (at least eight times in 24 hours guided by infant cues), support for positioning and attachment, and explicit acknowledgement of both parents' roles. Although this intervention did not affect maternal self-efficacy, mothers receiving support were more likely to breastfeed more frequently and to be exclusively breastfeeding at six months postpartum, again highlighting the importance of responsive support.

A Cochrane review by Gavine et al.(184) explored the impact of breastfeeding support provided by professionals, lay/peer supporters, or both. It included 116 trials, with 103 contributing data to the analyses, involving over 98,816 mother-infant pairs. This review explored the impact of breastfeeding-only support (interventions specifically focused on breastfeeding support) and breastfeeding-plus support (breastfeeding support delivered alongside broader maternal-child health interventions, such as nutrition, parenting, child health, immunisation, or maternal health programmes). The review found that breastfeeding-only support probably reduces women stopping any breastfeeding at six months, exclusive breastfeeding at 6 months, any breastfeeding, and exclusive breastfeeding at 4-6 weeks. The effects were strongest and most consistent for exclusive breastfeeding. Whereas evidence for breastfeeding-plus interventions was less consistent in that these types of interventions reduced stopping

[93] While the study does not detail what was 'later', the aim was to fill the gap in usual care that currently existed between cessation of hospital-based care and start of community-based support.
[94] Intensive support was characterised not by a single contact, but by multiple, sustained interactions delivered by trained healthcare professionals.

any breastfeeding and exclusive breastfeeding at 6 months but showed little or no difference for stopping any breastfeeding at 4–6 weeks.

A third pattern concerned the **dose** and **continuity** of support. The systematic review by McFadden et al. (185), synthesising 63 studies, found that interventions involving four or more postnatal contacts, particularly delivered face-to-face, significantly improved any and exclusive breastfeeding rates at four to six weeks and six months[95]. The Cochrane review by Gavine et al. (184) suggested that moderate-intensity breastfeeding-only support (4-8 contacts) may be associated with higher rates of exclusive breastfeeding at 4-6 weeks and six months postpartum, although the evidence was uncertain. Cheng et al.'s (186) review of home-visiting programmes reported similar patterns: seven of ten successful exclusive breastfeeding interventions involved three or more home visits and continued for a relatively longer period[96], whereas short-term or unstructured models were largely ineffective. Comparable trends were observed for any breastfeeding outcomes, where successful programmes tended to involve frequent visits (often five or more) and prolonged support (186). Similarly, the review by Skouteris et al. (187) found that postnatal interventions delivered in the home setting produced the most favourable outcomes. Findings from several primary studies were consistent with this observation. An extended postnatal home visiting programme (by a parent advisor from social services and a nurse) was implemented in a disadvantaged suburb in Stockholm, with parents receiving an additional four home visits, starting late pregnancy and into the postnatal period (188). The study found that more mothers attended routine check-ups and were breastfeeding compared to those who did not receive this additional contact. These converging findings suggest that breastfeeding challenges evolve over time and require ongoing, adaptive assistance rather than one-off contact.

The evidence also points to benefits from **hybrid or multi-modal** models of support. In Spain, a midwife-led intervention supplemented by participant-created online support groups was associated with higher breastfeeding rates at four months, alongside improved breastfeeding self-efficacy (189). Notably, secondary analysis of the same cohort reported reduced postpartum depression at four months (189), although the authors acknowledged uncertainty around causal direction. Further support for multicomponent approaches is provided in the review by Haroon et al. (190). This review found that interventions combining individual and group counselling appeared to be more effective than either approach alone, however this pattern was not observed consistently across studies (e.g., (191). Kim et al.'s (192) review of 27 RCTs (n=36,051 mothers) found that BFHI interventions, multicomponent programmes combining coordinated breastfeeding support strategies, and interventions delivered by trained healthcare professionals were associated with improved exclusive breastfeeding at six months. Likewise, Sinha et al. (193), comparing interventions across health system, family, community, work and policy settings, concluded that multilevel, multifaceted interventions produced the strongest and most consistent improvements in breastfeeding outcomes, arguing that coordinated action across settings is required. However, the Cochrane review by Gavine et al. (184) highlighted the need for further research to identify the most

[95] The review did not establish an optimal schedule or timeframe for delivery.
[96] Refers to the support being provided over a sustained postpartum timeframe, commonly across the first 2–3 months or more.

effective components of breastfeeding support interventions and how these can be implemented effectively across different settings and populations.

Multicomponent approaches can also yield improvements at the local service level. In the UK, Bick et al. (194) reported that a quality improvement initiative involving longer stays on delivery suites to promote skin-to-skin contact, changes to midwifery-obstetric handover, enhanced parent information, practical infant care demonstrations, and staff workshops, resulted in significant improvements in breastfeeding initiation, duration of any breastfeeding to 10 weeks, and duration of any breastfeeding to three months. Similarly, Lau et al. (104) demonstrated that perinatal education, hospital visits after delivery and postpartum follow-up[97] significantly increased any breastfeeding and exclusive breastfeeding among Chinese American women, whereas a single culturally sensitive postpartum education session alone did not improve outcomes (195).

Factors that undermine:
By contrast, interventions characterised by **limited accessibility or poor implementation fidelity** showed little impact. McLachlan et al. (179) and Cramer et al. (196) found that drop-in breastfeeding centres attracted fewer attendees than expected, often only one per session, and staff expressed frustration at low uptake. Challenges identifying suitable, convenient locations further constrained their utility. These studies underline that even promising approaches may fail without attention to feasibility, reach, and strategic partnership building. Contextual factors such as social norms, maternal motivation, and population characteristics, may also influence outcomes. McFadden et al. (185) reported stronger effects on breastfeeding outcomes among urban compared to rural populations, with benefits observed among both primiparous and multiparous women.

Lactation Consultants

Overall effectiveness: A review of 16 studies (n=5,084 participants) by Patel and Patel (197) found that programmes involving lactation consultants or lactation counsellors improved breastfeeding initiation, early continuation, and exclusivity, with effects evident in both prenatal and postnatal interventions. However, it is unclear whether the benefits were due to advanced clinical expertise (consultants), counselling skills, increased contact time, emotional support, or some combination of these factors. Chetwynd et al.'s (198) review similarly reported that International Board-Certified Lactation Consultant (IBCLC) involvement improved breastfeeding outcomes in the postpartum period, although the magnitude of effect depended strongly on intervention design, timing, and how outcomes were measured. Positive effects on maternal confidence and breastfeeding exclusivity were also found in Taiwan, where Lee et al. (199) randomised 214 postpartum women to breastfeeding education and peer support groups organised by IBCLCs during the first and fifth/sixth postpartum weeks. Mothers receiving the intervention demonstrated higher breastfeeding self-efficacy scores and were more likely to exclusively breastfeed at 6 weeks compared to usual-care controls.

Multi-modal models: Similar to the evidence reported above, several primary studies support the value of multi modal designs. Bonuck et al. (200), reporting on two randomised controlled trials conducted in the US, found that integrating lactation

[97] Timing not specified - refers to 'continue to follow-up over the phone periodically to provide additional support as needed'

support into routine care, both alone and in combination with prenatal discussions, increased breastfeeding intensity at three months postpartum. The Breastfeeding Support Programme (BSP) in the Netherlands combined education and practical help from a lactation consultant over six sessions from pregnancy to ten weeks postpartum, involving partners and offering in-person and telephone check-ins to build skills and confidence (201). Mothers in the BSP group had a 66% reduced risk of cessation of any breastfeeding and a 54% reduced risk of cessation of exclusive breastfeeding at any point compared with controls (201).

Conversely, a Canadian RCT by Pound et al. (202), providing lactation consultant support once in hospital and one to three times post-discharge to mothers of jaundiced infants, found no difference in exclusive breastfeeding at three months between groups. Importantly, qualitative and secondary data from this study showed that mothers receiving the support felt more encouraged, valued the reassurance, and reported increased motivation, improved emotional wellbeing, and greater confidence relative to controls, suggesting that psychological effects may be meaningful even where statistical differences are not observed (202).

Cultural tailoring: Other findings highlight the value of combining cultural tailoring and multiple modes of delivery. Furman et al. (101) evaluated a culturally competent intervention for African American women involving interactive community-health-worker training modules, prenatal and postnatal phone support, and postpartum home visits from a lactation consultant. The odds of any breastfeeding were increased by receipt of curricular modules and by postpartum visits, and the odds of exclusive breastfeeding were significantly increased by a postpartum visit[98].

Contextual factors: Effectiveness of lactation consultant support was found to vary by population context. Cameron et al. (203) and Cameron et al. (204) found no evidence of effect of certified lactation consultant support when delivered to well-educated women. Similar findings were observed in Saudi Arabia, where AlQurashi et al. (205) reported that, while lactation counselling increased maternal knowledge about breastfeeding, colostrum and effective attachment, this did not translate into improved exclusive breastfeeding rates, with no significant differences in breastfeeding duration between groups.

Collectively, these studies indicate that interventions involving lactation consultants may be more effective when they:

- span multiple timepoints (particularly into the postnatal period),
- are embedded within routine care,
- incorporate partner involvement and cultural relevance, and
- address both skills and confidence.

Targeted interventions for specific populations

Here we outline the evidence for some of the interventions targeting specific population groups.

[98] In this study, telephone contacts were *not* significantly associated with any breastfeeding, or exclusive breastfeeding once other intervention elements were included in the model.

- Caesarean births: Beake et al. (206) identified relatively few interventions designed to increase breastfeeding uptake and duration (skin-to-skin, bassinets, pumps, support), and found that they were mostly ineffective[99]. Only one bundled intervention comprising parent education and targeted breastfeeding support improved outcomes, but methodological flaws reduced confidence.

- Obese/gestational diabetes: Reichental et al. (207) reviewed 19 trials (n=2,740 participants) exploring breastfeeding interventions designed to support women who were overweight or obese or who had gestational diabetes. Multifaceted interventions, delivered by lactation consultants and through technological platforms, were associated with improvements in early exclusive breastfeeding and any breastfeeding at ≥6 months. Frequent contact was especially effective. The authors argued that the mechanism or implementation components necessary to achieve consistent improvement in breastfeeding outcomes for this population did not appear to be significantly different to what works for the general population[100].

- Parental-based interventions: The impact of delivering breastfeeding interventions to both parents on breastfeeding outcomes has also been assessed (also see psychosocial interventions below). In Canada, Abass-Dick et al. (128) randomised 107 couples to receive a coparenting breastfeeding support package comprising a brief face-to-face session with a lactation specialist, printed materials, an 11-minute video, access to a secure website, follow-up emails at one and three weeks, and a two-week telephone call. Significantly more mothers in the intervention group were still breastfeeding at 12 weeks, although differences in exclusive breastfeeding at six and twelve weeks were not significant. Fathers showed greater increases in breastfeeding self-efficacy, and more mothers reported receiving partner help and being satisfied with partner involvement. Participants later rated the intervention as useful, informative, parent-focused, and easy to understand (208). In Sweden, Saade et al. (209) evaluated an early home visit to both parents, combined with proactive telephone support among parents of 838 infants, with qualitative feedback obtained from 42 mothers and 38 fathers. Parents appreciated the service, but the intervention did not significantly affect breastfeeding outcomes up to six months postpartum, a finding attributed to ceiling effects in a context with already high initiation rates.

  > *The focus should not just be on the mother and the baby, but the impact for the father and the family as well. I mean, that really is so powerful. And I think it's time when the world is changing to have that kind of co-parenting input or whatever the setting is. Enabling wider family involvement in the work is just so beautiful to see and so empowering and so supportive for the mother.* (Site 2 public health HCP1)

  A recent randomised controlled trial in the USA evaluated the Happy, Healthy, Loved programme, a dyad-based intervention combining a brief interactive

[99] The review did not explore whether intervention effectiveness differed between elective and emergency caesarean births, despite these groups potentially facing different breastfeeding challenges.
[100] Although it is important to reflect that obese women may experience weight stigma and discriminatory attitudes during pregnancy and birth, often being viewed primarily through a lens of risk rather than as individuals. This can result in feelings of judgement and reduced trust in healthcare providers, highlighting the need for personalised, respectful and non-judgemental maternity and infant feeding care (https://queerbirthclub.co.uk/supporting-fat-birth)

educational programme with six weeks of tailored text messages for first-time mothers and their partners. The intervention was designed to enhance breastfeeding self-efficacy by promoting partner support and providing coping strategies and motivational messages. Although no significant differences were observed in breastfeeding self-efficacy at six weeks or in maternal anxiety or depressive symptoms at either six weeks or six months postpartum, mothers in the intervention group demonstrated significantly higher breastfeeding self-efficacy at six months compared with controls. The findings suggest that involving partners through personalised text messaging may strengthen maternal confidence in breastfeeding over the longer term, although the intervention did not improve maternal mood outcomes (210).

- Breastfeeding pain: One pilot study explored the efficacy of a pain self-management intervention on breastfeeding pain (211). Women in the intervention group received educational modules addressing breast and nipple pain, biweekly, text-based, nurse coaching, and completed a daily breastfeeding journal. Intervention women reported significantly less breast and nipple pain, but no differences in breastfeeding duration, thereby suggesting that further support was needed.

- Perceived breastmilk insufficiency: Perceived breastmilk insufficiency is one of the key reasons given by mothers for breastfeeding discontinuation. In their review of 22 studies to assess the influence of infant behaviour on caregiver's infant feeding decisions, Vilar-Compte et al. (212) reported that mothers frequently interpret infant crying and fussiness as signs of insufficient milk. Across included studies, 64% to 86% of mothers attributed perceived milk insufficiency to infant crying, leading to early formula supplementation or breastfeeding cessation, despite no clinical evidence of low supply. A small US-based study of 14 breastfeeding dyads evaluated the impact of a home-based breastfeeding education programme designed to address perceived insufficient milk and to enhance mother-infant interactions during the first postpartum month (213, 214). The intervention resulted in significant increases over time in mothers' sensitivity to infant behaviour and breastfeeding self-efficacy as well as significant decreased attribution of infant crying to breast milk insufficiency. The programme was reported to have helped mothers reframe infant behaviours and reduce misattributions, thereby promoting breastfeeding confidence and relational attunement.

- Physiological techniques: Some interventions have explored the impact of specific physiological techniques on breastfeeding rates. One example relates to the Thompson method[101]. A multi-method design using interrupted time series analysis

[101] The Thompson breastfeeding method (sometimes called the *Thompson positioning technique* or *Thompson method*) is a specific way of helping newborns, especially those having difficulty latching, to breastfeed more effectively. The key principles include:

- Gentle, baby-led positioning - The baby is placed skin-to-skin on the mother, usually in a semi-upright, reclined position rather than the traditional cradle hold.
- Focus on comfort and instinct - Instead of forcing the baby onto the breast, the method encourages waiting for the baby to use its natural reflexes to seek the nipple.
- Reduces nipple trauma - By improving latch and alignment, it helps prevent cracked nipples and pain.
- Supports babies with challenges - Particularly useful for babies who have tongue-tie, low muscle tone, or other difficulties coordinating sucking, swallowing, and breathing.

and surveys in an Australian tertiary maternity hospital was undertaken with 13,667 mother-baby pairs. Following implementation of the Thompson method, the declining trend in direct breastfeeding at hospital discharge was significantly averted by 0.4% relative to baseline. While the 3-month exclusive breastfeeding rate in the Thompson group was 3 percentage points higher than the baseline group, this result did not reach statistical significance. However, a subgroup analysis of women who were discharged from hospital exclusively breastfeeding revealed the relative odds of exclusive breastfeeding at 3 months in the Thompson group was significantly better than the baseline group (215).

- Long-term health conditions: Farre et al. (216) co-developed an evidence-based breastfeeding support intervention for women with long-term health conditions based on evidence from systematic reviews, stakeholder consultations, focus groups with women with long-term conditions, co-design workshops, and consensus-building activities. While the intervention needs to be evaluated, it highlights several components considered important for supporting women with long-term conditions, including longer antenatal appointments, continuity of support providers, integration of breastfeeding support within specialist clinics, improved professional training, and access to peer support.

Conclusion: Overall, this evidence demonstrates that skilled breastfeeding support is most effective when it is timely, skilled, continuous, and multi-component. Interventions delivered in the first 24–48 hours postnatally may be particularly impactful, as they enable practitioners to prevent early problems from escalating. Approaches that include correction of positioning and attachment, and tailored troubleshooting consistently outperform information-only models, highlighting the importance of practical skill-building.

Sustained contact over time also matters. Reviews show that multiple postnatal contacts, especially face-to-face or home-based, improve breastfeeding rates, reflecting the evolving nature of feeding challenges. Hybrid models that combine antenatal preparation, postnatal follow-up, online components, and group support further strengthen outcomes, and multi-modal interventions (e.g., BFHI-aligned training, integrated hospital-community pathways, and staff development) yield strong effects. Cultural tailoring and partner-inclusive approaches are beneficial for specific populations.

Some targeted professional interventions, for example, parental-based, addressing pain, perceived milk insufficiency, show promise in improving confidence, comfort, and interpretation of infant cues, although effects on duration are mixed and often require stronger continuity of support.

Interventions focused solely on education, delivered once or in limited formats, demonstrate limited impact. Drop-in models or delayed home visits are also comparatively ineffective, highlighting the need for adequate staffing, convenient delivery mechanisms, and strategic partnership working.

- Mother-centred - Aims to empower the mother to observe and respond to her baby's cues rather than relying on rigid rules or timed feeds.

Section II: Peer Support

In this section we report evidence from systematic reviews concerning structured and informal peer support. Peer support encompasses a diverse range of roles, models of delivery, levels of training and degrees of integration within healthcare services. Peer support may range from structured programmes delivered by trained and supervised peer supporters to informal community-based groups facilitated by parents with lived experience.

Definitions, roles and preference for peer support: In the included reviews, breastfeeding peer support can refer to interventions that involve informal mother-to-mother support, without any level of training or governance (e.g., within an online breastfeeding group). More generally within the evidence base, peer support refers to structured interventions where women who are not part of the client's own embedded network, who possess experiential knowledge of the target behaviour (i.e., breastfeeding skills), provide emotional, informational, and practical assistance to other mothers (face to face, online, 1:1 or in groups)[102]. Their role includes providing breastfeeding and nutrition-related knowledge, reassurance, encouragement, emotional support and problem-solving, alongside teaching breastfeeding techniques, addressing common challenges, and linking mothers to additional resources.

It is also important to recognise that peer support is not a homogeneous intervention. While many organisations require peer supporters to have lived experience of breastfeeding, effective peer support extends beyond personal experience alone. High-quality peer support typically involves comprehensive training, ongoing supervision, reflective practice and continuing professional development, enabling peer supporters to provide accurate, evidence-based information, appropriate signposting and empathetic, non-judgemental support. A key component of some training models (such as the Breastfeeding Network) is supporting peer supporters to reflect on and separate their own experiences from those of the families they support, helping to ensure that support is responsive to individual needs rather than shaped by personal beliefs or experiences. It is also important to note that training requirements vary considerably across peer-support models, ranging from brief programmes lasting only a few days to interventions based on more extensive WHO or UNICEF breastfeeding counselling curricula. Evaluations of peer support should distinguish between informal experience-based support and the variations in structured, supervised peer-support programmes, as these models may differ substantially in quality and effectiveness, this distinction is not always made clear and needs to be considered when interpreting the evidence base.

The availability of breastfeeding peer support (in the UK and elsewhere) has historically been variable. The stop-start nature of infant feeding policy and investment also suggests that service stability may be an important determinant of reach and engagement for peer support. Evidence indicates that services funded and sustained

[102] In the review of peer support interventions by Trickey et al. (2018) the authors found that similarity between peer and mother does not consistently trigger positive outcomes. Therefore, peers do not need to be socially matched to mothers to be effective, but those with specific experiential knowledge can help bridge understanding gaps. This could include experiences of multiple births, chronic health condition, having an infant admitted to neonatal care, etc. Moreover, as engaging women from different ethnic backgrounds can be challenging, it may be important to recruit peer supporters who represent the local demographic.

over longer periods are more likely to become established and trusted by both healthcare professionals and families, thereby increasing referrals, participation and service utilisation[21]. Longer-term investment may be particularly important in areas with historically low breastfeeding rates or high levels of deprivation, where building trust and engagement can take considerable time.

Alongside variation in service provision, mothers' preferences for how support is accessed also differ. Overall, preferences for the delivery of peer support vary, with some mothers favouring digital communication and others preferring face-to-face interactions (217). In one of the included reviews, discomfort with group settings or a preference for online support was reported to have prevented some women from accessing local peer support provision (218), thereby suggesting that a range of peer-support delivery models may be required to meet different preferences and needs.

Positive characteristics of peer support: Peer supporters have been described as relatable, caring, approachable, and non-judgmental, offering practical breastfeeding information and support (218). Four studies in a scoping review (219) found that mothers viewed peer supporters as encouraging, comforting, and helpful, enhancing positive feelings through shared experiences and empathy (220). The shared nature of the peer-mother relationship can make women feel more comfortable in asking questions (217), and peer supporters can help women in developing positive relationships with healthcare staff (219). Continuity of peer support over time has been found to help mothers appraise their feeding decisions and to develop trust, while short-term support was also found to be beneficial if it was warm and enabling (220).

Online peer support (with the included evidence reporting on structured as well as informal support) offers additional benefits in terms of being anonymous, convenient, timely and accessible, particularly when health professional support was conflicting or not available (221-223) or when there was a lack of support from within their social networks (223). The review by Reicher & Spatz (223) also highlighted how participants valued opportunities to develop subgroups that met their specific needs. This included, for example, groups for parents who exclusively express breast milk, parents who breastfeed beyond infancy, and parents dealing with trauma. Some women felt that online groups should be supplementary to in-person groups, rather than a replacement (224). Parents participating in location-specific online groups valued the links to local face-to-face services and the sharing of information about nearby resources; some groups served as a bridge to in-person support and facilitated the development of offline social connections (223).

Overall women report wanting peer support that provides:

- Flexible support options and early proactive contact both antenatally and particularly in the postnatal period to facilitate breastfeeding decisions and for timely support (220).
- Positive and supportive, non-judgemental communication (218).
- Medically accurate and reliable information and practical support that can address breastfeeding challenges (217).

Positive impact of peer support on health and well-being:

For parents: Peer support (whether delivered face-to-face, groups or online) has been associated with improved maternal confidence, self-esteem, empowerment, and positive perceptions of breastfeeding (221-227). Peer support can help alleviate stress and frustration by helping women to stay calm and relaxed when facing breastfeeding challenges (217). It can also foster mutual and reciprocal support when delivered in a group setting (face to face or online), helping mothers feel less alone (217, 218, 221-224, 226, 227). Many mothers who receive peer support express a desire to become peer supporters themselves, due to wanting to provide the same for others (217, 219, 221-226), while others engage in community activism to empower others and dismantle stigma around breastfeeding (221, 223).

For peers: Peer supporters can benefit by gaining a sense of purpose and confidence (218), improved communication skills and enhanced career opportunities (219, 225).

For healthcare professionals: Healthcare professionals can value peer supporters for reducing their workloads (218) and providing useful tips and support to address breastfeeding challenges (219). Peer supporters can offer the time, continuity and listening support that are often difficult to provide within pressured healthcare services.

For infants: Benefits for infants (related to breast milk provision) include reduced hospitalisations, diarrhoeal episodes, and medication use (225).

Cost-benefits: Cost benefit analyses suggest potential savings of peer support via reduced formula and healthcare costs (225).

Impact on breastfeeding outcomes: Peer support was reported to have helped parents overcome early challenges, make informed decisions, to provide motivation to continue breastfeeding or to alter their breastfeeding goals (such as breastfeeding for longer than intended) or to breastfeed in public (217, 218, 221-223, 226, 227).

Overall, however, findings regarding the effectiveness of structured peer support on breastfeeding outcomes are mixed. This may reflect variation in peer-support models, such as levels of training, supervision and governance or how peer support is delivered; however, there is currently insufficient evidence to assess the impact of these differences on outcomes. One systematic review and meta-analysis (228) found that, in high-income countries, peer support increased exclusive breastfeeding at 3 months but had no significant effects at 5 and 6 months. Similarly, a scoping review by Hoy Harrison et al. (225) found that peer support was associated with increased breastfeeding initiation, duration, and exclusivity, though some effects were modest or not long-lasting. Systematic reviews by Rodríguez-Gallego et al. (229) and Chepkirui et al. (219) also found that peer support was effective in increasing breastfeeding rates and duration, especially when combined with professional guidance from a health professional or IBCLC Lactation Consultant.

The review by Jolly et al. (230) found that peer support reduced the risk of not breastfeeding by 15% and not exclusively breastfeeding by 18%, though heterogeneity was high. Effects were smaller in high-income countries, with only a 7% reduction in any breastfeeding and 10% for exclusive breastfeeding, and no significant

effect was observed in UK studies. More intensive interventions (≥5 contacts) were associated with a significantly lower risk of breastfeeding cessation, whereas less intensive interventions showed no effect. Intervention intensity did not appear to influence exclusive breastfeeding outcomes. Postnatal-only support reduced the risk of not breastfeeding, while combined antenatal and postnatal support did not; however, both approaches similarly reduced the risk of not exclusively breastfeeding. The review by Chepkirui, et al. (219) also found that, while overall breastfeeding rates at discharge increased amongst women who received peer support, there was no significant effect on exclusive breastfeeding rates. However, it is important to note that the review by Trickey et al. (220) found that many peer support interventions faced difficulties in achieving the intended number of contacts between peers and mothers (220), thereby weakening the evidence base and any conclusions drawn.

Most of the evidence for online breastfeeding peer support focuses on experiences rather than quantitative outcomes (221, 223, 226); direct causation is often difficult to determine due to the complexity of the breastfeeding context and the challenges of controlling for confounding factors.

Barriers and challenges of providing peer support

Logistical challenges: Peer support does not operate in isolation, and its effectiveness may be influenced by wider system-level factors, including commissioning arrangements, funding stability, referral pathways, service integration and accessibility. Peer support interventions that are better integrated with existing health services and supported by programme champions (225) can offer a more seamless service and therefore tend to be more successful (220, 225). Whereas peer supporters working in areas with integration challenges (225) or misaligned policies, such as routine formula supplementation (220), can undermine peer support effectiveness.

In the review by Chang et al. (218), delays in the validation procedures for new peer supporters could lead to a loss of interest amongst potential supporters. Peer supporters could also face time constraints (225) and struggle to meet targets and need practical assistance such as transportation (218). In the review by Hoy Harrison et al. (225), there was also evidence of how professionalisation of the peer support role (often associated with paid rather than voluntary positions) could undermine peer supporters' motivation and capacities to provide support. Professionalisation may improve service consistency, capacity and sustainability; however, it could also lead to role ambiguity, reduced time for direct support and increased administrative pressures. While there is currently no clear evidence regarding the relative effectiveness of paid versus volunteer peer-support models, these findings suggest that ongoing reflective supervision and appropriate managerial support are important to ensure that professionalisation strengthens, rather than undermines, the value of peer support. In the review by Chang et al. (218), delays in the validation procedures for new peer supporters could lead to a loss of interest. Peer supporters could also face time constraints (225) and struggle to meet targets and need practical assistance such as transportation (218). In the review by Hoy Harrison et al. (225), there was also evidence of how professionalisation of the peer support role (often associated with paid rather than voluntary positions) could undermine the peer supporters' motivation and capacities to provide support. Professionalisation may improve service consistency, capacity and sustainability; however, it could also lead to role ambiguity,

reduced time for direct support and increased administrative pressures. While there is currently no clear evidence regarding the relative effectiveness of paid versus volunteer peer-support models, these findings suggest that ongoing reflective supervision and appropriate managerial support are important to ensure that professionalisation strengthens, rather than undermines, the value of peer support.

Interactions with healthcare professionals: Some healthcare professionals have expressed negative or ambivalent attitudes towards peer supporters due to, e.g., feeling threatened and a lack of trust in what information is provided (218, 220, 225). It has also been suggested that some peer supporters may struggle working alongside doctors who previously treated them (219). Some of the peer supporters could also struggle working alongside doctors who previously treated them (219).

Sociocultural norms: The realist review by Trickey et al. (220) found that peer support interventions are more effective when aligned with local infant feeding norms; in areas with low breastfeeding rates, interventions trying to persuade mothers to breastfeed are often seen as irrelevant. This has implications for peer support as peers are motivated when they feel valued and demotivated when their help is rejected (220).

Challenges of online peer support: While information from peers was often considered credible, appropriate, reliable, educational and evidence-based, some women worried about confidentiality (223) and did not trust the information they received (221-223), particularly if they did not know who was providing it (221). There were also occasions of parents receiving judgemental comments from their peers (221-223). While online peer support groups could create a sense of belonging and community (221, 222, 226), which was particularly important for mothers who felt 'othered' in mixed groups (223, 226), parents' cultural needs were not always met (221, 222). Some parents also experienced polarisations between those who exclusively breastfeed and those who use formula (221). Effective online peer support depends on proper moderation to ensure that the information provided is accurate and supportive (221, 222).

Conclusion: Overall, the evidence demonstrates that breastfeeding peer support, whether delivered face-to-face, in groups, one-to-one, or online, plays a valuable role in supporting parents' confidence, wellbeing, and feeding decisions. Peer supporters can provide relatable, practical and non-judgemental support that complements professional care. Parents value peer support for its emotional warmth, continuity, flexibility and accessibility, particularly where trust in maternity services is low or barriers exist to accessing traditional support. Flexible delivery models, including proactive early contact and digital or in-person formats, can help meet diverse parental needs. Peer support may also generate wider benefits, including increased confidence and skills among peer supporters, reduced demands on healthcare professionals, and potential reductions in infant illness and healthcare costs.

Despite these strengths, evidence for the impact of structured peer support on breastfeeding rates remains mixed, particularly in high-income settings, where effects tend to be modest or short-lived. Intervention intensity, timing, and fidelity appear to be key determinants of effectiveness, with some programmes struggling to achieve the intended number of contacts. The evidence for peer support is further challenged by logistical constraints, inconsistent supervision and training, variable integration with health services, and sociocultural contexts that may not support breastfeeding. Online

peer support shows strong experiential benefits but there is limited evidence of direct impact on breastfeeding outcomes. Trust, quality control, and effective moderation are critical in online support environments, where misinformation, judgement, or unmet cultural needs may undermine the quality and effectiveness of support.

Overall, the included literature suggests that breastfeeding peer support is most effective when it is well-integrated with local health systems, tailored to community norms, reliably delivered, and supported through adequate training, supervision, and resources. Providing multiple modes of support and ensuring collaborative, trusting relationships between peers, parents, and professionals are essential for maximising its impact. Further, efforts may be required to reach women from under-served communities, including those who are less likely to initiate or continue breastfeeding. This requires a careful balance between integration with formal health services and maintaining a community-centred approach. This can help ensure that support is accessible, culturally relevant, and responsive to the barriers these women may face, while enabling their voices, experiences, and needs to be genuinely heard and reflected in service delivery.

Section III: Psychosocial interventions

Here, we present evidence on the effectiveness of interventions underpinned by theory, focusing on breastfeeding outcomes as well as related maternal and infant outcomes.

Social-psychological & behavioural interventions

A recent Cochrane review by Lenell et al. (231), synthesising 10 randomised controlled trials, reported that psychosocial breastfeeding interventions may offer short-term protection against postpartum depression, modest reductions in anxiety, and longer breastfeeding duration. However, due to small samples, variations in intervention design, and inconsistent measurement, the overall certainty of the evidence was rated low to very low. These findings nonetheless highlight the potential for breastfeeding support to operate not only through biological mechanisms but also via psychological reassurance, enhanced confidence, and strengthened social connectedness.

A further dimension concerns the social-psychological context of feeding. Interventions that target both women and their partners may increase the availability and quality of tangible support. Howell et al. (232) demonstrated this in a study where postpartum mothers were randomised to receive a behavioural educational intervention versus enhanced usual care. Education materials normalised a wide range of postnatal physical and emotional symptoms and explicitly highlighted the importance of partner support. Partners received summary sheets outlining typical maternal experiences, and a two-week telephone call with a social worker enabled mothers and parents to develop personalised action plans and access community resources. Mothers receiving the intervention breastfed for a longer duration than control participants, suggesting that normalisation, preparation, and shared responsibility can mitigate psychosocial stressors that undermine breastfeeding continuation.

Behaviour change taxonomies provide further insight into the active ingredients of effective support. Davie et al. (233), drawing on 20 controlled and quasi-experimental

studies, concluded that behavioural interventions can improve breastfeeding initiation and exclusive breastfeeding. Interventions were categorised as education and support, empowerment-focused, or self-efficacy-based, and collectively demonstrated that programmes using a greater number of behaviour change techniques (typically six or more) produced the largest effects. Effective components included tailored information, uninterrupted professional input, access to practical materials (e.g., breast pumps), verbal persuasion, reflective listening, self-persuasion, and reattribution of negative experiences, such as reframing cluster feeding as normal rather than problematic. The authors argue that challenging unhelpful belief patterns, strengthening efficacy beliefs, and enabling mothers to differentiate typical feeding behaviours from signs of difficulty may be especially beneficial. Rojas-García et al. (234), reviewing 23 international postpartum interventions, identified 29 behaviour change techniques. 'Credible source' and 'instruction on how to perform the behaviour' were the most prevalent, while 'social support (unspecified)' contributed positively to exclusive breastfeeding between five and eight weeks postpartum. The authors contend that interventions integrating both cognitive (e.g., reframing, confidence-building) and behavioural (e.g., demonstration, guided practice) components may help women develop coping strategies that support continued exclusive breastfeeding.

Breastfeeding self-efficacy interventions

Breastfeeding self-efficacy (BSE) is defined as a mother's confidence in her ability to breastfeed; BSE predicts effort, persistence, and coping (235). BSE-type interventions target Bandura's four sources of self-efficacy:

- **Performance accomplishments** (practical skills),
- **Vicarious experiences** (peer examples),
- **Verbal persuasion** (encouragement),
- **Physiological responses** (managing discomfort or stress).

There is growing evidence that interventions underpinned by BSE theory can positively influence maternal confidence and breastfeeding outcomes. Brockway et al. (236) explored the theoretical link between BSE and breastfeeding by examining whether interventions successfully improved self-efficacy and whether these improvements translated into better feeding outcomes. Across 11 studies, mothers in intervention groups demonstrated significantly higher BSE, scoring on average 4.86 points higher at two months postpartum, and were 1.56 and 1.66 times more likely to be breastfeeding at one and two months postpartum respectively. Interventions delivered in the postpartum period, implemented across combined delivery settings, or explicitly informed by BSE theory exerted the greatest influence, suggesting that timing, context, and theoretical alignment matter.

A systematic review and meta-analysis by Galipeau et al. (237) reported similar findings. While BSE-focused interventions had a significant impact on self-efficacy, evidence remains limited regarding the most effective mode, format, and intensity of delivery. Interventions included structured educational classes, supportive approaches incorporating reassurance and praise, staff training, and integrated BSE-based models targeting the established sources of self-efficacy (mastery, vicarious learning, verbal persuasion, and emotional states). These were delivered prenatally, postnatally, or across both periods, by professionals or laypersons, and via in-person, telephone, or digital platforms. Notably, BSE-type interventions were found to be significantly

more effective in improving breastfeeding rates than education-only programmes, emphasising the importance of actively influencing confidence rather than simply providing information.

Primary studies offer further illustration. Chan, Ip and Choi (238) evaluated a single 2.5-hour in-person workshop delivered between 28- and 38-weeks' gestation, underpinned by BSE theory and supplemented with a 30–60 minute telephone counselling session at two weeks postpartum. Compared to education-only approaches, this intervention improved both BSE and breastfeeding outcomes, demonstrating that even brief, theory-informed sessions can meaningfully affect confidence and practice when reinforcement is provided after birth. Similarly, Antonanzas-Baztan et al. (239) assessed the feasibility, acceptability, and efficacy of a three-stage BSE-promoting programme alongside usual care. Although differences in BSE scores did not reach statistical significance between the groups, six-month breastfeeding maintenance was significantly higher among women receiving the intervention and drop-out in the control group was 3.3 times higher than in the intervention group.

Midwifery & continuous professional support

Other interventions demonstrate an impact of continuity on breastfeeding outcomes. Dagla et al. (240) evaluated a non-randomised controlled perinatal health intervention comprising long-term breastfeeding support delivered by midwives alongside psychosocial support for women. The intervention included antenatal education, mental health screening, physical activities, continuous midwifery counselling and breastfeeding support, access to mental health professionals, postpartum support, telephone helpline and family counselling. The study found that most women (96.3%) initiated either exclusive breastfeeding (70.7%) or any breastfeeding (with or without formula or other type of food/drink) (25.6%). At the end of the 6th month postpartum, almost half of the women (44.3%) breastfed exclusively. A greater intensity of midwifery-led support appeared to be associated with an increased likelihood of exclusive breastfeeding at six months postpartum and prolonged duration of any breastfeeding (240).

Motivational interviewing (MI)

Motivational Interviewing is a collaborative, person-centred counselling style designed to help individuals explore and resolve ambivalence about behaviour change. It emphasises autonomy, empathy, and guiding rather than directing. Several studies exploring the impact of MI have been conducted. Franco Antonio et al. (241, 242) explored the impact of a brief MI intervention; 88 women who gave birth by vaginal delivery and started breastfeeding during the immediate postpartum period were randomly assigned to the intervention group (brief MI) or control group (breastfeeding education). The authors found that brief MI increased breastfeeding and exclusive breastfeeding duration, an effect that was moderated through the women's BSE. Elliot-Rudder et al. (121) undertook a cluster randomised controlled trial with 330 women and found significantly higher rates of exclusive breastfeeding in those who received the MI intervention. While Wilhelm et al. (243) found no significant differences in breastfeeding intention, breastfeeding self-efficacy or breastfeeding duration among rural Mexican American mothers receiving a MI intervention, the authors suggested that the absence of significant effects may have been attributable to high attrition rates.

Psychological & relaxation-based interventions

There is growing interest in the use of perinatal psychological and relaxation-based interventions to support breastfeeding outcomes, with evidence suggesting benefits for maternal emotional wellbeing, milk production, and breastfeeding duration. Gomez et al.'s (244) narrative review of 20 studies (including 11 randomised controlled trials, two non-randomised trials, and two quasi-experimental designs) reported that interventions such as relaxation training, music therapy, cognitive-behavioural therapy, interpersonal therapy, and compassion-focused relaxation may improve breastfeeding outcomes when tailored to address perinatal distress. Notably, across studies involving mothers of preterm infants, simple relaxation techniques demonstrated strong effects on improving milk expression, emphasising the value of stress modulation in this population.

More recent evidence from a review by Levene et al. (245), examining music, guided relaxation, mindfulness, and breathing/muscle relaxation exercises, similarly found that relaxation interventions were associated with increased human milk volume, infant weight gain, and small reductions in maternal stress and anxiety, although heterogeneity prevented any conclusions about the optimal modality. A focused review on music interventions (246) reported that music had a low but positive effect on breast milk production. Likewise, Ouyang et al. (247), synthesising five trials, concluded that music-based interventions (e.g., flute music, local music, guided relaxation) had a modest beneficial impact on milk production.

Primary studies further illustrate these mechanisms. Shukri et al. (248) evaluated an imagery-based audio recording used while breastfeeding or expressing for at least two weeks. Mothers also received standard support. Intervention participants showed lower stress scores, reduced hindmilk cortisol, and their infants had longer sleep duration and higher gains in weight and body mass, suggesting an interplay between maternal relaxation, milk composition, and infant growth. Whereas Sansone et al. (249) found that a prenatal mindfulness programme enhanced maternal coping with labour pain, postpartum emotional regulation, and breastfeeding challenges, thereby strengthening bonding and resilience.

Cognitive and interpersonal approaches also demonstrate promise. A secondary analysis by Kao et al. (250) examined the ROSE programme, a group-based interpersonal psychotherapy intervention designed to prevent postpartum depression by enhancing social support and facilitating assertive help-seeking among low-income pregnant women. Women randomised to four 60-minute group sessions and a 50-minute individual booster session breastfed for longer durations than those in standard care, despite similar initiation rates.

Brief targeted counselling can also influence early outcomes. Sreekumar et al. (251) found that a single session of cognitive breastfeeding counselling delivered in the third trimester significantly improved LATCH[103] scores in the immediate newborn period compared with routine counselling, highlighting the potential of cognition-focused strategies. Psychological skills training also may have wider benefits. For example, an RCT by Perez-Blasco et al. (252) demonstrated that an 8-week mindfulness-based intervention significantly increased maternal self-efficacy, enhanced several facets of

[103] LATCH scores are a breastfeeding assessment tool used by healthcare professionals to evaluate how effectively a baby is breastfeeding and to identify where support may be needed.

mindfulness (observing, acting with awareness, non-judging, non-reactivity), improved multiple dimensions of self-compassion, and reduced psychological distress.

One randomised controlled trial explored the effect of a technology-based mandala activity[104] on women's BSE and attachment between mother and infant (253). Women who were in their 32-37th gestational week received three education modules via WhatsApp. The study found that women in the intervention group had significantly higher BSE and attachment scores compared to the control group.

Conclusion: Across this evidence base, social-psychological and behavioural interventions show promising potential to improve breastfeeding outcomes by targeting the emotional, cognitive, and relational factors that shape feeding decisions, although the strength and certainty of this evidence varies. Interventions underpinned by theory, particularly those focusing on breastfeeding self-efficacy, can enhance maternal confidence and are associated with longer breastfeeding duration, especially when support is reinforced after birth. Programmes that employ multiple behaviour change techniques, normalise common challenges, and provide tailored, ongoing professional input tend to be more effective than education alone.

Partner-inclusive and midwifery-led approaches may strengthen practical and emotional support, while motivational interviewing and relaxation-based interventions help to reduce stress, promote coping, and increase milk production in some populations. However, evidence quality varies, effects are often modest, and implementation factors (timing, continuity, dose) are critical.

Overall, these findings suggest that breastfeeding support should address not only the mechanics of feeding but also maternal confidence, interpretation of infant behaviours, emotional wellbeing, and access to social support. Integrating these psychological and behavioural components into routine care may contribute to more positive breastfeeding experiences and improved continuation.

Section IV – Breast milk expression

Breastmilk expression is defined as the removal of breast milk without the infant feeding at the breast. Mothers express for various reasons including returning to work, enabling others to feed the infant, relieving engorgement, storing milk in anticipation of separation, relieving engorgement or nipple pain, maintaining supply, or mixing with foods (254). Further evidence on expressing among mothers of preterm infants is reported in Chapter Ten.

Pump use and breastfeeding duration

Analysis of US Centers for Disease Control and Prevention Pregnancy Risk Assessment Monitoring System data for 19,719 women from four US states (2016-2021) demonstrated that pump use was associated with a 37% lower risk of breastfeeding cessation and an average of 21 additional weeks of breastfeeding (255). However, a review by Johns et al. of 22 papers (254) found that only seven reported the prevalence and/or outcomes of expressing amongst mothers of healthy term

[104] A technology-based mandala activity is a digital version of traditional mandala-making or colouring, delivered through electronic tools rather than paper and pens. It uses technology to support mindfulness, emotional expression, creativity, or therapeutic reflection.

infants, and that the findings were contradictory. While some studies suggested expression was associated with longer breastfeeding duration, others found the opposite. In some cases these inconsistencies were compounded by imprecise definitions of breastfeeding and breast milk feeding.

Pump use by sociodemographic factors

In a US-based study, pump use was found to vary by sociodemographic factors: mothers under 18, those on Medicaid, racial/ethnic groups other than non-Hispanic White women, women of lower income or education, and unmarried mothers were less likely to use pumps, demonstrating important inequalities (255).

Clinical applications of expressing

In mothers undergoing caesarean section, using a breast pump for nipple stimulation was shown to accelerate lactation onset by 19.57 hours compared to standard care, according to a review of four trials including 318 women (256). The evidence was graded moderate in certainty.

A randomised controlled trial comparing bilateral electric expressing to hand expression in healthy term infants feeding poorly at 12-36 hours found that expressing produced a slightly higher median milk volume (1 mL vs 0.5 mL), though was not statistically significant (257). However, mothers assigned to hand expression were more likely to still be breastfeeding at two months (257). These findings suggest that hand expression may support longer-term breastfeeding success, even if expressing seems more efficient in the immediate postpartum period.

Outcomes of exclusive expressing

An integrative review of 27 studies found that most mothers who exclusively expressed milk had initially planned to breastfeed directly but resorted to expressing after encountering difficulties (258). These mothers often reported inconsistent information from healthcare providers about expressing and turned instead to social media for practical guidance. Overall, evidence suggests that amongst mothers who exclusively expressed, outcomes are generally poorer: exclusive expressers had shorter durations of human milk feeding and were more likely to stop breastfeeding earlier compared with women who combined expression with direct feeding. The review stressed that distinguishing milk type from feeding method in both research and clinical practice is crucial to providing better guidance. The distinction is important because feeding a baby human milk is not the same as feeding directly at the breast, and each method involves different challenges and support needs. Separating milk type from feeding method allows research and clinical care to better reflect mothers' experiences and provide more appropriate, targeted guidance, particularly for those who exclusively express milk.

Equity, access, and support needs

Evidence also suggests that providing pumps alone is insufficient to improve breastfeeding outcomes. In a trial of 60 low-income, first-time mothers, participants randomised to receive a manual breast pump at birth were more likely to use one at six weeks (68% vs 29%), but there was no effect on exclusive or any breastfeeding at 12 weeks (259). These results echo larger population analyses showing lower pump use among disadvantaged groups, highlighting that lactation outcomes depend on structured, equitable support rather than access to equipment alone (255).

Conclusion: Across diverse populations and clinical contexts, breast milk expression, whether by pump or hand, plays a complex role in supporting human milk feeding. Emerging population-level evidence suggests that pump use can extend breastfeeding duration, but not consistently, yet access and uptake reflect persistent sociodemographic inequities. Clinical trials indicate potential benefits of expressing in specific circumstances, such as after caesarean birth, while also highlighting situations where hand expression may better promote sustained breastfeeding. Experiences of mothers who exclusively express illustrate how initial breastfeeding challenges, inconsistent professional information, and reliance on informal resources can shorten overall duration. Importantly, provision of pumps alone does not address underlying attitudinal, structural, and support needs, particularly for disadvantaged groups. These findings highlight the necessity of tailored, equitable lactation support that distinguishes between feeding method and milk type and meets parents' practical and emotional needs to optimise breastfeeding outcomes.

Section V: E-technologies

This section explores the evidence for electronic technologies (e-technologies) such as web platforms (the most commonly used mode, typically combining educational content with interactive features), mobile apps (often including features such as breastfeeding tracking, personalised tips, or locators for further information), computer kiosks (mainly used in clinical or hospital settings to deliver structured breastfeeding education), as well as remote breastfeeding support (provided by healthcare professionals, lactation consultants and peer supporters).

E-technologies tend to have two main purposes:

- **Breastfeeding education:** Providing information on breastfeeding benefits, techniques, and problem-solving.
- **Breastfeeding support:** Offering interactive, often real-time support through online discussion forums or web-based consultations.

And generally, include five key strategies:

- **Monitoring and breastfeeding tracking:** Tools for recording feeding times and frequencies.
- **Personalisation:** Tailoring information and feedback to individual needs.
- **Online discussion forums:** Enabling peer-to-peer and professional support.
- **Web-based consultation:** Direct access to lactation consultants.
- **Breastfeeding support locators:** Helping mothers find nearby facilities for breastfeeding.

Web/internet-based interventions: A scoping review by Putri et al. (260) explored empirical literature on m-health[105] interventions (delivered via smartphone applications, text messaging, video calls, or similar platforms to provide breastfeeding education and support) designed to enhance breastfeeding self-efficacy and promote

[105] mHealth (mobile health) is a subset of e-technologies that specifically involves mobile and wireless technologies, such as smartphones, tablets, SMS text messaging, mobile apps, and wearable devices.

exclusive breastfeeding. While most of the included interventions were delivered via smartphone applications (e.g., WhatsApp) or through video calls, some combined m-health with face-to-face components. The synthesis found that most studies reported significant increases in maternal breastfeeding self-efficacy and that, while some studies demonstrated improvements in exclusive breastfeeding practices among women who received the m-health interventions, this was not consistent.

Across multiple reviews, technology-based interventions, including web-based platforms, e-prompts[106], CD-ROM programmes, interactive computer agents[107], and telehealth[108], were generally associated with improvements in breastfeeding knowledge, initiation, exclusivity, duration, and maternal self-efficacy (261-265).However, findings were not consistently positive. For example, two of the included trials exploring web-based and visual consultation interventions in Lau et al.'s (261) review demonstrated no significant difference in exclusive breastfeeding rates at 6 weeks when compared with usual care. One of the studies in the review by McArthur et al. (262) found that their interactive computer agent significantly increased mothers' intent to exclusively breastfeed but did not show a statistically significant difference in intended breastfeeding duration between those who and did not receive this support.

Moreover, one of the trials included in Marcucci et al.'s (263) review found no significant difference when the control group also received face-to-face support (10). A CD-ROM based intervention included in the review by Tang et al. (265) failed to improve knowledge, breastfeeding rates, intention, and self-efficacy. Furthermore, another study in the same review that involved an interactive agent showed no significant improvement in breastfeeding intention and self-efficacy and failed to alter attitudes toward breastfeeding (265). McArthur et al. (262) argued that some of the key reasons for variations in outcomes for web-based interventions related to the quality of information and usability of the platform.

A systematic review and narrative synthesis by Almohanna et al. (266) explored the effects of internet-based interventions that used e-technologies. They found that interventions that provided a combination of early interactive antenatal breastfeeding education with postnatal web-based discussion support were generally more effective compared to usual care in terms of improved breastfeeding outcomes during the hospital stay and some evidence of a positive impact on exclusive breastfeeding rates up to 6 months (266). Similarly, the review by Jaynes et al. (267) suggests that digital education (including videos, text messaging, websites, apps and telephone support) can improve breastfeeding knowledge, confidence and continuation, particularly when interventions are interactive and provide ongoing support beyond hospital discharge. The authors emphasise that technology should be designed around women's needs, be equitable and culturally appropriate, and function as part of a broader package of responsive, relationship-based care rather than as a stand-alone intervention.

[106] E-prompts (electronic prompts) are digitally delivered reminders or cues designed to prompt an action, decision, or behaviour at an appropriate time.
[107] Interactive computer agents are software-based entities designed to interact with users in a responsive, conversational, or adaptive way, often simulating aspects of human communication or decision-making.
[108] Telehealth is the delivery of healthcare services and health-related support at a distance, using telecommunications and digital technologies rather than in-person contact.

Collectively, these findings indicate that while digital approaches may offer meaningful support, their impact varies and may depend on the type of intervention, the level of concurrent in-person support, and mothers' individual needs.

Tracker Apps: Several mobile apps are used for tracking breastfeeding frequency, barriers and maternal experiences (268), with apps that are rated more highly, being those that offer more comprehensive tracking functions (269). However, despite this positive feedback, in one of the reviews, interventions that provided monitoring and breastfeeding tracking appeared to be least effective in improving breastfeeding outcomes: the authors argue this could be because of a lack of meaningful educational and supportive interactions for different breastfeeding challenges (266).

More recent evaluations of breastfeeding support applications that incorporate infant feeding trackers demonstrate mixed evidence of effectiveness. Ahmed et al. evaluated a theory-driven, self-efficacy-based interactive web platform (LACTOR) in a two-arm randomised controlled trial conducted across three Midwestern hospitals in the United States (270). Mothers recorded feeding patterns, diaper output and breastfeeding difficulties for 30 days and received automated tailored feedback alongside access to lactation support. Although no significant differences in breastfeeding outcomes were observed at discharge, mothers in the intervention group demonstrated significantly greater breastfeeding duration, exclusivity and intensity at one, two and three months postpartum. A secondary analysis of the same trial also found significantly higher breastfeeding self-efficacy and maternal breastfeeding satisfaction at two and three months postpartum (271).

Across recent randomised trials, breastfeeding support applications have consistently improved maternal outcomes such as breastfeeding self-efficacy and perceived breastfeeding support but have not demonstrated consistent improvements in breastfeeding exclusivity or duration. The Mother's Milk Messaging™ app (developed using a range of theories including Social Cognitive Theory, Theory of Planned Behaviour and health communication approaches) sent evidence-based breastfeeding text messages from late pregnancy to three months postpartum and included a tracker function for feeding. The randomised controlled trial found that while there were no differences in breastfeeding exclusivity or duration, intervention participants reported higher breastfeeding self-efficacy and perceived social support (272). A further evaluation examined *LactApp*, an application that delivered personalised automated guidance and incorporated three monitoring tools for tracking infant growth, daily stools, and breastfeeding and infant feeding practices. The app was perceived as highly usable, especially by first-time and exclusively breastfeeding mothers, (273) but a randomised trial found no reduction in breastfeeding cessation or improvement in six-month breastfeeding rates compared with standard care (274). Non-adherence to the intervention was more common among foreign-born women and those with lower educational attainment (274). A small qualitative study from Australia found that mothers often valued infant feeding apps with tracking functions as convenient, data-driven tools that supported breastfeeding and broader infant care (275). Tracking enabled mothers to identify feeding patterns, troubleshoot concerns, compensate for sleep-related forgetfulness, and gain reassurance, particularly when worried about milk supply. Engagement with the tracking features tended to decline as mothers' confidence grew. Reported drawbacks of apps included over-reliance on data, concern about screen time, information overload, variable credibility of content,

and practical difficulties using apps during feeds, with many mothers seeking confirmation from health professionals (275).

Mobile apps: Some mobile apps have focused on supporting women to access milk banks or express their breastmilk among small groups of women (266) or provide educational content, such as guidance on breastfeeding, infant feeding practices, positioning, and addressing common breastfeeding challenges (265, 268). While delivery of breastfeeding interventions via apps is encouraging because of their simplicity and continuous availability (266), evidence mainly focuses on the usability of the apps rather than examining their effectiveness (266, 268, 276). There are also criticisms about app development lacking any theoretical underpinnings (266, 268).

An app-based intervention for 170 predominantly Black, low-income first-time mothers found that engagement with the interactive BreastFeeding Friend app did not improve breastfeeding rates, despite tailored educational content (277, 278); however, as technology-based resources were reported to be highly valued by mothers during the post-discharge period, the authors suggest future potential for this population (277). A mixed-methods feasibility study has also been conducted on the My Baby Now app. This app delivered evidence-based information and tailored support on infant feeding from pregnancy to the early postpartum period (279). The app included videos, interactive tools, goal-setting features, push notifications, and a moderated peer forum. The study found that women without a university education rated the app as more useful and impactful. Knowledge and intentions to exclusively breastfeed increased from baseline to late pregnancy, and attitudes and confidence improved from baseline through postpartum. Participants generally viewed the app as acceptable and useful, particularly for anticipatory guidance. However, variations in user engagement, notification fatigue, and reliance on professional endorsement[109] were noted as potential challenges. As this was a feasibility study without a control group or long-term follow-up, further research is needed to establish its effects on breastfeeding initiation, duration, and exclusivity.

Overall, while breastfeeding apps can enhance confidence, attitudes, and perceived support, evidence for improving breastfeeding duration or exclusivity is generally lacking.

Computer kiosks: This mode of support provides breastfeeding education and support by incorporating several educational modules such as basics of breastfeeding, benefits of breastfeeding, and coping with breastfeeding[110] (266). There is some evidence of positive outcomes in some cases (e.g., improved breastfeeding knowledge, stronger intention to breastfeed and short-term self-efficacy) but overall computer kiosks have been less frequently studied (265, 266). Computer kiosk interventions seem to be effective in enhancing women's knowledge and short-term confidence level (266), but further robust evidence is needed.

[109] This refers to participants' tendency to trust and value the app's information primarily when it was seen as aligned with, endorsed by, or consistent with advice from healthcare professionals.
[110] Computer kiosks are used to provide on-site, self-directed breastfeeding education and support for mothers, often in healthcare or community settings. They deliver structured educational modules covering topics such as the basics of breastfeeding, benefits of breastfeeding, and strategies for coping with common breastfeeding challenges, allowing users to access consistent, standardized information at their own pace.

Social media: A review by Orchard & Nicholls (224) explored how social media influences breastfeeding practices, defining social media broadly to include social networking sites, blogs, and interactive features within m-technology and apps. Overall, the evidence included in this review was mixed; some showed social media improved breastfeeding awareness and positively influenced attitudes toward breastfeeding and could influence outcomes, while others reported no significant effect on breastfeeding duration or exclusivity.

The review by Galvão et al. (280), exploring which social networks and digital resources are most frequently used by women for breastfeeding-related information and support, found that women increasingly turn to various online platforms, such as Facebook, dedicated mobile apps, websites, online videos, podcasts, and e-mail, for information and support on breastfeeding, often as an alternative to traditional health services. Participants reported using social media and app-based technology for a range of reasons, including seeking support with establishing breastfeeding, obtaining information on breastfeeding-related issues (e.g. tongue-tie), accessing advice on infant health and behaviour, and for topics that they found too uncomfortable to discuss in face-to-face settings (224, 280).

Disadvantages for the use of social media were also noted by Galvão et al. (280). Use of social media can lead mothers to miss opportunities for eye contact and to interact with their children[111] (also see Chapter Eleven for evidence on parental use of technology), mothers can feel overwhelmed by the amount of information, and some may be disadvantaged due to digital poverty. The effectiveness of social media interventions also appeared to depend on factors such as the quality of content, the credibility of individual contributors, and the dynamics within the online group (224).

Remote breastfeeding support (provided by professionals or peers): Gavine et al. (281) undertook a systematic review and meta-analysis of randomised controlled trials of remote breastfeeding support and education. This included support provided via telephone, video calls, text messaging, email, or social media on a group or one to one basis and could be offered by health professionals or lay people or both. While the included evidence found remote support effective in reducing the risk of stopping exclusive breastfeeding by 25%, the certainty of the evidence was low. No significant differences were observed in the cessation rates of any breastfeeding at 4-8 weeks, 3 months, or 6 months, nor in exclusive breastfeeding rates at 4-8 weeks and 6 months, except in sensitivity analyses excluding high-risk of bias studies. The review included one trial that explored the impact of remote support on maternal mental health. This study found a small but significant improvement in perinatal mental health in the intervention group when compared to controls (281). The only included study to assess for self-efficacy reported no significant difference between the intervention and control group (281).

A UK based study evaluated the Solihull Approach online course *Understanding Your Baby*[112], an online postnatal parenting programme designed to support parents' understanding of infant behaviour, communication, attachment and development. The

[111] Regarding general parenting and caregiving context, rather than a breastfeeding-specific mechanism.
[112] Self-belief in parenting ability increases during the postnatal period after completing the Solihull Approach online course solihullapproachparenting.com/self-belief-in-parenting-ability-increases-during-the-postnatal-period-after-completing-the-solihull-approach-online-course-understanding-your-baby/

evaluation involved 2,322 participants and found significant improvements in parental self-efficacy, including confidence in feeding, soothing, establishing routines, and understanding infant needs.

Virtual lactation support: A review focused on virtual lactation support delivered via various information and communication technologies was undertaken by Blackmore et al. (282). This review included 16 randomised controlled trials and concluded that overall, virtual lactation support significantly increased the likelihood of exclusive breastfeeding at both one month and at six months (282). Although one visual consultation trial (with women able to consult midwives by videoconference or telephone) in the review focused on the efficacy of e-technologies on breastfeeding outcomes by Lau et al. (261) found no impact on exclusive breastfeeding initiation among 683 women.

A mixed-studies review by Chua et al. (283) reported qualitative insights about virtual lactation support, and found that while there were variations in session frequency, duration and modality (on-demand vs. pre-scheduled), some of the stakeholders (mothers, fathers, healthcare providers) were receptive and satisfied with the support. Video consultations were reported to facilitate visual communication for a more personal focus, and accurate assessment and enabled healthcare providers and mothers to express themselves with greater confidence (283). There was also some evidence of participants who utilised tele-lactation consultations making fewer visits to the health centre regarding breastfeeding issues (283). However, not all stakeholders were as positive. Reasons why participants were not receptive for this form of support included individuals feeling uncomfortable with video chatting, that virtual methods should not replace personal consultations, or they already had access to in-person support (283). Tele-lactation consultations were sometimes pre-scheduled and offered during working hours, hence mothers who needed urgent support or those who were working were not able to use the service (283). There were also issues relating to ease of use being diminished by poor sound and video quality, and disconnected calls which could impact on providers ability to provide meaningful support (283).

Telephone and text messaging interventions: Fan et al. (284) undertook a review to evaluate the effectiveness of text messaging as a stand-alone intervention to improve breastfeeding outcomes (with a focus on exclusive breastfeeding and breastfeeding self-efficacy) and to identify intervention moderators that might influence efficacy. The review found that, at <3 months postpartum text messaging interventions nearly doubled the odds of exclusive breastfeeding, at 3–6 months the odds remained significantly higher, and at ≥6 months the benefit was even more pronounced. The pooled results indicated no significant effect on the rate of any breastfeeding at all the three time periods, but they did significantly improve mothers' breastfeeding self-efficacy scores. Some of the included studies in Tang et al.'s (265) review related to SMS interventions highlighted similar positive findings on breastfeeding outcomes, although one of the included studies was noted to have useability issues. One of the included studies that concerned an SMS-based breastfeeding encouragement system with 234 participants was effective in improving breastfeeding exclusivity but as it had no significant impact on self-efficacy, this was believed to explain why it failed to increase breastfeeding rates (283). These results thereby suggest that SMS encouragement may reinforce exclusive feeding practices among mothers who are already breastfeeding, without increasing confidence and problem-solving capacity.

A systematic review to explore the effectiveness of educational interventions conducted by telephone to promote breastfeeding was undertaken by Oriá et al. (285). Ten trials were identified, with mixed results; four found no significant efficacy regarding improvements in breastfeeding duration or exclusivity. In contrast, the remaining studies, most of which involved longer-term interventions and were predominantly delivered by nurse lactation consultants, demonstrated positive effects on both the duration and exclusiveness of breastfeeding. One of the studies included in Tang et al.'s (265) review also found mothers who received phone-call support at different points in the postnatal period had a higher rate of exclusive breastfeeding and lower formula feeding rate when compared with the control group. Similar to the results by Almohanna et al. (266), the reviews by Fan et al. (284) and Oriá et al. (285) found that text or telephone-based interventions that spanned both the antenatal and postnatal periods and to a higher intensity were most effective.

Variations related to socioeconomic and maternal characteristics

Some of the findings of these included studies were found to vary based on socioeconomic factors. For example, the review by Chua et al. (283) found that, in some studies, low level of education or low income, were factors associated with resistance toward tele-lactation use, although not consistently so. One of the included studies found that sociodemographic factors did not affect willingness to adopt tele-lactation interventions, and a further study found that primiparous mothers were more likely to attend virtual consultations (283).

The research to explore the effectiveness of m-health interventions predominately involved women with infants of normal birth weight (260), thereby excluding parents with more high-risk infants (low birth weight, preterm) and remote support was more generally used by rural mothers in geographically isolated areas (262, 281, 283). Some studies have reported demographic differences amongst women who proactively seek online breastfeeding peer support, with more affluent and highly educated women often overrepresented (222). One study included in McArthur et al.'s (262) review found that time spent on motherhood-specific websites was negatively associated with intentions to breastfeed. The authors suggested that women who spend the most time searching online for breastfeeding information may be those experiencing the greatest breastfeeding difficulties.

Conclusion: E-technologies offer promising avenues for improving maternal knowledge, confidence, attitudes, and, in some cases, breastfeeding rates. Across the included reviews, e-technologies, such as m-health and remote approaches including websites, telehealth, text messaging, virtual lactation support, and app-based tools could enhance breastfeeding self-efficacy and provide valued, timely support, particularly when theory-based, delivered at higher intensity, and across the perinatal period. Consistent with other evidence presented in this chapter and elsewhere in the report, e-technology-based interventions that combine interactive antenatal education with personalised postnatal support appear to be the most effective.

Overall, evidence for consistent improvements in breastfeeding duration or exclusivity is mixed. Effectiveness varies by platform quality, usability, the presence of tailored feedback, and whether women also receive face-to-face support. Mobile and tracker apps and interventions lacking theoretical underpinning or meaningful education tend

to show limited impact. While online peer groups are generally acceptable and can foster reassurance, community, and empowerment, most evidence is experiential rather than outcome-driven, and concerns remain around variable content quality, information overload, judgement, and digital access. The need for safe moderation and culturally relevant guidance is highlighted.

Socioeconomic differences are evident: women with lower education and income may face barriers to engagement. Conversely, more affluent, highly educated mothers are over-represented in online groups, and digital poverty may exclude others.

Overall, digital breastfeeding support can complement traditional care by offering convenience and accessibility, improving confidence and perceived support, but is not a substitute for skilled, equitable, in-person assistance. Future high-quality trials are needed to determine long-term impacts on breastfeeding initiation, exclusivity, and duration, and to ensure that interventions are accessible, culturally responsive, and grounded in behavioural theory.

Section VI: Women's values and needs

In this section, we draw on evidence from the lived experiences reviews (also see Chapter Three) to summarise what women value and need regarding infant feeding support.

Skilled evidence-based support: Women frequently report trusting the infant feeding knowledge of healthcare professionals (49), and sometimes more than private lactation consultants or peer supporters (49, 76). Women want professionals to provide skilled, consistent, and realistic information (33, 56, 59, 60, 66, 67, 76) highlighting the importance of quality-assured, evidence-based training -and systems. Consistent information is particularly valued and has been identified as a core component of positive breastfeeding support experiences (286). Furthermore, instruction on how to perform specific breastfeeding behaviours, with live demonstrations, are perceived as especially useful and acceptable behaviour change techniques (234). Furthermore, while some mothers appreciate scientific explanations of the properties of breastmilk (53), women value clear, easily understood language that enhances comprehension (76, 287).

Emotional support and validation: Across several of the lived experiences reviews, women report valuing authentic, empathetic, and non-judgemental care, marked by patience, kindness, and respect (71, 77) (63, 64). Care that is emotionally engaging, where professionals show warmth, responsiveness, and empathy, helps mothers feel reassured, confident, and supported in both feeding and infant care (79, 286).

Many women cite reassurance, encouragement, normalisation and validation of their breastfeeding efforts and the emotional labour involved (33, 64, 67) (63), as essential to help bolster maternal self-efficacy and for breastfeeding continuation (65). For example, positive feedback and encouragement about expressing efforts increase motivation, knowledge, and perseverance (53). Rojas-García et al.(234) investigated the value of identifiable behaviour change techniques (BCTs) to uncover which components of an intervention are perceived to be most useful and acceptable. Social support emerged as one of the most positively perceived behaviour change

techniques, reinforcing women's preference for encouragement delivered within supportive relationships (234).

Timing and continuity of support: The immediate postnatal period is believed to be critical for breastfeeding initiation and long-term success (51), with women wanting flexible, accessible and proactive support. Some evidence highlights that women who exclusively breastfeed in hospital are far more likely to continue breastfeeding for longer (73). Whereas for women who are expressing, those who establish a good milk supply by four days postpartum are more likely to maintain adequate volume at six weeks (53), and which can support the transition to breastfeeding (69). While concerns have been raised about the negative impact of early discharge on breastfeeding experiences, James et al. (286) found that early discharge did not adversely affect the most valued aspects of support; rather, midwives' practices (e.g., consistency, attitude, and practical assistance) played a greater role in shaping women's experiences.

> *I think there would be a probably a barrier for me ringing them* [health care professionals] *because sometimes you can't put your finger on why, but it's just something else to do when you're busy and something else to think about and you don't want to bother them. Maybe they might be busy. Whereas because they contacted me, I just felt like carried along, but in a good way, in a supportive way.* (Site 4 Mother5)

Observing full feeds together with practical help and guidance have been identified as core components of positive support experiences (71, 75-77, 286). Ongoing reminders of breastfeeding benefits could also help reinforce maternal decisions and motivation to continue, including with breastmilk expression (53, 76).

Community-based support: Women want information on available support soon after birth (76). Flexible community-based support, such as peer groups, helplines, and in-home professional visits, were reported to enable women to access help when needed (33, 70, 73, 76). Comfortable, non-clinical environments were also perceived as particularly valued in community settings where women can interact socially, share experiences, and access continuity of care (59, 64, 67).

As referred to earlier, mothers can turn to social media (e.g., Instagram, TikTok) for information and reassurance, particularly when they receive insufficient professional support (26, 33, 49, 76). However, as the internet and social media can influence infant feeding decisions and expose women to commercial influences, this area warrants further support and guidance (62).

Inclusivity and cultural sensitivity: Women value professionals who treat them as individuals (63, 71) and who accept their infant feeding choices, such as mixed feeding (64) (case study findings). Co-produced feeding plans, developed collaboratively with providers, can help women to build their self-efficacy and ensure relevance to their socio-biographical contexts (76, 286).

Some of the autistic women in the review by Grant et al. (50) and those with learning difficulties in the review by Johnson et al. (287) spoke of the benefits of one-to-one support, accessible written or visual materials, and short-term goal setting. Whereas some of the Black women in the review by Gyfami et al. (70) valued culturally sensitive

interventions, such as acknowledging and integrating cultural norms, involved trusted community members or peers of similar ethnicity and that addressed barriers like structural discrimination. Women with high BMI can also face practical challenges (also see section in Chapter Three) that may require additional professional support (75).

Conclusion: Overall, the evidence shows that women value breastfeeding support that is skilled, consistent, and grounded in practical problem-solving, delivered in ways that are clear, comprehensible, and responsive to individual needs. Skilled healthcare professionals can be highly trusted, and women appreciate practical guidance, live demonstrations, and time spent observing full feeds, which help translate information into confidence and competence. Emotional support is also critical: reassurance, empathy, and non-judgemental attitudes strengthen maternal self-efficacy, normalise common challenges, and encourage continuation.

Support provided in the immediate postnatal period appears to be vital for long-term outcomes, although the quality of midwifery practice can mitigate concerns around early discharge. Continued access to help beyond hospital, through flexible and accessible forms of support, such as home visits, helplines, and peer groups, ensures that women can seek timely information as feeding challenges emerge. Community-based support is valued when it is flexible, accessible, and delivered in settings that foster social interaction and shared learning. Where gaps in professional provision exist, women often turn to social media for information and validation, highlighting a need for credible, accessible digital guidance.

Finally, women want support that is inclusive and culturally sensitive. Tailored approaches, such as co-produced feeding plans, accessible communication formats, and respect for mixed-feeding choices, help ensure that care is relevant to diverse circumstances. Groups with specific needs, including autistic women, women with learning difficulties, socially disadvantaged mothers, and those with higher BMI, benefit from personalised adaptations that address both practical and social barriers.

Overall, the evidence suggests that breastfeeding support – whether provided by healthcare professionals or peer supporters - is most effective when it combines technical expertise, emotional attunement, continuity, accessibility, and individualisation, creating an environment in which women feel informed, respected, and supported to meet their feeding goals. A summary of the evidence in a pathway of effective infant feeding support is depicted in Figure 5.

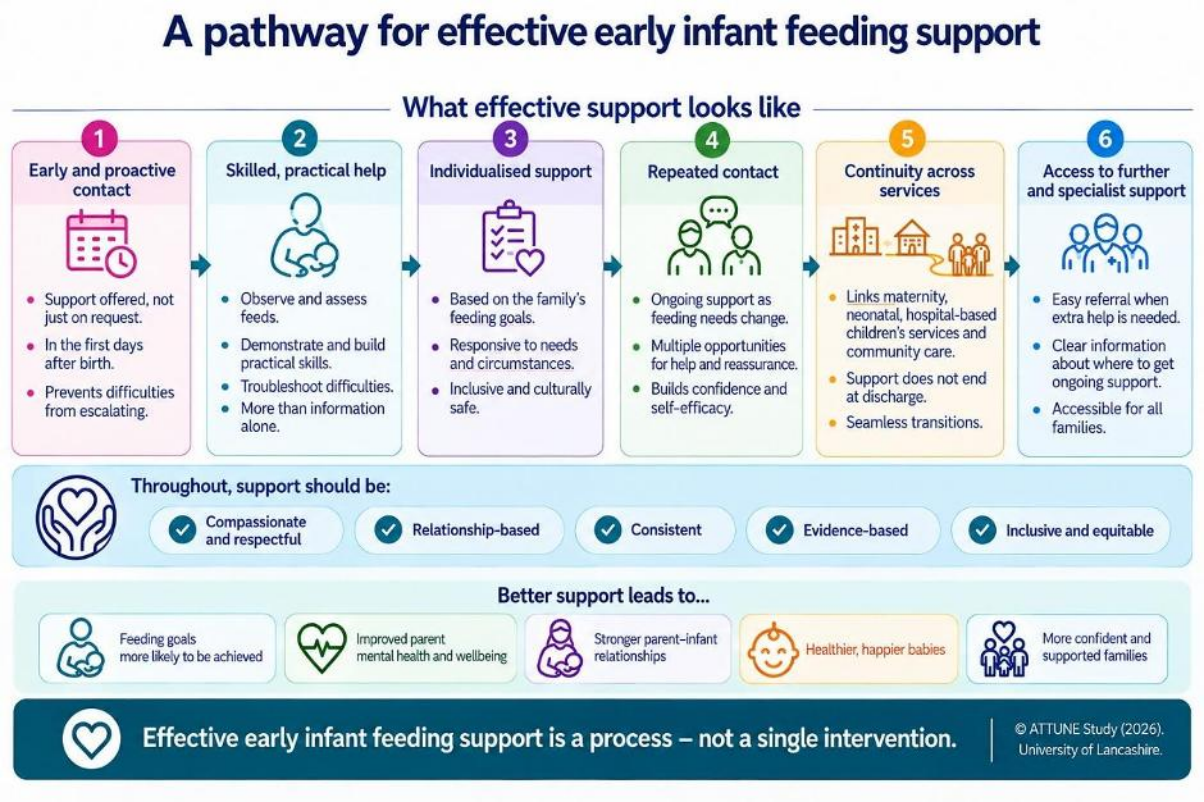


Figure 5: A pathway for effective infant feeding support

Limitations of the evidence base

Study design and internal validity

- **Weaknesses in trial design and risk of bias**
  Across all intervention types, many studies rely on observational or cross-sectional designs that limit causal inference. Even where randomised trials exist, they frequently suffer from baseline imbalances, contamination between groups and limited allocation concealment.
- Cluster trials in breastfeeding support often include too few clusters to ensure balance, and many recruit participants before randomisation, inadvertently introducing selection bias. In Baby-Friendly or digitally active environments, control participants often already receive substantial breastfeeding support, making it difficult to identify intervention-specific effects.

- **Underpowered samples, small pilots and high attrition**
  Many interventions - including psychosocial programmes, peer-support models, digital trials, tele-lactation pilots and pump-related studies - are underpowered. Sample sizes are too small to detect realistic effects, particularly due to attrition. High dropout rates are common in both face-to-face and digital studies, often with differential attrition that disproportionately affects mothers who stop breastfeeding or encounter difficulties. Trials also often have higher than expected breastfeeding rates in the control group which might suggest bias in recruitment, or some change in behaviour not accounted for. Moreover, coding missing participants as 'not breastfeeding' may artificially reduce apparent impact.

- **Limited follow-up and short evaluation horizons**
  A substantial proportion of studies report outcomes only to two weeks, six weeks or three months postpartum, leaving long-term breastfeeding maintenance poorly understood. This is a pronounced limitation in psychosocial trials, digital interventions, peer support and pump studies alike. Sustainability beyond six months, and effects on maternal and infant health outcomes, including anxiety and stress, are rarely assessed.

Measurement and outcome definition problems

- **Inconsistent definitions of breastfeeding outcomes**
  Definitions of exclusive breastfeeding vary markedly. Some studies use WHO criteria, others employ local adaptations, point-prevalence, 'since birth' measures or unclear definitions. This inconsistency undermines comparability across peer-support trials, psychosocial interventions, pump studies and digital evaluations. Systematic reviews repeatedly highlight that definitional ambiguity prevents meaningful synthesis.

- **Reliance on self-report, recall bias and poor data quality**
  Nearly all domains rely on maternal self-report, which is vulnerable to recall and social desirability bias. Electronic health record data are inconsistently recorded and often lack standardisation. Pump studies frequently depend on maternal recollection of expressing behaviours, while digital trials rely on self-reported app engagement, which is not always reliable.

- **Insufficient measurement of psychological and mechanistic variables**
  Even in explicitly psychosocial studies, mechanisms such as self-efficacy, perceived social support, stress regulation, mood trajectories, group cohesion and identity processes are inconsistently measured. Digital studies often capture only superficial engagement metrics (e.g., app opens), with little understanding of what content was used or how it shaped breastfeeding. Pump studies rarely measure why mothers expressed milk, how they felt about it or how expressing interacted with pain or mental health.

Generalisability, equity and contextual limitations

- **Skewed, motivated and homogeneous samples**
  Across all different types of support peer support, digital tools, psychosocial interventions, professional/IBCLC interventions and pump research - participants are disproportionately White, educated, married and motivated to breastfeed. Online studies in particular over-sample digitally literate mothers who are already active in breastfeeding groups, limiting the representativeness of findings.

- **Under-representation of marginalised and high-risk groups**
  There is limited evidence from rural communities, Indigenous populations, global majority groups, LGBTQ+ families, very young mothers, migrants, non-English speakers and families experiencing acute adversity. Evidence for preterm or medically fragile infants, mothers with mental health conditions or those navigating severe socioeconomic barriers is sparse. These gaps limit the transferability of conclusions across populations and health-system contexts.

- **Limited contextualisation of health-system and policy environments**
  Few studies meaningfully account for contextual determinants such as maternity leave policies, formula marketing, workplace expressing conditions, how services are funded, BFHI/BFI status, staffing patterns, digital access or broader social inequalities. This makes it difficult to understand whether an intervention works because of its inherent qualities or because of its alignment with local system norms.

Intervention content, fidelity and active ingredients

- **Multi-component 'black box' designs**
  Interventions frequently bundle numerous components, education, counselling, peer support, home visiting, digital tools, psychosocial elements and/or IBCLC expertise, without clearly articulating how each contributes. This issue spans peer-support models, psychosocial packages, complex hospital-community programmes and digital/hybrid systems. As a result, it remains unclear which components drive effectiveness.

- **Incomplete reporting and weak fidelity monitoring**
  Descriptions of training, supervision and delivery are often sparse. Peer supporters, educators, IBCLCs and digital moderators vary widely in roles and preparation, yet competence and adherence to protocols are rarely assessed. Even in structured psychosocial interventions, fidelity to motivational interviewing or mindfulness principles is rarely documented. Digital tools also lack systematic reporting of how content was updated, moderated or delivered.

- **Insufficient detail about pump use and lactation contexts**
  Pump studies often fail to specify the timing, frequency, duration, type of pump, purpose of expression or workplace context. Reverse causality, where women pump because they are struggling or because they are highly motivated, is rarely disentangled because intervention content and contextual factors are insufficiently described.

Engagement, acceptability and implementation

- **Low uptake and uneven engagement**
  Drop-in groups, home-visiting services and peer programmes sometimes receive minimal attendance, often because their location, visibility or cultural fit deter participation. In areas with high levels of deprivation or historically low breastfeeding rates, engagement may also take time to develop, as building trust and awareness among under-served communities is a gradual process that requires sustained investment. Digital interventions also show high variation in engagement: many mothers open apps only briefly, discontinue use early or selectively engage when distressed. Engagement among non-breastfeeding or ambivalent mothers is particularly low but rarely explored.

- **Practical, technological and workforce constraints**
  Tele-lactation services encounter connectivity issues, privacy concerns and platform inconsistency. Implementing proactive versus reactive telehealth models

has implications for staffing, training and cost that are not fully analysed. Peer-support schemes often struggle with volunteer recruitment and sustainability. Psychosocial interventions depend on trained facilitators whose availability in routine services is limited.

- **Limited integration into existing care pathways**
  Many interventions are evaluated as add-on or stand-alone programmes rather than embedded within maternity, primary care or community services. Without integration, even effective interventions may not scale, particularly when dependent on additional project-funded personnel.

Domain-specific limitations

- **Peer support**
  Peer support research shows wide heterogeneity in models, varying in intensity, theoretical grounding and delivery mode. Programmes also differ substantially in their recruitment processes, training, supervision, governance arrangements, integration with healthcare services, and quality assurance mechanisms, meaning that peer support should not be considered a single, standardised intervention. Many studies are small, qualitative or descriptive, providing rich insight but limited causal evidence. Most participants are those who already seek support, leaving dissenting, disengaged or negative experiences under-studied. Mechanisms, such as identity, normalisation, social comparison and emotional regulation, are seldom operationalised.

- **Digital and online approaches**
  Digital interventions can suffer from crude engagement metrics, privacy concerns, and exposure to misinformation or commercial formula marketing (see Chapter Twelve). However, the quality and governance of digital support vary considerably. While some platforms operate with limited oversight, others are delivered by established breastfeeding organisations that apply formal training, supervision, moderation and quality assurance standards within online environments.

- **Breast pumps and expression**
  Breast pump research often conflates expressing with breastfeeding without clearly separating how the milk is delivered to be infant. Exposures such as pump type, frequency or reasons for use are inconsistently captured.

- **Psychosocial interventions**
  Psychosocial trials frequently involve small, motivated and culturally specific samples. Many lack explicit mechanisms of action and adequate fidelity checks. Follow-up is short, and broader maternal outcomes, such as bonding, long-term mood, are rarely evaluated.

- **Professional/IBCLC interventions**
  IBCLC trials are few and heterogeneous, with frequent contamination in control groups. Reporting of IBCLC training, background, caseload and role integration is inconsistent. Many evaluations cannot disentangle IBCLC-specific effects from broader system contexts.

- **Home visiting and early contact models**
  Home-visiting programmes often involve localised pilots with confounding baseline differences. They struggle to isolate effects of extra contacts from wider system changes. Sustainability and scalability in routine services remain largely untested.

System-level, structural and sociocultural limitations

- **Insufficient consideration of social determinants**
  Most studies focus on individual behaviour, despite strong evidence that breastfeeding trajectories are shaped by poverty, racism, migration stress, precarious employment, housing insecurity and formula marketing. These contextual determinants are rarely integrated into analyses or intervention design.

- **Weak integration with policy and workforce realities**
  Few studies examine interaction effects between breastfeeding support and parental leave policies, workplace expressing rights, staffing levels, organisational culture or the commercial formula environment. Without this integration, interventions may appear ineffective simply because the surrounding system is unsupportive.

- **Limited economic and sustainability analysis**
  Cost-effectiveness analyses are scarce across all domains. Without evaluating cost, staffing requirements, and workflow implications, scaling effective interventions remains challenging.

Areas for further research

- **More rigorous, larger and more inclusive trials**
  Future research should prioritise adequately powered, multi-site randomised and mixed methods designs that include diverse populations and high-risk groups. Trials must limit contamination, employ clear comparison conditions and embed themselves within routine care.

- **Disentangling active ingredients**
  Factorial, multi-arm and adaptive designs should be used to identify effective components within multi-layered programmes. Future research should seek to identify the active components of complex interventions and determine which features are most strongly associated with meaningful improvements in outcomes and engagement.

- **Standardisation of outcomes and enhanced measurement**
  A core outcome set aligned with WHO definitions is needed. Long-term follow-up to 6–12 months should become standard. Studies should routinely measure psychosocial mediators, infant behaviour, pain, milk production and contextual factors influencing feeding decisions.

- **Mechanism-oriented and theory-driven intervention design**
  Interventions should articulate explicit programme theories, drawing on behavioural science, social support theory, identity processes, stress physiology

and health systems frameworks. Mediation and moderation analyses should be integrated to determine how and for whom interventions work.

- **System-level and structural research**
  Future studies should examine how breastfeeding interventions interact with health-system structures, parental leave policies, formula marketing, employment conditions and socioeconomic inequities. Implementation science should guide evaluations of feasibility, integration and sustainability.

- **Defining and reporting peer support intervention**
  Given the considerable heterogeneity in peer support models, future studies should clearly define what is meant by 'peer support' and provide transparent descriptions of intervention design and delivery. This should include details of peer supporter recruitment, training, supervision, ongoing support, quality assurance processes, standards, and integration with healthcare services as well as the organisational and policy contexts in which they are deployed. Greater consistency in reporting would improve comparability across studies and help distinguish the effects of peer support itself from variations in programme implementation and quality.

- **Characteristics of effective peer support**
  Future research should explore which characteristics of peer supporters are most valued by mothers, including whether similarity in age, recency of breastfeeding experience, or shared life circumstances influence the perceived credibility, relatability and effectiveness of support.

  Little is known about whether breastfeeding outcomes differ according to whether peer support is delivered by volunteers or paid peer supporters. Future research should compare these models and explore how remuneration influences peer supporter recruitment, retention, credibility, availability, continuity of support, and maternal experiences.

- **Safety, regulation and cultural relevance in digital and peer spaces**
  Research should focus on misinformation, moderation, privacy, data security and commercial influence in online environments. Co-design with marginalised communities will be essential to create culturally anchored and safe spaces for support.

- **Partners, families and networks**
  Partners and wider family networks (such as family elders) profoundly shape feeding decisions yet remain under-studied. Future interventions should evaluate family-inclusive support such as couple-based psychosocial models and e-technologies designed for households rather than mothers alone.

- **Pump support**
  Future research should move beyond evaluating pump provision alone and examine tailored, multi-component support interventions that reflect mothers' feeding practices, including exclusive expressing, mixed feeding, breastfeeding difficulties, and recovery following challenging births.

ATTUNE STUDY

7

Chapter Seven: Keeping parents and infants close

During the 1920s to 1950s in the UK, as births shifted from homes to hospital settings, maternal and infant separation became a standard practice in the early postnatal period. Newborns were immediately separated after birth for cleaning, examination, weighing, and observation purposes, with mothers seeing their babies only at set times. These routines continued, though gradually reduced, through the 1960s and 1970s as infection-control fears eased and research on bonding grew. However, for infants requiring hospitalisation, particularly those born prematurely or with medical complications, care was frequently characterised by periods of parent-infant separation. The emergence of special care baby units and, subsequently, neonatal intensive care services improved survival for vulnerable infants but often resulted in prolonged parent-infant separation due to the clinical needs of infants, technological dependency, and restrictions on parental presence. Consequently, while routine separation of healthy mothers and infants gradually declined, separation continued to characterise the experiences of many families affected by neonatal admission.

Since the 1980s, increasing recognition of the importance of issues such as infection control, stress-reducing environments, the role of parental sensory and relational inputs in supporting infant physiological regulation, and early relationship formation has led to the development of rooming-in policies, family-integrated care models, kangaroo care (KC), and single-family room neonatal units. These developments align with the concept of zero separation, an approach to maternity and neonatal care that seeks to keep parents and infants together throughout hospitalisation, with separation occurring only when clinically unavoidable. These approaches aim to minimise unnecessary separation and promote parental involvement in caregiving, bonding, infant feeding, and decision-making throughout neonatal hospitalisation.

Sleep disturbance is well recognised as both a risk factor for, and consequence of, perinatal mental illness, with multiple studies showing that poorer maternal sleep predicts higher rates of postpartum depression and anxiety (288, 289). Therefore, while improving maternal sleep is recognised as important, support for maternal sleep and recovery should wherever possible be provided in ways that maintain mother-infant closeness, with any need for temporary separation considered on an individualised and risk-based basis. Recommended approaches include managing sleep difficulties through psychological strategies, sleep hygiene measures and, where appropriate, medication, while carefully considering how any sedating medication may affect the mother's ability to care safely for her infant[113,114]. While specialist perinatal services, for mothers with severe mental illness (e.g., postpartum psychosis) may provide protected maternal sleep (such as by involving staff in night-time infant care), this is individualised, risk-based, time-limited and generally designed to preserve the mother–infant relationship[5]. Therefore, *any* reduction in maternal caregiving must balance mental-health needs with breastfeeding, infant safety and relational benefits of keeping the dyad together.

There are several key terms that collectively describe the practice of keeping parents and infants together during the period of hospitalisation. These relate to:

[113] NICE - Antenatal and postnatal mental health (CG192)
[114] Royal College of Psychiatrists - Mother and Baby Units

- *Transitional care:* This refers to the care provided to newborns who do not require admission to the NICU but still need closer monitoring and support than what is provided in routine newborn care. The aim is to stabilise and support the baby while keeping them close to the mother whenever possible.

- *Couplet-care*[115]*:* Couplet care, also known as mother-newborn couplet care, is a model of healthcare where a mother and her ill or preterm newborn receive medical care together, regardless of the level of care or location, from birth to discharge. This means the mother and baby remain together, ideally in the same room, and receive care from the same healthcare professionals. Couplet care can include different models of care[116], typically determined through clinical assessment of both patients, with decisions often guided by the individual with the greatest medical complexity, alongside local service configurations and available system flexibility. Variations in care models include the mother and infant being managed separately by different clinical teams; the infant being cared for on the postnatal ward with support from neonatal staff; or the mother being cared for on the neonatal unit, with input from midwives and other healthcare professionals (e.g., obstetricians) as required.

- *Rooming-in*: This is often a part of couplet-care and relates to keeping the newborn in the same hospital room as the mother 24/7, instead of placing the baby in a nursery.

- *Single-family rooms* (SFRs): This relates to a hospital room design, usually in neonatal units, where each baby (and often the parents) has a private room.

[115] A term more common in Nordic, USA, or Australian settings.
[116] https://www.nature.com/articles/s41372-023-01812-3

Evidence from the 2012 review reflected that rooming-in had become established as good practice within maternity services and was therefore not examined extensively as a discrete intervention. However, the review highlighted the importance of keeping mothers and babies together and maintaining proximity following birth. Evidence indicated that proximity facilitates responsiveness to infant waking and feeding cues and supports frequent feeding. Side-car cribs on postnatal wards were identified as a safe means of facilitating proximity during hospital stays, although evidence did not demonstrate an effect on breastfeeding duration or exclusivity. The review also highlighted associations between mothers sleeping close to their babies, increased maternal sleep and longer breastfeeding duration. The review placed greater emphasis on parental presence, proximity and participation within neonatal care, particularly for preterm or sick infants who may experience prolonged separation from their parents. It emphasised that parents should have unrestricted access to their baby, be welcomed as partners in care and be supported to provide skin-to-skin contact, comforting touch, feeding and day-to-day care.
Evidence from the updated review is strongly aligned with the 2012 evidence summary in its emphasis on parental presence, proximity, participation in care, and the importance of family-centred neonatal services. Both emphasise physical and emotional closeness, parental involvement in care, and respectful, family-centred support that empowers parents. The new review substantially extends the evidence on rooming-in within maternity settings, as well as maternal wellbeing and implementation issues such as staff training, leadership, and avoiding unnecessary separation. It also provides newer evidence on neonatal unit design, including single-family rooms and transitional/couplet care, and how family facilities and supportive environments may promote parental presence, breastfeeding, infant development, and readiness for discharge. Overall, the newer evidence supports movement towards a 'zero separation' approach, with greater emphasis on equity, parental wellbeing, and the practical and organisational factors needed to support continuous parental presence and participation in care.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

The UNICEF UK-BFI standards align with the philosophy of zero separation principle that mothers and babies should stay together day and night after birth in the hospital environment, unless separation is medically necessary both for infants and for mothers. For example, temporary separation may be justified when the baby requires intensive interventions that cannot be delivered in continuous contact (e.g. mechanical ventilation, major surgery, intensive monitoring), the mother requires urgent life-saving treatment, or due to rare infection-control scenarios. During these situations, current

evidence and guidance emphasises that separation should be as brief as possible, and that parents and infants should be reunited at the earliest safe opportunity[117].

Regarding **maternity care**, the BFI standards emphasise that keeping mothers and babies together enables them to recognise and respond to each other's cues, supports the establishment of breastfeeding, and promotes bonding, emotional wellbeing, and physiological stability. The existing guidance emphasises that there is no benefit to routinely separating mothers and babies, and that all maternity services should be organised in ways that make it possible for them to remain together. In practical terms, this means that postnatal wards should be set up to facilitate mothers and babies sharing the same space 24 hours a day. Staff should encourage and support parents to keep their baby with them, providing help with feeding, rest, and safety as needed. Routine nursery care, where babies are taken away from their mothers for observation or feeding, is not consistent with the BFI standards.

The BFI also recognises that there are some situations where separation is unavoidable, for example, if either the mother or baby requires medical treatment that prevents them from being together. However, even in these circumstances, services are expected to minimise the duration and impact of separation, and to support parents to have as much contact as possible, including through skin-to-skin contact (see Chapter Five) and full and active participation in their baby's care.

Overall, the Baby Friendly standards require that health services:

- Ensure mothers and babies remain together as the normal practice.
- Avoid unnecessary separation and provide the facilities and staffing that enable them to stay together.
- Support parents to respond to their baby's needs day and night while maintaining safety and rest.
- Recognise that close, continuous contact supports breastfeeding, bonding, and the baby's physical and emotional health.

In the **neonatal context**, the BFI standards emphasise that babies who require neonatal care, including preterm, sick or otherwise admitted infants, must not be treated purely as patients separate from their parents. Instead, the standards expect neonatal units to provide an environment in which parents are truly partners in care (also see Chapter Ten), and the relationship between parent and baby is protected, nurtured and enabled despite the technological or clinical complexity. The BFI neonatal standards make clear that routine separation of baby and parent should not be the norm. The philosophy is one of minimising separation (and ideally achieving zero separation where safe and feasible[118]) rather than accepting separation as standard. The standards and underpinning principles therefore require that neonatal units:

[117] WHO - Recommendations for the care of preterm or low birth weight infant

[118] Feasibility relating to the physical opportunities for parents to stay at the units due to space, facilities, etc.

- Ensure that parents have round-the-clock access and are valued as caregivers, enabling continuous or as-near-continuous presence with their baby wherever possible.
- Make the physical environment, routines and culture such that kangaroo care (KC) including skin-to-skin contact, parental holding, expression of breastmilk and breastfeeding and parental involvement in care are facilitated and supported.
- Recognise that even in circumstances of serious illness or preterm birth where clinical intervention is required the goal remains to maintain parent-baby proximity: if in exceptional circumstances separation is needed, then parent-infant closeness should be restored as soon as possible. Separation should be the exception rather than the default state. The unit should actively work to reduce the 'minutes of separation' (rather than simply counting the minutes of contact).
- Cultivate a relational culture: staff should move from seeing parents as visitors or passive observers to recognising them as partners in care with the unit's policies, practice, and space designed around enabling parental involvement rather than sidelining it.

  In **Community**, parents are encouraged to keep their baby close so that they can respond to their needs for love, comfort and security and to enable responsive feeding.

Regarding the links between these standards and wider policies, the BFI's stance on rooming-in and zero separation aligns with the NHS England report Reducing Harm Leading to Avoidable Admission of Full-Term Babies into Neonatal Units[119]. This report identifies that many admissions of well or near-well babies could be avoided through the development of transitional care models, allowing babies who require extra observation or feeding support to remain with their mothers instead of being admitted to neonatal units. The NHS England Three-Year Delivery Plan for Maternity and Neonatal Services[120] outlines a commitment to personalised, family-centred, and equitable care. The plan emphasises the involvement of parents as essential partners in neonatal and postnatal care and promotes service redesigns that support relational and continuity-based care, reinforcing the same ethos embedded in the BFI standards. A rights-based perspective also extends the rationale for parent-infant closeness beyond parental preferences and wellbeing. The United Nations Convention on the Rights of the Child[121] recognises children's rights, wherever possible, to know and be cared for by their parents and emphasises that separation should occur only when necessary, in the child's best interests. Similarly, the EACH Charter[122] states that children in hospital have the right to always have their parents or a parent substitute with them, including within neonatal intensive care settings. The Charter further emphasises the importance of parental participation in care and decision-making, positioning parental presence not simply as a source of support for families, but as an integral component of children's healthcare rights.

[119] NHS England - Reducing avoidable admissions of full-term babies into neonatal units
[120] NHS England - Three-year delivery plan for maternity and neonatal services
[121] UN Convention on the Rights of the Child (1989)
[122] EACH, the European Association for Children in Hospital

The BFI standards also align with NICE guidelines. The Postnatal Care up to 8 Weeks After Birth guideline (NG194)[123] highlights that care should actively involve parents in all aspects of infant care and decision-making. This inclusive approach supports parental involvement and the assumption that babies and parents remain together wherever possible. Similarly, the Intrapartum Care for Healthy Women and Babies guideline (NG235; NICE, 2023)[124] specifies that when a woman is transferred post-birth, her baby should accompany her. This practical recommendation reinforces the operational implementation of rooming-in and the avoidance of unnecessary separation across settings. Although important to note that the recent Maternity and Neonatal Infrastructure Review (2025) did not include a review of parental facilities[125].

Summary of the evidence in relation to UNICEF UK BFI standards

For **maternity services**, available evidence strongly supports the aims of the UNICEF UK-BFI standards for rooming-in. Evidence supports keeping mothers and infants together wherever possible, with benefits including greater opportunities for infant feeding, responsive caregiving, parental involvement and the development of parent–infant relationships.

Rooming-in is repeatedly associated with higher rates of breastfeeding initiation and continuation during the postnatal stay. Mothers who remain with their infants report more opportunities for KC including skin-to-skin contact, more frequent feeding, and greater confidence in recognising and responding to their baby's cues, all central to the BFI standards that emphasises responsive feeding and parental competence. Conversely, international research shows that mothers who do not room-in are more likely to experience delayed initiation or early cessation of breastfeeding, thereby reinforcing the importance of avoiding unnecessary separation[126].

The included evidence demonstrates that professional support is critical to translating BFI principles into consistent outcomes. Midwives who have received training and understand the rationale for continuous 24-hour rooming-in are more confident in supporting mothers to sustain it. This aligns directly with BFI guidance, which requires that all staff involved in maternal and newborn care are trained to enable mothers to feed and care for their babies responsively (see Chapter Eight). However, further training and ongoing supervision may be needed to strengthen staff confidence in caring for mildly unwell babies on postnatal wards, helping to prevent avoidable admissions and separation.

From the maternal perspective, rooming-in can support confidence, responsiveness and the developing parent–infant relationship and aligns with the BFI standards for parent-infant relationship support (see Chapter Eleven). Being alongside their infants enables mothers to gain confidence, interpret feeding cues, and feel emotionally supported in the transition to motherhood. Some studies even suggest that full rooming-in can protect against postpartum depression, particularly for women with pre-existing psychological vulnerabilities. However, it is recognised that the

[123] NICE - Postnatal care (NG194)
[124] NICE - Intrapartum care for healthy women and babies (NG235)
[125] NHS England - Maternity and neonatal infrastructure review findings
[126] While this may have included situations where babies were not nursed beside their mothers or were taken away by healthcare staff for a 'break', the evidence does not specify this explicitly.

experience is not universally straightforward: maternal fatigue, recovery after caesarean birth, and anxiety about safe sleep can make sustained rooming-in challenging. Cultural norms, such as expectations around postpartum rest or confinement, may also influence this practice. The BFI framework accommodates this through an emphasis on individualised care and practical support, ensuring that mothers can maintain close contact while having opportunities for rest and recovery in a safe, supported way.

However, despite this strong evidence base, barriers remain. Common challenges include staff shortages, limited facilities for partners to stay overnight, and inconsistent practices during night hours. The research highlights that some units (albeit in non-UK settings) still remove babies for routine checks, baths, or ward rounds, practices that are contrary to the BFI standard (of enabling mothers and their infants to remain together and to practise rooming-in 24 hours a day) which requires all normal newborn care to take place with the mother present. Studies indicate that even in BFHI-designated hospitals, policies do not always translate into uniform practice, emphasising the need for regular auditing, staff reflection, and leadership support to embed rooming-in as the default mode of care.

Within a BFI framework, flexibility and safety planning are vital. Staff should uphold the principle of zero separation while recognising that mothers may occasionally require brief, supported rest periods[127]. Clear guidance on safe sleeping (also see Chapter Nine), proactive promotion of responsible rest, and readily available practical assistance is essential to maintaining safety and confidence. Operationally, maternity services must develop clear pathways that ensure all routine newborn care, examinations, observations, and procedures are performed in the mother's room or immediate space (with the mother/parent present), unless there is a clinical reason for temporary separation. Finally, successful and sustainable implementation depends on strong interdisciplinary collaboration between maternity and neonatal teams. Coordinated working, particularly across transitional and couplet-care models, can help maintain continuity, safety, and consistency of messaging to parents.

In **neonatal units**, the BFI principle of zero separation translates into a more complex situation - the premise is the same, but the focus also shifts to involving parents as partners in care. This reflects the BFI neonatal standard that parents should have unrestricted access to their baby, and that care should be organised to enable continuous closeness and participation in decision-making and caregiving.

Single-family rooms (SFRs) in neonatal units, while rare in UK settings have an increasing evidence base, with positive impacts for parents, infants and staff. SFRs lower ambient noise and greater control over light and temperature, which can help to protect preterm infants' physiological stability, support rest, and enhance neurodevelopmental outcomes. Parents often describe these environments as calmer, more private, and more emotionally protective. Private bathrooms, sleeping areas, storage, and family zones can make long stays manageable. In-room fridges and dedicated expressing equipment help maintain hygiene standards, prevent

[127] There may be rare moments when a mother needs a short, supported rest break, and in those cases, staff can help safely care for the baby while the mother rests. Any separation should be short, necessary, and supported, not routine.

unnecessary separations, and protect early lactation, directly supporting the BFI focus on creating settings that facilitate mother-baby proximity and feeding responsiveness. Parents frequently describe these rooms as spaces where they can stay, rest, learn, and practice; conditions that make KC more likely. Staff echo some of these gains, noting the privacy and psychological safety needed for tailored teaching, sensitive conversations, and collaborative planning. These elements are all integral to BFI's emphasis on partnership working between staff and parents to support early bonding and confident parenting.

Parents who stay with their infants in SFRs, report feeling more confident, competent, and informed. When parents are actively involved in infant care, this may lead to reduced stress and depression and stronger attachment and readiness for discharge. Nevertheless, there are emotional and practical challenges. Parents may feel isolated from peers or uncertain about when and how to seek staff help. Nurses, in turn, can find it harder to monitor multiple families or maintain informal communication in decentralised layouts. These challenges emphasise the BFI message that the care culture is as important as the environment: physical design alone is insufficient without family-centred communication, staff presence, and staff-parent collaborations. Establishing peer-support programmes may help mitigate isolation, helping families share experiences and reassurance in line with BFI's emphasis on social support networks.

Several reviews and cohort studies associate SFRs and transitional care with increased breastfeeding (initiation, exclusivity and continuation) rates, fewer infections, reduced length of stay and re-hospitalisation rates, fewer sepsis events, and sometimes with lower mortality – outcomes that reflect the benefits of continuous parental presence and human milk provision. Developmentally, infants in SFRs often show lower stress, less pain, and improved sleep patterns, suggesting that quieter, more stable environments support maturation. Some studies also link human milk volume in early weeks with better cognitive and motor scores later in infancy, highlighting how the BFI priorities of zero separation and breastfeeding support work synergistically to promote developmental health. However, the evidence is not uniformly positive. Some studies show no difference in breastfeeding rates, neurodevelopmental outcomes, infection rates or mortality after moving to private room designs, and in rare cases infection rates rose for more complex infants. These mixed findings suggest that environmental design alone cannot guarantee safety or improved breastfeeding rates; continuous attention to infection control procedures, staff training, and parental support remains essential.

A truly BFI-aligned approach to zero separation must address equity and inclusion. Social and economic factors can strongly influence parental presence, which can adversely impact on milk supply and infant development. Therefore, neonatal services need practical enablers such as sleeping provision for both parents, travel and parking support, flexible visiting and access policies, and, where necessary, technology like secure webcams that may help to bridge unavoidable absences (although further research is needed on this). These provisions align directly with the BFI standard that parents should have unrestricted access[128] to their baby and be supported to participate in care regardless of circumstance.

[128] While this could include consideration of buzzers, swipe cards, PIN pads, or fingerprint/biometric access, there was no available specific research exploring their use in neonatal units.

Recommendations for the BFI programme

- **Maintain a strong emphasis on keeping parents and babies close,** supporting staff to have sensitive and parent-centred conversations on the impact of baby brain development and long-term outcomes**.**
- **Consider "zero separation" as a child's rights principle** whilst acknowledging that brief or unavoidable separation may sometimes be necessary.
- **Strengthen support for maternity and neonatal services to enable mothers, parents and babies** to remain together wherever possible as partners in care, including through individualised care planning, transitional care, rooming-in and single-family room models**.**
- **Work with services to address practical, environmental and equity barriers** that affect parents' ability to stay close to their baby including estates, equipment, overnight facilities, travel and parking, and the wider care environment needed to uphold BFI standards**.**

Detailed overview of included evidence

The following sections present evidence relating to zero separation models of care, including single family rooms (SFRs), rooming-in, transitional care and couplet care. Full details of the included reviews and empirical studies are provided in the Appendices.

The evidence considers the environmental and organisational features that support parent–infant closeness, together with the impacts of these approaches on parents, infants and healthcare professionals. Themes include parental involvement in care, parent–infant relationships, infant clinical and developmental outcomes, infant feeding outcomes, staff experiences, and the resource implications of care delivery. Challenges and barriers associated with implementation, including communication and teamwork, workload, environmental and logistical constraints, patient safety considerations, and the influence of parental and staff characteristics on the uptake and success of zero separation approaches are also reported.

Facilitators and benefits of zero separation/single family rooms (SFRs)

Environmental features

Several studies have focused on promising NNU design features that facilitate parent-infant closeness. For example, a US qualitative multi-case study investigated how interior design elements of SFRs support various family engagement behaviours (290). Positive features included:

- Private bathrooms and family-oriented room layouts facilitated parental presence and participation in care
- Positive distractions like TVs and windows, helped families manage stress and support bonding.

- Family zone partitions enabled privacy and control over interaction boundaries[129].
- Accessible family storage reduced clutter and enhanced comfort.
- Information boards improved communication, education, and awareness of the infant's condition.

> *We have 24-hour access to the unit. All families on admission get a swipe access card so they don't have to buzz to get in and wait, they come and go. So, I think that's a massive thing to encourage parents to be there as much as they can. We've also got transitional care and special care where and we can bring hospital beds in for mums or dads to sleep on. But in intensive care and high dependency, we now have reclinable chairs and bedding so parents can stay there 24/7 if they want. A big thing recently for us has been nutrition for families and trying to support that as much as we can. So, parents on admission both get a NICU water bottle each and at weighing, we often say, do you want us to fill your water bottle so, at least they are getting some hydration. We've had recent funding to improve our snacks and things we can give to parents in the parents' room. We've now got a much better variety of snacks and a mini buffet I suppose in the parents' room for parents to help themselves too and we've recently got a trolley like a snack trolley that comes round every day. And we've got a rota of who does it what day, and it's got like juice on it and different little cereal bars, different fruits. And that's just so they can stay with their baby, they can do skin-to-skin. They don't need to leave to eat. And they can have a little something to keep them going.* (Site 2_HCP2)

Another study highlighted NNU features such as in-room fridges and dedicated expressing equipment support infection control, convenience and enabling parental presence (291). A qualitative study (292) reported that parents who were relocated to a semi-private room, after being placed in SFR, found the adjustment of having less control over the environmental stimuli to be stressful.

From an environmental perspective, compared to open bay units (OBUs), SFRs have been reported to have:

- Lower noise levels (293-295) which can promote rest and protect the hearing, physiological stability (heart and respiratory rates, oxygen saturation) and overall development of preterm infants. OBUs in NICUs tend to have higher ambient noise, especially near entrances and nursing stations (296-298).
- Parents and staff felt that SFRs had better lighting (295, 298) although this could depend on window placement and design of the SFRs (296).
- Air quality improvements, although the level of illumination both in work areas and at the bedside in some of the included SFR studies was below recommended standards (299).
- Reduced foot traffic (although there was limited evidence reported) (299).

[129] Interaction boundaries refer to the social and spatial limits that define who can interact with whom, when, and how, it relates to allowing families choice in regulating how much contact or communication they have with others

- Sheltered both nurses and parents from stressful or traumatic events happening elsewhere in the unit, thereby offering a more emotionally protective environment compared to open bay NICUs (299).
- Better temperature stability (although limited evidence reported) (296).

Legge et al. (2023) found that implementation of a NICU web camera system, positioned at the infant's cot or incubator, was strongly supported by both parents and staff, with high usage rates and a trend toward reduced parental stress. While the introduction of this technology did not decrease depression or anxiety in parents, initial staff concerns about privacy or workflow disruption were not sustained after implementation (300). Other research also found that videoconferencing promoted parent-infant bonding and connection, as well as providing an important visual cue for expressing purposes (301). While these findings highlight that remote contact may not impact parental mental health it and could offer a suitable alternative during times of parental absence (also refer to 'preterm infants, bonding and attachment' in Chapter Eleven).

Impact of zero separation on staff

Several studies have reported lower stress and burnout levels in staff working in SFRs compared to OBUs (294, 296-298, 302), although not consistently. For example, a pre-post Canadian study by Feeley et al. (303) found no significant differences in nurses' total stress scores staff working in OBUs or pod/SFRs. Similar results were reported in a US study with 72 full-time NICU nurses (304). Other evidence highlights mixed views in that, while some staff reported higher perceived job satisfaction when providing care in SFRs, others did not (296, 297, 299, 302). The transition to couplet care or rooming-in also enhanced team morale in a quality improvement initiative in the US (305). Although an Australian study found that while staff satisfaction improved over time in a dual occupancy unit (from an OBU design) in a NNU, it did not return to pre-transition levels, highlighting the ongoing need for support and adjustment (306).

When considering the benefits for infants as well as parents, it is crucial to highlight how the architectural design of zero separation interacts with broader care practices of more positive parent-provider interactions and positioning parents as partners in care to improve key outcomes (also see Chapter Ten). These issues will now be considered to contextualise how positive outcomes can be achieved.

Enhanced parent care and involvement

Zero separation increases opportunities for skin-to-skin contact and increased parental involvement (297, 307), which in turns is associated with increased satisfaction (305) and confidence (293, 308) in caregiving. Evidence from systematic reviews (309) and primary studies (305) report how SFRs provide parents with:

- Greater privacy and comfort
- Better control over their baby's environment
- More involvement in care
- Reassurance and optimism (about their infant's improvement)

> *We had found whenever the boys were in neonatal, we were able to go in and basically provide all his care, and we wanted to do that. Like there is the set feeding time. And then there's the bed washes. We tried to be there daily to do that. It was important to us.* (Site 2_Mother 2)

Being able to spend unending time with their infants, means that parents could learn about hospital routines, become accustomed to taking care of their infants, as well as providing enhanced opportunities for positive physical contact such as skin-to-skin contact (292, 310). Unrestricted access, overnight accommodation, and active involvement in care are key facilitators to give parents a sense of control and to strengthen their parental role (311).

A key factor that facilitates positive parent-infant care practices in NNUs relates to the support provided by healthcare professionals (312). For example, parents have reported that consistent information and continuity of care during the transition from OBUs to SFRs was essential to help them feel confident and capable (313). Studies on transitional care (314), SFRs (294, 296, 298, 299, 306, 315, 316) and rooming-in (293) have also shown how these environments can lead to improved parents and staff perceptions of quality of care in terms of better-quality, more efficient, and meaningful staff-parent interactions. Moreover, nurses have highlighted how SFRs provide benefits of privacy for more confidential, tailored, and family-centred conversations, aided by tools such as whiteboards for asynchronous updates (317).

Several primary studies, e.g., Broom et al. (306) in Australia and Toivonen et al. (318) in Finland, found that nurse-parent interaction time significantly increased in a dual occupancy or SFRs when compared to OBUs suggesting less fragmented and more sustained communication. For example, in Broom's study that involved observing 30 nursing staff in a time and motion study, over weeks, the average number of minutes providing indirect care was 26 minutes in the OBUs v's 34 minutes in a dual occupancy room ($p=0.01$). Although important to note that in the Finnish study, the duration of nurse-infant interaction did not significantly change and the frequency of nurse-parent and nurse-infant interactions remained stable (318).

Parents in SFRs report feeling heard and receiving greater guidance and (emotional) support from nurses (319) when compared to parents in OBUs, leading to mothers reporting less need for information about understanding their infant's behaviour and about breastfeeding post discharge (319). Other neonatal-related studies highlight that supportive care practices, such as collaborative coaching, emotional encouragement, and breastfeeding support, were highly valued and perceived as essential in preparing mothers to feel ready for discharge (291, 320).

Impact on infant clinical and behavioural outcomes

Infection rates and immunity: Reviews and primary studies have identified that transitional care, SFRs and rooming-in (296-298, 307, 308, 312, 314, 319, 321) can lead to reduced:

- Apnoeic events
- Nosocomial sepsis
- Infections
- Sepsis
- Mortality

These improvements have been associated with 'mother as main carer' approach (314), sink-to-bed ratios, accessible handwashing facilities, and negative pressure isolation for airborne infections[130] (296, 307).

A retrospective cohort study with 1,046 infants found that the reduction of late onset sepsis in SFRs was largely mediated by reduced use of parenteral nutrition (308). In contrast a retrospective cohort study found that a transition from OBUs to SFRs did not reduce colonization or infection rates with multidrug-resistant organisms and third-generation cephalosporin-resistant bacteria among 1,293 infants (322). Similarly, a Dutch study found a move to SFRs did not significantly reduce nosocomial infections or Central Line-Associated Bloodstream Infections (CLABSIs) rates (323), and while SFRs were associated with lower risks of symptomatic patent ductus arteriosus, it did not significantly reduce most major morbidity or mortality outcomes (324). The limited impact of SFRs versus OBUs on mortality rates was also reported in the review by van Veenendaal (319). While a US longitudinal study found that sepsis rates reduced for extremely premature infants following a move to a SFR design, term/post-term infants had significantly higher odds of sepsis post-move (321): this variation in outcomes was believed to be associated with these infants having complex needs. These studies highlighted environmental factors (e.g., NICU design) may play a smaller role in transmission, with care givers, healthcare workers and developmental care practices likely to be more significant sources.

A pilot study compared the gut and skin microbiota, resistome, and virulome of infants cared for in an OBU NICU vs a newly built SFR NICU at the same hospital. The study found no significant difference in alpha diversity of bacterial communities, but a significant difference in skin microbiota composition and a higher abundance of antimicrobial resistance genes in the new NICU (325). The authors speculated that the excess resistance genes may reflect the new building's lack of established environmental microbiota rather than the SFR design alone. The review by Servel & Novais (297) on SFRs reported conflicting results on respiratory issues like bronchopulmonary dysplasia, with some studies showing benefits and others finding no impact. Whereas van Veenendaal (319) found no differences in major neonatal morbidities, including bronchopulmonary dysplasia, intraventricular haemorrhage or retinopathy of prematurity between infants cared for in SFRs and those cared for in OBUs.

[130] Refers to a special type of hospital room that's designed to keep airborne pathogens (germs that spread through the air) inside the room - preventing them from escaping into corridors or other patient areas.

Weight and growth: Infants cared for in SFRs have been reported to have greater weight gain (296-298, 319, 326) and higher discharge weights (296, 297, 319, 326). Although a retrospective cohort study in The Netherlands with 1,293 infants found no significant difference in weight gain between infants cared for in a SFR versus OBU (308). The review by van Veenendaal (319) also found no significant differences in growth outcomes between infants housed in SFRs compared to those in OBUs.

Developmental outcomes: Some neonatal staff consider SFRs to be a more developmentally appropriate environment (306). This is evidenced within several of the reviews and other primary studies that report improved neurobehavioral outcomes in infants cared for in SFRs including reduced stress (measured by neonatal salivary cortisol levels), better attention, and less pain (296-298, 327); with some of these benefits attributed to lower exposure to noise and light (297) and improved sleep (298).

Evidence regarding the impact of SFRs on infant language, motor and cognitive development remains mixed (298). One explanation proposed within the literature is that SFRs may reduce environmental stimulation when parental presence and engagement are limited (296). Similarly, van Veenendaal et al. (319) found no clear evidence of improved long-term neurodevelopmental outcomes among infants cared for in SFRs compared with OBUs, although the authors cautioned that relatively few studies assessed long-term outcomes and follow-up data were limited. In contrast, Lester et al. (328) reported that preterm infants cared for in SFR NICUs experienced greater maternal involvement than those cared for in OBUs. Higher maternal involvement, particularly kangaroo care and parental caregiving activities, was associated with improved cognitive and language outcomes at 18 months corrected age. The authors therefore suggested that any developmental benefits associated with SFRs may be mediated by increased parental involvement rather than the physical environment alone. Further complexity was highlighted in a retrospective cohort study comparing developmental outcomes and human milk provision in OBU and SFR NICUs, which found poorer developmental outcomes among infants whose parents were non-White and had lower levels of education and income (326), suggesting that family and socioeconomic factors may also influence developmental outcomes.

Parental impacts and benefits

Parental mental health and confidence (also refer to section in Chapter Eleven): In the review by Servel & Novais (297), mothers in SFRs reported lower levels of stress, anxiety, and depression. Similar findings were reported in primary studies about the impact of SFRs or couplet-care on parental wellbeing. These studies found significantly lower anxiety or stress scores during hospitalisation or at discharge (293, 303, 308, 319, 329, 330), although some of these effects diminished in the post-discharge period (319, 330). Similarly, a Norwegian study compared parents of very preterm infants cared for in a SFR NICU with those cared for in an OBU. Mothers in SFRs reported significantly lower depression scores over time, and both mothers and fathers reported lower stress levels during hospitalisation. There were, however, no differences in anxiety or attachment scores after discharge (330). In an international study across 23 NICUs, higher levels of family integrated care, including parental participation in infant care, involvement in decision-making, emotional support, and unrestricted parental access, were associated with lower parental depressive symptoms both at discharge and four months following NICU discharge (331).

However, not all studies reported benefits. The review by van Veenendaal et al. (319) and primary studies (e.g., Feeley et al., (303)) found no significant differences in depression scores between parents in SFRs compared to OBUs.

Qualitative insights from nurses (317) and parents (291) and evidence from comparative studies (332) highlight that SFRs improves maternal confidence. Though, it is important to note that parents recovering from birth or feeling unprepared to care for their infant independently found the transition to SFRs more difficult (313); some mothers who experienced rooming-in reported no improvements in maternal satisfaction or confidence (333).

As reflected above, the benefits of active parent participation can help to explain these variations in findings. For example, the mediation analysis by van Veenendaal et al. (308) found that active maternal participation in SFRs significantly mediated improvements in maternal mental health in terms of less maternal depression and anxiety, better mother-newborn bonding and higher maternal self-efficacy Similar effects were reported for studies exploring the impact of rooming-in. Mølmen Lichter et al. (334) found that full rooming-in moderated the relationship between insecure maternal attachment and postpartum depression: while insecure attachment (anxious or avoidant) was associated with higher PPD, this association was only observed among women in partial rooming-in, not full rooming-in, suggesting full rooming-in may buffer against psychological vulnerabilities.

Parent-infant contact and relationships: Evidence highlights that infants cared for in SFRs experienced more hours of visitation from parents (293, 296, 303, 309, 319, 330, 335, 336), although two of the included studies in van Veenendaal et al.'s (319) review found lower presence in SFRs compared with OBUs if the mother was not hospitalised. A qualitative study found that parents who were able to spend the night in a family room on the NNU described the arrangement as making their daily routines easier and allowing them to share responsibility for providing KC or other caregiving activities. In contrast, parents who stayed in a patient hotel or returned home spoke about feeling torn - being away from the unit reduced tension for them, yet it also heightened their worry. This distance made coordinating parent care such as KC more difficult (311).

Parents housed in SFRs (296, 298, 307, 336), as well as those who experienced transitional care (314), were reported to have enhanced parent-infant bonding, although not consistently (319, 336). Qualitative research reports that parents appreciated the privacy of SFRs and opportunities to bond as a family (292), as well as how being located close to their infant was important for successful expressing and for bonding purposes (310).

Studies have also explored the impact of rooming-in on parent–infant bonding and attachment. While an Israeli longitudinal questionnaire study found no significant differences in bonding scores between full and partial rooming-in, full rooming-in was a predictor of bonding at 2 months only for mothers who had intended to room-in (337). Handelzalts et al. (337), when exploring the impacts of rooming-in, found that variations in parent-infant outcomes were related to sociodemographic factors: i.e. mothers having their first baby, a lower education, history of psychiatric diagnosis and

a negative subjective childbirth experience were significantly more likely to have an impaired mother-infant attachment relationship.

Infant feeding impacts

Breastfeeding initiation/frequency: Systematic reviews report that rates of breastfeeding (or breast milk feeding) initiation and/or breastfeeding frequency in hospital were higher in rooming-in groups (333, 338), transitional care (314) and SFRs (296): this finding is also confirmed in several primary studies (305, 329, 335, 339-341). Mothers who did not room-in had significantly higher odds of not breastfeeding, delayed initiation of breastfeeding, or receiving supplementation (342-345) than those who were not separated. The study by Vohr et al. (326) also found that infants in SFRs received more human milk at 1 week and 4 weeks, with significantly higher volumes at 4 weeks, although the proportion receiving human milk at discharge did not differ significantly. Moreover, a US retrospective cohort study found that although time to first oral feed was significantly shorter in the post-SFR period, the time series models suggested this may reflect an ongoing improvement trend rather than a direct effect of the unit move (321).

Exclusive breastfeeding: Overall, evidence of the association between rooming-in or SFRs with breastfeeding exclusivity varied. For example, exclusive breastfeeding in hospital (343, 346) and at discharge (347, 348) was significantly more common amongst mothers who roomed-in with their infants; partial rooming-in (346) or non-rooming-in was associated with significantly lower odds of exclusive breastfeeding (343, 344, 346). Some studies (e.g., (335, 349, 350) and the review by van Veenendaal (319) found that infants in SFRs were significantly more likely to exclusively breastfeed at discharge that those in an OBU group. However, other studies found no significant differences in exclusive breastfeeding at discharge among infants cared for in a SFR compared to open bay (308, 332) or reported that rates of exclusive breastfeeding were higher within an OBU design (325).

One of the rooming-in studies conducted in Catania, Italy, found that rooming-in alone was not associated with higher rates of exclusive breastfeeding. Units achieving better breastfeeding outcomes were those with dedicated staff providing proactive lactation support, reinforcing the importance of professional support as well as the physical location of mothers and infants (351). This conclusion was also supported in the Canadian study by Chooniedass et al. (347) whereby geographical disparities in breastfeeding rates was associated with contextual factors and institutional practices, like Baby-Friendly designation, rather than rooming-in per se.

Breastfeeding continuation: There were also variable effects related to extended duration of breastfeeding (296). A Norwegian study found there were no significant differences in breastfeeding rates at 4 months corrected age between SFR or OBUs (335). Whereas the study by Wataker et al. (332) found that at 3 months post discharge, a significantly higher proportion of SFR infants were still being breastfed compared to infants that were cared for in an open bay, and less mothers reported needing more information about infant cues or breastfeeding.

Similar variable evidence was reported for rooming-in studies whereby some of the reviews found no significant differences in rooming-in for full breastfeeding at 3 months (333), 4 months (333) or 6 months (333, 338). While some primary studies found that rooming-in was associated with significantly higher breastfeeding rates in-hospital and at 3 months (352), the authors considered that this may be related to the mothers' motivation for breastfeeding (352).

Risk reduction: Other infant feeding-related benefits included reduced formula contamination associated with centralised preparation rooms (296), and evidence suggesting that SFRs may support improved nutritional outcomes through earlier transition to enteral feeding (296, 297, 299).

Self-efficacy: While some studies found no difference in breastfeeding self-efficacy scores between mothers in SFRs or OBUs (335), the studies by Koskinen et al. (353) and Chooniedass et al. (347) found that both primiparous and multiparous mothers who roomed-in had significantly higher self-efficacy scores (353), compared to those who did not room-in.

Length of stay and re-admission rates

Some of the evidence highlights that transitional care (314), SFRs, (296-298, 307, 326, 336, 354) and couplet care (305) are associated with reduced length of hospital stay. One of the trials included in Shahheidari & Homer's (307) review reported that infants cared for in SFRs had 5.3 days on average shorter length of stay for infants in SFRs compared to those in OBUs; contributing factors included enhanced parental involvement, breastfeeding, and skin-to-skin contact. A further US retrospective longitudinal study, however, found that length of stay for infants in SFRs varied significantly by gestational age; length of stay was significantly reduced among very preterm infants, but there was no significant difference for extremely and moderately preterm infants (although both groups had trends for shorter stays) (321). However, the review by van Veenendaal (319) comparing outcomes for preterm infants cared for in SFRs versus OBUs found no significant differences between length of stay.

Other evidence reports that SFRs are associated with fewer acute visits and re-hospitalisation rates (296-298, 307, 319) compared to OBUs.

Cost and resources

Evidence from two systematic reviews highlights that SFRs deliver care at comparable or lower cost to open-bay units (296, 298). Transitional care was found to have freed-up resources for critically ill infants and believed to help manage moderately preterm infants in a cost-effective manner (314).

Challenges and barriers of zero separation

Decreased communications and interactions

With staff: Some of the included studies in Servel & Novais's (297) review and other primary studies (316) found higher overall satisfaction amongst staff working in SFRs compared to open bays. However, despite these positive findings, other studies found no significant differences in perceived team effectiveness, work satisfaction, perceived level of support from colleagues, or ability to provide family-centred care between the two different unit designs (open bay v's pod/SFRs) (295). Staff repeatedly reported feeling isolated (295, 316), associated with complaints of reduced collaboration, communication, teamwork, and staff visibility, when working in SFRs (although improvements over time were noted in some studies) (296, 298, 299, 306, 307, 315, 316).

Fay et al. (302, 315), explored NICU staff perceptions of teamwork following the transition from OBUs to SFRs, finding that staff felt less connected to their coworkers suggesting that the new layout did not enhance collaboration as intended. This study found that corridors and huddle spaces emerged as key sites for multidisciplinary collaboration and should be intentionally designed to support teamwork and communication (302). Similar findings were reported in an Australian study (306), where staff noted reduced peer learning opportunities and professional interaction in dual-occupancy units.

Lyngstad et al. describe a ten-year process of adapting a Norwegian NICU from an open-bay model to SFRs. The authors emphasise that the move to SFRs did not simply change the physical layout of the unit; it required a cultural and organisational shift in how staff understood the family's role in neonatal care (also see case study findings). Continuous parental presence altered staff workflows, expectations and professional roles, with nurses increasingly acting as educators, supporters and collaborators rather than sole providers of infant care. The paper also notes challenges, including staff feeling isolated and needing new ways of working, demonstrating that architectural design alone is insufficient unless accompanied by changes in practice, staffing models and organisational culture (355).

The barriers to couplet care reported in the review by Curley et al. (356) found that staff reticence to safely care for infants with mild complications in a postnatal setting was often related to a lack of training, confidence, and familiarity (also see Chapter Thirteen). Issues about silo working, where midwives support mothers and neonatal nurses support infants in couplet-care, was also highlighted (356). Similar points were highlighted in the primary qualitative paper by Larsen (357) undertaken in Denmark. This study reports how the introduction of couplet care raises several important considerations, including safeguarding patient outcomes, maintaining standards of care, and supporting healthcare professionals as they adapt to new roles and responsibilities. While keeping mothers and infants together offers clear advantages for early bonding and relationship development, accommodating the varying clinical requirements of both patients can present practical challenges.

With parents: Some studies highlighted similar ratings of quality of communication between parents and staff in SFRs v's OBU designs (293, 303) - others reported more supportive mothering actions from nurses in OBUs than nurses in SFRs (317). While positive feedback towards the opportunities for private and focused interactions in SFRs were emphasised (see above), both mothers (317) and nurses (307) have reported that face-to-face and informal communication had decreased when compared to OBUs.

Some mothers in SFRs described challenges initiating contact with nurses (293, 317). (e.g., needing to press a call button), and nurses acknowledged that it was harder to maintain consistent communication or identify 'opportunistic moments' for engagement across multiple rooms (317). Parents of very low birthweight infants (<1500g) also reported feeling safer in open wards but more involved and supported in SFRs (293). Parents described feeling isolated in SFRs when nurses were not physically present or when physicians conducted rounds without entering the rooms, leaving them less informed and excluded from decision-making (291). In the qualitative study by Nelson et al., parents reported that sitting in their SFR could be depressing, and they would seek the company of others by accessing the Family Room on the NNU (292).

The review by O'Callaghan et al. (296) and primary studies undertaken in Germany, Canada and Australia found that parents in SFRs reported reduced interaction with other parents, leading to fewer opportunities to exchange experiences and receive emotional support (291, 293, 317). While limitations to interact with other parents was not universally perceived as negative (291), the evidence included within the review by Servel & Novais (297) highlighted that the lack of peer support was less of a concern during longer hospital stays. However, the negative impacts of mothers being isolated from their social networks was highlighted in some of the qualitative evidence (310).

With infants: Staff reported finding it harder to monitor multiple patients in SFRs (299, 307). This finding was echoed in primary studies who found that infants being isolated in private rooms caused staff emotional distress, particularly when infants received few or no visits from parents (294). Nurses expressed concern over infants being alone for extended periods or crying without being heard (294)[131]. A cross-sectional study undertaken at eight Finnish maternity hospitals to explore rooming in practices found that the duration of infant separation (particularly when there was limited space for parental presence) was longer during the night and when staff had a higher workload (345): infants were away from their mothers for over five hours in 50% and 35% of cases when maternity-ward staff were working double and night shifts, respectively (345)[132].

[131] This is on occasions when parents do not stay at the bedside, even when accommodation is provided.
[132] Key reasons reported in the paper relate to maternal fatigue, and infant admittance to the NNU.

Increased workload

Evidence (299, 307, 316) highlights staff perceptions about having to walk more while working in SFRs, leading to physical fatigue, with open-pod units being perceived as more efficient for staff movement when compared to SFRs (316). Although a primary study undertaken in Australia using pedometers to assess walking distance found that dual occupancy design did not significantly increase walking distances for staff compared to the open plan design (306).

The emotional intensity of private SFR settings was reported to have increased nurses' emotional labour (299). This finding was also reported in a qualitative study by the same author. They found that SFRs increased emotional demands on nurses, as they were more frequently exposed to parental stressors such as poverty, substance use, and domestic conflict, which made their work more emotionally taxing (294). In two of the systematic reviews, nurses reported feeling isolated or 'trapped' in rooms due to reduced peer interaction and limited visibility of colleagues (296, 299).

Environmental and clinical barriers

Barriers for couplet care reported in the review by Curley et al. (356) related to:

- Lack of guidelines/policy ambiguity
- Staffing shortages
- Inconsistent admission criteria for special care leading to unnecessary mother-infant separation.

While a study (358) found that rooming-in practices among US hospitals between 2007 and 2015 had increased from 27.8% to 51.4%, many hospitals in 2015 still removed infants from their mothers' rooms for routine procedures, including hearing tests (73.2%), heel sticks (65.6%), infant baths (40.2%), paediatric rounds (35.5%), and infant photos (25.4%). A Finnish study (345) also found that infants in university hospitals and BFHI-certified hospitals[133] were more likely to be out of the room for over one hour, thereby suggesting that BFHI certification alone did not guarantee more consistent rooming-in. Several parents in a qualitative study with parents of infants in neonatal care attributed difficulties of being present during the night due to high levels of illumination and the noise from alarms and staff chatting in loud voices (311).

In a Canadian study, organisational obstacles (such as difficulties obtaining information from colleagues) were significantly lower in pod/SFRs, while environmental and technological obstacles (such as how easy it is to locate equipment or supplies and how well supplies are stocked) were significantly higher compared to the OBUs (295).

Physical and logistical barriers

Several mothers explained that various circumstances restricted the amount of time they were able to be at the NNU. These included their own health concerns, living far from the unit, difficulties with transport, the financial costs of travelling and parking, having to go back to work, and managing the needs of their other children and partner (292, 310). Parents, particularly those who were unable to stay overnight on the neonatal unit, could feel divided between wanting to care for their family at home, while wanting to be near their baby 24/7 (311). Some mothers reported that their partners

[133] This relates to hospital, not NNU, BFHI accreditation.

expressed frustration about the amount of time they spent in the unit, while others felt that healthcare staff viewed them negatively for not being there often enough (292). In Heinemann et al.'s neonatal-related study, some parents felt compelled not to leave their infant's bedside due to a lack of staff sensitivity (311). The responsibility to be present on the units was also magnified in situations where units prohibited wider family members (e.g., grandparents) or friends from attending the unit alone (310).

Patient safety concerns

A Canadian pre-post study found that the rates of adverse events (medication, diet, and treatment errors) decreased substantially after the move to the SFR unit (295). However, reduced sight lines in private family rooms raised concerns amongst parents and staff about the ability to recognise emergencies quickly (295), and this study, as well as others, reported fears of delayed response to critical situations (291, 296, 297, 299, 313, 359). A US study reported that staff perceived greater personal safety in the open-pod units, and feeling safer during high-risk family interactions (316).

A mixed-methods study in The Netherlands evaluated how nurses respond to critical patient monitor and ventilator alarms. They found in private-room NICUs, nurses responded to only 26% of critical alarms within 90 seconds highlighting challenges in maintaining patient safety in decentralised environments (360). Nurse responsiveness also depended on alarm type, duration, and infant clinical condition, suggesting that context-aware alarm systems and improved coordination (e.g., with buddy nurses) may enhance safety (360). A further study by the same authors found that NICU architecture significantly affects alarm type and response: the SFR NICU had higher red alarm frequency, while the open bay NICU had higher overall alarm counts and noise exposure (361).

A study conducted in 2012 noted that restrictions on family involvement, such as rules preventing siblings, grandparents, or other relatives from touching the baby for safety reasons, were often distressing for mothers (362).

Parental and staff attitudes and characteristics

Some of the parent and staff characteristics associated with variation in the implementation and outcomes of rooming-in are outlined below:

Key parental-related barriers associated with rooming-in (345) include maternal fatigue or co-sleeping risks. Maternal experiences of birth were strongly associated with these concerns; mothers who had a caesarean birth experience greater fatigue, which led to more difficulties in caring for their infants when rooming-in (363, 364). One study found that even amongst mothers with uncomplicated vaginal births and who intended to breast feed and to room-in, none maintained continuous rooming-in during the postpartum stay (365). The reasons for separation included exhaustion and the need for rest to sustain their ability to continue breastfeeding. The study concluded that exclusive breastfeeding was not associated with strict 24-hour rooming-in (365), thereby suggesting that on some occasions maternal choice may support sustained breastfeeding.

In a study conducted in Taiwan (364), rooming-in was reported to conflict with traditional postpartum practices, particularly the Chinese tradition of *doing-the-month,* which emphasises bed rest and avoidance of physical exertion. Mothers in this study

reported several hindrances to rooming-in, including a preference for professional care, a perceived entitlement to make full use of paid hospital services, and viewing the postpartum stay as an opportunity for rest and recovery rather than for full-time caregiving (364).

Regarding socio-demographic variations, a study undertaken in Taiwan (349) found that it was older educated mothers who were employed full-time who were less likely to fully room-in (associated with confusion of benefits of rooming-in). This contrasts with findings from a study in the UEA (343) that found not rooming-in to be associated with younger maternal age, lower gestational age, higher or lower than normal BMI, and non-Arab mothers. Other studies report that a vaginal birth (345), prenatal decision to breastfeed (and exclusively (349)), and attending antenatal classes were significantly associated with full rooming-in (346).

A cross-sectional study in Finland found that staff characteristics associated with successful implementation of rooming-in included older, more experienced staff, with more positive attitudes, who had completed WHO breastfeeding counselling training (345).

A summary of how closeness affects outcomes and the circumstances required to enable it is presented in Figure 6.

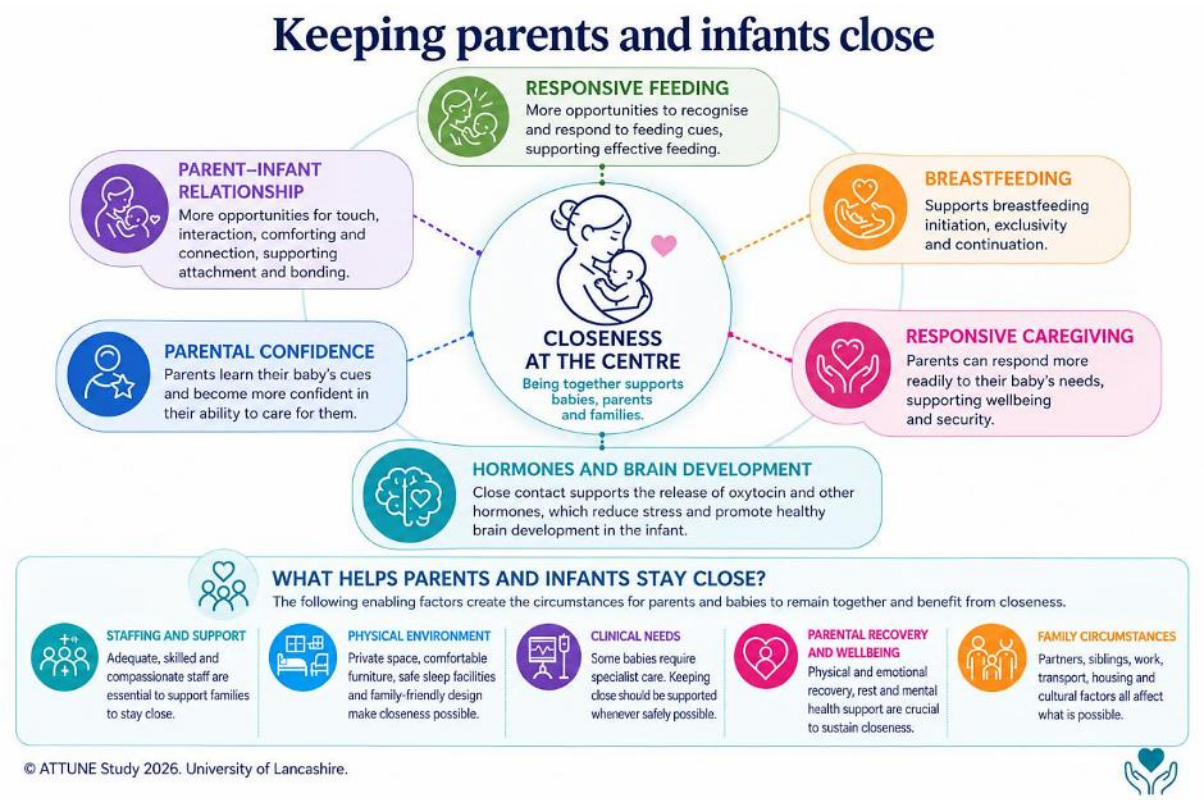


Figure 6: Factors and circumstances that affect closeness

Limitations of the evidence base

Methodological limitations

- Most studies used weak study designs, being observational, cross-sectional, or based on non-standardised survey tools, with very few randomised controlled trials.
- Many studies had a high risk of bias due to co-interventions, inconsistent definitions, and confounding variables such as differing hospital environments or local policies.
- Many studies involved single sites, small or self-selecting samples, limiting representativeness and statistical power.
- Findings may have limited generalisability across healthcare systems with differing parental leave policies, funding models, or cultural norms.
- Heavy reliance on self-reported data introduces recall and social desirability bias, while the lack of longitudinal studies prevents assessment of sustained outcomes.
- Fathers and other caregivers were often excluded, and participant populations were skewed towards higher education or income groups.
- Heterogeneity in interventions and outcome measures prevented meta-analysis and synthesis of results.

Theoretical and conceptual gaps

- Many studies were descriptive without clear theoretical underpinnings linking environmental design, family engagement, and outcomes.
- There was insufficient exploration of the emotional and psychological impacts on staff, particularly nurses working in decentralised single-family room (SFR) environments.

Neglected or underexplored areas

- Few studies examined how infection prevention protocols interact with unit design or parental presence.
- There was minimal evaluation of how telemetry, remote monitoring, or audiovisual tools could mitigate isolation or support teamwork.
- There was limited evidence on lasting psychosocial effects, such as post-traumatic stress disorder or parental wellbeing beyond discharge.

Areas for further research

Measurement and methodological development

- Validated, standardised instruments should be developed to measure how NICU layout affects staff workflow, family engagement, and infant outcomes.
- Larger, multicentre studies with diverse populations should be undertaken to enhance generalisability and reduce bias.
- Robust research designs, including longitudinal, randomised, or time-series studies, should be prioritised to enable causal inference.
- Theory-driven frameworks should be developed, for example, applying systems-thinking models to understand interactions between the physical environment, human behaviour, and clinical outcomes.

Understanding mechanisms and human experiences

- Qualitative and mixed-methods studies (e.g., interviews, ethnographies) are needed to capture the nuanced experiences of parents, staff, and families within different unit designs.
- The mechanisms of benefit in SFRs and zero-separation models, including how parental presence, staff–parent interactions, and cultural context influence outcomes, should be explored.
- Further research should examine how care culture and relationship-building mediate the effects of environment on family wellbeing and infant development.
- Innovative models of care and design
- Blended or hybrid NICU models that combine open-bay and SFR elements should be explored to balance privacy, flexibility, cost-efficiency, and safety.
- Research should investigate decentralised nursing stations or clustered room configurations to help optimise visibility while maintaining family-centred care.
- Evaluations of design adaptations that align with BFI zero-separation principles should be undertaken to ensure spaces enable continuous parental presence and responsive caregiving.

Technology integration and safety solutions

- The role of technological enhancements, such as audiovisual monitoring, remote communication systems, and telemetry, in mitigating visibility and communication challenges in private-room settings should be explored.
- Research should examine how technology can support team coordination, family engagement, and safety without compromising privacy or parental bonding.
- Long-term and system-level outcomes
- Long-term infant neurodevelopmental and psychosocial outcomes associated with different NICU designs and care models need to be assessed.
- Parental wellbeing trajectories, including stress, confidence, attachment, and post-traumatic stress symptoms, should be explored beyond discharge.
- Cost-effectiveness and sustainability analyses of rooming-in and SFR models should be conducted to inform policy, resource allocation, and scalability.

Clinical practice and implementation research

- Implementation strategies for transitioning to family-centred, zero-separation models should be evaluated, identifying barriers and enablers across diverse healthcare contexts.
- Further research is needed to investigate how staff education and interprofessional training influence successful adoption of couplet care and BFI-aligned neonatal practices.
- Infection control systems and environmental safety measures (e.g., hand hygiene infrastructure, water quality, ventilation) within family-centred design frameworks should be examined.

ATTUNE STUDY



Chapter Eight: Responsive feeding

Responsive feeding refers to feeding practices that encourage a child to feed and eat in response to physiological and developmental needs, to encourage both close and loving relationships and self-regulation in eating. It involves a reciprocal process where the caregiver recognises and responds appropriately to a child's hunger and satiety cues as well as the mother's own instinctive desire to breastfeed, rather than following strict schedules. In babies, this means offering breastmilk, whether given by breast or bottle, or infant formula when the baby shows signs of hunger, such as rooting, sucking on hands, and stopping when they signal, they are full, for example by turning away, slowing sucking, or relaxing their hands. It also emphasises the importance of holding the baby close, making eye contact, and offering comfort and reassurance during feeding. Responsive breastfeeding is a reciprocal feeding approach in which mothers respond to their infant's cues for hunger, comfort, and emotional needs, using breastfeeding not only for nutrition but also to promote bonding, reassurance, and the wellbeing of both mother and baby. Responsive bottle feeding is an infant-led feeding approach in which caregivers use paced feeding techniques, respond sensitively to the baby's hunger and fullness cues, and engage attentively during feeds to support the infant's self-regulation and strengthen the caregiver-infant relationship.

Responsive feeding when introducing solid foods means offering age-appropriate foods when the child is developmentally ready, encouraging exploration of new textures without pressure, and responding sensitively to signs of hunger, interest, or satiety. Responsive feeding in older children focuses on providing regular nutritious meals and snacks, modelling healthy eating, and respecting the child's autonomy and appetite so they can decide how much to eat from what is offered. Overall, responsive feeding, whether by breast, bottle or when introducing solid foods, may support parent-infant relationships, infant self-regulation and the development of healthy eating behaviours. However, evidence for longer-term effects of introducing solid foods responsively on growth, obesity and developmental outcomes remains limited and inconsistent.

In contrast, non-responsive feeding is defined as a lack of reciprocity between caregiver and child during feeding, where the caregiver either dominates the feeding process (controlling/pressuring), allows the child to make most food choices with little guidance or consideration of developmental needs (indulgence), or ignores the child altogether (uninvolved) (366). Non-responsive feeding in a baby occurs when a caregiver does not notice or respond appropriately to the baby's hunger or fullness cues. For example, a baby may turn their head away, close their mouth, look distressed, or push the bottle or breast away to show they are full, yet the caregiver continues trying to feed them or encourages them to 'finish the bottle' despite these clear signals. Non-responsive feeding can also happen when a baby shows early hunger cues, such as rooting, sucking on hands, but the caregiver ignores these signs and delays feeding until a predetermined time. In an older child it may include practices such as using pressure to encourage the child to 'clean their plate'. These approaches fail to respond appropriately to the child's hunger and satiety cues, potentially disrupting self-regulation, autonomy, and the establishment of healthy eating behaviours (367).

Evidence from the UNICEF 2012 review positioned responsive feeding as a key mechanism through which early relationships influence lifelong health and development. Evidence linked responsive feeding to improved maternal responsiveness, strengthening attachment and supporting emotional and neurodevelopmental outcomes. Responsive feeding practices, such as allowing the infant to control the pace and amount of feeding and avoiding pressuring behaviours, are associated with longer breastfeeding duration and greater maternal confidence, while non-responsive (controlling or cue-ignoring) feeding is linked to feeding difficulties and less optimal growth patterns. The review emphasised that this evidence applies across both breast- and formula-feeding contexts, although formula-feeding requires more active support to avoid overfeeding.

Evidence from the updated review is consistent with the earlier UNICEF 2012 evidence summary, highlighting associations between responsive feeding, parent–infant relationships, development and health. It recognises that while breastfeeding is associated with greater maternal responsiveness and infant cue signalling and bottle feeding has been linked to more pressuring feeding styles and rapid early weight gain, responsive bottle feeding remains possible. Determinants of responsive feeding are discussed, including parental knowledge, stress, mental health, infant temperament, socioeconomic context, and cultural beliefs, illustrating that responsiveness is shaped by wider psychosocial and environmental factors, not just feeding method.

The new review updates the evidence on baby-led weaning, suggesting that infant-led approaches may enhance self-regulation and responsiveness, while noting mixed evidence on growth and nutrient intake. It also provides evidence from intervention studies demonstrating that responsive feeding behaviours can be modified through structured support, leading to reductions in controlling practices and modest improvements in dietary patterns and growth outcomes.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

The UK BFI standards require healthcare services to support parents in practicing responsive feeding. It emphasises that feeding is not only for nutrition but also for comfort and emotional connection, encouraging parents to respond to signs of hunger, distress, and their own desire to feed, helping parents build close, loving relationships with their baby (Chapter Eleven). Note that cue-based feeding for babies in the neonatal unit is discussed in Chapter Ten.

Services accredited under BFI standards are expected to ensure that:

- Breastfeeding mothers understand responsive feeding, including feeding cues and breastfeeding as a means of comforting and calming babies and themselves. As the standards emphasise that feeding helps parents build close and loving relationships with their baby, services must ensure staff can explain that breastfeeding can be offered when the baby shows hunger cues, when the baby seeks comfort, or when the mother wishes to connect with her baby, and that babies cannot be overfed or "spoiled" through responsive breastfeeding.
- Mothers who formula feed are enabled to do so as responsively and safely as possible. For example, parents should watch for and respond to their baby's

hunger and fullness cues, rather than encouraging the baby to finish the bottle. Feeding should be paced, with pauses, allowing the baby to control the flow and avoid overfeeding. The caregiver should hold the baby close, maintain eye contact, and consider feeding as an opportunity for comfort and connection - not just to satisfy hunger.

- In the community, mothers have the opportunity for a conversation about their options for continued breastfeeding (including responsive feeding), according to individual need and about how to introduce solid foods in ways that optimise their baby's health and wellbeing.
- In hospital-based children's services responsive feeding should be the goal, recognising that babies may have specific needs for proactive feeding regimes during the acute phase of illness. Solid foods should be offered from around six months in ways that optimise health and wellbeing.

Summary of the evidence in relation to UNICEF UK BFI standards

The evidence strongly supports the UK BFI standards, which advocate for responsive feeding as foundational for infant care and relationship-building. Evidence suggests that direct breastfeeding may facilitate responsiveness to infant feeding cues, with some studies reporting greater maternal sensitivity to feeding signals than during bottle feeding. This may partly reflect the infant's more active role during breastfeeding and the absence of external cues such as the volume of milk remaining in a bottle. However, feeding method alone does not determine responsiveness, and bottle-fed infants also signal hunger and satiety and can be fed responsively.

Bottle feeding can encourage pressuring practices, such as prompting infants to finish the bottle, which is linked to rapid weight gain in early infancy. To mitigate these risks, BFI guidance requires healthcare professionals to teach parents how to feed responsively, focusing on infant-led cues and avoiding control-based behaviours. However, some of the evidence highlights that professionals lack training in responsive bottle feeding, highlighting need for consistent education and policy support. This aligns with BFI's commitment to fostering close and loving relationships through flexible, responsive feeding across all infant feeding contexts.

Enablers of responsive feeding, such as parent's understanding of their baby's feeding cues, skin-to-skin contact, keeping baby close, and adequate knowledge of feeding and nutrition, align with BFI's guidance on promoting close and loving relationships and equipping parents with practical skills. Conversely, barriers, including misinterpreting cues, rigid routines, conflicting information, and social pressures, highlight the importance of consistent, evidence-based messaging from trained professionals. Maternal stress, anxiety, and depressive symptoms, along with challenging infant temperaments, can undermine responsive feeding, highlighting the need for holistic support and sensitive care.

For older children, the BFI principles of developmental readiness resonate with much of the evidence supporting Baby-Led Weaning (BLW) and its modified version, Baby-Led Introduction to Solids. These approaches promote self-regulation and feeding independence by allowing infants to control intake based on hunger and satiety cues. Parents practicing BLW often report greater trust in their child's ability to self-regulate and demonstrate more responsive feeding behaviours, reinforcing BFI's relational

approach. Available evidence has not identified an increased risk of choking with BLW compared with traditional feeding approaches, although the evidence remains limited and is often reliant on parental report. While evidence shows that many health professionals view BLW as natural and safe, their recommendations may be constrained by a lack of formal training and confidence, leading to conflicting information. Consequently, parents may rely on informal sources such as social media, increasing the risk of misinformation. This emphasises the need for staff to be equipped with clear, evidence-based information to ensure that parents receive accurate support to implement BLW safely and effectively.

Responsive feeding interventions often involve giving parents guidance on how to recognise and respond to infant hunger and fullness signs, both during early feeding and when introducing solid foods. These interventions have been shown to reduce non-responsive behaviours, such as pressure to eat and using food as a reward. Some interventions are associated with healthier child eating patterns and there are modest impacts on weight gain. However, effects on parental self-efficacy and long-term child weight outcomes were inconsistent, and many studies lacked extended follow-up, making it difficult to draw firm conclusions about their role in obesity prevention.

Recommendations for the BFI programme

- **Continue to strengthen staff knowledge and understanding of newborn instinctive behaviours and early infant communication**, ensuring that staff are equipped to support responsive caregiving and feeding practices, recognise infant cues, and promote close and loving relationships between parents and infants.
- **Continue to strengthen healthcare professionals' knowledge and skills in supporting responsive breastfeeding**, including recognising feeding cues, promoting frequent and unrestricted breastfeeding, supporting parents to respond confidently to their baby's needs, and reinforcing the role of breastfeeding in relationship-building and responsive caregiving.
- **Strengthen healthcare professionals training and ongoing support to promote responsive bottle feeding**, including recognising infant hunger and satiety cues, using paced feeding techniques, avoiding pressure to finish feeds, and supporting feeding as a responsive relationship.
- **Consider broadening the standards to include responsive approaches to complementary feeding and the introduction of solid foods** alongside breastfeeding, ensuring that guidance supports parents to make informed, developmentally appropriate decisions.
- **Recognise the impact of responsive bottle feeding and complementary feeding on longer-term health outcomes and public health priorities**, including obesity prevention, and strengthen standards, education and resources to support consistent, evidence-based messaging for families and professionals.
- **Embed responsive feeding within wider, holistic family support** rather than treating it as a standalone feeding technique, considering parents' circumstances, cultural influences

Detailed overview of included evidence

Responsive feeding is increasingly recognised as a central mechanism linking infant nutrition, growth and early relationships across both milk feeding and the introduction of solid foods. The following sections synthesise evidence on how parental responsiveness operates in different feeding contexts, i.e., breast and bottle feeding, the wider determinants that shape responsive practices, and emerging approaches such as baby-led weaning that explicitly promote infant-led, cue-based feeding. Together, this evidence highlights that responsive feeding is not only a set of behaviours, but a dynamic, context-dependent process influenced by caregiver-infant interaction, social environment, and cultural norms, with important implications for supporting healthy development and long-term eating behaviours. Full details of the included reviews and empirical studies are provided in the Appendices.

Parental responsiveness when breast and bottle feeding

Research suggests mothers of infants fed directly from the breast report greater responsiveness to their infant's feeding cues than bottle feeding mothers (also refer to Chapter Eleven). For example, breastfeeding infants have been found to exhibit more engagement and disengagement cues than formula fed infants (368) and breastfeeding mothers have been shown to be significantly more sensitive to infant cues than those who were bottle-fed expressed breast milk (369). These differences may be due, in part, to the more active role infants play when being breastfed and the lack of other cues, such as the amount of milk left in the bottle. Indeed, preliminary studies have found that removal of the visual and/or weight cues related to the amount of formula in the bottle improved the bottle-feeding practices of mothers who have pressuring feeding styles (370) and was associated with significantly lower weight-for-length z-scores (371), though no differences in maternal sensitivity or intake were observed.

It has been suggested that bottle feeding may encourage a pressuring feeding style (372) and it has been identified as an independent risk factor for rapid weight gain during the first six months of life (373). However, research has also noted that bottle-fed infants can and do signal satiation[134] during a feed and that maternal and infant characteristics, including feeding style (mother led or infant led) and infant temperament, also influence feeding behaviours among bottle-fed infants (374).

> *Because many parents who are living with extended family, they all want their baby to be in a routine by feeding every two to three hours. I always say to them feed your baby when your baby is hungry. I always explain to them, 'it's a bit like yourself, you're not always going to want a three-course meal every single time. Sometimes you might want a snack. Just go with what your baby is telling you, if your baby's hungry, and your baby needs feeding, feed your baby.'* (Site 4_HCP7)

Healthcare professionals play a vital role in supporting parents to bottle feed responsively, although some admit they feel somewhat conflicted between providing support for bottle-feeding whilst encouraging breastfeeding, and

[134] As assessed by observing the following infant behaviours: (1) waves arm(s); (2) displays negative facial expressions; (3) leans away or arches back; (4) turns head and/or body away from bottle; (5) bites or chews nipple; (6) pushes bottle away; (7) spits out nipple; (8) gags, coughs, or chokes; (9) spits out formula or spits up; (10) crying bout; and (11) sleeping bout.

often lack training in responsive bottle feeding (375). Policy, systems and environmental change strategies[135] to promote responsive bottle-feeding within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics in America have demonstrated reduced controlling feeding behaviours, such as using food to soothe, and lower likelihood of exhibiting rapid weight gain (376).

Determinants of responsive feeding practices

Enablers of responsive feeding include parents' ability to recognise and respond to infant hunger and satiety cues, adequate knowledge of feeding and nutrition, flexible attitudes that trust infants' self-regulation, and supportive environments such as clear information from health professionals and family support. Physical contact, planning around infant hunger patterns, and positive emotional states also promote responsiveness (377). Barriers to responsive feeding include parents' difficulty interpreting cues, having a rigid feeding regime, controlling attitudes, and conflicting or absent guidance from professionals. Environmental challenges, such as low income, lack of facilities, and maternal distraction (e.g., digital media) hinder responsiveness, as do cultural norms, and unrealistic feeding goals (377). Both general and parenting stress and anxiety have been linked to suboptimal feeding practices, such as controlling and restrictive feeding practices and uninvolved feeding styles (378, 379). Likewise postpartum depressive symptoms have been negatively associated with maternal responsive feeding (380). A qualitative study found that parental concern about fussy eating is closely linked to nonresponsive feeding practices and that these practices are influenced by multiple social cognitive factors, including beliefs, self-efficacy, and self-regulation (381). In infants, difficult infant temperament (e.g., irritability, slow calming) has been linked to non-responsive feeding, such as scheduled feeding, pressure to eat, and use of food to soothe, suggesting that responsive feeding is more difficult when child temperament challenges caregiver interpretation (382).

Cultural beliefs shape responsive feeding practices and perceptions of infant readiness across communities (also see Chapter Three). For example, Thai, Hmong, and Vietnamese migrant mothers in Australia introduced solid foods based on traditional symbolism, staple diets, and concepts like the 'hot-cold' continuum, while Australian mothers tended to follow health service guidance (383). Maternal concerns about milk supply and infant growth also influenced early food introduction in migrant mothers, whilst others overlooked their babies' hunger and satiety cues, frequently pressuring their children to finish their entire plate (383). Healthcare information sometimes conflicted with traditional norms, prompting shifts in feeding practices, especially among migrant mothers, highlighting the need for culturally sensitive guidance that respects traditional beliefs (58) while promoting responsive feeding.

Overall, this evidence highlights that feeding styles appear to be multidimensional, evolve over time, and are shaped by cultural context, maternal resources, and infant characteristics (384, 385). This evidence indicates that healthcare professionals should be equipped with adequate pre-service and on-the-job-training on responsive feeding to be able to adequately educate and support parents.

[135] Strategies involved: 1. More inclusive assessment of early infant feeding decisions as a foundation for tailored intervention; and 2. Enhancing WIC resources to support optimal infant feeding, including healthy bottle-feeding, throughout the first year of life.

Baby-Led Weaning and Baby-Led Introduction to Solids

UK guidance on introducing solid foods recommends that a wide variety of solid foods, including iron-containing foods, should be introduced in an age-appropriate form from around 6 months of age. The recent UK Infant Feeding Survey reported that around two-thirds of mothers (67%) introduced solid foods when their baby was 6 months (26 weeks) or older. The most common reasons given by mothers for why they had started giving their baby solid foods were because they thought it was the right time (66%), their baby was able to sit up and hold food (57%), and they were following NHS guidance (43%)[136]. Complementary feeding can be introduced through a range of approaches, including traditional spoon-feeding of purées (parent-led), baby-led weaning (infant-led), or a combination of both. Increasingly, there has been a shift away from traditional caregiver-controlled feeding towards more responsive, infant-led approaches, where babies guide their own intake according to hunger and satiety cues, reflecting growing recognition of the importance of early self-regulation and autonomy.

> *She [health visitor] just said try one thing at a time over a course of a couple of days, and if he doesn't eat it the first week, he isn't enjoying it, come back to it and reintroduce it again. She said it will take a good few tries of introducing foods and textures. She also suggested going by the NHS guidance of finger food that he can grasp and try himself*. (Site 2 Mother7)

Baby-Led Weaning (BLW) is a feeding approach that encourages infants to self-feed solid foods from the start of complementary feeding period. Developmental readiness is a key prerequisite for BLW and includes several observable milestones:

- Sitting upright with minimal support
- Good head and neck control
- Ability to grasp and bring objects to the mouth
- Showing interest in food and mealtimes
- Ability to move food from the front of the mouth to the back for swallowing

These signs indicate that an infant is physically and neurologically prepared to handle solid foods safely. BLW encourages the infant to feed themselves all their foods rather than being fed purees by spoon. Baby-Led Introduction to Solids is a modified version of BLW designed to address common concerns of BLW by providing parents with additional guidance and strategies to maximise their baby's iron intake, support healthy growth and minimise the risk of choking during the self-feeding process. The following sections explore the evidence for BLW/baby-led introduction to solids on various outcomes. Of note, much of the research conducted on BLW/baby-led introduction to solids has been observations, with few randomised controlled trials carried out to date.

Feeding and eating behaviours

Six reviews (386-388) and three empirical studies (389-391) reported that a baby-led approach to complementary feeding enhances self-regulation of appetite and feeding independence by allowing infants to control their intake in response to hunger and satiety cues. Arden and Abbott (392) further support this view, with qualitative data showing that mothers commonly expressed a strong trust in their infant's ability to self-

[136] Infant Feeding Survey 2024

regulate feeding, including the timing, amount, and type of food consumed. Many mothers hoped that this autonomy would foster a positive long-term relationship with food.

Whilst a systematic review conducted in 2021 found no strong evidence to suggest that the feeding technique used to introduce solids contributed significantly to specific parent-reported feeding difficulties in children older than 1 year of age (393), more recent studies challenge this assertion. A cross-sectional study of 1215 children participating in the CORALS cohort, a Spanish longitudinal study on childhood obesity risk factors, found that a baby-led or mixed weaning approach was associated with healthier eating behaviours in preschool children, in terms of higher enjoyment of food and reduced food fussiness (391). A retrospective, cross-sectional study involving 179 caregivers in Portugal found that parents who used BLW tended to engage in more responsive feeding techniques with their preschool children and were less likely to minimise their children's negative emotions (394). However, more methodologically rigorous studies are needed to confirm these findings.

Weight and growth

Reviews based primarily on observational studies (204, 386, 388, 395, 396) have suggested that BLW may offer a protective effect against childhood obesity. Proposed mechanisms include improved satiety responsiveness, decreased pressure to eat (386, 388), and promotion of better internal appetite regulation (204, 396). Most reviews however have reported that the evidence comparing the energy intake, growth and weight of BLW and traditional spoon-fed infants is conflicting (397, 398). The two RCTs reported in these reviews, one conducted in a high-income country (399) and one in a low-middle income country (400) also revealed conflicting results, but results of a meta-analysis on the aggregated data from the two RCTs did not show statistically significant differences (398).

Nutrient intake

Eight reviews (204, 387, 388, 395, 396, 401-403) reported that BLW infants often consumed less iron and zinc than traditionally spoon-fed infants, and that breastfed infants who may not consume sufficient iron-rich solids and BLW infants with vegetarian/vegan diets may be particularly at risk (387, 396). Some reviews (396, 402, 403) suggested an association between BLW and lower protein, B12 intakes. Reasons given for the deficiencies were a reduced intake of fortified cereals or meats in BLW infants. Much of the evidence relating to nutrient deficiency and BLW, however, arises from observational studies, parental reports, or theoretical nutritional modelling and should be treated with caution.

The baby-led introduction to solids RCT reported no significant differences in dietary zinc, iron and selenium intake nor in plasma zinc, plasma selenium or risk of iron deficiency anaemia between toddlers fed via a baby-led approach and those who were spoon-fed (399, 404). However, it is important to note that this study assessed a modified version of BLW in which parents were given advice to offer 'high-iron' foods with each meal. Nevertheless, these finding concur with recent observational data from the First Foods New Zealand project which found no significant association between either partial or full BLW and iron status measures compared to traditional spoon-feeding, even after adjusting for potential confounders (405).

Raising potential concerns about the inappropriate timing of solid food introduction, however, a cross-sectional survey found that BLW mothers in Poland were significantly more likely to introduce solid foods after 6 months (63.7%) compared to mothers who did not use the method (26-47.7%), emphasising the need for parents to be educated on the safe and effective implementation of BLW (389).

Adverse feeding-related events

Most reviews (386, 398) found no increased choking risk between BLW and traditional spoon-feeding, especially when using baby-led introduction to solid foods, and/or with proper parental education. The baby-led introduction to solid foods RCT (which incorporated parental education in avoiding foods posing a choking risk) found no significant differences in the rates of choking between baby-led and spoon-fed infants (406). Rather it was suggested that choking incidents were more closely related to offering inappropriate foods.

Other adverse feeding-related events have been reported to be more common among BLW-fed children compared to those that were spoon fed, such as vomiting reflex (34.9% v 25.2%), spitting out food (62.19% vs. 51.86%) and gagging (51.90% vs. 29.10%) (389).

Parental perspectives

Parental attitudes towards BLW were generally positive. Mothers perceived this approach to be more enjoyable (388, 392), less stressful (204, 402), and easier to implement than tradition spoon feeding (204, 407). Some reviews (204, 396, 401, 402) noted increased maternal confidence and positive attitudes toward mealtimes. Although some parents felt unsure about the safety and nutritional adequacy of BLW (396), and had concerns about the messiness (204, 390, 407) and judgment from others about the practise (204). Mothers have also expressed confusion due to a lack of clear professional guidance (396). Reflective of this, it has been reported that parents most frequently obtain their information about BLW from informal sources such as social networks and online forums rather than healthcare professionals (395, 403) (also see findings in the case studies).

Reasons for choosing BLW include seeing it as part of a wider parenting philosophy (e.g., attachment parenting), while other mothers say they adopted it after failed attempts with traditional spoon-feeding (392). Caregivers who practiced BLW have been found to be more likely to demonstrate responsive feeding behaviours, such as responding appropriately to their child's hunger and satiety cues, than those who followed traditional spoon-feeding methods (394). Conversely, a longitudinal study found that it was higher levels of infant self-feeding at 12 months that was associated with greater maternal responsiveness to satiety cues, irrespective of the reported weaning style (408).

Hybrid approaches to the introduction of solid foods have been found to be common, with many families combining BLW with spoon-feeding (396). A survey conducted amongst Polish mothers highlights this, finding that only 2.9% of mothers who reported using BLW entirely avoided spoon-feeding (389).

Healthcare professional hesitancy

Some reviews (204, 386, 395) found that health care professionals were reluctant to recommend BLW due to lack of high-quality evidence, fear of choking, nutritional concerns, and limited professional training on BLW. A qualitative study conducted in Spain (409) highlighted that healthcare professionals generally viewed BLW as a natural and safe method, but their recommendations were often constrained by limited formal training. They also acknowledged widespread fears of choking among families, typically shaped by misinformation or conflicting advice and suggested that providing clearer, evidence-based education to both families and health staff could help improve BLW uptake and safety (409).

Effectiveness of responsive feeding interventions

Healthcare professionals are in a unique position to guide and support parental feeding practices and behaviours (410). Several interventions have been developed for health care setting delivery that incorporate elements responsive feeding. Often these are multi-component interventions, which can make it challenging to identify which specific elements were responsible for the observed effects. Although not intended to be an exhaustive list, the following section will discuss the findings of some of the more recent trials. Further information about these studies, detailing the responsive feeding elements of the intervention, are shown in Table 6 below. The responsive feeding elements tended to emphasise key practices such as recognising and responding to infant hunger and satiety cues, promoting child-led feeding, avoiding emotional or controlling feeding, and fostering positive feeding environments. Some also supported encourage modelling healthy behaviours, and provide strategies for coping with feeding challenges, aimed at nurturing self-regulation and healthy growth in infants. As detailed within Table 6, one intervention began antenatally and continued postnatally, one intervention in the UK was delivered to mothers of formula fed infants aged 2-6 months, two interventions started in the early postnatal weeks, and the remainder began at around infant age 4 months in preparation for the introduction of solid foods. Most studies did not assess long-term outcomes, making it difficult to draw firm conclusions about sustainability of the intervention.

Parental feeding practices: Both NOURISH and INSIGHT reported significant reductions in non-responsive feeding behaviours, notably pressure to eat, emotional feeding, and using food as a reward (see Table 6). Parents in the INSIGHT study also reduced the use of food to soothe (411) and increased the use of alternative soothing strategies in response to infant fussiness (412). An INSIGHT follow-up study also found that the intervention had longer-term positive impact by establishing consistent feeding routines in subsequent siblings (413).

The 'Strong African American Families' intervention, based on INSIGHT but culturally adapted for African American families, found that the intervention group reported using less pressure and more responsive feeding than controls, but that no significant group differences were observed in bottle-feeding practices (e.g., adding cereal to bottle, using an appropriate nipple/bottle size) (414). Similarly, the brief, low-intensity Baby Healthy Living Triple P intervention, which aimed to empower parents to use responsive feeding practices, reduced parental controlling feeding behaviours but had no impact on responsive feeding-related self-efficacy (415).

Child eating behaviour: The NOURISH intervention reported a modest impact on aspects of "obesogenic" child eating behaviour, food preferences, and dietary quality 6 months post intervention (such as less emotional overeating eating, less fussiness, and eating more fruit and vegetables) when the infant was 2 years of age (416). In the INSIGHT study, while most infants consumed diets low in fruits and vegetables, the intervention was associated with healthier dietary patterns (417).

Parent-infant interaction: The Mother-Infant Feeding Interaction (MI-FI) intervention with first-time mothers demonstrated significantly more positive mother-infant mealtime interactions and maternal responses to infant cues compared to the control group (418). The NOURISH study found that parenting interactions with higher levels of autonomy encouragement in the intervention group six months post-intervention (416).

Child weight: Current evidence from observational studies suggest that parental feeding practices are associated with child BMI Z-score, weight status, and adiposity (367). Correspondingly the impact of interventions promoting responsive feeding on infant weight gain or obesity prevention show some promise. The INSIGHT intervention resulted in a modest reduction in BMI z scores at age 3 years compared to controls (419), and NOURISH was associated with reduced growth-related indicators of future obesity risk (420) at 14 months of age. The Baby Milk Trial, a theory-based behavioural intervention to prevent rapid weight gain in formula milk-fed infants in the UK, reduced reported infant formula intakes at ages 3, 4, 5 and 6 months, and slowed initial weight gain to age 6 months. However, the effect of the intervention on weight gain was not sustained to age 12 months (421). The Mothers and Others study, a home-based intervention for non-Hispanic black women and their study partners, however, showed no statistically significant effect on infant size or growth during the first 15 months of life (422).

Table 6: *Responsive feeding elements of included interventions*

Study	Primary aim	Timing of intervention	Intervention	Responsive feeding elements
NOURISH Australia RCT (416, 420)	To evaluate a universal obesity prevention intervention that commenced in infancy	First intervention module at infant age 4-7 months. Second module at 13-16 month of age.	Anticipatory guidance on early feeding practices was delivered through two group-based education modules over six months, each comprising six interactive 1-1.5-hour sessions covering when, what, and how to introduce solid foods.	Five key messages for parents were: (i) feeding practices shape children's food preferences and health, (ii) trust children to regulate their intake ("parent provides, child decides"), (iii) eating habits develop early and persist into adulthood, (iv) model healthy behaviours, and (v) foster a positive parent-child relationship.
Intervention Nurses Start	To determine whether a responsive	Intervention delivered at home at	A responsive parenting intervention for	Infant feeding guidance covered recognising hunger and satiety

Infants Growing on Healthy Trajectories (INSIGHT) USA RCT (411, 417, 419)	parenting intervention affects BMI z-score at age 3 years	infant age 3–4, 16, 28, and 40 weeks, and at a research centre at 1 year.	obesity prevention focused on infant cues and parent responses across four behavioural states: drowsy, sleeping, fussy, and alert/calm.	cues, age-appropriate bottle-feeding, delaying solids until 4-6 months, promoting healthy foods through repeated exposure, serving appropriate portions, and using responsive, non-controlling feeding practices.
Mother-Infant Feeding Interaction (MI-FI) training (418)	To assess whether professional behavioural and nutritional training for first-time mothers can improve feeding interaction at age 12 months	Intervention for mothers of infants aged 4-6 months. Included four weekly two-hour workshops followed by online support from a dietitian and social worker until 12 months.	Small group workshops to establish positive feeding attitudes and a good feeding relationship at the stage of solid food introduction.	Training covered responsive feeding based on infant cues, avoiding emotional feeding, creating positive feeding environments that encourage independent eating, and using emotional acknowledgement and calming techniques during feeding.
Baby Healthy Living Triple P Australia RCT (415)	To test the efficacy of a brief 2-hr parenting intervention in increasing protective factors against and reducing risk factors for infant obesity.	Intervention for infants aged 4-18 months at increased risk of obesity due to at least two risk factors (e.g., parental overweight or low parental education).	A 2-hour parent discussion group based on behavioural and social learning principles aimed to promote responsive feeding, support children's self-regulation of eating, and encourage healthy role modelling.	Training promoted responsive feeding, healthy activity and sleep habits, positive role modelling and parenting strategies, and emotional coping skills.
Strong African American Families (Sleep SAAF) USA RCT (414, 423, 424)	To evaluate whether a responsive parenting intervention could prevent rapid weight gain in first-born African American infants during the	Intervention delivered at infant age 3 w (90–120 min) and booster session at 8 w (45–60 min). All materials were tailored for African	The responsive parenting intervention focused on responsive parenting in the context of (1) sleeping, (2) crying, (3) feeding, and (4) playing.	An INSIGHT-based curriculum adapted for African American families provided training on recognising hunger and satiety cues, responsive bottle-feeding, typical feeding patterns, and using non-feeding soothing strategies.

	first 16 weeks postpartum.	American families.		
The Baby Milk Trial UK RCT (421)	To assess the efficacy of a theory-based behavioural intervention to prevent rapid weight gain in formula milk-fed infants	Intervention for mothers of formula-fed infants that included three ~45 min face-to-face sessions and two ~20 min telephone contacts up to 6 months postpartum.	A theory-based behavioural intervention to reduce formula intake and prevent excess infant weight gain, incorporating motivational, action-planning, and coping-planning components.	The intervention encouraged mothers to recognise infant satiety cues, avoid pressuring infants to finish bottles, understand that crying is not always hunger-related, and use alternatives to feeding when appropriate.
Mothers & Others USA RCT (422, 425)	To assess the effectiveness of a home-based, responsive feeding and care intervention	Intervention started in the second trimester and continued until 12 months postpartum, comprising eight home visits, an information toolkit, and four newsletters.	Provided anticipatory guidance and support for six infant feeding and care behaviours: breastfeeding, responsive feeding, non-food soothing, appropriate complementary feeding, limited media exposure, and healthy sleep.	Parents received guidance on responsive feeding and caregiving, including recognising hunger, fullness and developmental cues, responding appropriately to crying, and identifying readiness for solid foods and appropriate feeding amounts.

A summary of the evidence is presented as a practice guide for staff in Figure 7 below.

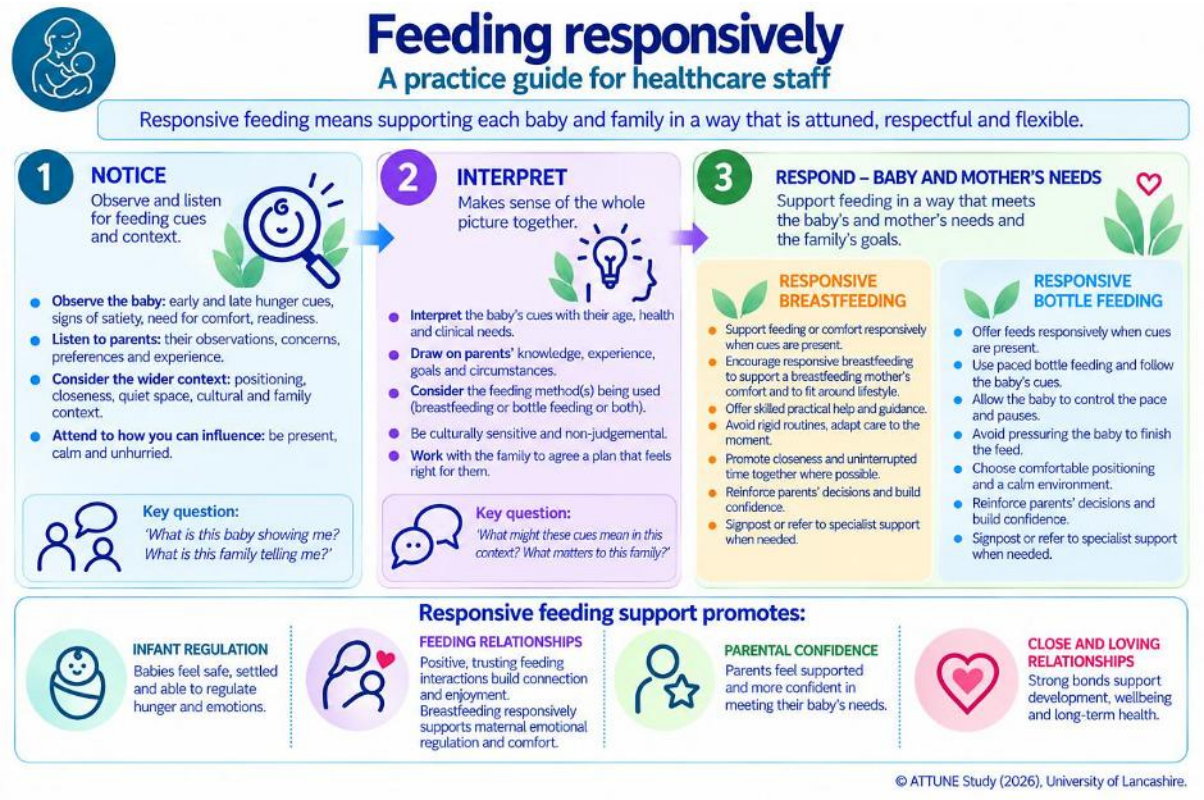


Figure 7: A practice guide for staff to support responsive feeding.

Limitations of the evidence base

Study Design

- Most BLW studies are observational, cross-sectional, or short-term, with very few RCTs, leading to low-quality evidence and high risk of bias.
- Responsive feeding interventions often lack methodological rigour, with poor reporting of intervention fidelity and unclear timing.
- Responsive feeding is often part of multi-component interventions, making it difficult to isolate effects.

Definitions and standardisation

- BLW definitions vary widely, making comparisons inconsistent.
- RF and related constructs are inconsistently defined and measured, hindering comparability.

Participants

- Many responsive feeding interventions fail to target high-risk groups, reducing generalisability.
- BLW studies rarely control for key confounders such as breastfeeding duration, socioeconomic status, and parental education.

Outcome measures

- BLW studies rely heavily on self-reported dietary intake and anthropometrics rather than objective measurements.
- Breast milk intake in BLW is typically estimated, complicating nutrient adequacy assessments.

- RF studies often lack long-term follow-up and rarely analyse outcomes by child age, they have high dropout rates, limited use of behaviour change theory, and poor reporting of intervention fidelity.
- Important outcomes such as weight gain velocity, growth trajectories, eating behaviours, and food acceptance are seldom included.
- BLW safety concerns (e.g., choking risk) are based on self-reported data, often misclassifying gagging episodes.

Areas for further research

Study design

- Employ large, high-quality randomised controlled trials for BLW and methodologically rigorous, theory-informed, longitudinal designs for responsive feeding interventions.
- Use standardised definitions of BLW and consistent outcome measures across studies.
- For multicomponent responsive feeding interventions, apply frameworks such as Multiphase Optimization Strategy (MOST), for optimising the design of such interventions (426) to isolate effects of individual components (e.g., via factorial experiments).
- Incorporate longer-term follow-up to evaluate growth trajectories, obesity risk, and eating behaviours beyond infancy for BLW.
- For responsive feeding, ensure longitudinal tracking to clarify causal relationships between feeding practices and child outcomes.

Participants

- Define clear eligibility criteria (e.g., infant age, health status for BLW; caregiver-child dyads for responsive feeding).
- Ensure inclusive recruitment across diverse populations.

Intervention development

- For BLW: Describe the complementary feeding approach and strategies to mitigate micronutrient gaps.
- For responsive feeding: Co-design interventions with caregivers and healthcare professionals to ensure cultural relevance and effectiveness.

Outcome measures

- Use validated tools for dietary assessment measurement.
- Apply objective measurement methods for breastmilk intake (e.g., test-weighing or isotope techniques).
- Evaluate how satiety responsiveness, food neophobia, and feeding practices linked to weight outcomes.
- Analyse outcomes by child age to capture developmental differences.
- Adjust for key variables such as breastfeeding duration, socioeconomic status, and other relevant factors.

ATTUNE STUDY

9

Chapter Nine: Infant sleep, feeding and safety

Bed-sharing, defined as sharing a bed with one or both parents while baby and parent(s) are asleep, has been a common caregiving practice across cultures and throughout human history. Evolutionary and anthropological perspectives emphasise that human infants have historically been cared for in close proximity to caregivers and highlight the potential importance of physical closeness for feeding, regulation and responsiveness. Bed-sharing reflects the biological expectation that human infants are cared for in close contact with their caregivers, rather than in isolation. Contemporary interest in parent–infant closeness, including concepts such as rooming-in, kangaroo care, family-integrated care, and zero separation, reflects a growing recognition of the importance of maintaining physical and relational proximity between infants and their caregivers during the early postnatal period.

Evidence from the UNICEF 2012 review highlighted that breastfeeding and bed-sharing have a closely interconnected relationship, although the risks and benefits vary considerably depending on individual family circumstances, infant characteristics, and the wider social and cultural context. Research indicated that breastfeeding mothers who sleep in close proximity to their infant may report longer breastfeeding duration and increased maternal sleep, while practices such as side-car cribs can support proximity without negatively affecting breastfeeding outcomes.

However, bed-sharing also carries recognised risks, particularly in the presence of factors such as parental smoking, alcohol or drug use, prematurity, or low birth weight. Guidance therefore emphasised the importance of informed, individualised discussions with parents about safer sleep practices, including avoiding sofa-sharing and recognising circumstances in which bed-sharing may increase risk.

Evidence from the updated review is broadly consistent with the earlier UNICEF 2012 evidence summary, particularly in recognising the close relationship between breastfeeding and bed-sharing, the importance of context-specific risk assessment, and the need for informed, individualised conversations with parents rather than routine prohibitions. Both emphasise that risks are greatest in hazardous circumstances such as smoking, alcohol or drug use, and sofa-sharing, while also highlighting the importance of keeping mothers and infants in close proximity and supporting breastfeeding.

This new review extends the earlier evidence by placing much greater emphasis on cultural norms, stigma, parental motivations, inequalities, and the role of relational and culturally sensitive communication. It also provides more detailed discussion of breastfeeding duration, SIDS risk, intentional versus reactive bed-sharing,

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

UNICEF UK-BFI acknowledges that many families will choose or end up bed-sharing, whether intentionally or reactively, so to support parents BFI takes a harm-reduction approach, services accredited under BFI standards are expected to:

- Provide clear, evidence-based, and non-judgemental information about infant sleep, including the risks and benefits of bed-sharing[137].
- Encourage room sharing (defined as babies sleeping in the same room, but on a separate surface (e.g., crib, bassinet near the parental bed) and support mothers to always have their babies by their bedside, including overnight.
- Give parents tailored guidance on safe bed-sharing, outlining situations when it is unsafe (e.g., if parents smoke, have consumed alcohol or drugs, are extremely tired, or if the baby is preterm or unwell).
- Highlight safe sleep environments, such as a firm mattress, absence of loose bedding, and avoiding sofa-sharing, while empowering parents to make informed decisions.
- Ensure staff are trained to have open, respectful conversations about sleep practices, acknowledging parental instincts and cultural traditions.

UNICEF UK's stance on bed-sharing aligns with NICE requirements that every routine postnatal contact includes information on safer practices for bed-sharing and clear discussion of when not to bed-share[138,139]. Devolved guidance echoes the same: Scotland's Safer Sleep for Babies[140] and Northern Ireland's Promoting Safer Sleeping for Infants[141] both stress consistent messaging on high-risk situations while enabling tailored conversations that support breastfeeding and close parent–infant relationships – both of which are core BFI values. Internationally, WHO safe-sleep materials[142] emphasise universal risk-reduction (back-sleeping, firm/clear sleep space) rather than endorsing bed-sharing per se; the UK adapts this within an informed-choice model consistent with BFI. UNICEF UK BFI has also worked collaboratively with organisations such as The Lullaby Trust, alongside public health bodies, to develop evidence-based guidance on infant safety, particularly safer sleep and SIDS prevention.

Summary of the evidence in relation to UNICEF UK BFI standards

The body of evidence included in the review demonstrates that infant sleep practices, and bed-sharing in particular, are shaped by a complex mix of cultural norms, parental motivations, and practical realities. In many non-Western/minority communities, bed-sharing is normative and supported by family networks. However, in Western contexts, bed-sharing mothers can face disapproval, leading to concealment, and limiting opportunities for harm-reduction information and support.

[137] Although this practice is often referred to as co-sleeping (as defined by the Lullaby Trust - The Lullaby Trust), it is important to recognise that terminology and definitions vary across the published literature.
[138] NICE - Postnatal care (QS37)
[139] NICE - Postnatal care (NG194)
[140] Scottish Government - Safer sleep guidance
[141] Public Health Agency - Promoting Safer Sleeping for Infants - Guidance for Practitioners.
[142] WHO - Sleep safely guidlines for newborns and children under 5

The most consistent finding is the strong interdependence between bed-sharing and breastfeeding: mothers who strongly intend to breastfeed are more likely to bed-share and mothers who bed-share with their infants tend to breastfeed more frequently, for longer durations, and over more months than those who do not bed-share. This is significant because breastfeeding itself provides protection against sudden infant death syndrome (SIDS), even when not exclusive. Evidence indicates that as little as two months of breastfeeding can reduce the risk of SIDS by half. Although important to note that while some of the evidence highlights that bed-sharing without hazards and breastfeeding may not increase the risk of SIDs or even be protective, further research that controls for known risk-factors is needed.

The greatest risks associated with bed-sharing are consistently observed in hazardous circumstances, particularly sofa-sharing, parental smoking, and alcohol or drug use. Some evidence suggests that, in the absence of these hazards, bed-sharing may not confer additional SIDS risk, although uncertainty remains because of residual confounding and variation in study definitions and design. Bed-sharing has also been associated with increased infant arousability and mother–infant sleep synchrony, which have been proposed as possible protective mechanisms. However, the physiological significance of these patterns remains uncertain, and other features of the bed-sharing environment, such as overheating or soft bedding, may increase risk.

The evidence included in this review suggests that only a minority of parents consistently follow core safe sleep practices. Unsafe behaviours persist, including prone positioning, the use of soft bedding and non-infant sleep surfaces, as well as disparities linked to race and socioeconomic status. Evidence indicates that relational, conversational, and culturally sensitive approaches to safe sleep education are more effective than prescriptive or directive warnings.

The UNICEF UK BFI reflects the available evidence in its standards and guidance. Rather than prohibiting bed-sharing outright, BFI adopts a harm-reduction approach, supporting parents to keep their babies close while also providing clear, evidence-based information about when bed-sharing is unsafe and how to minimise risks. This strategy enables services to protect breastfeeding while giving parents the practical tools to make informed choices about sleep. Importantly, BFI emphasises culturally sensitive and non-judgemental communication, recognising that stigma around bed-sharing can lead to concealment of practices and greater risk. By encouraging openness and tailoring information to family values and circumstances, BFI ensures that parents are supported rather than alienated.

In addition, BFI standards acknowledge the importance of parental wellbeing, expectations, and the postnatal environment. Evidence reports that parents' motivations to bed-share include soothing unsettled babies, bonding, monitoring safety, maintaining traditions and economic/housing constraints. Findings also vary depending on whether bed-sharing is intentional and valued, or reactive and stress-driven. Some studies suggest that experiences and outcomes may differ according to whether bed-sharing is intentional and valued or occurs reactively in response to sleep difficulties. Intentional bed-sharing has been associated with greater parental satisfaction and breastfeeding, whereas reactive bed-sharing has more often been associated with stress, exhaustion and dissatisfaction. However, relatively few studies distinguish these patterns clearly, so these findings should be interpreted cautiously.

Parental stress is often linked more to mismatches between expectations and infant behaviour than to bed-sharing itself. Programmes such as *Sleep, Baby & You*, may help to reframe expectations and reduce stress, but further research is needed. Similarly, service design choices, such as the provision of side-car bassinets, may help reduce unsafe practices and improve the hospital experience for mothers and infants.

The alignment between research evidence and the UNICEF UK BFI standards highlights the importance of moving beyond routine prohibitions towards nuanced, hazard-specific, and culturally sensitive guidance, potentially tailored according to whether parents intend or do not intend to bed-share. By supporting breastfeeding, enabling informed choice, addressing inequities, and promoting safe environments that allow mothers and babies to remain close, the BFI provides an evidence-based framework for reducing risk while safeguarding parental wellbeing and the parent-infant relationship.

Recommendations for the BFI programme

- **Maintain a harm-reduction approach to bed-sharing**, rather than wholesale discouragement in line with wider organisation and national guidance. BFI should continue to support open, non-judgemental conversations that help parents understand when bed-sharing is safe or unavoidable and how to reduce risk.
- **Strengthen the link between infant sleep guidance and breastfeeding support**. BFI guidance should continue to avoid separating sleep safety from breastfeeding support, and should help staff discuss night-time feeding, normal infant waking, responsive feeding and safe proximity together.
- **Support staff to have relational, culturally sensitive, individualised conversations** to avoid stigma or fear of criticism to prevent parents concealing bed-sharing practices.
- **Promote realistic expectations about infant sleep and parental wellbeing.** BFI could strengthen guidance on instinctive newborn behaviours, parental coping, responsive care and practical planning for tiredness, including considering appropriate resources where possible.

Detailed overview of included evidence

The evidence reviewed is reported in several themes relating to infant sleep practices. These include the relationship between bed-sharing and breastfeeding, parents' motivations for and experiences of bed-sharing, considerations relating to risk, safety and SIDS, and adherence to safe sleep recommendations. It also considers the implications of sleep arrangements for maternal and infant outcomes, including sleep, wellbeing, parent–infant relationships and infant development. An infographic that outlines best practice is presented in Figure 8. Full details of the included reviews and empirical studies are provided in the Appendices.

Bed-sharing and breastfeeding

One of the most consistent findings is the strong and reciprocal relationship between bed-sharing and breastfeeding (427, 428). Baddock et al. (427), synthesising 59

studies from 48 cohorts, reported robust associations between bed-sharing and a range of breastfeeding behaviours, including more frequent and successful feeds, longer total feeding time per night, and later cessation of breastfeeding. Mothers who strongly intended to breastfeed were also more likely to bed-share, suggesting that the practice and the intention reinforce one another. This close connection has been captured in the concept of "breastsleeping"(429), which emphasises the physiological and behavioural synchrony between mother and infant when feeding and sleeping occur together.

While there are difficulties in the definitions of bed-sharing, co-sleeping, etc, in the literature (see below), some evidence highlights that bed-sharing confers more benefits for breastfeeding (e.g., continuation) when compared to room sharing (430).

Long-term studies have also shown that bed-sharing and breastfeeding reinforce one another over time. Ball et al. (430) followed 870 mothers through the first six months postpartum and found that frequent bed-sharers (~28% of their sample) were significantly more likely to maintain breastfeeding at six months compared to those who rarely shared sleep. Frequent bed-sharers also reported stronger prenatal intentions to breastfeed, with breastfeeding valued as part of their parenting identity.

Physical contact and maternal responsiveness

Bed-sharing not only supports breastfeeding through proximity but is believed to also enhance the quality of maternal responsiveness. Little et al. (431), using a combination of online surveys (with 626 breastfeeding mothers) and feeding logs (from 96 participants), found that practices involving direct physical contact such as bed-sharing and babywearing[143], predicted more responsive feeding patterns. Mothers who maintained frequent contact tended to feed more responsively, breastfeed exclusively for longer, and continue breastfeeding beyond six months. The authors concluding that tactile closeness, not proximity alone, enhances maternal sensitivity to early hunger cues and supports sustained breastfeeding.

Parents reasons for bed-sharing

Why do parents' bed-share: The included literature suggests that bed-sharing and how parents view infant sleep is a complex and deeply contextual practice. In the review by Mileva-Seitz et al. (428), they found that the prevalence rates of bed-sharing varied widely across the globe, with higher rates in Asia, Africa, and developing nations and lower prevalence in North America and Europe.

Salm Ward (432) conducted a narrative synthesis of 34 studies published between 1990 and 2013 to understand parents' motivations for bed-sharing. This work highlighted ten recurring parental motivations for choosing to share sleep surfaces with infants. These included the facilitation of breastfeeding, provision of comfort and soothing, expectations of improved sleep for either infant or parent, closer monitoring of infant safety, strengthening of bonding and attachment, influence of environmental constraints, management of infant crying, continuation of cultural traditions, maternal instinct, and parental disagreement with professional messaging about danger.

[143] Babywearing is the practice of carrying a baby or young child close to your body using a sling, wrap, or structured carrier.

Further qualitative work by Salm Ward (433) revealed that infant sleep decisions are dynamic rather than fixed. Parents commonly altered their plans after the birth, experimented to find what suited their baby, balanced safety concerns with maternal comfort, drew on advice from others, and attempted to be cautious while still meeting family needs. This study confirmed that knowledge of safe sleep practices alone does not determine practice; instead, decision-making is fluid and influenced by multiple, shifting factors.

The role of risk in parents' decision-making: In exploring the role of risk in parents' bed-sharing decisions, a qualitative study by Lau & Hall (434) suggested that parents adapt safe sleep guidelines pragmatically. This involved parents' altering bed-sharing to fit their circumstances and beliefs, for example, by distinguishing between day and night sleep in terms of SIDS risk. They used practices such as swaddling (also see below) and bed-sharing to replicate the womb environment, valued co-sleeping for enhancing attachment and sleep, and withheld their actual sleep arrangements from healthcare professionals due to fear of criticism. Mothers re-framed bed-sharing as reducing SIDS because they believed they would be more aware of their infants' distress. In weighing risk of harm arising from inadequate infant sleep v's SIDS, mothers generally opted for infant sleep. Furthermore, like other areas of evidence reviewed for the ATTUNE study, mothers could turn to the internet or social media sources for information instead of healthcare professionals (see case study findings from staff and parents).

> *They [health visitors] were making you feel you really shouldn't be doing this even if you were thinking about it… The breastfeeding group would have been a bit more 'OK, if you do decide to bed share, this is what you should do', because then some of the mums at the breastfeeding group were saying, 'Oh well, I actually do this'. (Site 3 Mother8)*

Similar views are reported in the scoping review by Kruse et al. (435), who found that positive attitudes from extended family members and cultural networks often reinforced bed-sharing or co-sleeping, while healthcare professionals more frequently discouraged the practice. Discouraging attitudes could also be encountered from extended family members, with concerns relating to child development and social implications being mentioned, although not as frequently as concerns regarding risk from healthcare professionals. Positive reinforcement could encourage parents to adopt and maintain bed-sleeping. Whereas negative comments that failed to acknowledge parental values and cultural traditions could provoke family tension, lead parents to conceal their practices, reducing the opportunity for constructive discussion about risk and may unintentionally push exhausted parents into riskier practices such as sofa sleeping (436).

Risks, safety, and SIDS

Breastfeeding as protective against SIDS: Evidence highlights that breastfeeding itself is protective against SIDS, even when not exclusive. A meta-analysis of eight case-control studies found that breastfeeding for at least two months was associated with an approximately 50% lower risk of SIDS. Breastfeeding did not need to be exclusive to confer this protection. However, the two-month duration was the analytical

cut-point used in the study and should not be interpreted as a threshold at which protection begins (437).

Bed-sharing and mutuality: One of the protective factors for bed-sharing dyads relates to the increased infant arousability[144] and mother-infant sleep synchrony (427, 428). Mutual arousals are believed to prompt rapid caregiving and infant adjustments – helping to keep airways clear, and temperature and breathing regulated. Compared with formula-feeding mothers, breastfeeding mothers were more likely to see these sleep-wake cycles as natural and manageable (438).

Baddock et al. (427) in their review of the evidence noted that bed-sharing infants experienced more frequent arousals, higher body temperatures, and altered sleep and cardiac regulation compared with cot-sleeping infants. While more frequent arousals may confer some protection against SIDS, the warmer environment and altered physiological regulation associated with bed-sharing may increase risk under specific circumstances, such as overheating or excessive bedding. These findings underscore the importance of understanding infants' physiological adaptation to different sleep environments.

Bedsharing in hazardous contexts: The risks associated with bed-sharing have been found to be concentrated in hazardous contexts. Blair et al. (439), drawing on two large case–control studies of 400 SIDS cases and 1,386 controls in England, found that co-sleeping was present in one-third of SIDS cases compared to 15% of controls. The highest risks were associated with sofa-sharing and bed-sharing when parents had consumed alcohol. Smoking further compounded risks, particularly for infants younger than three months. By contrast, in the absence of hazards such as smoking, alcohol, or unsafe sleep surfaces, bed-sharing did not increase SIDS risk and was associated with protective effects among older infants (439). This analysis found no interaction between co-sleeping and low birth weight, and although the risk for pre-term infants who co-slept was more marked, the interaction did not reach statistical significance[145].

Regarding breastfeeding, the study by Blair et al. (439) found that breastfeeding was protective against SIDS when infants slept alone, but was not significantly protective when infants co-slept, potentially explained as differences in routines, sleep position or feeding behaviours. Another meta-analysis by Thomson et al.(437) of case-control studies on breastfeeding and SIDS included 2,259 SIDS cases and found that breastfeeding was associated with a markedly decreased risk of SIDS in a dose-dependent fashion (i.e., >2 months duration). However, while the authors controlled for co-sleeping, they did not control for all the hazards in this environment (e.g., alcohol or drug exposure) and did not control for socioeconomic status. Neither of these studies (437, 439) explored breastfeeding prevalence in hazardous versus non-hazardous bedsharing environments. Another study found that among mothers who breastfed and bed-shared there was a lower frequency of known SID risk-factors, but as this was a cross-sectional study it only highlights associations rather than outcomes

[144] This is thought to be protective because babies who arouse readily are better able to restore normal breathing, rather than remaining in prolonged, unresponsive sleep.
[145] UK guidance from the Lullaby Trust (The Lullaby Trust) and the NHS dedicated advice highlight that premature or low birth weight infants have a significantly higher risk of SIDS if they bed-share. However, this is not within national guidelines.

(440). Overall, these findings emphasise that public health messages should focus on high-risk contexts rather than discouraging all bed-sharing.

While the relationship between breastfeeding, bed-sharing and SIDS is complex, in the discussion article by Bartick et al. (441) they draw on the evidence to highlight several reasons *why* breastfeeding may be protective against SIDS. These include:

- Breastfeeding bedsharing infants rarely sleep prone (after feeding they tend to settle naturally on their backs)
- Breastfeeding mothers commonly adopt a protective sleep posture, keeping their infant's head aligned with their breasts, and creating a boundary with their arm and legs which helps prevent the baby's head moving towards the pillows
- When sharing a sleep surface, both the mother and baby exhibit lighter sleep and wake more easily
- Breastfeeding is more frequent during bed-sharing than dyads sleeping separately
- Bedsharing mother-infant dyad experience increased sleep synchrony – whereby mothers have an increased ability to be vigilant.

Swaddling: A more controversial area relates to swaddling, with evidence highlighting trade-offs between sleep outcomes and feeding safety. Dixley & Ball (442) in a synthesis of six studies, albeit with methodological issues, found that swaddling increased quiet sleep duration and reduced changes between sleep states, potentially helping infants settle. However, by suppressing arousability, swaddling may increase the risk of sudden unexpected death in infancy, especially when newly introduced or combined with unsafe practices.

Swaddling immediately after birth can delay initiation of breastfeeding, reduce suck effectiveness, lower milk intake, and increase weight loss compared with non-swaddled infants (443). It can suppress infant feeding cues and crying, leading to fewer prompts for feeding and potentially reduced milk supply (443). Therefore, while swaddling may help to reduce feeds and promote weight regulation, this approach may undermine breastfeeding adequacy and infant growth (443).

Post-natal equipment: Infant's sleep arrangements following a caesarean section have also been studied. In a randomized post-caesarean postnatal-unit study, side-car bassinets vs stand-alone bassinets showed no significant differences in breastfeeding (0.6 vs 0.4 bouts/hour)[146], sleep overlap, or midwife presence, and bed-sharing rates were similar (444). However, while mothers strongly preferred side-cars, unsafe pillow placement was observed with stand-alone units. These findings thereby suggest that side-cars may reduce unsafe handling even if they do not increase breastfeeding following caesarean section.

Adherence to safe sleep recommendations: Despite decades of public health campaigns, some of the included evidence highlights that adherence to safe sleep guidance remains low. Cole et al. (445), in a cross-sectional survey of 3,341 caregivers

[146] This was a follow-up study to previous RCT post-vaginal births where there was a significant increase in postnatal breastfeeding with both bed-sharing and side-car compared to standalone bassinets. Ball, H. L., Ward-Platt, M. P., Heslop, E., Leech, S. J., & Brown, K. A. (2006). Randomised trial of infant sleep location on the postnatal ward. *Archives of disease in childhood*, *91*(12), 1005-1010.

in Queensland, reported that only 13% followed all six safe sleep recommendations. Risky practices were common, with one-third of infants placed in the prone position, 38% exposed to unsafe bedding or soft items, nearly half placed in non-infant sleep environments such as prams or bouncers, and 50% sharing a sleep surface within the previous two weeks. By eight weeks postpartum, 17% of infants were no longer receiving breastmilk.

Huber et al. (446) highlighted two major challenges for community-level interventions in the USA regarding unsafe sleeping practices: gaps between promotional messages and actual outcomes, and persistent racial and ethnic disparities in both safe sleep and breastfeeding practices. Their mixed-methods study, combining provider interviews with data from national and state surveillance systems, recommended conversational, relationship-centred approaches to intervention delivery, stronger community collaborations, and more equitable organisational practices.

Bed-sharing and maternal and infant outcomes

Aside from benefits in terms of reduced SIDS, bed-sharing is also associated with wider maternal and infant outcomes, outlined as follows:

Bed-sharing and sleep patterns: Mankova et al. (447) explored the existing literature to map the relationship between infant feeding method and total sleep time, number of nocturnal awakenings, awakenings after sleep onset of mothers and infants and sleep quality of mothers. While there was considerable heterogeneity across the studies, most found that breastfed infants wake up more often at night, however total sleep time and time spent awake during the night did not differ between breastfed and non-breastfed infants and their mothers. These findings thereby helping to dispel myths about formula-fed babies sleeping longer. Similarly, Brown and Harries (448) found no differences in night waking or night feeding between breastfed and formula-fed infants. Infants receiving more milk or solid feeds during the day were less likely to feed at night but were no less likely to wake, suggesting that increasing daytime intake does not necessarily reduce night waking.

Parental mental health and well-being: The evidence on the impact of bed-sharing on parental mental health is varied. Mileva-Seitz et al. (428) found mixed results for associations between bed-sharing and maternal mood, and that the associations were complicated by cultural and SES differences. Barry and D'Souza's (449) review also found contradictory findings, with some studies showing reductions in maternal depressive symptoms, some increases, and others no effect, which the authors attribute to heterogeneity in study designs.

Chénier-Leduc et al. (450) addressed a criticism of Barry and D'Souza's (449) review by examining the role of parental expectations. They found that depressive symptoms were more strongly associated with a mismatch between parents' expected and actual sleep arrangements than with the sleep arrangements themselves. Larger mismatches were associated with higher depressive scores in both mothers and fathers, with mothers generally more supportive of co-sleeping than fathers. These findings also reflect those related to intentionality. A systematic review by Mileva-Seitz et al. (428), encompassing 659 publications between 1973 and 2016, found that intentional bed-sharing was generally associated with higher satisfaction, whereas reactive bed-sharing often coincided with stress, marital dissatisfaction, and

perceptions of sleep problems.[147] These authors thereby argue that inconsistencies in prior research may stem from insufficient consideration of parental expectations or intentionality rather than the objective nature of the sleeping arrangement.

One intervention to help reframe parents' expectations and to improve outcomes is the "Sleep, Baby & You," an intervention adapted from the Australian Possums program for use in the UK NHS (451). The program encourages parents to reframe expectations about infant sleep, practice responsive caregiving, experiment with strategies to support infant sleep regulation, and apply Acceptance and Commitment Therapy (ACT) principles to manage negative thinking and anxiety that can interfere with rest. Field-tested by 164 practitioners across five UK sites with 535 families, SBY was judged easy to use and parent-friendly. Around 70% of parents maintained changes for at least two weeks, reported lower stress and improved reframing of infant sleep, and recommended antenatal and digital versions, supporting SBY as a promising and accessible intervention for promoting healthier sleep practices in the first year of life.

Parent-infant attachment: Evidence on attachment outcomes is similarly nuanced. Mileva-Seitz et al. (452) studied 550 Caucasian mother–infant dyads and found that infants who slept alone – when compared with those who bed-shared at least occasionally - were at greater risk of insecure attachment at 14 months compared to bed-sharers. Bed-sharing mothers were also more likely to breastfeed and to use proximal comforting behaviours at night. However, analysis using a three-level measure of bed-sharing frequency (solitary sleepers, some bed-sharing and frequent bed-sharing) did not reveal a dose-response relationship. The authors argue that their results provide some support for the theory that children who do not have nighttime access to their parents may be 'clingier' compared to bed-sharing children. While different results were reported in a New Zealand study (453), with impaired bonding found to be more common among bed-sharing mothers, this was a survey study, that did not distinguish between intentional and reactive bed-sharers.

Infant physiological and psychosocial outcomes: Overall, any associations between bed-sharing and infectious or somatic harms remain inconsistent (428). Only one relevant study was identified within the review period which provided some evidence of the positive impacts on bed-sharing on infant psychosocial outcomes. Lerner et al. (454) undertook an observational study of 63 African American dyads to explore: whether mother-infant bed-sharing at 3 months was related to infants' affect and behaviour during a dyadic stress task at 6 months; and whether nighttime mother-infant contact at 3 months might explain potential connections between bed-sharing and later infant outcomes. This study found that infants engaged in any amount of bed-sharing at three months demonstrated greater self-regulation and lower negativity in a stress paradigm at six months. Moreover, infants whose mothers consistently bed-shared throughout the observation period displayed notably lower levels of negativity during the reunion phase of the stress task than their non-bed-sharing counterparts. Although as night-time contact did not mediate these associations, this suggests that the broader experience of bed-sharing may support socio-emotional regulation.

[147] Currently appears to be little evidence that stratifies bed-sharing into intentional vs reactive and then shows higher prevalence of *reactive* bed-sharing among non-breastfeeding mothers. Most studies linking bed-sharing and feeding show bed-sharing = more/longer breastfeeding overall, without categorising by 'reactive' vs 'intentional'.

Overall, the evidence highlights that supporting safer infant sleep requires more than providing information about risk. It emphasises the importance of understanding how and where families sleep, discussing potential risks openly and without judgement, and working with parents to identify practical strategies that are appropriate to their individual circumstances. Figure 8 brings these elements together as a partnership-based approach to supporting informed decision-making and reducing avoidable risk.



Figure 8: Overview of factors to support informed decision-making and reducing avoidable risk for safer sleep.

Limitations of the evidence base

Generalisability of the findings

- Many studies used small, geographically limited samples, which reduces their generalisability. Even larger cohort and case-control studies were often conducted in single regions or countries. This narrow sampling makes it difficult to draw universal conclusions about bed-sharing, breastfeeding, and infant safety.

Reliance on self-report data

- A substantial proportion of studies relied on maternal recall of infant sleep arrangements, feeding frequency, and bonding experiences. This introduces recall bias and social desirability effects, particularly in contexts where bed-sharing is stigmatised. In some studies, parents admitted concealing their practices from healthcare professionals, suggesting that reporting may underestimate bed-sharing frequency.

Study designs

- Many studies were cross-sectional, limiting causal inference. Longitudinal research was rarer, meaning little is known about the sustained impacts of early sleep arrangements on child development or maternal wellbeing. Even where prospective cohorts were used, follow-up often ended in infancy or early toddlerhood.

Heterogeneity in definitions and measures

- There is a lack of consistency in how terms like bed-sharing or co-sleeping were defined across studies. Some include sofa-sharing in definitions, while others did not. Studies also vary in whether they distinguish between 'intentional' and 'reactive' bed-sharing, which may explain conflicting results across studies. There were also variations in relation to frequency – while some studies include terms related to frequency (such as 'usually', 'regularly', 'every night', or 'at least 5 nights per week') others do not. Similarly, measures of maternal mood, bonding, and infant sleep quality differ, limiting comparability.

Limited consideration of contextual and cultural factors

- While some studies explicitly examined cultural norms, many did not account for socio-economic status, cultural background, or family structure in their analyses. This is problematic as these factors strongly influence parental decision-making, sleep practices, and risks.

Hawthorne effect

- In studies involving video recording or observation (430, 444), participants may have altered their behaviours due to being monitored, raising questions about ecological validity. Observations were also often limited to one or two nights, which may not reflect typical patterns.

Methodological quality

- Narrative and scoping reviews (427, 432, 447) note that many included studies lacked methodological detail, did not adequately control for confounders such as smoking or alcohol, or used inconsistent measurement tools. This reduces confidence in pooled conclusions.

Areas for further research

Longitudinal effects

- Future work should examine the long-term effects of early sleep arrangements on child development, attachment security, socio-emotional regulation, breastfeeding duration, and maternal mental health. Most current studies end within infancy or toddlerhood, leaving gaps in understanding ongoing impacts.

Cross-cultural and contextual comparisons

- There is a need for more research outside Western contexts, especially in regions where bed-sharing and co-sleeping are normative. Cross-cultural comparisons could help distinguish universal from culture-specific outcomes and inform more nuanced global guidance.

Maternal and paternal mental health

- Findings on maternal depression and co-sleeping remain mixed, and paternal experiences are rarely studied. Future research should investigate how sleep arrangements intersect with both maternal and paternal mental health, marital dynamics, and family stress.

Intentional vs reactive bed-sharing

- Evidence suggests outcomes differ depending on whether bed-sharing is intentional (proactive, valued, often linked with breastfeeding) or reactive (a response to infant difficulties, often associated with stress). More studies should explicitly examine this distinction and its implications for outcomes.

Safe sleep messaging and intervention testing

- Research should test tailored risk-reduction approaches that reflect parental motivations and lived realities, rather than routine discouragement of bed-sharing. Intervention studies (e.g., 'Sleep, Baby & You') show promise in reframing expectations, but larger-scale trials are needed.

Mechanisms underpinning breastfeeding benefits

- Although the association between bed-sharing and breastfeeding is consistent, the underlying physiological and behavioural mechanisms remain poorly understood. Future work could explore how nocturnal proximity affects maternal milk production, infant feeding cues, and arousability.

Integration of swaddling and feeding research

- Research on swaddling points to potential risks for breastfeeding and arousability, but evidence is limited. More work is needed to clarify how swaddling interacts with feeding practices and infant sleep safety, and to develop integrated guidance for parents.

Partner, family, and structural influences

- Most studies focus solely on mothers, neglecting the roles of fathers, partners, and extended family in sleep decisions. Research should also account for structural factors such as poverty, housing conditions, and healthcare access, which shape both risks and choices.

Consistency in terminology and measurement

- Developing standardised definitions and measures of bed-sharing, co-sleeping, and related outcomes is critical to improving comparability across studies and strengthening evidence syntheses.

ATTUNE STUDY

10

Chapter Ten: Care in the neonatal unit

Admission to a neonatal unit (NNU) is often an unexpected and highly stressful experience for families. Preterm and sick infants require specialised medical care to support survival and optimise growth and neurodevelopment, yet this care frequently involves prolonged hospitalisation, separation from parents, invasive procedures and disruption to early parent–infant interactions. Parents commonly experience anxiety, stress, guilt, uncertainty, and loss of confidence in their caregiving role, while the neonatal environment can present additional barriers to establishing breastfeeding, skin-to-skin contact and responsive caregiving. These challenges may adversely affect parent–infant attachment, parental mental wellbeing, and infant feeding outcomes if appropriate support is not provided. Increasing recognition of the importance of family-centred care (FCC) and family integrated care (FICare) has led to a shift towards models of neonatal care that actively involve parents as partners in their infant's care.

Evidence from the UNICEF 2012 review highlights that successful implementation of family-centred care (FCC) in neonatal services requires organisational commitment and healthcare professionals to provide breastfeeding support, developmental care, emotional support and effective communication. FCC emphasises treating parents with dignity and respect, building trusting relationships, involving them in all aspects of their infant's care, recognising the emotional impact of preterm birth, supporting the wider family, promoting parenting skills and breastfeeding, and providing practical, psychosocial and family-centred support.

It highlights how breastfeeding can be challenging due to infants' immature feeding reflexes, neurological immaturity and fatigue, alongside maternal stress, separation and medical interventions that can affect lactation. Mothers should begin expressing within 1–2 hours of birth and express at least eight times in 24 hours including once at night to establish an adequate milk supply, with skin-to-skin contact, breast massage and hand expression supporting milk production.

Successful feeding requires individual assessment, appropriate positioning, kangaroo care, non-nutritive sucking, peer support, and multidisciplinary staff training. Additional support may be required for mothers with diabetes or multiple pregnancies, donor breastmilk should be used where maternal milk is unavailable, and breastfeeding should continue during the management of neonatal jaundice.

Evidence from the updated review largely corroborates the UNICEF (2012) review, reinforcing the importance of family-centred care, breastfeeding support, kangaroo care, early milk expression and parental involvement in improving outcomes for preterm infants. However, the newer review extends the evidence by providing stronger support for specific breastfeeding interventions, including cue-based feeding, avoidance of bottles during breastfeeding establishment, cup feeding, oropharyngeal colostrum administration and structured Family Integrated Care (FICare) models.

It also expands the evidence relating to donor human milk, demonstrating reductions in necrotising enterocolitis, earlier achievement of full enteral feeding and improved

breastfeeding rates at discharge compared with formula feeding, while reinforcing that mothers' own milk remains the optimal source of nutrition.

The updated review also provides greater insight into parental experiences by identifying barriers such as maternal stress, inconsistent advice and restrictive hospital environments, alongside facilitators including skilled staff, supportive communication and family-friendly care.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

Services accredited under BFI standards are expected to:

- Support parents to have a close and loving relationship with their baby.
  This includes information about the importance of touch, comfort and communication with their baby and how this impacts their development, together with support to provide comfort and emotional support, including prolonged SSC, comforting touch and responsiveness to behavioural cues. For parents who are bottle feeding, to do this responsively.
- Enable babies to receive breastmilk and to breastfeed when possible.
  This values mother's own breastmilk as the first choice of feed and includes support to express early and effectively. Mothers are supported to transition onto breastfeeding with appropriate support and prepared effectively for discharge.
- Value parents as partners in care.
  This ensures that all parents have unrestricted access to their baby and that the environment enables this to happen. Staff support parents to be fully involved in their baby's care, keeping them fully informed, listening to their wishes and observations about their baby and involving them fully in decision making.

The UNICEF UK Baby Friendly Initiative neonatal standards are closely aligned with both national and international policies. Internationally, they reflect the WHO/UNICEF Neo-BFHI framework[148], which adapts the original Ten Steps to Successful Breastfeeding for neonatal units, emphasising early initiation of breastfeeding, skin-to-skin contact, and adherence to the International Code of Marketing of Breast-milk Substitutes. Nationally, they complement UK guidelines such as NICE recommendations[149] and British Association of Perinatal Medicine (BAPM) standards[150], which advocate for family-centred care, parental involvement, and evidence-based feeding practices. Recent UK legislation on Neonatal Care Leave and Pay[151] also supports BFI principles by enabling parents to remain with their infants during critical care periods. Globally, the BFI approach mirrors WHO's guidance for integrating breastfeeding support into health systems, including staff training, monitoring, and compliance mechanisms. This alignment ensures that UK neonatal

[148] Neo-BFHI: The Baby-friendly Hospital Initiative for Neonatal Wards. - International Lactation Consultant Association
[149] Recommendations | Postnatal care | Guidance | NICE
[150] Service and Quality Standards for Provision of Neonatal Care in the UK | British Association of Perinatal Medicine
[151] Neonatal Care Pay and Leave: Overview - GOV.UK

units meet international best practice while embedding national priorities for infant health, parental empowerment, and equitable care.

Summary of the evidence in relation to UNICEF UK BFI standards

The body of evidence included in our review describes strategies to improve breastfeeding and breast milk feeding for preterm and sick infants in neonatal units (NNUs). The evidence identifies a range of strategies that can support breastfeeding and breastmilk feeding among preterm and sick infants. Avoiding bottles during the establishment of breastfeeding can improve breastfeeding outcomes, while skin-to-skin contact/Kangaroo Care and cue-based feeding offer broader benefits for feeding, infant wellbeing and parental involvement. Cup feeding, oropharyngeal colostrum administration and quality improvement approaches may also offer benefits, although the strength of evidence varies across interventions and outcomes. Structured parental education and support can further strengthen parental confidence and aspects of breastfeeding and breastmilk feeding.

When mother's own milk is unavailable or insufficient, donor human milk provides an important alternative to formula feeding. Across the evidence base, donor milk is associated with reduced risk of necrotising enterocolitis, shorter duration of parenteral nutrition, and earlier achievement of full enteral feeding compared with infant formula. Although formula feeding may support greater short-term growth, fortification of human milk can improve growth outcomes while maintaining protective benefits. These findings support donor milk as a clinically beneficial strategy within neonatal feeding pathways.

Evidence also indicates that the introduction of donor milk can influence maternal experience. While some mothers initially report feelings of guilt or disappointment when unable to provide sufficient milk, supportive communication, clear information, and culturally sensitive counselling promote acceptance and reassurance. The availability of donor milk demonstrates reductions in necrotising enterocolitis and earlier achievement of full enteral feeding compared with formula, while the introduction or availability of donor milk within neonatal services has been associated with higher rates of breastmilk feeding at discharge.

Evidence on Family Integrated care (FICare) models which empower parents as partners in care is described. FCC/FICare models demonstrate benefits for parental involvement, confidence, satisfaction and stress, with some evidence of improvements in infant growth, breastfeeding and length of stay. Evidence for other outcomes, including attachment, depression and longer-term neurodevelopment, is less consistent. These approaches can help parents feel more confident, involved and connected to their baby, although their effectiveness depends on how they are implemented and supported within neonatal services.

Research limitations include small sample sizes, single-centre studies, heterogeneity of interventions, short follow-up periods, and underrepresentation of fathers and marginalized groups. Many studies rely on self-reported data and lack standardised definitions for breastfeeding outcomes, making comparisons difficult. Future research recommendations include conducting large multicentre randomised controlled trials, developing standardised protocols, extending follow-up to assess long-term

outcomes, and incorporating digital tools and telehealth for post-discharge support. Comparative effectiveness studies and mechanistic research are also needed to understand how combined interventions influence neurodevelopment and maternal well-being.

In relation to milk type, further research is needed to clarify how differences between mother's own milk and pasteurised donor milk influence gut microbiome development, growth trajectories, and long-term neurodevelopment. Although donor milk remains the recommended alternative when maternal milk is unavailable, greater exposure to mother's own milk is consistently associated with improved growth, more favourable microbial colonisation patterns, and enhanced developmental outcomes, reinforcing the importance of maximising maternal milk provision wherever possible.

These findings strongly align with UNICEF BFI standards, which require neonatal services to support close and loving parent-infant relationships, enable babies to receive breastmilk and breastfeed when possible, and value parents as partners in care. The evidence reinforces that embedding the principles of FCC, staff training, family-friendly environments, and consistent breastfeeding support into neonatal care can improve infant health, maternal well-being, and long-term breastfeeding success. Integrating consideration of donor milk into neonatal standards would help ensure access to human milk when mother's own milk is unavailable, while maintaining a clear priority on protecting, promoting and sustaining maternal milk production.

Recommendations for the BFI programme

- **Put greater emphasis on practical, skilled support for early and sustained provision of mother's own milk**. BFI could strengthen expectations around early expression, frequent expression, access to appropriate pumps, support to express close to the baby, and skilled help with transition to direct breastfeeding.
- **Strengthen the link between the provision of mother's own milk and its relationship with maternal and infant health and emotional wellbeing**. Compassionate support which recognises the emotional and practical demands of expressing can help protect and support parents and positively impact mother's and infant's mental health and strengthen parenting role, and mother-infant relationship.
- **Include clearer guidance on donor human milk within neonatal feeding pathways** as donor milk has important protective benefits compared with formula,, can support parental mental health and may support breast milk feeding at discharge, when embedded in a supportive care model.
- **Enhance staff knowledge of infant behavioural cues, feeding readiness and responsive feeding approaches as part of relationship-based neonatal care.** Feeding readiness, infant cues, parental confidence and transition to direct breastfeeding should be emphasised. Evidence suggests benefits for parental involvement, confidence and feeding outcomes, although findings are mixed for some clinical outcomes and implementation is influenced by clinical judgement, staff training and local policies.

Detailed overview of included evidence

This chapter synthesises evidence on interventions and approaches that support parent–infant relationships, breastfeeding and breastmilk feeding, developmental care and family involvement within neonatal services, with consideration of how these contribute to improved clinical, developmental and psychosocial outcomes for infants and their families. Full details of the included reviews and empirical studies are provided in the Appendices.

The importance of breastmilk in a neonatal unit (NNU) context

Approximately 8% of infants are born preterm in the UK, placing them at a significantly higher risk of mortality and health complications than infants born at term[152]. Breastmilk is particularly important for preterm infants because their organs and immune systems are immature and vulnerable. Human milk helps protect against serious complications such as necrotising enterocolitis (NEC) and late-onset sepsis by supporting gut maturation, reducing inflammation, and providing antibodies and other immune factors that preterm babies have not yet fully developed. It is also easier to digest than formula and is associated with improved feeding tolerance, earlier establishment of full feeds, and better long-term neurodevelopmental outcomes.

The WHO recommends that stable preterm or low birth weight (LBW) infants should start breastfeeding as soon as possible and be exclusively breastfed for the first six months[153]. UNICEF UK BFI guidance recommends expressing 8–10 times in 24 hours, including at least once at night, with no long gaps between expressions[154]. WHO recommend that the expressed milk can be given to the baby via a tube, cup, spoon, or bottle: support should be provided for mothers and babies to transition to direct breastfeeding as soon as they are able[2].

Qualitative evidence highlights that, while antenatally some mothers had not decided whether they were going to breastfeed or not, having a premature baby placed them in different situation of feeling ‘forced‘ (455-457) or wanting to breastfeed/provide breast milk (362) for their infant’s health. Some mothers felt obligated to provide breast milk to make amends for their perceived role in the premature birth (362, 458) or because it was their only way to participate in infant care (455, 457). Whereas, for other mothers, providing breast milk was perceived as a symbol of the maternal role (69, 458) and their unique way of helping and ‘saving‘ their infants (69, 456, 458): expressing could also provide hope to achieve their breastfeeding goals (69, 456, 459). Providing breast milk was described as a bridge for mothers to sustain a continued connection with their infants (69, 362), fostering attachment and creating a meaningful bonding experience (458). Emerging evidence also suggests that the provision of donor human milk has a positive impact on the mothers’ wellbeing (460, 461) (also see 'donor milk' section below, and evidence from parent case study findings).

[152] Our World In Data. Neonatal mortality rate, 2023
[153] World Health Organization. (2011). *Exclusive breastfeeding for six months best for babies everywhere*. https://www.who.int/news/item/15-01-2011-exclusive-breastfeeding-for-six-months-best-for-babies-everywhere.
[154] UNICEF UK, FM E. The evidence and rationale for the UNICEF UK Baby Friendly Initiative standards. 2013. Available: https://www.unicef.org.uk/babyfriendly/about/evidence-and-rationale-for-the-babyfriendly-standards/.

Partners in care

Partners in care is a broad philosophy that recognises parents as essential members of the neonatal care team, promoting collaboration, shared decision-making and parental involvement. Family Integrated Care (FICare) is one structured model through which these principles can be operationalised, using parent education, coaching, peer support and participation in care.

Qualitative research emphasises the need for a partner in care approach in neonatal care. Research reports that parents of premature or sick infants can experience intense anxiety, uncertainty, guilt and fear as they struggle to make sense of a birth that feels abrupt, traumatic and far removed from their expectations. Many mothers describe a sense of loss, shock and disconnection, reporting that they did not initially feel like a 'real mother' because they were separated from their baby, unable to hold or care for them and reliant on staff to make decisions. The unfamiliar and highly medicalised neonatal environment also further heightens stress. Parents can experience difficulties when handling their infant due to their size, health, fragility and the monitors and feeding tubes connected to them (69, 455, 458). These negative experiences can leave parents feeling like outsiders, observing rather than actively parenting, because decisions are being made by staff and routines for infant care are dictated by procedures and rules (292, 310, 311, 362, 455, 462, 463). A review exploring the barriers and enablers to fathers' involvement in neonatal units revealed that fathers often felt excluded, with maternal priorities dominating care models, leading to feelings of isolation and diminished self-efficacy (464). Some parents report feeling that their baby belonged more to the staff than to them (455).

When staff support more active parental involvement, parents gain confidence, suggesting that opportunities to learn new skills, particularly around feeding and handling, are crucial for developing parenting self-efficacy (53, 292, 310, 362). Being enabled to interact with and care for their infant was central to parents gaining a sense of control, feeling like a parent, and developing a connection with their baby (292, 310, 311), and with potential positive implications for breast milk feeding (53) (also refer to evidence regarding preterm infants, bonding and attachment and developmental care practices in Chapter Eleven). Furthermore, parents feeling that they know their baby better than staff is crucial in developing a sense of ownership (362). Situating parents as partners in care therefore plays a critical role in situating parents as central partners in their infant's care, with implications for parental and infant health and well-being (also see case study findings from staff and parents).

When looking at the evidence for partners in care – it is relevant to draw on research focused on a FICare approach. However, the literature is complicated by differences in a Family Centred Care (FCC) and FICare approach and these terms being used interchangeably. FCC is an overarching philosophy that recognises families as partners in their infant's care through principles of respect, information sharing, participation and shared decision-making. However, FCC does not prescribe how these principles should be implemented, resulting in variation across neonatal services. In contrast, FICare is a structured model that operationalises FCC by supporting parents to become active members of the neonatal care team through parent education, staff training, peer support and organisational changes that facilitate parental involvement. FICare is generally regarded as an evolution of FCC, providing

a practical framework for translating family-centred principles into routine neonatal practice[155].

Several interventions have been developed to translate the principles of FCC into neonatal practice, although they differ in their primary focus and mechanism of implementation. Developmental care programmes such as the Newborn Individualized Developmental Care and Assessment Program (465) emphasise individualised care based on infant behavioural cues while promoting parental involvement in caregiving. Similarly, Family and Infant Neurodevelopmental Education and Close Collaboration with Parents are primarily staff-focused educational interventions that seek to improve healthcare professionals' knowledge, communication and partnership skills, thereby enhancing collaboration with families and supporting parent–infant relationships (466). In contrast, FICare interventions generally extend beyond staff training by integrating parents as active members of the neonatal care team through a defined programme of parent education, staff education, peer support and organisational change. Some examples include the original Canadian FICare model, developed by Bracht, O'Brien and colleagues. An adapted Alberta FICare model developed for Level II neonatal units (467, 468) and in the UK, Integrated Family Delivered Care (IFDC) adapted for NHS neonatal services (469, 470).

A scoping review provided a detailed description of what constitutes FCC[156] interventions in NNUs (471). The review included 146 RCTs of FCC and FICare-type interventions, identifying 77 distinct intervention packages. Educational interventions dominated (94.5% of RCTs), often combined with family support, environmental changes, communication strategies, and policy initiatives, but direct comparisons of the same interventions were lacking, reflecting the broad nature of FCC. The authors highlighted gaps such as limited interventions for fathers, siblings, and other family members, inadequate reporting of staff training, minimal physician involvement, and lack of outcome measurement in health workers.

A mixed-methods systematic review of 48 studies examined the effectiveness and family experiences of interventions promoting partnerships between families and paediatric and NNUs. The interventions included education, touch, family participation in rounds, amongst others. Meta-analyses revealed improvements in anxiety, satisfaction with FCC/FICare, and stress, but no conclusive effects on attachment and depression. Qualitative findings highlight that parents' feeling involved as equals were associated with parental feelings of respect, dignity, emotional support, and empowerment that improved parental confidence, communication, and involvement; however, the research also revealed challenges such as persistent stress and occasional increased anxiety due to information overload (472). Further qualitative research supports these findings highlighting that while parents valued 'teaching' and 'explanations' (292, 310) about caregiving activities and what was expected of them (311), feelings of being overwhelmed in the immediate postnatal period (310) meant they required repeated, consistent and clear information (311).

[155] The evolution of family-centered care: From supporting parent-delivered interventions to a model of family integrated care - Franck - 2019 - Birth Defects Research - Wiley Online Library

Systematic reviews have reported that FCC/FICare in NNUs significantly improves infant weight gain and sleep duration, improves breastfeeding rates and shortens the total length of hospital and NNU stay (473-476). Interventions and support that engages parents as partners in care also enhances parental outcomes including increased satisfaction, knowledge, and skills, while follow-up data indicates reductions in parental anxiety, depression, and stress (473, 475). Similar positive impacts of FCC/FICare on parents' well-being, knowledge, and participation, as well as decreased stress and anxiety in paediatric settings compared to usual care have also been reported (477).

Overall, the evidence highlights that partnership in neonatal care is about more than involving parents in individual caregiving activities. Parents can initially feel like outsiders within a highly medicalised environment, particularly when separation and reliance on healthcare professionals disrupt their expected parental role. Enabling closeness, shared decision-making and recognition of parents' knowledge of their own baby can help restore confidence, connection and parental identity. Figure 9 illustrates the conditions that can support this transition from feeling like an outsider to being enabled and recognised as their baby's parent.

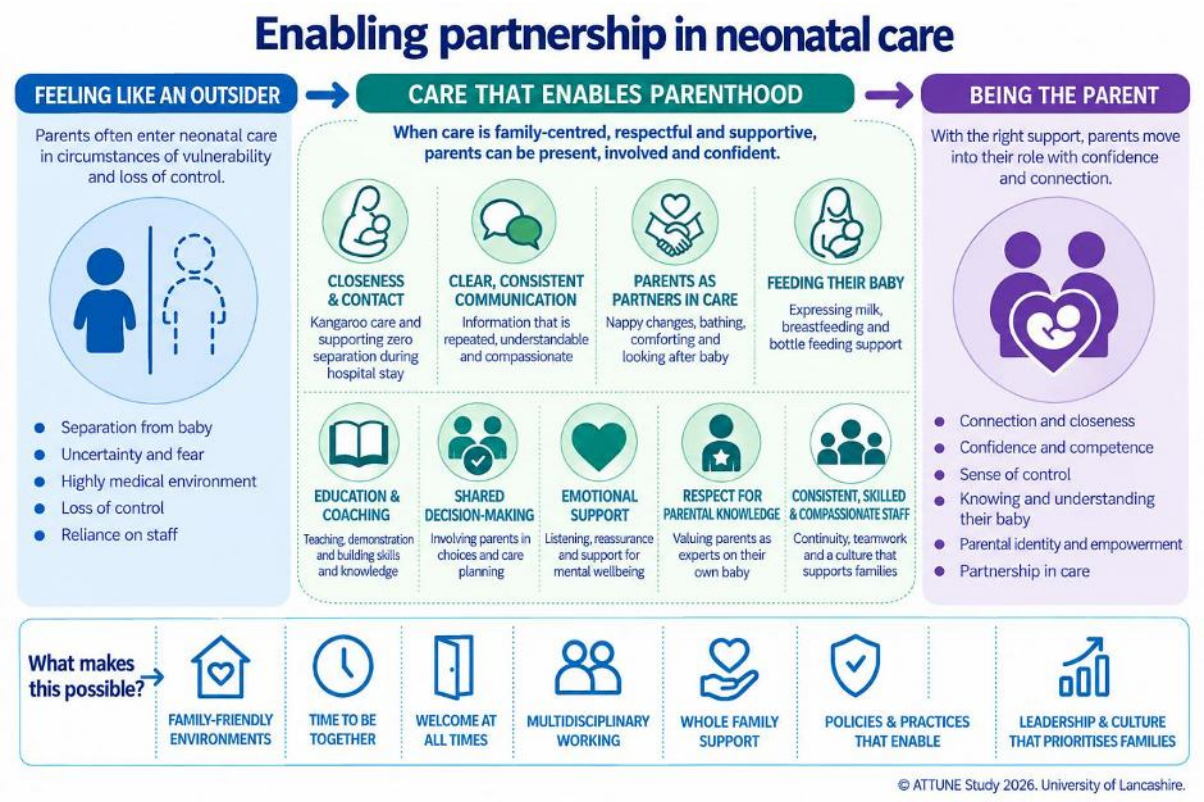


Figure 9: Conditions that can support parents transition from feeling like an outsider to being enabled and recognised as their baby's parent.

> *And she was like, 'oh, you can do something called NG competencies'. So, I had a leaflet, and then you have three sessions being supervised, and then do it on your own. I was so excited once that lady said you can do it because to me, I thought, oh, I'm not qualified, I'm not clinical, I'm not sterile or whatever. They said you don't have to be to do tube feeding. was so nice someone could show me to do that. And in the end, I did do some of that as well. … I enjoyed it. I would much rather have fed her the normal way, but it was nice that I could help her care.* (Site 1 Mother1)

Avoidance of bottles

In a review of reviews[157] of NNU interventions to increase breastfeeding in preterm infants, Hilditch et al.(478) found clear evidence of benefit for the avoidance of bottles during the establishment of breastfeeding (utilising other feeding devices to supplement breastfeeds e.g., gavage tube[158], cup, spoon, etc) on breastfeeding at discharge and exclusive breastfeeding at 3 months. A retrospective chart review study in the US found that, after controlling for length of stay, VLBW infants born between 24 weeks to 37 weeks, whose first oral feed was directly at the breast when developmentally able were more likely to continue receiving breast milk at hospital discharge (479).

These findings were supported by a Cochrane review of five studies involving 1,152 preterm infants, which found that avoiding conventional bottle-feeding increased rates of full and any breastfeeding at discharge and at three and six months post-discharge (480). Five studies were included, two of the largest evaluating cup feeding, one tube feeding alone, and one a specially designed teat intended to mimic breastfeeding. Most were conducted in high-income countries. Avoiding conventional bottle-feeding increased rates of full and any breastfeeding at discharge and at three- and six-months post-discharge. The specially designed teat showed no improvement, suggesting that the observed effects were primarily attributable to cup feeding (and possibly tube feeding). However, evidence for a tube-only approach is uncertain due to poor study quality. No benefit or harm was found for other outcomes, including length of stay or weight gain.

Cup feeding

A review of reviews found evidence (albeit of low-quality) to suggest a possible benefit of cup feeding for preterm infants who are unable to fully breastfeed, compared with other supplemental feeding methods, in reducing rates of no breastfeeding at 3 months (478). Other reviews have found that cup-feeding was associated with more mature breastfeeding behaviours at 1-6 weeks post-discharge, increased likelihood of being exclusively breastfed up to 6 months (481, 482) and having a higher proportion of breast milk feeds post discharge (478, 481-483) compared to bottle fed infants.

Concerns around the safety of cup feeding for preterm infants has been discussed. A systematic review of cup feeding studies (including preterm infants, and multiple randomized trials) undertaken concluded that cup feeding '*appears to be safe'* when

[157] A review of reviews is a type of evidence synthesis that analyses and summarises findings from multiple systematic reviews rather than from individual primary studies.
[158] Gavage feeding is a method of giving milk directly into a baby's stomach through a thin tube when they are not yet able to feed safely by breast or bottle.

judged by physiologic stability and reported adverse events, though intake may be lower and spillage higher than bottle feeding (484).

Included evidence therefore highlights that in clinically stable preterm infants, cup feeding generally shows similar physiological stability compared with other non-breast oral methods and no consistent differences in weight gain or discharge outcomes. However, as the quality of evidence is mixed, local policy can emphasise staff training, readiness cues and monitoring[159].

Supplemental feeding tube devices (SFTD)

Very limited research exists on the use of supplemental feeding tube devices (SFTD) as a method of supplementation for breastfed infants, and the quality of evidence is low to moderate, particularly in preterm infants. Available evidence suggests that SFTDs may help mothers feel empowered and committed to breastfeeding, are acceptable to motivated mothers and can support re-lactation and induced lactation. However, use of SFTDs is associated with practical challenges including device complexity, need for training, frustration with slow milk flow) and variable clinician familiarity and support (485). Current evidence suggests that SFTDs are most appropriately used with clinically stable infants when accompanied by skilled lactation support, although further high-quality research is needed to determine their effectiveness in improving breastfeeding outcomes.

QI bundles

Quality improvement (QI) bundles[160] designed to promote breastfeeding have demonstrated some evidence of benefit for breastfeeding at discharge. For example, QI initiatives in the US, comprising lactation education and support and/or expressing equipment, have been found to significantly increase the proportion of preterm and VLBW infants receiving mother's own milk at discharge by up to 61% (486-488). However, meta-analyses evaluating these bundled interventions are unable to determine which specific components were most effective or which are likely to have the greatest impact on enabling and sustaining breastfeeding among preterm infants (478).

PERIPrem (Perinatal Excellence to Reduce Injury in Premature Birth) is an 11-element perinatal care bundle developed across 12 NHS Trusts to standardise evidence-based care for babies born before 34 weeks' gestation and contribute to the NHS Long Term Plan's aim of reducing neonatal mortality and severe brain injury(489). The bundle includes interventions such as ensuring birth in the right place, antenatal steroids, magnesium sulphate for neuroprotection, optimal cord management, thermoregulation, early maternal breast milk, volume-targeted ventilation, caffeine therapy, prophylactic hydrocortisone, probiotics, and intrapartum antibiotic prophylaxis to reduce infection risk. Between 2019 and 2021, implementation of these elements

[159] WHO guidance stipulates that low-birth-weight infants who need an alternative oral method should be fed by cup (or palladai) or spoon – although important to note that the guidance does not address sick LBW infants or birthweight <1.0 kg. Cup-feeding for low-birth-weight infants unable to fully breastfeed

[160] The interventions vary and can include development of evidence-based interventions, education of hospital staff, parental education (prenatal consultations and postnatal education), increase availability of pumps, help to initiate early human milk expression, oropharyngeal administration of colostrum, lactation consultant tracking of visits or phone calls, skin-to-skin care, NNS, human milk management, standardised enteral feeding guidelines, preparation for discharge (family-integrated care, transition to direct breastfeeding), post-discharge lactation support and follow-up care.

increased from 3 % to 29%, with preterm mother–baby dyads significantly more likely to receive the full bundle. The programme was associated with improvements in team functioning, situation monitoring and communication, demonstrating that a coordinated, multi-organisational quality improvement approach can improve the delivery of best-evidence preterm care while strengthening perinatal team performance.

Parent education

Systematic reviews have consistently reported that breastfeeding educational interventions that help parents understand their infants' physical characteristics and recognise their behavioural cues can improve breastfeeding exclusivity and duration in late preterm infants (481, 483, 490). Other studies have found that parental education programmes are associated with significant improvements in parenting confidence (491) and motor development and feeding skills (492). The PROBREAST parental education programme, which included sessions on the benefits of human milk, the importance of KC, methods of expression and maintenance of milk supply, and collection, storage, and transportation of expressed milk, significantly increased exclusive breastfeeding rates at discharge and direct breastfeeding compared to historical controls (493). This study found that although post-discharge, breastfeeding rates declined sharply, infants discharged with direct breastfeeding maintained higher continuation rates (493).

Parent support

Studies confirm that parents of infants in NNUs need adequate support for breastfeeding. A secondary analysis of the 2010 Infant Feeding Survey found that receiving adequate help with breastfeeding in hospital and being given contact details for community support groups was strongly associated with breastfeeding at 10 days for preterm infants (494). US studies have found that the introduction of dedicated lactation support into NNUs significantly improved staff confidence in providing breastfeeding support (26% to 74%) and increased maternal access to lactation support (15% to 80%) (495). Other positive outcomes of dedicated lactation support included more infants going to the breast as their first oral feed, a rise in receiving any mothers own milk (MOM) during NICU stay, and higher odds of receiving any human milk versus exclusive formula feeding (495-497). However no sustained improvements were observed at discharge from hospital (495, 496). For breast milk supply specifically, parents value practical knowledge about expressing and storing milk, access to accurate information on its benefits, positive reinforcement and guidance from health professionals, and alignment between NICU routines and parental needs (463).

Several qualitative studies, however, describe women receiving insufficient or contradictory information and having inadequate support (practical or emotional) for breast milk feeding (69, 455, 458, 459, 498). Parents believed that inconsistent or conflicting information from staff and limited social support reduced their milk supply (463). Some parents from global majority backgrounds reported being spoken to in a disrespectful manner by healthcare staff (310). These negative experiences could lead to healthcare professionals being perceived as unreliable and untrustworthy, negatively impacting on women's perceived self-efficacy (498). A lack of suitable information could lead to women seeking information from alternative sources (69), such as social media (455) (also see case study findings from staff and parents).

Some women, such as adolescent parents, could also avoid disclosing difficulties due to fear of repercussions or feeling embarrassed about exposing their breasts for assistance (69).

An integrative review identified six key support needs for parents in NNUs: the sharing of consistent information, the need for emotionally intelligent staff, support to care for their infant, targeted support for infant and family needs, psychological/emotional needs, and practical needs (499). Mothers desire positive, empathic, consistent, respectful individualised, and continuous reassurance, reinforcement and support throughout the breast milk feeding/breastfeeding process (53, 311, 362, 458, 462, 463, 498, 500) (also see evidence reported in Chapter Six). For example, as expressing breast milk typically starts slowly, mothers highlighted the importance of being reassured that this was normal and that every drop mattered, motivating them to persist (500). Mothers need health professionals to help them hold and connect with the infant, particularly when attached to clinical equipment (498) and to provide strategies and techniques to support infant feeding (53, 311, 362, 458, 462, 463, 498, 500), and to receive information from professionals who were knowledgeable about feeding a premature infant (498). Mothers also need healthcare professionals to provide emotional support (498) and to provide suggestions if their infants are distressed during feeding episodes (500). Some mothers also referred how to how this support needed to be a balance for healthcare professionals to intervene when needed, or step back if the mother appears to be coping with the situation (500).

Several parental support interventions have shown a positive impact on breastfeeding outcomes. A breastfeeding support intervention for late-preterm infants in Spain that was designed to promote parents' education and involvement, shared decision-making, and avoid separation of the mother-infant dyad, significantly improved exclusive breastfeeding at discharge (68.4% vs. 50.7%) (501). Similarly, a study evaluating a breastfeeding coaching programme for mothers of late preterm infants discharged from NICU in South Korea, combining web-based education and weekly home visits for four weeks, found that coaching significantly increasing breastfeeding rates by week four. Growth outcomes showed no adverse effects, while jaundice (TcB levels) declined naturally in both groups, indicating that coached breastfeeding did not exacerbate hyperbilirubinemia or negatively impact on growth (491, 502). However, while a RCT of proactive telephone support for mothers of preterm infants after NNU discharge in Sweden found no impact on exclusive breastfeeding rates at eight weeks, mothers receiving proactive support reported lower parental stress (503). The lack of effect on breastfeeding may reflect Sweden's high baseline breastfeeding rates and widespread domiciliary care, which helped ease the transition to home (503).

Non-nutritive sucking (NNS)

Systematic reviews have found that NNS shortens the time to achieve full oral feeding and reduces hospital stay (504, 505) and may improve some aspects of feeding development, particularly breastfeeding skills (LATCH scores), feeding readiness, milk intake efficiency, sucking organisation (sucks per burst), and physiological stability during feeding in preterm infants (505, 506). Overall though the evidence for NNS on weight gain, breastfeeding behaviour and breastfeeding rates in preterm infants remains unclear, with systematic reviews finding insufficient evidence to assign levels of effectiveness (504, 506). A RCT in 59 preterm infants found that NNS did not improve language outcomes at six months (507).

Multisensory stimulation

Infants who received a multisensory stimulation intervention together with maternal guidance to recognise infant behavioural cues (H-Hope study: Hospital to Home: Optimizing the Premature Infant's Environment[161]), had a significant increase in the frequency and quality of orally directed behaviours, such as sucking, rooting, and bringing hands to mouth, compared to control. Such behaviours are important indicators of feeding readiness and neurodevelopmental maturity (508). The H-Hope intervention has been shown to improve weight and linear growth in premature infants (509).

Oropharyngeal colostrum administration (OPC)

Oropharyngeal colostrum administration is the delivery of small volumes of maternal colostrum (typically about 0.2 mL) to the oral and pharyngeal mucosa of preterm infants using sterile cotton swabs or oral applicator who are unable to feed orally, with the aim of providing immunological and developmental benefits and reducing complications associated with prematurity. Meta-analyses indicate that OPC in very low birth weight (VBLW) or preterm infants is associated with a significant reduction in ventilator-associated pneumonia and a shorter time to achieve full enteral feeding (510, 511). Reviews also report trends towards reducing the incidence of necrotising enterocolitis (NEC), mortality and sepsis (510, 511). However, no statistically significant differences were observed for length of hospital stay, bronchopulmonary dysplasia, retinopathy of prematurity, infant growth or breastfeeding rates (478, 510).

Breast milk expression

When mothers of premature infants start breast milk feeding, they usually have to express milk due to their infant's immature neurological control of the sucking, swallowing and breathing patterns (500). Evidence highlights that the timing and frequency of breast milk expression are important determinants of milk yield. Expressing within 6 hours of very preterm birth has been found to be associated with a significant increase in mother's milk yield during the first weeks after birth (512). Higher expressing frequency and prior breastfeeding experience of 6 months or more was also strongly associated with increased 24-hour milk yield, with night-time expression offering no inherent benefit beyond reducing long intervals between expressions (513).

Expressed breast milk yield in the first weeks after very preterm birth has been shown to be closely associated with long-term full mother's own milk (MOM) feeding. A study in the UK showed that expressing ≥250 g at Day 4 or ≥650 g at Day 21 increased the likelihood of full MOM feeding at 36 weeks' postmenstrual age by 3–4 times, while yields <50 g at Day 4 or <250 g at Day 21 were linked to 3–5 times lower likelihood (513).

Having sufficient time for expressing (456), or even viewing the time as negligible when compared to the issues their infant was facing (457), supported continued expression (456, 457). Techniques such as visualisation, alternating suction levels, and distraction

161 15-min multisensory intervention appropriate for the infant's current development – comprising Auditory (female voice), Tactile (moderate touch massage), Visual (eye to eye) and Vestibular stimulation (horizontal rocking) - performed twice daily by the mother or nurse prior to feeding plus maternal participatory guidance on preterm infant behavioural cues.

strategies during separation helped maintain milk flow (69, 514). Although an RCT exploring the effectiveness of a 12-minute lactation-focused audio relaxation and visualisation recording to improve milk quantity showed no significant effect on milk quantity, nor on any secondary outcomes including anxiety, post-traumatic stress, or exclusive breastmilk feeding at discharge and follow-up.

While some mothers found expression easy, comfortable, achievable (456), more common were women's views of expressing being unnatural, uncomfortable, demoralising and time consuming (362, 456-458, 463), leading to mothers feeling demotivated and exhausted (69, 362, 455, 456, 458). Some mothers felt that expressing 'takes time away' from being with family, friends or other parents (456, 457). Other mothers perceived that separation (physical and visual) from their infants – due to reasons such as a lack of family rooms, distance from hospital, other family responsibilities - influenced their ability to express (69, 455-458, 463). While women were often encouraged to be close to, or to think about their infants while expressing (458, 514), they could experience challenges in motivating themselves to express when they were separated (69).

Physical discomfort, such as nipple soreness, is common initially (53), and while physical sensations, such as the milk ejection reflex, can reassure mothers about milk sufficiency (514), those who do not experience these sensations can experience anxiety, even despite expressing adequate volumes of milk (514). One strategy to help motivate and sustain expressing noted in Ikonen et al's study was recording and observing an increase in milk supply (456). Logistical and financial challenges in transporting milk to NICU also pose difficulties (69). Some mothers also complained about being unable to express while holding their infants skin-to-skin (311).

Emerging evidence suggests that correct breast pump flange (breast shield) fit may be an important but under-recognised component of lactation support for mothers of preterm infants. Poorly fitting flanges have been associated with nipple pain, tissue trauma, reduced comfort and less effective milk removal, all of which may contribute to reduced milk production and early cessation of expressing (515). In a randomised crossover trial, Sakalidis et al. (515) demonstrated that breast shield design influenced expressing effectiveness, with a wider-angle breast shield improving comfort and milk removal compared with a standard design. More recently, Anders et al. (516)reported that an individualised flange-sizing approach significantly improved maternal comfort and expressed milk volume compared with traditional sizing methods in a within-subject crossover pilot study. However, the evidence remains limited, with few neonatal-specific studies, and further high-quality research is needed.

Breast milk fortifier

A quality improvement project in the UK aimed to improve post-discharge growth in exclusively breastfed preterm infants by introducing routine home use of breast milk fortifier (BMF) until 48 weeks' gestational age. Using four PDSA cycles, the team developed practical guidelines, parent information sheets, and electronic records to support implementation. Results showed improved growth trajectories, with positive changes in weight, length, and head circumference SDS at discharge and at one year compared to pre-QI data. Parents reported that BMF was acceptable, although preparation complexity was noted as a drawback and the authors concluded that use of BMF may protect breastfeeding by avoiding formula supplementation (517).

A Cochrane review evaluated whether adding multi-nutrient fortifier to human breast milk improves outcomes for preterm infants compared with unfortified breast milk (518). Eighteen trials involving 1,456 preterm infants were included. Overall, the evidence (low- to moderate-certainty) showed that multi-nutrient fortification modestly increased in-hospital growth, including weight gain, length, and head circumference growth. However, there was insufficient evidence to determine whether fortification improves long-term growth or neurodevelopmental outcomes. Importantly, the review found no clear evidence that fortification increases the risk of adverse effects such as necrotising enterocolitis, although the certainty of this evidence was low.

Cue-based feeding

Historically, oral feeding in preterm infants was guided by gestational age and volume-driven models, often disregarding developmental readiness and contributing to feeding aversion, poorer neurodevelopment, and prolonged difficulties. Cue-based feeding (CBF), which is closely aligned with the principles of responsive feeding (see Chapter Eight), shifts the focus to infant behavioural and physiological cues, such as alertness, rooting, hand-to-mouth movements, tone, posture, and stable vital signs, rather than age or prescribed volumes (519). A recent global survey of oral feeding practices in NNUs found that 70% of surveyed units used established feeding protocols that incorporate readiness cues, reflecting a growing recognition that CBF is best practice for preterm infant care (520). There is an increasing body of research supporting the use of CBF on several neonatal outcomes:

- ***Feeding outcomes:*** CBF has been found to reduce the time taken for infants to transition from enteral tube to oral feeding (521-524) by an average of 5.5 days (522). A meta-analysis of six RCTs and eight quasi-experimental studies involving 2239 preterm infants also reported that CBF significantly reduced feeding intolerance but found limited evidence on whether it had an impact on number of feeds per day or on amount of milk intake (523).

- ***Weight gain and growth:*** Systematic reviews have reported slightly slower rates of weight gain in CBF infants (522, 525). A review of QI studies reported mixed findings, with some reporting increased weight gain velocity, but lower overall weight gain in the CBF group (521). There was insufficient evidence to establish any impact of CBF on linear growth (525).

- ***Length of hospital stay:*** The impact of CBF on length of hospital stay is unclear. In meta-analyses, Talej et al.(525) reported a slightly shorter hospital stay with CBF, but Watson & Mcguire (522) found no consistent effect. In their review of QI studies, Fry et al.(521) observed shorter hospital stays in the CBF intervention group of 5 of 6 QI studies. Subsequent QI studies have supported this finding, together with associated cost savings for the institution (526).

- ***Impact on parental outcomes:*** A systematic review reported that parental involvement and satisfaction increased significantly following CBF implementation (523). CBF has been found to reduce parental stress and empower parents in NNU settings (521) and a study in the UK reported that mothers depicted CBF as an intuitive and respectful feeding approach that aligned with their desire to meet their babies' needs (527). However, whilst

mothers who successfully practice CBF have described feeling empowered and validated, those who struggle, especially under rigid or judgemental advice, may experience frustration and self-doubt (527).

Healthcare professional practices: A study conducted in the UK found that, whilst healthcare professionals acknowledged the importance of CBF, practices were found to vary across services in part due to institutional constraints (e.g., time pressures, policy requirements) and some staff provided guidance that contradicted the principles of responsiveness, particularly in busy maternity wards (527). Under such circumstances, mothers may find CBF challenging to implement due to lack of support or inconsistent information from health professionals, hospital routines that prioritised scheduled over responsive feeding, and pressure to track milk intake or maintain feeding logs (527).

Use and impacts of donor milk (also see parent case studies)

A 2022 systematic review and meta-analysis evaluated the effects of donor human milk (DHM) compared with formula in preterm infants (528). Eleven randomised controlled trials involving 1,390 infants were included. The analysis found that donor milk significantly reduced the incidence of NEC, shortened the duration of parenteral nutrition, and decreased the time to reach full enteral feeding compared with formula. However, formula feeding was associated with greater short-term growth, including higher weight gain, faster head and length growth, and quicker return to birth weight. The authors concluded that donor milk offers important protective benefits, particularly in reducing NEC risk (528). When donor milk is fortified, growth outcomes may be comparable to those achieved with infant formula, supporting its role as a safe and beneficial alternative for preterm infant nutrition.

Recent reviews comparing mother's own milk with donor breast milk in preterm infants suggest that although donor breast milk is beneficial, it is not equivalent to maternal milk. Greater exposure to mother's own milk is associated with improved growth and a more diverse and favourable gut microbiome. A systematic review by Chen et al. (529) examined the impact of predominant feeding with donor human milk compared with mother's own milk on gut microbiome development in preterm infants. From 717 identified publications, eight studies met inclusion criteria. These studies assessed differences in microbial composition, alpha diversity[162], and specific taxonomic patterns between feeding groups. Across the included studies, consistent differences in microbiome profiles were observed. Preterm infants fed predominantly donor human milk had lower alpha diversity, particularly when preterm formula was also part of the feeding regimen. Taxonomically, donor milk–fed infants demonstrated higher relative abundances of Staphylococcaceae and Clostridiaceae and lower levels of Bacteroidetes and Bifidobacterium compared with those receiving predominantly mother's own milk. These bacterial patterns have previously been associated with less favourable health outcomes in preterm populations. The findings suggest that compositional differences between mother's own milk and donor human milk may influence early microbial colonisation, potentially contributing to differences in clinical outcomes. Although donor human milk remains the recommended alternative when maternal milk is unavailable, the evidence reinforces the importance of maximising

[162] Alpha diversity in breast milk refers to the diversity of microorganisms (the breast milk microbiome) within a single milk sample. It is a measure of how many different microbial species are present (richness) and how evenly they are distributed (evenness).

mother's own milk provision in preterm infants. The authors also conclude that further high-quality studies are needed to clarify causal pathways between milk type, microbiome development, and long-term health outcomes. A narrative review by Hård et al. (530) also highlighted important compositional differences between raw maternal milk and pasteurised donor breast milk. Raw mother's own milk contains key bioactive components that support immune function, antioxidant and anti-inflammatory defence, gut microbiome development, feeding tolerance and metabolism. Many of these protective factors are reduced or lost during Holder pasteurisation. While both mother's own milk and donor breast milk are associated with lower rates of NEC, higher doses of mother's own milk are linked to improved growth, reduced morbidity and better neurodevelopmental outcomes.

> *But I thought it was nicer that I could have that than just go, oh, well, there's formula, that's convenient. We'll just use that then. Because I thought I was only going to be literally a matter of days. And I can do it myself. So, I literally just used that donor milk. I think maybe two to three days. And I was like, yes, I can take over now. (Site 1 Mother1)*

When considering the impact of donor milk on breastfeeding, a systematic review by Williams et al. (531) examined breastfeeding outcomes before and after the introduction of donor breast milk in neonatal units. The review included 10 studies and found that the availability of donor milk was associated with significantly higher rates of any breastfeeding at discharge, but there was no consistent increase in exclusive mother's own milk feeding. These findings have been replicated in cohort studies. For example, a population-based study linked neonatal clinical data with hospital-level donor human milk availability in California between 2007 and 2013. During this period, the number of hospitals offering donor milk increased from 27 to 55. In the 22 hospitals that introduced donor milk, availability was associated with a 10% increase in breast milk feeding at discharge and a 2.6% reduction in necrotising enterocolitis rates (532). A recent systematic review of qualitative research synthesised findings from 41 studies exploring the perspectives and experiences of women (including recipient mothers and donors), family members and healthcare professionals regarding donor breast milk use (533). The review found that mothers of preterm infants often experience an emotionally complex journey when consenting to donor milk. Common initial reactions include guilt, disappointment and anxiety, particularly when mothers had hoped to exclusively provide their own milk, as well as concerns about safety and the concept of their baby receiving "someone else's milk."[163] However, with clear information, reassurance and supportive communication from healthcare professionals, many mothers report increased acceptance and appreciation of donor breast milk, especially when they understand its protective benefits compared with formula. Trust in staff and culturally sensitive counselling were identified as key influences on maternal experience. Overall, donor breast milk is

[163] Milk kinship is an important cultural and religious consideration when providing donor human milk, particularly for Muslim families. In Islamic law, breastfeeding can establish a familial relationship, known as *rada'a* (milk kinship), between the infant and the lactating woman, as well as certain members of their respective families. This relationship may have implications for future marriage eligibility under Islamic law and can influence some families' decisions about accepting donor human milk. Interpretations of milk kinship vary between Islamic scholars and communities, particularly in relation to anonymous donor milk provided through regulated human milk banks, with some considering that milk banking does not establish milk kinship due to pooling, pasteurisation or the inability to identify individual donors, while others maintain more cautious views.

generally perceived as a valuable alternative when mother's own milk is insufficient, but emotional support is crucial in promoting positive maternal experiences.

Some studies have also explored the association between donor milk and maternal mental health. For example, Brown et al. (460) examined the relationship between access to donor human milk and parental mental health in 80 parents who accessed donor milk from a community milk bank for reasons including maternal illness, infant health complications and low milk supply. Scores were assessed before and after receiving donor milk. Both anxiety and depression levels significantly decreased following access to donor milk. While longer duration of milk provision and additional lactation support were associated with greater improvements, only the volume of milk received remained a significant predictor in regression analysis. Qualitative responses indicated that parents felt reassured by improved infant health protection, respected in their feeding choices, and supported during challenging circumstances. Similarly, Brown and Schenker (461) highlighted the close relationship between infant feeding decisions and parental wellbeing, noting that access to donor milk may reduce anxiety by alleviating concerns about infant health and supporting parental preferences. Together, these findings suggest that beyond clinical benefits, access to donor human milk may contribute positively to parental mental health, emphasising the complex interaction between feeding practices and psychological wellbeing.

Maternal related facilitators and barriers to breastfeeding and breast milk supply

Maternal-related factors that facilitate breastfeeding and maintain their breast milk supply include mothers having specific breastfeeding goals (534) and understanding the contribution of breast milk to their infant's growth and well-being (69, 458, 463). Breast milk production volumes among mothers of VLBW infants have also been found to be positively associated with mothers' perception of breastfeeding self-efficacy (535). Opportunities to share experiences and seek support from those with similar realities can help mothers sustain breast milk feeding (459, 498). Social support from partners, family members, or other parents is also beneficial (69, 462).

Maternal demographic factors, such as low socioeconomic status, single motherhood (490), and lower maternal education (536), can act as barriers to breastfeeding preterm infants. Clinical challenges, including low gestational age, and multiple births, may also interfere (536). Delayed lactogenesis following caesarean section has also been highlighted as a barrier (455). Maternal concerns about meeting infant's nutritional needs are common (362, 457, 458, 500); some mothers lacked knowledge about what constitutes adequate milk volumes (456). In one study, women expressed their disappointment at healthcare professionals prescribing infant formula as the only option for their infant's limited weight gain (498). Receiving donor milk, in one study, was shown to demotivate mothers from continuing to express (455).

Stress, negative moods, and perceived pressure to produce milk, whether self-imposed or from healthcare professionals, has been found to interfere with women's ability to maintain their milk supply (455-457, 459, 463, 498, 514). While studies have found that many women become more adept in developing adaptive strategies to manage infant feeding, mothers have also been found to describe each stage of infant feeding, such as tube, expressing, and transitioning the child to the breast, as difficult or tiresome (458, 459, 514).

Environmental and organisational facilitators and barriers to breastfeeding and breast milk supply

Neonatal units with higher rates of breast milk feeding at discharge tend to have strong leadership, a dedicated infant feeding specialist with protected time, proactive antenatal and postnatal support, regular staff training, and a culture of FCC/FIC (537). Positive breastfeeding experiences are associated with physical closeness and skin-to-skin contact, skilled and empathetic staff support, and environments that promote cue-based feeding, such as private spaces and FCC/FIC (538). Conversely, neonatal units with low breastfeeding rates often lack strategic leadership, have minimal specialist time, inconsistent information, poor collaboration with postnatal wards, and limited facilities for parents to stay, resulting in missed opportunities for early initiation of expressing and transition to breastfeeding (537).

Environmental factors can facilitate milk expression. For example, accessible, functional, and easy-to-use equipment, such as portable and comfortable breast pumps, is highly valued by women (69, 514). Some mothers prefer expressing at the infant's bedside (514), while others benefit from private, peaceful, and comfortable spaces for expressing success (456, 463, 498). Mothers of VLBW infants have been found to yield significantly higher breast milk volumes when expression is performed in proximity to the infant, particularly during or immediately after KC, compared to expressions beside the incubator or away from the infant (539).

Environment-related barriers included the stressful nature of NNUs, lack of privacy, and rigid feeding routines (463). On some occasions, the mothers' expressed milk was on open display with that of other mothers, whereby the amount expressed became an object of comparison (456, 500); those who expressed less could feel a sense of failure (456, 500). Equipment-related issues, such as outdated or unsterile pumps, are significant barriers, whereas inadequate access to suitable pumps further compounds the problem (69, 456, 458, 463). Other women described how extended hospital stays and the physical exhaustion of adhering to expressing routines further reduced the amount they were able to express (69, 455-459). Skin-to-skin contact, while perceived as a vital relational activity (462) for breastfeeding and for milk production (458), was not always possible due to infant health or neonatal unit restrictions (e.g., staffing, parent visiting) (3). When social support from partners, family members, or other parents was available it was found to be beneficial (462). In some studies, however, hospital policies restricted wider family members attendance at the units (310).

Overall, the evidence indicates that effective neonatal care is not dependent on any single intervention, but on how clinical practices, relationships, workforce support and organisational conditions work together. Practices such as SSC/KC contact, responsive feeding, breastmilk support and parental involvement are strengthened when delivered by skilled and compassionate staff within environments that enable families to remain close to, and actively involved in the care of, their baby. Strong leadership, adequate staffing, specialist expertise, supportive policies and family-friendly facilities provide the wider conditions needed to embed and sustain this care. Figure 10 illustrates this neonatal care ecosystem, with the baby and family at its centre.

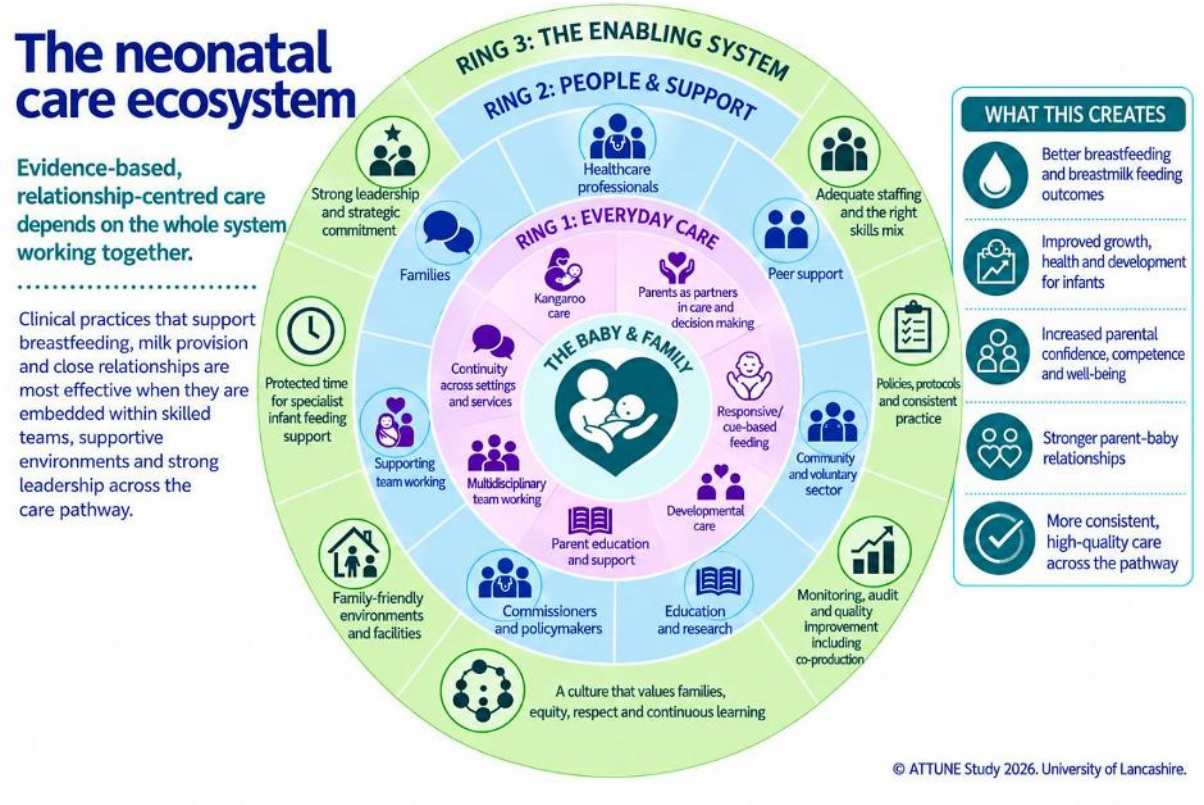


Figure 10: The neonatal care ecosystem

Limitations of the evidence base

Study design and sample size

- Most studies are single-centre and retrospective, limiting external validity. Small sample sizes are common, reducing statistical power and increasing risk of Type II error.
- Few randomised controlled trials exist; most evidence is observational.
- Several donor human milk studies use before-after or ecological designs, limiting causal inference and making it difficult to isolate the independent effect of donor milk availability from concurrent changes in neonatal practice.

Intervention and outcome variability

- Wide heterogeneity in interventions (e.g., KC, lactation support, cue-based feeding) and inconsistent implementation protocols.
- Lack of standardised definitions for breastfeeding outcomes (exclusive vs. any breastfeeding).
- Minimal reporting on intervention fidelity, making replication difficult.
- Variability in donor milk handling, pasteurisation, storage, and fortification practices across settings limits comparability between studies.
- Inconsistent differentiation between mother's own milk and 'any human milk' at discharge obscures understanding of exclusive maternal milk outcomes.

Measurement and data collection issues

- Heavy reliance on self-reported data, introducing recall and social desirability bias.
- Missing data on key variables such as maternal psychosocial factors, skin-to-skin contact, and visitation frequency.
- Short follow-up periods, often only until discharge or 6 weeks postpartum, limit understanding of long-term outcomes.
- Variability in microbiome sampling methods, sequencing techniques, and analytical approaches reduces comparability across studies examining milk type and gut colonisation.
- Limited long-term follow-up data on growth, neurodevelopment, and metabolic outcomes following donor milk versus mother's own milk exposure.

Generalisability and contextual limitations

- Studies often conducted in high-resource settings.
- Underrepresentation of fathers, partners, and marginalised populations in research.
- Several reviews restrict inclusion to English-language publications, introducing potential publication and language bias.

Methodological weaknesses

- Inadequate blinding, allocation concealment, and lack of washout periods in multi-phase studies.
- High risk of bias in many RCTs due to poor reporting of performance and selection bias.
- Non-concurrent study periods and uncontrolled external influences in some interventions.
- Limited adjustment for co-interventions such as changes in feeding protocols, antibiotic stewardship, or quality improvement initiatives that may confound outcomes.
- Convenience sampling in some feeding intervention studies reduces generalisability.

Technology and Scalability Constraints

- Few studies assess cost-effectiveness, scalability, or integration into routine NICU care.
- Limited economic evaluation of donor milk banking programmes and long-term cost-benefit analyses.

Areas for further research

High-quality study designs

- Conduct large, multicentre RCTs to strengthen evidence and improve generalisability.
- Include cluster RCTs or pragmatic trials to evaluate interventions in NNU settings.
- Further research is needed to evaluate the effectiveness, safety and acceptability of different feeding positions and strategies in neonatal units, including elevated side-lying, paced bottle feeding and alternative feeding

methods, to inform evidence-based approaches that support responsive feeding and positive feeding experiences for preterm and medically vulnerable infants.

-
- Design studies that isolate the independent impact of donor milk availability from concurrent clinical practice changes.
- Undertake rigorous comparative trials of alternative feeding methods and transition strategies with adequate power.

Long-term follow-up

- Extend follow-up beyond discharge to assess sustained breastfeeding rates, maternal mental health, and infant neurodevelopmental outcomes.
- Validate biomarkers (e.g., EEG changes) as predictors of long-term cognitive and behavioural outcomes.
- Investigate long-term growth, metabolic, microbiome, and neurodevelopmental outcomes associated with varying exposure to mother's own milk versus donor milk.

Comprehensive and inclusive models

- Combine medical, psychosocial, and family-centred care approaches in intervention design.
- Include fathers, partners, and marginalised populations to assess family-wide impact and equity.
- Explore culturally sensitive counselling models to support parental decision-making and emotional adjustment when donor milk is required.

Implementation and scalability

- Explore cost-effectiveness, staffing models, and integration of FIC into routine neonatal care.
- Evaluate optimal donor milk processing, fortification, storage, and distribution models to maximise safety, bioactivity, and equity of access.

Technology and innovation

- Evaluate digital tools and telehealth for post-discharge support, including SMS and app-based interventions.
- Test scalable delivery models such as remote coaching and virtual lactation consultations.
- Evaluate individualised breast pump flange fitting and breast shield design to determine their impact on maternal comfort, milk removal, milk production and breastfeeding outcomes, and develop evidence-based guidance for routine use in neonatal services.

Comparative effectiveness and mechanistic studies

- Compare combined interventions (e.g., KC + lactation counselling + non-nutritive sucking) to single strategies.
- Investigate biological mechanisms linking maternal-infant co-regulation to improved feeding and neurodevelopment.
- Clarify mechanistic pathways linking milk type, bioactive components, microbiome development, immune function, and clinical outcomes.

- Determine optimal fortification strategies for donor human milk to balance growth and protective benefits.

Conceptual and methodological clarity

- Clarify the conceptual distinction between FCC and FICare, as inconsistent terminology limits meaningful comparison between studies and obscures intervention-specific and identity-related effects.
- Develop consensus regarding the core components of FICare interventions to improve the consistency, reproducibility, and evaluation of research.

ATTUNE STUDY

11

Chapter Eleven: Close and Loving Relationships

Close and loving relationships are central to positive parent–infant interaction and provide an important foundation for healthy development. Through repeated sensitive and responsive interactions, such as holding, eye contact, touch, skin-to-skin contact and responding to infant cues, caregivers provide opportunities for infants to experience safety, co-regulation and emotional connection. Such early relational experiences are associated with attachment, social and emotional development and developing neural systems involved in regulation and learning.

Evidence from the UNICEF 2012 review highlighted that close and loving parent-infant relationships are foundational for infant development, beginning in pregnancy and supported through responsive, sensitive caregiving after birth. Secure attachment, fostered through behaviours such as skin-to-skin contact, responsive feeding, and emotional attunement, promotes optimal brain development, emotional regulation, and long-term physical and mental health, while reducing stress (via lower cortisol) and enhancing bonding through oxytocin pathways.

Practices that promote closeness, particularly early and sustained skin-to-skin contact, breastfeeding, and relationship-based support, are consistently associated with improved bonding, maternal sensitivity, and infant outcomes (e.g., less crying, better physiological stability, stronger attachment), whereas lack of sensitive early care or exposure to stress can have lasting negative effects on neurodevelopment and wellbeing.

Evidence from the updated review is consistent with the earlier UNICEF 2012 evidence summary and provides further evidence linking caregiving to specific brain structures and neural processes (e.g., hippocampal development, myelination, functional connectivity), highlighting how relationships become biologically embedded.

The new review demonstrates how developmental care practices in neonatal units directly regulate infant stress physiology (e.g., cortisol reduction), improve neurodevelopmental outcomes, and support parent-infant interaction even in highly medicalised environments.

Importantly, the new review highlights how relationships are context-dependent and bidirectional, incorporating factors such as maternal mental health, stress biology, breastfeeding experience, technological distraction, and genetic influences on oxytocin. It demonstrates how close and loving relationships are shaped by interacting biological, environmental, and experiential processes that can be actively supported through targeted clinical and behavioural interventions.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

The UNICEF UK BFI position on close and loving relationships aims to ensure that all families are supported to develop strong emotional bonds with their babies[164]. It emphasises the importance of responsive, nurturing care from conception, recognising that such relationships are foundational to infant brain development, emotional wellbeing, and long-term health. The standard requires services to support parents, regardless of feeding method, in building close and loving relationships through practices such as kangaroo care and skin-to-skin contact, breastfeeding, responsive feeding, keeping parents and infants together, and emotional support. This is embedded across all stages of the BFI accreditation process, including maternity, neonatal, hospital-based children's services, community services and universities. The standard applies antenatally and to all babies, including preterm or sick infants who are more likely to have disrupted care and to experience difficulties in developing a secure attachment relationship with their primary caregivers. The standards stipulate that staff should support parents to have a close and loving relationship with their baby by:

- In maternity services,
    - Ensuring that those who are pregnant and their partners/ significant others are encouraged to develop a positive relationship with their growing baby in utero.
    - Encouraging skin-to-skin contact immediately after birth and throughout the postnatal period.
    - Supporting parents and primary caregivers to understand a newborn baby's needs (including encouraging frequent touch and sensitive verbal/visual communication, keeping babies close, responsive feeding and safe sleeping practice) and how this supports their development.
    - Encouraging parents/primary caregivers who bottle feed to hold their baby close during feeds and offer most feeds to their baby themselves to help enhance the carer-baby relationship.
    - Providing information about local parenting support that is available.
- In the neonatal unit,
    - Having a conversation with parents/primary caregivers as soon as possible about the importance of touch, comfort and communication for their baby's health and development.
    - Actively encouraging parents to provide comfort and emotional support for their baby (including prolonged skin-to-skin contact, comforting touch, responsiveness to behavioural cues and staying close to their baby when expressing milk).
    - Supporting parents and staff who are bottle feeding to do this as responsively as possible.

[164] Mother-infant attachment, described as the reciprocal relationship between the mother and her infant, is a multidimensional construct shaped by individual, relational, and contextual factors. This bond begins in pregnancy, where the mother communicates with the unborn baby, has mental images and develops future plans with her baby and continues into the postnatal period, where it is influenced by close continual physical contact and maternal interactions with their infant.

- In the community,
    - Ensuring that those who are pregnant and their partners/ significant others are encouraged to develop a positive relationship with their growing baby in utero.
    - Supporting parents to understand their baby's emotional and social development and their continued need for love, comfort and security.
    - Encouraging parents to respond to their baby's needs (including encouraging frequent touch, sensitive verbal and visual communication, keeping babies close, responsive feeding and safer sleeping practices).
    - Providing information about services for parents to support the development of close and loving relationships with their baby and support networks in their community that enhance health and wellbeing.
    - Enabling parents to discuss the impact of feeding challenges on emotional wellbeing with signposting to additional support if needed.
- In hospital-based children's services
    - Ensuring parents/primary caregivers have unrestricted access to their baby unless individual restrictions can be justified in the baby's best interest, including provision of a comfortable environment to enable them to stay.
    - Enabling parents/primary caregivers to be fully involved in their baby's care, including effective communication between the family/care team and supporting joint decision making.
    - Supporting parents/primary caregivers to understand the importance of close, loving and responsive relationships for their baby's health and development.
    - Actively encouraging parents/primary caregivers to provide comfort and emotional support for their baby, including prolonged skin contact, comforting touch, and responding to baby's behavioural cues.

The UNICEF UK BFI emphasis on close and loving relationships explicitly supports or is closely aligned with national and international policies. Nationally, the DHSC Parent-Infant Relationships Practitioner's Guide (2024)[165] provides a 3-step framework to help frontline staff talk about, notice and support early parent-infant relationships. The NICE *Antenatal Care* guidance (NG201)[166] and Postnatal Care guidance (NG194)[167] recommend practices that mirror BFI principles, including providing information and support for emotional attachment and responding to infant cues. The NHS Best Start in Life[168] embeds bonding and breastfeeding support in universal services. Scottish policies like The Best Start[169] and NHS Scotland's Neonatal Infant Feeding Policy[170] promote person-centred maternity/neonatal care prioritising family involvement, relationship-based care, and supporting a close and loving bond via responsive care. Internationally, the UNICEF UK BFI focus on supporting close and loving relationships aligns strongly with both the WHO Nurturing Care Framework[171], a roadmap for action for responsive, family-centred care, and the UN Convention on the Rights of the

[165] Parent-infant relationships: starting conversations (practitioner guide) - GOV.UK
[166] NICE - Antenatal care (NG201)
[167] NICE - Postnatal care (NG194)
[168] Best Start in Life health advice - NHS
[169] The Best Start: A Five-Year Forward Plan for Maternity and Neonatal Care in Scotland
[170] NHS Scotland - Neonatal Infant Feeding Policy
[171] Nurturing Care for Early Childhood Development

Child[172], supporting every child's right to the highest attainable standard of health and nurturing care. This alignment ensures that BFI standards not only improve health outcomes but also uphold children's rights and promote sustainable, family-centred care.

Summary of the evidence in relation to UNICEF UK BFI standards

This evidence review highlights the importance of helping families to establish and maintain a close, loving and responsive relationship with their infants; a concept which underpins all the UNICEF UK BFI standards. The evidence indicates that sensitive parent–infant interactions, through touch, gaze, voice, skin-to-skin contact and emotional attunement, are associated with developing neural processes involved in regulation, learning and social-emotional development. These findings directly support practices such as skin-to-skin contact (see Chapter Five), responsive feeding (see Chapter Eight), and rooming-in (see Chapter Seven), which facilitate co-regulation and bonding.

Oxytocin has been associated with maternal sensitivity, synchrony and bonding behaviours, although evidence regarding these relationships is mixed and suggests that effects are context-dependent. Evidence concerning the influence of synthetic oxytocin administered during labour is also inconsistent. The review emphasises the benefits of breastfeeding and physical closeness practices in fostering emotional connection, while recognising the influence of other factors such as fatigue, parity, infant behaviour, birth experiences and positive emotional experiences on maternal-infant bonding. It also highlights how maternal depression, anxiety and birth trauma can negatively affect bonding and responsiveness.

The evidence highlights the challenges faced by mothers of preterm infants, including stress, separation, and feeding difficulties (see Chapter Ten) and emphasises the importance of promoting emotional closeness and parental involvement in neonatal units. The findings support the need for emotionally supportive family-centred environments to protect and promote bonding (also refer to 'partners in care' section in Chapter Ten).

Overall, the evidence provides a strong rationale for supporting parents and infants to develop close and loving relationships across all care settings. These relationships develop through repeated, sensitive and responsive interactions and are not dependent on a single behaviour, experience or method of feeding, but are shaped through everyday opportunities for closeness, communication, comfort and responsiveness to infant cues. Support should be tailored to individual circumstances, recognising the wider factors that can enable or challenge these interactions and reinforcing the BFI's inclusive, rights-based and family-centred approach.

[172] United Nations Convention on the Rights of the Child (1989)

Recommendations for the BFI programme

- **Continue to strengthen the importance of close and loving relationships across all BFI standards**. Close, responsive relationships are central to maternal and infant mental health and wellbeing, emotional regulation and infant development.
- **Emphasise antenatal care as the starting point for relationship-based support** including clearer individualised information giving about why early relationships matter, previous infant feeding experiences, parental responsiveness and mental health.
- **Strengthen the focus on close and loving relationships when babies are being cared for in clinically complex settings.** This should include emphasising the value of closeness, supporting zero separation, skin-to-skin contact/kangaroo care (SSC/KC), and parents as partners in care during the hospital stay, alongside supporting continued closeness and responsive relationships following discharge.
- **Continue to develop workforce learning on the interrelationship between infant feeding and parental and infant mental health**, and factors that impact the parent-infant relationship, poor maternal mental health, breastfeeding pain, and use of technology.
- **Maintain inclusive, non-judgmental care and messaging that supports all families.** Continue to support the opportunities that feeding provides for relationship-building regardless of feeding method, which includes a role for fathers, partners and non-maternal caregivers. Recognise factors such as inequalities, trauma, mental health, and neonatal admission as these may shape families' experiences and support needs.

Detailed overview of included evidence

This review integrates evidence across neonatal care, neuroscience, and psychobiology to demonstrate how close and loving parent-infant relationships are biologically supported and shaped in early life. It examines the evidence relating to the neurobiology of parent–infant interaction, including brain development and oxytocin, alongside the influence of breastfeeding, maternal mental health, stress and breast milk composition on bonding and maternal sensitivity. It also considers the unique challenges experienced by families of preterm and sick infants in neonatal care, the role of developmental care practices in supporting attachment and responsive caregiving, and the impact of factors such as breastfeeding difficulties, negative feeding experiences and technology use. Finally, the chapter reviews interventions designed to strengthen parent–infant relationships and support optimal developmental and emotional outcomes for infants and their families. Full details of the included reviews and empirical studies are provided in the Appendices.

An overview of situations and factors that can facilitate close and loving relationships is portrayed in Figure 11.

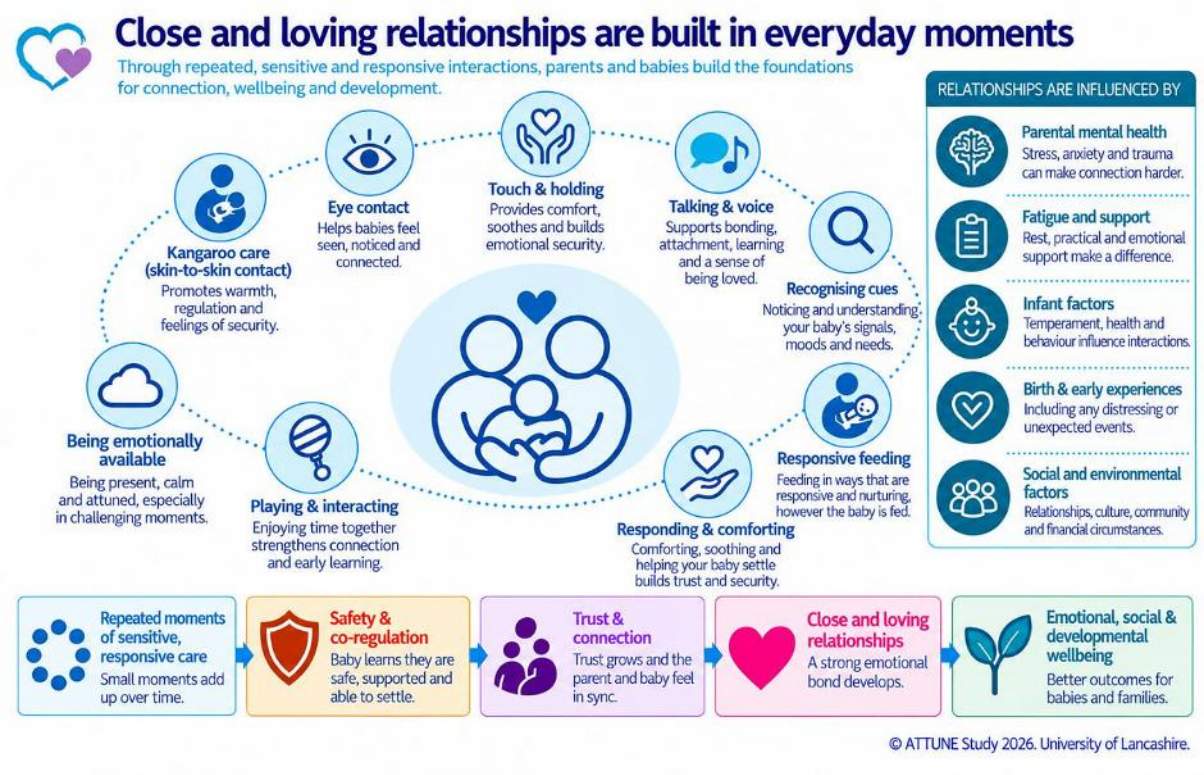


Figure 11: Situations and factors that can facilitate close and loving relationships

Parent-infant interactions and brain development

Across a broad body of evidence, early caregiving quality consistently emerges as a central influence on brain and behavioural development. Because humans are an altricial species, born dependent and neurologically immature, stable, responsive caregiving is vital for the maturation of neural systems supporting regulation, cognition, and social functioning. Conceptual models reinforce this, such as that proposed by Diaz-Rojas et al.(540), who frame parent–infant co-regulation as a dynamic, ongoing process driven by mutual responsiveness through external cues like voice, touch, and gaze. Empirical research supports these principles: variations in parental sensitivity and responsiveness have been linked to structural and functional differences in infants' limbic and frontal systems. For instance, maternal sensitivity predicts hippocampal and amygdala development (541-543) while disruptions to caregiving or elevated maternal stress, cortisol, or anxiety are associated with altered hippocampal growth and amygdala connectivity in the baby (544-547). Similarly, maternal depression and low sensitivity predict greater right-frontal EEG asymmetry and negative affect in infancy skills (548, 549). Broader population studies echo these patterns, revealing that socioeconomic adversity is linked to reduced frontal gamma activity as early as 6–9 months (550). These findings converge with evidence that secure attachment and sensitive caregiving support the development of self-regulation and higher-order skills (543, 551-555). Longitudinal studies further show that early attachment quality has been associated with emotion regulation and brain structure into adulthood, influencing prefrontal and amygdala function (551-555).

Research examining specific mechanisms highlights how these relational processes become biologically embedded. Huber et al. (556) demonstrated that the frequency of parent–infant conversational turns, rather than total speech exposure, predicted

greater myelination in dorsal language tracts by age two, highlighting the unique neural impact of interactive language. Similarly, Perone and Gartstein (557) found that responsiveness, reciprocity, and positive emotional tone during parent-infant play were associated with stronger functional connectivity across frontal-posterior networks, indicating that synchronous exchanges help organise developing neural circuits. Intervention studies further emphasize the plasticity of these systems: the Family Nurture Intervention (FNI) in preterm infants operationalises co-regulation through structured emotional contact - scent exchange, gentle touch, and soothing vocalisation - and has been shown to enhance frontal brain activity (558, 559) and accelerate cortical maturation (558, 560) leading to superior cognitive, attentional, and social outcomes at 18 months (560).

Overall, these studies demonstrate associations between early caregiving and co-regulation and developing neural systems, including white matter microstructure and cortical and limbic networks involved in regulation, learning and social functioning

Oxytocin, maternal sensitivity and parental bonding

Oxytocin is released in response to breastfeeding and skin-to-skin contact, facilitating milk ejection and supporting ongoing milk production. Breastfeeding-induced oxytocin release is associated with elevated prolactin levels and lowered stress (adrenocorticotropic hormone (ACTH) and cortisol) and gastrointestinal hormone (somatostatin) levels, suggesting that oxytocin induces physiological adaptations in the mother (561).

The evidence linking oxytocin to maternal sensitivity and parental bonding remains mixed. Systematic reviews of observational studies have consistently shown that higher oxytocin levels (or greater oxytocin reactivity) are associated with more positive parent-infant interactions, including increased affectionate touch, gaze, synchrony, and responsiveness and with stronger observed parent-infant bonding (562). However, experimental evidence is less consistent, with a large meta-analysis showing that social interaction does not reliably increase endogenous oxytocin levels, highlighting methodological limitations and variability across studies (563). Findings on exogenous (synthetic) oxytocin administered during labour are similarly inconsistent. Some studies report improved bonding after accounting for factors such as infant sleep (562, 564), while others link synthetic oxytocin to increased depressive and anxiety symptoms and reduced exclusive breastfeeding (565, 566), possibly due to supraphysiological dosing or disruption of endogenous oxytocin pathways.

Evidence increasingly shows that oxytocin's effects are context-dependent rather than uniformly prosocial, challenging the idea that oxytocin functions simply as a 'bonding hormone'. While oxytocin can enhance trust, empathy, and bonding in supportive environments, studies have demonstrated that it may also amplify antisocial responses under conditions of anxiety, mistrust, or social threat (567). Mechanistically, this is often explained by the social salience hypothesis (568), whereby oxytocin heightens sensitivity to social cues, making negative cues (e.g. competition or threat) more prominent in some contexts. These findings indicate that oxytocin functions as a modulator of social motivation, promoting affiliative behaviour in safe contexts but potentially enhancing vigilance and antisocial responses when individuals perceive threat or distrust (561).

Emerging evidence further suggests that individual differences in the oxytocin system may influence maternal caregiving, mental health and breastfeeding outcomes. A recent scoping review of 23 studies found that variation in oxytocin-related genes (OXT and OXTR), was associated with susceptibility to postnatal depression and anxiety, often through interactions with early life adversity, social stress and perceived social support. Several studies also reported associations between oxytocin-related genetic and epigenetic variation and maternal caregiving behaviours, with some genotypes linked to lower maternal sensitivity, greater intrusiveness and reduced parental engagement, particularly among women with histories of childhood adversity. Evidence relating to breastfeeding was limited and inconsistent; however, some studies suggested that OXT and OXTR variants were associated with shorter breastfeeding duration, lower exclusivity and greater nipple and breast pain, while a large genetic association study found no clear relationship with breastfeeding duration (569).

This evidence highlights that oxytocin plays a central role in maternal caregiving and emotional regulation, but its effects are highly context-dependent and may be disrupted by pharmacological intervention of often supraphysiological oxytocin doses. Individual differences in genetic makeup, early attachment experiences, and social environment appear to shape how oxytocin influences maternal sensitivity, caregiving behaviour, breastfeeding experiences and maternal mental health (570).

Maternal stress and breast milk composition

Maternal stress (and associated cortisol changes) and postpartum depression have commonly been linked to delayed onset of lactation (571) and alterations in breast milk hormones, immune factors (secretory immunoglobulin A, transforming growth factor beta 2, and lactoferrin), microRNA (572, 573) and lower docosahexaenoic acid and polyunsaturated fatty acid (573). Maternal depression has also been associated in some studies with elevated cortisol and reduced prolactin, which can influence milk production and secretion (573). The impact of anxiety and depression on milk volume however is unclear, with one study finding no significant association with volume of breast milk production among depressed mothers of very low birth weight infants (535). There is also evidence to suggest that maternal stress may influence infants' gut microbiota composition in both term and preterm infants, with some studies demonstrating significant associations between maternal stress and a higher abundance of potentially pathogenic bacteria (573-575) and lower milk bacterial diversity at 3 months postpartum (576). This may predispose infants to a more inflammatory-prone microbiome which is associated with dysregulated metabolic process that have the capacity to influence long term health and disease (575). Effects are often inconsistent across studies but suggest that both acute and chronic stress can shape the immunological and biochemical profile of milk (573, 574), with potential downstream impacts on infant immune and microbial development.

It should be noted that, the evidence linking maternal stress to alterations in breast milk composition and infant gut microbiota is emerging but still relatively weak and inconsistent overall. Overall, the literature supports an association, but causality and the magnitude of effects remain uncertain due to small samples and heterogeneous study designs. However, the evidence also emphasises the importance of providing sensitive, practical, and emotional support to mothers during the perinatal period, both

to promote maternal wellbeing and to optimise potential downstream benefits for infant health.

Breastfeeding, bonding and attachment

The evidence in this section considers the relationship between breastfeeding and attachment behaviours. Whilst several studies have reported associations between breastfeeding and maternal sensitivity, responsiveness and parent-infant bonding, these findings should be interpreted alongside the UNICEF UK BFI principle that responsive caregiving is not determined by feeding method alone. Rather, close and loving relationships are supported through responsive feeding practices, enabling parents to recognise and respond to their baby's cues, whether infants are breastfed, fed expressed breast milk, donor human milk or infant formula.

> *I didn't know why I wanted to breastfeed, but then it was more as time went on, I was like I'm breastfeeding because of the closeness and I just like the fact that people are saying, 'oh, you're still doing it all on your own', seven months later.* (Site 3 Mother4)

Current evidence reveals a complex relationship between breastfeeding and mother-infant bonding, with observed associations influenced by physiological, psychological and contextual factors. Ventura (577) reviewed 43 studies and found that breastfeeding mothers were generally more responsive during feeding compared to mothers who use formula or bottles, with longer breastfeeding duration linked to fewer non-responsive feeding behaviours later in childhood. However, two RCTs aimed at enhancing maternal responsiveness did not affect breastfeeding outcomes, although the trials may have been insufficiently powered to detect differences in breastfeeding rates.

> *[HCP] said that babies can see like 8 to 12 inches away, and that's as far as from the breast to your face. She was telling me, when I'm breastfeeding, just really enjoy that time and take it slowly, because then he will always look up and see you. It's so lovely, he just sort of stares up at me.* (Site 2 Mother4)

A subsequent review exploring the association between breastfeeding and attachment found mixed evidence, with just over half of studies showing that longer breastfeeding duration was associated with slightly higher infant attachment security, while others reported no relationship. It also found that mothers with more secure attachment styles were more likely to initiate and sustain breastfeeding, though results for breastfeeding duration were inconsistent (404). Other research has found exclusive breastfeeding to be associated with higher maternal sensitivity and cooperation (578), and affectionate touch and favourable EEG patterns have been observed in predominantly breastfeeding dyads (579). Greater breastfeeding intensity has been correlated with increased maternal sensitivity, lower intrusiveness (580) and better child behavioural outcomes (581) and Weaver et al. (582) found that breastfeeding duration predicted maternal sensitivity up to child age 11, even after controlling for multiple confounders. Physical closeness practices like co-sleeping (also see Chapter Nine) and babywearing also appear to enhance maternal responsiveness to hunger cues (431).

Other research challenges the assumption that breastfeeding alone fosters bonding, suggesting that factors such as maternal mental health, fatigue, parity, and infant

behaviour mediate this relationship (583-585). Some studies have highlighted birth experiences, maternal satisfaction with care and positive emotional experiences during feeding as predictors of bonding quality, rather than feeding method (586, 587). In contrast, breastfeeding challenges have been found to predict lower bonding scores, independent of depression (588).

Overall, while breastfeeding may support maternal sensitivity and bonding in some contexts, emotional experiences, feeding challenges, maternal mental health, and broader contextual factors play critical roles. A key limitation across studies is their correlational design and lack of prenatal responsiveness measures, making it unclear whether breastfeeding promotes responsiveness or if responsive mothers are more likely to breastfeed (577). Indeed, research has found that antenatal breastfeeding intention was more strongly associated with maternal responsiveness than actual breastfeeding practice, suggesting that pre-existing maternal traits may drive both (589).

Preterm infants, bonding and attachment

Maternal sensitivity following preterm birth is shaped by a combination of factors, such as infant characteristics, maternal psychological wellbeing, and the neonatal environment. Vizzari et al. (590) highlight that preterm infants, especially those born at lower gestational ages, frequently experience persistent feeding difficulties and that these challenges are associated with maternal anxiety, depression, and stress, negatively affecting breastfeeding and bonding. Bilgin and Wolke (591) found that while maternal sensitivity was initially comparable to mothers of full-term infants, feeding issues in very preterm and low birth weight infants predicted a decline in maternal sensitivity over time.

Mothers of preterm infants admitted to NICU often experience elevated levels of stress and depressive symptoms, which may be related to mothers' sense of powerlessness in this context and have been associated with poorer mother-infant interactions (592). Hospital-related stress has also been associated with reduced rates of breastfeeding, particular in intensive care settings or during extended stays (593). The introduction of web-cameras in NICUs has made it possible for parents to see their sick or premature infant when they cannot be close to them due to prolonged hospital admissions. A systematic review found that NICU webcams may enhance feelings of closeness, support responsiveness, and reduce parental stress and anxiety, especially for parents who cannot be physically present, but can also increase stress for some parents (594). Similarly, the use of asynchronous video messaging in neonatal units has been shown to improve parental experience, provide reassurance about their infant's care, and helped them feel emotionally close to their baby, in addition to facilitating supportive relationships between families and staff (595, 596). A study that used "Facetime" technology to reduce the waiting time for mothers who were unable to visit NICU to see her baby for the first time (due to caesarean section delivery or peripartum complication), demonstrated that waiting times were reduced by 60%. The technology allowed mothers to see her baby in real time and provided the opportunity for the neonatal nurse to answer questions about her baby's care and well-being (597).

Qualitative studies of mothers' experiences in NICU support these findings, describing interruptions in bonding due to separation, maternal emotional crisis, and the NICU's

technological environment, whilst bonding and closeness were facilitated by physical contact, participation in care, kangaroo mother care, breastfeeding, and supportive relationships with nurses and other mothers (598, 599). Viglione et al. (600) added that mothers who provided exclusive maternal milk in the NICU reported greater sensitivity and emotional concern than a mixed feeding group, indicating that encouraging mothers to provide exclusive breast milk to their preterm infants may support emotional connection.

Systematic reviews have found that interventions such as counselling, emotional support, psychotherapeutic, stress-releasing, education, and music therapy may improve breastfeeding outcomes and parent–infant relationships among mothers of preterm infants (244, 601, 602). There is also evidence that auditory stimulation with maternal voice supports emotional stability and bonding (603).

The role of developmental care practices in the neonatal unit

Developmental care practices in neonatal settings help reduce physiological and behavioural stress in infants by supporting regulation of the immature nervous system and minimising excessive sensory stimulation. Approaches such as environmental modification (reducing light and ambient noise), kangaroo care promoting skin-to-skin contact, optimised positioning, and clustered care (grouping necessary medical procedures), have consistently been shown to stabilise heart rate, improve oxygen saturation, and reduce stress-related biomarkers such as cortisol. For example, skin-to-skin care promotes autonomic stability and dampens stress responses by enhancing parasympathetic activity and supporting thermoregulation (604). Similarly, clustered care and reduced handling decrease behavioural indicators of stress, such as grimacing, crying, and disrupted sleep, while facilitating self-regulation and energy conservation (605). Symmetrical, developmentally supportive positioning (including flexed and contained postures) is important for stress reduction and improved neurological and musculoskeletal organisation (606).

Developmental care interventions in the NICU have been found to significantly improve both the mental development index and the psychomotor development index at 12 months corrected age (607). These benefits appear more pronounced when babies are cared for in SFRs within the NICU, compared to those treated in an open-bay NICU (326) (see Chapter Seven). Beyond enhancing the survival rates of preterm infants, developmental care has long-term positive effects on social and behavioural outcomes. Children who received this type of care tend to exhibit lower rates of school absenteeism, hyperactivity, aggression, and behavioural issues, and reduced socio-deviant conduct in young adults (608). Despite these benefits, developmental care implementation remains inconsistent across healthcare settings, often limited by structural, socioeconomic, and cultural barriers (609).

Factors that influence attachment

While it is acknowledged that skin-to-skin contact is a key practice in supporting the development of close and loving relationships, it is explored in detail elsewhere in this report and is not the primary focus of this chapter.

Breastfeeding pain

Maternal pain during breastfeeding has been linked to reduced maternal engagement and altered infant behaviours, including diminished affective expression and gaze

(610). Such negative experiences can lead to feelings of guilt, perceived failure, and poor attachment (611) and stopping breastfeeding because of pain or physical difficulty has been found to be strongly associated with higher depression scores, regardless of breastfeeding duration (612).

For mothers who have experienced birth trauma, pain during breastfeeding is one of the factors that can intensify distress and contribute to postnatal depression, although positive breastfeeding experiences may help protect maternal wellbeing (613).

Genetic factors may play a role in how strongly mothers experience nipple pain; variation in oxytocin receptor genes (OXTR) has been associated with nipple pain and early breastfeeding cessation (569).

Negative emotional experiences of breastfeeding

Breastfeeding aversion response (BAR) and dysphoric milk ejection reflex (D-MER) present as negative emotional experiences of breastfeeding and lactation yet are considered physiological in origin. D-MER presents as a sudden onset of dysphoria prior to and during milk ejection, whilst BAR refers to unpleasant feelings and physical sensations during breastfeeding. Women experiencing D-MER or BAR often report distress, guilt, self-doubt, or feeling like they were “failing as a mother,” emotions that can undermine confidence and create internal conflict about continuing breastfeeding (614). Women with D-MER have been shown to have lower breastfeeding self-efficacy, higher depression scores (615), more bonding difficulties, and are at risk of stopping breastfeeding early (616). Because healthcare professionals often lack awareness of these phenomena, women may feel misunderstood or fear being misdiagnosed with postpartum mood disorders, which can increase isolation and potentially strain the mother-infant experience.

Maternal mental health

Maternal mental health has significant implications for breastfeeding, maternal sensitivity, and mother-infant attachment. Depressive symptoms and anxiety are linked to reduced maternal responsiveness, less affectionate interaction, increased risk of insecure attachment (617-622) shorter breastfeeding duration and lower self-efficacy (572, 622-627). Increasing maternal anxiety during the pre-postpartum transition has also been linked to harmful feeding beliefs, such as increased concerns about infant hunger, infant weight and over/underfeeding at 6 months of age (628). Childbirth-related post-traumatic stress can also impair bonding, breastfeeding initiation, and some aspects of child development, though many associations weaken when controlling for depression (629)[173].

Importantly, breastfeeding may act as a buffer against postpartum depression and support maternal-infant interaction, especially in mothers with prenatal depression (630, 631). Breastfeeding-induced oxytocin release is associated with reduced anxiety in the mother (561) and exclusive breastfeeding has been associated with higher maternal sensitivity independent of maternal mental health (578). There is also some evidence to suggest that positive breastfeeding experiences may aid bonding after

[173] Evidence highlights up to a third of women may experience their birth as traumatic – Keedle et al. (2023) What women want if they were to have another baby: the Australian Birth Experience Study (BESt) cross-sectional national survey | BMJ Open.

traumatic births (613). Breastfeeding difficulties however may exacerbate psychological distress, with some women describing them as traumatic experiences that can influence future feeding decisions (626, 632). These findings highlight a bidirectional relationship: while poor mental health can hinder breastfeeding and bonding, breastfeeding may also protect against adverse psychological outcomes.

Dysregulation of the maternal hypothalamic-pituitary-adrenal (HPA) may serve as a key mechanism linking maternal mental health, breastfeeding outcomes, and maternal sensitivity. The HPA axis, which governs the body's stress response, triggers a hormonal cascade culminating in cortisol release. Elevated cortisol levels, often observed in mothers with infants in NICU and/or who are experiencing perinatal stress, trauma or depression, have been associated with impaired mother-infant bonding and disruptions in lactation processes (633, 634). However, findings across studies remain inconsistent, likely due to methodological variability, limited consideration of hormonal interactions (e.g., between cortisol and oxytocin), and the potential involvement of additional biological pathways (635).

Parental use of technology **(**also see evidence about technology/apps in Chapter Six)

On maternal responsiveness: There is increasing recognition that the integration of smartphones and other technologies into daily life presents both opportunities and challenges. On one hand, digital devices can enrich family life by enabling parents to share experiences, access information, and maintain connections with distant relatives. On the other, overuse may fragment parental attention, delay responses to infant cues, and reduce emotional availability, thereby undermining the foundations of parent-infant bonding. Whist many women will use social media at some point while feeding their babies, one qualitative study found that mothers who breastfeed reported more media use than bottle-feeding mothers, often as a distraction from pain or longer duration of feeds (636).

Overall, the evidence base on the impact of technology use on maternal responsiveness is mixed. A scoping review by Braune and Krickau et al. (637), which drew on 12 experimental and naturalistic studies found that frequent and prolonged use of smart phones led to parents providing less eye contact and delayed responses. Similarly, primary studies such as Ventura et al. (638) and Nomkin & Gordon (638) found that smartphone use reduced affection and responsiveness during breastfeeding. Authors suggest that breastfeeding may be particularly vulnerable to distractions, as infants are less interactive (due to the focus on sucking and feeding) and the primary focus is on feeding, making mothers more likely to divert attention to phones or other activities. However, other studies undertaken in Japan (639, 640) found that while mothers commonly reported using their smartphones during breastfeeding, they also continued to observe their infants. Smartphone use did not appear to undermine bonding or increase negative emotions toward children, although mothers were less likely to respond visually to infant bids for attention. Similarly, Tomfohrde and Reinke (641) found frequent technology use among breastfeeding mothers, particularly social media, but did not conclude that this necessarily reduced eye contact or early communication. Instead, mothers often used social media for connection, entertainment, and advice, highlighting that technology can also serve supportive functions. (For wider evidence on use of e-technologies – see Chapter Six)

On bonding and attachment: Some studies suggest there is a negative impact of smartphone use on bonding and attachment. For example, Alvarez Gutierrez and Ventura (642), in a survey of 332 mothers with infants aged 2–6 months, found that higher smartphone use was linked to poorer mother–infant attachment, higher infant negative affectivity, and increased maternal hostility toward motherhood. Importantly, infant temperament did not explain these associations, suggesting that the use of technology may directly interfere with bonding processes. Other studies suggest that the use of devices could support bonding. Hood et al. (643) interviewed 30 families of infants aged 9-15 months and found that smart phone use enabled video calls with distant relatives, access to music or nursery rhymes, offered developmental information, and created shared opportunities for joy. Devices also facilitated communication between partners and co-play among siblings. Parents described these practices as enriching, allowing for connections that might not otherwise exist. However, they also acknowledged that devices sometimes diverted attention, interrupted interactions, or created frustration when infants disrupted device use. Thus, parents themselves recognized the dual nature of smartphones: they can enhance family relationships but also risk undermining them when overused or poorly managed.

On infant and young child behaviour: Some studies highlight the negative impact of parental smartphone use on infant and young child behaviour, such as increased protest, withdrawal and reduced positive engagement (637, 644): with risks associated with frequent or prolonged smartphone use, compared to short occasional use (637). Younger infants were also reported to be especially vulnerable, while older infants sometimes adapted by dampening their responses (637).

Interventions to support parent–infant bonding

A growing body of research has explored targeted interventions designed to support parent–infant bonding and sensitive interaction, with some approaches showing promising effect. A scoping review found that nurse/midwife-lead interventions providing focused activities (including maternal singing, listening to the feal heartbeat, infant massage) and targeted education during the pre and postnatal periods were effective in supporting the development of the mother-infant relationship (132). Notably the influence of culture in supporting the mother-infant relationship remains largely unexplored (132).

> *The midwife told me about building a relationship with bump by talking and singing and touching. Just trying to relax and connect with the baby while it's still in the belly. And then obviously when he was born, she gave me information about like skin-to-skin and how that can really help develop attachments.* (Site 3 Mother4)

Another review of interventions aimed at improving post-partum bonding noted that most were designed to prevent difficulties in at-risk populations, rather than promoting parent-infant bonding in healthy populations, and that interventions delivered over the internet or phone were not effective at improving parent-infant bonding (645). Preliminary work on mindfulness-based approaches have shown promise in facilitating the mother-infant relationship during pregnancy, post-partum, and breastfeeding (249).

Skin-to-skin contact (SSC) has been consistently linked with improved maternal-infant bonding in both postnatal and NICU settings (see section on parent-infant relationships in Chapter Five). Immediate SSC following birth has been shown to promote maternal attachment behaviours such as affectionate touch and eye contact, as well as infant regulation, whilst delays in SSC can negatively impact bonding and maternal sensitivity (646, 647). In NICU contexts, KC has been linked to improved interaction quality (574, 599), with neurobiological evidence suggesting increased plasma oxytocin levels in both the preterm infant and their caregivers (648).

The evidence reviewed in this chapter highlights that close and loving parent–infant relationships are shaped by multiple, interacting influences rather than any single behaviour or practice. These include opportunities for sensitive and responsive interaction, physical closeness and feeding, alongside parental wellbeing, infant characteristics, birth and early experiences, and the wider care environment. Table 7 brings these different strands of evidence together and identifies their implications for supporting families across maternity, neonatal and community settings.

Table 7: *Factors shaping close and loving parent–infant relationships and implications for care*

Area of evidence	**What evidence tells us**	**Practice based implications**
Sensitive and responsive interaction	Sensitive interactions including touch, gaze, holding, synchrony and responsiveness to infant cues support connection, regulation and early development.	Enable parents to spend time with their baby and support them to recognise, understand and respond sensitively to their baby's cues.
Physical closeness	Physical closeness, including skin-to-skin contact, can support physiological regulation, parental sensitivity, bonding and emotional connection.	Protect and promote opportunities for physical closeness across maternity, neonatal and community settings.
Feeding and relationships	Breastfeeding is associated with aspects of maternal sensitivity and responsiveness, but feeding method alone does not determine the quality of parent–infant relationships.	Support responsive, relationship-centred feeding and opportunities for connection however an infant is fed.
Parental emotional wellbeing	Stress, anxiety, depression, birth trauma and fatigue can make bonding and responsive interaction more difficult.	Recognise circumstances that may make connection more difficult and provide compassionate, individualised support without creating expectations that bonding should occur in a particular way or timeframe. Parents should be referred to

		appropriate support as required.
Infant characteristics	Infant temperament, behaviour and health can influence parent–infant interactions and parents' ability to recognise and respond to cues.	Help parents understand their individual baby's behaviour and communication and adapt support accordingly.
Preterm and sick infants	Stress, separation, feeding difficulties and the neonatal environment can disrupt opportunities for closeness and parental involvement.	Minimise unnecessary separation and create environments that enable closeness, involvement and parents' confidence in their parental role.
Birth and early experiences	Birth experiences, satisfaction with care and positive or difficult feeding experiences can influence subsequent bonding and interaction.	Recognise the influence of parents' previous experiences and avoid treating relationship-building as separate from the wider experience of maternity and neonatal care.
Digital technology	Prolonged or absorbed parental smartphone use may interrupt sensitive responsiveness and responses to children's bids for attention; occasional short use appears less disruptive. Evidence remains limited.	Promote awareness of attentive interaction without presenting technology use itself as inherently harmful or placing unrealistic expectations on parents.
Relationship-focused support	The evidence supports interventions and services that strengthen sensitive interaction and parent–infant relationships, particularly where additional difficulties are identified.	Equip staff to discuss parent–infant relationships sensitively, identify when additional support may be needed and provide or refer families to appropriate services.

Limitations of the evidence base

Methodological heterogeneity

- Most studies are observational or cross-sectional, limiting causal inference. Definitions and measures of bonding, attachment, breastfeeding, and psychological symptoms vary widely, and reliance on maternal self-report introduces bias. Smartphone use is often assessed via self-report without objective tracking or clear distinctions between types of use.

Sample limitations

- Small sample sizes and overrepresentation of White, educated, middle-class women reduce generalisability and statistical power, limiting insights into diverse populations.

Confounding and moderating variables

- Key variables, such as socioeconomic status, parity, birth complications, and social support, are often poorly controlled. Co-occurring mental health conditions (e.g., depression, anxiety, PTSD) complicate interpretation, especially given the bidirectional nature of distress, bonding, and feeding challenges.
- For brain development studies, confounding factors, such as nutrition, sleep, environmental exposures, and broader context/stress biology, are not always comprehensively assessed.

Limited longitudinal data

- Few studies follow dyads beyond infancy, leaving gaps in understanding long-term outcomes.
- Brain development research often relies on sparse or widely spaced neuroimaging data, limiting insights into sensitive periods and developmental trajectories.

Underexplored biological mechanisms

- Research on oxytocin and cortisol remains largely correlational and inconsistent.
- Emerging evidence suggests maternal stress may alter breast milk composition and infant microbiome, but mechanisms are unclear and sample sizes small. Co-regulation models in brain studies lack empirical validation using real dyadic data.

Intervention studies

- Few studies rigorously evaluate interventions to support maternal–infant bonding.
- Protocols vary widely in content, delivery, and timing, making comparisons difficult and limiting generalisability.

Ecological validity

- Lab-based studies on smartphone use and early brain development often lack real-world relevance.

Areas for further research

Standardisation of measures

- Inconsistent definitions and tools for assessing maternal bonding, mental health, and infant behaviour limit comparability across studies. Future research should adopt validated, multidimensional instruments combining subjective scales (e.g., EPDS, STAI, PSS) with objective biomarkers (e.g., cortisol, cytokines, microRNA), timed to key developmental stages.

Longitudinal cohort studies

- Extended follow-up of mother–infant dyads is needed to understand long-term effects of maternal stress on child development, health, and relational outcomes. Tracking microbiome, behaviour, and health trajectories will help identify intervention windows.

Biological mechanisms

- More research is needed on hormonal, genetic, and epigenetic pathways, especially oxytocin and cortisol, that mediate stress effects on caregiving and infant

development. The impact of maternal stress on the breast milk microbiome and metabolome is a major gap, requiring integrated sampling and analysis.

- The role of oxytocin in breastfeeding challenges, such as nipple pain, needs further exploration, particularly in relation to genetic and stress-related factors affecting lactation success.

Training for health professionals

- Many professionals lack training in interpreting infant behaviour and supporting stressed mothers. Research should guide development of clinical guidelines and education to improve early identification and support.
- Research is needed to identify strategies to overcome barriers to commissioning parent-infant relationship services, including low awareness of infant mental health (649).

Technology and attachment

- Studies on smartphone use in parenting should use longitudinal, multi-method designs with physiological measures and device-logged data. Research should explore how technology use interacts with maternal mental health, infant temperament, and oxytocin-related processes, and test interventions promoting mindful digital engagement.

ATTUNE STUDY

12

Chapter Twelve: Impact of commercial influences on infant feeding

While commercial entities can play an important role in improving health through the provision of beneficial products and services, growing evidence shows that the activities of some large multinational corporations can adversely affect health, nutrition, environmental sustainability, and health equity. These influences, often operating through marketing, lobbying, product formulation, and policy engagement, are collectively described as the commercial determinants of health (650). Within this context, infant and young child feeding is shaped not only by parental choice but also by powerful commercial forces, including the marketing of infant formula, toddler milks and commercial baby foods. These influences can shape feeding practices, perceptions and norms, undermine breastfeeding, and affect the quality of foods offered to infants and young children[174]. This highlights the importance of strengthening the implementation and enforcement of the International Code of Marketing of Breastmilk Substitutes, both within maternity and hospital facilities and in the wider community.

Evidence from the UNICEF 2012 review highlighted that global implementation of International Code of Marketing of Breastmilk Substitutes[175] (the 'Code') was incomplete, particularly in the UK and Europe. Research indicated that inadequate enforcement of the Code creates commercial pressure on parents, contributing to the undermining of breastfeeding, and generating tensions between public health goals and industry interests. The review highlighted the need for stronger monitoring and regulation of breastmilk substitutes.
Evidence from the updated review extends the evidence base to include the commercial determinants of health, providing contemporary evidence on the influence of formula and baby food companies through marketing, lobbying, digital advertising, cross-promotion, product labelling and industry relationships with health professionals. The review incorporates evidence from the 2023 *Lancet* Breastfeeding Series, which highlights that breastfeeding is being increasingly undermined by aggressive commercial milk formula marketing, requiring coordinated policy action to protect, promote, and support breastfeeding worldwide. New evidence on ultra-processed commercial baby foods is provided, including their nutritional quality, health implications, and the growing role of commercial baby foods in young children's diets.

[174] WHO - How the marketing of formula milk influences our decisions on infant feeding
[175] WHO - International Code of Marketing of Breast-milk Substitutes

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

The UNICEF UK BFI standards incorporate the principles and requirements of the Code and relevant World Health Assembly resolutions to protect, promote and support breastfeeding and minimise inappropriate commercial influence. This includes prohibiting the promotion of breastmilk substitutes, bottles, and teats in healthcare settings, banning industry-sponsored free samples and gifts to health workers, and ensuring that information provided about infant feeding is scientific and unbiased. The UNICEF UK BFI operationalises the Code within healthcare facilities by embedding these principles into staff training, policy development, and monitoring systems, thereby creating an environment that supports breastfeeding and protects families from misleading marketing practices. The UK BFI provides a guidance document to support health workers to adhere to the Code[176], protect breastfeeding and ensure that parents who formula feed have access to accurate and evidence-based information[177]. Services and universities accredited under BFI standards are expected to:

- Develop a Policy which covers all of the Baby Friendly standards, including full implementation of the International Code of Marketing of Breastmilk Substitutes and subsequent resolutions. The Head of Service will sign a statement confirming compliance.
- Adhere to the requirements of the Code: there will be no advertising in the service or by the staff.
- Provide information about infant formula and bottle feeding should be given to families at the point of need.
- Ensure procurement arrangements for infant formula, bottles, teats and related products are transparent and purchased at market rate in line with the Code and free from commercial influence, including avoiding free or discounted supplies, sponsorship, gifts including for example, access to free or subsidised study days or promotional materials from manufacturers or distributors.

UK legislation partially reflects the Code but falls short of full compliance. The UK's legislation, 'The Infant Formula and Follow-on Formula Regulations'[178], incorporates some provisions of the Code, particularly for infant formula intended for babies under six months. However, they do not cover follow-on formulas or other products for older infants, creating loopholes that allow widespread advertising and brand promotion. The 2026 Status Report on the Marketing of Breast-milk Substitutes reported that, although many countries have strengthened legislation aligned with the Code, the UK scored only 40/100 for implementation. Notable weaknesses included insufficient regulation of commercial milk formula (CMF) promotion within health facilities and ongoing industry engagement with health workers, alongside very few prosecutions for Code violations[179]. Such weaknesses in enforcement undermine the Code's intent to protect infant health through unbiased information and restricted promotion of breast milk substitutes[180]. In 2020, the UK Parliament acknowledged the need for stronger

[176] A guide for health workers to working within the Code - Baby Friendly Initiative
[177] UUK-2025 Guide to the Code
[178] The Infant Formula and Follow-on Formula (England) Regulations 2007
[179] Marketing of breast-milk substitutes: national implementation of the International Code, status report 2026
[180] WHO - International Code of Marketing of Breast-milk Substitutes

implementation of the Code and called on the government to fully adopt and enforce it, as yet however, no major legislative changes have been made to fully align UK law with the Code. The recent Competition and Markets Authority (CMA) market study into infant formula and follow-on formula in the UK[181] highlighted that the CMF market is not working well for parents, with weak price competition, strong brand loyalty, and limited switching leading many families to pay more than necessary. It finds that complex information environments and restrictions on marketing (linked to the regulatory framework) shape consumer behaviour, often reducing price sensitivity and reinforcing trust in established brands. The report concludes that these dynamics, alongside concentrated market supply, contribute to higher CMF prices. The study recommends improvements to how information is presented to parents, such as clearer, more consistent labelling and guidance, to support informed choice and reduce overreliance on branding. It also proposes measures to strengthen price competition, including reviewing regulatory constraints, increasing price transparency, and considering interventions that make it easier for families to compare products and switch to lower-cost options. These findings highlight how limited competition and high CMF prices intersect with the cost-of-living crisis, exacerbating financial pressure on families and increasing the risk of food insecurity among households with infants.

The Code is positioned within a wider network of global and regional policies that promote, protect and support breastfeeding. The Code is identified as a core mechanism in the WHO and UNICEF Global Strategy for Infant and Young Child Feeding[182] for creating enabling environments for breastfeeding, alongside maternity protection and skilled breastfeeding support. Step 1 of the WHO/UNICEF Ten Steps to Successful Breastfeeding[183] explicitly requires adherence to the Code within all maternity and newborn care settings. The UN Convention on the Rights of the Child[184] recognises children's right to the highest attainable standard of health, which includes promoting breastfeeding and by ensuring the provision of accurate health information. The Committee on the Rights of the Child has recognised the Code as an appropriate measure that states are obliged to take to fulfil their obligations under the Convention. EU Guidance on the Composition and Labelling of Infant Formula and Follow-on Formula[185] offers regulatory mechanisms for labelling and health claims; but it does not cover the broader marketing restrictions included in the Code, meaning Code-compliant implementation often requires additional national measures.

Summary of the evidence in relation to UNICEF UK BFI standards

Both UK and global evidence highlight the pervasive influence of the CMF industry on infant-feeding practices and the potential consequences for breastfeeding and public health. Violations of the Code are widespread across retail, healthcare, and digital platforms, with aggressive marketing tactics such as free samples, misleading health claims, and cross-promotion[186]. Digital marketing, especially through social media and personalised advertisements, is a growing challenge, often portraying formula feeding as easier and more beneficial than breastfeeding. Branding similarities between infant

[181] Competition and Markets Authority (2025) Infant formula and follow-on formula market study - GOV.UK
[182] Global strategy for infant and young child feeding
[183] Baby-Friendly Hospital Initiative | UNICEF
[184] The UN Convention - World's Children's Prize
[185] Infant and follow-on formula – composition and information | EUR-Lex
[186] CMF companies use cross-promotion tactics such as branding infant formula similarly to follow-up and toddler formulas.

and toddler formulas contribute to consumer confusion, while weak enforcement of national legislation and ongoing industry lobbying continue to impede regulatory progress. Healthcare settings are also affected, with formula distribution in hospitals linked to reduced breastfeeding rates. CMF companies continue to engage health professionals through educational sponsorships and incentives, creating conflicts of interest and weakening public confidence in breastfeeding support. Facilities accredited under the UNICEF UK BFI demonstrate higher levels of Code compliance, and targeted training for healthcare workers has been shown to improve adherence to best practice and strengthen breastfeeding support.

Overall, the findings demonstrate that infant-feeding decisions are made within a complex commercial environment, in which multiple influences operate across families, healthcare systems and wider society. Figure 12 illustrates these interconnected influences and the protective role of effective implementation, monitoring and enforcement of the International Code in supporting informed decision-making.

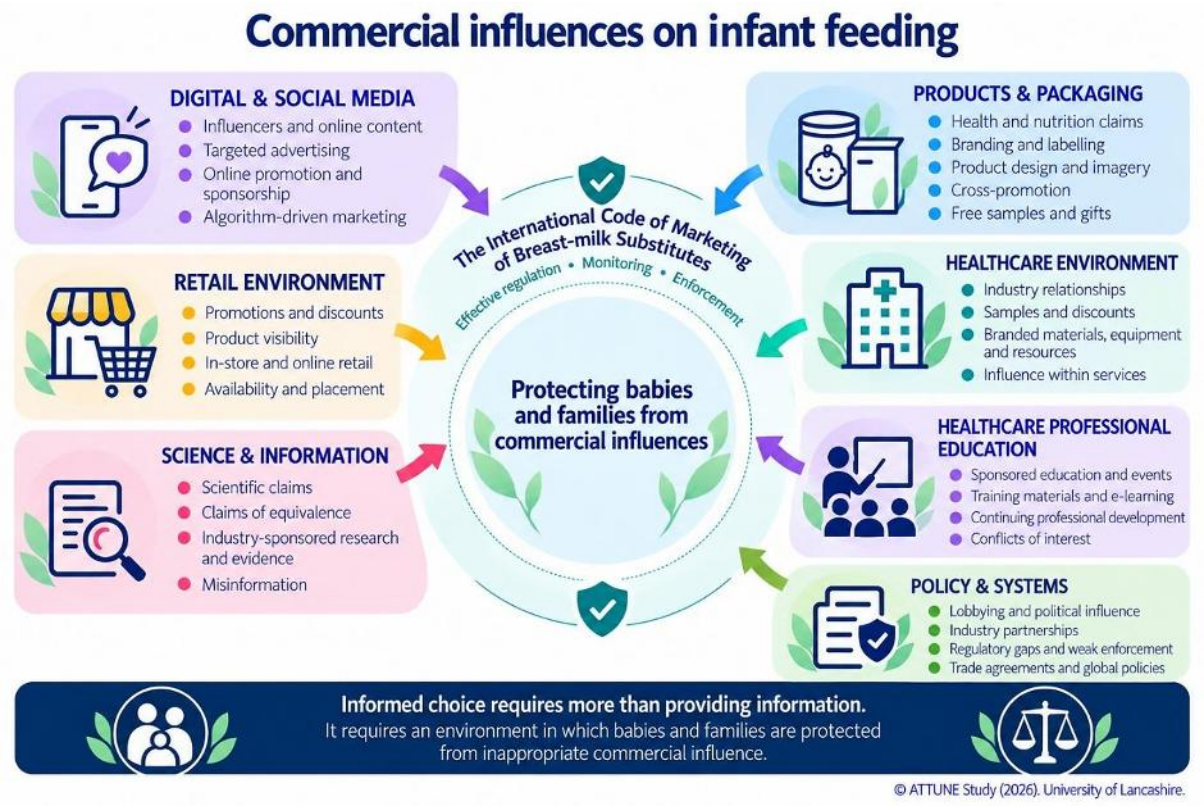


Figure 12: Overview of marketing influences

Recommendations for the BFI programme

- **Strengthen BFI's role as a practical mechanism for Code implementation** by positioning BFI standards, training and assessment to help relevant UK public services operationalise the Code in everyday practice.
- **Continue to address and adapt to marketing risks** recognising the impact of digital marketing, influencers, cross-branding, follow-on/toddler milks, specialist formulas and commercial materials reaching families antenatally and postnatally.
- **Improve staff confidence and consistency in evidence-based conversations** about commercial milk formula and other breast milk substitutes. Develop clearer training, case studies and practical resources so staff can respond accurately and non-judgementally to questions about infant formula, while avoiding commercial influence.
- **Strengthen focus on how marketing practices disproportionately affect those families experiencing food insecurity and socioeconomic disadvantage,** including support for the development of appropriate emergency pathways that do not contravene the Code.
- **Consider assessing the feasibility of expanding the programme to include the impact of the commercialisation of young child's diets and ultra processed foods** on breastfeeding and infant feeding.

Detailed overview of included evidence

The world has seen a rapid global expansion of the milk formula market and the corresponding rise of what Baker et al. (651) term "Big Formula" - a group of transnational corporations that manufacture and distribute commercial milk formula. As described in the 2023 Lancet Series on breastfeeding, their growth is driven by a combination of market expansion strategies and political practices that together reshape first-food systems, ultimately undermining breastfeeding and public health (1, 652, 653).

The evidence presented in this chapter highlights the persistent and evolving nature of violations of the International Code of Marketing of Breast-milk Substitutes, including the growing use of digital marketing, cross-promotion and product labelling strategies. It also examines the role of regulatory and healthcare systems in shaping compliance with the Code, alongside emerging concerns regarding the commercial promotion of baby foods and ultra-processed products for infants and young children. Whilst this document focuses on the BFI standards, the evidence review should be understood within the larger context of Code violations across the whole infant feeding ecosystem. Full details of the included reviews and empirical studies are provided in the Appendices.

Persistent violations of the Code

Across the world, widespread violations of the Code are reported across multiple settings including retail stores, health facilities, digital platforms, and public spaces (654, 655). Point-of-sale violations are particularly common, especially price promotions, gifts, and discounts (654, 655). CMF companies use traditional and modern marketing tactics, including free samples, discounts, sponsorships, misleading health claims, and cross-promotion strategies (654-657). A multi-country study conducted by the WHO reported that 51% of women interviewed had seen or heard CMF marketing, with the UK having among the highest rates (84%)[187]. Survey studies from Canada and the United States report high levels of exposure to Code violations among mothers. In one study, 87% of respondents (n=119) experienced at least one violation (36), and in another, 57% of 3,031 mothers received infant formula samples by mail during late pregnancy or soon after birth (658). Receipt of these samples was associated with lower exclusive breastfeeding rates at six months. A further US survey found that women intending to exclusively breastfeed were significantly more likely to receive formula samples by mail than those planning to mix feed (74% vs. 36%), possibly due to differences in exposure to direct and indirect marketing of infant formula given the observed demographic differences between women planning exclusive breastfeeding and mixed feeding in this study (659).

> *The backlash from some of the managers at that point in time, tells me how ridiculous this was – they were saying 'why shouldn't staff be able to meet with people and have a nice lunch and get some nice goodies?' So that was a big culture change. But I have to say the reps have now completely disappeared off the scene. I always remember sitting in one of the health visiting offices and I took a call when it was one of the reps who thought I was somebody else arranging to meet me for lunch. And I went 'I think you've got the wrong person here' and she just about died on the spot. There's been a lot of work done to kind of really implement the WHO Code* (Site 3 community HCP3)

The growing challenge of digital marketing

CMF companies have shifted heavily to digital marketing, using social media, e-commerce, influencer partnerships, and direct consumer engagement (654-657). Personalised digital marketing tactics, such as direct messages via apps (e.g., WhatsApp), targeted ads, and online baby clubs, are growing, leveraging consumer data to maximise engagement (656, 657). Consumer data is routinely collected across devices like smartphones, tablets, and smartwatches used by parents to access health information and research baby products. For example, activities such as posting a pregnancy announcement or searching for pregnancy symptoms online can trigger targeted ads across a person's digital devices. Manufacturers also share promotional content on social media and encourage engagement, which amplifies reach through user networks and groups. To further identify and reach potential customers, CMF advertisers use tools such as predictive analytics, artificial intelligence, machine learning, geo-targeting, and search engine optimisation (656, 657).

> *I hate the adverts for the formula because they don't even need follow-on formula and it just leaves people thinking I need to spend all this money on this follow-on formula. But it's just like, no, you just need milk.* (Site 3 Mother3)

[187] WHO - How the marketing of formula milk influences our decisions on infant feeding

Monitoring digital marketing is more complex than traditional methods due to its highly targeted and less visible nature. Enforcement of national regulations aligned with the Code is further complicated by cross-border marketing, highlighting the need for stronger international collaboration. Automated tools and artificial intelligence could help detect violations more consistently and support national authorities in applying appropriate sanctions (655, 656).

CMF companies also engage in both overt and subtle messaging on own their own websites that encourage infant formula feeding and discourage breastfeeding in ways that violate the Code. In a content analysis of US CMF manufacturers websites, Pomeranz et al. (2021) found that CMF was more frequently associated with baby health benefits (44%) compared to breastfeeding (26%), especially in terms of brain, neural, gastrointestinal, and immune health. In addition, images showed bottle-feeding as easy, while breastfeeding was depicted as requiring effort with 40% of breastfeeding content dedicated to breastfeeding difficulties such as latching issues, nipple pain, and supply problems (660). (Also refer to parent views on the influence of marketing in the case study findings).

Cross-promotion and labelling

Beyond traditional infant formulas, CMF companies have increasingly diversified their product range to offer follow-up, toddler, and specialised formulas, thereby expanding the potential consumer base and deepening market penetration (651). CMF companies use cross-promotion tactics by branding infant formula similarly to follow-up and toddler formulas, potentially causing confusion amongst parents (654, 655). In a content analysis of all formula packs available for sale over the counter in the UK, nearly three quarters of follow-on formulas were found to have high similarity scores with infant formula (661). A US study found that branding and packaging similarities between infant formula and toddler milks contributed to caregiver confusion, with 11% of 1625 infant caregivers reporting serving toddler milk to infants, often believing it was infant formula (662).

Investment in product development and 'corporate science'[188] helps to validate product safety and nutritional claims, influencing both consumers and health professionals (651). Labels, however, often contain misleading claims about health benefits, digestion, or immunity, falsely presenting CMF as superior (654, 655), or they promote CMF as solutions to normal infant behaviours (e.g. crying, sleep) (652). Many of these health claims are not supported by high-quality evidence and are based on CMF industry-funded studies that often have high risk of bias (652). Many product labels also lack required breastfeeding support statements[189] (655), or when they are included they are typically in small font and poorly placed, reducing their visibility and effectiveness (661).

[188] Corporate science is research conducted by the corporations themselves, and through engagement with external scientists and organisations, is used to support and amplify their marketing activities.

[189] The Code recommends that CMF information, including that on labels, should explain the benefits of breastfeeding and the costs and dangers associated with the unnecessary or improper use CMF. The Code extends to commercially produced complementary foods for children aged 6–36 months, recommending that their marketing messages always include statements advising against feeding them before 6 months and emphasising the need for continued breastfeeding for 2 years.

Brand labelling has been shown to have an impact on infant feeding decisions. A qualitative study of 25 mothers in the UK found that mothers' decisions about formula feeding were influenced by on-pack labelling, with branding and design elements creating a sense of trust and familiarity that can override a lack of clear nutritional differentiation (663). A survey of 1,645 US caregivers of infants aged up to 3 years found that over half of infant caregivers (52%) thought that infant formula could be better than breastmilk for digestion and brain development, and 62% believed that it provided nutrition not found in breastmilk (662). Parental agreement with marketing claims was shown to significantly increase their likelihood of giving their children infant formula or toddler milk (662). In Singapore, healthcare provider recommendations, perceived nutritional benefits, and brand reputation strongly influenced mothers' choices, even among breastfeeding mothers (664).

Clear, consistent information from healthcare professionals regarding the equivalence of formula products could help counterbalance the persuasive influence of on-pack marketing. Qualitative research reported that mothers in the UK wanted more supportive guidance from healthcare professionals about CMF products to minimise the confusion and anxiety they experienced when selecting 'the best' product for their baby (663).

Weak enforcement of national laws

The CMF industry has used its resources to shape policy through lobbying multiple policy fora and decision-making spaces. For example, the CMF industry has lobbied international bodies such as the WHO, Codex Alimentarius Commission, and World Trade Organization to weaken, delay, or block regulations aligned with the Code. Tactics include direct lobbying of government officials, leveraging economic diplomacy, and using trade disputes to challenge national laws (651, 652). In the US, lobbying expenditures by major CMF companies exceeded $180 million between 2007 and 2018, targeting the Senate, the House of Representatives, and agencies such as the Food and Drug Administration and Department of Agriculture (651, 652). CMF companies have increasingly promoted voluntary self-regulation of their marketing practices according to Code recommendations, as an alternative to stricter governmental regulations, often delaying or diluting the implementation of the Code (651). Self-regulation however has consistently failed to reduce marketing practices that violate the Code (664).

> *I think it does need that drive from governments to be able to really start to fully adopt The WHO Code. I think until we have more kind of influence over the marketing side of things, this is always going to be a big problem that we're fighting against.* (Site 3 community HCP3)

Further, many countries lack strong monitoring and enforcement mechanisms, allowing violations to persist (654-656). Along with the UK, fewer than 20% of countries worldwide currently have laws that explicitly prohibit the digital marketing of CMF[190]. Even where digital CMF marketing is prohibited, enforcement is inconsistent, and companies find legal loopholes (655, 656). At the 78th World Health Assembly in 2025, Member States committed to expanding the Code's provisions to regulate digital marketing more effectively, acknowledging the challenges posed by cross-border

[190] Regulating Digital Marketing of Breast-milk Substitutes | Global Breastfeeding Collective

advertising and influencer-driven promotions[191]. The WHO and UNICEF have called for stronger national legislation, improved monitoring, and international cooperation to close regulatory gaps and protect breastfeeding from aggressive online marketing tactics[192]. Stronger penalties and independent monitoring bodies are needed to improve compliance (655, 656).

Code violations in healthcare settings

CMF supplementation of breastfed babies in hospitals has a detrimental effect on the establishment of breastfeeding. A study in Hong Kong found a dose-response relationship between infants receiving formula in hospital and increased risk of early breastfeeding cessation (665). Research in the US has found that women receiving industry-sponsored formula or coupon bags at discharge from the post-natal ward undermines exclusive breastfeeding up to 6 months (666). A further US study found that the removal of industry-sponsored formula sample packs was associated with higher breastfeeding rates at 10 weeks postpartum (49% compared to 44%) (667). Similarly, a study in Hong Kong found that implementation of a hospital policy to not accept free infant formula was associated with reduced in-hospital formula supplementation rates and increased rates of exclusive breastfeeding and a longer duration of breastfeeding (668). Despite this evidence, healthcare professionals in the US perceive that there are barriers to ceasing formula distribution in hospitals, included concerns that some mothers might resort to feeding infants inappropriate substitutes like soda or water (667).

A cross-sectional analysis of national/regional maternity provider professional associations in Australia, New Zealand, USA, Canada and the UK, found that only half had policies addressing the CMF industry (14/28). CMF promotion was most commonly seen in the form of event advertising (5/28, 18%) and event sponsorship (4/28, 14%) (669). In the wider literature, the targeting of healthcare workers through sponsorships, gifts, and financial incentives is commonly reported, leading to potential conflicts of interest (654, 655) and reinforcing their products' credibility (670).

Globally, healthcare worker compliance with the Code has been found to vary, with public hospitals generally showing better adherence than private hospitals (664). In Canada, facilities with BFHI designation have been found to have significantly better compliance with the Code compared to non-designated facilities (671).

Low awareness among healthcare workers about the Code and related laws undermines breastfeeding support and highlights the need for targeted training (670). Where this has been implemented in the Czech Republic, Code compliance has been shown to increase from 0% to 100%, with the support of hospital management and department leaders being crucial to achieving sustained policy change (672). Overall studies have demonstrated that more training is needed for health professionals on both the Code and national laws (655).

Ultra-processed foods for infants and toddlers

While the Code regulates the marketing of CMF, baby foods fall outside these protections and are not subject to the same marketing restrictions. Commercial baby foods are increasingly displacing minimally processed, home-prepared foods in young

[191] Countries commit to regulate the digital marketing of formula milk and baby foods – WHA78 – IBFAN
[192] GBC Policy Brief Digital Marketing 2024.pdf.pdf

children's diets and the global baby food market have grown from US$ 9.6 billion in 2010 to US$ 17.9 billion in 2022 (673). A recent UK study reported that a substantial proportion of commercially available baby foods for children under 36 months failed to align with WHO recommendations. Among 469 products assessed, only 45% met the WHO Nutrient and Promotion Profile Model criteria[193], while none complied fully with the promotional standards because of the use of inappropriate marketing claims on product packaging. Furthermore, only 5% of products provided adequate statements supporting breastfeeding (674). Data collected from 10 countries across the European region has also found that most categories of commercially produced baby foods marketed to children up to 36 months of age contain high levels of sugar. The sugar in these products contributed approximately one-third of an infant's total energy intake, substantially exceeding the WHO recommendation that free sugars should provide less than 10% of total energy intake and ideally less than 5% for both adults and children[194].

Many commercial baby foods are classified as ultra-processed foods (UPFs). A UK study of commercial baby foods, which analysed more than 600 baby food items from leading brands, found that, overall, 31% of baby food products were classified as UPFs, whilst 87% of baby snacks and 79% of baby cereals fell into the category of UPF (675). A recent UNICEF review concluded that UPFs are increasingly dominating children's diets worldwide, beginning in infancy and continuing throughout childhood and adolescence. Commercial determinants of health, such as marketing, product formulation, pricing strategies and corporate influence on policy, were identified as key drivers of UPF consumption (676).

Higher UPF consumption during childhood has been associated with poorer diet quality, adiposity and cardiometabolic risk factors (677), although the strength of evidence varies across outcomes and age groups. Wider research involving older children and adolescents has also reported associations with mental health and sleep outcomes (678), while emerging evidence has explored possible associations with brain development (679). Evidence specifically examining these longer-term outcomes following UPF exposure during infancy remains limited. In adults, a review of reviews found that greater exposure to UPFs was associated with a higher risk of adverse health outcomes, especially cardiovascular disease related mortality, type 2 diabetes, anxiety, adverse sleep related outcomes and depression (680). International organisations, including the WHO and UNICEF, have recommended closer monitoring and stronger regulation of commercial baby foods, alongside public health measures to reduce children's exposure to ultra-processed foods[195,196].

In conclusion, the evidence demonstrates that commercial influence operates across multiple and interconnected environments, extending from direct exposure of families to wider influences within healthcare, science, retail and policy systems. Addressing

[193] The WHO Nutrient and Promotion Profile Model (NPPM) provides a standardised framework to assess the nutritional composition and marketing claims of commercial baby foods to ensure they are appropriate for infants and young children aged 6–36 months. Nutrient and promotion profile model: supporting appropriate promotion of food products for infants and young children 6–36 months in the WHO European Region

[194] WHO - Guideline: Sugars intake for adults and children. It should be noted that these guidelines do not focus specifically on infants and young children.

[195] WHO - Policies to protect children from the harmful impact of food marketing

[196] UNICEF Advocacy Packages for Food Environment Policies | UNICEF

these influences therefore requires more than restrictions on individual forms of advertising. Table 8 details the principal areas of commercial influence identified within the evidence and the corresponding approaches required to strengthen protection, support Code implementation and enable informed infant-feeding decisions.

Table 8: *Areas of commercial influence and strategies to address them*

Where commercial influence operates	**Examples identified in the evidence**	**Approaches to strengthening protection**
Digital and social media	Targeted and personalised advertising, social media promotion, influencers and other forms of digital marketing can extend commercial reach and make monitoring more difficult.	Extend regulation and Code implementation to contemporary digital environments, supported by effective monitoring and enforcement mechanisms.
Products, packaging and branding	Health and nutrition claims, product differentiation, similar branding across product ranges and cross-promotion can shape perceptions and create confusion between products.	Strengthen regulation of labelling, promotional claims, branding and cross-promotion, alongside effective compliance monitoring.
Retail environments	Discounts, promotions, samples and point-of-sale marketing continue to expose families to commercial messaging.	Strengthen monitoring of retail practices and ensure clear enforcement arrangements and meaningful sanctions for non-compliance.
Healthcare settings	Formula distribution, free or discounted products and commercial presence within healthcare can expose families to marketing and influence feeding practices.	Maintain Code-compliant procurement and practice, independent monitoring, and organisational policies that protect healthcare environments from inappropriate commercial influence.
Healthcare professionals	Sponsorship, incentives, industry-provided information and professional relationships can create conflicts of interest and influence practice.	Provide independent, evidence-based education; strengthen staff understanding of the Code; and establish clear standards concerning commercial relationships and conflicts of interest.
Science and health information	Scientific and health-related claims can be used to differentiate products and shape perceptions of their benefits or equivalence.	Ensure families and professionals have access to independent, accurate and evidence-based information and strengthen scrutiny of health and nutrition claims.
Policy and regulatory systems	Industry lobbying, partnerships and engagement with policy processes can weaken or delay effective regulation.	Strengthen legislation, ensure transparent policy processes, protect against conflicts of interest, and establish independent monitoring with clear accountability and enforcement.

Where commercial influence operates	Examples identified in the evidence	Approaches to strengthening protection
Families and wider society	Repeated exposure to commercial messages can shape feeding norms, expectations and perceptions of what constitutes normal or desirable infant feeding.	Protect access to impartial information and create environments that enable informed decision-making without inappropriate commercial influence.

Limitations of the evidence base

Data access and scope

- The limited public availability of legal documents relating to CMF marketing legislation and regulation (e.g. decrees, regulations, sanctions, agreements, laws, administrative orders) may lead to underreporting. The lack of centralised databases for Code violations also hinders systematic tracking.

Methodological constraints

- Many studies are cross-sectional and some rely on self-reported data, introducing recall and desirability bias. Few studies directly assess the impact of digital CMF marketing on breastfeeding outcomes.
- Monitoring processes and enforcement mechanisms are inconsistently defined across countries and there is no globally accepted framework that exists for categorising digital marketing strategies, making comparisons difficult. Some marketing practices are so embedded in health systems that their influence may be underestimated.

Limited stakeholder perspectives

- Few studies explore health worker attitudes to the Code and its implementation and there is limited exploration of fathers and other caregivers' experiences.

Areas for policy/practice improvements and further research

Policy and legal reform

- National legislation should be strengthened to align with the Code, including coverage of toddler milks and specialised formula for cow's milk allergy. This could include introducing legally binding declarations of industry sponsorship alongside the enforcement of conflict-of-interest policies. International cooperation is needed to regulate online advertising and cross-branding tactics that undermine breastfeeding.
- Guidance given by WHO-Europe to help countries implement the Code more effectively should be utilised[197]. Stronger regulatory policies that aim to reduce population exposure to UPFs are needed. Recommended approaches include warning labels, taxation, marketing restrictions, and school-based policies,

[197] WHO - Effective regulatory frameworks for ending inappropriate marketing of breast-milk substitutes and foods for infants and young children in the WHO European Region

while ensuring that healthier food choices remain affordable, accessible, and practical for consumers.

Monitoring and enforcement

- Independent, transparent monitoring systems should be established, and enforcement roles and sanctions should be clarified. The use of AI tools to detect and monitor violations should be explored. Governments and public health agencies should use robust systems, such as the NOVA classification[198], to monitor UPF consumption and assess the effectiveness of policies designed to reduce intake. Continued efforts are needed to improve the consistency and accuracy of food classification and dietary surveillance methods.

Public health communication

- Misleading marketing claims should be countered with evidence-based messaging. Further work should be undertaken to educate professionals and caregivers on CMF product distinctions and their appropriate use. Public health messaging should clearly communicate the evidence linking high UPF consumption with increased risks of mortality, cardiometabolic disease, obesity, type 2 diabetes, and poor mental health. Communication should encourage healthier overall dietary patterns centred on minimally processed foods, while recognising the contemporary barriers that influence food choices.

Marketing, digital environments and consumer influence

- Interdisciplinary research is needed to understand the broader socio-economic and environmental impacts of formula marketing, including digital marketing.
- Research should explore consumer perceptions of marketing cues and evaluate the effectiveness of regulatory interventions, including the potential impact of plain packaging policies.
- Given the increasing role of social media influencers in promoting CMF, further research is needed to better understand their impact and ensure the effective implementation of the Code in the digital environment.

Commercial influence within healthcare systems

- Further research is needed to examine the extent and impact of the promotion of highly specialised infant milks through healthcare systems, such as provision of free and heavily discounted CMF through pharmacy consortia.

Regulation and policy effectiveness

- Evaluate the effectiveness of regulatory interventions, including the potential
- impact of plain packaging policies.
- Examine how the Code can be effectively implemented and enforced within digital environments, including influencer marketing.

[198] The NOVA classification categorises foods into four distinct groups based on the nature, extent, and purpose of industrial processing, rather than their nutrient content. It is widely used in public health to identify UPFs.

Health effects and mechanisms

- Further research should focus on mechanistic studies and short-term randomised trials to strengthen understanding of the causal pathways linking UPFs to adverse health outcomes.
- Additional work is also needed to investigate outcomes with weaker evidence, improve dietary assessment methods, examine differences between UPF subcategories, and address residual confounding in observational studies.

ATTUNE STUDY

13

Chapter Thirteen: An educated workforce

Workforce education is a core component of the BFI and is fundamental to developing the knowledge, skills and confidence healthcare professionals require to deliver consistent, evidence-based infant feeding and relationship-building support. Effective education and training can help healthcare professionals translate evidence into practice, support the implementation of Baby Friendly standards, and promote high-quality, family-centred care. In addition to enhancing knowledge and skills, workforce education may influence attitudes, behaviours and organisational culture, thereby helping to create environments that support the delivery of evidence-based care. Understanding the effectiveness of workforce education and the factors that influence its delivery is important for informing policy, service development and quality improvement initiatives. The evidence on breastfeeding education for healthcare staff and students included in this chapter draws primarily from systematic reviews and is supplemented by findings from a select number of primary papers. The evidence relates to either general education programmes or from the global BFHI; no available evidence relates specifically to the UNICEF UK BFI.

Evidence from the 2012 review highlights that training is a key component of implementing BFI standards and improving the quality of breastfeeding support. Across the evidence base, substantial gaps were identified in healthcare professionals' knowledge, confidence and organisational support for infant feeding practice. Educational interventions were generally associated with improvements in practitioners' knowledge, attitudes, confidence and clinical practice, and in some cases were linked to reductions in non-medically indicated supplementation.

However, the evidence suggests that education alone is unlikely to produce sustained improvements in breastfeeding outcomes without accompanying organisational change, including supportive policies, leadership, audit and quality improvement processes. The findings also highlight the importance of skilled, proactive breastfeeding support delivered by healthcare professionals and peers across antenatal, postnatal and community settings, which may contribute to improved breastfeeding duration. Effective education was characterised by a combination of technical knowledge, communication and relational skills, recognising breastfeeding as a dynamic biopsychosocial process. Practical, reflective and multidisciplinary approaches to learning were frequently recommended, alongside mentorship, experiential learning opportunities and the integration of women's lived experiences to support the development of competence and confidence in practice.

Evidence from the updated review is broadly consistent with the findings of the 2012 review. Both reviews emphasise the importance of developing practical skills, effective communication, practitioner confidence, multidisciplinary approaches, and providing organisational support alongside education and training.

The newer evidence places greater emphasis on competency-based education and the objective assessment of clinical skills, highlighting the need to evaluate whether training translates into consistent BFI-aligned practice. However, the available evidence relates predominantly to breastfeeding education and competencies and does not adequately evaluate education relating to other components of the current

UK Baby Friendly standards, including supporting close and loving relationships and supporting parents who formula feed. This represents an important evidence gap. It also draws attention to other important limitations within the evidence base, including a reliance on self-reported outcomes, short-term educational interventions, and limited evaluation of long-term learning retention or the application of knowledge and skills in practice.

Compared with the 2012 review, the more recent literature positions workforce education less as a standalone intervention and more as a system-level responsibility, embedded within leadership, organisational culture, policy, and implementation processes that support sustained practice change.

Description of the UNICEF UK BFI standards and links to wider policies and guidelines

Currently, to achieve Stage 2 accreditation, a service must demonstrate that staff are educated to implement the BFI standards and can care for parents and babies effectively. This means that all staff who have contact with pregnant women, mothers, babies, and families should receive role-specific breastfeeding and infant feeding education that will allow them to support evidence-based practice. Staff include healthcare professionals, support staff, students, and volunteers. Recognising the multidisciplinary nature of maternity, neonatal, hospital-based children's services and community services, education should be proportionate to staff roles and responsibilities. Education should ensure staff understand their role in relation to supporting mothers with infant feeding and building close and loving relationships with their baby, and when referral to additional services/support might be required.

According to BFI standards, education should be competency-based, that is, it should support the development of knowledge and practical skills. This includes skills to enable compassionate communication, and the skills to support mothers to breastfeed responsively or where relevant to formula feed responsively and as safely as possible. Staff education should also ensure staff understand the International Code of Marketing of Breastmilk Substitutes[199] and how to apply Code provisions in practice.

Accredited services are expected to provide ongoing rather than one-off education. This includes annual updates to ensure staff knowledge and skills remain current, particularly when guidance or evidence change. Processes should be in place to enable staff to remain up-to-date, such as including education within induction and updates that are frequent enough to support staff to maintain knowledge. It is expected that education is embedded in a wider, supportive and enabling organisational culture.

The UNICEF UK BFI University Standards were developed to ensure that pre-registration midwifery and health visiting education programmes equip future practitioners with the knowledge, skills and attitudes required to support infant feeding and early parent–infant relationships[200]. Through a structured accreditation process,

[199] WHO - International Code of Breastmilk Substitutes

[200] National Maternity Standards for midwifery include competencies' mapped to the UNICEF UK BFI programme further reinforcing the education and training standards based on the evidence. Standards of proficiency for midwives

universities are required to demonstrate that Baby Friendly principles are embedded throughout programme curricula, learning outcomes, teaching activities and practice learning experiences. By aligning educational preparation with the standards expected in clinical practice, the University Standards seek to strengthen the consistency and quality of infant feeding support across maternity and community services; universities are thus a key lever within a system-level approach.

The UNICEF UK-BFI standard on workforce education closely mirrors international policy (i.e. the WHO/UNICEF BFHI[201], neo-BFHI[202] and the International Code of Marketing of Breast milk Substitutes) as well as matching UK guidance. The NICE NG194 Postnatal Care guideline[203] requires that infant feeding support is delivered by competent professionals, supports parents to build strong emotional relationships with their babies, and is respectful, evidence based, and aligned with parents' preferences. This guideline states that all maternity care providers should implement an externally evaluated, structured programme that encourages breastfeeding, using the Baby Friendly Initiative as a minimum standard. The Breastfeeding and Infant Feeding Strategic Framework 2025–2030 (Scotland)[204] also calls for consistent, evidence-based learning outcomes across education and training programmes for all roles that support mothers and babies. UNICEF UK-BFI also aligns with standards set by professional bodies: the 2024 World Breastfeeding Trends Initiative (WBTI)[205] assessment, which assesses workforce education under Indicator 5, Health Care Systems in support of breastfeeding and Infant and Young Child Feeding, notes that BFI accreditation is the main form of in-service training in maternity and health visiting services in the UK.

Summary of the evidence in relation to UNICEF UK BFI standards

Competency-based workforce education: The BFI standards emphasise development of knowledge, practical skills, and compassionate communication. Systematic reviews of educational infant feeding interventions found that many successfully improved knowledge and self-reported confidence, particularly in the short term. However, fewer interventions assessed skill development or objective measures of competence, and practical application was often limited or inconsistently evaluated. There was substantial variability and weakness in outcome measurement, with heavy reliance on self-report and non-validated tools. This contrasts with the BFI expectation of auditing and practical skills reviews to measure application of knowledge. Some education interventions were conceptually aligned with BFHI principles or the WHO/UNICEF Ten Steps, particularly in relation to breastfeeding knowledge and basic support practices. However, few interventions evaluated whether education translated into consistent BFI-aligned practice at service level.

Ongoing education and updating: BFI accreditation requires education to be ongoing and as part of continuing professional development. Available evidence is based on evaluations of educational interventions which were time-limited or one-off training

[201] Baby Friendly Hospital Initiative - 10 steps to successful breastfeeding Baby-Friendly Hospital Initiative | UNICEF
[202] Baby Friendly Hospital Initiative for small, sick and preterm newborns
[203] NICE - Postnatal care (NG194)
[204] Scottish Government - Breastfeeding and infant-feeding-strategic-framework 2025-2030
[205] World Breastfeeding Friends Initiative - UK Report 2024

activities, with minimal follow-up or reinforcement. Few studies assessed retention of learning or longer-term outcomes. Further research is needed on approaches to provide sustained workforce competence.

Multidisciplinary and role-specific training: Existing evidence mostly relates to education interventions targeting specific professional groups, most commonly nurses, midwives, doctors, and students of these professions, rather than multidisciplinary training. While this aligns partially with the BFI requirement for role-appropriate education, BFI expectations are for consistent, service-wide support. Staff who have contact with pregnant women, parents and infants should have the role-appropriate knowledge and skills needed to provide basic support at the point of contact and know when additional or specialist support is required. There is also a need for more equitable training across MDT practitioners, and related research on interdisciplinary or whole-team training.

Organisational and system-level integration: BFI accreditation frames workforce education as an organisational responsibility, embedded within leadership, policy, and clinical systems. Available evidence relates mainly to studies of education interventions delivered as standalone initiatives, with limited attention to organisational context, implementation processes, or system-level enablers and barriers. Studies highlight the importance of contextual factors such as institutional policies, leadership, and workplace culture on the outcomes of educational interventions**.** Also highlighted is the theory-practice gap arising when students are educated to high standard in universities and then transition to practice-based settings not adhering to these same standards.

Recommendations for the BFI programme

- **Build more practical, experiential and reflective learning** into education programmes to strengthen expectations that training should go beyond didactic teaching and include opportunities to practise communication, positioning and attachment support, hand expression, problem-solving and compassionate conversations.
- **Strengthen the emphasis on assessing competence of practical and interpersonal skills** to prioritise competency-based assessment, practical skills reviews, observation, audit and feedback.
- **Continue to frame workforce education as part of whole-system change, not a standalone training requirement to** position staff education as an organisational responsibility, linked to implementation of standards, supportive management, mentoring and consistent practice environments.
- **Increase focus on multidisciplinary and role-specific education across the whole workforce** to strengthen guidance and resources for multidisciplinary learning, including non-clinical staff, neonatal and paediatric teams, community settings, students, peer supporters and volunteers, while keeping education proportionate to role. Advocate for role-relevant infant feeding training within health and social care workforce education.
- **Strengthen ongoing education, updating and retention of learning** by continuing to require ongoing education and annual updates.

Detailed overview of included evidence

The following sections consider the educational approaches and content used within training programmes, the professional groups targeted, and the extent to which education influences healthcare professionals' knowledge, attitudes, skills and confidence. It examines the contribution of workforce education to the implementation of Baby Friendly standards and breastfeeding-related outcomes, together with evidence regarding the retention of learning over time. In addition, consideration is given to the organisational, professional and sociocultural factors that influence educational outcomes, as well as healthcare professionals' perspectives on the characteristics of effective infant feeding education. Full details of the included reviews and empirical studies are provided in the Appendices.

Educational approaches

Across the studies reviewed, breastfeeding education for healthcare staff and students varied widely in format and duration. Most interventions adopted multi-modal approaches, combining didactic lectures, workshops, clinical placements, simulations, role-play, and use of standardised patients (681-686). Application-based methods, i.e. those involving role playing, simulators, clinical practice with patients, or standardised patients, were found to provide hands-on skill development in low-stress settings[206] (682-685). Simulations and role-play provided opportunities to practise communication and problem-solving before working with real and varied families (682-685). Despite

[206] Low-stress settings mean learning environments where the pressure, risk, and emotional stakes are intentionally reduced, so participants can practise skills safely and confidently.

being recognised as a rigorous method for assessing breastfeeding clinical skills, Objective Structured Clinical Examination (OSCE)[207] was rarely used (683).

Educational content

Few studies detailed the theoretical underpinnings of their programmes, and there was limited application of educational or behavioural theory (682, 687). Some studies did link to recognised frameworks such as the Wellstart International Lactation Curriculum Guide, the USA Academy of Breastfeeding Medicine 'What Every Physician Needs to Know About Breastfeeding', the American Academy of Pediatrics Breastfeeding Curriculum, or the International Board of Lactation Consultant Examiners Academic Projects (682-685, 688). Some interventions were linked explicitly to BFHI curricula (684, 687, 689).

Core content areas commonly covered included anatomy and physiology of lactation, the benefits of breastfeeding, breastfeeding techniques, breastfeeding assessments, and the management of breastfeeding-related problems (682, 684, 685). Interpersonal skills, counselling skills, and taking a breastfeeding history were also commonly included (683, 689, 690). Use of breast pumps and nipple shields was covered in a small number of studies (683). For neonatal staff, educational interventions included lactation physiology and breast milk expression within the context of caring for the high-risk infant (681), and breastfeeding practices, kangaroo care, and positive touch in neonatal units (691).

Targeted to professional groups

Education interventions were delivered to a broad range of professionals, including midwives, nurses, doctors, and students in nursing, medicine, pharmacy, and dietetics (682, 683). One study extended to non-clinical staff such as hospital housekeepers who were seen as having influential interactions with postpartum women in hospital (692). Different types of professionals received different breastfeeding education programmes. For example, several studies involving midwives and nurses used the global 20-hour WHO/UNICEF Breastfeeding Management Course[208] (689). Whereas educational programmes for healthcare and medical students showed a wide variation in duration from 3 minutes to 300 hours (684). For the most part, studies used interventions aimed at specific professional groups, with multidisciplinary education identified as an under researched area (682-684).

Attitudes towards infant feeding and providing breastfeeding support

The evidence regarding the effect of educational interventions on the attitudes of health professionals is mixed. Most studies found that education improved staff and student attitudes toward breastfeeding, reducing negative or ambivalent views and enhancing motivation to support mothers (687, 689, 690). Implementation of the BFHI or Neo-BFHI frameworks was associated with more facilitating and less disempowering attitudes to breastfeeding (693).

However, attitudinal change following breastfeeding education was not found in all studies, suggesting that attitudes can be difficult to shift through education alone (687, 689). In some student groups, particularly nursing and medical undergraduates,

[207] An OSCE evaluates a learner's clinical competence through a series of short, structured stations where they must demonstrate specific skills.
[208] Note that this international UNICEF course differs from UNICEF UK BFI training.

discomfort with public breastfeeding or mixed views about formula feeding persisted even after education (688). A process-oriented[209] training programme in Sweden included lectures on breastfeeding management and promotion, and discussions on counselling skills and reflection on personal breast-feeding experience. The programme decreased antenatal midwives and postnatal nurses 'regulating' attitudes (attitudes leading to being more directive). However, the same study found that while the programme increased 'facilitative' and decreased 'disempowering' attitudes among postnatal nurses, similar changes were not seen for antenatal midwives, indicating the complexity of influencing attitudinal change (687, 689).

Knowledge

Several systematic reviews reported statistically significant improvements in knowledge scores following an educational intervention (681, 685, 689, 690). In several reviews and primary studies, healthcare professionals and student groups, education led to short-term gains in breastfeeding knowledge, particularly in understanding lactation physiology, infant cues, positioning and attachment, and problem management (685, 690, 694, 695). A UK pre-post study of an educational package aimed at neonatal clinicians found increased knowledge regarding breastfeeding and parental engagement practices (kangaroo care and positive touch) following the intervention (691).

Educational interventions that included clinical practice-based sessions showed greater improvements in knowledge than lecture-based ones (685). For instance, studies where the intervention included an observational or experiential opportunity showed improvements in professionals' recognition of effective positioning and attachment, identification of common breastfeeding problems, assessment of milk supply, and appropriate management strategies (683). Although while a UK-based study using educational videos found no difference in outcomes comparing a video that used role-play and a video that used a real clinical encounter, staff preferred the latter (696).

Practical and communication skills

Effective breastfeeding support requires health professionals to move beyond theoretical knowledge to demonstrate practical competencies. Available evidence suggests that educational interventions can improve the breastfeeding support skills of health professionals (685, 690), particularly when they include practical, experiential and feedback-based components (683, 684, 697). As with the findings in relation to improvements in practitioners' knowledge, the inclusion of clinical practice-based sessions also produced greater improvements in skills than educational interventions without this component (683). For students, simulation and role-play using high-fidelity breast models or standardised patients enhanced practical skills and confidence (685). The global WHO/UNICEF breastfeeding counselling course has also been shown to increase communication and counselling skills in areas such as clinical history taking, assessment of a breastfeed, non-verbal communication, active listening and learning, and building mothers' confidence and giving support (687, 689).

[209] 'Process-oriented' in this educational programme refers to a focus on practitioner reflective and problem-solving processes.

One study reported that students showed improvements in clinical skills, such as assisting mothers with practical skills such as infant positioning and attachment, as assessed by OSCE, following breastfeeding education (683). A study of family practice doctors found that breastfeeding education using standardised patients increased learner's ability to correctly evaluate and diagnose common breastfeeding problems, as assessed by OSCE (682).

Confidence

Educational interventions generally led to improvements in staff and student confidence or self-efficacy in providing breastfeeding support (682, 684, 694, 696, 698), although not consistently (684, 689). Improvements in confidence were seen alongside increases in knowledge and skill development, especially when the educational intervention included practical or experiential components as well as theory (683).

However, confidence did not always reflect improved knowledge: students sometimes reported high levels of confidence even when their measured knowledge was objectively low (688). This highlights the need for educational interventions to build confidence rooted in demonstrable competence, particularly in practical breastfeeding management (688). Confidence was also influenced by organisational and interpersonal factors such as managerial encouragement, peer support, and alignment of policies with practice (683). For example, neonatal nurses in unsupportive environments, i.e. with inadequate support from peers or managers, often felt powerless to influence outcomes, despite good theoretical knowledge (681) (also see staff views in the case study chapter).

Alignment with BFHI standards and practice outcomes

Education increased adherence to global BFHI standards, particularly Steps 1 (policy), 5 (supporting breastfeeding initiation), 7 (rooming-in), and 8 (feeding on demand) (687, 693, 699). Nevertheless, gaps remained in fully realising Steps 5 and 6 (maintaining lactation and exclusive breastfeeding) (695). In a Croatian study assessing the impact of BFHI training on hospital practices and breastfeeding rates, participating mothers still reported limited practical guidance on sustaining milk supply, inconsistent communication about supplementation, and occasional contravention of informed consent principles (695). Authors of a review exploring health facility staff training suggest that while education improves compliance to global BFHI standards, interventions to support adoption of the Ten Steps are likely to be more effective when implemented in concert (687).

Retention of learning outcomes

Most studies lacked long-term evaluation of learning retention or transfer to practice, with most assessing learning immediately or shortly after education (684, 690). However, a small number of studies included in reviews reported findings regarding knowledge and attitude retention over several months, with mixed results. Some studies reported improved attitudes towards breastfeeding and increased knowledge among midwives, postnatal nurses and other health

> *I think it's really crucial to keep staff upskilled to remind them of things maybe they've forgotten just due to the busyness of their working lives and capacity of caseloads.* (Site 4, maternity HCP9)

professionals persisting 6-12 months following education (687, 690). Others reported inconclusive retention, where breastfeeding knowledge improved immediately post-intervention, but this was not sustained at 3 months post-intervention, suggesting that merely developing superficial knowledge might not be robust or sustainable (681, 700). Authors suggest that regular in-service education is likely necessary for sustained impact of education programmes (681, 690) (also see staff views in the case study chapter).

Breastfeeding rates and maternal experience

Overall, staff education was associated with some improvements in early breastfeeding rates, particularly exclusive breastfeeding during hospital stays (682, 687, 690, 693, 699). One study of education for neonatal staff found that mothers cared for post-intervention were more than twice as likely to breastfeed their infants in the hospital (681). Long-term effects, however, were not seen: a meta-analysis found no significant impact of staff education interventions on exclusive breastfeeding rates at the six-month mark (690) and a study evaluating the impact of BFHI training found no post-training increases in breastfeeding rates at 3–12 months postpartum (695).

Even when improvements in breastfeeding rates were modest, mothers reported better experiences of support when cared for by educated staff. Education enhanced the quality and coherence of counselling, reduced perceived breastfeeding difficulties, and increased maternal satisfaction and confidence (681, 690, 697) (also see staff views in the case study chapter). This suggests that education influences relational and experiential aspects of care, even when population-level feeding rates remain unchanged.

Contextual factors influencing education outcomes

Several non-educational factors influenced the outcomes of educational interventions. At the organisational level, institutional policies, leadership, and workplace culture influence the outcomes of education interventions, in part through the availability of ongoing support and reinforcement (683) (also see staff views in the case study findings). Where educated staff had access to supportive mentors, learning was enhanced and sustained, while entrenched practices tended to undermine learning (683). For example, midwifery students trained in 'hands-off' techniques struggled in settings where hands-on techniques were the norm (683). This emphasises the importance of consistent mentorship and alignment between classroom teaching and workplace culture. In addition, managerial support, workload, and professional hierarchies affected how confidently staff could apply new knowledge (701).

At an individual level, healthcare professionals' personal or familial experience of breastfeeding was associated with higher baseline knowledge, more positive attitudes, and greater confidence in providing support, independent of formal training (683, 688, 700). Gender, previous exposure to breastfeeding, and cultural background shaped learning outcomes, with studies of Scandinavian students demonstrating stronger baseline knowledge and attitudes than peers in lower-breastfeeding contexts (688, 700). Practitioners with over 10 years' experience demonstrated higher confidence and leadership in delivering breastfeeding support (702). However, one study of educational interventions for neonatal staff reviewed by Higman et al, observed a negative relationship between the length of time a nurse had worked in a neonatal unit and their pro-breastfeeding attitudes (681).

Broader sociocultural factors were also implicated: cultural attitudes to infant feeding and national government restrictions on infant formula were seen to influence baseline attitudes and the receptiveness to educational interventions in some studies. For example, students in Sweden, which has extensive maternity leave, high breastfeeding rates and robust public health support for breastfeeding, had more positive attitudes to breastfeeding than students in the USA (685, 688).

What healthcare professionals want from infant feeding education

> *I think education is everything. It's the more I learn then the more it makes me passionate to support families because I know what the current evidence is and what's best for the babies and families. If I feel confident about what I know, then I'm confident to go to the families and give them the education and then they can still make the decisions at the end of the day*. (Site 4 maternity HCP2)

Research on healthcare professionals' perspectives on breastfeeding education shows that they value training that is relevant, practical, and supportive of their confidence and clinical roles. For example, midwives, nurses, doctors, and psychologists who had participated in a structured breastfeeding training programme reported that they felt more interested in breastfeeding, gained new practical tools, and valued group discussion and structured learning formats as key components of effective education, with many noting that the opportunity to share attitudes and clinical experiences was particularly useful in enhancing their competence and engagement in breastfeeding support (703). Evidence also indicates that professionals recognise significant gaps in their knowledge and skills and express a need for improved and ongoing education that goes beyond theoretical instruction to include confidence-building, evidence-based practices, and multidisciplinary collaboration (688, 700). Currently, there remains limited direct evidence regarding interventions specifically designed to address healthcare professionals' personal infant feeding experiences or biases, representing an important gap in the literature.

In conclusion, the evidence indicates that developing an educated workforce requires more than the provision of training. Knowledge and skills need to translate into demonstrable competence, confidence, relational practice and consistent delivery of evidence-based care. Achieving and sustaining this requires supportive organisational conditions, including leadership, protected time, multidisciplinary and experiential learning, opportunities for reflection and mentorship, objective assessment, supportive policies, and ongoing audit and feedback. Figure 13 illustrates this progression from education to workforce capability and highlights the wider organisational conditions required to embed learning within everyday practice.



Figure 13: Progression from training to workforce capability

Limitations of the evidence base

Lack of studies

- Systematic reviews repeatedly highlighted the lack of research on whether breastfeeding education for healthcare staff can help improve knowledge, attitudes, skills and breastfeeding rates and maternal experience. The lack of studies and the poor methodological quality of existing studies represent a major gap in knowledge.
- Follow-up periods in most studies were short or limited to immediate post-intervention, which restricts conclusions about durability of effects. There is limited evidence to link education interventions to sustained changes in practice or improvements in breastfeeding outcomes.

Methodological quality

- Included studies were of moderate to low quality, with high or unclear risk of bias associated with non-randomised designs, inadequate control of confounding, lack of blinding, high attrition, and poor reporting of methods and outcomes.

Heterogeneity

- There was substantial heterogeneity of educational interventions, populations, settings, and outcomes, which undermines comparability and synthesis. The studies varied widely in training content, duration, delivery mode, implementation strategies, and targe

- ted professional groups, alongside differences in study design and contextual factors. This heterogeneity limits the ability to identify core intervention components or draw conclusions about optimal educational approaches.

Outcome measures

- Studies tended to rely on self-reported measures of knowledge, attitudes, confidence, or self-efficacy, often using non-standardised or non-validated instruments. Few studies included objective assessment of clinical competence, behaviour change, or parent-level outcomes.
- There was inconsistency in outcome definitions and measurement tools, particularly for breastfeeding outcomes, which reduced comparability across studies and weakened confidence in pooled or narrative findings. It is unclear whether reported improvements reflect meaningful or sustained changes in breastfeeding support practices.

Scope

- Many studies focused on specific professional groups such as nurses, midwives, or doctors, typically in hospital-based settings; few studies looked at interdisciplinary teams, or community-based care.

Areas for further research

Standardisation of educational interventions

- There is a need to develop and evaluate more clearly defined and standardised breastfeeding education interventions, including specification of core components, duration, delivery methods, and educator qualifications.

Improved outcome measurement and use of validated tools

- Along with more clearly defined interventions, the use of validated, standardised outcome measures for knowledge, skills, confidence, and practice behaviours, alongside objective assessments where feasible, would strengthen the evidence on what works to educate staff.

Assessment of sustained impact

- Most studies measure outcomes immediately or shortly after the intervention. Longitudinal studies are needed to determine if improvements in knowledge, attitudes, and practice are sustained over time. In addition, the effect of reflective practice on these outcomes should be explored.

Interdisciplinary education

- Studies of education interventions aimed at a range of healthcare professional groups and/or interdisciplinary teams are needed to improve generalisability and relevance to healthcare services.

Education for professionals working within community situations and settings

- There is a lack of research exploring educational opportunities (e.g. observation and shadowing) in naturalistic situations such as where care is delivered in the community or the home. There are important gaps in terms of what can be learnt, from whom, and in what contexts.

Implementation-focused research

- Further studies should assess the impact of education within organisational, policy, and system-level change strategies, including evaluation of implementation fidelity, scalability, sustainability, and resource implications.

International Code of Marketing of Breast-milk Substitutes

- Future studies should assess the impact of training on staff adherence to the International Code of Marketing of Breast-milk Substitutes, a fundamental component of protecting breastfeeding.

Opportunities to debrief

- Healthcare professionals' personal experiences, beliefs and emotions relating to infant feeding may influence the support they provide to families. There is a need for studies investigating the value of reflective practice and supervision to help practitioners recognise and manage the influence of their own experiences.

ATTUNE STUDY

14

Chapter Fourteen: Case studies

Introducing the case studies

Case studies were undertaken at four sites across the UK to explore parent and staff experiences of care within services implementing the BFI standards across different organisational and accreditation contexts. Sites were from England, Scotland and Northern Ireland and therefore located in different policy contexts. While in Scotland and Northern Ireland, maternity, community and neonatal services operate within the same NHS Health Board or Health and Social Care Trust, in England, maternity and neonatal services sit within NHS services while community services are commissioned by local authorities.

By including different policy contexts, sites were in areas with a predominantly White British population (this was particularly pronounced in two sites). All four sites serve populations experiencing socioeconomic disadvantage, although the extent of deprivation differed, with all sites including a mix of deprived and more affluent areas. Table 9 below gives an indication of ethnicity and deprivation at the sites, drawing on several sources, with some reflecting the area where the sites are located, not of the mothers giving birth in the maternity services. This is because at some sites, the maternity and community services served overlapping but not identical geographic areas, and/or the BFI-accredited maternity service was not equivalent to its parent health service organisation[210]. In addition, there are differences in demographic data collection and reporting across UK nations.

Sites were initially identified in relation to maternity care, with the intention that the maternity service at each site would hold Achieving Sustainability (Gold) BFI status. All four maternity services held Gold BFI accreditation, as did the associated community services, while neonatal services were at different stages of accreditation, ranging from Stage 1 to Achieving Sustainability. This variation should be considered when interpreting the findings, as practices and experiences within neonatal settings may reflect different levels of implementation and may not be representative of neonatal units that have achieved full accreditation. However, this variation also provides valuable insights into the opportunities and challenges associated with implementing BFI standards across different organisational contexts.

All sites had had BFI accreditation (in maternity services) for many years at the time of the study. The most recent available breastfeeding initiation rates show a range from 61% to 70% across the four sites (see Table 9 below).

[210] For example, at one site, one of three hospitals within the organisation had BFI accreditation.

Table 9: *Overview of case study sites*

	Site 1	Site 2	Site 3	Site 4
Number of births per year	~3660	~3990	~3700[211]	~5360
BFI Accreditation:[212]				
Maternity	Achieving Sustainability	Achieving Sustainability	Achieving Sustainability	Achieving Sustainability
Community	Achieving Sustainability	Achieving Sustainability	Achieving Sustainability	Achieving Sustainability
Neonatal	Stage 2	Achieving Sustainability	Stage 3	Stage 1
Breastfeeding initiation rate[213]	68% (2024/25)	70.3% (2024/25)	61.2% (2021)	64.4% (2024/25)
Breastfeeding rates 6–8 weeks[214]	59.6% (2024/25)	51% (2024/25)	26.7% (2021)	43.5% (2023/24)
Ethnicity[215]	88% White British	90% White British	97% White British	Two areas – one 86% White British with 9% Asian population; the other 74% White British, 19% Asian population.
Deprivation[216]	Local authority district ranked 113/296 nationally on multiple deprivation index	Includes a city where 36% live in areas ranked within the 20% most deprived plus other areas where lower concentrations of severe multiple deprivation exist. There are also rural areas where deprivation is more dispersed.	Covers two areas which share similar measures of deprivation – in one area ~ 29% live in the 20% most deprived SOAs (Super Output Areas) and in the other area over 30% of areas are in the top 20% most deprived SOAs.	Two local authority districts ranked 71/296 and 85/296 nationally on multiple deprivation index

The case studies provide insight into how Baby Friendly principles are implemented and experienced within everyday practice. Although staff and parent findings are presented separately in this chapter, their experiences are interconnected and shaped by the organisational, workforce and wider social contexts in which care is delivered and received.

[211] Figure combined from two hospitals.
[212] In 2025. Source BFI Accreditation statistics and awards table Accreditation statistics and awards table - Baby Friendly Initiative
[213] Source local Site data, NHS Health Informatics Service, Public Health Scotland (2025); Northern Ireland Public Health Agency (2024); Figures reported are from the year of the study (2024-25) or the most recent available where data from the study year was unavailable.
[214] Sources: OHID (2025); Public Health Scotland (2025); Northern Ireland Public Health Agency (2024)
[215] Source Local data /Area Factsheets/ Census 2021 / Census 2022. Note this is an indication of the demographics of these areas not the mothers giving birth in the maternity hospital
[216] Source Local government, Office for National Statistics and public health data. Note this is an indication of the demographics of these areas not the mothers giving birth in the maternity hospital.

In the following sections, we first present insights from staff, followed by those from parents. Each section presents the detailed findings organised around key themes, together with overarching emergent recommendations that identify areas where BFI implementation could be strengthened and refined, followed by specific recommendations for the BFI programme.

Staff case studies

Interview details and participants

Interviews were conducted by three researchers (NC, LH, VM) and took place between March and December 2025. Staff interviews ranged from 25 to 60 minutes (mean 47 minutes). An overview of participant characteristics is reported in Table 10.

Table 10: *Participant characteristics – staff interviews*

	Total (n=40)
Site	
Site 1	9 (22.5%)
Site 2	10 (25%)
Site 3	11 (27.5%)
Site 4	10 (25%)
Service	
Maternity (midwives and MSWs)†	18 (45%)
Neonatal	5 (12.5%)
Health visiting/ community/ FNP	9 (22.5%)
MNVP / peer support	4 (10%)
University BFI leads	3 (7.5%)
Public health†	1 (2.5%)
Band	
N/A	10 (25%)
Band 3	5 (12.5%)
Band 4	3 (7.5%)
Band 5	2 (5%)
Band 6	8 (20%)
Band 7	8 (20%)
Band 8	4 (10%)
Executive	1 (2.5%)

MSW, maternity support worker; FNP, family nurse partnership; MNVP, maternity and neonatal voices partnership.
†Three participants (one from each of Sites 1–3) were Baby Friendly Guardians; Guardians were from Maternity and Public Health.

The findings are presented across seven overarching themes, exploring the implementation and sustainability of BFI; leadership, resources and policy support; the delivery of relationship-centred care; sociocultural influences and inequalities;

professional experiences and system pressures; audit and quality improvement; and the delivery and experience of BFI training.

Implementing the BFI: standardising care, sustaining change, and building a culture of collective practice

Findings are presented across five themes: 'best way to provide consistent care', 'climbing a mountain', 'changing hearts and minds', 'implementing and influencing change', and 'building a BFI community'. Together, these themes capture how the BFI was perceived to standardise and strengthen evidence-based practice, while also requiring sustained effort, adaptation, and commitment to implement and maintain. Participants described both the challenges and benefits of embedding the standards, including shifts in staff attitudes, improvements in care practices, and the importance of collaboration across roles, services, and organisations to support ongoing change and sustainability.

Best way to provide care

Several professionals described the BFI standards as *'reassuring'* due to providing a clear, prescribed, and consistent approach that ensures all families, regardless of their infant feeding intentions, receive equitable care. A recurring reflection was how the BFI standards meant that all staff caring for women and families were working from the same *'hymn sheet'*, irrespective of where the support was provided. One professional reflected on how she observed this continuity in practice:

> Yeah, it's been really, really positive. So, I think the main benefit that I've seen that I've noticed is that everyone that I come into contact with at work, all the health professionals seem to have the same knowledge about infant feeding. And I found that really, really helpful especially seeing ladies in community, because there's not a lot of continuity postnatally in our community team. But I've noticed that when I've been in to see ladies that other midwives or healthcare assistants have been in to see before they've been told the same advice that I would give them. And that's really, really helpful with my job role because we see so many women it's nice to know that we're all giving them the same information, so actually it's been a really positive experience. (Site 1 maternity HCP2)

A few HCPs felt the BFI could encourage a *'tick-box'* approach to care, or that their practices could deviate from the standards in certain circumstances[217]. However, far more common was staff describing the BFI as providing knowledge and evidence about the *'best way to do things' (*Site 3 maternity HCP5). The BFI enabled them to provide *'independent research-based evidence'* to parents, and which helped explain changes in infant feeding practices, such as '*this is the reason behind why we say to make formula up this way and why we don't say what we did 20 years ago'* (Site 1 community HCP9). Furthermore, it prevented staff from providing opinion- or non-evidence-based or dismissive practices around breastfeeding support, such as '*midwives who don't enjoy breastfeeding, just ignoring it and allowing it to be well, you*

[217] This could involve recommending *'nipple shields'* or people using *'their own little tips and tricks'* (Site 3HCP7).

know, she said she wanted to bottle feed, so never mind. Doesn't matter' (Site 2 maternity HCP7). Some reflected on how BFI accreditation meant that staff, irrespective of their own beliefs towards infant feeding, had a mandate to implement the standards to allow families to make informed choices, and '*to give that proper care to women'* (Site 4 maternity HCP1):

> I think it's when you've got someone who doesn't care or isn't passionate about it or maybe hasn't retained knowledge and things at least then you've got that that they know that there is a standard and that they have to stick by it. So, I guess it gives it that importance that it probably needs. (Site 2 maternity HCP4)

A few of the participants also referred to the value of adopting a holistic approach to training whereby all staff, from receptionist upwards, were included, meaning that everyone had a consistent and welcoming approach to infant feeding: '*that impact when they walk through the door and see the receptionist … congratulating them, and offering a private space as needed'* (Site 4 community HCP9). Other comments referred to how they would ensure that '*all maternity professionals were included, such as MSWs'* (Site 4 maternity HCP5), or those working in non-BFI-accredited organisations, such as staff who run breastfeeding groups in the Family Hub[218], to ensure consistency in evidence-based care (Site 4 community HCP3). A professional also highlighted the need for a *'condensed version of the accreditation'* for all health services, such as *'general medicine and all walks of healthcare'* to counteract situations where *'mums haven't had the confidence or the education or the knowledge to consider pushing back against poor advice*' (Site 2 PSMNVP HCP8).

Climbing a mountain

Some referred to how the BFI was *'hard work'* to implement at the beginning due to the need to develop all the policies, guidance and infrastructure '*in accordance to the BFI'* (Site 1 maternity HCP1). For some, the continuous process of '*always something to do* […]*, audit or preparing for audit or just the modules and updating and going to the regional meetings and things'* was described as *'overwhelming'* (Site 3 university HCP11). One university BFI lead described maintaining University BFI status as being like a '*shark*', creating a *'little insidious pressure'* to keep *'moving forwards'* in implementing and sustaining the standards:

> It's a bit like a shark, isn't it? So, I suppose there's a little insidious pressure that you can't do nothing or you would lose your accreditation. So, you're either striving to the next thing or at least trying to hang on. So, there's always a test point of what you're doing. You know, you can't just have a year where you think, right, well, I've just got so much else on or something. I can't focus. You're always having to move and prove kind of. that you're there with the standards, which keeps you on track and which is right, but it is just another little constant consideration. (Site 3 university HCP11)

This view was reflected by others who felt that implementing the BFI was less challenging than sustaining it:

> Because it's, you need to look for more innovations, more things to provide

[218]As Family Hubs at this site did not have the capacity to do BFI in their own right.

> more support, and that could be more challenging than when it starts from nothing. (Site 1 maternity HCP1)

Some staff shared a sense of frustration about the continually evolving nature of BFI standards; '*it never ends'* (Site 2 neonatal HCP2). These participants described a feeling of never quite catching up, as progress towards meeting one set of standards is quickly followed by the introduction of new or revised requirements (within their area of service delivery). One professional described this as *'moving goalposts'*, where efforts to achieve compliance were undermined by ongoing change:

> But the reality of when that hits the ground can be quite challenging and a bit overwhelming sometimes. And again, a lot of eye rolling from staff sometimes when you go OK, great, we got you to that point. But now we have a new set of standards and sometimes you do get a bit of a sense of hands being thrown up in the air and going OK. Here we go again. (Site 3 community HCP3)

Some of the IFLs also spoke of the challenges of being a BFI lead and how their role had evolved over time to include audits, assessments, training, providing specialist support through feeding clinics and services such as tongue tie services and pump loans. This meant that expectations from staff, and women, for the IFLs to provide timely support when faced with these competing commitments could be difficult to achieve, when you are '*pulled in lots of different directions'* (Site 3 community HCP3). Another spoke of the tension between increased administrative demands associated with BFI accreditation and the need to maintain efficiency in practice:

> [There are challenges in] streamlining that [administrative work] as much as possible while still making sure that making sure that we're meeting the standards really for accreditation. (Site 2 community HCP5).

There were challenges of IFLs not having protected hours to implement the standards and feeling pressured to do '*more of the same'* without any extra resource, because '*we're not getting really any more money'* (Site 3 maternity HCP5). One of the University BFI leads also complained about the *'size'* and complicated nature of the BFI, expressing her wish for it to be '*far simpler'* as '*there's so much paperwork'* (Site 2 university HCP10).

However, it was notable to reflect that for some professionals the additional workload was self-chosen due to an '*interest'* and *'passion'* in supporting feeding (Site 2 community HCP5). Another reflected that rather than create more work, the fact that it gives a '*really nice, structured framework'* of how to support women meant it was less onerous to implement (Site 3 maternity HCP5). A University BFI lead also reflected that despite the work needed to achieve and sustain the award being a '*baptism of fire'*, it was *'exciting'*, an *'adventure'* that had professional and personal benefits. (Site 2 university HCP10).

Changing hearts and minds

Across the interviews, there was an uneven staff commitment to the BFI ranging from those who described themselves as *'passionate and interested'* (Site 4 maternity HCP5) versus colleagues who it was felt would '*do it as part of the job, but it's not necessarily a passion of theirs*' (Site 2 maternity HCP4). Some considered these

negative attitudes could be related to *'personal biases'* (Site 2 PSMNVP HCP8) or a lack of skills and confidence. However, this variability in staff engagement was acknowledged to occur even when staff had received comparable training:

> But where everyone's trained the same, they should be able to give that advice. But I know it doesn't happen. (Site 1 maternity HCP3)

Notwithstanding these challenges, several participants referred to how the BFI had created a positive shift. Some spoke of how initially staff were reticent in adopting the BFI, such as *'collective sighing'* or seeing the IFLs as *'almost as the enemy'* (Site 1 community HCP8). However, over time, the BFI was often perceived to have not only changed practices but created a positive shift in professionals being aware of the standards and an attitude change towards infant feeding support.

Some HCPs felt the BFI standards aligned with their professional or personal beliefs and values, which for one, was how the BFI relationship-building focus aligned with her Solihull-training (Site 3 community HCP3), whereas for another the BFI was '*just what I wanted to do*' (Site 2 neonatal HCP2). However, across all the case study sites, professionals reflected on how the BFI had introduced a '*positive culture'*, and positive shift in *'pro-breastfeeding attitudes'*, such as through recognising, e.g. *'why rooming-in was important, etc'* (Site 2 community HCP5).

Staff appreciated how the BFI was part of the *'bigger picture'* in terms of *'supporting parents' decisions'* (Site 4 neonatal HCP6), through discussions on choice, even if this meant *'sowing the seeds'* for a different infant feeding decision next time (Site 1 community HCP8). They also appreciated the focus on *'empowering parents to care for their infants'* (Site 2 neonatal HCP2) as well as the need for family rather than mother-centric support:

> That focus on not just the mother and the baby, but the impact for the father and the family as well. I mean, that really was so, so powerful. And I think it's time when the world is changing to have that kind of co-parenting input or whatever the setting or is but enabling a wider family involvement in the work is just so beautiful to see and so empowering and so supportive for the mother. And that that was it, really struck home. (Site 2 public health HCP1)

Some participants also valued the BFI framework in providing balanced, evidence-based infant feeding information in a way that felt supportive rather than coercive, so that women felt protected from misinformation and able to make genuinely informed decisions without judgement or pressure:

> I think it protects the women most importantly, but it protects the people who like breastfeeding and they want to promote it without sounding like the breastfeeding mafia to try and get the information across to women in a way that they'll understand and they'll be able to make an informed decision, you know, because I don't care if you breast or bottle feed. As long as you're making the decision based on the proper information and the real information rather than hearsay and a lot of it, you know a lot of misinformation. (Site 2 maternity HCP7)

One HCP considered that preventing women from expecting judgemental care and feeling guilty for the decision to not breastfeed will take *'a long time to change'* (Site 1 community HCP8). Moreover, while some staff appreciated that formula feeding is no longer a '*taboo subject*' (Site 1 community HCP8), others could still interpret the BFI as '*really the promotion of breastfeeding'* (Site 1 maternity HCP1) and worry about how much information provided about formula feeding. However, the change in focus away from purely breastfeeding was considered particularly valuable for those working in cultures where '*the majority of our mums do formula feed' (*Site 3 community HCP3). One HCP spoke of how previous to BFI implementation the focus was on '*getting the baby fed any way possible'* whereas now it was on *'taking time'* to *'meet families where they are at'* (Site 2 maternity HCP9).

Some of the senior professionals interviewed described how achieving BFI accreditation was '*a very strong symbol*' (Site 3 maternity HCP5), of helping to create a culture of pride and achievement in the organisation. This was reflected by some of the professionals who perceived the BFI not as a chore but as a call to action *'to work higher'* describing how it had evolved into a *'second nature'* (Site 4 community HCP4) within everyday caregiving practices.

Implementing and influencing change

Implementing the BFI standards was seen to be challenging but incremental, with one participant reflecting on how it is '*like one step forward, two steps back'* (Site 3 maternity HCP1) but that change inevitably occurred. For example, several professionals spoke of challenges regarding implementation of the Code, but that since reporting mechanisms were introduced[219], current practices were considered to be fully compliant with Code requirements. Another participant described a cultural shift away from previously accepted interactions with infant formula representatives, which were once normalised and even encouraged. These insights thereby highlighting how sustained efforts have successfully aligned practice with the Code requirements:

> The backlash from some of the managers at that point in time, kind of tell me how ridiculous this was and why shouldn't staff be able to meet with people and have a nice lunch and get some nice goodies? So that was a big culture change for me coming over here. But I have to say the reps have now completely disappeared off the scene. I always remember sitting in one of the health visiting offices and I took a call when it was one of the reps who thought I was somebody else arranging to meet me for lunch. And I kind of went I think you've got the wrong person here and she just about died on the spot. So, I think there's been a lot of work done to kind of really implement the WHO Code (Site 3 community HCP3)

Others reflected on how practices such as skin-to-skin, while previously an *'alien'* concept was now commonplace in the post-natal period, as well as how the training

[219] This involved reporting any Code violations to the IFLs or managers (with this information then shared across services to raise awareness and prevent further breaches). At one University, staff had introduced a '*digital post it note'* for students to record Code violations (Site 2 HCP10).

and support meant *'it was easy'* to encourage parents, e.g., to be present at the neonatal unit and to advocate for their baby (Site 2 neonatal HCP2).

A few participants described how the BFI provided the focus, kudos and momentum to drive forward evidence-based care. Examples provided included working with multidisciplinary professionals to develop new policies and guidelines, such as breastfeeding and returning to work, breastfeeding for looked-after infants, breastfeeding for women requiring surgery or medical admissions (Site 3 maternity HCP1), or guidelines for late preterm infants (Site 4 neonatal HCP6). It also included adapting existing policies to better support breastfeeding, such as those addressing hypoglycaemia or weight loss.

Others reflected on how the BFI had changed practices through setting up new postnatal breastfeeding clinics, integrating resources such as *'knitted boobs in every room'*, leaflets, posters, availability of breast pumps, as well as study days so staff '*can learn more'* (Site 2 neonatal HCP2 interview). A BFI lead at one of the Universities also spoke of how they had introduced breastfeeding rooms (and fridges)[220] at each of their campuses and organised multidisciplinary events (e.g., World Breastfeeding Week) (Site 2 universityHCP10). One IFL reflected how following COVID, they had introduced an early postnatal phone call *'to ensure that if people needed early support, we could step in'* and were '*quite proud'* that this practice subsequently featured as part of the new community standards (Site 4 community HCP3).

Others also described a contagious effect whereby BFI accreditation and achieving Gold status had not only increased passion but also brought new people on board with new innovations to support parents. These included *'increased snacks in the parent's room, the clip-on mirrors'* in neonatal units (Site 2 neonatal HCP2), or developing QR codes that provided information about key topics such as '*introducing solids and nutrition'* (Site 3 maternity HCP1). One participant also spoke about how new staff (such as a lactation consultant) joining the team helped to revise their plans, such as adapting the training with *'fresh eyes'* (Site 4 maternity HCP8). Several professionals also reflected on how the standards were making a difference to families, such as through improved breastfeeding rates and breastfeeding practices:

> Getting the baby on right and making sure the baby's latched, not just people assuming that the baby's latched right, you know we might see him on day three or five and the nipples are absolute shreds, but it does seem to be less, I don't know. It might just be, I mean, a different set of people on the wards, don't know, but it does seem to have improved, I think. (Site 4 maternity HCP1)

Building a BFI community

Several professionals spoke of how they were building and feeling part of a BFI community that was driving change. This was underpinned by collaboration across services, organisations and professional networks. Figure 14 illustrates the interconnected relationships that supported BFI implementation and sustainability, and the key benefits of collaborative working, with families at the centre.

[220] Although there were challenges in the University Estates department subsequently removing the fridges and a delay in organising their return.



Figure 14: Building a BFI community

Participants reflected on how achieving and sustaining the awards required a *'team behind us'* (SITE 3 community HCP3). For example, professionals across different settings described having regular cross-service meetings to create a joined-up approach and including leads from voluntary and community groups to ensure that '*any families that are accessing support from different people, again the information is the same*' (Site 1 maternity HCP3). Some described how BFI provided a framework to structure these collaborations:

> So, what we did for our Terms of Agreement, we base them on the Baby Friendly standards. So that again that keeps our focus to make sure that you know we're doing what we need to do to keep that Gold award. You know, across both midwifery and health visiting. (Site 4 community HCP3)

In some instances, at sites where the neonatal unit was not yet fully BFI accredited, professionals highlighted that effective collaboration across maternity and neonatal services was still developing – *'we're hoping as well to work more with maternity'* (Site 4 neonatal HCP6). Some IFLs also spoke of being highly proactive to expand their networks amongst different disciplines, such as '*ITU, paediatrics, orthopaedics*', etc. (Site 1 maternity HCP1). This was considered important for these professionals to be aware of their remit, and to call on them for guidance as needed.

One university had a large steering group, comprising students and academics from different disciplines (including physiotherapists, radiographers, midwifery students) (Site 2 university HCP10). At another university, there were only two named staff leading on BFI implementation: despite the limited number of staff involved, they felt they had *'time'* to do the role, because *'I've got a good level of support behind me'* (Site 3 university HCP10). Irrespective of the internal level of support within the

universities, there was evidence of strong links between academic and clinical practice. This was demonstrated in IFLs attending the university to talk to students and supporting students in practice, clinical teams sharing resources with the university such as providing '*knitted boobs*' and providing copies of the '*BFI little handbook*' (Site 3 HCP); and positive relationships between BFI leads in the academic and clinical settings. As the university was providing the same BFI-related content as the health sector, one educator felt part of the wider infant feeding community, recognising shared contributions in making a positive difference to breastfeeding rates, and a positive infant feeding culture:

> You know, changing a culture in X [country] (laughs) is not without its work. But I think slowly it's something that has deliberately been done slowly. You know, we had other public health campaigns that were made very quick. […] The breastfeeding, the feeding campaign has gone much more slowly, but we are changing. You know, it's a big element of who we are that we're trying to change. (Site 3 university HCP11)

National Infant Feeding Networks (NIFNs) were considered '*really helpful*' (Site 3 university HCP10) for bringing together BFI leads across various contexts and for sharing ideas and good practice. This network was described as a network for celebration of their achievements, and for comparison across areas. Moreover, those able to attend the UNICEF BFI conference described it as an invaluable opportunity to reinforce their knowledge and '*because you do forget certain things*' (Site 1 community HCP8) and to learn about practices in other settings which they could then adapt and implement within their own services:

> So, I've been in the last two years in a row, and I've been supported through work to go to those and, you know, hear new ideas from different units to then bring to our unit to help improve (Site 2 neonatal HCP2)

The above BFI University lead also described this opportunity as a '*highlight of the year*' to meet others in similar roles[221].

As well as collaboration between services in the same area, professionals gave examples of collaboration across organisations in their region or across the country. These might be strategic, multidisciplinary meetings with multiple clinical and policy stakeholders - *'you have dietitians, you have family nurse partnership, you have midwives, you have health visitors, you've got neonatal staff* (Site 3 maternity HCP1) where good practice was shared across healthcare organisations and with policy stakeholders. There were also examples of national meetings that were more practice-focused, such as '*with all of the other breastfeeding support workers or midwives who do more breastfeeding support'* (Site 2 maternity HCP4). Professionals valued these opportunities to share best practice, updates and training, discuss issues, and to suggest new ideas. One IFL highlighted the importance of these

[221] In one area, there was an open call for wider staff (e.g., midwives, breastfeeding support workers) in addition to the IFLs to attend the UNICEF BFI conference (Site 2 HCP9). Whereas in another area, some professionals wished they had the opportunity to do so '*I have never been to myself, but I know some staff members that have and find it really beneficial'* (Site 3 HCP7).

collaborations in developing a legacy plan to ensure that documentation and plans are *'easily accessible'* and support a seamless transition (Site 2 university HCP10).

Driving and sustaining BFI: The role of leadership, resources and policy support

This theme describes the organisational and wider policy context shaping BFI implementation describing how leadership, resourcing and policy environments are essential. First, it explores the importance of 'management buy-in', describing the role of leadership, governance and advocacy in driving visibility and prioritisation of the BFI. Next 'fighting for resources' considers the challenges of sustaining implementation under resource constraints. The need for broader structural support through 'wider government and policy support' is then described.

Management buy-in

Successful implementation of the BFI was viewed as requiring whole-system leadership and cross-sector collaboration. Senior leadership buy-in for a *'unified collective approach'* to BFI implementation and to ensure BFI remains on '*on senior agendas, team meetings'* (Site 3 maternity HCP5) was viewed as essential. In this context, BFI Guardians played a vital role in enabling the visibility of the BFI, and offering '*leadership'*, '*prominence'* and '*endorsement'* (Site 2 public health HCP1) amongst the senior leadership team. One Guardian also referred to how they offered support with resources, budgeting or practical support - such as *'pushing for protected hours'* (Site 4 neonatal HCP6) - as needed:

> They [IFLs] are great and it's actually a pleasure to work with them because they just come to me with right, we need this operationally, I'm like yep, that's fine I'll do it for you. And we have that sort of working relationship so I know what they're doing […] I am a more supportive role to them and they can lean with any extras they need or anything they need ordering or any budget problems I try and help with. (Site 1 maternity HCP3)

One Guardian spoke of their pride in championing the BFI via its '*brilliant kind of governance structure'* that had made *'tangible differences'*:

> What has been beautiful about it is to be able to work with the teams to monitor their progress, to see the tangible differences that they're making to be able to report on the both the quantitative but also qualitative element of the work and to raise the profile of that work up at executive level across my organisation and partner organisations, and to have that endorsement by UNICEF and that connectivity of UNICEF is really invaluable also. So now I think it's an absolutely brilliant programme of work. (Site 2 public health HCP1)

Another Guardian described how she actively *'guarded'*, *'protected'* and promoted BFI within a remit that extended beyond maternity services. Her role provided a direct line to Board and Director level, which she could draw upon when needed. She described using this position to share relevant data sets, advocate for resources (e.g., new innovations and equipment), ensure Code compliance, and promote BFI and breastfeeding in a wide range of forums:

> I've been invited on to that group just as [role]. But in that form, again I can talk around obviously breastfeeding, etcetera being such a population health, you know, a fantastic opportunity to improve population health. So those are things I can bring into those sort of more interfacing groups. So, the more I suppose opportunity I get to talk about Baby Friendly, they see the benefit of it, I think. (Site 3 maternity HCP5)

One of the Guardians spoke of how they would frame BFI as a cost-effective, population-level public health intervention with benefits spanning nutrition, physical health, bonding, safeguarding, and mental health. Framing BFI in this way was seen as important for securing senior leadership support by aligning it with wider public health priorities such as '*the child healthy weight strategy'* or the BFI actively targeting women who face the worst outcomes, such as younger mothers in areas of high deprivation (Site 2 public health HCP1). In this site, a decision had been made to appoint a further Guardian from midwifery to offer complementary leadership roles, with Public Health providing strategic oversight and coordination, and midwifery providing operational leadership. This combined skill set was felt to ensure both frontline delivery and Board-level accountability:

> Yeah. I mean, I think from a public health perspective, it's absolutely imperative to population health and well-being for a future generations, and I think within public health, we have that skill around the communication, disseminate information dissemination, engagement in public, that whole system perspective, that whole system working and in fact the maternal infant nutrition coordinator sits within public health and again, it's because of that whole system approach that linking up various services, including third sector so that's a key element as to why the [role] has such a leadership role around it, but clearly also within midwifery, you want to have that leadership focus because that is that's a crucial pinch point when people engage with services. And I think it's invaluable to have that midwifery visibility of leadership endorsement of this work to both support the teams operationally, but also drive, drive the activities and the strategic perspective going forward and that kind of whole aggregate of information and reporting and of impact going up to Board level. (Site 2 public health HCP1)

Several participants highlighted the importance of being supported by managers or service leads who had a strong understanding of the benefits of breastfeeding, the BFI standards and their impact on outcomes, and the challenges faced in implementation. This view was echoed by some of the Guardians with one believing that by valuing accreditation themselves, they set the tone for other staff to share their pride both in the organisation and the midwifery profession, which would encourage staff to aspire to be '*high achievers*' (Site 3 maternity HCP5).

One strategy to secure this support was involving Guardians and managers in UNICEF BFI assessor feedback:

> I think that then the value of having the external assessors then coming in and reporting on practice both positive and negative, but generally positive was really, really beneficial and then kind of helped to bring the managers on board

then to see this not necessarily as a threatening process but as a beneficial process and enabled the celebration of good practice. (Site 3 community HCP3)

Some IFLs organised celebration events for re-accreditation to help *'refocus'* and *'shine the light'* on their achievements, with the added intention to promote what they are doing amongst the '*trust board level and director level'* (Site 3 maternity HCP5). The importance of sharing success by '*shouting from the rooftops'* (Site 3 community HCP3) was felt essential in securing management buy-in and associated financial support.

Fighting for resources

Funding and organisational support were subject to change, creating inevitable challenges for sustainability. Several staff referred to ongoing financial challenges and having to *'fight'* to keep key people in infant feeding roles, while having to take a *'hit'* elsewhere, such as being unable to offer peer support in hospital (Site 1 maternity HCP3). One Guardian referred to challenges in '*prioritising prevention'* when having to sustain an immediate and reactive service delivery (Site 2 public health HCP1).

While resource pressures were evident across all the sites, what was notably different to the insights shared in the sub-theme above, was one site where the neonatal unit was not yet fully accredited experiencing resistance and ongoing challenges in securing time and resources for this. This participant described frustration when managers did not fully understand the role, being *'pulled'* back into clinical practice (Site 4 neonatal HCP6) and having no protected time to undertake the BFI work. Her insights thereby reflecting how restricted hours and competing ward demands undermined the role, creating tension between service pressures and expectations to deliver BFI responsibilities[222]. This lack of support meant that they had had to push back on accreditation timescales '*we achieved stage 1 and then they completely dropped all the funding*' (Site 4 neonatal HCP6).

Need for wider government and policy support

Some participants highlighted a perceived gap between hospital-based breastfeeding support and the wider community environment, suggesting that the BFI had limited influence beyond clinical settings and how insufficient policy-level support undermines sustained breastfeeding:

> I mean we do our little bit with BFI, but what happens in the public sector and everything we don't have control and I think the UNICEF needs to have more and the BFI more voice within the public sector and the government saying this is what we are promoting in the hospitals and how do you support us whilst women are away from the hospital and once women don't see any healthcare professionals because we they do well with us, but two months, three months later, the majority of them, sadly they give up and it's a way from our control (Site 1 maternity HCP1)

This view was also reflected in the perceived need for stronger governmental support to ensure implementation of the Code:

[222] This participant also reflected how a colleague's tongue tie service had been eroded over the years including reduced hours, and lack of office space.

> I do feel like governments could go a lot further and I think it does need that kind of drive from governments to be able to really start to fully adopt The WHO Code, and I think until we have more kind of influence as such over the marketing side of things. I think that was always going to be a big problem that we're kind of fighting against. (Site 3 community HCP3)

Restricted resources to support breastfeeding in NHS-provided care, and the potential implications of this for population health were highlighted:

> I think that if we are not having the funding and the ability to be able to support women as much as what we would like in terms of infant feeding, breastfeeding and all of that in 30 and 40 years' time, we will see a different demographic of children growing up with other health problems. (Site 1 maternity HCP6)

One participant highlighted the potential role of national policy mechanisms in strengthening uptake, suggesting that inclusion within government annual delivery plans and performance metrics for health boards could increase visibility, accountability, and activity in this area:

> From a health board perspective in X [geographical area], our work is focused around annual delivery plans […] and for Government to think about embedding this as a requirement across all health boards and being one of the key indicators that they measure health board's performance on would be another mechanism for driving interest activity and action in this area. (Site 2 public health HCP1)

Enacting relationship-centred infant feeding care in practice

This theme explores how BFI standards were translated into everyday practice across the antenatal, postnatal and neonatal care journey. The first sub-theme 'implementing infant feeding care and support' is a more descriptive subtheme that outlines the main ways staff delivered care and the practical contexts in which support was provided. The remaining sub-themes focus more on values-based approaches to care by highlighting the importance of 'changing the dialogue' that describes how conversations need to be tailored to parents' needs and feeding intentions. This is followed by the 'use of tools and resources', and approaches to 'informing about products and marketing'. The final subthemes focus more on the relational dimensions of care, including parents as 'partners in care', 'positive professional-woman relationships', 'involving partners, families and peers', 'close and loving relationships', and the 'value of skin-to-skin'.

Implementing infant feeding care and support

There were various ways in which staff were implementing the standards. Antenatal classes were reported as being a key conduit of information to families (also see Chapter Four). Different formats were reported, with some in-person and some online, typically involving a combination of talks – '*we go through a PowerPoint, I show some videos'* (Site 4 maternityHCP5) – and demonstrations *'with dolls and boobs and things like that*' (Site 4 maternity HCP5). However, some felt concerned about the influence of social media (see section below) and that standard antenatal classes were

dated. There were also attendance issues of expecting women to '*take time out of their busy days to attend'* (Site 3 maternity HCP8), suggesting that more flexible formats may be warranted.

A new area of practice, albeit not required as part of BFI implementation, related to antenatal breastmilk expression. This was generally described as being widely promoted across the case study sites via the provision of colostrum collection kits. One professional reported:

> We promote it, the community midwives promote it. It's discussed at all antenatal appointments. (Site 1 maternity HCP3)

Overall, however, there were mixed views about this practice, which was described by some as '*a bit of a double-edged sword*' (Site 4 maternity HCP5). It was felt that while some mothers felt reassured by having expressed colostrum, it could be anxiety-provoking for those who were unable to or found it difficult. Some also noted a high prevalence of tongue tie and that management of tongue tie had become an expected part of the IFL role.

When sharing how professionals provided breastfeeding support, this typically included scheduled postnatal appointments, drop-in clinics, breastfeeding groups, and Facebook groups. The value of timely support for parents as well as professionals was highlighted:

> We're having to do a lot less extra visits for big weight losses because we're getting in there with the feeding support on day three. (Site 1 maternity HCP2)

When discussing supporting formula feeding, professionals described how they communicated with mothers about safe preparation of formula – '*how to make up the feeds, whether it's sterilised and what they're using to sterilise'* (Site 4 maternity HCP7) – noting that many parents did not know this information *'I've come across so many who make the feeds up so wrong'* (Site 4 maternity HCP7). Professionals' views on mixed feeding were relayed, and while there was a sense from some that '*mixed feeling is on the increase'* (Site 2 PSMNVP HCP3), it was felt that women did not always realise the implications of introducing formula alongside breastfeeding - *'they've given the bottle and then it's that spiral. So, they've just thought, right, I'll just mix feed'* (Site 4 maternity HCP1). Thereby highlighting an area where more information and support is needed.

Changing the dialogue and tailoring the care

In discussing the various approaches and issues in supporting parents with infant feeding choices, professionals described the various ways in which they were changing the dialogue.

Antenatal care was perceived to offer the opportunity to explore and to address parents' knowledge and feelings about infant feeding, e.g., to '*myth bust in a way, in case there's any misconceptions or misunderstandings*' (Site 2 maternity HCP9). Professionals noting that antenatal discussions about breastfeeding sometimes led to women being '*a little bit more open'* (Site 3 maternity HCP9) and sometimes changing their infant feeding intentions '*because they've looked at it, just because I've told them*

about it' (Site 3 maternity HCP9). The opportunities to then repeat and revisit information on infant feeding and parent–infant relationships across subsequent appointments, as well as begin to build relationships: '*when I go back and do a new baby visit, they know who I am*' (Site 2 community HCP6) was perceived as crucial for effective support-giving as well as the potential to influence behaviours:

> Sometimes you will have woman who's maybe 10 days postnatal and you mention a fact about breastfeeding, and they look at you like, "Oh my gosh, that's amazing". (Site 3 maternity HCP8)

Some highlighted how they felt it was important not to present a dichotomous choice of '*you can either breastfeed or bottle feed, or this is how we do one, this is how you do the other'* (Site 1 maternity HCP2). Instead, professionals described asking exploratory questions as the beginning of a conversation, such as *'What are you thinking? What are you feeling? What do you know already?* (Site 1 maternity HCP2). This could also involve exploring the mother's personal as well as family history of breastfeeding. Several professionals highlighted the value of an individualised and sensitive management of breastfeeding issues where it was important to '*listen to their worries and listen to their feelings around it and I really try to make out a plan that's achievable with them'* (Site 2 community HCP6). It was felt that while the BFI standards were '*relevant to everybody*' (Site 2 maternity HCP7) professionals were able to highlight different elements with women depending on their circumstances '*you can kind of break it down …. so, you've got a bit of asthma - right, let's have a look at this'* (Site 2 maternity HCP7).

In the neonatal context, some professionals noted that at the time of admission, mothers often had not considered how they wanted to feed their baby. One referred to the importance of having an '*open discussion'* (Site 2 neonatal HCP2) with mothers at the point of admission about the benefits of breast milk. This early conversation was seen to open the door for parents to '*start to ask questions'* (Site 2 neonatal HCP2) and then opt to express breast milk: *'then two months later they're still expressing and their baby's getting all their milk'* (Site 2 neonatal HCP2).

At one site, a professional described how women who had decided to formula feed were unreceptive to hearing any information about breastfeeding, leading to concerns about whether this was a truly informed choice. In addition to supporting formula feeding, she reported providing information about colostrum as a means of initiating discussions and encouraging breastfeeding initiation:

> We would give the information around formula feeding but then we started to say, can I just make you aware that your body's making colostrum regardless of your feeding method and just so that you feel comfortable with your breasts when your milk changes from colostrum to mature milk, can I show you how to hand express so that you feel comfortable and you know what to do? And then we were weaving in, and did you know that in a mL of colostrum, there's millions of protective cells and in five mL of your breast milk, there's lots of protective cells and some people give that to the babies. And it doesn't have to lead to breastfeeding if you don't want it to. (Site 4 community HCP3)

Moreover, despite the negative influence of cultural norms (see section below), several professionals remarked that many women who were formula feeding were still receptive to instruction about responsive feeding.

Despite these opportunities to influence infant feeding practices, some professionals reported difficulties in attempts to manage women's preconceptions of pressure. Some professionals expressed challenges in discussing breastfeeding with women who expressed a wish to formula feed because '*they would then be accused of pressurising mums or trying to make mums feel guilty about formula feeding'* (Site 4 maternity HCP5). Similarly, it was felt that women often did not disclose their true intentions whereby they would feel they had to say, '*they want to breastfeed even if really, they don't'* (Site 4 maternity HCP5): this could lead to conversations where '*we're all kind of pretending*' (Site 4 maternity HCP5). Although not mandated by the BFI, organisational polices of not providing infant formula were met with a mixed reception by mothers, particularly '*in the middle of the night when they're shattered'* (Site 4 maternity HCP8). While this professional referred to how she would offer support on hand expression as an alternative, this could either be well received, or mothers being '*a little bit obstructive about it*' (Site 4 maternity HCP8).

Using tools and resources

Professionals described how they used UNICEF UK resources such as videos or leaflets to help convey information to women, and how these were perceived to be trustworthy as well as '*very informative, but easy to read and understand*' (Site 2 neonatal, HCP2). One also referred to how these resources enabled a shift from subjective to objective decision-making:

> So, I think people just feel like there's more support for them based on the fact that we have, it's not their, it's not their advice, it's well, this is the advice that is given. This is the advice we've subscribed to almost in a way. This is the support I can give you based on that. (Site 1 maternity HCP3)

Trust/Health Board Facebook pages were used to provide information about infant feeding and infant care, with links to these given to women in their booking packs. Professionals expressed how they made choices in their use of online materials, using resources from organisations such as UNICEF UK - '*I always direct people to the UNICEF stuff because you know it's accredited*' (Site 4 maternity HCP1) or others, such as First Steps Nutrition. Some professionals used online resources alongside, as an aid to, in-person communication. One described:

> We've got QR codes that we can sit there and actually the parent downloads it and [….] we can go through it with them (Site 1 neonatal HCP4).

A few professionals also described trying to be attuned to the pace that parents needed, offering information and resources in stages:

> Sometimes it can feel a bit like you're bombarding, but I think it's just breaking it down. Not doing too much in the same appointment. (Site 2 maternity HCP9).

Informing about products and marketing

Some professionals believed that parents often lacked knowledge about infant formula products, and '*not just formula milks but weaning products, early infant foods and things as well*' (Site 2 community HCP5). Parents described being surprised by some of the information they received – '*when you tell them that all first stage formula needs to be the same*[223]*, they kind of look at you with wide eyes'* (Site 2 community HCP6). One professional considered that information about products such as formula preparation machines did not always make an impression with parents – '*They listen to your advice, but they're not going to stop*' (Site 4 maternity HCP7) – while also expressing '*if we don't educate them, I feel like then we haven't done our job*' (Site 4 maternity HCP7). Others referred to how they felt it was their job to protect families from '*dodgy marketing strategies'* (Site 2 community HCP5) to ensure families received unbiased evidence-based information. One described how she would tell parents:

> Private companies don't always follow the safety advice or guidance. You know, we can't always guarantee that just because things are said that they're for your baby, that means they're good for your baby, or for you. So, it's trying to I suppose help them think a little bit more critically about yeah how marketing impacts as a family' (Site 2 community HCP5).

Others felt that further information, such as '*almost myth busting'* (Site 2 PSMNVP HCP8) about practices that underpin the Code, and better strategies for implementation, while addressing cultural beliefs about formula feeding, were needed.

Parents as partners in care

The neonatal standard about parents as partners in care was viewed as empowering. Activities to encourage parent involvement involved facilities such as '*reclinable chairs'* (Site 2 neonatal HCP2) or '*beds in for mums or dads to sleep on*' (Site 2 neonatal HCP2). Providing parents with refreshments, such as '*a NICU water bottle each*' (Site 2 neonatal HCP2) and a snack trolley, was important to encourage parents to stay on the unit and perform infant care, such as kangaroo care. Providing parents with '*swipe access to the units, a card, so they don't have to buzz to get in and wait*' (Site 2 neonatal HCP2) was seen to support their sense of being valued and recognised as integral to care routines. Professionals also discussed supporting parents to develop *'confidence and the knowledge of what to do'* (Site 1 neonatal HCP4) and actively involving them in decision-making, such as '*we ask all parents if they want to NG feed'* (Site 1 neonatal HCP7).

Positive professional-mother relationships

Positive professional–mother relationships were seen as key in providing effective care. Some felt that the centrality of relationships with women was something that had changed over time – '*probably been the biggest change I've seen is that respect*' (Site 3 maternity HCP5). Others felt that, while they valued giving emotional support and were *'really good at the fluffy kind of stuff'* (Site 1 neonatal HCP4), not all colleagues were comfortable doing so. Relationship-building could involve giving

[223] In the UK, all first-stage infant formula (0–12 months) must strictly comply with compositional regulations, ensuring all brands meet the same nutritional standards regardless of price. Regulations, including EU 2016/127 (retained in UK law), mandate nutritional composition, ban health claims, and require specific levels of Docosahexaenoic acid (DHA).

women *'time and the space'* to voice any concerns (Site 4 maternity HCP7), and taking time to understand their beliefs, attitudes and needs:

> What led us to where we are today, what is actually happening at that moment in time and what you can then do to help support (Site 2 maternity HCP7).

Professionals mentioned the facilitative effects of continuity of carer in this relational context, both in terms of ensuring women had timely support: '*a key person that you could easy just ring them or contact or message'* (Site 1 PSMNVP HCP5), and in promoting access to wider support services:

> But they already know us. So, by doing the latch clinics, the home visits or antenatal, they're walking into us, already knowing (Site 4 community HCP4)

Involving partners, families and peers

In recognition of the influence that family members can have on parenting decisions, several professionals described their approaches to involving partners and families. Sometimes this was by encouraging partners to attend antenatal appointments, for '*a little bit of a discussion around infant feeding, kind of get what they're thinking*' (Site 1 maternity HCP2), or suggesting that partners learn about hand expression to help mothers express colostrum[224] antenatally. Some explained how they proactively invited family members to come to breastfeeding groups:

> We advertised it, we wanted dads. We want grandmas, we want friends. Who's your support network? Bring them along. (Site 4 community HCP9)

This was noted to be *'highly successful'* in encouraging attendance amongst wider family members.

It was noted that partners and families could perceive infant feeding to be the only means to offer support. In response, some professionals described how they would discuss '*all the other bonding and relationship-building things that other people involved in baby's care can do'* (Site 2 PSMNVP HCP8). This involved promoting partner and family involvement in building close and loving relationships with infants, starting in pregnancy, such as with reading to the unborn baby:

> The husbands are, like, can they hear me as well, the partners, the partners tend to get involved as well like family members get involved. It's really nice. I try to get siblings involved as well. Which is going to say, you know, if they're reading a book at nighttime, read to the baby as well, which is nice. Yeah, and partners, birth partners feel the baby moving. So, the partners can kind of start to develop that bond as well, which is nice. (Site 1 maternity HCP2)

In the neonatal context, some professionals noted that they would encourage fathers in all caregiving activities. Others highlighted normalising new fathers' experiences of

[224] This practice was undertaken at Trust level but was not stipulated within the BFI standards

vulnerability, aiming '*to really explain facts and biology for dads, I think is powerful'* (Site 4 community HCP9).

While some referred to father-specific resources, such as the '*DadPad QR code*'[225] (Site 4 maternity HCP7), others felt this was an area where further support was needed. A suggestion was made for an additional section within electronic maternity notes for fathers and partners, '*something that was theirs and belonged to them*' (Site 2 maternity HCP7), separate from the woman's notes where professionals could record parent-specific information, with one stating, '*I don't necessarily want her partner to be able to access that information because it is quite private*' (Site 2 maternity HCP7).

Linking to peer support was seen as '*incredibly important for meeting all the other [BFI] standards'* (Site 2 community HCP5). Some felt that successes in improving breastfeeding rates would not have been possible without peer support, since '*they really fill a gap that statutory services aren't able to provide*' (Site 2 community HCP5). However, some commented on the drawbacks of relying on volunteers due to capacity issues, and that ideally '*we should have paid peer supporters'* (Site 4 PSMNVP HCP10).

Close and loving relationships

Professionals typically considered that the standard around close and loving relationships was integrated into their practice, feeling that close and loving *'is our bread and butter'* (Site 2 community HCP5) and part of maternity care discourse. Some considered this standard had been easier to integrate than others, due to e.g., students' perceiving bonding as a universal benefit (Site 3 university HCP10&11), or aligning with the theoretical underpinning to their role - *'feeding and those early responsive relationships are a massive part of our priorities'* (Site 2 community HCP5). Others described emphasising this standard with colleagues to dispel the sense that '*BFI has become really conflated with just breastfeeding'* (Site 4 maternity HCP5). Similarly, some felt it was easier to talk to mothers about close and loving relationships than about the benefits of breastfeeding – '*It's one of the easier parts of my job*' (Site 3 maternity HCP9) – as it provided a way to recognise mothers' efforts whatever the breastfeeding outcomes:

> It's much more attractive to parents to hear that rather than the benefits, which they want to hear, of course, but depending on who you're talking to. You know, you can just praise them because then if, because for instance, actually I spoke to a mum, and her breast milk supply was just going. But then I could bring up about, you know, the close and loving, why it's important to continue and whatever she was doing was a good thing because. Whereas that wouldn't have really come up before, I don't think, would it particularly? (Site 1 community HCP8)

In practice, professionals used a variety of approaches through the antenatal and postnatal periods to introduce ideas around close and loving relationships. These included providing information via posters '*in the lift as you go up to maternity*' (Site 1 maternity HCP2) and discussing it in antenatal appointments by '*slip[ping] it into the*

[225] DadPad | The Essential Guide for New Dads

conversation in a kind of natural way' (Site 2 community HCP6), offering the information in *'little bits at each one*' (Site 1 maternity HCP2). Professionals also described the information they shared, usually geared towards describing '*what is normal newborn behaviour'* (Site 2 PSMNVP HCP3), dispelling societal myths by explaining '*you can't spoil your baby'* (Site 4 maternity HCP7) and that '*babies are not manipulative, they just want to be with you'* (Site 4 community HCP4). Some felt that emphasising responsiveness was a way to encourage mothers, e.g., to '*just to chill and relax with baby and cuddle baby'* (Site 4 maternity HCP1).

While close and loving relationships were mostly discussed in relation to parents, some professionals noted that they also considered wider family as well. For instance, in thinking about who might feed the baby, rather than imply this could only be the parents themselves, they suggested parents think about who in their networks would be '*the close people who are going to be the main carers for your baby'* (Site 4 maternity HCP7).

Professionals had varying views about how conversations about close and loving relationships were experienced by parents. Some noted that questions about this topic were rarely fully answered in mother audits and wondered whether this was due to parents dismissing the information '*because they're just thinking well, of course I'm going to love my baby'* (Site 4 community HCP4), or whether it was due to the volume of didactic information received. Parent responses to information about infant relationships were described as '*variable*' (Site 3 maternity HCP8). One referred to how some parents would '*look at you like you've got three heads when you start talking about reciprocity'* (Site 3 maternity HCP8). However, other professionals reported receiving '*a lot of positive feedback'* (Site 1 maternity HCP2) about the information they shared with mothers. They also reported observing mothers sharing information with them about responding to fetal movements. Similarly, others relayed how in giving postnatal care they found it rewarding to observe '*mums interacting with their babies … when they're in the clinic and you can see them watching the baby all the time'* (Site 3 maternity HCP7). Nonetheless, there were concerns about whether bottle-feeding mothers understood or had received information about relationship-building:

> And often there's just a bit when you talk about close and loving relationships. No, because I was going to bottle feed. OK, but did they still talk about it? Yeah, but I were bottle feeding, so I don't need that. And that's really, really hard because it's like, no, you can still do that. You know, you can still be part of that. That's just as important. You know, if not more, you know? (Site 4 community HCP4)

Value of skin-to-skin

Support for skin-to-skin contact between parents and infants was widely mentioned, with most discussion centring on the idea that skin-to-skin supports bonding. Most described skin-to-skin primarily being associated with the immediate postpartum period – the *'golden hour',* although there were also occasions of encouraging this practice '*at any age'* (Site 4 maternity HCP2). Professionals also described explaining how skin-to-skin contact was not just for breastfeeding but also '*for bonding with the baby'* (Site 3 maternity HCP7), helping '*regulate babies breathing, it can calm mum down'* (Site 3 maternity HCP7), to resolve the '*majority of the upsets or the*

unsettling' (Site 2 PSMNVP HCP3), and describing it as '*a really powerful bonding tool for Dad as well'* (Site 4 maternity HCP2).

Overall, however, there were reports of variable support for skin-to-skin in the immediate postpartum. It was suggested that the practice of supporting skin-to-skin after birth was firmly embedded with reports that '*now it's just common knowledge that a baby gets skin-to-skin*' (Site 3 maternity HCP1). However, one participant noted that the rhetoric of skin-to-skin immediately after birth did not always align with some mothers' reports. The lack of support for skin-to-skin contact was felt to be more of an issue in certain settings, such as '*in theatre'* (Site 4 PSMNVP HCP10) – while in other settings such as birth centres or home visits, skin-to-skin was common practice. One professional who worked in a birth centre reported '*we really promoted skin contact, and it didn't matter how long it was, we wouldn't break it'* (Site 4 maternity HCP8).

Navigating sociocultural influences and inequalities in infant feeding support

This theme explores how infant feeding support is shaped by wider sociocultural influences, inequalities, and changing sources of information. First, it explores the 'challenges of sociocultural norms and beliefs', followed by professionals understanding and interpretation of 'perceptions of culture and cultural needs'. Efforts to reduce inequity are described through 'addressing inequalities in BFI implementation: practical adaptations and challenges' and 'addressing inequalities through modified approaches to care', these findings highlighting the ways professionals tailored support to different needs and contexts. Finally, the growing 'influence of social media' is considered as both a challenge and an opportunity in shaping infant feeding beliefs, decisions, and support.

Challenges of sociocultural norms and beliefs

Professionals spoke of the challenges of navigating sociocultural issues, both within the community and the workforce, when delivering BFI care. For example, one professional spoke about difficulties in addressing community-led beliefs about not co-sleeping with their infants within their community. Others referred to how a television documentary episode on infant formula, or guidance around donating tins of infant formula to foodbanks, had been misinterpreted as a slur on formula feeding mothers, which then needed to be addressed when having conversations with parents:

> I remember seeing a lot about things like that at Christmas time when one of those, oh, it was the people who do all the Christmas number ones about the sausage rolls were doing some kind of fundraiser for donating tins of formula to a local food bank and things like that. And it was, I think, a lot of people were hearing about the Code for the first time and kind of misinterpreting the aims. And again, I think there's this horrible tendency for people who don't know enough about it to misconstrue it as an attack on formula feeding. (Site 2 PSMNVP HCP8)

Several professionals described the challenges associated with high caesarean section rates and entrenched bottle-feeding cultures, which left them feeling they were '*pushing uphill'* and, at times, *'demoralised'* (Site 3 community HCP3). In this context, even small gains, e.g., '*1% increase per year'* needed to be recognised as a success

(Site 3 community HCP3). Complexities in discussions on responsive bottle-feeding were reported due to parents still holding cultural beliefs, e.g., the '*baby should be feeding every three to four hours, eight times a day*' (Site 4 maternity HCP2) as well as the *'culture of top-up supplementation'* (Site 3 university HCP11). One professional also referred to how promoting breastmilk and influencing maternal feeding behaviours was easier during periods of admission (i.e., to neonatal care), but post-discharge, the influence of wider sociocultural norms could prevail:

> Whenever the baby ends up in neonatal unit. I suppose they're [mothers] maybe much more willing to take the advice, you know, and we are emphasising maybe more the benefits for those small or preterm babies. So, I suppose they're more willing maybe to take on board the standards. But at the same time, you know by discharge them we're facing those same challenges, of what they had originally wanted to do. (Site 3 neonatal HCP4)

One also considered that the challenges of supporting breastfeeding were not about the BFI, but rather parents' expectations:

> I don't think the challenges come from the BFI standards. I think the challenges come from the patients themselves, people's perspective of breastfeeding and what they expect it to be versus the reality of what breastfeeding actually entails, (Site 4 maternity HCP2)

Some professionals believed that attitudes towards breastfeeding were beginning to change, e.g., *I think generally breastfeeding, even just across society, is much more accepted than perhaps it was 20 years ago*' (Site 2 community HCP5). Whereas others felt that ongoing stigma and judgement around ***public breastfeeding*** meant that more work was needed:

> In X [geographical area] and on our TVs, I think, and even social media just still seems to be that women need to cover up, or women need to be put into a toilet or a corner or something. (Site 3 maternity HCP5)

In one of the sites, in response to a local woman being admonished for breastfeeding in public, the *'Facebook mafia completely supported her'* by offering to revisit the location and *'breastfeed in a big group'* (Site 2 maternity HCP7). This example illustrating how online community networks can function as forms of collective advocacy, mobilising social support and resistance. While some participants noted efforts to normalise breastfeeding through local businesses signing up to '*Breastfeeding Friendly*' schemes (Site 2 PSMNVP HCP8), no feedback on the efficacy of these schemes was reported by professionals.

Entrenched ***workplace cultures*** were also described as hard to shift and that changing them required '*buy in – it's about people really believing that that's the right way to go*' (Site 3 maternity HCP5) which was often hard to maintain. While training was perceived as key to changing staff attitudes and beliefs, one participant reflected that the standards could be experienced as '*pressure'* (Site 4 maternity HCP2), with negative attitudes potentially persisting, as evidenced by reduced referrals to infant feeding services such as breastfeeding peer support:

> There is that core cohort of midwives who are regularly referring and having that discussion with mums. But there are obviously some who aren't, whose names I never see (Site 2 PSMNVP HCP8).

Supplementation from a professional perspective was raised by multiple professionals as '*a real challenging area*' (Site 3 maternity HCP1). It was perceived that some staff, irrespective of receiving the BFI training, defaulted to habitual solutions – '*a bit trigger friendly with the provision of the formula'* (Site 4 maternity HCP2) – to breastfeeding issues. This was believed to be associated with an interplay of women's expectations, resource implications and staff's lack of understanding of formula use on breastfeeding:

> Part of the story is, oh, I've brought in some. I brought in some formula because I've got told to, because I've read online, you know. I think they think the message antenatally is very much bring your own formula in and then you're not stuck. And then what I think happens and what I've heard staff talk about is well, she had some there, so I just thought she wanted to use it. And if that baby's then had a good feed, that baby's probably able to be discharged sooner, I'm cynical about this kind of stuff. Sorry, but for me, I think, well, they can then say that baby's had a good feed, that feeding's established. That woman then gets to go, gets to go home and another person can come in and use that bed, and then it's kind of somebody else, not, not somebody else's problem. (Site 4 PSMNVP HCP10)

One potential solution to this issue was the documentation of supplement feeds. This was believed to promote better practice in this area, through prompting reflection on the clinical reasons for using them:

> And now actually it's better because if you're given a supplement feed there is a page just to why are you doing it? You know, before you give it, have you thought of… have you done…, you know. So definitely. I think it's helped with that. (Site 3 maternity HCP9)

Perceptions of culture and cultural needs

Several professionals shared their ideas about how culture influenced mothers' beliefs and practices around infant feeding and relationships. They expressed definite ideas about which demographic groups were more – *'I find some women from certain ethnic minority backgrounds take [breast]feeding as the absolute norm'* (Site 3 maternity HCP8) – or less likely to breastfeed. These perceptions often aligned with statistical data on breastfeeding rates among different groups of mothers but also involved interpretations about the reasons for differences in rates. For example, one when referring to teenage mothers stated:

> I do think a lot of teenage mums want to just get back to feeling themselves when they're not pregnant. (Site 4 maternity HCP2).

Some professionals reflected that there could be an assumption that women from ethnic groups with higher breastfeeding rates were less likely to need support, '*they've taken to that like a like a duck to water because that's in their culture*' (Site 3 community HCP6) and highlighted the need to be alert to how this could lead to gaps in

support. Similarly, professionals cautioned against assuming that '*young people don't breastfeed*' (Site 2 community HCP5) and emphasised the importance of ensuring that all families receive support.

Some professionals perceived a lower uptake of services among some marginalised groups. International differences in the structure of antenatal care were thought to explain why some women did not attend antenatal appointments. Language barriers were also considered relevant, although some professionals observed low uptake even where attempts were made to overcome these, such as '*an ESOL class*[226] *specifically tailored to antenatal and giving birth and caring for a baby*' (Site 4 maternity HCP2). While some professionals felt unable to explain why some women were less likely to attend, others suggested relationships with marginalised communities was key:

> If they don't feel there's a bond, like if they don't feel that they can approach that person, then they most likely won't. (Site 1 PSMNVP HCP5)

A few professionals also reflected on the complexities faced by some mothers, asylum-seeking women in particular, who '*don't have a wide support network, they just have the partners and that's it*' (Site 1 PSMNVP HCP5). One also reflected how the offering of healthcare services was so limited in comparison with these extreme circumstances:

> Speaking to those parents, and they all talk about how difficult it is to bond with their babies in that kind of environment [asylum hotels], I'm not sure really what we can do to put in in place there (Site 4 PSMNVP HCP10).

Many participants used 'culture' as synonymous with global majority ethnic groups. While some participants recognised that White British culture also influenced women's infant feeding choices (discussed above), this was seen as '*not necessarily from a strong cultural reason but just a societal pressure*'. A few professionals described what they saw as a cultural norm of mixed feeding in some South Asian communities '*I don't know whether it's a cultural thing, a lot of the Pakistani ladies do mixed feeding* (Site 4 maternity HCP2). This was linked to the practice of offering breastmilk substitutes instead of colostrum, and to concerns about exposing their breasts while breastfeeding. Although conversely, some professionals associated the cultural change of mixed feeding being underpinned by the BFI, through influencing *'mums that maybe never intended to breastfeed are actually giving some breast milk now'* or that *'mums that maybe would have solely breastfed are now introducing formula as well to get the best of both worlds'* (Site 3 maternity HCP1). Another professional stated:

> I think one of the factors that's had people leaning towards formula feeding and now mums are kind of seeing well, I can have the best of both worlds. I can still provide breast milk, but we can do, we can have that convenience factor as well. (Site 2 PSMNVP HCP8)

[226] ESOL = English for Speakers of Other Languages courses

Professionals appeared to be more confident talking about challenging the cultural norms in White British families – *'You know, part of what we were trying to obviously do is to change [cultural attitudes towards breastfeeding]'* (Site 2 maternity HCP7) – whereas in relation to other ethnic groups, some professionals seemed to see 'culture' as intractable, making BFI standards seem irrelevant:

> So, I feel like sometimes we kind of have to give them this information about, you know, exclusive breastfeeding and things that they aren't, isn't necessarily relevant to their cultural environment and isn't what they're going to do. And I kind of know that isn't what they're going to do, but I've still got to, kind of. (Site 4 maternity HCP5)

Addressing inequalities in BFI Implementation: practical adaptations and challenges

Various complexities, solutions and suggestions to address inequalities were raised. First ***support in other languages*** was perceived to be essential for women with limited or no English. Some believed that women with limited English were less aware of how and where to seek support – '*she really didn't know that she could go back to the hospital*' (Site 1 PSMNVP HCP5) and were more hesitant to do so - '*because of her lack of English, she probably didn't feel as confident to then approach and say look, I'm struggling with this*' (Site 1 PSMNVP HCP5).

Several professionals discussed complexities of organising interpreter services to be available at the right time for appointments. They also felt that providing effective care could be more difficult using an interpreter as it was less '*personal'* having a '*three-way conversation'* (Site 4 Maternity HCP1). Some professionals also reported occasions of interpreters skilled in certain languages not being familiar with the mother's dialect – '*they were going off into their own dialect and the interpreter was like, I don't actually know what they're saying at this point*' (Site 3 community HCP6). While acknowledging that this did not often happen due to high caseloads, additional time in appointments to accommodate interpretation was needed:

> I think women from ethnic minority backgrounds and language barriers, I think they definitely need longer appointments, but not a standard, not a standard. And I feel like that's really important. If they ever were to deliver any training to say, right, OK, these women need longer appointments. Need more time. (Site 4 maternity HCP7)

A few professionals reported how attempts to work with language barriers sometimes led to a greater burden for minoritised staff. Professionals who were fluent in languages other than English reported being frequently asked to undertake informal interpreting, noting that this was not recognised or remunerated, *'All the time and I hate it because I don't get paid extra for it'* (Site 4 maternity HCP7). This practice was also perceived as inappropriate for other colleagues:

> They [doctors] are put upon to speak things like Urdu … and really, we shouldn't be doing that. It's a quick fix, but it's not the right fix' (Site 4 maternity HCP7).

Professionals also noted that colleagues might be fluent in the language but have less knowledge about infant feeding, which would influence translation:

> But sometimes if we've the more expertise at feeding, we might pick up on something that that parent is saying that the doctor doesn't necessarily pick up on. So, they will translate it in a different way, and it might mean a different thing to you than what the parent actually…' (Site 1 neonatal HCP7)

Professionals described how they used ***printed and video resources*** in the mother's own language as aids when providing infant feeding support. However, some noted the limits of these materials, such as where mothers may '*be able to speak the language, but they can't read it*' (Site 4 maternity HCP7), and highlighted how these resources were not always culturally sensitive:

> One of the feedback we got when I spoke out about this from another lovely family who were very honest with me that, you know, you can translate. It doesn't mean anything to us. You still don't understand us. It's just a translation off a computer. We wouldn't talk like that. We wouldn't say that. So actually, you're still not incorporating us properly and how we would like to be seen and held. (Site 4 community HCP9)

Some professionals were uncertain about what adapted BFI resources were available that would help for mothers with '*complex needs'* such as learning disabilities, visual impairments, or '*literacy I think, I don't know if that it's really covered in the BFI'* (Site 2 community HCP6). While advocating for the use of accessible resources, professionals tended to express the view that an individual 'one-to-one' approach was needed, and it was up to the professional to adapt the BFI standards to meet inequalities – '*it's the midwife's job to take those standards and translate them into a way that's meaningful for everybody'* (Site 3 maternity HCP8).

A few professionals also described how help with ***expenses and logistics*** could be a way to mitigate income inequality while meeting BFI standards. Being able to loan breast pumps to enable mothers to express milk was considered key since '*breast pumps are expensive'* (Site 1 neonatal HCP7). Although some professionals raised concerns about loan pumps not being returned, and the '*financial sustainability of keep having to replace these pumps'* (Site 1 neonatal HCP7). The location of breastfeeding groups was considered to make sure they were accessible to mothers '*from the more deprived areas of town'* (Site 2 PSMNVP HCP8), and some home visits were offered since '*some of our mums can't afford to get to latch clinics or get to the groups'* (Site 4 community HCP4).

Addressing inequalities through modified approaches to care

A key element to address inequalities was through the provision of ***non-judgemental care***, which professionals saw as involving clear communication and '*respecting and supporting choice'* (Site 2 maternity HCP9). This included combatting stereotypes about some groups, such as young mothers who were sometimes assumed to prefer formula feeding. Professionals noted that working to the BFI standards helped to ensure that *'everybody's getting those discussions. It's not just who you think needs that discussion'* (Site 2 community HCP5). In the neonatal context, professionals gave examples of non-judgemental support by building a

rapport with mothers from complex backgrounds such as those whose babies were admitted with neonatal abstinence syndrome and then supporting them to be partners in care:

> The admission packs actually come with little a little book in it, so we encourage them to, you know, say, why don't you read them a story? I know you – I know you probably feel a bit stupid. I was like, I'll pull that, you know, I'll pull the privacy screens around, and just quietly read to her or him. They'll know your voice, that'll comfort them. Just things like that I suppose, and just a lot of encouragement and not making judgement. (Site 2 neonatal HCP2)

At one site, ***proactive support*** was highlighted as an important means to mitigate inequality, as while more affluent mothers were seen to be confident about seeking breastfeeding support, mothers in more deprived areas were considered less likely to reach out. There were some concerns that healthcare professionals may be less likely to refer some women to breastfeeding support services – '*choosing who gets that support or, you know, a bias there*' (Site 2 maternity HCP4) – and so proactive support was seen to be '*helping to reach mums who perhaps would have slipped through the net otherwise*' (Site 2 PSMNVP HCP8).

Empowering parents with information was also perceived to be an important strategy for equitable care. Some professionals reported how '*parents want to do the best for their children*' (Site 4 community HCP9) and therefore welcomed information which supported them to do this. It was highlighted that previous stereotypes about some groups of mothers had influenced how professionals discussed breastfeeding, and how working to BFI standards expanded both the focus of conversations and the recognition of what mattered to women:

> I've seen that in the past ….. seeing the way that, like, breastfeeding would be discussed with teenagers. It was very much like, do you know, you'll get back in your jeans quicker, you'll not have to spend money on formulas - well, they care about their baby's brain development, too. They care about attachment. They care about, like, these are, they care about their baby's risk of diabetes and asthma. So, I think it's like, you know, I think that's where the standards like having these conversations with everyone like, yeah, it's really important. (Site 2 community HCP5).

Some also suggested that quality care and support alongside information-giving could have widespread effects beyond the individual '*because if she's educated, she can then further educate others'* (Site 1 PSMNVP HCP5). A suggestion to educate young people about breastfeeding, and to normalise breastfeeding was highlighted:

> I think schools personally, myself, I think we should be in schools talking to classes about breastfeeding, about normalising breastfeeding, about what it is and what it does, and you know and get and getting it to the point where you know when they're coming out of school, breastfeeding isn't a complete taboo. (Site 2 maternity HCP7)

It was considered that supporting ***informed choice*** '*rather than telling somebody what to do or making judgments'* (Site 2 community HCP5) was particularly empowering for

mothers from marginalised groups such as younger mothers who may not have previously experienced support for their autonomy. Professionals working with young mothers considered their role to involving *'help[ing] these mothers develop a higher sense of self-efficacy'* (Site 2 community HCP5). Where strong cultural norms were seen to influence mothers' decisions, access to information was considered important in supporting women to navigate these influences and to exercise choice. e.g., '*she can then stand up to whoever was telling her you don't have enough milk'* (Site 4 maternity HCP7).

A further key avenue for support among families facing inequalities was ***peer and community support***. For example, where breastfeeding groups were working well in areas of deprivation, this was seen to help mothers in those areas feel comfortable to attend since *'they can see that, oh, this mum is from here'* (Site 4 community HCP4). Similarly, peer support was seen to be valuable for mothers from global majority ethnic groups: '*a peer supporter who would be able to connect*' (Site 1 PSMNVP HCP5), but a lack of diversity in breastfeeding groups was seen as a barrier:

> Especially for a person who does not speak the language, and they walk in and they just see a group of white middle class women, and they just do not feel comfortable. They're not going to go. They're not likely to go. People who, even if people with, you know, they're fluent in English, even they don't feel they fit in. (Site 1 PSMNVP HCP5)

Some professionals also described running breastfeeding groups in more deprived areas with mothers where '*none of their family have breastfed before'* (Site 4 community HCP4) differently to those in more affluent areas. This included using a more active facilitation style '*rather than relying on mums to be able to be like hi, I'm so and so*' (Site 4 community HCP4). Other adaptations involved having a nominated one-to-one support worker to offer continuity to young mothers. Several suggestions concerned needing to make services more '*user friendly'* for communities (Site 1 PSMNVP HCP5) by linking offers such as breastfeeding groups to existing groups or services that were already well-attended. Relatedly, involving community and faith leaders was suggested as an avenue to promote services and build connections, and some professionals who were themselves members of minoritised groups emphasised the potential role of champions within the community in building these connections.

Some professionals also highlighted the need for ***cultural sensitivity.*** One example related to recognising that mothers' need to care for their cultural or religious clothing could add a layer of complexity in navigating breastfeeding outside the home. They responded by '*implementing hooks now and extra chairs*' (Site 4 community HCP9), a suggestion they would not have thought of had they not actively sought service user feedback. While some believed that White British professionals tended to be uncomfortable addressing cultural issues, they suggested that skills in enquiring about cultural norms was essential:

> You're not going to know everything about a certain person's culture, but I think it's worthwhile asking about, oh, what does your, you know, just finding out more about, OK, in your culture, how is breastfeeding perceived? You know, or in your culture, what do you do? That type of thing. So just basic

> couple of questions and then from that maybe they might be able to understand a little bit better and then be able to, if there is an issue, or some sort of concern, then they'll be able to address it better (Site 1 PSMNVP HCP5).

Different approaches to ***individualising the standards*** were described, such as by providing more frequent but shorter appointments to give 'bite-sized' information: '*from the BFI information, we then tailor it to the mums that we're actually seeing*' (Site 4 community HCP4). Moreover, while professional-based information sometimes conflicted with cultural infant feeding practices such as giving formula instead of colostrum, some spoke of how they would '*try and remain consistent with the advice*' (Site 4 maternity HCP8) via interpreters to try and balance this tension:

> We do have those same conversations with these families, with these mums. And give the same, the same advice as we would give everybody. At the end of the day, obviously it is their choice and as long as we can evidence that we've had those conversations and this is where we go back to that documentation that we've used and interpreted, they've had these conversations. And they've chosen to give formula for the first few days, for example, and then we will, we will support that, absolutely. (Site 4 maternity HCP8)

Influence of social media

Several participants raised concerns about social media having a *'massive influence'* over new and expectant parents (Site 4 maternity HCP7), particularly when non-evidence based *'snippets'* (Site 2 HCP7) are being shared:

> It tends to be a lot of people just sharing what worked for them, which I would hazard a guess doesn't always align with BFI standards (Site 4 PSMNVP HCP10)

Participants reflected on how social media influencers could positively shape perceptions of breastfeeding by sharing '*how natural it is and what a wonderful experience it is for them*' (Site 3 maternity HCP5). However, these messages could be countered by exposure to content depicting '[mothers] *pushing some baby with the bottle*' (Site 3 maternity HCP5), or bloggers sharing feedback on '*oh, this is brilliant milk. It's the closest to breast'* (Site 3 community HCP6). Some professionals felt that the rise in mixed feeding may be influenced by content shared on social media. There were also examples of online messages that reinforced the unacceptability of public breastfeeding, counteracted safe storage of breast milk or presented idealised messages, such as *'your perfect baby should be sleeping through the night'* (Site 4 maternity HCP2). Social media was thereby perceived to operate as a '*double-edged sword'* whereby information-sharing could either inform and empower individuals or destabilise or undermine parents through inflammatory, unrealistic or non-evidence-based comments. Some professionals reflected on how some women would seek guidance by questioning the online content and promotion of consumerist-based practices:

> I think there's a lot of, especially on TikTok now a lot of mums are kind of making videos about their breastfeeding and feeding experiences and I think social media, I mean everyone's on it, aren't they? And they'll show me the video and they'll kind of say, oh, is there any truth to this? Or do I need to get that? Or do

> I need to buy this or? So many advertisements now, so many, you know, sort of breast pumps and things and they go that or do I need to get that before I have the baby, or do I need to buy this or do I need to buy that? (Site 1 maternity HCP2)

However, this practice was felt to be more likely amongst parents who were more educated, and '*did their own research'* (Site 4 maternity HCP2). Concerns were raised that social media was creating *'pressure'*, e.g., on certain behaviours and what to purchase, particularly amongst those that '*may be quite vulnerable'* (Site 2 community HCP6), or new to breastfeeding. Some professionals therefore considered that they had to work harder to offer reassurance to ensure parents have *'actually got evidence-based information'* (Site 2 PSMNVP HCP8). Professionals would aim to counteract these messages such as directing them to evidence-based information (via UNICEF, NHS, etc.) and encouraging parents to question the information:

> I wouldn't say I'm blunt with parents, but I would say that I'd just kind of say to them OK, well, you know, just make sure you're checking your sources here and here are some good sources of information instead of TikTok, instead of this person may not even live in the UK and has completely different experience so. (Site 2 community HCP6)

At one site, a participant stated that while social media content was not routinely monitored, any issues of parents sharing information where it was thought '*Oh my God, this is wrong'* would be flagged for follow-up within the IFT (Site 1 maternity HCP1).

A few professionals held a more balanced view in that while social media has as an unregulated and pervasive influence, it also holds the potential for positive impact, particularly in reaching specific populations. One participant suggested that greater visibility of breastfeeding through relatable influencers could help normalise the practice, noting that *'if more young mums on the Internet did breastfeed then it would be more out there'* (Site 4 maternity HCP2). This view was echoed by others who expressed the need to *'embrace'* this communication mode and to have a social media presence with '*trusted information'* because '*if we can't beat them, we have to join them'* (Site 3 maternity HCP8). Another expressed a wish for widening channels of communication, such as '*a podcast and then create like short videos of that to go on to TikTok*' (Site 4 PSMNVP HCP10). However, it was felt that '*trying to get it through a hospital, a Trust-wide governance kind of thing is really hard*' (Site 4 PSMNVP HCP10).

Professional self in context: Personal experiences, support and system pressures in BFI Care

This theme explores the workforce and organisational conditions that shape professionals' capacity to provide infant feeding support. It first considers the 'person in the professional', including how personal experiences can influence practice, before exploring how staff are 'supported to support' through the expertise, visibility and accessibility of infant feeding leads and teams. Finally, 'pressures of time and resources for infant feeding support' considers how staffing, workload, service

pressures and infrastructure can constrain the time and capacity available to deliver BFI care.

Person in the professional

Professionals referred to how their own personal experiences and history influenced their work, since '*everyone's been fed or everyone has fed a child*' (Site 2 community HCP5). Adhering to BFI standards was seen to place a boundary around personal experience, with the expectation that while personal experience was ever-present, ideally '*we're not pulling from that, we're pulling from what the research tells us*' (Site 2 community HCP5). Conversely, others believed that influence would be inevitable, that '*you would be inhuman not to let the personal experiences change your practice*' (Site 3 maternity HCP8), and this could lead to '*practice maybe not fitting with the standard sometimes*' (Site 3 maternity HCP8). Some described how knowledge of BFI standards in their current role had made them reflect on their experiences with feeding their own children – '*I can't change it now. But yeah, I do. I think about that a lot*' (Site 3 community HCP6) and how this at times '*it does make me feel a little bit regretful*' (Site 3 community HCP6). For some, their personal experiences of having struggled with breastfeeding motivated them to offer support with some suggesting that such personal experience '*gives you a bit more empathy with mums*' (Site 4 maternity HCP1).

The importance of supporting staff returning to work breastfeeding was discussed, with some professionals concerned that even where organisations supported breastfeeding for service users, they did not always adequately support employees. However, others described support in place within the organisation, including facilities for milk expression and storage, attention to shift patterns – '*if people are feeding, they tend not to work nights because they're pumping at night*' (Site 1 maternity HCP3).

Supported to support

At all sites, professionals described how they felt supported to implement the BFI standards through the role, efforts and accessibility of the IFLs. One participant stated:

> If I do have any problems or I'm not sure about something, they're approachable and really knowledgeable (Site 1 maternity HCP2)

IFLs were seen as influential through their accessibility – '[they are] *at the end of the phone if I'm struggling with anything*' (Site 2 community HCP6); dedication, through giving strategic direction in '*taking the service forward*' (Site 3 maternity HCP5), maintaining clinical practice – *'they are so present, they're visible*' (Site 1 maternity HCP3) – and their passion for infant feeding:

> I think when you've got two people who are so passionate about it and they're the ones that are doing the training and they're very hands on as well, very clinical. I think it makes a massive difference. You know, they're inspirational, really (Site 4 maternity HCP2)

Another reflected on how the IFTs interpersonal skills and a friendly collegial manner were seen as central when delivering updates, reminders or practice improvements:

> I think because they're so approachable, the [Infant Feeding] Team. I mean, even I think the other day, like one of them came in just to heat up her food and she said, oh, just to let you know, girls, XY and Z, just make sure XY. And it's done in such a nice friendly mannerism. You don't mind that you're eating your dinner and you're having a conversation about feeding because they're just such a warm team. (Site 1 maternity HCP6)

The knowledge and expertise of the IFLs meant that staff felt fully supported when faced with '*anything out with the scope of your experience or your knowledge*' (Site 2 maternity HCP9). Some professionals also reflected that knowing this specialist support was available meant they could *'be more beneficial to my patients*' (Site 3 maternity HCP7).

Pressures of time and resources for infant feeding support

Insufficient staff and lack of time to support infant feeding were perennial issues in all services, with one professional describing how they '*just don't have that capacity with time and staffing to be able to spend that one-on-one time*' with parents (Site 4 maternity HCP8). Some referred to how the pressure and stress of heavy workloads meant that '*sickness levels seem to be quite high'* (Site 2 community HCP6), leading to infant feeding being *'sidelined'* (Site 4 maternity HCP5) and the standards not being implemented:

> I think time pressures within maternity care is significant. And I think achieving that golden hour skin-to-skin with babies until the first feed or until mummy wants that to finish, that often doesn't happen in practice' (Site 3 maternity HCP8)

One HCP reflected how the tools used to determine workforce needs did not accurately capture the time needed for infant feeding support – '*I'm not always sure it captures everything*' (Site 2 community HCP6). Some highlighted how the pressures of clinical tasks could mean infant feeding conversations were overlooked:

> Our antenatal period is so focused on measuring fetal growth and doing all these things that we actually forget that we were meant to be having these conversations' (Site 3 maternity HCP8)

Limited infrastructure resources presented a challenge in supporting breast milk feeding on neonatal units was related to space constraints, which had a '*knock-on effect*' in limiting the availability of fridges and freezers for milk storage (Site 1 neonatal HCP7).

A further time and resource related pressures was related to women being offered fewer routine maternity appointments and being discharged within six hours from the postnatal wards, on occasion '*with a baby that has not been fed successfully from the breast at all*' (Site 3 maternity HCP8). Higher rates of complicated births, along with increases in medical complexity were also reported to pose challenges to providing infant feeding care:

> So, I just think it's the complexity – women's complexity overall is increasing and with that comes just an additional workload in the postnatal ward. I mean

> our caesarean section rates are, you know, really high now compared to even 5 to 10 years ago. So, I think the complexity that women are presenting with you know, makes it more difficult to spend the time that women for midwives spend the time with women on supporting them to breastfeed. (Site 3 maternity HCP5)

Some of the professionals described how they attempted to meet BFI standards through providing information to women through alternative means that were out with standard health service contacts:

> So, say for example, like with the health visitor contacts. We did give everybody a three-to-four-month contact, but now that's again funding, it's just become targeted. So, we're thinking, like, well, when do they get the information about the introduction to solid foods. [….] we've worked with Family Hubs, and we've got some displays now that provide six reasons to wait for six months to start solids. Because the new standards ask mum to give one reason to wait to six months. And when they have the antenatal, they're focused on the birth of the baby and everything. And at the birth visit there's so much information. And then usually they got it at the three to four months. You could have those conversations. (Site 4 community HCP3)

Audit processes and data use in BFI: Challenges, experiences and quality improvement

Accredited BFI services are required to carry out internal audits and submit an annual audit form each year to UNICEF UK to demonstrate ongoing compliance with the standards. For Gold accredited units, UNICEF do not prescribe a fixed number of audits per year (e.g. quarterly), rather it expects that audits are regular, systematic, and proportionate to the service's monitoring needs. However, in practice, services still choose to audit frequently (e.g. every few months) to ensure continuous improvement, drive culture change, and maintain readiness for external monitoring but this is local practice, not a formal BFI requirement.

This section explores healthcare professionals' experiences of audit and assessment processes within the BFI, and how these contribute to monitoring, learning and service improvement. First, 'overall reflections' on the audits is presented, followed by practical challenges related to 'timing and resources', the 'selection process' for staff and parents and 'issues with recall'. It then highlights how audits can create 'opportunities for reflection and praise' and how audit findings and wider information are used as 'a tool for change' in terms of quality improvement, informing training, and shaping practice.

Overall reflections

While audits and feeding assessments were recognised as important for ensuring staff remained up to date with expected standards, views on them were mixed. Some referred to the audits *'as really great'* (Site 2 maternity HCP4) and just *'part of my job'* (Site 3 maternity HCP9), whereas others could find the process *'daunting'* or hold more critical views - '*that stupid audit they keep making us do'* (Site 1 community HCP9). Another described the audits as '*really annoying'* and that they '*don't particularly like doing them'* due to feeling they were '*testing'* parents when *'trying to find out what they*

know without them making them feel grilled or uncomfortable' (Site 4 maternity HCP5). The need to make the audits an easier process was highlighted.

Timing and resources

Some complained about the frequency of audits (e.g., at one site every six months) as in reality they take weeks to complete due to staff shifts, work patterns and workload. One participant reported:

> Yeah, and you're trying to deal with them, the hours they work, which everyone, you know, not everyone's full-time. Quite a few staff are part-time or against the hours that you work, against their visits. So, you're trying to slot people in. Which then I think for you, [colleague] and [colleague], that does cause quite a conflict for your workload because you're having to get all the staff audited. (Site 1 community HCP9)

A similar situation was reported for mother audits, with one site stating how *'BFI want us to do 25* [mothers] *a quarter*', which meant *'as soon as we finish the audits on one quarter, we're running into the next'* due to competing workloads (Site 4 community HCP3). The frequency thereby feeling that '*no sooner have we done one lot of mother audits, we're on to the next'* (Site 4 community HCP3). While one IFL referred to submitting less audits than expected to the UNICEF team, the feedback from UNICEF to submit more was recognised as part of their mandate of *'what we've got to do'* (Site 4 community HCP3). One university BFI lead complained that UNICEF should be more definitive in numbers of students to audit, rather than '*being wishy washy about it* […] *so, I think they need to just say either 10 percent, 20%, yeah, roughly how many*' (Site 2 university HCP10)

For some, audits were viewed as time-consuming and were perceived to detract from the time available to support parents and families:

> I think it is very time-consuming because it's, you know, it's 20, isn't it? So, 15 to 20 and that's, you know, that's quite a lot of hours because when you think about, you know, the time that we have in a week to see families, do meetings, etcetera. I mean that's not a BFI problem, that's probably us for being under resourced in terms of staff. (Site 1 community HCP8)

There were also challenges of trying to coordinate dates for staff, who then wanted to undertake it immediately as otherwise they would be '*worrying about it, I'd rather just do it*' (Site 4 community HCP3). While one of the suggestions was to do fewer audits, every couple of months, one referred to how this would *'prolong the agony'* (Site 1 community HCP8), when less auditing would be preferable.

Selection process

While staff aimed to select staff for audit at random, this could mean that the same person is picked more than once, and '*they're not always happy about that'* (Site 4 community HCP3). This professional referred to using an ad-hoc approach of cold calling staff, whereby '*we just say we're phoning from the infant feeding team and see whether they're happy to do an audit*' or recruiting mothers at breastfeeding groups (Site 4 community HCP3).

At one site, a creative approach of using infant feeding assistants to support the audits funded through the Family Hub was in place. One of the university BFI leads also referred to student steering group members being involved in the audits, a process the students *'enjoyed'* and were *'competent at'* (Site 2 university HCP10). Another spoke of how they would use occasions of support giving to complete an audit, rather than always trying to identify a separate cohort. One participant reflected:

> So, I try and fill them in whenever I've maybe had contact with a mum, like spoken to on the postnatal ward or seen her in clinic, tend to do it that way rather than specifically finding people out that I wouldn't see otherwise just. (Site 4 maternity HCP5)

Some professionals reflected that parents who do take part in the audits are not representative, and perhaps *'not the young people that we'd like to engage with'* (Site 2 community HCP5). This practitioner suggested that alternative and more creative means to engage with underserved populations, such as working with organisations who already have a trust-based relationship with these families is needed. Others referred to challenges of engaging with formula feeding women, who may *'already feel judged'* (Site 4 community HCP3) for not breastfeeding, and therefore more reticent about sharing their experiences; *'bottle fed mums tend not to want to talk as much'* (Site 4 community HCP4). One professional also spoke of challenges of talking to those who mixed-fed as the audits were designed for those who either breast or bottle-fed, not a combination of both:

> Even the audit, it's like, oh, you're either breastfeeding mother or a formula feeding mother. Whereas most people end up being a little bit both. And so, for example, some of the audits are difficult to fill in because a mum might have started as a breast feeder and then moved to formula feeding. (Site 4 maternity HCP5)

Issues with recall

While one IFL considered they had never had anyone who was *'not receptive'* (Site 2 maternity HCP9) to the audit process, others referred to how staff found the assessment processes stressful '*we all get our knickers in a twist'* and complained that the wording was *'too stringent'* (Site 1 community HCP9). Some professionals were critical about the challenges of staff or parents not saying *'the words that are on my sheet'* (Site 1 community HCP9) and the pressure of having to remember too many answers to answer the question correctly. This was felt to be particularly problematic for time-poor parents who are '*trying to look after the baby*' (Site 1 community HCP8) and potentially overwhelmed by the birth and new parenting This was also confirmed when parents would forget receiving information that had been documented in their maternity records:

> I find it bit tricky to be honest. You know, you're asking women maybe quite early on, they're maybe only one or two days postnatal, and sometimes they can't remember what somebody said to them in pregnancy. They're like, oh, I don't know maybe or they'll say nobody ever mentioned that to me. And then you'll look on the notes and the midwife will have documented that they've had that conversation. (Site 4 maternity HCP5)

One of the BFI university leads highlighted disagreement amongst the teaching team regarding the validity of some of the questions:

> Do the audits actually do what they claim to be doing? Because some of the lecturers from my experience have different views on what those answers should be. […] (Site 2 university HCP10)

Some IFLs also referred to how they acknowledged the challenges of staff remembering all the key information, and would emphasise how it was a *'conversation, rather than a test'* (Site 2 community HCP6).

There were also potential issues about asking parents about information that they had not yet received:

> [So, they have not] had a discharge check yet, so somebody's mentioned safe sleep to them, but not gone into depth with them. So, I guess it's that issue of timing of when you do the audits, it's difficult. (Site 4 maternity HCP5)

Opportunities for reflection and praise

Some IFLs used the results of the audits and assessments to celebrate and promote good practice among the clinical teams – an approach that was believed to be '*rewarding for staff to hear'* and particularly in a climate within the health service where they must *'deal with a lot of complaints and things*' (Site 3 community HCP3). Others referred to using the results of the audits in real time to reinforce positive behaviours as well as areas where further work is needed:

> Because like I say when they are having an audit, if you were noticing something straight away, say for example like with say hand expressing and it's just not quite right and you're thinking if you were doing that with a mum, would she fully understand? So, we wait till the audit's finished and then we give them, like, you know, the positive feedback and then we'll say we just noticed… (Site 4 community HCP3)

Some IFLs also reported how feedback was not contained in formal audits, but rather whenever poor practice was identified:

> So, I suppose it would be whenever they're doing the UNICEF Baby Friendly audit, but also if they're seeing somebody with feeding problems and looking through the notes and noticing, you know, oh, actually that advice maybe wasn't quite what was indicated. And that advice maybe wasn't in line with Baby Friendly, the infant feeding team would certainly sort of e-mail or phone that healthcare professional and just so you know, I've been supporting this person. I noticed that you gave this advice and actually what we could have done is maybe suggested XY said. Yeah. So, I think it's sort of them ad hoc as well for that because it's as and when and they find it, yeah. (Site 2 maternity HCP9)

For some, the audits were not only about highlighting gaps but also providing positive feedback, using a *'strengths-based approach'*:

> I think they appreciate, you know, because it's so hard. You have to have knowledge of so many different areas, you know, not just infant feeding to do your job. And so, I think it's good knowing that you know there's somebody there to just sort of say you're doing a great job. Let's also incorporate this into your great care. And so that we can maximise the benefits. (Site 2 maternity HCP9)

This positive approach was also reflected in those being assessed. One referred to how they *'actually don't mind them* [assessments]*'*, as it provided an opportunity to '*show them what I'm doing*' (Site 3 maternity HCP9). Another reported:

> So, our breastfeeding coordinator will come in and would sit in the room with me when I am with the patient and just make sure that I go through, you know, chins, which is the position and attachment of baby, find out what the mum is having issues with, If she's having any issues and if there's any fixes for that, making sure everyone's comfortable, and then the coordinator would just make sure I'm happy with everything at the end and if I had any questions about any difficult cases that I've had or anything like that. (Site 3 maternity HCP7)

In this regard, audits were perceived as an opportunity for self-reflection, upskilling, and to increase confidence:

> So, you know, if there's areas where we feel we're weak, we're addressing it within the audit because the staff, like I say themselves, that they'll say oh I feel a bit rusty here. So, you know, we'll ensure whether they've gone away from the audit, feeling more confident about that area that they're feeling a little bit rusty on. (Site 4 community HCP3)

Data as a tool for change

While audit results were used to inform further training (see section X), one participant noted that they also provided evidence of gaps in care, which could be used to advocate with management for increased support for mothers. This professional stressed, '*it's* [audits] *not about blaming anyone. It's about supporting staff*' (Site 3 maternity HCP1). In a similar regard, others considered that while the audits could feel like a *'paperwork exercise'* (Site 2 university HCP10), their true remit was a tool for action and change.

One university BFI lead described an annual, OSCE-style 'racetrack' training event being held after the audits had been undertaken. This event involved students rotating through a series of practical stations to refresh skills and maintain competency in line with BFI current standards. This event would also be repeated if there was no clear improvement:

> That's one for all the students. Each cohort is audited once in their final at the start of their final year. And then on the back of that a training event, that racetrack event is prepared. If we get a sense at the end of that that they haven't learnt, we will redo the whole thing. (Site 3 university HCP10)

Students at this university were also expected to use an electronic portfolio system, aligned to BFI standards, to capture and assess their infant feeding competencies. This was complemented by end-of-programme audits, which helped to identify gaps

in learning and to inform improvements in training. However, as completion was not mandatory, compliance was poor. One of the educators described this lack of engagement as *'disappointing'*, while reflecting that the audits was where *'you really get to see what they're actually like in practice*' (Site 3 university HCP11).

Aside from the audits, several professionals spoke of how they were constantly compiling and using wider data to undertake quality improvement projects and to drive forward positive care. For example, one professional described:

> And the other thing is with sustainability is that you're not just constantly being assessed, it's about you looking at as infant feeding leads us looking at our own data, us looking at our own areas, problem areas or challenges should I say. And then thinking right as a team, what can we do about this? So, there is some lovely, QI projects going on looking at different areas. What can we do to support women? Why aren't they attending clinics? Why aren't they looking at breastfeeding? What is it that's happening in their background? And I think that's what sustainability is about. It is working on those standards that's embedded but actually pushing it a little bit further. (Site 3 maternity HCP1)

Another participant described the BFI as an evolving quality improvement project, where the aim was to achieve accreditation while continuously reviewing and improving areas of practice, and to ensure its focus keeps it on *'everybody's radar'*:

> We have obviously a very good relationship with our feeding leads here and they will highlight where they have an area of concern to me particularly and then we put in a bit of an action plan. So, I mean that happens routinely. There's, there's just something and maybe there's a slipping about supplementation or there's something else that's slipping and then we just go and re-address it again. I think it's what's been very obvious to me through Baby Friendly process is that it's not just you get your accreditation you're done and dusted, move on to the next thing. It is a continual, you know, revisiting often, then refocusing on focusing on it and you know there's no end point to such and that's fair […] to keep it really on everybody's radar (Site 3 maternity HCP5)

Professionals also described how feedback from women and families helped to shape resources used in practice, to ensure these were '*pitched right for the women that we're speaking to*' (Site 4 PSMNVP HCP10).

Overall, audits and assessments as well as other forms of patient feedback such as via the CQC and maternity surveys meant they could be responsive to what was happening in the local area, and to refine, adapt or introduce new areas of practice as needed.

Experiences and delivery of BFI training in practice

This section explores healthcare professionals' experiences of the BFI training and how it is delivered and enacted in practice, with most comments relating to in-house training delivered by the IFLs. First, it explores how training contributes to building confidence and capability, followed by the role of developing skills via experiential learning in consolidating knowledge. It then considers how staff maintain competence

through keeping updated, before exploring practical challenges and innovations in delivery under approaches and practicalities. The section also describes the importance of adopting a multidisciplinary approach within the wider system context and concludes by identifying further training needs.

Building confidence and capability through BFI training

There were some negativity and ambivalence expressed towards a range of IFL training. For instance, one professional reflected that '*matrons, managers, etc'* could look *'really bored'* during the training (Site 4 maternity HCP5). Another felt that while the training had not necessarily taught them anything new, it still consolidated what they were *'covering anyway'* (Site 3 neonatal HCP4) and the BFI had helped to embed key practices due to its alignment with their family-integrated care approach and the Bliss Baby Charter (Site 3 neonatal HCP4). However, what was far more common was participants providing very positive feedback about the training, using terms such as '*amazing', 'empowering'* and *'phenomenal'*. The training was considered to have empowered staff through understanding the differences in different types of feeding and expanding their knowledge of more *'complex'* issues such as *'oxytocin, the prolactin and the things that you need to do to make sure that breastfeeding is successful*' (Site 1 neonatal HCP4). Others spoke about valuing about the theoretical underpinnings, such as *'why the latch is important'* (Site 4 maternity HCP1) or learning about brain development, and how they would convey these messages to parents using the resources provided:

> So, that was kind of a big thing for me, is that I always think about just different ways I can give information to people. So, that was one of the best things from that training too was just like I carry that book[227] with me and I take it to I pull it out if I feel like I'm not putting I'm like, look, this is a graph that I want to show you or this is like a picture I want to show you. (Site 2 community HCP6)

Another professional spoke of how the training had made them aware of the Code in their everyday lives, such as when visiting *'the supermarket'* and seeing how breast milk substitutes are marketed (Site 4 community HCP4). Some reported how they had *'loved the training'* to such an extent that they had sought out additional opportunities to learn about infant feeding, such as through the Association of Breastfeeding Mothers (Site 2 PSMNVP HCP3)[228].

There were variations in experiences of the training depending on whether they had breastfed their own children. One professional who had breastfed her children considered the training to have expanded her knowledge and skills, such as how to observe feeds, *'you know, swallow, suck and swallow reflex with the baby*' (Site 4 maternity HCP1). Whereas another who had not breastfed initially felt *'hypocritical'* and *'paranoid'* about providing breastfeeding support: the training and support from the IFT helped address these concerns and enabled her to feel '*a lot more confident'* (Site 3 community HCP6).

[227] UNICEF resource given out during BFI training

[228] At some case study sites, practitioners also had access to wider CPD sessions such as *'cow's milk protein allergy stuff'* (Site 2 HCP4)

As reflected by the participant above, many professionals described how the training had increased their confidence in providing evidence-based care. For one participant this meant no longer having to *'second guess'* what information to provide (Site 2 neonatal HCP2). Some HCPs felt unable to recall all the standards but still felt confident that their practice was aligned with *'what we are aiming for'* (Site 4 maternity HCP5) and knowing where they could locate[229] and refer to the standards was felt to be '*half the battle'* (Site 2 maternity HCP9). A further participant reflected that, while they were not '*100% confident',* they were *'confident enough'* (Site 3 maternity HCP7) to support women on their '*infant feeding journey'* (Site 4 maternity HCP7). Another HCP described:

> I mean with the infant feeding sessions that they put on for ourselves, we can, you know, I can assess latch, I can assess position, I can assess the tongue tie […]. So, I can look at breastfeeding as a whole, and I can look at it holistically as well and get the overall picture. And then I can kind of refer on if I need to and I feel like I have that knowledge as to whether I need to refer on to the experts. (Site 1 maternity HCP2)

As indicated above, confidence was not just about providing direct support, but also recognising limitations of their knowledge and knowing when to refer to more specialist staff:

> So, if I'm doing a postnatal appointment and I'm assessing feeding and I'm sort of thinking that I've identified that there's issues and there's problems, there's, I know who I can go to. I know with the pathways I can go down with weight changes with weight gains, weight losses as well, there's a really clear pathway set out to us, which is also taught and provided to us in those feeding sessions as well as by staff and I know what way we can go from that. (Site 1 maternity HCP2)

Several participants spoke of the reciprocal nature of learning which was manifested in various ways. These participants felt that the more they learnt about infant feeding, the more passionate they became about providing the support; how learning provided confidence to '*to go to the families and give them the education';* and seeing the positive impact of practices, e.g., skin-to-skin, not only reinforced their learning but fuelled their confidence and motivation to offer this support in the future. One HCP reported:

> I remember the first time that I ever did it, after my course I had a mum in high dependency and one of the nurses said like you've just done your course, can you come and help this mum? And it was her second baby. She couldn't breastfeed her first one for whatever reason. So I laid her back in a chair and I've done the crawling and put the baby in the crawling position and that was one of the first things that I've watched on a video in a BFI, and it's amazing watching it on a video, but until you actually see it with your own eyes, you sometimes think, does that really work? And it actually worked for this mum. And she cried. And I remember getting so excited because the baby latched

[229] One HCP referred having the standards *'open on my laptop during appointments'* to make sure the correct information was being provided (Site 2 HCP9).

> first time and it was just…. yeah, and I think that was one of the big things that I got so excited at earlier on because I could actually see, Oh my God, this actually works. Listening to what they've said and putting into action. (Site 1 neonatal HCP4)

University BFI leads highlighted their sense of responsibility in training students, as '*If we don't get it right, it has big ramifications for what happens out in practice'* (Site 2 university HCP10). This participant also reflected on how the evidence-based training had stimulated students to adopt a more critical approach when reviewing the wider evidence, thereby highlighting how the training had fostered a more inquisitive learning environment:

> So, they're always asking me questions of, oh, X [name] is this appropriate research or not? So, I'm always looking at it and going, well, actually, probably not. But have you looked at this instead or signposted to the UNICEF website (Site 2 university HCP10)

Developing skills via experiential learning

The importance of developing, reinforcing and consolidating theoretical knowledge through direct, hands-on experiential learning was expressed by many. Several participants referred to the benefits of developing their learning and skills while in practice, such as students learning alongside the IFLs during placements:

> Our infant feeding leads are excellent in practice. When they have time, they'll support our students really nicely and the students love that. They love being with a breastfeeding specialist. I think it really imparts such value. It really shows breastfeeding is valuable. (Site 3 university HCP11)

In this setting, students had placements across the whole maternity experience and *'each year they do an antenatal, intrapartum and postnatal placement'* with the associated content and proficiencies aligned to this timeframe to embed and reinforce their learning. The students also had placements in different trusts enabling them to be exposed to different practices:

> They also move Trusts so they can experience infant feeding and support in one Trust and then go to another Trust and see how it's done differently. (Site 3 university HCP10)

It was considered that students viewed the IFLs as more credible and were *'much more interested in what she has to say'* (Site 3 university HCP11). This point was reinforced by an IFL who felt that shadowing her was more *'practical than the training they get from the universities'* (Site 1 maternity HCP1). Some felt that increasing these opportunities was needed but problematic due to the IFLs heavy workloads and there being '*too few of them on the ground*' (Site 3 university HCP11).

Similar issues were raised by professionals who worked within clinical practice. While midwives were more easily able to reinforce their learning as *'every day is breastfeeding'* (Site 4 community HCP4), others appreciated opportunities to work alongside practice educators (Site 2 community HCP6), shadowing *'support workers'* (Site 2 PSMNVP HCP3) or using supervision as opportunities to discuss specific cases

(Site 4 community HCP4). Some spoke of the benefits of *'listening'*, *'watching'* and *'observing'* those more proficient: these occasions enabled them to not only learn about providing practical support, but also how support should be communicated:

> So, it was helpful being able to shadow the support workers and the advisors to see how they do it and to hear how they conduct conversations as well. That was probably most helpful for me because that was very practical. (Site 2 PSMNVP HCP3)

One of the university educators explained that she taught theory and practice simultaneously, as teaching these topics separately could lead to poor retention, *'by the time they get to the skill sessions, they've completely forgotten absolutely everything that they had learned within the theory class'* (Site 2 university HCP10). While this remained an untested approach, she was optimistic for audit results to demonstrate this practice as '*a little bit more effective'* (Site 2 university HCP10), and particularly when students '*like the skills sessions more than they like the theory*' (Site 2 university HCP10). One of the clinical BFI leads also described how cognitive overload among attendees led her to separate theoretical and skills-based teaching, allowing more focused time for practising skills such as positioning, attachment, and managing common breastfeeding problems (Site 4 community HCP3).

In one case study site, postnatal care had changed since COVID from home visits to a postnatal clinic. This was believed to be detrimental to students learning about infant feeding as parents *'feed them before they come in',* the clinical environment was not conducive to feeding, and parents tend to *'rush out'* (Site 3 university HCP11) following their appointment. While clinical staff were encouraged to attend breastfeeding support groups to *'refresh their skills'* and hear about new practices[230], one of the university BFI leads wished they could mandate this practice amongst students, to expose them '*not only to breastfeeding, but breastfeeding support*' (Site 3 university HCP11). This practice was also perceived as highly relevant in areas with lower breastfeeding rates, where opportunities to observe breastfeeding were more limited.

Keeping updated

Here we describe feedback related to how staff kept updated through ***refresher training*** and via ***information channels***. Several professionals spoke of how they valued the ***refresher training*** to educate and reinforce learning about the BFI standards. In one area, BFI training was perceived to be *'so embedded'* that refreshers were *'part and parcel of their normal yearly practice'* (Site 4 maternity HCP8). Refresher sessions provided occasions to reinforce BFI messages that staff were more likely to forget, which for one IFL was the '*most principle one'* – '*neurodevelopment, skin-to-skin and the attachment part of it'* (Site 1 maternity HCP1).

A recurring issue was how the IFLs would use the audit results, or incidents in clinical practice, or the general media to direct the focus of the update sessions. For example, if an audit found that the staff were *'low on their hand expressing'* knowledge, this would be the topic of a future session (Site 2 community HCP5). Other examples were clinical incidents being used in refresher events to remind staff about best practice or

[230] One example is the Supplemental Nursing System - a small straw-like tube that allows mothers to give supplements while the infant is at the breast.

local policies including hypoglycaemia, readmission rates for weight loss, tongue tie assessments, etc. One of the university educators also referred to a local Code violation being used to reinforce its importance with students:

> We had something to do with food banks at one point where formula pictures had been out on show and one of the students didn't think that that was bad. And I had to explain to them that actually that was breaking our Code, and it had to be taken down from our screens around the university. And when it started a bit of a debate of what was acceptable and what wasn't acceptable, it's just keeping on top of certain things and what that actually means for the university and breaking certain parts of it (Site 2 university HCP10)

One also reflected on how they would like to show evidence of how formula companies advertise their products, while being hampered by the notion that this was a breach of Code guidelines:

> So, it's not really the same, it's not the same thing, but it's still Code compliance and I suppose it's I'm never sure whether I'm being overcautious or not, but often there's like really good stuff, especially recently, you know, the Lancet 2023 series. […] And there were slides showing how they would advertise formula milk in in Asian countries where academic performance is highly valued. They would show the tub of formula with a baby with like a mortar board and glasses and things. And I wanted to show that, but I thought, you know, I don't actually think I can even show that because there is the name, even though the whole purpose of the site was to say, look how much they're manipulating you. (Site 3 university HCP11)

Refreshers were perceived as important to *'keep staff upskilled'* (Site 4 community HCP9), provide new learning, prevent complacency, and to ensure staff knowledge was up to date as '*things change all the time*' (Site 4 maternity HCP7).

In one site, additional, ad hoc sessions were also organised to reinforce learning on key issues or in response to unusual situations in practice. This participant explained:

> But what we do here as a team is every now and again, sometimes we would get in touch with one of the breastfeeding coordinators and ask them to come down in person and we would do a quick, you know, one or two hour session face to face of you know, positioning and things like that and asking any questions. If we've come up with some, you know, if I've met a patient and I think, oh, this is something unusual I've never dealt with before, what can I do here to help and things like that? It's really good. (Site 3 maternity HCP7)

One of the BFI university leads referred to how students were taught the standards which were then updated every year, so '*they're constantly learning something that they might be forgotten for a couple of years or haven't had much experience with'* (Site 3 university HCP11).

Aside from the refresher training, professionals commented about the value of regular ***information channels*** where updated and insights were shared. Team meetings, huddles, emails and online presentations were commonly described as avenues for

sharing new information or reminding staff about existing services or resources. However, some professionals observed that communication methods such as emails and newsletters may be left in a '*to be read pile*' (Site 2 maternity HCP7), suggesting that other means of communication were needed.

Less formal means of communication were employed, such as posters or information sheets explaining feeding issues that were particularly relevant for babies in neonatal units which could be shared with maternity staff - '*I thought they could stick it on the midwives' desk about, you know, I made it sort of jolly, you know, neonatal stuff.'* (Site 4 neonatal HCP6). Informal communication also included in-person conversations, but these could be hindered by lack of time and high workloads:

> There could be a lot more. I mean, I if I'm on a long day and I've got a moment or I'll go around to where [maternity infant feeding lead] office is and we just update each other. I used to have a lot more time to do that. When I did have a feeding day, but now I just whizz round if I've got a minute and I'll go around and ask her what's going on'. (Site 1 neonatal HCP5)

Another suggestion was appointing Breastfeeding Champions within a service to '*filter information down*' (Site 2 community HCP5). Electronic patient records where staff recorded care against the standards were also considered another way to maintain staff knowledge.

Approaches and practicalities

Several staff reported issues in delivering the training, along with solutions and areas of innovation in its delivery. At some of the sites, staff spoke of how they were encouraged to attend the training by supportive and '*passionate'* managers (Site 4 community HCP4). At one site, staff were enabled to attend training through the provision of overtime, allowing them to participate while managing the demands of their role:

> You will actually get paid for turning up, not just because you, you know, you've got a bit of an interest in it. (Site 1 community HCP8)

However, others reported challenges in staff attendance often associated with staffing issues and workload. In one site, in response to reduced training hours meaning staff could no longer attend the standard two-hour refresher sessions, the IFT introduced a series of 30-minute 'bite-size' sessions. Staff were expected to attend enough sessions to total two hours; however, uptake exceeded expectations, with many staff, including team leaders, attending more sessions than required:

> They were half-hour sessions and I put a few ones so that people could, they knew that they had to make up the two hours. Well, even though there were more sessions than would make the two hours, some people chose to do all of it. And you know that was fine. And even some of the team leaders decided, Oh, well, we'll do all of it. So, we're just, we've got that information. So, even though I'm giving them at that point, you don't have to do all of them but just make sure you do enough to add up to two hours' worth of refresher. They still did three hours. (Site 4 community HCP3)

Due to challenges in releasing staff as well as the time commitment for IFLs to provide full-day training, a suggestion was made for the foundational training to be delivered over half-day sessions:

> There is no achievable way that even [name] and I together can run a 2-day infant feeding course once a month. It's just it, however much we probably want to do it, it's unachievable, whereas if we do the three-hour afternoon or morning, you know, the three-hour session, I think definitely probably for [name] it's more achievable and I can do the ones that she's not available for. I think that would be more achievable. (Site 1 neonatal HCP7)

Across the sites, there appeared to be a mix in terms of how the training was delivered, e.g., at one site, all the foundational and refresher training was face-to-face, at others, the foundational training was face-to-face, with refreshers provided online. While staff were reported to appreciate face-to-face training as it is *'nice to actually see people'* (Site 3 maternity HCP9), as training at one site was delivered across multiple locations, this created barriers to staff attendance. Others highlighted the value of small group sessions for the training (Site 4 community HCP3) due to it facilitating an interactive rather than didactic approach, so *'there's loads of opportunities to ask questions if there's things we're not sure about'* (Site 1 maternity HCP2). This also fed into the importance of having an individual delivering the sessions, rather than purely online, as then they were able to *'share life stories' and 'human connection'* of breastfeeding support (Site 4 community HCP9). However, beyond a purely human focus, some participants referred to the importance of 'passion' among those delivering the BFI training, suggesting this had a motivational influence on others:

> It helps if you have people from the education side of things that are really passionate about it then your training reflects that (Site 3 maternity HCP8)

From a similar perspective, some highlighted a tension between the benefits of standardised breastfeeding education (e.g., anyone could deliver it, consistency across settings) and the potential loss of passion and authenticity in delivery, with concerns that structured programmes may enable more tokenistic approaches to teaching:

> I think sometimes when you bring in something standardized, there's just sort of a tokenism, sometimes can come into play, just to get a class covered (Site 3 university HCP10)

Only one criticism of online BFI training was raised. One university BFI lead found the UNICEF BFI online training to be '*really interesting*' well-resourced and informative, while also raising criticisms around repetition, content level and concentration issues (Site 2 university HCP10).

Adopting a multidisciplinary approach

Despite different areas of practice (maternity, health visiting, etc) having their own IFLs, staff in one case study area spoke of how previously they had adopted a multidisciplinary approach to training (in terms of staff who delivered the training and those who attended). An approach they considered invaluable to help staff understand different areas of practice:

> I thought it was quite helpful to have that introduction with other colleagues because you link, you have those links and understanding such as what advice you have with the health visitors. (Site 1 maternity HCP1)

However, a decision was made to change to service-specific training followed UNICEF adapting their accreditation process away from *'a whole-system*' approach towards separate assessment procedures:

> I mean the majority of hospitals state now have an infant feeding lead or health visiting, one for maternity and one for neonatal, and they tend to run the accreditation separately. They used to before do it as a whole. So, we used to do it with the health visitors within the same area as well as the neonatal, so we used to be together. Now the assessment for UNICEF is separate. So maybe that was the issue that we decided, OK, let's do the training separate and we thought, before I thought it was quite helpful to have that introduction with other colleagues because you link, you have those links and the understanding where do you prefer to be health visitors and what advice you have with the health visitors. But I think it is that it's just different now. (Site 1 maternity HCP1)

This HCP reflected that this had created more work to try and ensure their training addressed this gap and for staff to understand the standards in other areas of practice (such as health visiting or neonatal) as *'sometimes they forget that link'*. (Site 1 maternity HCP1), while recognising that gaps were still evident:

> But I still think they need to have someone from those areas that could take part in facilitating the training so they understand how their service work, because our maternity infant feeding leads, they could know a bit of what happens in neonatal what happens in paediatrics but they don't have the specialties to understand it. (Site 1 maternity HCP1)

The need for this practice reinforced by the concerns raised by some professionals about perceived overlaps between maternity and community services, arising from BFI requirements for earlier contacts from community teams. There was concern that overlaps made it harder to ascertain where responsibility lay, and about possible duplication:

> The new community standards, which are asking health visiting teams and stuff to make earlier contact with mums, I find that that's really muddying the waters. Because we're getting in touch with them and then the health visiting team are getting in touch with them and then it's like, it's just getting confusing as to who is looking after that mum and then who is, you know, going to give that feeding support if then feeding issues are identified. If the health visiting infant feeding leads are, you know, doing phone calls and day three and get them into their clinics. And then we're also seeing them. It's just seems almost like a little bit of not, the best use of resources. You know if maternity services are there for those first two weeks, then? (Site 4 maternity HCP5)

In one case study area, discipline-specific e-learning packages had been developed. One participant highlighted the value of directing these resources across professional

groups, noting that materials designed for one discipline (e.g. a paediatric-focused package on *'jaundice and weight loss*') would also be beneficial for others, such as midwives (Site 3 maternity HCP9).

Further training needs

Various additional training needs were reported. First, some reflected that flexibility to re-access the foundational training was needed (Site 4 community HCP4). This was felt to be particularly important for those who attended years ago to renew their knowledge and motivation '*it renews your love [for breastfeeding] as well'* (Site 1 community HCP8). Some wanted more time in refresher sessions and for these to be provided more frequently such as *'once every two months'* due to infant feeding being something '*we face every single day in practice'* (Site 3 maternity HCP8). While some felt they had received sufficient training, others felt additional training was needed, particularly for those who do not have a clinical background *'such as volunteers'* (Site 2 PSMNVP HCP3), or those who were newly qualified:

> It's probably quite difficult for the younger team members… they're thrown in at the deep end with a caseload and expected to know a little bit of everything (Site 2 maternity HCP7).

This practitioner also suggested that a *'clinical skills review'* could be beneficial for newly qualified staff in assessing and supporting their skills development (Site 2 maternity HCP7). Furthermore, as one professional highlighted conflicting information among the IFLs, this suggests a need for enhanced opportunities for their ongoing learning and development:

> I think three infant feeding leads within the Trust and without laying criticism or anything but the conflicting advice is very evident and you'll find that with our women as well, who you know, were coming out now like well, she said to do this, but then this other one said to do this and I don't know what's the right thing to do. (Site 3 maternity HCP8)

Others highlighted specific areas where more training was required such tongue ties (Site 4 maternity HCP1), paced feeding (Site 2 maternity HCP9), and the Code, to dispel myths for staff as well as parents (Site 4 community HCP3). Another requested more emphasis on the *'neonatal feeding side of it'* (Site 1 neonatal HCP7), and the frequency of expressing:

> I think probably the most common one I've seen in practice is frequency of using the breast pump initially after birth for mums who are struggling to latch babies. Sometimes there can be a discrepancy. I think we're getting a lot better at it, but I think there's still sometimes we're just not given the right advice or given the right number of how many times to pump, you know, and how often to do it. And then that leads to sort of early formula use that maybe wasn't clinically indicated and could have been avoided – unless it was mum's choice of course, which we would respect. (Site 2 maternity HCP9)

Some of the university BFI leads considered areas where students needed further instruction, such as learning about hormones, caring for a baby who is at-risk (Site 3 university HCP10), how to make up formula feeds (Site 2 university HCP10) and why

'*it's important not to provide supplementary feeds'* (Site 3 university HCP10). One participant requested further instruction on '*overcoming common challenges in the community'* (Site 3 maternity HCP8), such as infant weight loss. This participant suggested that a case study approach, highlighting what worked and what did not, could be a useful mechanism to upskill professionals on specific topics, and a '*toolkit of how to handle problems*' (Site 3 maternity HCP8)[231]. Another professional recognised that while there were generally proficient at antenatal education, and support for early feeding, a key gap was supporting families into the extended postnatal period:

> I think what we're maybe not getting so well is supporting ongoing breast feeding and perhaps that's because we've had such poor rates for so long that we became maybe a little bit deskilled in supporting families at kind of three months, four months, six months, 10 months, a year, 18 months, three years whatever they're feeding to. So that that's the area I think we're really good at putting the feeding plans in place and dealing with the early faltering growth. But I think we're probably less skilled at dealing with the feeding challenges as time goes on, so. (Site 2 community HCP5)

One professional also felt there was a need for further training about using guidelines to reinforce they are *'only a guidance*' not as a proxy to dismiss the need for '*clinical judgement*' (Site 4 maternity HCP7).

There was a call for more training in inequalities to support professionals in providing equitable care. Some considered that while students and newly qualified professionals may have a much better understanding of '*public health and health inequalities'* (Site 2 community HCP5), BFI training needed to include wider representation of marginalised groups – *'I do think we could represent more groups, then there could be more diversity in the [BFI] training itself* ' (Site 1 maternity HCP3) – and include more skills training for supporting mothers with additional needs:

> I'm not sure they have enough training or the standards cover things like learning disabilities. And those skills that we need to have to support some women with learning disabilities or they are neurodiverse. It doesn't go that deep. (Site 1 maternity HCP1)

Some professionals perceived that sometimes they and/or their colleagues lacked awareness and knowledge of how to support LBGTQ+ parents, with one expressing that '*it's sometimes difficult to know how to support them with their feeding journey*' (Site 1 maternity HCP1). Professionals wanted more information to increase their knowledge and confidence to support these parents, including surrogates, about '*inducing lactation and things like that'*. (Site 4 maternity HCP5). Instances of poor care were recalled, where standard hospital practices had been prioritised over inclusivity, and it was suggested that *'maybe that could be added to training in future'* (Site 1 maternity HCP3).

[231] Although important to note that BFI training and qualifications approach was updated in November 2025 to place much greater emphasis on applied learning, implementation examples, and case-study-based teaching.

A final area reported by several participants was opportunities to reflect on their own experiences of infant feeding, either during training or supervision. One reflected how important this was to '*acknowledge the fact that everyone's experiences are different and that we all bring something different to the table'* and to ensure that there were appropriate boundaries in place when providing care (Site 3 maternity HCP8).

Summary of key findings

Overall, the findings suggest that BFI-accredited care is viewed by staff as a valuable framework for delivering consistent, evidence-based and relationship-centred care. Staff across maternity, neonatal, community, and university settings described the BFI as providing a common set of standards that helps ensure families receive similar messages and support regardless of where they access care. Accreditation was widely perceived as helping to standardise practice, strengthen infant feeding support, and create a culture in which infant feeding, parent–infant relationships and informed decision-making were recognised as shared responsibilities rather than the remit of individual enthusiasts.

A key strength of BFI accreditation appears to be its role in changing attitudes and culture over time, promoting a shift away from inconsistent, opinion-based practices towards evidence-based support. Staff particularly valued the broader BFI focus on close and loving relationships, parental confidence and relationship-centred care, with some suggesting this has helped move conversations beyond breastfeeding promotion alone. Infant Feeding Leads were repeatedly identified as central to successful implementation through their expertise, visibility, training, clinical support and leadership. Training, audit processes and strong multidisciplinary networks were also viewed as important mechanisms for improving practice and sustaining change.

The findings also highlight the importance of collaboration and community-building. Staff described strong partnerships between maternity, neonatal, community, voluntary sector and university services, with BFI providing a framework around which services could align their work. Audit and quality improvement processes were generally seen as useful for identifying gaps, celebrating good practice and driving ongoing service development, even if they could sometimes feel burdensome.

Despite these strengths, implementation was not experienced as fully consistent. Staff reported variation in engagement, confidence and practice, both within and between services. While some professionals were highly committed to infant feeding support, others were perceived as less invested despite receiving the same training. There were also examples of inconsistent advice around supplementation, breastfeeding management, expressing, tongue tie, and skin-to-skin care. Some participants felt that aspects of BFI could become overly administrative or perceived as a 'tick-box' exercise, particularly given the ongoing requirements for audits, training and reaccreditation.

Resource pressures emerged as one of the biggest challenges. Staffing shortages, high workloads, limited protected time, increasing clinical complexity and competing priorities often constrained staff ability to provide the level of infant feeding support they felt families needed. Concerns were also raised about over-reliance on small infant feeding teams to maintain standards.

The findings suggest that future programme development should focus on sustaining implementation as well as achieving it. Priorities include strengthening workforce capacity, ensuring protected time for BFI activity, supporting greater consistency across services, and reducing over-reliance on specialist staff. There is also a need to further develop support for inequalities, cultural competence, LGBTQUIA+ families, neurodivergent parents and other groups whose needs are not always fully addressed within existing resources and training. Finally, participants highlighted opportunities to strengthen support beyond the early postnatal period, engage more effectively with social media and wider community influences, and build stronger policy-level support for infant feeding and relationship-centred care.

Figure 15 summarises the key barriers and enablers identified across the staff interviews that influenced the implementation and sustainability of BFI standards.

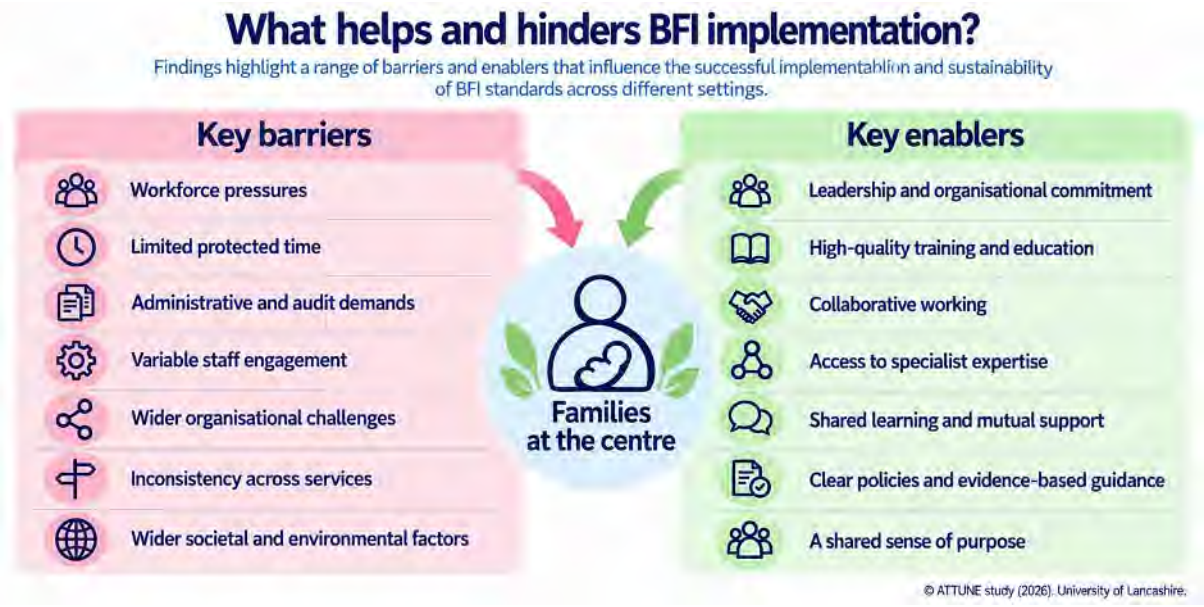


Figure 15: Barriers and enablers to BFI implementation

Emergent recommendations for BFI implementation

Key recommendations from the staff insights are outlined as follows:

Supporting sustainable implementation of evolving BFI standards

- UNICEF UK BFI could consider clearer communication of revised standards, alongside adequate organisational support, to reduce staff perceptions of 'moving goalposts', implementation burden, and change fatigue associated with evolving accreditation requirements.

Invest in infrastructure and protected capacity to support implementation

- A key barrier identified was the lack of protected time and resources, particularly for IFLs, who were often required to manage training, audits, service development, and clinical support simultaneously. Without sufficient resource, implementation risks relying on individual passion rather than sustainable systems. Organisations should ensure adequate staffing, protected time, and administrative support to enable meaningful and sustained delivery of BFI standards.

- A clearer job description for IFLs that reflects the full scope of responsibilities could also help align expectations and support more appropriate resourcing.

Strengthen leadership, visibility, and organisational ownership of BFI

- Successful implementation was strongly associated with senior leadership engagement, governance structures, and organisational prioritisation. Where Guardians/leaders actively championed BFI, it was more visible and more embedded in practice. This also highlighted the importance of leaders having sufficient understanding of BFI standards and implementation processes to effectively support staff and sustain organisational commitment, for example, through bespoke BFI training.
- Positioning BFI within broader public health and organisational priorities, such as population health, inequalities, and early years outcomes, presents opportunities to strengthen leadership buy-in and long-term commitment.

Maintain and strengthen a whole-system approach across services and sectors

- Consistency of care was enhanced where collaboration existed across maternity, neonatal, community, academic, and voluntary sectors. Participants highlighted the importance of shared messaging, joint working, and cross-service communication in supporting families. Despite structural changes in accreditation processes, maintaining a whole-system approach remains essential to avoid fragmentation, duplication, and inconsistent information.
- To achieve this there is a need for continued investment in, and expansion of, UNICEF UK BFI training across all services that support families. Participants described BFI as providing a shared framework that reduced conflicting or outdated information; without it, support was perceived as more likely to become variable, inconsistent, and influenced by individual staff beliefs or knowledge.

Develop a more experiential, practice-oriented and flexible approach to BFI training

- While BFI training was widely valued for building knowledge and confidence, the findings highlight variability in how training is experienced, retained, and translated into practice. These insights suggest that training (for healthcare professionals and students) should incorporate more experiential and practice-based learning, including observation, shadowing, and case-based discussion, which were identified as key to consolidating skills and confidence.
- In addition, training delivery should be more flexible and accessible to accommodate workforce pressures, for example through shorter, modular or blended formats, while still preserving opportunities for interaction and reflection. Ongoing refresher training should be tailored to local needs and informed by audit findings, clinical incidents, and emerging gaps in practice, rather than delivered as standardised updates.

Develop a more responsive and inclusive approach to BFI training

- The findings also indicate the need to expand training content to better reflect the complexity of infant feeding support in practice. This includes greater focus on areas such as sustained breastfeeding, mixed feeding, neonatal care, and the use of clinical judgement alongside guidelines. Furthermore, training should more explicitly address inequalities and inclusivity, including supporting families

with diverse cultural backgrounds, socioeconomic deprivation, language needs, neurodiversity, disability, and LGBTQ+ identities.

- Finally, creating space for reflective practice within training and/or supervision may help address variability in staff experiences, attitudes and confidence, supporting deeper engagement with the principles underpinning BFI, foster staff wellbeing, and promoting more consistent, person-centred care.

Use audit and data processes as drivers of improvement rather than compliance

- Although audits were recognised as important for maintaining standards, they were also experienced as time-consuming and, at times, burdensome. However, when used constructively, audit findings supported reflection, informed training, and drove quality improvement.
- Services should streamline audit processes where possible and emphasise their role in supporting staff development and service enhancement, rather than as purely evaluative or compliance-focused exercises. Examples of good practice in the use of audit data, including where this has worked well and the implications of this, could be showcased via UNICEF, such as during their yearly conference, or during the training.

Strengthen equitable, inclusive, and culturally responsive care

- Participants highlighted significant challenges in addressing inequalities, including language barriers, cultural differences, and barriers to accessing services. While BFI promotes equitable care, its implementation requires adaptation to meet diverse needs. This includes culturally appropriate resources, improved access to interpretation, proactive outreach to underserved groups, and greater attention to inclusivity within service design.

Extend support beyond early postnatal care to sustain infant feeding practices

- Gaps were identified in longer-term support, particularly beyond the immediate postnatal period. Strengthening continuity of support across the infant feeding journey, including later months, may improve sustained breastfeeding and overall outcomes.

Engage with wider sociocultural influences, including social media and public perceptions

- Infant feeding decisions were strongly shaped by broader sociocultural factors, including social media, community norms, and marketing influences. Participants described both the challenges and opportunities associated with these influences. More proactive engagement with digital platforms and public messaging to provide accessible, evidence-based information and counter misinformation are needed.

Reinforce relationship-centred care as central to BFI implementation

- Across the findings, effective infant feeding support was closely linked to continuity of carer and the quality of relationships between professionals and families. This aligns with wider maternity evidence demonstrating the benefits of midwife-led continuity of care for maternal and infant outcomes, and national maternity recommendations promoting continuity and personalised care.

- Time pressures and service demands were identified as barriers to this relational work. Ensuring that services are structured to allow meaningful interactions, continuity, and personalised support is essential to fully realise the intent of the BFI standards.

Modernise and diversify antenatal infant feeding education

- Further work to consider more flexible and accessible formats for antenatal education, including a combination of in-person, online, and on-demand resources, to improve attendance and engagement.
- Antenatal education content should be regularly updated to reflect contemporary feeding practices and address misinformation circulating on social media. Consideration of targeted antenatal education for parents of premature infants, and who are unable to access standard provision is also needed.

Provide balanced and individualised information on antenatal breastmilk expression

- While not a BFI standard, due to its use in practice, clear, evidence-informed guidance should be developed regarding antenatal breastmilk expression to ensure women are supported to make informed choices without creating unnecessary anxiety or pressure. Discussions should acknowledge both the potential benefits and emotional challenges associated with the practice.

Enhance education and support around mixed feeding

- Further guidance and support (as well as associated audit tools) are needed to support mixed feeding. Parents should also be supported to understand how introducing formula may affect breastfeeding, while ensuring women who choose formula feeding feel respected and supported.

Strengthen the involvement of partners and families in infant feeding support

- Services should actively encourage partners, grandparents, siblings, and wider support networks to participate in antenatal and postnatal infant feeding education and support opportunities. Family-inclusive approaches should be embedded within routine care pathways to enhance shared understanding and support for infant feeding and parent–infant relationships. This could also involve dedicated resources such as tailored information, digital tools, and partner-specific documentation.

Strengthen the communication of relationship-building messages

- Professionals should be better supported to deliver information about close and loving parent–infant relationships in clear, practical, and accessible ways delivered throughout the perinatal pathways that parents can relate to and apply in everyday interactions. This could include interactive, strengths-based approaches that help parents recognise and build confidence in responsive caregiving behaviours, including responding to fetal movements, recognising infant cues, and engaging in sensitive interactions with their baby.
- Services should review (i.e., through audit materials) how information about close and loving relationships is communicated and received by families, including exploring why some parents may not engage with or recall this information during audits and feedback processes.

Recommendations for the BFI programme

- **Continue to strengthen and provide development for the leadership and Guardian role** recognising that strong leadership, visibility and governance are critical enablers to help them champion BFI strategically and secure resources.
- **Work with organisations and services to support workforce planning for Infant Feeding Leads/Teams** recognising that resource pressures, lack of protected time and unrealistic expectations, risks making implementation dependent on individual commitment rather than sustainable systems.
- **Review training to include more practical and experiential learning** to develop staff confidence and competence in providing infant feeding and relational care.
- **Review resources to respond to the digital landscape to support staff** to provide evidence-based information and to counter misinformation.
- **Develop clearer evidence-based guidance and communication on supplementation, mixed feeding, formula feeding and responsive bottle feeding** to strengthen staff confidence, while maintaining strong protection and support for breastfeeding.

Parent case studies

Interviews were conducted by two researchers (NC, LH) and took place between March and December 2025. Parent interviews ranged from 24 to 62 minutes (mean 45 minutes). Surveys were open at all four sites from when sites joined the study in March/April 2025 until December 2025.

Across the four sites, interviews were conducted with 35 mothers, and 180 mothers completed an online survey. For the interviews, mothers' ages ranged from 19 to 39 years with a mean age of 30 years: more than half of the mothers (55%) were under 30 and 28.5% were aged under 25 years. Mothers responding to the survey were typically older, with no respondents aged 20 years or under, around 7% aged 21-25 years, around 6% aged 41-45 years, and most (41.1%) aged 31–35 years.

In both the interviews and surveys, around 86% of mothers were White British, reflecting the demographic make-up of the sites. One site was in Northern Ireland[232] where 97% of the population is White British, and one site was in a region of Scotland[233] where 94% of population is White British. There were two sites in England[234], one where 88% of the population is White British and one which comprised two areas with 86% and 74% white British populations. See Table 11 below and table in Appendix 7.

Area deprivation measures are calculated differently across the devolved UK nations and so quintiles in each country are not directly comparable, thus these are reported separately. Across the two English sites, 39% of participants were in IMD quintiles 1 or 2 (where 1 is most deprived and 5 the least deprived IMD area). At the Scottish site,

[232] Northern Ireland 2022 Census Data
[233] Scotland 2022 Census Data
[234] Ethnic group, England and Wales: Census 2021

44% of participants were in SIMD areas 1 or 2 (where 1 is most deprived and 5 the least deprived SIMD area). At the Site 3 site, 25% of participants were in NIMD2017 ranks 1-356 out of 890, 1 being most deprived See table in Appendix 7.

Most mothers interviewed were married or living with a partner (91.4%). Around 43% of interviews were with first-time mothers, with more (57.2%) of mothers responding to the survey having one child. Around 40% of interviews took place when the mothers' youngest baby was under 3 months of age, while 16.7% of survey respondents had a child under 3 months. Age of youngest child age ranged from 1 week to 18 months in interviews, and 0–3 months to 18–24 months categories for survey respondents. Around 69% of mothers were breastfeeding at the time of interview. Most survey respondents (92.2%) had ever breastfed, with 74.4% breastfeeding at time of the survey. Four (11%) interview participants had had neonatal unit experience with their most recent child. Note that different questions were asked in interviews and surveys in relation to infant feeding, relationship status, neonatal experience. See table in Appendix 7.

Interviews included mothers with varying specific support needs, including those who were neurodivergent, were living with a chronic health condition, had experienced perinatal medical/health issues for mother or infant, were in a same-sex relationship and/or inducing lactation, had specific cultural and/or religious needs, whose most recent birth was twins, or were seeking asylum. Information on specific support needs was not collected in the survey. See tables below and in Appendix 7.

Table 11: *Selected participant characteristics*

Parent characteristics	**Interviews (n=35)**	**Survey (n=180)**
Ethnicity		
White British	30 (85.7)	156 (86.7%)
White other	1 (2.9%)	0 (0%)
Asian/British Asian	2 (5.7%)	18 (10%)
Black British/ Black African	1 (2.9%)	1 (0.56%)
Mixed ethnicity	0 (0.0%)	1 (0.56%)
Other ethnicity	1 (2.9%)	2 (1.1%)
Did not answer	0 (0.0%)	2 (1.1%)
Age (years)		
16-20	4 (11.4%)	0 (0%)
21-25	6 (17.1%)	13 (7.2%)
26-30	9 (25.7%)	49 (27.2)
31-35	9 (25.7%)	74 (41.1%)
36-40	7 (20.0%)	30 (16.7%)
41-45	0 (0.0%)	10 (5.6%)
Did not answer	0 (0.0%)	2 (1.1%)
Specific support needs†	16 (45.7%)	--
Neonatal unit experience (most recent baby)	4 (11.4%)	--

Full participant characteristics tables are shown in Appendix 7.

†Specific support needs not detailed to protect participant anonymity. They include participants who were neurodivergent, were living with a chronic health condition, had experienced perinatal medical/health issues for mother or infant, were in a same-sex relationship and/or inducing lactation; had specific cultural and/or religious needs; whose most recent birth was twins; were seeking asylum. Note some participants had two or more specific support needs.

Mothers' journeys through BFI-accredited care were shaped by a combination of personal circumstances, social influences, professional support and the quality of relationships with healthcare staff. The findings are therefore presented across seven related themes that capture mothers' experiences of care throughout the perinatal period. The themes are as follows:

- '***Sociocultural influences and challenges around infant feeding***' which describes the wider social and cultural context of infant feeding;
- '***Making sense of infant feeding decisions***' which explores how mothers navigated feeding choices;
- '***Accessing, interpreting and applying infant feeding information***' which examines experiences of informational support;
- '***Access, inclusion and quality in infant feeding support***' which focuses on mothers' experiences of receiving support, including examples of effective and poor care;
- '***Specific issues***' which addresses particular infant-feeding concerns and situations;
- '***Relational care***' which explores interpersonal aspects of care and their impact on maternal and family wellbeing;
- '***Close and loving relationships***' which examines experiences relating to this BFI standard.

Sociocultural influences and challenges around infant feeding

This theme reflects how infant feeding practices are strongly shaped by sociocultural influences and mothers' day-to-day environments and pressures. It includes the subthemes of 'influence of peer and family norms', 'practical support from family', 'housing insecurity and social isolation', 'navigating personal circumstances and social norms, and the 'mothering in the digital landscape'. Figure 16 illustrates the interconnected personal, social, cultural and structural factors that can shape infant-feeding experiences and journeys.

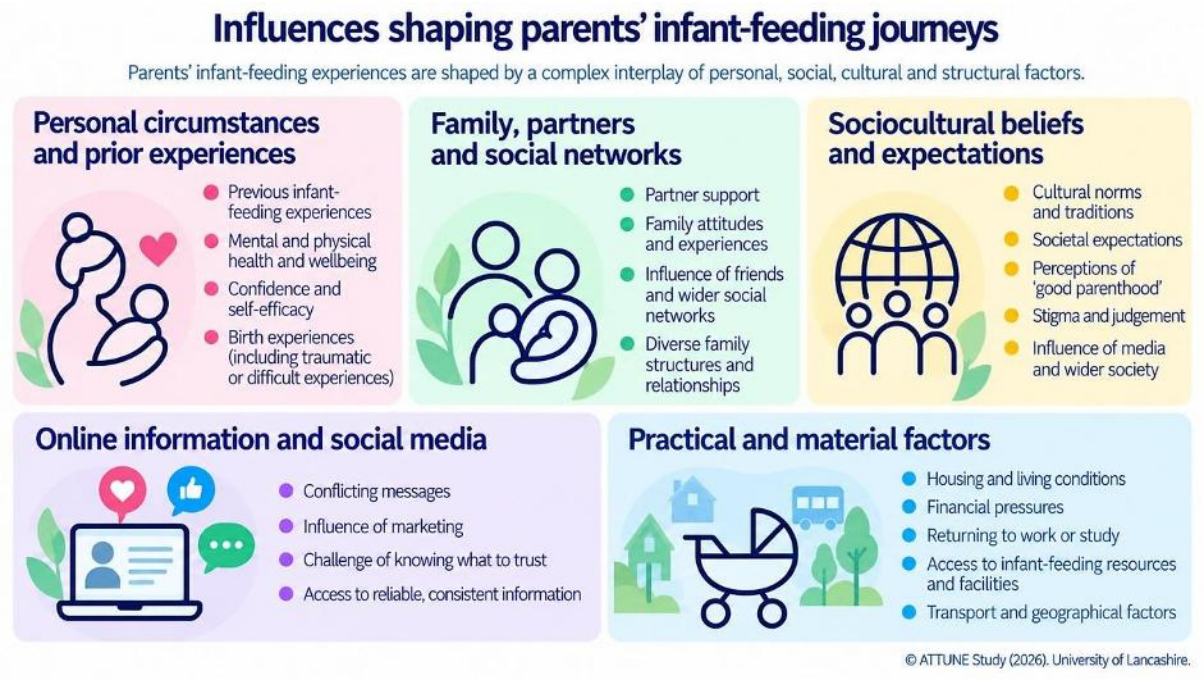


Figure 16: Factors that can influence parent's infant feeding journey

Influence of peer and family norms

For some mothers, breastfeeding was framed as a natural or expected choice because it had been modelled by their own mothers. In these accounts, breastfeeding required little deliberation: '*from the beginning, I wanted to because my mum had breastfed us and it was just the influence of that' (*Site 3 Mother4) and was positioned as part of family culture rather than primarily motivated by health promotion messages. Grandmothers could be a good source of encouragement, reassurance and practical support, particularly when they had prior experience of breastfeeding: *'my mother-in-law did (breastfeed) so she knew what to do. So that was good' (*Site 2 Mother8). When mothers received encouragement, emotional backing, and pride from their own mothers, this helped reinforce their feeding choices:

> Well, my mum, she bottle fed all of us. I think she tried breastfeeding with the first and it just didn't really work. So, you know, she was really supportive of obviously me trying it and that it was working for me even though I was finding it hard with my first in the very early days. (Site 3 Mother8)

Another mother described receiving advice from her parents about introducing solid foods, which she had learnt was outdated advice through attending groups:

> At [group session], we had a discussion this week on weaning. So how to do the weaning and when to start the weaning. But for lots of our parents, they were like 'oh you could do it at four months'. But actually, that's not the case anymore. (Site 1 Mother2)

Friends and peers also played an important role in shaping mothers' expectations of breastfeeding. Exposure to extended breastfeeding challenged assumptions about what was normal or achievable, and could influence intentions around duration:

> I have a friend who had a baby, maybe about a year before my son was born and she's still feeding her son, and he will probably be 18 months and that blew my mind. But yeah, I definitely would plan to keep feeding as long as I can. (Site 2 Mother7)

However, many mothers spoke about hearing from friends and work colleagues about how challenging breastfeeding can be: *'they were all telling me, the pregnancy, the delivery, it's not a big deal. Come to the breastfeeding journey, then you will know it's very hard'* (Site 3 Mother6). These messages sometimes deterred mothers initially from thinking about breastfeeding, but they also created a flexible, low-pressure mindset that if they tried breastfeeding it would be okay if it didn't go to plan:

> I think because a lot of people that I work with, it's a lot of mums and they were just saying it's really hard. So, it kind of put me off. I want an easy life, not a hard life... But then obviously people give you pros and cons on both bottle feeding and breastfeeding and then I actually thought, I will try breastfeeding and if it does go OK, I'll carry on. I just didn't want any pressure on myself. (Site 4 Mother1)

Despite some mothers having supportive family, others experienced scrutiny and pressure. Where family members had little experience of breastfeeding, mothers perceived this to fuel questions: *'you feed them on demand and they're like, 'oh, you've just already fed them. Why do you need to feed them again?''* (Site 3 Mother8). These interactions contributed to a perception that breastfeeding was viewed as unusual or even *'quite controversial'* (Site 4 Mother6). Some encountered repeated questioning about whether their baby was receiving enough milk and pressure to introduce bottles, often framed as offering help:

> A lot of my family, we're very 'you don't need to breastfeed for a long time. You should get them on a bottle, even with expressed milk'. There was a lot of pressure to introduce bottles to him. And I think it was more so because my family or my husband's family wanted to take him. More like, 'we'll take the baby for you. So, get him on a bottle so you can rest'. (Site 2 Mother7)

For one mother, her decision for purchasing a specific brand of infant formula was based on her mother's recommendations: '*my mum said, 'oh, you and your brother were on that* [name of infant formula]*''* (Site 1 Mother2).

Practical support from family

Family support played a significant role in mothers' infant feeding experiences and took multiple forms, including encouragement, practical help, and shared caregiving. Sources of support included partners, grandmothers, and wider family networks. Partners were frequently described as providing practical, hands-on support such as caring for older children: '*like dishing out this food to my other little one and making sure he's not throwing it all over the floor' (*Site 2 Mother8), taking responsibility for household tasks. Mothers reported that their sisters or parents provided important practical and emotional support, particularly for mothers recovering from birth and

caring for older children. One described this support as collective, with multiple family members contributing to care:

> My dad works from home, and my mum took a bit of time off… My brothers they're still at school, so they're coming home at half three. So, all hands are on deck. And then my granny and granddad… I'm definitely happy with all the support that I've got (Site 3 Mother7).

When extended family lived nearby, this enabled regular visits and ongoing assistance: *'people have been coming most days to help lift him [older child], because obviously there's getting him in the pram and the car and the high chair'* (Site 2 Mother8), while another mother described how her mother-in-law had *'travelled from India to take care **of** me and the baby'* (Site 3 Mother6).

For two younger mothers (aged 19 and 20), living with parents and extended family provided intensive, everyday support that reduced isolation and supported mothers to feel more confident with feeding. Both mothers reflected that living with family meant they felt well supported and did not feel the need to access additional professional services:

> I think maybe because I'm living at home with my family because I'm 19, I think I have a lot of support here. If I was in my own house, I think it would be different and maybe I would opt for more help because I think you're maybe secluded more into your own home. (Site 3 Mother7)

> They don't really have to do much because at that time I was living with my mum, so she helped me. (Site 2 Mother3)

Experiential knowledge within the wider family was valued. One mother explained that her sister had shown her how to prepare bottles when she had had her own children, highlighting informal learning through family support.

> I've got a niece and a nephew, and I helped my sister when she had them… She roughly showed me how to make a bottle. (Site 2 Mother2)

Despite the positive influence of family members, their support did not always result in successful breastfeeding. One first-time mother described how her mother-in-law tried to help with latching and positioning, but despite this support, feeding challenges persisted:

> I have my mother-in-law here, so she had three grandkids before, so she was helping. She was just giving her best to make him latch to my breast and take the breastmilk, but we just couldn't do it. It's just that the positioning and the certain things that I didn't know. It's my first baby, so I really didn't know. (Site 3 Mother6)

Housing insecurity and social isolation

While many mothers described drawing on family and friends for support, others experienced raising children in conditions such as housing insecurity and social

isolation. One mother, living in temporary accommodation while seeking asylum, described how, while '*the midwife and the health visitor came…[and] the hotel manager also used to come and visit*' (Site 4 Mother 3), she missed support from her own social networks:

> I really appreciate everything that they are doing, but as a woman, who has given birth whereby I may need friends to come and visit me or assist me or something like that, but I didn't get all this (Site 4 Mother 3)

Living in accommodation without cooking facilities constrained this mother's ability to care for herself while also responding to her baby's feeding needs. She described prioritising breastfeeding despite regularly missing hot meals:

> I'm in a hotel whereby I can't cook for myself… She'll start crying, so I have to put the food down. By the time I finish here, the food has already been cold, which there is no microwave here too. (Site 4 Mother3)

Navigating personal circumstances and social norms

Mothers' infant feeding practices were influenced by their changing circumstances and their endeavours to negotiate breastfeeding in public spaces. Some mothers described changes in feeding practices over time, shaped by changes in personal circumstances such as returning to work or experiencing bereavement. One mother reflected on how these factors influenced her decision to change to mixed feeding:

> I went back to work quite early around the six- or seven-month mark. You know, I think if I had to still been feeding them and combi feeding, I probably would have definitely finished by that point anyway. And as I talked about as well, like that change in personal circumstances with losing my dad just meant that that was a big deciding factor in actually just switching to full combi feeding. (Site 2 Mother5)

For some mothers, breastfeeding outside the home presented challenges, particularly when feeding in public settings. Some mothers planned feeds in advance or sought private spaces to maintain personal comfort and confidence. One mother described how she adapted to breastfeeding when outside the home:

> Maybe more so just to do with my confidence, but if I was out somewhere, I would maybe not try to have planned the feeds around it, but I maybe before I would have went in for lunch or coffee somewhere I would have maybe fed them in the car beforehand. So, then I was OK, they've been fed, you know, then I don't have to worry… And if I was at somebody's house, I maybe would have asked to went to a different room, but that was more so just for myself and maybe because it was difficult for their latch to go on properly so then I felt like I had to have more of me on show. (Site 3 Mother8)

Mothering in the digital landscape

Social media was frequently used for both seeking information and emotional support. Mothers accessed Facebook groups and content on Instagram, TikTok, and YouTube.

Social media was valued for its ease of access, especially when '*sitting down feeding, the easiest thing is to look at your phone, isn't it?'* (Site 1 Mother6). It was noted that feeding content appeared regardless of active searching, perhaps shaped by previous or related online activity:

> I think because your phone listens to you, whenever they know that you're pregnant, then every video that comes up is all about labour and everything. And now because obviously I've had the child, then you start to notice that everything's all about a newborn baby. (Site 3 Mother8)

Visual content was valued by mothers who described themselves as '*visual learners*': '*videos and stuff like that did help me figure some things out and different positions to hold baby'* (Site 4 Mother7). Pictures were valued for help with positioning and attachment, and short, engaging videos were seen as especially helpful for specific feeding challenges:

> On TikTok… there was an infant feeding midwife who did quick videos and it was all about the different teats (Site 4 Mother5).

Some mothers reported using smartphone apps for breastfeeding guidance and tracking. Information-based apps were valued, especially those developed by professionals: *'LactApp is an app built by an IBCLC counsellor'*, alongside commercial apps such as *'Bounty App… and Emma's Diary'* (Site 4 Mother2). One mother said she had used tracking apps with her first baby but chose not to for her second baby, because her partner found them burdensome. This mother reflected on how her midwives helped with this transition through providing simple reassurance:

> So last time I used an app to track all my feeds and wet nappies and dirty nappies. And I loved it because I could see at the end of six months, I could see how many weeks' worth I had breastfed for over the course… I thought it was so fascinating… This time round, my husband said 'can you not use the app? Because I found it really frustrating', and so I didn't. And then every time the health visitor and or the midwife came postpartum, she would ask me how many wet and dirty nappies are you having? And I was like, I have no idea, and then one of the midwives said to me, as long as he's having one wet nappy, every time you feed and maybe a dirty nappy then that's good and it shows that he's eating enough. And so that was really helpful because now I don't need to track it, but I know every time we do a feed, we have to change the nappy. (Site 2 Mother8)

Some mothers followed influencers and content with *'a lot of positivity around breastfeeding. Lots of helpful tips like the breastfeeding cookies to get your supply up' (*Site 2 Mother8) or information about breast milk expression. Others followed social media influencers documenting pregnancy and parenting as a way of learning through others' experiences:

> I've always watched family channels and pregnancy videos and stuff, but a lot of my information I got from there… I think probably pregnancy journeys as well… Mostly YouTube, but they do have like Instagrams as well. I think majority

> of my followings are actually channels that just post about what they do in the day. (Site 2 Mother3)

0Some described using social media to resolve their doubts in the face of contradictory messages from family:

> [Channel] on Instagram was great as well. It kept me breastfeeding, which I wanted to do. I know bottle feeding is fine, but I really wanted to breastfeed. It really helped my confidence when social media/ relatives etc gave conflicting advice (Site 2, Survey data)

For one same-sex couple, social media enabled access to relatable experiences and informed feeding choices, namely induced lactation, not initially perceived as supported through the NHS:

> Mostly TikTok, to be honest. A lot of people on there were sort of doing the same sort of thing so… I saw a couple who live near us. They gave me the inspiration, the non-pregnant one induced lactation… Obviously when I did get the chance to do it, I was really grateful for it, and I couldn't believe that it [support to induce lactation] was something the NHS did offer. (Site 1 Mothers7&8)

Many mothers described critically evaluating social media content or actively avoiding information from influencers that they perceived as unrealistic: '*People are like, 'oh, I've got gallons of breast milk. Follow me and I'll tell you how I do it'. And it's like, no!'* (Site 1 Mother5). Some mothers noted how they avoided content that negatively affected their confidence:

> On TikTok … People just saying this is how much I pump in this many hours… Obviously that can you put you down if you're like, oh, I'm only getting this and they're getting that… [it makes me feel] like I'm not doing enough sometimes, yeah, so I try not watch them. (Site 2 Mother4)

While some felt that social media could *'helps lots of women that can't access to this kind of help directly in the hospital'* (Site 4 Mother2), for others, professional credibility was prioritised over peer- or influencer content based on personal experience: *'it helps when it's content created from an expert because lots of mums say things like based on experience, but not necessarily it's the truth for all' (*Site 4 Mother2). Trust was commonly assessed through visible qualifications and professional background such as being *'a published author' (*Site 2 Mother5). Some mothers were also aware of the commercial nature of social media content and expressed caution around professionals promoting services online, such as from '*lactation consultants self-promoting… it seems like they're kind of preying on the people who are desperate to breastfeed'* (Site 1 Mother4). One mother described how she decided which social media accounts to follow, to ensure content came from trustworthy sources:

> I just made sure I was following decent accounts that were like either lactation consultants, not too much of mummy influencers and certainly not celebrities that that think that they're professionals. (Site 4 Mother8)

There was sometimes reluctance to disclose social media use with HCPs. Despite widespread online searching, one mother explained that she *'kept it [social media use] quite separate because I feel like the midwives and that only ever really recommend NHS sites'* (Site 4 Mother7). Some mothers also spoke of how they relied less from the internet when they felt adequately supported by healthcare services*: 'I've not needed it for baby [two] just because [support] has been excellent on the team' (*Site 1 Mother9)

Making sense of infant feeding decisions

Mothers described the varying influences that helped shape their initial and ongoing decisions around how they fed and cared for their babies. Their thoughts around initial decision-making are captured in the subtheme 'arriving at decisions', while ongoing refinement of decisions is described in 'evolving decisions over time'. 'Healthcare professional influence on decisions' describes how mothers experienced input from HCPs, and the role of marketing is addressed in the subtheme 'influence of marketing on decisions'.

Arriving at decisions

Most mothers interviewed had already made firm decisions antenatally about how they planned to feed their infants, with many demonstrating a strong commitment to breastfeeding or breast milk feeding. Across the participants, the decision to breastfeed was based on beliefs or messaging of *'breast is best'* (Site 3 Mother5), knowledge of the health benefits of breastfeeding (for mothers and infants), the convenience of breastfeeding and view that preparing bottles would constitute extra work – '*total laziness with the bottle'* (Site 3 Mother5) – or previous negative or positive experiences of breastfeeding: '*My kids were breastfeeding too, for like 2 years, each one*' (Site 4 Mother2). One mother spoke of how she had always intended to give colostrum and then infant formula as her '*first* [child] *just kind of put me off even attempting to breastfeed the second and the third* (Site 3 Mother2).

For others the decision was based on being breastfed themselves, or observing her siblings being breastfed, contributing to their perception of breastfeeding as the natural method of infant feeding. One participant acknowledged awareness of the benefits of breastfeeding yet described her desire for a *'nice connection'* with her baby that *'nobody else can have*' as *'a bit selfish'* (Site 4 Mother6). A further participant reported feeling initially unsure why she wanted to breastfeed, but came to value it through the experience, particularly for the sense of closeness with her baby and recognition from others of her achievement:

> I didn't know why I wanted to breastfeed, but then it was more like as time went on, I was like I'm breastfeeding because of the closeness and I just like the fact that people are saying, oh, you're still doing it all on your own, like seven months later. (Site 3 Mother4)

One 20-year-old mother referred to how she was initially less keen to breastfeed, attributed to being *'a bit younger'* and perceived breastfeeding as an *'odd kind of thing'* (Site 2 Mother3). Others demonstrated ambivalence. For example, some mothers *'wanted to breastfeed'* (Site 1 Mother1), while also being '*open-minded'* about the need

for infant formula, often due to hearing about *'other people's problems'* (Site 4 Mother6), not wanting to cause *'any pressure on myself'* (Site 4 Mother1), or previous infant feeding experiences. For another, her decision to use infant formula was based on a misaligned belief (based on observations of infants) of infant formula fed babies being '*fast learners and intelligent*' (Site 4 Mother3). For others, infant formula was never considered an option:

> For me, I just really didn't want to do formula, and I don't know why that was just a personal thing, but I was, if it didn't work out with breastfeeding, I was just going to pump and give it to him. (Site 3 Mother4)

A few mothers also spoke of how they had always intended to feed the baby via breast and bottle due to wanting *'baby bonding with Dad as well'* (Site 1 Mother1) or to try a different approach than previously, '*I will be breastfeeding though, but I decided this time to try formula for my baby'* (Site 4 Mother3).

Evolving decisions over time

Over time, mothers described developing confidence to filter opinions from other people and trust their own judgement, recognising that what works with one baby will not necessarily work for another:

> Everyone's going to tell you how they're doing things, and then you think, actually, and from [group name] that I go to on a Thursday, they say that everybody's different and you're actually like, oh, actually that makes sense now, because what might work for you and your baby doesn't necessarily mean that's going to work for us and what he's like (Site 1 Mother2).

Some planned to breastfeed as long as possible: *'I'd like to go until she's one*' (Site 1 Mother5) and others felt that the information and support and ongoing encouragement had led them to breastfeed for longer than initially planned. A mother of multiples stated:

> The challenge of trying to feed two. And I think it gave me the mental strength to go a little bit longer than I would have done. I think also I don't know, I feel like some of it's because you're aware of people putting so much effort into you and then you want to do well and just prove that you can. You can do well. So, like there was a little bit of that, and it's just my personality. But yeah, no, it kept me going for longer with the breastfeeding. (Site 2 Mother5)

Another mother who was initially mixed feeding described how the enjoyment she derived from breastfeeding, alongside knowledge of its health benefits, led her to transition to exclusive breastfeeding (Site 4, survey data). For several women, the decision to mixed feed was not an antenatal intention, but rather a consequence of complications that required alternative decisions to be made:

> I just wanted to breastfeed. But then with the haemorrhage, my milk came in late and he lost weight, so I had to mix feed (Site 2 Mother4)

One also reflected on how different her decision could have been had she not had sufficient support available to her:

> I do feel that was a moment where, had I not had people around me who I could go to, such as [name of breastfeeding supporter] and my mum and other people who were, and the health professional who kind of talked me down a little bit, I probably – and especially had it been my first baby – I think I would have gone, "OK clearly I'm starving the baby. I'm not making enough milk. I'll switch to formula". (Site 3 Mother5)

Healthcare professional influence on decisions

Some mothers reflected on a sensitive, nonjudgemental, infant feeding approach being provided within health services, in that while the '*information is more about breastfeeding, but it's respectful with bottle feeding'* (Site 4 Mother2). Others reflected on how there was no *'pressure'* to breastfeed, rather the professional was there to answer questions and *'fill in the gaps'* (Site 4 Mother6). Similarly, another mother who planned to feed her baby infant formula held a balanced view of the need to promote breastfeeding, as *'everybody deep down knows that is the best way*' while recognising that her decision to not breastfeed was a choice (Site 3 Mother2). Some parents considered that receiving information about the benefits of breastfeeding from healthcare professionals had not influenced their decision as they '*wanted to do it anyway'* (Site 1 Mother4). Whereas others spoke of occasions of HCPs (along with family members) changing their perspective about wanting to breastfeed: '*my mum and the midwife and my [HCP] all talk about how good it was'* (Site 2 Mother3). One mother reflected how information she received antenatally had given her the '*confidence*' to '*just try it [breastfeeding]*', leading to her *'actually doing some breast feeding now… which I was not planning to do*' (Site 1, local evaluation data). For a few mothers, it was an initial conversation with healthcare professionals, such as the midwife, telling them new information such as *'it's much more beneficial to the baby to have breast milk because obviously it can be tailored to the baby's needs and everything'* (Site 2 Mother6), that led them to undertake their own research to learn more:

> I just remember reading things about like antibody like transfer and like the health benefits for your baby with breastfeeding over bottle feeds. So that's why I chose it, really. (Site 3 Mother1)

While some mothers referred to limited conversations about feeding intentions antenatally, one considered that it is antenatally, rather than postpartum, when professionals have time to discuss infant feeding:

> When you're in hospital, it's a different experience because they are, not less available, but you know they've got a lot of patients. Obviously, while you're pregnant, they can give you all the time in the world at your appointment, but it's a different case when you're actually in hospital having the baby that is different. (Site 1 Mother6)

While enquiring about feeding intention antenatally is not part of the BFI standards, rather, the focus is on meaningful, individualised conversations, one mother suggested

that some HCPs may be reluctant to ask about feeding intentions, particularly breastfeeding, due to fear of negative reactions:

> Some of them look almost scared to ask if you're planning to breastfeed because they're scared of what reaction they're going to get from some people. (Site 4 Mother8)

While some mothers reported being supported in their decision to mixed feed by HCPs, other experiences were less positive due to differing views among HCPs about what mixed feeding comprises:

> Apparently, there's a lot of confusion when you mention to nurses that you're bottle and breastfeeding. They think combi feeding naturally means half formula, half breast. For us, it's not, it's all breast. But it's just we're choosing to use a bottle as well. (Site 1 Mother1)

Influence of marketing on decisions

Some mothers spoke of following influencers on social media and being encouraged to buy products that they recommended:

> The person's videos as well, you'll see like, oh, they put this product in their birth and bag, so maybe I'll buy it. And that's just kind of what I get. (Site 2 Mother3)

Some participants expressed scepticism about social media content: '*Some stuff that was coming up, you just think to yourself, you're like, that's definitely not true'* (Site 3 Mother7) and others noted how commercialised content was:

> I did feel like I was slightly targeted with courses promising a totally pain-free experience from the off, and that if you were, if you're having any kind of problems, it's you, you're doing something wrong, we can fix you. (Site 3 Mother5)

Through following influencers or online scrolling, participants were exposed to wider commercial advertising, including products such as *'baby pouches'* (Site 2 Mothers3), or '*breast pumps'* (Site 3 Mother3). Mothers also reported frequent exposure to infant formula advertising on television and online platforms, including adverts for first milk, follow-on milk, and baby food: '*I always see advertisements follow on milk and then they come up on YouTube' (*Site 3 Mother3). Responses to infant formula advertising varied and some mothers felt reassured by brand familiarity. A mother new to the UK who had breastfed her older children who were born in her country of origin, described how infant formula advertising confirmed her feeding choices for her fourth child:

> I have seen Cow & Gate, SMA advert and baby food advert and when I see it, I know that is the correct thing that I am using. (Site 4 Mother3)

However, others expressed frustration with the messaging:

> I hate the adverts for the formula because they don't even need follow-on formula and it just leaves people think I need to spend all this money on this follow-on formula. But it's just like, no, you just need milk. (Site 3 Mother3)

One spoke of differences in messaging between the infant food companies, including contradictory evidence about introducing solid foods to that provided by the NHS (i.e., suitable from 4 months), complaints about the pricing differences in infant formula, as well as confusion over which infant formula are 'best'. Others described being glad they sought clarification from healthcare professionals to help interpret manufacturer recommendations, which may otherwise have led to challenges, such as overfeeding:

> Because also there's a little bit of information on the side of the packet on the side of the box that tells you the weight of the baby and it's all approximate, but like the weight of the baby and the amount that you should be having. And then recently I went to the feeding team because he was having too much and she said 'no, no, no - you do not stick to that, because he might be going for a growth spurt', but again, that was quite helpful just to speak to somebody because at one point we thought, 'oh, God, now we're overfeeding him because he's just guzzling all the bottles', but actually that information on the side of the box is a little bit irrelevant. (Site 1 Mother2)

Accessing, interpreting and applying infant feeding information

In this theme, the provision and impact of infant feeding information is explored. The subtheme 'breadth and depth of information provided' addresses this in relation to breastfeeding, infant formula, nighttime feeding, and solid foods. The subtheme 'a realistic picture of breastfeeding?' explores the rhetoric–reality gap perceived by some mothers in relation to the information they were given, while 'information tailored to circumstances' addresses the role of personalised information. 'Antenatal education classes' examines information provision in this setting. The subtheme 'information resources' focuses on additional sources of information provided by HCPs, while 'accounting for information gaps' and 'mothers' own research' explore mothers' experiences of not receiving sufficient information from HCPs and their efforts to source information for themselves.

Breadth and depth of information provided

While experiences were generally positive, mothers described considerable variation in both the breadth and depth of **infant feeding information** provided. Many mothers recalled receiving detailed information across the perinatal period about the benefits of breastfeeding, including infant and maternal health, bonding and immune protection:

> The nutrients provided, how it was good for the mother and how the colostrum provided the antibodies. How it was good for a premature baby even to get that bit stronger and gain weight. I suppose there's more fat in the in the breast milk. And good for the mother I think mentally and physically, and they had said about the mummy getting into shape quicker after breastfeeding and stuff like that. And obviously the bond. (Site 3 Mother2)

In addition to information about the benefits of breastfeeding, some mothers described receiving detailed explanations about **infant feeding behaviour**. This included guidance on feeding frequency, digestion, crying, and expectations around milk supply. Some mothers felt that they had received enough information about infant feeding from healthcare professionals during the perinatal period. In some cases, HCP expertise was seen as 'scientific': '*another thing that I had no idea that there's such a science about burping a baby*' (Site 2 mother6). Sometimes this information contrasted with advice from family members, and considered to be helpful in resolving doubts:

> I'm really glad, like even though there are many people, like I have elder people in my house, and you know, I have my mum and everybody who obviously had babies and things. But after all that, I just came here and these scientific [explanations of infant behaviour], I don't know how to say, you know, the science behind everything. That gave me more clarity and I'm so happy. (Site 3 mother6)

Many participants were satisfied with the information they received about infant feeding: *'I can't really fault them with the information and things that I got'* (Site 1 Mother6), with reassurance that further information would be given if needed: '*even if you only receive a leaflet, the leaflets are so complete. The videos, the information that they give you, are complete'* (Site 4 Mother2), and appropriate within the context of their busy lives or previous parenting experience:

> I think I was happy with it at the time. Obviously, I've got two other kids, so it's busy, and I didn't want to put pressure on myself because I knew I'd get support in the hospital. I knew there'd be stuff after. It was the right level for me for what I wanted at the time. (Site 1 Mother5)

Several mothers felt there was limited information given about infant formula, mixed feeding, milk expression, or alternative feeding methods. There was a perception that HCPs were not '*allowed'* to '*promote'* these options. One mother described learning about infant feeding at an antenatal class:

> They weren't particularly forthcoming about bottle feeding. We kind of got the feeling that midwives weren't really allowed to promote it, so they weren't really. They sort of told us a little bit on how to prepare a bottle, but nothing else about sort of hold how to hold your baby or how to position them best and about winding them and things. (Site 4 Mother7)

One mother described not being aware of having to increase the amount of infant formula her baby received, which led to a delay in her baby putting their birth weight back on.

> I think that was why he wasn't putting on his birth weight. We didn't know we were just going with what we were doing in the hospital, not realising that actually you should up it that quickly - the amount you're giving. (Site 1 Mother2)

A few women expressed a desire for further information about breastfeeding cessation, with one mother reporting:

> Yeah, my plan was to get to six months and then once I got to six months, it's a year now, and now it's like I'm probably going to end up going for longer than a year. But I think that's more like, I don't know how to stop. So, it's like, I don't know what to do. (Site 3 Mother 4)

Mothers who were concerned about feeding frequency or their milk supply described postnatal information about **nighttime feeding** as reassuring and informative: '*they were good about explaining the importance of continuing feeding overnight*' (Site 3 Mother3). One mother described how, when her second child was in the neonatal unit she had been told by the IFT that '*milk supply is the highest between 12:00 and 4:00 AM*' (Site 1, mother9) which had encouraged her to express breast milk at nighttime. She highlighted the importance of hearing information about nighttime breastfeeding repeated with her subsequent baby:

> But I forgot with this baby. And when I went to the one of the weigh-in checks I was like, yeah, he seems to be cluster feeding a lot at nighttime. And then she mentioned it and I was like, oh, yeah, my God, I forgot about that. But I think maybe if you don't ask you, you won't get told. (Site 1, mother9)

Mothers reported receiving information about safe sleep and messaging around SIDS prevention:

> The [HCP] had told me the risk of SIDS… Just make sure he's on his back, no hats, put him at the bottom of the cot, make sure the blankets are tucked under and nothing in the cot with him. (Site 2 Mother4)

Several mothers described variations in how bed sharing was discussed. Some had received guidance from HCPs about safety considerations if bedsharing, such as having '*not too much blankets and stuff around*' (Site 1 Mother 10), while others perceived guidance from HCPs as discouraging this practice, with advice from peers seen as more pragmatic:

> They [health visitors] were making you feel you really shouldn't be doing this even if you were thinking about it… The breastfeeding group would have been a bit more 'OK, if you do decide to bed share, this is what you should do', because then some of the mums at the breastfeeding group were saying, 'Oh well, I actually do this'. (Site 3 Mother8)

Postnatal information about **introducing solid foods** was generally described as adequate and appropriately timed, with health visitors providing standard guidance and signposting to trusted resources:

> She [health visitor] just said try sort of one thing at a time over a course of a couple of days, and if he doesn't eat it the first week, he isn't enjoying it, come back to it and reintroduce it again. She said I'll take a good few tries of introducing foods and textures. She suggested going by the NHS guidance of finger food that he can grasp and try himself. And she did say it's more just for fun, until he turns one. (Site 2 Mother7)

A realistic representation of breastfeeding?

Many mothers felt that antenatal and early postnatal information about breastfeeding presented an overly optimistic or simplified picture. Some described how they felt they had unrealistic expectations prior to having a child: '*You go into breastfeeding a little bit like well, I've got boobs, anyone can do it, it's easy, that's what they're there for'* (Site 4 Mother4). While the benefits were clearly communicated, mothers described a lack of preparation for the physical, emotional, and practical challenges of breastfeeding: *'It was here's the benefits and here's why you should do it. But the harder side of it wasn't* given' (Site 3 Mother1). Several mothers felt unprepared for common breastfeeding difficulties, including pain, latch issues, mastitis, engorgement, tongue-tie, and sleepy babies:

> Before you have the baby, it sounds like they sugar coat it a bit, like it's really good for bonding. It's really good for this. It's really good for that. And they have all these benefits. However, they should say literally just stay in your home for four months in a good way, just like don't have any pressure to go out or anything. And it's going to be painful. It's going to be tiring. Babies genuinely don't sleep if they're breastfed and this is for like a long time, not just for a week postpartum. (Site 4 Mother1)

Although many mothers wanted information about the realities of breastfeeding, some reflected on the importance of getting the balance right to not deter mothers from trying to breastfeed:

> I think actually sometimes less information is better until you're going to experience it, because say you don't experience it and actually everything happens really smoothly… But I don't think on any of the leaflets or any of the information given there's anywhere where it's written, don't worry if you have poor latch or poor supply or your baby is not putting on weight despite breastfeeding. Then we can help you or we can just explain what the reason is. (Site 1 Mother9)

The following mother described how, as well as '*loads of leaflets and everything*' (Site 3 mother4), her health visitor provided opportunities for practical learning:

> She also brought in a baby doll to show me, like, how I would latch, that was later when I was in the third trimester. So, it gave me a better idea than just talking through it. The doll just kind of helped me get like a better, like a full understanding of it, because it was an actual like the weight of a baby, and the head was as floppy as a baby's head would be. I would say if you wanted more people to breastfeed, that would be the way to do it, because it's very it's scary at first, holding this infant and you're the one in charge of feeding them. But with the doll, just makes it all feel more real. So, it's like you're practising, but it's not with a real baby, so it's OK. (Site 3 Mother4).

Information tailored to circumstances

Where information was adapted to mothers' preferences, this was experienced positively. One mother highlighted the importance of clear and accessible communication, including proactive consideration of language needs:

> Yeah, they have interpreters. I know because they asked me at the beginning if I need interpreters. I decided to speak in English rather than Spanish, because I want to. I like to practice and I always told her like speak slow. (Site 4 Mother2)

One mother, who was 19 at the time of her interview, described how the information she received from her HCP was less formal, more relational and highly tailored to her needs, particularly during periods of feeling overwhelmed:

> I think initially, did it start off as phone call? She lives half an hour away, so she comes out. I think it's quite relaxed, which is really nice, it's not as formal. It feels like you're just having a conversation with a friend about something. So, I think it's good because, say you're getting bored of a subject or she kind of tailors it to what you know and your needs, which is good… I definitely asked her questions. I think it's so overwhelming as well, whenever the pregnancy stage, because I feel like you're getting loads of this information, but I feel like you can't really do anything with it until you experience it. But I would definitely say that she helped a lot she was very supportive and she was very understanding. (Site 3 Mother7)

However, not all mothers with specific needs felt information provision had been suitably adapted. Some who were under consultant-led or specialist care, felt that feeding discussions were deprioritised, with some attributing this to their own concerns: *'I was less worried about the feeding, I think I was more worried about things like how they were developing'* (Site 2 Mother5), while others described appointments just being focused on maternal or fetal health:

> I had a different type of care because obviously I was seen by the diabetes consultant. So, I don't know if it's specific to that group of midwives that I don't know. I'd say prior to having the baby it was practically non-existent until right up until the point of you having the baby. (Site 1 Mother4)

Antenatal education classes

Most mothers enjoyed attending antenatal classes nearing the end of their pregnancy and learned a lot from them: '*I did learn quite a lot from that to be fair'* (Site 4 Mother4). Classes were reported to be reassuring – '*I came out of the class with all those worries lifted and felt so empowered*' (Site 1, local evaluation data). The use of practical teaching methods, such as using dolls, crocheted breasts, videos, and visual representations of infant stomach size, were highlighted as particularly helpful:

> They had the crocheted breasts, and then they showed you like the underneath, like the anatomy of it – like all the ducts and I'd never seen that before either so that was pretty cool. And then just showed you how to express, got the baby doll and showed you like, how to bring it on. And then they also showed you the size of the baby's belly, like little marble and then up to an egg so you could see how much they can manage in the first week… It was good. It was good information. (Site 2 Mother4)

However, some felt the information on infant feeding was lacking: '*it was sort of a brief. You know, here's what you do'* (Site 2 Mother7). Others experienced the volume of information given in antenatal classes as overwhelming and generalised: '*they went through like everything? That was quite helpful, but it's really long so it's a lot of information to take in' (*Site 1 Mother7). A few highlighted that classes could be more interactive, particularly since *'lots of people are visual learners and lots of people are hands on learners' (*Site 2 Mother3):

> I think it might have just been the midwife that taught us, but she wasn't really interactive. She was more just telling us, and it wasn't in depth. It was quite basic it was like this is that, this is that, and this is that… Going back to the feeding, they spoke mainly about breast feeding, but again it was all like I'm going to tell you stuff and they gave you a baby but you just kind of hold it yourself. So, they did ask, can you show us some positions that you know how to feed a baby in or how to hold the baby in? It didn't really like explain like other positions other than the ones that we showed *(*Site 2 Mother3)

One same-sex couple highlighted limitations in the relevance and inclusivity of group-based antenatal infant feeding education. The couple felt that the session was not tailored to their specific circumstances, with content framed primarily around heterosexual couples: '*obviously catered more towards, I would say like say, like normal couples. Yeah, straight* couples' (Site 1 Mother7). There was little discussion of alternative feeding methods, such as inducing lactation for a non-gestational parent:

> There was nothing called inducing lactation, so it didn't feel very personal to me in my journey. And yeah, obviously there's a lot to cram in and they teach you a lot about, obviously breastfeeding, that breast is best and all this stuff, but yeah, obviously nothing in respects to what was to be expected of me. Like no one told me whether I would make colostrum or what to expect when I first did start. So, there was nothing. Yeah, nothing in respects to what I was going through. (Site 1 Mother8).

There were varying views about format with some preferring online, while others preferred in-person classes. Where interaction between parents in the group was not facilitated, this reduced opportunities for peer connection and support: '*No one really spoke to each other, to be honest. Everyone kind of sat separate' (*Site 1 Mother8). While some found online classes less conducive to asking questions, others felt online classes were: *'quite informal. You could stop and ask questions as they went through it'* (Site 3 Mother8). Relatedly, at antenatal classes, some mothers described feeling inhibited by worries about whether their questions were valid: '*I'm the type of a person who would get into my head about, Is that a silly question and should I be asking that or should I know that*' (Site 2 mother 6), an effect that was heightened if classes were online:

> It kind of put you on a spot more when you want to ask a question. It's not just like stopping someone mid-sentence when you're having a conversation. It's like you actually need to make sure that they stopped speaking, you've raised your hand (Site 2 Mother6)

Information resources

Mothers consistently reported receiving a lot of printed and digital leaflets, which many found overwhelming: '*You're getting leaflets left, right and centre'* (Site 3 Mother2). As a result, mothers often reported not reading leaflets because of a lack of time: *'I'm not going to lie, I didn't really read much of it'* (Site 1 Mother3). Despite this, many women identified leaflets they found helpful. The most useful content tended to be visual and practical, including pictures illustrating latching and positioning, clear instructions for breastfeeding: *'it had the QR code and on there you could go onto a website where you can see videos and things'* (Site 1 Mother9), comparisons between breastmilk and infant formula, telephone numbers and helplines: '*The most important I think is lots of telephone numbers that you can call if you are struggling with feeding*' (Site 4 Mother2), and information about classes and support groups: *'there was one that had information about classes, and days and dates*' (Site 1 Mother9).

Some mothers felt '*a good conversation [with a HCP] over all those things instead'* (Site 3 Mother1) would have been more helpful than receiving multiple leaflets. One mother suggested that leaflets were unengaging or unnecessary, particularly when the design was basic or they already knew the content:

> I read through the magazine that's in there. It had all the just ads for products and stuff, but I read like the actual information, yeah… The information that I received from midwives in the early appointments was not too engaging really. You can tell it's been printed on like recycled paper, which is great, but just like no colour, so I would completely understand why someone would just put that aside and not look at it. But then of course I agree that we shouldn't be printing loads of fancy leaflets as well, because obviously it costs money, it's not good for the environment… If you compare it to different campaigns - so the Start for Life… It's really colourful and a really good leaflet that you can pull out. That's something that you would enjoy reading rather than just a basic A4 sheet. (Site 4 Mother8)

Nonetheless, a few mothers used the leaflets proactively, bringing them to appointments to support discussion with midwives: '*I took it with me and I kind of asked the questions I needed to ask about it' (*Site 1 Mother5).

Posters displayed in hospitals and children's centres were also viewed as useful, particularly when they were visually appealing: '*posters with really good information about breastfeeding, smoking, drinking, even about how to eat to avoid the diabetes' (*Site 4 Mother2). The Badger Notes App[235] was described by one mother as *'inefficient'* and *'like a tick box exercise*' (Site 2 Mother1). Some mothers accessed information prompted by NHS text messages, which included reminders and links to videos related to feeding and infant development:

> I don't really remember anything before [giving birth] but the texts that I'm getting now from an NHS now they're useful. They're YouTube links and stuff, because they'll get you an update, like six months is coming up, this is like ready

[235] This app, used in some NHS organisations, allows mothers to access their maternity notes and receive digital leaflets and push notifications.

for feeding and teething. They're quite interesting. And then I've shared them with my partner as well (Site 4 Mother1)

Accounting for information gaps

Several mothers reported receiving limited information and speculated about the factors that may have contributed to this. Mothers often attributed this to assumptions made by healthcare professionals. The most common explanation was that healthcare professionals assumed less information was required because mothers were not first-time parents: *'if you've had a baby already, I think they just kinda dismiss you or they know that you've got the experience' (*Site 1 Mother9). This was particularly evident among mothers who had previously breastfed successfully:

> I think because it's a second baby, it wasn't really discussed in too much detail because I was able to breastfeed the first time around, so it was it was just a question if I'm planning to do the same. (Site 2 Mother6)

Relatedly, one mother speculated that presenting as calm, organised, or confident may have signalled to professionals that less information or support was needed: '*I think it's probably because we were organised and probably quite chilled and calm' (*Site 1 Mother2).

Others felt that the amount of information provided depended on whether they explicitly asked for it. One mother felt that expressing limited interest in breastfeeding affected how much information she was offered:

> I wasn't planning on breastfeeding, so I wasn't really that interested in it. But they did tell you about it and they did give you knowledge about it. I feel like if you were more interested, they would give you more (Site 4 Mother1).

Another participant felt that appointments were led by mother's concerns, meaning feeding was not explored in depth if it was not raised:

> I suppose when you go to your midwife appointments, they kind of lead it based on what your concerns are or if you're worried about anything. So, I think because that wasn't something that I was overly concerned or worried about that that's probably why the conversation didn't lead that way. (Site 1 Mother2)

Mothers' own research

Many mothers described undertaking their own research to fill gaps in information provided by healthcare professionals or to expand on brief discussions: *'The information wasn't great when pregnant, it was more of my own research'* (Site 2 Mother7). This self-directed information seeking occurred antenatally and postnatally and included searching websites, using social media (described under 'The digital landscape' in the theme above), and learning from peer experiences. Finding visual resources was felt to be particularly useful: '*I just go on Google Images about positioning for checking latches and things like that'* (Site 4 Mother7), as were searches to find information about symptoms:

> There was one night… one of my breasts was really, really red, and I knew about mastitis, but I didn't have it with my first, so I was like, is this mastitis? So, then I was Googling all about it and was like, OK, it sounds like I maybe do. And then just went and took the paracetamol and stuff and it sort of helped. (Site 3 Mother8)

While for some mothers, self-directed research was motivated by a desire to feel '*as prepared as I could have physically been*' (Site 3 Mother4), conversely, one mother felt that not researching feeding made her feel overwhelmed once her baby arrived:

> I only was concentrating on the delivery and what stuff I need to get for the baby. I never thought about feeding. It was just in my mind that I wanted to do breastfeeding, but I didn't do any sort of research or anything. But once he was in my hand, that's when it hit me hard, oh, I didn't know much things. (Site 3 Mother6)

Mothers who were feeding their baby infant formula described how *'we had to do our research to decide which formula was more suitable'* (Site 1 Mother9), reflecting the divergence between parents' perceptions of their needs and HCP priorities to refrain from marketing breast milk substitutes:

> I spent a lot of time on Google, Googling how to make one [a bottle], how to boil your kettle, and they didn't go into the pros and cons of using, you know, why they don't recommend say the prep machines, there was none of that support. (Site 4 Mother7)

Access, inclusion, and quality in infant feeding support

This theme describes different aspects of support that mothers experienced. The subtheme 'accessing support' explores the barriers and facilitators to access such as awareness, accessibility, and maternal confidence. The subtheme 'facilitative and ineffective care' refers to mothers' varying experiences of care from HCPs and wider community support, encompassing both positive experiences of facilitative care, and those situations where care was lacking. The experiences of mothers from marginalised groups are described in the subtheme 'the necessity of inclusive support'. The subtheme 'The impact of health and community services' describes how some of the realities of current maternity and postnatal care affect infant feeding support, while the subtheme 'experiences of peer support' explores this particular aspect of care, and the subtheme 'seeking support beyond routine maternity care' describes where mothers sought care from private or third sector providers. Finally, the subtheme, the 'centrality of the infant feeding team' explores the tensions between the value of dedicated support and the potential for this to affect consistency and resilience of infant feeding care.

Accessing support

This subtheme describes the **barriers and facilitators** that influenced mothers access to infant feeding support. Facilitators to access included becoming aware of breastfeeding groups through attending antenatal appointments such as via *'posters in the clinics'* (Site 2 Mother5), which meant they felt they were '*quite aware of those*

[breastfeeding support] groups beforehand' (Site 2 Mother5). Often mothers described being signposted via multiple avenues and timepoints both antenatally and postnatally:

> I was aware that there was a clinic on a Monday which was like a drop in that I could go to if I needed to. The midwife told me, I think it was one of the later appointments when I was pregnant and then when I was in the hospital, they said it again and then the midwife that did the first home visit said it as well. (Site 1 Mother5)

In the postnatal period, mothers were given lists of phone numbers, including direct phone numbers of the infant feeding team so they were able to '*call them whenever I had an issue with feeding*' (Site 1, Survey data). Participants also described being given '*timetables'*, and directions to groups and clinics by HCPs. Baby groups and clinics were easier to access when '*you don't need to book, you can just turn up'* (Site 1 Mother2), were '*not too far away and it's got free parking*' (Site 1 Mother4), and had a welcoming environment and different options for engagement, including the option for individual support in a 'side room' for privacy:

> It's quite a nice building and the ladies are really lovely. They give you tea and biscuits when you arrive and they do you can you choose just to talk to them, chit chat to them or you can have a one-to-one session which you put your name down for and they'll come and see you in turn. (Site 1 Mother4)

One mother described how receiving support at home was particularly impactful – *'A home visit… really was a game changer in the first week or two*' (Site 2, local evaluation data).

Some mothers described not knowing who to ask for support, with some describing this as '*a bit confusing*' (Site 4 Mother1), particularly when there were challenges '*that was a tricky situation and … I did see quite a few different people then to get it [reflux] diagnosed*' (Site 1 Mother3). Other barriers to access included mothers lacking confidence to travel with their baby or feeling anxious about the social aspect of breastfeeding groups: '*it just feels a bit scary to go down there and be with all those people who are breastfeeding*' (Site 2 Mother 4). The difficulty of bringing or finding childcare for older children was a deterrent for some, as was a lack of available transport or the time required for travel which for some could be *'40 minutes just to go to the [breastfeeding group]*' (Site 4 Mother6). One mother with very limited resources described being unable to attend antenatal classes because she could not afford the bus fare:

> I have to take bus. And I was, that time I was not working so sometimes because of the transportation, I cannot. Yeah. of course, of course, because I wanted. That was my first experience in UK, so I wanted to participate in everything. (Site 4 Mother3)

Findings highlighted the need for **proactive support.** Some participants felt that while they were assured that '*definitely there's support there'* (Site 3 Mother8), they needed to reach out for support themselves: '*it was then obviously up to me to avail of it if I*

wanted to. They're not going to obviously push it' (Site 3 Mother8). However, sometimes this led to doubts:

> I sort of feel like if I didn't keep asking and following up on it, then would I have even got an appointment (Site 3 Mother8)

Mothers described the need to be assertive in asking for help on the postnatal ward, which they felt required '*confidence*'; some reflected they had managed this with second or subsequent children but not with their first baby, thereby emphasising the need for a proactive approach to providing support:

> You just had to be a lot more proactive with it, but I think it's just the nature of the ward and it's busy and there's a lot of new mums wanting help with things and so, but the support that I got was good. You know, when I asked for it. So, like I wanted to put them on and then for some reason I find it more difficult on one side. So, I remember, like ringing the bell. And I was like; can you please help me latch him on this side and so I got help with that. And so, the support that was there was great. I think you just had to be a lot, a bit more, like can you please help me? (Site 3 Mother3)

However, other mothers shared the experience of HCPs or peer supporters offering proactive feeding support, feeling that this was '*like they took me under their wing*' (Site 4 Mother5). It was suggested that mothers are particularly vulnerable in the early postnatal period, and that '*someone actually calling me being like, hey, I'm here just in case if anything, that that is quite helpful'* (Site 2 Mother6) in terms of reducing social pressure and solving practicalities of finding the correct contact details:

> I think there would be a probably a barrier for me ringing them because sometimes you can't put your finger on why, but it's just something else to do when you're busy and something else to think about and you don't want to bother them. Maybe you know they might be busy. You don't want to bother them, whereas because that was done for me. I just felt like carried along, but in a good way. If you get what I mean, like in a supportive way, not in a like coercive way like, yeah, like a supportive way. (Site 4 Mother5)

Facilitative and ineffective care

Mothers' experiences of care from HCPs and wider community support varied, encompassing both positive experiences of facilitative care, and situations where care was lacking. There were examples of good care regardless of staff role, where mothers felt they had received care from all the HCPs they had interacted with: '*I had to stay in hospital for 5 days with my son and I found that the breastfeeding support I received from all staff was amazing*' (Site 2, survey data). Another participant stated:

> And then even the girl who were taking my dinner slip, she said oh do you mind if I step in and help? I were like yeah, go ahead. And she helped me. So, like, Oh my God, this is amazing. But I didn't know if you're a nurse or anything. Like she had a different uniform on and she helped. And then someone were doing checks on him. And he were crying. So, she said, oh, let's try it. Literally every single person who stepped through that door helped. (Site 4 Mother1)

Several mothers described the **practical essentials** of the support they received. This could take the form of demonstrations using props: '*she got a knitted boob out and then showed me the different latches and stuff*' (Site 4 Mother1), or supportive strategies: '*just super practical tips*' (Site 2 Mother8) to manage difficulties with positioning and attachment. Even when mothers felt they had adequate information, receiving support in person, rather than remotely (e.g., via videocall), was seen to be crucial for overcoming breastfeeding difficulties:

> I do know all the positions, but honestly when I went to the people direct only then I was able to, you know, correct the positions and everything. The video call didn't do much. (Site 3 Mother6)

Key to feeling supported was the experience of **timely and responsive** care. Mothers shared how prompt responses from HCPs, whether in hospital: '*every time I buzzed, someone would come and help me get them on*' (Site 2 Mother4), or once home: '*they always answer the phone as well, so I feel I feel like they're there*' (Site 1 Mother4) helped them with breastfeeding. Mothers benefited when HCPs were able to offer patience: '*She had the time and she just was really patient with us*' (Site 4 Mother4), and showed committed to helping them, with the HCP saying, '*I'm not leaving you 'til we're sorted*' (Site 2 Mother8). HCPs were also reported to show sensitivity to the pace of establishing feeding: '*once they saw that he was on, then they just kind of stepped back and allowed me like a bit of time and space*' (Site 3 Mother3). Frequent care meant that mothers described feeling supported even when facing challenges: '*we literally had a midwife come every day just to make sure that she were gaining enough weight*' (Site 4 Mother4). One mother described how beneficial support had been following caesarean section – '*After a c-section birth… getting help and advice for breastfeeding was so valuable*' (Site 2, local evaluation data). Another mother described how timely and responsive care felt '*personalised*':

> Very much personalised, very much. It wasn't like just taking up reading off a book. It was catering, literally for what I was needing at that moment in time. (Site 1 Mother10)

Parents described how staff knowledge and interpersonal skills enabled them to feel safe, even in situations involving potential exposure:

> They're all very, very knowledgeable and I felt safe with all of them. Because to be fair, you're going. Hello. And then they're like would you like to take your top off? And I'm like, I don't really want to but yes, you know what I mean? (Site 1 Mother1)

While many of the mothers interviewed described support for breastfeeding challenges, some also shared experiences of support for bottle feeding:

> And the midwife on duty that night was really helpful. And I said, look, I don't have, I've not really been around babies, so I didn't really know how to do the bottle. You know, how to wind them. And she was really helpful. She sat with me that night and showed me how to give them the bottle, how to wind them (Site 1 Mother2)

In the neonatal context, this mother commented on how neonatal staff celebrated with her when she managed to express even very small amounts of breastmilk for her baby:

> She helped me hand express and then we sent it over to the NICU, so at least it was a little bit of something from mum when they do the mouth care for the baby. So, I was quite excited by that, because to me now, 0.1 seems piddly amounts but at the time over there they celebrate the small amounts for you. (Site 1 Mother1)

As well as positive experiences of care, mothers also described **gaps in support**, including inadequate, dismissive and, at times, disrespectful interactions. For some, these experiences were deeply distressing:

> I was a crying mess, and the midwives were incredibly uppity and cold. Nothing the midwives did provided any comfort or support at this time; my wellbeing was at an all-time low. (Site 4 Survey data)

Others described support as '*a bit hit and miss'* (Site 1 Mother4), and felt that HCPs could be quick to give up on helping to establish breastfeeding:

> I really, really struggled getting into latch on the ward and I think at one point the midwives got a bit frustrated with it as well. I've kind of got the impression they were. Just at one point I had two midwives come at the same time and they both tried to help and they couldn't, and in the end, they said right, that's all we've got. I don't know what else to say. And they walked away. And I was like "brilliant. Thank you!" If that makes sense. Yeah, they kind of gave up on it. And I was like, OK, so now I've got hungry baby and I've got nothing. (Site 1 Mother4)

Another mother describes how she attributed the lack of support in hospital to HCPs' assumptions about her having already received help, she believed that she had been overlooked, perhaps due to shift changes:

> I think at first when I was struggling with establishing breastfeeding, I did feel very let down. I was quite annoyed, like why didn't they show me? Why didn't they tell me? Like, why didn't they tell me how to latch my baby on? They just. I think they assumed that I was to be fair, and the midwife asks. She thought I'd been shown in the delivery room when I, because the room that I was in after giving birth, I was there for maybe about 3 hours. They just assumed that the delivery midwives must have covered that, but they didn't. Like I said it was shift handover time. It was kind of just pop the baby on. Yeah, that's how it's done. And that was it. (Site 2 Mother7)

Some mothers described being directed to alternative feeding methods such as cup, spoon, or syringe feeding in the early days postnatal when they struggled with positioning and attachment, but without being given support about how to do this: '*I wasn't given any support other than given a medicine spoon and a syringe'* (Site 2 Survey data). This could lead to mothers feeling unsupported with both establishing breastfeeding at the breast, and how to provide expressed milk:

> I think that's where it went wrong because we kind of just got discharged with some cups, didn't get told how to cup feed, didn't get told really how to hand express to cup feed (Site 4 Mother7)

In the neonatal context**,** support for mothers in establishing their milk supply was found to be variable, depending on which staff were on duty, the time of day and even the time of the week. One mother described her experience with seeking help with expression from different members of staff: '*with one person, I got quite a bit. The next person, I didn't get a lot*' and questioned '*whether some aren't 100% comfortable*' with helping mothers to express. She also wondered whether some staff were unsure how to use breast pumps:

> Cause that's what they tell you. If they can't get it, they just go, 'you're not ready yet. You're not ready yet'. I was like, I don't think that's the case. But the lady was really sweet. She did try. I don't know. She was a bit of an older one, so maybe the pump was just a bit beyond her. Technology wise, I don't know. (Site 1 Mother1)

One survey respondent described how she felt that breastfeeding had been made more difficult because staff had bottle fed her baby while on the neonatal unit:

> Although I received some help to breastfeed, it was extremely difficult. While my baby was in the neonatal unit, the midwives were bottle-feeding him, and he quickly became used to the bottle. This made breastfeeding even harder. (Site 1 Survey data)

A few mothers described receiving infant feeding care from **paediatric services**. One mother, describing the multidisciplinary help she received for her baby's cow's milk protein allergy, expressed: '*I felt like I got such focused care*' (Site 2 Mother5). Another felt unsupported with breastfeeding following hospital readmission to the children's ward:

> I then didn't receive midwife visits as we ended up back in hospital for 4 days when my baby was 9 days old. I told the staff on the children's ward I was breastfeeding but again had no support. (Site 2 Survey data)

One mother described fewer positive experiences with paediatric HCPs following her baby's weight loss, reflecting that they had not *'handled it particularly well*' (Site 3 Mother5).

The necessity of inclusive support

Mothers had varying experiences of inclusive support. For example, a non-birthing mother who had induced lactation described feeling marginalised and '*made to feel insignificant*' (Site 1 Mother8) by HCPs, whom she perceived as disregarding her because she was not the person who had been pregnant or given birth. This continued into the postnatal period when engaging with support when her baby had lost weight due to being continually asked *'who am I'* (Site 1 Mother8). This mother reported that her confidence in her expressed milk was undermined by communications from HCPs:

> And they also told me that, without doing any research or testing my milk or whatever, they come out with a statement that my milk wasn't good enough for her. It wasn't nutritious enough. And that I was not to feed her my milk. They wouldn't let me even store it in their fridge. (Site 1 Mother8)

Another mother in a same-sex relationship reported that, while she did feel her partner had been included in conversations with HCPs, her partner had not had the opportunity to hold their baby skin-to-skin when she (the birth mother) needed medical attention postpartum:

> Because most of the first hours, he [baby] was with my partner, so like they should have been bonding in that, but she wasn't told exactly what to do. (Site 2 Mother4)

Although some mothers reported not being asked about potential cultural or religious needs, this was not always viewed negatively. This was due to standard information not being *'very much different from what we do'* (Site 3 Mother6). Other mothers noted that HCPs appeared to be unfamiliar with their cultural or religious needs, for example, relating to restrictions associated with the observing the Sabbath:

> They [midwives] don't even know too much about the Jewish culture. (Site 1 Mother10)

One suggestion to facilitate culturally appropriate care for women with specific cultural or religious needs was to involve trained peer supporters or doulas from the community who could liaise with healthcare professionals:

> There is there is the labour support group. I don't know if you've heard about them. The Jewish women that go in together with the women to give it to give birth. So, there's a bunch of trained women from [place] and a bunch of trained women in [place], and they are doulas basically, that go accompany the woman that's giving birth and support her through the birth. So, I'm sure they've had. I'm sure they've had meetings with the midwives to tell them who they are and what's going to go on and everything. (Site 1, Mother10)

Inclusive care could involve family members; for example, one mother described HCPs involving her mother-in-law in conversations, despite a language barrier which limited direct communication:

> The other health visitor who came home met the mother-in-law and she doesn't speak English… My mother-in-law were like 'oh I'm getting the support and those sorts of things' but was not in the direct conversation because she couldn't talk. Sometimes they talked with her because she can understand, it's just that she cannot respond. (Site 3 Mother6)

One mother who was in the process of being diagnosed for ADHD spoke of how the IFT adapted the support to meet her needs, by, e.g., '*explaining to me two or three different ways at different points, or I'd forget it, or I would fixate on something, particularly'* (Site 1 Mother1). This mother felt that staff were aware of her needs, without her having to communicate them: '*they never asked me what was wrong with*

me or anything like that' and greatly appreciated how she was '*never treated any differently*' from other women (Site 1 Mother1). This mother reflected how the team worked *'with'* individuals with complex needs, rather than *'against'.*

The impact of health and community services

This subtheme describes how structural aspects of health and community services influenced the infant feeding care that mothers received. Mothers highlighted how the **availability of staff** could be a key factor in them receiving the care and support they needed. While some reported ready availability of support, '*anytime they [HCPs] were just walking about they'd always come in and just sit and have a conversation with you*' (Site 3 Mother7), a lack of staff availability was particularly acute in the postnatal ward, where it was felt that due to so many other mothers needing support that the HCPs did not have time to provide effective support. For some, a lack of timely support led to distressing experiences

> Unfortunately, the ward was so busy when I asked for more help, she was too busy and I couldn't be seen which resulted again in me being deflated and told by a health care assistant AGAIN that I'm starving my baby and should feed formula. (Site 2 Survey data)

Even as mothers described needing more support, there was often recognition of staffing pressures:

> I would have loved to have had more support in the hospital, but it never happened. I was just shut in a side room and kind of forgotten about. I know they're short staffed and they can't be blamed (Site 2 Survey data)

The **hospital environment** was felt to have an impact on mothers' experiences with infant feeding support. Some experienced the hospital as a '*supportive environment*' (Site 3 Mother1) because they could hear other mothers around them receiving support. Others noted the need to tolerate noise from visitors: '*It's very loud, I'd say. Very loud*' (Site 1 Mother4), or infants: '*it's so exhausting and now so you're in a ward full of other babies. Everyone's screaming*' (Site 1 Mother7). Some felt they were '*left your own devices*' (Site 1 Mother7) in caring for their baby in hospital, exacerbated by the lack of facilities for partners to stay overnight. The length of hospital stay could also affect mothers' infant feeding experiences, with some feeling they had had to go, or opted to go, home earlier than might have been beneficial for establishing feeding with one mother reflecting '*I wish we'd have stayed now. But*' (Site 4 Mother1). A mother who had had a home birth noted that she had received '*this undivided attention from the midwives, which is really nice*' (Site 2 Mother8), as well as '*proper bonding time*' (Site 2 Mother8) with her baby after birth.

As well as support from HCPs, health service support for breastfeeding could include the **provision of equipment**. A few mothers shared examples of being loaned or given breast pumps by health services:

> It was kind of like a loan through [site name]. They actually lent you a breast pump for a month. Which I thought was really good actually, because it helps

because I had a manual one. So, they were like, oh, I have this electric one and you can lend it. So yeah, that really helped. (Site 4 Mother4)

A local survey evaluation of a breast pump loan service at one of the sites found it to be a valued, intervention, particularly for mothers experiencing complex breastfeeding challenges. Over a 12-month period, 151 pump loans were issued, of which 92% were issued the same day and 97% within 2 days. The main reasons for pumps to be issued were low milk supply (58%), faltering growth (25%), and baby not latching (24%). 91% of mothers reported being shown how to use the pump, with 88% reporting they received additional feeding support. 74% of mothers felt the loan had helped them breastfeed longer, with one commenting '*The loan of a breast pump was a key factor… I'm still breastfeeding my daughter at age 13 months*' (Site 3, local evaluation data).

Experience of peer support

As well as support provided by HCPs, mothers' needs were met by a wider community, principally breastfeeding peer support services, whether in a group or one-to-one, and other postnatal community groups. These were often the principal source of support accessed by mothers beyond the initial postnatal period, and for some this support was pivotal: '*Without peer support, I would have given up within the first few weeks… I ended up breastfeeding for 14 months!*' (Site 3, local evaluation data). Peer support was seen to support continued breastfeeding, as expressed by this mother of twins: '*having things like [peer support service] …. that was that was really nice because that probably meant that I fed them for longer*' (Site 2 Mother5). However, some mothers struggled with not receiving immediate help from peer support services when needed:

> *"I tried calling… had to leave a message and wait for a call back… by the time… the moment had passed."* (Site 3, local evaluation data).

The opportunity for support from other postnatal mothers was given as a key advantage of attending groups. Being around other postnatal mothers was felt to be helpful for normalising breastfeeding: '*It was just lovely to be in a room with a lot of other women with their baps out*' (Site 3 Mother5), building confidence and for emotional support. Both of the following quotes are from mothers who had moved to the UK in adulthood:

> Whatever you feel, maybe someone might be feeling the same. So, when you go there you know you will get to know. You'll feel lighter when you know somebody is also going through the same. And you know there's a solution. (Site 3 Mother6)

> Even if you are, let's say if you are not in a happy mood, their experience will encourage you (Site 4 Mother3)

A few participants expressed reservations about community groups that were run by volunteers due to concerns about them not being *'properly trained*' (Site 1 Mother3). However, another reflected on how the combination of shared mother-to-mother experience and professional input, meant receiving the *'right information'*:

> Because you've got, like, all these different mums. So, they've had their experiences, but then you've got someone professional there as well, you know, supporting you and giving you the right information. And it's just a lovely group, really. Like, she didn't pressure anyone. She's there if you need a chat. (Site 4 Mother1)

Conversely, some mothers felt more comfortable asking for help from peer support services than from HCPs – '*Peer support gave me a space to share my concerns in a text message as I felt embarrassed asking my midwife*' (Site 3, local evaluation data).

In addition to in person groups, peer support was also provided via WhatsApp and Facebook groups. These were a source of information: '*even if you weren't meeting, you could send in a message in the WhatsApp group to ask some of the other mums*' (Site 3 Mother8), and generally reported as supportive: '*I felt like it is a nice, safe, safe space*' (Site 2 Mother6). Mothers valued online groups for practical feeding knowledge and challenge misconceptions, often learning from more experienced parents, as well as shared experiences and reassurance: '*If I'm up feeding in the night…I just read it and you just learn stuff about different experiences' (*Site 4 Mother8). One mother described how she was invited to join a WhatsApp group specifically for parents who shared her specific circumstances which she found helpful:

> I got quite quickly put into a WhatsApp group with other multiple mums and then the peer supporters that were in that group were also multiple mums so there was, that was quite nice (Site 2 Mother5)

Similarly, Facebook groups were also used to explore feeding options and connect with parents experiencing similar challenges. In some cases, this led to friendships:

> There was an Exclusive Pumping group on Facebook which I looked at all the time… That was really helpful… I'm in a Born in May 2025 group… And there was one woman on there who wanted this certain teat because she was having feeding issues and we connected on there and I still talk to her now… We're meeting up soon… I've become quite good friends with her. (Site 4 Mother6)

Seeking support beyond routine maternity care

A few mothers mentioned referrals or proactive support-seeking from private or third-sector providers. Some mentioned that HCPs had referred them to third sector breastfeeding helplines as sources of support outside of working hours: '*if you're struggling through the night when I'm unreachable, call them*' (Site 2 Mother7). One mother described arranging a frenotomy for her baby from a private provider because she felt unable to continue breastfeeding, while another accessed support from an osteopath:

> But when I went this osteopath that I went to was quite well known, and had done it for a while, and she was actually working with some infant feeding advisors and things on certain resources and You know, she's she, she said she feels that osteotherapy is like a massive piece of jigsaw missing from infant feeding advice and like the NHS. That was her perspective. But she was like,

> you can do all that. But if you've not done the osteotherapy then it's not going to work. (Site 4 Mother5)

Centrality of the Infant Feeding Team

Mothers frequently reported that the IFT were a key source of support; this subtheme reflects their perspectives on the support they received and the impact this had on their infant feeding experience. It also reflects perceptions of the importance of specialised support alongside concerns of how concentration of expertise in a small team may reduce the resilience and consistency of support across the wider system. Some mothers who had been struggling with feeding described how intervention from the IFT had been pivotal in their feeding journey:

> The support from the infant feeding team was exceptional, the consistency was beneficial and has not experienced in other services and the care and commitment of the team amazing (Site 1 Survey data).

Contact with the IFT was considered to have far-reaching consequences, with some suggesting that they '*would have given up if it was just me*' (Site 2 Mother6). Some mothers attributing their continued breastfeeding of older infants to the support they had received, with one reflecting: '*I can easily say that I wouldn't still be feeding him without the support of the infant feeding team*' (Site 1 Survey data). The impact was considered both in terms of a mother's current baby and for future infant feed decisions:

> But had I not gone to see them [infant feeding team], maybe I, he probably would be formula fed or I'd still be pumping exclusively, and maybe I wouldn't even consider it [with] the next one if I had another. (Site 1 Mother4)

The IFT were seen to be different from other HCPs in their constructive attitudes and deeper knowledge towards breastfeeding. It was felt that, while other HCPs were supportive, they showed less investment: '*the midwives were more, you know, if it doesn't work out, we're not going to judge you through. Go and buy a bottle of formula*' (Site 2 Mother7). Whereas the IFTs' deeper level of knowledge was felt to be reassuring: '*I find them very informative. They're very knowledgeable, like no one said, oh, I don't know what to do*' (Site 1 Mother10). Some also spoke of how the IFTs' belief and encouragement made the difference:

> I think if you if someone – this sounds very like cheesy – but if someone believes in you to do be able to do it, you then feel like, OK, I have a chance at doing it. Whereas if someone's sort of like giving you an attitude of, OK, look, just try your best and you know, just take it from there, then you're like, OK, well, great. (Site 1 Mother9)

Mothers described how the IFT were there when they needed them and when they sought help, they would receive a prompt response: '*they would either come straightaway, later that day or the next day. They were really responsive*' (Site 1 Survey data). This provided a source of continuity where mothers felt they could rely on someone who knew their situation:

> [Infant feeding team HCP] also continued phone calls up until 4 weeks which I really liked as I already knew her, and she knew the journey we had been on (Site 2 Survey data)

The consistency and thoroughness of support were reflected in mothers accounts of care they had received: '*I feel like no stone has been left unturned*' (Site 1 Mother5) and feeling that '*They were quite on top of every little detail of us*' (Site 1 Mother10). Another participant stated:

> It's a drop-in thing, and I spent, I think over an hour in a room with her, her name is [infant feeding team HCP]. And she was brilliant. Like, it was like there was no one else waiting. You know, like, we were in a room (Site 1 Mother5).

There was seen to be a tension between a need for specialised skills and universal care. Some contrasted the care they received from the IFT whose '*sole purpose is how babies are fed*' (Site 2 Mother7) with that from other HCPs, who they felt were '*more focused on the baby and doing my obs and things*' (Site 2 Mother7). In highlighting the need for timely breastfeeding support in the early postnatal period, this mother expressed her view that this should come from an '*infant feeding specialist*':

> I do think every woman should be offered, or an infant feeding specialist should see a lady, within at least within the first five days, I would say of having the baby. I think that would make a world of difference because I think a lot of a lot of women just try and struggle on their own. And all it takes, like I said, is a little change in the latch to how you're holding, you know that we can't pick up ourselves, that someone who's trained will pick it up straight away, like, oh, you're holding her like this or you're pushing her head in. Let her do the work or, you know, all of that stuff that you are then told if you do reach out for help. (Site 1 Mother6)

Conversely, some mothers reflected that as the IFT were typically a team with perhaps two or three staff members, this meant that their capacity to support women was limited. Mothers felt '*very grateful for it [support] from the infant feeding team*' (Site 2 Mother7) while also suggesting that services had an overreliance on the team to provide feeding support postnatally. This was seen as placing significant demands on specialist staff and potentially compromising the resilience of the wider support system:

> I think the infant feeding team lady was really lovely, but I think she was just run so thinly that she just couldn't. She couldn't give us her best. She gave us the best she could do at the time, but I think if obviously she'd had the proper resources and the proper, like there'd be more of them and she hadn't have been so run thinly, I think we would have been able to get better support and maybe her 100%. I think you know, we did have to compromise on that. (Site 1 Mother8)

Specific issues

While many common infant feeding issues are referred to throughout the other themes, this theme describes some specific issues related to infant feeding and care

and mothers' experiences of the support available to address them, that recurred through the interviews and survey data.

Tongue tie

Tongue tie was a commonly reported infant feeding issue. Some case study sites reported holding specialist tongue-tie clinics. Mothers described feeding challenges arising from their baby having a tongue tie, and the process of investigation and subsequent referral for frenulotomy:

> I think it was just what during one of my midwife appointments, I think it was because like his weight had went down and I think he was like he was just struggling to put on the weight and that prompted it to look at it, if that makes sense. I think if his weight had been fine, they maybe wouldn't have (Site 3 Mother3).

One mother described difficulties in obtained a referral to her local tongue tie service – '*I had to ask a few times to be referred into it [tongue tie clinic]*' (Site 3 local evaluation data).

Most of the reports were of tongue tie issues resolving, but one mother shared an experience of how feeding problems had become more pronounced following frenulotomy, leading to cessation of breastfeeding, a risk that had not been discussed with her. Although she did not '*feel that's anyone's fault and I know the frenulotomy is working in other babies really well*', she shared that '*in hindsight, I wish I'd not gone for the frenulotomy*' (Site 4 Mother5). Another mother reported continuing to feel '*anxious, stressed and low mood*' following frenulotomy as she still lacked confidence in her ability to breastfeed:

> Tongue tie revision also felt quite dismissive, being asked if things feel 'better' when feeding but no point of reference other than it being better than before but still not good (Site 1 Survey data)

As in postnatal services more widely, time constraints were also reported in relation to tongue tie clinics, where some participants felt they needed more time – '*I found the time was limited. I left and still wasn't feeling 100% sure I was getting my baby to latch properly*' (Site 3, local evaluation data).

Antenatal breastmilk expression

While not a specific BFI requirement, antenatal breastmilk expression (AME)[236] sits alongside wider BFI-aligned antenatal conversations about breastfeeding, hand expression and early feeding. Many of the mothers in the study had been given information about AME. Some with older children noted that this was a '*new thing for me*' (Site 2 Mother1), or '*I've not done it the first-time round*' (Site 4 Mother8). One mother shared her perception that '*it had not been, like, marketed properly'* and held perceptions of it only being suitable for *'people that were weren't planning to*

[236] While antenatal breastmilk expression (AME) is the term commonly used in research literature, participants commonly used the term 'antenatal colostrum harvesting', so this term appears in direct quotes.

breastfeed' (Site 4 Mother8). An increased awareness of the practice meant that some mothers believed that they should have been given the opportunity to do this as a matter of course, and some described the influence of their peers who had recommended it:

> Quite a few people that I know who've had babies who said, oh, you know, have you started colostrum harvesting? Like, I'd recommend it. Do it from these many weeks pregnant. So, I kind of learned that from other people really (Site 4 Mother4)

When mothers were unable to express colostrum antenatally, this tended to leave them feeling that they were doing something wrong: '*Suppose I really just felt like I wasn't doing it right, or my body wasn't ready*' (Site 3 Mother8). This often led to feelings of worry or stress, although fears were then allayed by staff:

> When I were trying, I was like, oh God, I'm not getting anything out. I'm just getting a drop here and there and that's it. But then when I went to the hospital for a growth scan, I saw one of the midwives, she's like, have you been trying to colostrum harvest? I said, yeah. Been trying to do it. And I said I'm not really getting much though. I said, like some of my friends are getting syringes full and they were like, oh, I mean, you might just even get a drop. That's normal. You know, you might not get anything. It doesn't mean that it's going to affect your breastfeeding. So, yeah, I found that quite difficult until I got that information really, because I didn't know if I was doing it right. (Site 4 Mother4)

Conversely, some described having been given information but without any practical help or follow up: '*I was encouraged to harvest colostrum the night before, was given a leaflet but no further help*' (Site 4 Survey data). One mother reported being unable to express colostrum antenatally and felt that some practical support may have helped:

> Interviewer: Is there anything that you thought that wasn't very helpful?
>
> Mother: I mean; I guess the colostrum harvesting kit. I didn't really get anywhere with it. Maybe it would have been good if I did it if I could have done it in an appointment, maybe. Maybe I would have got more out of that. Yeah. I got handed a kit, had a, you know, print out there. And I thought, oh, it can't be that difficult. And I couldn't really get it out. So yeah, maybe that. (Site 1 Mother5)

Donor milk

A small number of mothers had received donor milk for their babies in the neonatal unit. They described how they were '*very excited*' and '*very, very grateful*' (Site 1 Mother1) for donor milk when they themselves were unable to express enough milk or when they '*felt so burnt out*' (Site 3 Mother2). One mother, however, described her mixed feelings about this:

> And at the time, I was like, this is a really strange concept that some random - in my head that sounds awful - some random woman's going to feed my kid for me. (Site 1 Mother1)

Despite feeling like she was '*relying on some total stranger to help feed my baby*' she believed that it would only be for the short term and that this was preferable to giving her baby infant formula:

> But I thought it was nicer that I could have that than just go, oh, well, there's formula. That's convenient. We'll just use that then. Because I thought I was only going to be literally a matter of days. And I can do it myself. So, I literally just used that donor milk. I think maybe two to three days. And I was like, yes, I can take over now (Site 1 Mother1)

This also helped her feel like she had done the best for her baby, with this mother going onto say:

> Didn't feel like [I] failed because I thought, well, one person's starting it for me and then I'm going to, I'm going to take over, and it felt great because I felt like such a relief to be able to have that option (Site 1 Mother1)

Relational care

This theme focuses on the relational aspects of care, beginning with the subtheme 'the significance of communication' which explores the sometimes far-reaching impacts of interpersonal communications between HCPs and mothers. The subtheme 'the value of continuity' then explores how continuity was highly valued by mothers. The impacts of relational care for mothers and families are described in the subthemes 'protecting maternal wellbeing' and 'facilitating partner involvement'.

The significance of communication

This subtheme explores the effect of communication from HCPs on mothers' emotional wellbeing, confidence, and practices. Mothers explained how communication from HCPs could convey either judgement or acceptance. There were many reports from participants of supportive, open-minded communication: '*I have found that there is no judgement on how you feed your baby at all which is lovely*' (Site 3 Survey data). Many mothers had experienced a non-judgemental approach from HCPs about their feeding decisions, describing how their uncertainties had been normalised and accepted:

> Well, just that everybody, like, they don't judge. Like, if you change your mind multiple times, they just go with you. They don't go. 'Oh, you said this before'. You just sort of go with what you're saying and follow you. (Site 2 Mother4)

For some mothers, this acceptance helped encourage and reassure them, as exemplified by how one mother reported interactions with her HCP:

> She [HCP] was extremely lovely and you could tell she really cared about maternal mental wellbeing as I was so adamant I wanted to breastfeed but she could see I was evidently struggling and was exhausted she give me so much support and encouragement and reassured me that even if I stopped feeding my baby now I still had given her the best start to life with all the breastmilk she'd had in the first 2 weeks. (Site 4 Survey data)

Some mothers described how HCPs opened the door for questions and dialogue: *'[the HCP] always said to me, you've got any questions about anything? do you want to talk through anything?'* (Site 1 Mother6) and described HCPs taking their experiences seriously: '*whenever I was telling her something was happening like she believed me'* (Site 3 Mother4). One mother described how HCPs' focus on what was working well helped to reassure and encourage her, alongside receiving practical support for positioning and attachment:

> Was positive and pointed out the good things rather than focussing on the negatives regarding breastfeeding. Made me feel better when I explained we had to top baby up with formula and not made to feel like I was wrong or not good enough. Helped with latching too. (Site 4, local evaluation data)

A few contrasted their positive experiences with those of friends or family:

> I always, always talk about how good it is in [site 4] when you compare it to like where my friends live in [city] and [city] and my family in [city]. Like there's no comparison to the support. (Site 4 mother8)

There were also reports of conflicting messages from HCPs in relation to feeding, where '*everyone seems to say something completely different*' (Site 2 Mother1). Some felt this was due to differential knowledge between regular and specialist HCPs: '*maybe most midwives don't really know the ins and outs of. But obviously the infant feeding midwives do know a lot more about that*' (Site 4 Mother6). Others highlighted the lack of continuity of carer, '*every day there was a new midwife or care assistant coming round and each one would offer different advice*' (Site 4 Mother7), or a change of staff shifts in hospital:

> At one point, I was told that he didn't need testing for jaundice anymore. Then the next day I couldn't go home until we've been tested for jaundice again. I was like, 'what is going on?' (Site 1 Mother4)

Some mothers described insensitive or even harsh communication which made them feel less able to engage with support: '*it kind of did put me off sort of speaking to anyone about where I was getting information from and things*' (Site 4 Mother7), or questioned their motivation to breastfeed: '*I was shamed when I was adamant about breastfeeding, told I must want my baby to be hungry*' (Site 4 Survey data). Others reflected on the lack of patience they experienced from some HCPs when encountering breastfeeding difficulties – '*some of them [community midwives] were very dismissive and made me feel like I was deliberately doing something wrong*' (Site 2 Survey data). For some this had far-reaching impact, as one participant reflected: '*I left there [hospital] thinking I wasn't going to breastfeed ever again'* (Site 1 Mother4).

The value of continuity

Various comments were made in relation to continuity of care. Those who were able to receive care from a known provider, such as a named midwife, health visitor or staff within the IFT, spoke highly of the experience. One mother who received continuity of carer from a midwife described her as *'phenomenal'* and *'life changing*' (Site 3 Mother5). Mothers spoke of how the positive relationship formed with known

caregivers meant they felt more *'comfortable to talk about stuff (with her health visitor)'* (Site 3 Mother4) or the HCP being able to detect any mental health changes, and to offer support accordingly:

> So, my midwife, because I had continuity with her, she knows me, and as soon as I opened the door postnatally she knew I wasn't right. She said you're not right. And I said, "I know". (Site 4 Mother5)

Some mothers spoke of how continuity of carer enabled personalised support due to the named staff knowing the *'journey we had been on'* (Site 2 Survey data) and how staff would *'cheerlead'* their achievements (Site 2 Mother5). Mothers also valued the continuity provided by the IFT as it meant they could contact them as new issues arose, such as *'weaning while on holiday'* and knowing the support will be *'personalised to me because the questions that I ask will be answered just by her basically*' (Site 1 Mother2).

Some mothers, including those with more complex needs, such as a mother with an eating disorder and poor mental health, greatly appreciated the same HCPs providing her maternity as well as mental health support as it meant she had '*familiar faces always*', and how these HCPs helped to advocate and meet her needs:

> And then my medications got put up and then that was quite positive because I've been thinking that they were needing put up for a while, but I hadn't had the confidence to tell the doctor, but they [midwives] did that for me. They went to the doctor and told them. (Site 2 Mother4)

A lack of continuity could lead to fragmented and inconsistent information and support. Women reflected on challenges of '*starting from scratch'* when relationship building with different HCPs, as, e.g., '*there is only so many people who you want to cry in front of*' (Site 2 Mother5). On occasion, women would reach out to a HCP who they knew from a previous pregnancy:

> I just had a previous relationship with [name]. She runs baby reflexology, baby massage baby yoga, kind of classes I'd gone to with my first. I knew she ran breastfeeding support group, so I reached out directly to her and she said, look come to our Monday support group. You'll meet other people. I can give you a pump if you want to pump, but we'll talk about it. (Site 3 Mother5)

Whereas some considered how continuity could be less important than good quality care:

> Literally this woman came and showed you different positions, different techniques. She was a midwife, so she was a different midwife because it were rotation. So, she didn't know me throughout giving birth, but she was very helpful (Site 4 Mother1)

Protecting maternal wellbeing

Several mothers referred to the support provided for their emotional wellbeing. One mother described how helpful it was that her midwife had '*cautioned*' her about the risk

of postnatal depression among mothers of multiples, which she felt enabled her to access support '*more quickly than I would have done'* when experiencing poor mental health (Site 2 Mother5). Another referred to having a *'brilliant network of midwives'* who supported her through her postnatal depression, by *'checking-in'* to make sure she was *'coping mentally with my two children'* (Site 2 Survey data). Similar views were expressed by other women who appreciated maternity (or mental health) staff asking or answering questions about their mental health, or staff encouraging and supporting them to engage in self-care. One mother reflecting on support from a psychologist stated:

> [She would] check in and be like, you know, are you OK and if any time you need to chat you know, come and get me and we'll set up a meeting' (Site 3 Mother2).

One mother spoke of how being asked about her mental health when she was crying at a maternity appointment initially made her *'panic'* in case this was made a *'big deal about'* (Site 3 Mother3). Being provided with information about normal *'hormonal changes'* (Site 3 Mother3) or reassurance of *'it's going to be OK' (*Site 3 Mother6) from trusted maternity professionals were perceived as helpful and supportive. This sense of being cared for by staff was reflected in parents' perception that staff were '*in it with us'* (Site 2 Mother5). While some mothers did not need any wider support, the consideration of their needs, knowing who to contact, and feeling that support would be available if needed, was valued, '*if 'I did* [need support]*, the support would have been there definitely'* (Site 1 Mother6). Another mother stated:

> Yeah, the midwives that came afterwards were very involved in my well-being. They were asking me how I am and if I feel I will need any support then they would give me like numbers and stuff to call.… I didn't need to, but yeah, I think if needs be then why not? (Site 1 Mother10)

Some mothers referred to the holistic nature of postnatal care, whereby they felt their physical, mental health as well as infant feeding support needs were being accounted for:

> Then you would have went to maybe the clinic, you know, maybe twice within the first two weeks and they were, you know, checking if you had a tear or anything. They were checking to make sure it was healed, asking you if you're mentally OK. They were talking about feeding. (Site 3 Mother2)

However, from a counter perspective, some referred to how maternity staff did not speak to them about anything other than '*checking up on him [baby]*', a situation attributed to a lack of continuity and *'seeing different midwives each time'* (Site 3 Mother4), and that more opportunities to discuss and promote self-care were needed.

In the neonatal context, mothers valued the support they received from staff '*who not only just cared for the babies, but also made sure that the parents were OK*' (Site 3 Mother2) while their babies were in the unit:

> So yeah, I think the support system that was there helped us. And like I said, I think it's like the nurses are supporting you and just checking on making sure you're OK and being compassionate is very important as well. (Site 3 Mother2)

Facilitating partner involvement

Partners were often described as providing important practical and emotional support, such as during hospital stays and in the early postnatal period. Partners also acted as advocates during periods when mothers felt physically or emotionally overwhelmed. Some mothers described partners being actively included in feeding discussions, with HCPs giving suggestions on '*little things that he can help with. How you can help with my position, 'get drinks because she's going to be drinking like a whale', stuff like that*' (Site 4 Mother1). HCPs who directly sought partners' views reinforced shared decision-making and acknowledged partners as legitimate contributors to feeding choices:

> Some of the time when she [infant feeding lead] came to visit, she would have a three-way conversation, so it'd be her, me and the husband like she would also want to know my husband's opinion and what he thinks and how he feels. Which not everyone does. (Site 1 Mother9)

Where partners were actively included by services, mothers described enhanced confidence, bonding, and coping. Experiences of partners being present in the hospital varied but were generally positive where flexibility was shown by staff. Being able to remain on the postnatal ward, following overnight or complicated births, allowed mothers to have reassurance, rest, and created a shared responsibility for infant care:

> She was born at 2:00 am, so he was allowed to stay through until visiting time closed at like four the following day, they just let him stay because it wasn't busy. It's good as well because you feel like you can have a rest and there's somebody there looking after your baby. (Site 3 Mother1)

Some mothers saw their partners' absence from the hospital as necessary or pragmatic, for example some had other children at home, or because '*He could have stayed, but it would have been very uncomfortable*' (Site 1 Mother2). One mother emphasised the importance of HCPs acknowledging partners' emotional needs. Staff who engaged partners directly, such as checking in emotionally, recognising their role as caregivers, and offering debriefs, were described as supportive:

> It wasn't just about me; it was about him as well and that were quite nice because I think sometimes the man's just forgotten about. He really struggled the first couple of weeks because he was being a carer for me and looking after his daughter. So yeah, she was just really, really good. She was saying, 'if you need a debrief after everything what you've been through, we can do that." She was amazing. (Site 4 Mother4)

Another mother recalled her and her husband being told about Dad Pad and Dad Matters, organisations which offer advice and support for fathers with new babies:

> And we also received something for my husband, Dad Pad and that had bonding tips for dads. And we were told about Dad Matters as well. I think that were interesting as well to pass on to my husband for something for him to read because obviously they do get a bit pushed out of the picture. He wasn't going to [engage with Dad Matters], he shut it down at first and I were like 'just read it, we didn't get this the first time around'. And he did. The Dad Pad app were a bit more suitable because well it's just easier to read on your phone. (Site 4 Mother8)

Close and loving relationships

This theme describes mothers' experiences of receiving support to nurture a close and loving relationship with their babies. It includes the subtheme 'skin-to-skin contact' which describes mothers' experiences of receiving information about, and support to experience, skin-to-skin contact in the immediate and later postpartum period. The subtheme 'bonding and early relationship building' focuses on information and support for prenatal and postnatal mother–baby relationships, while the subtheme 'family bonding' refers to information and support for bonding with partners and other family members. The subtheme 'parents as partners in care' explores the experiences of support for relationships in the neonatal unit.

Skin-to-skin contact

Mothers consistently described receiving repeated **information about skin-to-skin contact** with their infants, beginning in pregnancy and continuing postnatally within the hospital and on returning home. Skin-to-skin was presented as routine, expected, and a normal part of care after birth, closely linked with bonding, breastfeeding initiation, and mother and infant wellbeing. Mothers recalled being given information about infant behaviours during skin-to-skin, such as rooting, nuzzling and breast-seeking. One mother remembered watching a video in an antenatal class showing '*how the baby crawls to the breast and when they're born*' (Site 4 Mother6). The concept of the 'golden hour' was frequently mentioned, referring to uninterrupted skin-to-skin in the first hour after birth:

> I think she said it was called golden hour or something. So, it's like they don't do anything with you and your baby until like an hour after birth. So, it's just you and them having skin-to-skin for like an hour. (Site 3 Mother4)

Mothers reported that midwives actively supported their preferences for immediate skin-to-skin and explained how this would usually be facilitated in hospital settings if mother and baby were well:

> She helped me to build a birth plan, and we discussed what is important for me… I told her I want the skin-to-skin, and she told me in the hospital it's the general norm. I asked what happens when baby is born and she told me in the hospital, usually if everything is OK with baby, baby will stay in your chest. She told me what happens usually and we make a birth plan and print and she uploaded the system with my birth notes, my pregnancy notes. (Site 4 Mother2)

Some mothers described receiving tailored explanations about how skin-to-skin would work in the context of caesarean births or multiple pregnancies. While acknowledging

potential logistical differences, midwives emphasised that contact would still be prioritised where possible:

> I was forewarned the mechanics would be slightly different with twins because the neonatal teams would be on standby outside the room and that they would go outside the room, get checked over and then come back. We did talk about all those things and just making sure that we still had that contact and that me and my partner were both set up to do that with one each of the twins. (Site 2 Mother5)

Most mothers replayed positive stories about their **skin-to-skin experience**, receiving skin-to-skin as quickly as possible after birth and for a prolonged length of time. Mothers described feeling grateful that skin-to-skin was prioritised over checking, cleaning or weighing their baby. Many mothers recalled their baby being placed onto their chest immediately after birth, with midwives actively facilitating this contact. This early initiation was often described as instinctive, emotional, and memorable: '*I remember I cry a bit, my husband cry a bit*' (Site 4 Mother2). Many mothers described uninterrupted contact lasting one to three hours or longer, with routine observations and procedures delayed or completed subtly to avoid disruption:

> They really did leave as many checks as possible 'til after… they gave us that bonding time and space. (Site 3 Mother5)

Several mothers described being physically supported to maintain skin-to-skin for extended periods of time, including after caesareans, during recovery, or when movement was restricted:

> I had him in skin-to-skin for ages… all the way back from theatre. I still had him in skin-to-skin and then when we got back I kept him there just until we'd phoned friends and family… The midwives were supportive with that because obviously I couldn't move from the spinal, so a midwife came in just to support [dad's name] with getting him in the right position. (Site 4 Mother6)

In contrast, a few mothers experienced very brief periods of skin-to-skin before deciding to pass their baby on to their partner or putting them into their cot. One mother described feeling unsure about what to do during skin-to-skin. She felt that HCPs assumed she should know what to do and therefore did not receive detailed explanations or support.

> We were just sort of staring at each other… They just told me to speak to him and pick him up every two hours and do skin-to-skin… It felt like 'you should know this' because they were saying 'come up every two hours, do skin-to-skin' and then I was feeling stupid for asking the questions… I was asking 'what do I do with him?', and then they were saying, 'well, do skin-to-skin, pick him up'. (Site 2 Mother4)

In one account, skin-to-skin contact was initiated despite the mother having initially indicated that she did not wish for it. She explained that, based on her previous births, she expected her newborn to be managed in the same way as her other two children, for whom skin-to-skin had not been discussed and babies had been immediately

dressed and placed beside her. This prior experience informed her expectations and preferences at the time. Although the initiation of skin-to-skin did not align with her stated wishes, she later reflected positively on the experience, describing it as something new and enjoyable. Skin-to-skin ultimately provided her with a meaningful experience that she had not had with her earlier births:

> Before giving birth, before the baby was coming out, they asked me if I would prefer the baby to be on top of me and I said no… Because my other children, the midwife didn't ask me that and when they remove them, they will clean them and dress me also up. And by the time I will be sent to my bed, they will put the baby in bed and then place her beside me and sometimes they will put her beside on top of the bed, whereby I will be sleeping beside her. So, this time when they asked me, I said they should do the same. But when she came out, they put her on top of me, and I started giving her kisses and all that… It was something new. I like it. (Site 4 Mother3)

In the **neonatal context**, holding the baby in skin-to-skin contact for prolonged periods of time was also described: '*Yeah, it was you know, it wasn't like it was 10 minutes here and there it was good, solid time together, yeah*' (Site 3 Mother2). This mother described how both she and her partner were encouraged to hold their baby in NICU as soon as they were able to come out of their pods:

> So, when he was able to come out. Yeah, it was very much promoted, you know, with the shields, you know, the screening, the screens around you to kind of have your night gown and take your top off and you know, down onto the chest. And his daddy was very excited for that as well. And I think it was important for us too. Yeah, it as soon as it could be done. It was done, yeah. (Site 3 Mother2)

Information and support for **skin-to-skin continued in the postnatal period** after discharge from hospital. Many mothers described being encouraged to continue with the practice at home. Several mothers highlighted the importance of reminders, suggesting that repetition was helpful even when information was already familiar. Health visitors and infant feeding teams played a key role in reinforcing these messages, sometimes providing practical guidance during feeding difficulties:

> Someone from the infant feeding team came out to my house after he was born because I was still having issues feeding. I do remember her saying 'just take your clothes off, get the baby stripped down, you stripped down, and just let him lay on you for feeding'. That was a help definitely. (Site 2 Mother7)

Despite the majority of mothers receiving information about skin-to-skin, a smaller group perceived limited, surface-level or assumed knowledge. For these mothers, skin-to-skin was mentioned, but not explored in detail or tailored to their needs. Some multiparous mothers felt that having previous children resulted in reduced discussion, even though each birth and postnatal experience was different:

> This time around, with the third, not really any of that information, but I think that's because I have told them that I was happy enough and I was pretty confident with what I needed to do. (Site 3 Mother1)

Some mothers described skin-to-skin as being addressed in a procedural or 'tick box' manner, such as within birth planning or 'golden hour' discussions. In these accounts, mothers were asked whether they wanted skin-to-skin but felt there was little else given beyond this:

> It was quite a tick box. I think there was 'what do you want to happen in that golden hour? Do you want to do skin-to-skin as part of a birth plan?' And I wouldn't say there was much said. I just said, 'yes, skin-to-skin for sure'… It's hard to say, we didn't really know how it would go, whether I'd have to have a C-section, so I don't think it was really explored like how it would go each way. (Site 2 Mother1)

Bonding and early relationship building

Some mothers recalled receiving information about other aspects of bonding, both antenatally and postnatally. This included relational aspects such as talking to their baby, making eye contact, singing, reading, and interacting with the baby before birth. Several mothers described antenatal information about the baby's sensory awareness in utero, including babies hearing, and becoming aware of and familiar with their parents' and siblings' voices.

> In the antenatal class and with the health visitor… talking about how when they're in utero, they can hear you, see lights, even smell and things and talking about reading to them, singing to them before they're born. (Site 4 Mother6)

It was reported that midwives and health visitors provided encouragement around talking, singing and touching the bump, as well as continuing these interactions after birth:

> Building a relationship with bump, talking and singing and touching. Just trying to relax and connect with the baby while it's still in the belly. And then obviously when he was born, she gave me information about like skin-to-skin and how that can really help develop attachments. (Site 3 Mother4)

Some additional bonding focused activities, such as baby massage, bathing, music, hypnobirthing and yoga, were mentioned, but these were often encountered through leaflets, word of mouth, classes, or personal initiative, rather than being actively discussed with midwives.

One mother remembered being given information when she attended a lactation clinic about making sure her baby was facing her when in the pram '*because the baby doesn't want to see the world. Now, the baby only wants to see you*' (Site 3 Mother6). While others reported being given information, on occasion, this was described as reminding them of what they felt they already knew:

> I got an information sheet on talking to baby for bonding and singing to them. And they obviously can't really respond, but how important it is to talk to your baby... I think it's good to just be reminded (Site 2 Mother8).

Some mothers appreciated scientific explanations, which helped to justify practices which might otherwise feel trivial or socially discouraged:

> [The How to Build a Happy Baby leaflet] just gives you a bit of confidence to have that science behind it… Sometimes people have the view of 'you're spoiling your baby', but I really enjoy all the research behind it. It just helps you know that you're doing the right thing by all the little things that you're doing with your baby by like holding them and giving them that attention and contact. (Site 3 Mother3)

Others described learning about eye contact, facial expressions, and proximity, particularly during feeding, as ways of deepening connection:

> [HCP] said that babies can see like 8 to 12 inches away, and that's as far from the breast to your face. So, she was telling me, when I'm breastfeeding, just really enjoy that time and take it slowly, because then he will always look up and see you. It's so lovely, he just sort of stares up at you. (Site 2 Mother4)

Despite many positive examples across sites, many mothers reported little or no discussion about bonding beyond skin-to-skin. Some only recognised this gap when reflecting on their experiences, especially when bonding had not been easy. One mother described significant challenges bonding with her baby, alongside mental health issues, noting that although professionals showed care and concern, no one asked about her relationship with her baby or offered guidance on building it:

> I've had signs of depression, and I've never, ever been like that…. I'm not saying conversations about relationship would have helped, I don't know whether it would have done… I didn't think at the time, 'oh, you've not spoke to me about the relationship'… I could tell they really cared about our well-being, but nobody said even when I had the baby blues, I don't feel like anyone said like, "how do you feel about [baby]? How's your relationship with her?"… I didn't think at the time, my mental health was suffering, I physically felt quite unwell afterwards and the feeding was difficult. (Site 4 Mother5)

One mother recalled significant distress resulting from her belief that breastfeeding was essential for bonding. Through breastfeeding challenges, she felt that she was not able to give her baby the milk she needed, and therefore felt she had failed to bond with her baby:

> For the first two weeks of my daughter being here I was really upset every single day and crying every single day because I felt like number one, I wasn't getting a bond, because I was told that you get this amazing bond with your child and I wasn't able to. She wasn't latching, and she was crying. Every time she went to the boob because she wasn't getting enough from me, she couldn't latch. So, then I felt like we didn't have a bond because I was told that you get this bond from breastfeeding. (Site 4 Mother4)

Some mothers felt that bonding with their baby was idealised in antenatal discussions, with limited acknowledgement that emotional connection may develop gradually rather

than immediately. Mothers described wishing they had been reassured that delayed bonding was normal and not indicative of failure:

> Maybe if they mentioned you might not get that bonding at the start… don't worry about it, that you'll get there. (Site 4 Mother1)

Some mothers described bonding as something that developed over time, rather than occurring instantly after birth. However, expectations that bonding should be immediate caused stress and led mothers to question whether something was wrong. Health visitors played a key role in reassuring mothers, normalising delayed bonding and helping them to feel less anxious:

> The information was good; however, I felt like it were a while till I formed a bond with my baby. It's because it's so hard and I'm like, oh, that I thought I should have a bond straight away, but I didn't. I'm like, "oh, is this normal?", and then my health visitor said it is. (Site 4 Mother1)

Although most mothers appreciated receiving information on bonding, this messaging did not appeal to all. Some felt 'silly' the first time they spoke to their bump but soon got used to it. One mother was happy to listen to information on bonding, but she didn't want to be '*pushed into'* singing or speaking to her bump, which she saw as different to her actual baby:

> For me, there was quite a disconnect between what a bump was compared to the baby at the end. I did lots of like rubbing and quite liked my bump and things, but I just didn't feel singing or speaking was something I was too keen on… Yeah, bring it up, but I wasn't too interested in being pushed on it for sure. (Site 2 Mother1)

Some mothers reported they could not recall being given information about skin-to-skin or building a relationship with their baby:

> I can't recall actually any information on that. I recall knowing the importance of skin-to-skin, but I don't think I was given anything directly. (Site 4 Mother8)

Family relationships

Some participants spoke of how there were no conversations about bonding with their partners. One referred to how this would have been particularly useful as her baby had needed to be admitted to neonatal care, and *'most of the first hours he was with my partner*' (Site 2 Mother4). However, others described how partners were enabled to engage in skin-to-skin with their newborn, especially when mothers required medical care. Several mothers described partners having extended or meaningful skin-to-skin experiences:

> My husband had skin-to-skin for nearly an hour while they were sorting me out… He probably had more skin-to-skin than I did, but obviously nature of the birth. (Site 1 Mother6)

Skin-to-skin contact was framed as beneficial not only for mothers, but also for fathers, reinforcing its role in family bonding. One mother said that postnatal prompts reinforced the importance of both parents having skin-to-skin at home, helping to increase awareness of its value beyond the immediate postnatal period:

> At all my postpartum appointments, they would remind me, 'are you doing skin-to-skin?'. And then, it was actually really helpful, somebody said to me, 'is Dad doing skin-to-skin?' And I was like, 'no, well, he did in the in the first day'. Now if he's getting a cuddle, I'm like, 'just take your top off'. (Site 2 Mother8)

Another mother mentioned attending classes with her partner, this time being taught about bonding with their baby through bathing. Activities such as these were viewed as important so that partners could feel involved in early infant care:

> A few bits about bathing baby and sort of a bonding experience through that. It's nice for dads to do because it's something that they can take the lead in because I think they get forgotten about with it. (Site 4 Mother7)

There were varying ways that mothers experienced guidance on close and loving relationships in relation to wider family. This mother describes how, while she and her partner had been encouraged to restrict bottle-feeds to the two of them, they had come to a different decision:

> I mean, when we were discharged from the hospital, she did say to us, so, if we are giving him a bottle, it should only be mum and dad feeding. Which we kind of did stick to, but then we made our own judgement that actually there's, like for example, my parents and my partner's parents so. If we made the decision that if they were going to be his life for, you know, not just splitting in and out, then we would let them feed and that's been fine. And that takes some of that strain off. (Site 1 Mother2)

One mother who already had children, described efforts by staff to involve siblings in the early postnatal period. This was described as emotionally meaningful for the family:

> My little one had been asleep up the stairs the whole time. So, he woke up and they let my husband go get him and bring him in. They were just really sweet and took videos for us and pictures of my little one meeting my little one. *(*Site 2 Mother8)

Parents as partners in care

Mothers in the study described how they felt involved with their baby's care while on the neonatal unit. This included care activities such as washing and drying their babies, changing nappies, and checking feeding tubes. One mother described how she felt staff helped her and her partner feel welcome:

> I think they were glad to see us coming you know, because like we were just like, so hands on, we wanted to be hands on. (Site 3 Mother2)

Survey responses reflected positive supportive experiences while being on the neonatal unit, with one woman commented how expressing milk created a feeding of shared involvement in her baby's care:

> Being showed and demonstrated how to hand express for my baby while she was in NICU so that I could provide milk for her while away from her was very helpful and made me feel included in her care (Site 2 Survey data)

One mother described that '*being there to do all of them routines, all them bonding routines*' (Site 3 Mother2) had helped her to bond with her baby while in the neonatal unit. Another mother described how she was given a knitted square, made by volunteers, which is used to facilitate bonding in the neonatal unit. Mothers were encouraged to keep the square close to them (sleep with it or put it in their bra) so their scent transfers onto it. The square would then be put into the baby's cot '*and the baby can smell the mum and then that way you're there when you're not, if that makes sense. And then the baby can bond with you*' (Site 1 Mother1). This mother described how her partner was also encouraged to add his scent to a knitted square, and how she '*got a little clip that one of the nurses gave me so he could clip it onto his chest*' (Site 1 Mother1). This mother valued being shown how to tube feed her baby as it meant that she was more knowledgeable and able to provide this care:

> And she was like, oh, you can do something called Ng competencies, which is where they watch you do it, or so you watch them do the first one, like a troubleshooting thing. So, I had a leaflet, and then you have to do three being supervised. And do it on your own. …. I was so excited once that lady said you can do it because to me, I thought, oh, I'm not qualified, I'm not clinical, I'm not sterile or whatever you want it to be. They said you don't have to be to do tube feed. It's literally just a simplest kind of plunge it in a thing. But it was so nice someone could show me to do that. And in the end, I did do some of that as well. … I enjoyed it. I would much rather have fed her the normal way, but it was nice that I could help her care. (Site 1 Mother1)

Although she did caution that "*some parents might feel pressured into it*" (Site 1 Mother1)

Summary of key findings

Across the perinatal period, many mothers described receiving respectful, compassionate and evidence-based support that helped them make informed feeding decisions and manage challenges. Breastfeeding support was generally viewed as a routine and valued aspect of care, while many mothers described positive support for skin-to-skin contact, responsive caregiving and parent–infant relationships. Specialist infant feeding teams, peer supporters and knowledgeable professionals were credited with helping mothers initiate and sustain breastfeeding, particularly during periods of difficulty.

Mothers reported receiving clear information about breastfeeding, infant behaviour and responsive feeding, which increased their confidence and understanding of their babies' needs. Breastfeeding promotion was generally experienced as supportive rather than judgemental. Specialist infant feeding teams were viewed as a particularly

valuable resource due to their expertise, accessibility, responsiveness and ability to provide tailored support. Relational aspects of care were also highly valued, with mothers emphasising the importance of being listened to, believed and treated with kindness, empathy and reassurance. Peer support services further contributed by normalising feeding experiences, offering practical guidance and providing emotional support. Positive experiences were particularly evident when care was tailored to individual circumstances and needs. However, experiences of such individualisation varied, with gaps identified for some parents with specific language, cultural, religious, neurodivergent, health or family-structure needs.

Despite these strengths, mothers reported inconsistencies in implementation across services. Conflicting information from different professionals and variation in staff knowledge, confidence and expertise were seen, particularly regarding breastfeeding management, combination feeding, bedsharing, tongue-tie support and expressing milk. Antenatal education often focused on breastfeeding benefits but was perceived as providing insufficient preparation for common feeding challenges and alternative feeding methods, leaving some parents underprepared.

Access to support was also variable, with practical and social barriers sometimes limiting engagement. Concerns about inclusivity were raised by some same-sex parents, non-birthing parents and families with specific cultural, religious or medical needs.

Emergent recommendations for BFI implementation

Increase practical infant feeding education

- Parents consistently valued practical demonstrations and visual learning approaches more than written information alone. It is therefore important that antenatal and postnatal education includes visual demonstrations, for example, of positioning and attachment and paced bottle feeding, opportunities to practise skills using dolls or models, visual demonstrations, videos, and QR-linked resources. Classes should be interactive, accessible, and suitable for different learning styles, with opportunities for discussion and questions.

Provide realistic infant feeding information

- Infant feeding information should provide a more realistic and balanced account of breastfeeding, formula feeding, expressing, and mixed feeding. While mothers valued information about the benefits of breastfeeding, many felt underprepared for the practical and emotional realities of feeding, including pain, fatigue, latch difficulties, concerns about milk supply, and the unpredictability of infant behaviour. Information should therefore normalise common feeding challenges, explain when and how to seek support, acknowledge that feeding journeys may change over time, and reassure parents that changing feeding plans does not represent failure.

Ensure consistent and evidence-based support across services

- Mothers described receiving inconsistent information from different professionals, particularly in relation to breastfeeding difficulties, mixed feeding, expressing, infant weight gain, and formula feeding. Findings highlight a need for greater consistency across maternity, neonatal, health visiting, and community services, part of which could be addressed through multidisciplinary

workforce training. Services should strengthen communication and handovers between professionals, improve shared documentation and care planning to ensure consistent evidence-based messaging.

Address overreliance on specialist infant feeding support

- Specialist infant feeding teams were frequently described as pivotal to mothers' feeding experiences and confidence. However, mothers also perceived these teams to be overstretched. The findings highlight a need for workforce planning and workload modelling to ensure sufficient capacity to meet demand, maintain continuity of care and reduce pressure on specialist teams.

Proactive models of support

- The findings reinforce the importance of proactive infant feeding support, consistent with the BFI emphasis on anticipating parents' needs, initiating supportive conversations and ensuring timely access to help before difficulties escalate. Services should therefore consider more proactive approaches, including routine follow-up contact after discharge, proactive check-ins by midwives, health visitors, or IFTs, clear and simple routes for accessing support, repeated signposting throughout pregnancy and the postnatal period. Reducing the burden on mothers to initiate support may improve engagement and early identification of feeding difficulties, which may also support ongoing breastfeeding.

Ensure infant feeding support is inclusive

- Some participants felt that existing services and education were not sufficiently inclusive of different family structures, identities, or cultural experiences. This was particularly evident among same-sex couples, non-birthing parents, and families with specific language, religious, or cultural needs. Services should review teaching materials and language for inclusivity, better acknowledge diverse family structures, include information relevant to non-birthing parents and induced lactation, ensure effective use of interpreters where required, and provide culturally responsive care. One suggestion from mothers themselves included partnering with doulas from global majority or religious communities to facilitate culturally appropriate care in the early postnatal period.

Recognise the influence of social and digital contexts

- Infant feeding decisions and experiences were strongly shaped by family, peers, workplaces, and social media. While online spaces provided support and reassurance for many parents, they could also contribute to pressure, misinformation, unrealistic expectations, and commercial influence. Services should acknowledge social media as an important information source. Further training and resources are needed to enable HCPs to enquire about and non-judgementally discuss mothers' social media use, signpost to trusted and evidence-based digital resources, support parents to critically evaluate online content. Parents may benefit from guidance that helps them navigate conflicting information and social pressures around feeding.

Peer and community support

- Peer support groups including online communities and breastfeeding groups, family hubs, and community-based services were highly valued for reducing isolation, increasing confidence, and normalising feeding experiences. Continued investment in these various forms of support is needed. Targeted peer support for parents with additional needs should also be considered.

Embed emotional wellbeing within infant feeding care

- Infant feeding experiences were closely linked to mothers' emotional wellbeing, confidence, and mental health, and there is an interrelationship between infant feeding support and emotional support. Mothers valued emotionally supportive care, reassurance, and professionals who checked on their wellbeing alongside infant feeding.
- While maternity care professionals are expected to enquire about mental health at every contact, these findings suggest that this does not always occur consistently in practice. Consideration should therefore be given to strengthening the integration of emotional wellbeing within infant feeding support, including reinforcing expectations around routine enquiry, enhancing staff training and confidence in having sensitive conversations, and ensuring sufficient time within contacts to address both feeding and emotional needs.
- Services may also benefit from monitoring the extent to which maternal wellbeing is routinely discussed alongside infant feeding, helping to ensure that emotional support is embedded as a core component of care rather than addressed only when concerns become apparent.

Improve continuity of care

- Where mothers experienced continuity of care, they described feeling more comfortable, understood, and supported. In contrast, fragmented care could lead to repeated explanations, inconsistent information and reduced trust. Services should seek to improve continuity through named professionals or small teams where possible, effective communication between professionals, continuity for families with complex feeding needs or vulnerabilities, clearer documentation of feeding plans and ongoing concerns. Continuity was particularly valued by mothers requiring ongoing or specialist support.

Deliver personalised, practical, and ongoing support for skin-to-skin

- Given the evidence supporting skin-to-skin contact and its importance within the BFI standards, services should ensure all parents receive personalised, practical and ongoing support to establish and continue skin-to-skin contact where appropriate.
- Support should be tailored to individual needs and birth circumstances, provide clear instruction and demonstration rather than relying on written information alone, avoid assumptions about prior knowledge, and be reinforced consistently across antenatal, inpatient postnatal, and community care settings.

Broaden and normalise support for bonding and early relationships

- Proactive guidance on everyday bonding behaviours and to support the development of parent–infant relationships is needed throughout the maternity, neonatal and postnatal pathway, in line with Baby Friendly standards.

- Care should be undertaken to normalise diverse bonding experiences and address expectations, proactively reassuring parents that bonding may develop gradually.
- Relational, hands-on involvement needs to be promoted in neonatal care to support parents as partners in care, ensuring involvement is encouraged but not experienced as pressure, adapting to individual preferences and confidence as appropriate.

Facilitate partner and family involvement

- Partners and wider family members often played an important role in practical support, emotional wellbeing, and feeding decisions.
- Mothers valued when services actively included partners and recognised their support needs. HCPs should routinely involve partners (and wider family members, such as grandmothers where possible) in feeding discussions and education, encourage shared caregiving and bonding opportunities, considering differing family structures and provide information specifically tailored to partners.

Antenatal breastmilk expression

- Findings suggest that awareness of AME has increased leading some mothers to perceive it as an expected aspect of pregnancy preparation. However, inconsistent messaging and limited practical support contributed to confusion, self-doubt, and anxiety when mothers were unable to express colostrum.
- Mothers particularly valued reassurance from staff that expressing only small amounts, or none, was normal and did not predict breastfeeding success. If AME is suggested, professionals should explain its purpose clearly to avoid misconceptions and include normalising messages about variation in milk expression. Written information alone may be insufficient; mothers may benefit from practical demonstrations, discussion during appointments, and opportunities for follow-up support.

Recommendations for the BFI programme

- **Recognise the influence of social and digital contexts,** including on mixed feeding decisions. Support practitioners to discuss social media use, address misinformation and commercial influence, and signpost parents to trusted digital resources.
- **Increase emphasis on practical, personalised antenatal and postnatal support** to build on parents' preference for visual, interactive and skills-based learning. Antenatal conversations should be realistic and individualised, including previous feeding experiences, expectations, likely challenges and where to get help.

ATTUNE STUDY

15

Chapter Fifteen: Summary and recommendations

Overall, the ATTUNE study brings together a substantial body of evidence supporting the UNICEF UK BFI as a comprehensive, evidence-based framework for improving infant feeding and relationship-centred care. Across the evidence reviews and case studies, the findings show how the different standards work together across the care pathway to support breastfeeding and responsive feeding, strengthen parent-infant relationships, build parental confidence and wellbeing, and improve outcomes for infants and families. They also highlight the importance of the wider conditions in which BFI care is delivered, including a knowledgeable and supported workforce, continuity and consistency of care, organisational leadership and culture, and services that are responsive to the needs and circumstances of different families. The findings also reinforce the value of BFI as an established model for managing and sustaining organisational change, demonstrating how evidence-based standards, leadership and continuous improvement can support changes in practice and care over time.

This chapter draws these findings together, first presenting a summary of key findings across the evidence reviews and staff and parent case studies. It then presents an overarching recommendation for the continuation and sustained support of the BFI, followed by recommendations for strengthening the BFI standards and their implementation, and priorities for future research.

Summary of key findings

The BFI standards provide an integrated framework for infant feeding and relationship-centred care

Overall, the evidence reviewed through ATTUNE supports the BFI standards and the practices and principles that underpin them. Across the evidence, the BFI standards emerge as interconnected components of care rather than discrete practices. The standards span preparation for feeding and parenting during pregnancy, support for establishing and continuing feeding, keeping mothers and babies close, responsive feeding, and supporting close and loving relationships. Within neonatal services, these principles extend to enabling parents to have a central role in their baby's care, supporting breastmilk feeding and maximising opportunities for closeness and contact. Together, these practices support breastfeeding and other feeding methods while also promoting parental confidence, responsive caregiving, parent-infant relationships and wellbeing.

The evidence therefore supports the BFI approach of integrating infant feeding with relationship-building rather than treating these as separate areas of care. Skin-to-skin contact, keeping parents and babies together, responsive feeding and everyday interactions, such as touch, talking and comforting, simultaneously provide opportunities to support feeding, parental confidence and developing relationships. This interconnectedness is particularly evident within neonatal care, where family-integrated approaches, skin-to-skin contact, breastmilk feeding and parental involvement work together to support feeding, developing parent-infant relationships, parental confidence and readiness for discharge.

Delivering the standards effectively requires individualised, relationship-centred support

The evidence strongly supports the emphasis within BFI standards on informed decision-making and care that is responsive to parents' individual needs. Central to this is parental autonomy, ensuring that families receive clear, evidence-based information while their individual feeding decisions and circumstances are respected and supported without judgement. How support is provided is as important as the information or intervention itself. Parents valued honest and realistic preparation, practical support, compassionate and non-judgemental communication, and being listened to and involved in decisions. Antenatal preparation was most valuable when connected to ongoing postnatal support, while proactive, skilled help following birth and timely responses to feeding difficulties were particularly important.

The findings also reinforce the importance of continuity and consistency across the BFI care pathway. Parents may encounter maternity, neonatal, health visiting, specialist infant feeding, peer and community services, and the benefits of BFI are more likely to be realised when these operate as a coherent system of support. Fragmented care and contradictory information can undermine parental confidence, whereas trusted relationships, consistent information and accessible specialist and peer support can help parents navigate feeding challenges and sustain their decisions.

Applying BFI standards requires responsiveness to different families and circumstances

A consistent framework does not mean providing identical care. BFI provides consistent standards and principles for care, while their delivery needs to be responsive to parents' individual circumstances, preferences and needs. Feeding difficulties, fatigue, maternal wellbeing, socioeconomic circumstances, cultural influences and wider family demands can all affect how parents experience and enact infant feeding information. This is particularly apparent in relation to infant sleep, where feeding, proximity, fatigue and family circumstances interact, reinforcing the importance of realistic, open and non-judgemental conversations about safer sleep.

The findings also reinforce the importance of recognising the wider family context, including the role of partners and other family members in feeding decisions, practical and emotional support, and developing relationships with the baby. Greater attention to partners and diverse family structures would strengthen the family-centred approach already embedded within BFI.

There are also opportunities to strengthen how the standards respond to diversity, inequalities and areas where parents identified gaps in support. Some families require additional or differently tailored support, while the case studies identified gaps around formula and mixed feeding, tongue-tie and antenatal breastmilk expression. The findings therefore reinforce that equity within BFI should be understood as responding appropriately to different needs rather than providing the same support to everyone.

An educated and supported workforce is essential to translating BFI standards into practice

Workforce education is integral to the BFI framework, and the findings strongly reinforce its importance. Training supports staff knowledge, confidence and consistency, particularly when it is practical, skills-based and reflective rather than focused on knowledge acquisition alone. Staff themselves described BFI as providing a shared evidence-based framework that helped standardise practice, improve communication and support positive changes in care and culture.

However, education alone is insufficient. Staffing shortages, workload, limited time, competing priorities and workforce turnover affect both opportunities for education and staff capacity to translate learning into practice. Sustaining the standards therefore requires protected time, access to specialist expertise, continuing education and organisational conditions that enable staff to provide the quality of care expected within BFI.

Sustaining BFI standards requires organisational and system-wide commitment

The evidence demonstrates that successful BFI implementation depends on more than individual practitioners delivering individual standards. Leadership, organisational culture, staffing, service design, resources and consistent policies determine whether BFI principles become embedded in everyday care. This was evident across skin-to-skin, keeping parents and infants together, neonatal care and workforce education, and was reinforced by staff experiences of the work required to maintain BFI practice over time. Audit, monitoring and quality improvement also emerged as important mechanisms for sustaining BFI, providing opportunities to identify variation in practice, respond to gaps, maintain staff competence and use parent and service data to drive continuing improvement. These findings strongly reinforce the BFI Achieving Sustainability standards and their emphasis on leadership, organisational culture, monitoring and progression as foundations for embedding and sustaining Baby Friendly practice.

BFI also provides an important framework for maintaining evidence-based, relationship-centred infant feeding care within increasingly complex health, social and commercial environments. By establishing shared standards for practice, workforce education, organisational responsibility and the provision of independent information, it can help protect consistency and quality of care in the context of workforce pressures, fragmented services, inequalities, social media and commercial influences. Continued implementation of the Code within BFI, alongside attention to emerging digital and commercial influences, remains important in enabling families to access independent, evidence-based information and make informed feeding decisions.

Overall, the findings demonstrate that the strength of BFI lies in both the individual standards and the way they operate collectively across the care pathway. Effective Baby Friendly care integrates infant feeding with responsive, relationship-centred and family-focused care, supported by a knowledgeable workforce and organisational systems that enable consistent practice. The findings also highlight that implementation needs to remain responsive to the realities of families' lives, inequalities in access and experience, and the wider social and commercial

environments in which infant feeding decisions are made. An overview of what enables effective and sustainable BFI implementation is portrayed in Figure 17 below.



Figure 17. Key factors enabling effective and sustainable implementation of the UNICEF UK BFI[237].

The recommendations that follow build on this evidence, beginning with an overarching recommendation for the continuation and sustained support of the BFI, before considering how the standards and their implementation can be further strengthened, and identifying priorities for future research.

Overarching recommendation

ATTUNE strongly supports the continuation and sustained implementation of the UNICEF UK Baby Friendly Initiative across maternity, neonatal, health visiting and related services. This is underpinned by evidence supporting the BFI standards and the practices and principles on which they are based, together with findings demonstrating the value of BFI as a comprehensive framework for integrating infant feeding and relationship-centred care with workforce development and continuous quality improvement.

Without such a framework, there is a risk of greater fragmentation and variation in practice, reduced consistency across services, and increased reliance on individual practitioners and local priorities to maintain standards. Continued investment in BFI is therefore important not only for maintaining existing standards, but for sustaining and

[237] Reflecting the BFI Theory of Change, these interconnected conditions support the delivery and sustainability of relationship-centred infant feeding care Theory of Change: Creating change for babies and children in the UK - Baby Friendly Initiative

strengthening improvements in care and outcomes for infants, parents and families. This should include continued emphasis on the BFI Achieving Sustainability standards, supporting organisations to embed Baby Friendly principles through leadership, culture, monitoring and continuous progression.

Continued implementation should be accompanied by ongoing development of the programme. The BFI standards should continue to evolve in response to emerging evidence, changing family needs and contemporary care contexts, while retaining clear and consistent core principles. Changes to standards should be communicated clearly and accompanied by appropriate implementation guidance, resources and transition support to enable services to incorporate new requirements without creating unnecessary burden or undermining sustainability.

Recommendations for the BFI programme

While standard specific recommendations have been embedded in each of the chapters (Chapters Three to Fourteen), the following section offers overarching recommendations that apply across all Baby Friendly service areas, reflecting priorities for strengthening and sustaining the BFI programme.

1. Relationship-centred and emotionally sensitive care

- **Continue to make relationship building and emotional wellbeing more visible within programme delivery** by recognising the interrelationship between infant feeding and maternal and infant mental health and ways to promote close and loving relationships.
- **Strengthen how the programme supports services to address the links between breastfeeding, maternal mental health, infant mental health and parental confidence**, including how staff recognise distress, respond sensitively and avoid reinforcing guilt or judgement.

2. Equity, diversity and inclusion

- **Make equity, diversity and inclusion more explicit across standards, training, assessment and programme resources**, including cultural inclusion, disabilities and neurodiversity, different family structures, marginalised communities and the needs of mothers facing additional barriers or stigma.
- **Encourage services to embed equity throughout service design and resource development**, including tailored support for marginalised families and parents with complex needs.
- **Continue to embed equity, diversity and inclusion principles across all aspects of the programme** to ensure all families receive compassionate, inclusive, accessible care.

3. Family-focused care and wider support networks

- **Ensure the standards cover and include support for partners, fathers, wider family members and peer networks** so that families receive consistent, constructive messages and are better equipped to support feeding decisions and early relationships.

- **Support services to recognise the role of partners and significant caregivers**, particularly where mothers or infants are unwell and recovering, while continuing to protect and support the mother-infant relationship.
- **Strengthen family-focused practice more explicitly across resources, training and assessment** to support services to include partners, grandparents and wider family members where appropriate and ensure support is responsive to circumstances and needs.

4. Continuity and consistency of support across the care pathway

- **Position infant feeding support as a continuous pathway across antenatal, hospital and community services**, with care planning, clear referral routes, consistent messaging and multiple postnatal contacts rather than one-off interventions.
- **Strengthen consistency of infant feeding support across the care pathway** by using these findings to review how the BFI programme's standards, education and assessment processes support consistent, evidence-based care across all relevant services and university programmes. Particular attention should be given to reducing variation in information, practical support and staff confidence.

5. Evidence-informed communication in changing digital environments

- **Address the challenges of misinformation in the context of the evolving digital landscape**, supporting staff to identify and respond to misinformation by providing access to evidence-based, independent and trusted sources of information at relevant points.
- **Consider the use of appropriate, trusted, evidence based and independent digital resources** for education and support and to complement face to face support.

Recommendations for BFI implementation

The ATTUNE findings highlight that effective BFI implementation requires more than the delivery of individual standards. It depends on how Baby Friendly principles are embedded, supported and sustained across organisations and the wider care system, while remaining responsive to the changing context in which care is delivered. The following recommendations identify nine priorities for strengthening BFI implementation and sustainability in practice.

1. Respond to contemporary and evolving challenges

BFI implementation needs to remain responsive to the changing context in which infant feeding and relationship-centred care are delivered. ATTUNE identified several contemporary and evolving challenges that have implications for implementation and sustainability, including:

- Increasing workforce and service pressures.
- Digital information environments and social media influences.
- Commercial marketing of breastmilk substitutes and other infant and young child feeding products.
- Rising caesarean section rates in the UK and complications of birth.
- Increasingly complex family circumstances.

- Persistent and widening health inequalities.

Implementation approaches should be sufficiently responsive and adaptable to address these changing influences while maintaining the core evidence-based principles of the BFI.

2. Strengthen and extend sustainable culture change

The ATTUNE findings strongly support the principles underpinning the BFI Achieving Sustainability standards and their focus on leadership, culture, monitoring and progression. Implementation should continue to build on this approach, supporting Baby Friendly as an organisational culture-change programme rather than an accreditation exercise. This should include:

- Embedding Baby Friendly principles within everyday practice.
- Building organisational ownership across all services, rather than responsibility residing primarily with infant feeding teams.
- Reducing reliance on individual champions.
- Ensuring BFI principles remain embedded despite workforce turnover and service pressures.
- Integrating BFI into wider organisational systems and processes.

This is particularly important in the context of the evolving and ongoing challenges identified above.

3. Strengthen leadership and strategic commitment

Sustainable implementation depends on visible leadership and accountability at all levels. Services should:

- Establish executive-level accountability for BFI.
- Integrate BFI within organisational strategies and priorities.
- Ensure infant feeding and relationship-centred care remain visible organisational priorities.
- Align BFI with wider quality improvement, safety, inequalities and family-centred care agendas.
- Support leaders at service and practice levels to maintain momentum and ownership.

4. Take a whole-system approach

BFI should be implemented across the care pathway rather than within individual services in isolation. This includes:

- Maternity.
- Neonatal care.
- Health visiting.
- Hospital-based children's services.
- Community services.
- Family hubs and early years services.
- Universities and workforce education programmes.

Greater integration and collaboration across these settings should enable parents to experience consistent Baby Friendly principles throughout their care journey.

5. Strengthen workforce capacity, capability and wellbeing

A knowledgeable, skilled and supported workforce is fundamental to BFI implementation. Services should:

- Ensure adequate staffing and protect time for infant feeding and relationship-centred care.
- Maintain access to specialist infant feeding expertise.
- Protect time for ongoing training and competency development across the workforce including for IFLs.
- Address workload pressures that constrain implementation.
- Recognise and monitor staff wellbeing.
- Support reflective practice and psychologically safe working environments.
- Training should extend beyond breastfeeding knowledge to include practical skills, communication and emotional support, cultural competence, trauma-informed care and responsive relationship-building.
- Existing mechanisms such as the National Infant Feeding Networks (established by UNICEF UK) should be further utilised to support collaborative learning, disseminate emerging evidence and good practice, and address implementation challenges identified by ATTUNE.
- Continue to work with and monitor developments within midwifery/health visiting training programmes.

6. Improve consistency and continuity of information and care

Parents frequently reported inconsistent information and experiences across professionals and services. Implementation should therefore strengthen:

- Consistent, evidence-based messaging across professions and services.
- Shared and multidisciplinary training.
- Communication and collaboration between services.
- Continuity across care pathways.
- Access to specialist support when required.

Consistency should not, however, mean providing identical care; information and support should remain responsive to individual needs and circumstances.

7. Embed equity, inclusion and responsiveness

Equity and inclusion should be integral to BFI implementation rather than treated as additional considerations. Services should understand and respond to the needs of their local populations, including:

- Global majority families.
- Religious and belief systems
- Families experiencing socioeconomic disadvantage.
- Young parents.
- Neurodivergent parents.
- LGBTQ+ families.
- Families with disabilities or complex health or social needs.

- Families who experience language or other barriers to accessing care.

Implementation and evaluation should consider whether BFI care is accessible, acceptable and responsive across different groups, rather than assuming that universal provision results in equitable care.

8. Strengthen parent, family and community involvement

Parents, families and communities should have a stronger role in shaping how BFI is implemented and improved. This should include:

- Involving parents and families in service design and improvement.
- Using parent experience and feedback as part of quality improvement.
- Proactively engaging underserved and seldom-heard communities.
- Strengthening integration of infant feeding peer support within local health and community services by
    - Ensuring peer support is adequately resourced, with appropriate training and supervision.
    - Providing flexible, culturally responsive peer support that fosters trusting relationships between parents, peers and professionals.
- Ensuring services remain responsive to local population needs.
- Considering the role and inclusion of partners and wider family members.

9. Strengthen monitoring, evaluation and continuous quality improvement

Monitoring should support ongoing improvement and sustainability rather than focus solely on demonstrating compliance with accreditation requirements. Services should:

- Use meaningful implementation and outcome measures.
- Monitor parent experiences alongside breastfeeding and other feeding outcomes.
- Assess whether BFI principles are embedded within organisational culture and everyday practice.
- Monitor staff knowledge, confidence and experience.
- Use audit and quality improvement data actively to inform service development.
- Strengthen management information systems and quality assurance processes.

Recommendations for research

While recommendations for research are embedded throughout the review chapters (Chapters three to thirteen), ATTUNE identified broader priorities both for BFI as a programme and overarching recommendations across the wider evidence base for infant feeding and relationship-centred care. The following recommendations address these areas, paying particular attention to implementation, longer-term outcomes, inequalities and wider contextual influences.

1. Strengthen research specifically evaluating the Baby Friendly Initiative

While ATTUNE identified substantial evidence supporting the practices and principles underpinning the BFI standards, there is a need for further research examining the UNICEF UK BFI programme and system-wide approach, including how it is

implemented, sustained and influences outcomes across different service contexts. Research should examine:

- The impact of BFI accreditation and different stages of accreditation on parent, infant, staff and service outcomes.
- The impact and added value of the BFI Gold Award and sustainability framework.
- How individual BFI standards operate together as part of an integrated programme.
- How BFI is implemented and sustained across maternity, neonatal, health visiting and related services.
- The mechanisms through which BFI influences practice, organisational culture and outcomes.
- Leadership, workforce and organisational factors influencing implementation and sustainability.
- The costs, resource requirements and cost-effectiveness of BFI implementation.
- How BFI implementation and outcomes vary across different populations, settings and service contexts.

This research should move beyond assessing breastfeeding outcomes alone to consider the wider outcomes that BFI is intended to influence, including parent–infant relationships, responsive caregiving, parental confidence and wellbeing, staff practice and organisational culture.

2. Strengthen the quality of the wider evidence base

Future research across infant feeding and relationship-centred care should prioritise:

- Large, multicentre, well-powered studies where appropriate.
- Longer follow-up beyond the early postnatal period.
- Better reporting of interventions, implementation processes and fidelity.
- Standardised outcome measures to facilitate comparison across studies.
- Greater use of objective measures alongside self-report.

3. Examine longer-term and broader outcomes

Much of the existing evidence focuses on short-term breastfeeding outcomes. Future research should examine:

- Sustained breastfeeding and other feeding practices.
- Parent–infant relationships and attachment.
- Parental wellbeing and mental health.
- Child development and behavioural outcomes.
- Longer-term infant and family outcomes.

4. Address inequalities and inclusion

Important evidence gaps remain in relation to underserved and underrepresented populations. Future research should include:

- Families experiencing socioeconomic disadvantage.
- Black, Asian and other global majority communities.
- Neurodivergent parents.
- LGBTQ+ families.

- Young parents.
- Parents with disabilities and complex needs.
- Families experiencing language barriers.

Research should be co-produced with relevant communities to ensure that questions, methods and outcomes are meaningful and accessible.

5. Understand how care works within current systems and contexts

Beyond BFI specifically, research needs to better understand how infant feeding and relationship-centred care are shaped by the wider contexts in which families and services operate. This includes the interaction between:

- Infant feeding and parent–infant relationships.
- Parental wellbeing.
- Workforce capacity and practice.
- Organisational culture and service challenges.
- Health and social inequalities.
- Digital information environments.
- Wider social and commercial determinants.

This requires longitudinal, theory-informed, implementation-focused and inclusive research capable of examining what works, for whom, how and under what circumstances within current maternity, neonatal, hospital-based children's services, community services and universities.

Conclusion

In conclusion, the ATTUNE study provides strong and consistent evidence that the UNICEF UK BFI offers a comprehensive, evidence-based framework that integrates infant feeding, relationship-centred care, workforce development and continuous quality improvement across maternity, neonatal, hospital-based children's and community services, and university education programmes. The findings demonstrate that the greatest benefits are achieved when the standards are implemented as a connected system, supporting not only feeding outcomes but also parental confidence, wellbeing, responsive caregiving and close parent-infant relationships. At the same time, ATTUNE highlights the importance of sustaining the organisational, workforce and leadership conditions that enable Baby Friendly practice to flourish, while ensuring care remains equitable, inclusive and responsive to the diverse realities of family life.

Going forward, ATTUNE identifies a future research agenda focused on strengthening the evidence for implementation, including intervention effectiveness, fidelity, longer-term outcomes and inequalities in access to and experiences of care. The findings will also inform UNICEF UK's ongoing review and development of the BFI standards, guidance, workforce education and resources, helping to ensure that the programme remains responsive to emerging evidence and changing family, service and societal contexts.

Overall, the evidence presented in this report supports continued investment in, and development of, the BFI as a key mechanism for promoting high-quality, evidence-informed care for infants, parents and families, while identifying clear opportunities to strengthen practice, address inequalities and build the evidence base for the future.

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Appendices

Appendix 1 – Advisory group membership

Annie Aloysius	Speech and Language Therapist and IBCLC at St Mary's Hospital and Queen Charlotte's and Chelsea Hospital in London
Anna Byrom	Founder and CEO, All4Maternity
Fiona Dykes	Professor Emeritus, University of Lancashire
Francesca Entwistle	Former Deputy Programme Director for the UNICEF UK Baby Friendly Initiative
Renée Flacking	Professor of Paediatric Nursing, Dalarna University, Sweden
Smita Hanciles	Deputy Programme Director at UNICEF UK BFI leading on education and the Qualifications Framework
Catherine Hine	CEO, Breastfeeding Network
Sarah Johnson	Senior Midwifery Lecturer and BFI lead at University of Lancashire
Rafael Pérez-Escamilla	Professor of Public Health (Social and Behavioral Sciences) and Co-founder and Scientific Lead, Becoming Breastfeeding Friendly Initiative at the Yale School of Public Health
Sarah Pickford	Professional Lead for the UNICEF UK Baby Friendly Initiative
Alison Spiro	UK Steering Group of the World Breastfeeding Trends Initiative (WBTi)
Karen Whittaker	Senior Education and Workforce Lead, Institute of Health Visiting
Clare Whitehead	Infant Feeding Lead, Wirral Community Trust

Appendix 2 – Search terms

A full list of search terms used in the reviews can be found on the University of Lancashire's Lancashire Online Data repository at https://data.lancashire.ac.uk/id/eprint/707

Appendix 3 – Parent survey

Page 1

Research staff at the University of Central Lancashire are undertaking a study funded by UNICEF UK Baby Friendly Initiative. In this survey we are asking parents about their experiences of infant feeding support during pregnancy and the postnatal period.

If you are:

- Aged 16 years or older;
- Your youngest child is 24 months old or younger;
- You received maternity (and/or postnatal care) from [name of maternity trust]

We would like to hear your views.

The time it takes to complete the survey will depend on how much information you choose to share.

It is entirely up to you if you want to take part or not. Participation is voluntary. If you decide to take part all the questions are optional. Please note that any information you share will be used, and it will not be possible to withdraw your data once you have entered your responses.

We don't anticipate any risks, but if you find any of the questions being asked upsetting. You can choose not to answer any questions you feel uncomfortable with. Taking part will not have any direct benefits for you, but you may find it valuable to share your experience. The findings will help us to understand experienced of infant feeding support.

The University is using Survey Monkey to administer this questionnaire. This means your data will be stored by Survey Monkey and used by them in accordance with their Privacy Notice (available https://uk.surveymonkey.com/mp/legal/privacy/), as well as being used by the University for the purposes of this study.

Your responses will be held securely at the University of Central Lancashire, and we will delete your responses 7 years from the end of the study. All information used will be anonymous – no-one will know you took part in this study.

You can find out more about how your information is used from:

- At www.hra.nhs.uk/information-about-patients/
- Leaflet available from www.hra.nhs.uk/patientdataand research
- The University privacy notice for research participants available here Data protection information.
- By contacting a member of the research team (details below)

The information you provide will be used in a report to UNICEF, journal publications, presentations and for teaching purposes.

If you have any questions please feel free to let us know by contacting Professor Gill Thomson (GThomson@uclan.ac.uk) and we will try to help. If you are unhappy or have

a complaint, please contact the Ethics, Integrity and Governance Unit at OfficeForEthics@uclan.ac.uk

Please confirm whether you are happy to proceed to the survey, and for your data to be used for this study Yes / No

If click no – will go to the end of the survey and thank them for their interest.

Page 2

We want you to tell us about your experiences of infant feeding support – you can do this by writing in the text box below and/or uploading files to share poems, drawings, photographs, or voice recordings (using the 'upload file' option below).

You can tell us as little or as much as you'd like, in whichever ways you like. This could include telling us about:

- What support was most (and least) helpful?
- Did the support meet your expectations?
- When did you receive the support?
- Who provided the support?
- What strategies did you find helpful?
- How did the support influence your infant feeding decisions, your confidence to feed your baby, your relationship with your baby, and/or your well-being?
- What additional support did you need?

Page 3

If possible, we would like to collect some basic information from you, so we know who has provided the information [**these questions will be non-compulsory in the survey**]

- Age (brackets will be provided, i.e., 16-20, 21-25, 26-30, 31-35, 36-40, 41-45, 45-50, 50+ years)
- Ethnicity (broad level categories will be used, e.g., White, Asian, Black, Mixed, Other)
- How many children do you have (1, 2, 3, 4, 5+)
- How old is your youngest child (0-3 months; 3-6 months; 6-12 months; 12-18 months; 18-24 months)
- Have you ever breastfed – yes/no - if yes, are you currently breastfeeding – if no, how long did you breastfeed your youngest child; did you breastfeed for as long as you intended?
- Postcode

Page 4

Thank you for taking part in the survey. Your responses have been recorded.

If you would like to be entered into the draw to win a £100 voucher – please click the link (this will take participant to a separate link to record their name and email address so can be stored separately from the responses)

Appendix 4 – Interview schedules

Interview schedule: parents

Opening questions – about you and your baby

- How old is your most recent baby?
- How are you currently feeding your baby?
- How many weeks pregnant were you when your baby was born?

[INTERVIEWER NOTES – ADAPT QUESTIONS BASED ON HOW INFANT IS BEING FED, AND EXPERIENCES OF NEONATAL CARE IF APPLICABLE]

Thinking about *during* your pregnancy:

- Tell me about the infant feeding support/information you received [i.e. What info: classes/groups in your area; leaflets/websites etc. Were different infant feeding options discussed with you?]
    - Who gave you this information? When did they share it with you [i.e. At what point in your pregnancy]?
    - What aspects of the info/support did you find *most* helpful?
    - What aspects of the info/support did you find *least* helpful?
    - To what extent were your information/support needs related to infant feeding met during pregnancy? [if not, why not]
    - To what extent did the information/support help you to consider how to feed your baby? What additional information/support was needed? Did you feel supported in your decisions about feeding your baby?
    - What information were you given about what to expect after birth [ask about information on skin-to-skin, baby's breast-seeking behaviour]?

- What information were you given about building a relationship with your baby?
    - who gave you this information, how was this given, what did you think of it?]
    - To what extent did the information/support help you think about your relationship with your baby? What additional information/support was needed?
- What do you feel were the key messages about feeding and caring for your baby that you were given during your pregnancy?

Thinking about *after* your baby was born:

- Tell me about the support you received straight after birth (in hospital, birth centre, or home if homebirth, neonatal unit) (i.e. **What** support - infant feeding, relationship building – closeness, responsiveness, skin-to-skin, introduction of CF – – for neonatal to probe about preventing parent-infant separation, expressing breastmilk, prolonged skin to skin, and involvement in infant's care, i.e., how supported to provide care, involvement in ward rounds, etc). **Where** did you receive support? **Who** were the most helpful people in supporting you? (e.g., midwives, neonatal unit staff, health visitors, peer supporters, family/friends, internet, etc). **When** were you given support (e.g. were you given enough time, did you receive support at the right time).
- Tell me about the support you received after you left hospital (i.e. **What** support - infant feeding, relationship building – closeness, responsiveness, skin-to-skin, introduction of CF – for neonatal to probe about, continued skin to skin, feeding support from outreach teams/HV, etc). **Where** did you receive support? **Who** were the most helpful people in supporting you? (e.g., midwives, outreach team, health visitors, peer supporters, family/friends, internet, etc). **When** were you given support (e.g. were you given enough time, did you receive support at the right time).

Overall, after your baby was born

- How did you feel about the infant feeding support you received? (PROBE: interactions with health care professionals (e.g. how knowledgeable/non-judgmental/sensitive) Were there any interactions with health professionals that were memorable/stood out to you?
- To what extent did the support you receive after you had your baby meet with your expectations?
- What other support would you have liked to receive, and [also by whom, when and where?]

- To what extent did you feel that the support you received influenced your [infant feeding decisions; confidence/ ability to feed your baby; well-being; relationship or bond with your infant]?
- Were you given information on where you could get support? If yes, what info, who gave you this info. If no, how did you find out where to go for support?
- [If breastfed] - do you feel you were you able to breastfeed for as long as you intended? If no, can you tell us more about the reasons for this? What other support could have made a difference?
- Have you seen any infant feeding advertising (online, posters, tv, social media advertising/influencers, email…)? What did you think of it? What influence did it have on how you fed your baby?
- What does 'helpful' infant feeding support look like for you?
- What additional infant feeding support would you have liked to receive to make your infant feeding experience better?

Demographics:

Age, ethnicity, how many children you have, marital status, postcode.

Interview schedule: staff

- **Role / Band / Where currently (and previously) working**

Thinking about your current workplace

- Tell me about your experiences of working with the BFI standards. What are the benefits? What are the challenges? What do you feel the purpose of the standards is? – what do you think about that? (Probe for infant feeding and close and loving relationships, and in Neonatal services also include-parents as partners in care)
- What training have you completed to support implementing the BFI standards (at university or within the Trust, length/frequency of training/updates)? To what extent did it change anything you do in your practice? Can you give us an example? Have completed practical skills reviews (in positioning and attachment, hand expressing, skin to skin care, responsive bottle feeding)? How knowledgeable and confident do you feel about the BFI standards? What else was needed?
- How do the BFI standards influence your practice/care you provide – for parents, staff, organisational, cultural perspective?
- How do the BFI standards influence how you support parents who experience inequalities (e.g. those who are younger, live in areas of high deprivation, have complex needs, required care on a neonatal unit, from ethnic minority backgrounds, are LGBTQ+)? Are there ways the BFI standards could be improved to support these parents?
- How confident do you feel to support parents with infant feeding? (including when IF isn't going well, complex needs, referral pathways, sick or premature infants) Can you give some examples of how you do this? – what kinds of conversations do you have?
- How confident do you feel supporting parents to have a close and loving relationship with their baby? Can you give some examples of how you do this? – what kinds of conversations do you have? If <u>neonatal</u> – give examples of how you support close and loving relationships and parents to be partners in care.

- What is your understanding of the WHO Code of Marketing of Breast-Milk Substitutes? – how is this implemented in your organisation?

- (If applicable) What changes have you noticed since the BFI standards were implemented in your practice (for parents, staff, organisation, culture, students, staff, parents, babies etc)? What do you think about these changes? Do you have experience working in non-BFI accredited settings – what were the differences?
- Are there any impacts for you personally? (well-being, previous personal experience, workload)

<u>For service/IF Leads</u>

  - What processes [if any] are in place to sustain BFI implementation?
  - Tell me how you feel about implementing BFI standards [personal experiences, challenges, well-being, balancing roles as professionals and parents, personal motivation(s)].
  - What works well regarding implementing the BFI standards?
  - What are the challenges of implementing the BFI standards (for service/ are there challenges unique to your setting/service)? (Are some standards easier to implement than others – why/how; what else is needed? How can we address these challenges to make implementation easier?)
  - Has BFI implementation influenced any other organisational policies (e.g. healthy weight, child mortality, inequalities, breastfeeding at work/staff returning from maternity leave, reducing separation between parents and babies in the hospital setting, any others?)

<u>For all staff:</u>

- Do you have any suggestions or recommendations to change or adapt the BFI?

Appendix 5 – Local evaluation data sources

Tables below list local evaluation data sources from sites, which includes infant feeding and related statistics, feedback from parents, evaluations of classes, workshops, clinics, groups, or peer support services, within or shortly prior to the study period.

Site 1 local data

Data source	Description
Maternity infant feeding statistics	Data from 2022–2025 on total births, % of women who gave breast milk at first feed, % of initiation rate continuing to give breastmilk at discharge to health visitor
Parent feedback 2025	Feedback from four individuals (three mothers and a grandmother) relating to breastfeeding clinics and infant feeding workshops
Staff feedback 2025	Feedback from a staff member who attended an event targeted towards pregnant women

Site 2 local data

Data source	**Description**
Appendix to 2024 strategic document outlining infant feeding statistics	Infant feeding data on total mothers at discharge and infant feeding status at discharge. Breast pump loan statistics.
Parent feedback 2024-25	22 feedback forms relating to site infant feeding services
Tongue tie service overview 2024	Statistics on referrals to, and outcomes from, tongue tie service

Site 3 local data

Data source	**Description**
Breastfeeding group evaluation 2024	Attendance statistics and parent feedback relating to breastfeeding support group
Tongue tie service evaluation 2024	Data on tongue tie service referrals, uptake, outcomes and parent feedback
Peer Support Service evaluation 2024- 25	Data peer support service referrals, contacts,
Breast pump loan service evaluation 2023	Data on numbers, reasons, and outcomes of loans, and parent feedback
Specialist breastfeeding support service evaluation 2023-24	Data on referrals, contacts, parent feedback

Site 4 local data

Data source	Description
Breastfeeding clinic feedback 2023-24	Survey of 43 parents' experiences of breastfeeding clinic support
Breastfeeding clinic feedback 2024-25	Survey of 47 parents' experiences of breastfeeding clinic support
Breastfeeding initiation data 2019-2025	Comparison of local and national breastfeeding initiation data over the period 2019-2025
Maternity infant feeding data 2021-2026	Data on Total Births, Breastfeeding Initiation, Formula Supplementation Rate and Breastfeeding rate at discharge at home

Appendix 6 – Details of literature included in the rapid integrative reviews

Chapter Three: Summary table of reviews on motivations and challenges of infant feeding

Author (Year)	Aim	Number of Studies Included	Countries of Included Studies	Population	Type of Studies	Key Findings
Aderibigbe et al. (2024) (48)	Synthesize evidence from qualitative studies on the experiences of women from around the world who exclusively breastfed their full-term infants.	17	Countries across Africa, Europe, Asia, and Oceania (e.g., Ghana, Ethiopia, Kenya, Tanzania, South Africa, Spain, UK, Ireland, Australia, Thailand, Indonesia, US)	Women who exclusively breastfed full-term infants for at least one month.	15 qualitative studies, 1 mixed-methods study, 1 online dissertation; methods included phenomenology, descriptive and exploratory designs, interviews, and focus groups.	Five overarching themes emerged: (1) Favourable Conditions – supportive policies, physical characteristics, proximity to work, special foods, and maternity leave aided EBF; (2) Not a Smooth Journey – challenges like work-life balance, pain, societal expectations, lifestyle constraints, and financial insecurity; (3) Support – encouragement from partners, family, friends, colleagues, and health professionals; (4) Determination and Perseverance – motivation and prior breastfeeding knowledge helped overcome barriers; (5) Reflections on Benefits – recognized infant health, bonding, maternal satisfaction, contraception, and financial advantages.
Bai et al. (2024) (49)	Synthesize qualitative studies on the breastfeeding experiences of women	8 studies	Canada, Turkey, New Zealand, Iceland, Ghana, China	Mothers with multiple births (twins, triplets) from diverse cultural backgrounds, including 122 participants total	Phenomenology, ethnography, mixed methods, and qualitative descriptive studies	Strong breastfeeding intentions were driven by maternal identity and bonding. Challenges included physical and psychological burdens, immature feeding patterns, and work-breastfeeding conflicts. Stage-specific adaptation strategies ranged from intensive

	with multiple births to support the development of targeted interventions.					early management to individualized adjustments in mature stages. Support experiences varied; while family, medical, and social support were helpful, gaps in tailored professional and informational support were evident. Recommendations included developing multidisciplinary support teams, targeted antenatal education, and promoting co-parenting support frameworks
Baker et al. (2023) (68)	Examine evidence on infant feeding outcomes, experiences, and support in women with severe mental illness (SMI), including associated factors, interventions, and healthcare professionals ' (HCPs) attitudes.	18 studies	UK, USA, Australia, Norway, Greece, Israel and the Netherlands	Women aged 18 years and older, with SMI and a psychiatric episode occurring within 2 years after giving birth	11 cohort studies, 2 cross-sectional, 1 case-series, 1 case-control, 2 qualitative studies, 1 quasi-experimental	Women with SMI are less likely to initiate and maintain breastfeeding compared to women without SMI. Challenges included poor professional support with infant feeding. Education and training are needed for healthcare professionals to individualise infant feeding support and include information about medication and optimising sleep. No evidence of effective interventions to support breastfeeding in women with SMI was identified. Limited evidence was available on women's experiences of infant feeding. Further research is required with larger sample sizes and clearer measures of infant feeding outcomes.
Beggs et al. (2021) (33)	Synthesize empirical literature on women's	59 studies	Primarily UK, USA, Canada, Australia, Iceland, Ireland, Sweden, New Zealand, Netherlands, and Poland	Women of reproductive age who have breastfed or attempted to	Predominantly qualitative (n=42), with some mixed	Many women perceived breastfeeding as positive, natural, and beneficial but felt unprepared for its difficulties. Barriers included

	perceptions about and experiences with breastfeeding, identify barriers they face, and supports they need to guide their breastfeeding choices.			breastfeed, across a variety of socio-cultural contexts	methods (n=10), and a few quantitative articles	physical challenges (pain, latching, milk supply), inadequate support, public shaming, conflicting healthcare advice, and workplace inflexibility. Interpersonal influences (partners, family, social norms) were central in shaping decisions and experiences. Cultural values and local policies influenced perceptions and practices, with judgment reported when deviating from societal expectations. Supports such as peer groups, social media, professional counselling, and flexible public health messaging were found beneficial. The review emphasizes a shift from rigid 'breast is best' rhetoric toward realistic, individualized, and socially inclusive breastfeeding support
Bengough et al. (2022) (76)	Synthesise qualitative evidence on factors influencing women's engagement and satisfaction with breastfeeding support programmes to suggest strategies for improving support	51 studies	UK, USA, Australia, Ireland, Sweden, South Africa, Brazil, Malawi	Pregnant and postnatal women, including first-time and multiparous mothers, with diverse ethnic, educational, and socio-economic backgrounds	Qualitative studies using interviews, focus groups, observations, written responses, and think-aloud methods	Engagement with support is influenced by four overarching process factors: (1) Information provision, (2) Type of implementers, (3) Delivery modes, and (4) Maternal care pathways. Women preferred non-technical, experience-based information and disliked inconsistent advice. Trust and relatability of implementers (e.g., peers or culturally competent professionals) shaped engagement positively. Women valued personalised, flexible, and context-specific delivery modes (e.g., virtual, group-based, or home-based support). Continuity

	alignment with women's needs.					and timing of care, especially antenatal-to-postnatal transitions, influenced satisfaction and outcomes. Effective support needs to match individual women's situations, including cultural, emotional, and physical needs
Billings et al. (2024) (26)	Synthesise existing qualitative literature on breastfeeding experiences of women with a wide range of perinatal mental health conditions .	17 studies	UK, USA, Canada, Ireland, Sweden, New Zealand, Australia, Ghana, DR Congo	Women with perinatal mental health (PMH) conditions including postnatal depression, PTSD, bipolar disorder, eating disorders, OCD, anxiety, and emotional distress (N = 551).	Qualitative studies using phenomenology, ethnography, grounded theory, thematic analysis, and psychoanalytical methods.	Three major themes emerged: Vulnerabilities, Positive Outcomes, and Challenges. Vulnerabilities included a mismatch between expectations and reality, isolation, and self-perception as a mother. Positive outcomes included enhanced bonding, emotional healing, and sense of control through successful breastfeeding. Challenges included lack of consistent professional support, conflicting medication advice, and mental health stigma. Breastfeeding could both improve and worsen mental health, depending on experience and support received. Calls were made for better-informed healthcare support, culturally sensitive practices, and guidance on medication safety.
Chang et al. (2020) (71)	Examine breastfeeding barriers and support experienced by overweight or obese women, support	16 studies	USA, UK, Singapore, France	Pregnant and postnatal women classified as overweight (BMI ≥ 25) or obese (BMI ≥ 30), and individuals providing them breastfeeding support, including healthcare	Mixed-methods systematic review of quantitative, qualitative, and experimental studies using an integrated methodology.	Physical barriers included large breasts, poor infant positioning, delayed lactation, and post-C-section complications. Psychological barriers included low confidence, negative body image, embarrassment, and stigma. Breastfeeding duration was often reduced due to discomfort and perceived milk insufficiency.

	shown to be effective in increasing breastfeeding among them, and perceptions of supporters such as professionals and family.			professionals and family.		Support from healthcare professionals and family significantly influenced outcomes; tailored education is needed for professionals. Research gaps exist in understanding experiences of supporters; further studies are needed to inform effective interventions.
da Silva Tanganhito et al. (2020) (63)	Investigate the breastfeeding experiences, perceptions, and support needs of women with postnatal depression.	6 studies	UK, USA, Canada, Sweden, Norway	Women with postnatal depression (PND), including both self-reported and clinically diagnosed cases, across HICs.	Qualitative studies using interviews, grounded theory, and semi-structured approaches.	Women expressed a strong desire to breastfeed, associating it with being a 'good mother', though this also led to guilt and feelings of failure when unsuccessful. Many struggled with breastfeeding, facing pain, fatigue, and emotional distress, with some reporting breastfeeding difficulties as a trigger for PND. Experiences of healthcare support were mixed; while some received empathetic care, others felt unsupported or judged and faced conflicting advice. Practical and emotional support from family and peers was important yet often lacking or insufficiently tailored. Fear of antidepressant effects on infants discouraged medication use, highlighting the need for informed support around treatment options. A bidirectional relationship was suggested between breastfeeding and PND, reinforcing the need for individualized, timely, and sensitive support from professionals.

Dattilo et al. (2020) (57)	Synthesize qualitative research on parents' attitudes, beliefs, and perceptions regarding infant feeding, and identify influencing factors .	73 studies	Primarily North America, Europe, UK, Australia, Asia, and Africa	Parents or primary caregivers of infants up to 1 year old; mostly mothers.	Qualitative studies using interviews and focus groups; some studies also used mixed methods, but qualitative data were included.	Breastfeeding is broadly viewed as best and most natural, though some cultural exceptions exist. Mothers who breastfeed and those who don't exhibit distinct emotional and social experiences; many feel judged or stigmatized. Infant feeding decisions are strongly shaped by the socio-cultural family environment, including roles of fathers, family elders, and traditions. Parents' expectations for individualized education and culturally sensitive support from healthcare professionals are often unmet. Parents desire factual, non-judgmental guidance that respects their choices and reflects their cultural context.
Gargiulo-Welch et al. (2023) (78)	Explore what is currently known about the lactation and infant feeding care and support needs of trans and non-binary parents and identify implications for midwifery practice in aotearoa New Zealand and research needs .	25 studies	Primarily USA; limited to no data from Aotearoa New Zealand	Trans and non-binary parents, including transmasculine individuals and those who chest feed/breastfeed.	9 original research articles, 9 clinical practice papers, 6 literature reviews, 1 lactation protocol.	Western perinatal systems are built on cis-normative, gender binary foundations, excluding trans and non-binary parents. Trans and non-binary individuals are often invisible in perinatal systems, exacerbated by inadequate data collection and fear of disclosure due to discrimination. There is a widespread lack of provider knowledge about gender-inclusive lactation and perinatal care, leading to misgendering, microaggressions, and inadequate support. Individualized care, gender-affirming language, and trauma-informed approaches were identified as best practices. Specific clinical considerations include post-chest masculinisation

						feeding techniques, managing dysphoria, and lactation induction for trans women. More research is needed in Aotearoa NZ to address gaps in local context, midwifery education, and support for takatāpui and gender-diverse whānau.
Grant et al. (2022) (50)	Undertake a qualitative systematic review exploring autistic women's experiences of infant feeding using thematic synthesis.	22 studies	USA, UK, Australia, Ireland	Autistic mothers and birthing parents; 324 mothers + 11 commentaries	8 peer-reviewed qualitative studies; 14 grey literatures (blogs, commentaries, interviews)	Autistic mothers often face barriers to breastfeeding including poor support from services, sensory challenges, and lack of understanding from clinicians. Despite these, many are determined and knowledgeable about breastfeeding. Some reported positive experiences, while others found formula feeding calming. Services need to be better tailored to Autistic needs.
Grant et al. (2022) (80)	Undertake a qualitative systematic review investigating barriers and facilitators to breastfeedin g in public in OECD countries	74 studies	UK, USA, Australia, Canada, Ireland, Mexico, Sweden, Global (social media), Finland, Italy, the Netherland, New Zealand, Spain	Pregnant women and/or mothers (including adoptive and nonbiological mothers); those who influence breastfeeding in any age of baby or child, including partners, family, friends, and health professionals; members of the public (observers or would be observers of breastfeeding in public).	46 interviews, 20 Focus groups, 8 surveys, 7 documentary analysis, 4 observations, 2 ethnography/aut oethnography, 1 diary, 1 Not stated (appears ethnographic)	Five core factors influenced mothers' thought processes and their breastfeeding in public behaviour: legal system; structural (in)equality; knowledge; beliefs and the social environment. Macro-level factors relating to legislation and inequality urgently require redress if breastfeeding rates are to be increased. Widespread culture change is also required to enhance knowledge, change hostile beliefs and thus the social environment in which mother/infant dyads exist. The sexualisation of breasts, disgust narratives and lack of exposure among observers to baby-led infant feeding patterns

						resulted in beliefs which created a stigmatising environment. Many mothers felt unable to breastfeed in public; those who breastfed outside the home were usually highly self-aware, attempting to reduce their exposure to conflict. Evidence-based theoretically informed interventions to remove barriers to breastfeeding in public are urgently required.
Griswold and Pagano-Therrien (2020) (61)	Describe social and emotional experiences of infant feeding for women living with HIV in HICs; Raise ethical considerations surrounding the clinical recommendation in HICs to avoid breastfeeding .	6 studies	Canada, UK	Women living with HIV (WLWHIV), majority being African, Afro-Caribbean, or black immigrant/refugee women, some with insecure immigration status.	Qualitative: interviews, focus groups, narrative methods, interpretive phenomenology, risk framework.	Themes included maternal self-worth, deculturalization, surveillance, and intersectionality. Breastfeeding avoidance led to guilt, cultural disconnection, mistrust of healthcare, and fear of criminalization. Ethical imperatives demand informed, culturally sensitive, and rights-based lactation counselling for WLWHIV in HICs.
Gyamfi et al. (2021) (70)	Explore the breastfeeding experiences of African American women in the USA,	26 studies	USA	African American women in the USA, including diverse ages, socioeconomic backgrounds, and familial structures.	Qualitative, quantitative, and mixed-method peer-reviewed articles published within the last 5 years.	Three key dimensions emerged: (1) Cultural – Family, peers, and community networks strongly influence breastfeeding through education, support, and positive deviance; myths and misconceptions discourage EBF; personal factors like self-efficacy,

	focusing on cultural, sociological, and health dimensions through an equity lens.					spirituality, and empowerment encourage breastfeeding, while pain, shame, and past experiences act as barriers. (2) Sociological – Racism, prejudice, sexualization of Black women's bodies, workplace challenges, household composition, and socioeconomic status shape breastfeeding behaviors; role models and social support are critical. (3) Health – Supportive healthcare environments, timely and transparent communication from staff, culturally sensitive education, partner involvement, WIC, and Baby-Friendly Hospital Initiatives improve breastfeeding outcomes.
Hedberg (2013) (73)	Identify barriers to breastfeedin g and recommend guidelines for the WIC population.	24 studies	USA	Women participating in the WIC program, including various subpopulations such as African American women, low-income mothers, adolescents, and women with limited education.	Systematic review using quantitative and qualitative studies evaluated via Evans' hierarchy of evidence.	Barriers to breastfeeding among WIC participants were categorized into five themes: lack of support (prenatal, hospital, postpartum), return to work, practical challenges (pain, milk supply fears), WIC-related program issues, and social/cultural barriers. Subpopulations most at risk of low breastfeeding rates include non-Hispanic mothers, obese women, those with depressive symptoms, and women with unplanned pregnancies. Effective interventions include peer counselling, improved hospital-WIC staff communication, lactation clinics, and restricting formula distribution in hospitals and WIC offices. Recommendations include culturally sensitive education,

						hospital policies supporting breastfeeding, community support, and shifting WIC's focus from formula to breastfeeding promotion.
Izumi et al. (2023) (51)	Examine the experiences and perceptions of immigrant mothers who achieved successful EBF in HICs and identify supportive factors enabling EBF.	11 studies	US , UK, Australia, Ireland, Spain, Norway	Migrant mothers from low- and middle-income countries living in HICs, with diverse cultural and ethnic backgrounds (N=222)	Qualitative studies including semi-structured interviews and focus group discussions	Five main themes emerged: (1) Recognising breastfeeding differences between home and host countries; (2) Breastfeeding knowledge, including health benefits and challenges; (3) Cultural identity's role in shaping attitudes; (4) Influence of social networks including family, healthcare providers, peers, and workplaces; (5) Autonomy and self-determination supporting sustained EBF. Mothers adapted practices during acculturation. Supportive environments and culturally aware healthcare professionals were critical to enabling successful EBF. Public stigma, lack of support, conflicting advice, and systemic barriers in host countries were major obstacles.
Joanna Briggs Institute (2012) (77)	Synthesize the best available qualitative evidence on women's perceptions and experiences of professional and peer	31 studies	Primarily UK and USA	Primiparous and multiparous women who had initiated breastfeeding, including adolescents.	Qualitative studies and large-scale surveys that analyzed qualitative data from interviews or open-ended responses.	Four key categories emerged: authentic presence, disconnected encounters, facilitative approach, and reductionist approach. Women valued support characterized by trust, empathy, time, and relational continuity—commonly associated with peer support. Negative experiences included rushed care, lack of rapport, standardized advice, and feeling pressured or blamed. Facilitative support styles

	breastfeedin g support .					involving dialogue, realistic and detailed information, and hands-on help were seen as effective. Recommendations include improving midwifery/nursing communication skills, enhancing continuity of care, and expanding evaluated peer support schemes.
Joseph et al. (2019) (58)	Understand maternal infant feeding experiences pre- and post-resettlement for the benefit of policy and healthcare practice.	14 studies	Australia (studies conducted among migrants from Vietnam, Thailand, India, Cambodia, China, Hmong communities, and refugees from Liberia, Burundi, DRC, Sierra Leone, Sudan	Migrant and refugee mothers from low- and middle-income countries residing in Australia; 372 participants across 10 studies (reported in 14 papers)	Qualitative studies using meta-synthesis methodology based on Noblit and Hare approach	Migration alters breastfeeding and complementary feeding practices due to socio-cultural, healthcare, and systemic factors. Mothers negotiate between traditional beliefs and Western norms. Acculturation and lack of familial support affect confidence. Colostrum rejection, hospital practices, visibility of breastfeeding, and perceptions of formula were central themes. Supportive, culturally sensitive healthcare is critical to promote optimal infant feeding practices.
Leeming et al. (2021) (64)	Re-examine qualitative UK research on receiving breastfeedin g support, in order to explore the role of self-conscious emotions and related appraisals in interactions with professional	34 studies	UK	UK mothers receiving formal breastfeeding support (from midwives, health visitors, lactation consultants, trained volunteers, or peer supporters) for healthy term infants.	UK-based qualitative studies using interviews, focus groups, audio diaries, surveys with open-ended questions.	Self-conscious emotions such as shame, guilt, embarrassment, humiliation, and pride are common but often unspoken in breastfeeding support encounters. Three key themes emerged: (i) Breastfeeding ‘support’ could challenge mothering identity and emotional well-being; (ii) Women often manage interactions to avoid negative self-conscious emotions; (iii) Supporters can either validate and affirm women’s experiences or contribute to emotional distress. Emotionally attuned support—recognizing hidden shame or self-

	and peer supporters .					judgment—was critical to effective support. The study emphasizes the importance of training breastfeeding supporters to develop emotional sensitivity (‘emotional antennae’) to prevent undermining women’s identities.
Li et al. (2021) (52)	Summarize existing data on c-section and breastfeeding to understand their relationship, explore maternal perceptions and experiences, and identify initiatives that support breastfeeding after c-section .	18 studies	US , UK, China, Nicaragua, Australia, Turkey, Iran, Bangladesh, South Africa, Canada, Italy	Mothers who delivered via C-section, including diverse age, socio-economic, and cultural backgrounds.	13 quantitative (2 retrospective, 2 cross-sectional, 4 cohort, 5 RCTs) and 5 qualitative studies.	C-section is associated with delayed initiation and reduced duration of breastfeeding; planned C-sections particularly limit success. Maternal perceptions and barriers include pain, fatigue, negative emotions, and lack of support. Initiatives supporting breastfeeding include skin-to-skin contact, expressing, educational counselling, and preoperative carbohydrate intake. Breastfeeding success is influenced by physical recovery, confidence, familial and professional support, and cultural practices like 'Zuo Yue Zi'. Recommendations emphasize culturally sensitive, well-designed RCTs to improve breastfeeding outcomes post-C-section.
Li et al. (2024) (69)	Interpret mothers’ experiences and perceptions while expressing breast milk during separation from their hospitalized	13 studies	US , China, Denmark, Spain, Canada, Finland, Australia	Mothers separated from their hospitalized preterm or low birth weight infants in the NICU (N=332).	Qualitative and mixed-method studies, including phenomenology, grounded theory, ethnography, qualitative descriptive, and interpretive approaches.	Purpose and Motivation: Mothers expressed milk to compensate for early birth, ensure infant health, bond with infants, reinforce maternal identity, and prepare for eventual breastfeeding. Physical and Emotional Experiences: Frequent expression led to exhaustion, feelings of bereavement, isolation, stress, and a paradoxical experience combining dislike for pumping and

	infants, and to aid future development of targeted in-hospital strategies .					love for the baby. Barrier Factors: Included physical conditions of mother or infant, negative perceptions or knowledge gaps, inadequate professional support, and cultural/family pressures. Coping Styles: Mothers relied on family support, mental strategies, expressing hope, and structured routines to maintain expression and emotional stability.
Lojander et al. (2022) (79)	To review and synthesize the existing literature on maternal perceptions and experiences of breastfeeding support in Baby-Friendly hospitals	17 studies	USA (n=5), Brazil (n=3), Taiwan (n=2), Australia (n=1), Saudi-Arabia (n=1) Russia (n=1) Italy (n=1), Switzerland (n=1), UK (n=1) Croatia (n=1).	No total provided - qualitative studies varied between nine and twenty-one, quantitative studies varied between 100 and 6752.	Studies used a variety of methods to assess mothers' perceptions of breastfeeding support. Only 3 studies used the WHO/UNICEF standardized tool to assess compliance with the Ten Steps. Quantitative studies used questionnaire, in-person surveys, and telephone surveys. Three studies used qualitative interviews (semi-structured, in-depth, or ethnographic).	Most mothers reported good adherence to the Ten Steps, including breastfeeding information, skin-to-skin contact, rooming-in, and feeding on demand. Practical breastfeeding support was available but not always sufficient to address difficulties. Exclusive breastfeeding was common during hospital stay. Baby-Friendly hospitals had lower rates of supplementary feeding and pacifier use than non-Baby-Friendly hospitals.

Lucas et al. (2014) (53)	Uncover information regarding emotional and other types of support required by mothers providing breast milk for infants in the NICU.	44 studies	Primarily USA and other HICs	Mothers of preterm infants in the NICU who are pumping breast milk, including those experiencing extended hospitalization.	32 research studies (2 RCTs, 16 qualitative interviews, 8 mixed-methods, 5 surveys) and 12 reviews or clinical recommendations.	Mothers face emotional and logistical challenges with prolonged pumping due to NICU admission, requiring targeted support. Early initiation and high frequency of pumping are critical for sustaining milk supply. Emotional support, privacy, peer counsellors, and consistent education significantly impact maternal experience. Bundled interventions, including lactation consultants, milk diaries, hands-on support, and culturally sensitive staff training, are effective. Transitioning to direct breastfeeding requires maternal education, NICU staff training, and supportive environments. Mothers value the maternal role associated with milk provision and see their milk as life-giving.
Lyons et al. (2019) (75)	Systematically identify and synthesise the qualitative literature that explored the perceptions and experiences of women with a bmi ≥ 30 kg/m2 who breastfed .	5 studies	USA, Scotland, England, New Zealand	Women with a BMI ≥ 30 kg/m2 who breastfed or attempted to breastfeed.	Qualitative studies using thematic or content analysis.	Theme: 'Weight amplifies breastfeeding difficulties' with three subthemes: (1) Psychological reactions to medical intervention – Women with BMI ≥ 30 kg/m2 often experienced birth complications and medical interventions that negatively influenced breastfeeding initiation and motivation. (2) Perception of body's ability to breastfeed – Women lacked confidence in their body’s ability to produce milk, feared suffocating their infant, struggled with positioning and latching, and doubted the nutritional quality of their milk. (3)

						Additional need for support – Women required extended professional and social support but often did not access it due to discomfort, misunderstanding of its purpose, or feeling intimidated.
MacVicar et al. (2015) (65)	Review the literature exploring how women from socioeconomically deprived backgrounds experience breastfeeding establishment and to identify factors associated with supportive practice .	8 studies	UK, Canada, Republic of Ireland, USA	Women from disadvantaged groups including low-income mothers and teenage mothers in the early postnatal period.	Qualitative studies using interviews, focus groups, surveys, and ethnographic approaches.	Three overarching themes: (1) Practical influences: Need for breastfeeding skills, realistic knowledge, consistent support, and tailored education. (2) Psychological influences: Self-efficacy, emotional vulnerability, encouragement, and mutual respect impacted maternal motivation. (3) Person-centred approach: Culturally relevant, individualized care, role of social norms, stereotypes, and relational support were key. Disadvantaged women benefited from trust-based, nonjudgmental, and supportive relationships.
Matriano et al. (2022) (62)	Understand and synthesise the contemporary factors that influence women's decisions on infant feeding from the antenatal period and	14 studies	America, Australia, Bangladesh, Brazil, Canada, Indonesia, Israel, Nigeria, Spain	Primiparous and multiparous women (n=9,388) from diverse cultural backgrounds.	10 qualitative, 3 cross-sectional, and 1 cohort study.	Five main themes identified: (1) Women's own views—beliefs, knowledge, and maternal identity influence breastfeeding decisions; (2) Family and friend's preferences and advice—strongly shape infant feeding choices; (3) Health professional's advice and practice—can either support or hinder breastfeeding depending on quality and consistency; (4) Sociocultural norms—traditions, social status, and cultural rituals

	across the breastfeeding continuum .					affect perceptions and practices; (5) Media representation—TV, internet, and social media significantly influence breastfeeding decisions. Framework of birth territory and midwifery guardianship used to interpret intrinsic and extrinsic power influencing women's decisions.
Mitchell et al. (2023) (59)	Synthesise qualitative evidence about the factors that influence breastfeeding and infant feeding practices of aboriginal and Torres strait islander women and their families.	7 studies	Australia	Aboriginal and Torres Strait Islander women and their families (n=405).	Qualitative studies using methods such as yarning, interviews, and focus groups; reviewed using an Indigenous quality appraisal tool.	Ten themes identified across ecological levels: breastfeeding is culturally accepted but public breastfeeding is seen as shameful; formula feeding is normalised in some areas; culturally safe, supportive services are preferred; family and partner support crucial; individual knowledge, prior experiences, and concerns about milk supply influence decisions. Strong need for Aboriginal-led, culturally safe programs and policy development.
Monge-Montero et al. (2024) (72)	Gain a deeper understanding of the reasons why mothers choose to practice mixed milk feeding .	138 studies	NR	Parents/caregivers of healthy term infants aged 0–2 years practicing MMF, across diverse socioeconomic and cultural backgrounds.	Cohort (44.2%), cross-sectional (28.3%), qualitative (20.3%), case–control, literature reviews, and RCTs.	13 unique MMF drivers were identified and categorized into: perceived necessity (e.g., hunger or perceived milk insufficiency), perceived pressure (e.g., return to work, healthcare advice), and perceived choice (e.g., convenience, flexibility). Perceived necessity was the most commonly cited reason (39%), especially in the first 3 months postpartum. Demographic analysis showed MMF more common among middle-income, educated,

						employed mothers; variations existed by region and infant age. Mothers practicing MMF often experience emotional conflicts, guilt, or pressure; responsive feeding education and culturally appropriate support were recommended. A unified definition of MMF is needed for future research comparability; further studies on long-term MMF health impacts are recommended.
Nelson (2012) (66)	Synthesize the findings of qualitative research studies related to infant feeding decision making and contribute to an increased understanding of this phenomenon.	14 studies	USA, UK, Australia	Mothers (primiparas and multiparas), including adolescents and women of various racial and socio-economic backgrounds	Qualitative studies including grounded theory, ethnography, phenomenology, focus groups, and semi-structured interviews	Two key processes emerged: making a personal choice and defending the choice. Six influential themes were identified: knowing ‘breast is best’; disapproval of public breastfeeding; sense of personal comfort; level of confidence/commitment; need for support; and perceived lifestyle compatibility. External pressure influenced decisions, especially among low-income and minority women. Personal beliefs, emotional readiness, social networks, and healthcare support shaped infant feeding choices. Mothers often sought to justify or defend their feeding decisions to maintain their identities as 'good mothers'.
Odeniyi et al. (2020) (54)	Identify, synthesise, and appraise the literature on breastfeedin	35 studies	UK, USA, Australia, Norway, Netherlands, Italy, Ireland, Israel, Sweden, Spain, Canada, Denmark, Finland	African immigrant mothers aged 16–45 living in HICs; includes Somali, Ethiopian, Moroccan, Congolese, Sierra	Mixed-methods systematic review including 12 qualitative and 23 quantitative	Breastfeeding initiation rates were high (~90%) but EBF dropped significantly after migration. Mothers were knowledgeable about breastfeeding benefits but had mixed understanding of EBF.

	g knowledge and experiences of African immigrant mothers in HICs.			Leonean, Liberian, Burundian, and other sub-Saharan African origins	studies (e.g., cohort, cross-sectional, interviews, focus groups)	Cultural beliefs, such as feeding water and avoiding colostrum, persisted post-migration. Migration-induced lifestyle changes, desire for bigger babies, and return to work led to early supplementation. Health professionals often lacked cultural competence; family and community influence could either support or hinder breastfeeding.
Robinson et al. (2019) (74)	Assess the effect of racism, bias, and discrimination on breastfeeding care, support, and outcomes for African American women.	5 studies	USA	Pregnant and postpartum African American women, health care providers (midwives, peer counsellors, lactation consultants).	Scoping review including 3 qualitative and 2 quantitative studies.	Racism, bias, and discrimination were consistent barriers negatively affecting breastfeeding initiation and duration. Health care providers' implicit bias and assumptions led to fewer referrals for lactation support and lower priority for African American women. Peer counsellors and lactation consultants reported witnessing discriminatory practices including inadequate lactation care and rushed support. African American women faced structural barriers, mental health stressors, and poverty that hindered breastfeeding efforts. Culturally appropriate care was largely absent, and both patients and providers highlighted the need for improved support systems.
Schmied et al. (2012) (55)	Explore the diversity of migrant and refugee women's experiences and practices	11 studies	England, Canada, USA, Australia	Migrant and refugee women from countries including China, India, Pakistan, Thailand, Vietnam, Dominican	8 qualitative studies and 3 mixed-methods studies (qualitative and quantitative) using	Overarching theme: 'Breastfeeding in a new country: facing contradictions and conflict' with four sub-themes—Mother's milk is best; Contradictions in breastfeeding practices; Breast milk requires health; Role of

	related to breastfeeding in a new country to inform health care policy and practice.			Republic, Puerto Rico, and Mexico. (N=322 plus 14 Asian grandmothers and 23 white British women)	ethnography, thematic analysis, descriptive, interpretative approaches.	female relatives. Breastfeeding was widely valued, though contradictions in practices (e.g. colostrum, duration, public breastfeeding) often created tension. Migrant women struggled with traditional postpartum rituals, believing these were essential to breastfeeding success. Influence of family—especially grandmothers and mothers-in-law—was central, often encouraging or discouraging breastfeeding based on cultural beliefs. Health professionals often lacked cultural competence; women preferred culturally sensitive care, materials in multiple languages, and peer support. Acculturation had mixed effects: increased time in host country reduced breastfeeding duration, but some second-generation women revived traditional practices.
Spencer & Grassley (2013) (60)	Present a comprehensive integrative literature review of factors that influence breastfeeding intentions, initiation, and duration in the African American population, including	37 studies	US	African American women, including adolescents, low-income groups, WIC participants, and women in various healthcare and community settings	Integrative review including quantitative and qualitative studies, theoretical articles, and literature reviews	African American women receive less breastfeeding information and support from healthcare providers compared to other groups. Intention to breastfeed is influenced by social support, older maternal age, income, education, and attending prenatal classes. Barriers include fear of pain, embarrassment, public stigma, concerns over milk supply, early return to work, and comfort with formula. Protective factors include intrinsic motivation, confidence, self-efficacy, and family history of

	health disparities and related interventions.					breastfeeding. Effective interventions include Baby-Friendly Hospital Initiatives, peer counselling, breastfeeding education, and community-based support. A need exists for culturally specific and feminist-informed research approaches.
Ulfa et al. (2023) (56)	Explore women's experiences of breastfeeding after a C-section using a meta-synthesis of qualitative studies.	7 studies	England, Australia, South Africa, China, Indonesia	Women who underwent C-section deliveries across diverse ethnic and national contexts. (N=194)	Qualitative studies using phenomenology, grounded theory, and interviews/focus groups.	Six categories emerged: (1) Perceived values of breastfeeding – seen as natural, rewarding, and demanding; (2) Emotional vulnerability – feelings of failure, disappointment, and low confidence impacted breastfeeding; (3) Physical difficulties – included low milk supply, pain, latching problems, and limited movement; (4) Inconvenient conditions – fatigue, sleep deprivation, environmental discomfort, and caring for other children; (5) Inadequate resources – inconsistent information, lack of skin-to-skin contact, early formula use, and insufficient equipment/support; (6) Support systems – effective breastfeeding was aided by healthcare provider support, grandmotherly influence, and post-C-section skin-to-skin contact.
Yas et al. (2023) (67)	Assess the breastfeeding needs of adolescent mothers through a systematic	41 studies	USA, UK, Canada, Brazil, Indonesia, Thailand, Ghana, South Africa, Iran, Iceland, Belgium, Australia	Adolescent mothers aged 12–18 with full-term, healthy newborns.	Qualitative and mixed-method studies using ethnography, phenomenology, grounded theory, content	Breastfeeding needs were grouped into eight categories: (1) Social support from healthcare providers, partners, and families; (2) School support for breastfeeding mothers; (3) Breastfeeding counselling based on cultural sensitivities; (4)

	review of qualitative studies in LMICs, and HICs.				analysis, and descriptive approaches.	Educational assistance from health providers for adolescent mothers' families; (5) Changing harmful cultural values and judgments; (6) Additional home or outpatient visits post-discharge; (7) Peer support and counselling; (8) Economic needs. Adolescent mothers face physical, mental, social, and spiritual challenges that complicate breastfeeding. Supportive networks, cultural sensitivity, and educational reinforcement are critical for successful breastfeeding.
Exclusive breastfeeding (EBF); Organisation for Economic Co-operation and Development (OECD); severe mental illness (SMI); healthcare professionals (HCPs); perinatal mental health (PMH); body mass index (BMI); randomised controlled trial (RCT); postnatal depression (PND); women living with HIV (WLWHIV); low-middle income countries (LMICs); high-income countries (HICs); Baby-Friendly Hospital Initiative (BFHI); neonatal intensive care unit (NICU); mixed milk feeding (MMF); Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); Democratic Republic of the Congo (DRC); caesarean section (C-section).						

Chapter Four: Summary table of reviews on antenatal preparation

Authors	Aim	Number of Included Studies	Countries of Included Studies	Population	Types of Studies	Key Findings
Ablett et al. (2023)(135)	To explore whether antenatal breastmilk expression could be optimised as a breastfeeding promotion intervention using implementation science.	22	Primarily OECD countries (Australia, UK, US, Norway, Ireland)	Diverse populations including low- and high-risk pregnant individuals (e.g. with diabetes), multiparous and primiparous	Descriptive, qualitative, retrospective cohort, RCTs, pilot studies, cross-sectional surveys	AME is feasible and acceptable to women and healthcare providers, with positive attitudes toward its use. Successful implementation is facilitated by supportive healthcare environments, staff training, and appropriate guidance. The review highlights variability in clinical recommendations and practice, emphasizing the need for standardized protocols. AME may contribute to improved breastfeeding outcomes, especially in women with diabetes, but further high-quality research is required to confirm long-term effects.
Aderibigbe et al. (2024) (48)	To synthesise evidence from qualitative studies on the experiences of women from around the world who exclusively breastfed their full-term infants.	17 studies	13 countries across Africa, Europe, Asia, and Oceania (e.g., Ghana, Ethiopia, Kenya, Tanzania, South Africa, Spain, UK, Ireland, Australia, Thailand, Indonesia, US	373 women who exclusively breastfed full-term infants for at least one month.	15 qualitative studies, 1 mixed-methods study, 1 online dissertation; methods included phenomenology, descriptive and exploratory designs, interviews, and focus groups.	Five overarching themes emerged: (1) Favourable Conditions – supportive policies, physical characteristics, proximity to work, special foods, and maternity leave aided EBF; (2) Not a Smooth Journey – EBF was challenging due to (a) separation after returning to work, (b) breastfeeding difficulties (e.g., latching, pain, fatigue), (c) societal expectations and cultural norms discouraging exclusivity,

						and (d) lifestyle constraints and financial insecurity.; (3) Support – encouragement from partners, family, friends, colleagues, and health professionals; (4) Determination and Perseverance – motivation and prior breastfeeding knowledge helped overcome barriers; (5) Reflections on Benefits – recognized infant health, bonding, maternal satisfaction, contraception, and financial advantages.
Bai et al. (2024) (49)	To synthesise qualitative studies on the breastfeeding experiences of women with multiple births to support the development of targeted interventions.	8 studies	Canada, Turkey, New Zealand, Iceland, Ghana, China	Mothers with multiple births (twins, triplets) from diverse cultural backgrounds, including 122 participants total	Phenomenology, ethnography, mixed methods, and qualitative descriptive studies	Strong breastfeeding intentions were driven by maternal identity and bonding. Challenges included physical and psychological burdens, immature feeding patterns, and work-breastfeeding conflicts. Stage-specific adaptation strategies ranged from intensive early management to individualized adjustments in mature stages. Support experiences varied; while family, medical, and social support were helpful, gaps in tailored professional and informational support were evident. Recommendations included developing multidisciplinary support teams, targeted antenatal education, and promoting co-parenting support frameworks

Baker et al. (2023) (68)	To examine infant feeding outcomes in women with SMI and factors associated with this; experiences of infant feeding and infant feeding support; interventions for supporting infant feeding; and health care professionals' attitudes toward supporting infant feeding in women with SMI.	8 studies	High-income countries only: UK, US, Australia, Norway, Greece, Israel, Netherlands	Women aged ≥18 years, with SMI occurring within 2 years postpartum (psychotic disorders, bipolar disorder, severe depression, anxiety disorder, personality disorder, postpartum psychosis)	11 cohort studies, 2 cross-sectional, 1 case series, 1 case–control, 2 qualitative, and 1 quasi-experimental study.	Women with SMI were less likely to initiate and maintain breastfeeding compared to women without SMI. Factors influencing breastfeeding included antenatal intentions, ethnicity, employment, mental health symptoms, use of psychotropic medication, and inconsistent health professional support. Qualitative evidence highlighted challenges such as poor professional support, conflicting advice, perceived pressure to breastfeed, concerns about medication safety, and difficulties balancing breastfeeding with mental health needs. No effective interventions to support breastfeeding among women with SMI were identified. Health care professionals showed variable attitudes toward breastfeeding in women with SMI, influenced by training, experience, and personal beliefs. Findings indicate a need for tailored infant feeding support, staff education, and policy change to address the unique needs of women with SMI. Relevant Category: Barriers and facilitators to breastfeeding; health system and provider support; maternal

						experiences; breastfeeding outcomes; PMH.
Beggs et al. (2021) (33)	To synthesise empirical literature on women's perceptions about and experiences with breastfeeding, identify barriers they face, and supports they need to guide their breastfeeding choices.	59 studies	Primarily UK, US, Canada, Australia, Iceland, Ireland, Sweden, New Zealand, Netherlands, and Poland	Women of reproductive age who have breastfed or attempted to breastfeed, across a variety of socio-cultural contexts	Predominantly qualitative (n=42), with some mixed methods (n=10), and a few quantitative articles	Many women perceived breastfeeding as positive, natural, and beneficial but felt unprepared for its difficulties. Barriers included physical challenges (pain, latching, milk supply), inadequate support, public shaming, conflicting healthcare advice, and workplace inflexibility. Interpersonal influences (partners, family, social norms) were central in shaping decisions and experiences. Cultural values and local policies influenced perceptions and practices, with judgment reported when deviating from societal expectations. Supports such as peer groups, social media, professional counselling, and flexible public health messaging were found beneficial. The review emphasizes a shift from rigid 'breast is best' rhetoric toward realistic, individualized, and socially inclusive breastfeeding support
Bengough et al. (2022) (76)	To synthesise qualitative evidence on factors influencing women's engagement and satisfaction with breastfeeding support programmes to suggest	51 studies	UK, US, Australia, Ireland, Sweden, South Africa, Brazil, Malawi	Pregnant and postnatal women, including first-time and multiparous mothers, with diverse ethnic, educational, and	Qualitative studies using interviews, focus groups, observations, written responses, and think-aloud methods	Engagement with support is influenced by four overarching process factors: (1) Information provision, (2) Type of implementers, (3) Delivery modes, and (4) Maternal care pathways. Women preferred

	strategies for improving support alignment with women's needs.			socio-economic backgrounds		non-technical, experience-based information and disliked inconsistent advice. Trust and relatability of implementers (e.g., peers or culturally competent professionals) shaped engagement positively. Women valued personalised, flexible, and context-specific delivery modes (e.g., virtual, group-based, or home-based support). Continuity and timing of care, especially antenatal-to-postnatal transitions, influenced satisfaction and outcomes. Effective support needs to match individual women's situations, including cultural, emotional, and physical needs
Billings et al. (2024) (26)	To synthesise existing qualitative literature on breastfeeding experiences of women with a wide range of PMH conditions.	17 studies	UK, US, Canada, Ireland, Sweden, New Zealand, Australia, Ghana, Democratic Republic of the Congo	Women with PMH conditions including PND, PTSD, bipolar disorder, eating disorders, OCD, anxiety, and emotional distress (N = 551).	Qualitative studies using phenomenology, ethnography, grounded theory, thematic analysis, and psychoanalytical methods.	Three major themes emerged: Vulnerabilities, Positive Outcomes, and Challenges. Vulnerabilities included a mismatch between expectations and reality, isolation, and self-perception as a mother. Positive outcomes included enhanced bonding, emotional healing, and sense of control through successful breastfeeding. Challenges included striving for control, lack of consistent professional support, conflicting medication advice, and concerns over milk quality and supply. Stigma was also discussed as a factor

						exacerbating negative experiences, though not a formal subtheme. Breastfeeding could both improve and worsen mental health, depending on experience and support received. Calls were made for better-informed healthcare support, culturally sensitive practices, and guidance on medication safety.
Chipojola et al. (2020) (82)	To determine the effectiveness of theory-based educational interventions (breastfeeding self-efficacy and planned behaviour theories) on breastfeeding outcomes and to identify key factors of effective educational breastfeeding programmes.	24 studies	Organisation for Economic Co-Operation and Development countries - 14 countries including US, Canada, Denmark, Australia, Turkey, non-OECD countries (specific countries not listed).	Healthy mothers who had full-term infants, who intended to breastfeed, or who were breastfeeding	RCTs	Theory-based interventions improved breastfeeding self-efficacy up to 6 months postpartum. Exclusive breastfeeding rates were significantly higher at 1-2 months and 3-6 months. Older mothers, non-OECD country participants, and hospital-based interventions had better outcomes. Self-efficacy-based interventions were more effective in early postpartum, while planned behaviour-based interventions had greater effects at 3-6 months.
da Silva et al. (2016) (97)	To analyse the impact of educational strategies developed in low-risk antenatal care on obstetric outcomes (birth weight, prematurity, and breastfeeding).	9 studies	US, Ghana	Low-risk pregnant women (often low-income) who received educational interventions during antenatal care.	RCTs	Educational interventions during antenatal care had a positive impact on breastfeeding and birth weight. Breastfeeding was the outcome most sensitive to educational strategies. Home visits by trained professionals or community members significantly increased

						exclusive breastfeeding initiation and duration. Establishing support groups for pregnant women helped reduce prematurity rates. Educational activities reduced anxiety and improved childbirth preparedness.
Da Silva Tanganhito et al. (2020) (63)	To investigate the breastfeeding experiences, perceptions, and support needs of women with PND.	6 studies	UK, US, Canada, Sweden, Norway	Women with PND, including both self-reported and clinically diagnosed cases, across high-income countries.	Qualitative studies using interviews, grounded theory, and semi-structured approaches.	Women expressed a strong desire to breastfeed, associating it with being a 'good mother', though this also led to guilt and feelings of failure when unsuccessful. Many struggled with breastfeeding, facing pain, fatigue, and emotional distress, with some reporting breastfeeding difficulties as a trigger for PND. Experiences of healthcare support were mixed; while some received empathetic care, others felt unsupported or judged and faced conflicting advice. Practical and emotional support from family and peers was important yet often lacking or insufficiently tailored. Fear of antidepressant effects on infants discouraged medication use, highlighting the need for informed support around treatment options. A bidirectional relationship was suggested between breastfeeding and PND, reinforcing the need for individualized, timely, and

						sensitive support from professionals.
Foudil-Bey et al., 2021 (136)	To identify, characterise and appraise the literature on AME, and map maternal and newborn outcomes.	20 studies	Australia, New Zealand, UK Sweden, US, India	Pregnant women including general obstetric populations and high-risk groups (e.g. diabetes, hypertensive disorders, obesity)	1 quality improvement, 2 case studies/series, 4 qualitative/cross-sectional, 3 cohort, 10 interventional (incl. 1 RCT)	AME may positively impact maternal confidence, increase the likelihood of early exclusive breastfeeding, and support newborn stabilization, particularly among high-risk groups. The review identified variations in the initiation, frequency, and technique of AME across studies. Potential benefits include reduced formula supplementation and improved neonatal glycaemic control. However, methodological limitations such as small sample sizes, lack of control groups, and inconsistent outcome reporting limit the strength of conclusions. Further robust trials are needed to establish safety and efficacy in diverse populations.
Grant et al. (2022) (50)	To undertake a qualitative systematic review exploring Autistic women's experiences of infant feeding using thematic synthesis.	22 studies	US, UK, Australia, Ireland	Autistic mothers and birthing parents; 324 mothers + 11 commentaries	8 peer-reviewed qualitative studies; 14 grey literatures (blogs, commentaries, interviews)	Autistic mothers often face barriers to breastfeeding including poor support from services, sensory challenges, and lack of understanding from clinicians. Despite these, many are determined and knowledgeable about breastfeeding. Some reported positive experiences, while others found formula feeding calming. Services need to be better tailored to Autistic needs.

Grant et al. (2022) (80)	To undertake a qualitative systematic review investigating barriers and facilitators to breastfeeding in public in OECD countries using thematic synthesis.	71 studies	UK, US, Australia, Canada, Ireland, Mexico, Sweden, Finland, Italy, Netherlands, New Zealand, and Spain.	Mothers	Qualitative studies including interviews, focus groups, surveys with open-text responses, documentary analysis, observations, ethnography/autoethnography, diaries, and mixed qualitative methods.	Breastfeeding in public was commonly hindered by stigma, sexualisation of breasts, lack of public support, and inadequate breastfeeding-friendly environments. Supportive legislation increased public awareness, and positive social attitudes were identified as important facilitators.
Huda et al. (2022) (116)	To examine the influence of breastfeeding educational interventions on breast engorgement, breast pain, and exclusive breastfeeding and identify the effective components of such educational programs.	22 studies	US, Iran, Jordan, Taiwan, Brazil, China, Turkey, Malaysia, Kenya, Hong Kong	Postpartum women	RCTs	Breastfeeding education significantly reduced breast engorgement at postpartum days 3, 4, and 5–7, and breast pain at postpartum days 4–14. It increased exclusive breastfeeding at 1–6 weeks postpartum (OR 2.16). Interventions combining knowledge and skills were most effective.
Joseph et al. (2019) (58)	To understand maternal infant feeding experiences pre- and post-resettlement for the benefit of policy and healthcare practice.	14 studies	Australia (studies conducted among migrants from Vietnam, Thailand, India, Cambodia, China, Hmong communities, and refugees from Liberia, Burundi, DRC, Sierra Leone, Sudan	Migrant and refugee mothers from low- and middle-income countries residing in Australia; 372 participants across 10 studies (reported in 14 papers)	Qualitative studies using meta-synthesis methodology based on Noblit and Hare approach	Migration to Australia shapes breastfeeding and complementary feeding practices among migrant and refugee women through socio-cultural, healthcare, and systemic factors. Women negotiate between traditional beliefs and Western norms, with familial disconnection and cultural dissonance undermining breastfeeding confidence. Key issues include perceptions of colostrum, hospital practices, visibility of breastfeeding, and views on

						infant formula. Feeding decisions also reflect changing perceptions of complementary feeding, traditional food beliefs, and responses to healthcare advice. Using the socio-ecological model and Bourdieu's theory, the authors show how power dynamics and access to different forms of capital shape these experiences. Culturally sensitive healthcare support is critical to promote optimal infant feeding.
Juntereal & Spatz, 2021 (137)	To explore the practice of antenatal breastmilk expression (AME) and related outcomes for mother-infant dyads during the first 2 weeks after birth.	15 studies	Australia, India, UK, US, New Zealand	Pregnant women (predominantly White, healthy, some with diabetes), mother-infant dyads	5 RCTs, 1 quasi-experimental, 2 retrospective cohort, 2 cross-sectional, 3 qualitative, 1 case series, 1 thesis	AME may improve breastfeeding self-efficacy, increase milk supply, reduce early formula use, and promote exclusive breastfeeding. Women reported greater confidence and familiarity with breastfeeding. Infants were more likely to be exclusively breastfed during early postpartum and less likely to be admitted to NICU. Evidence was moderate in quality, with limitations including self-reporting, lack of standardized outcome measures, and underrepresentation of diverse populations.
Kehinde et al. (2023) (83)	To determine the effectiveness of antenatal breastfeeding education on breastfeeding outcomes	14 studies	US, Iran, Jordan, Taiwan, Brazil, China, Turkey, Malaysia, Kenya, Hong Kong	Pregnant women from conception till six months postpartum	9 Quasi-experimental studies, 4 RCTs, 1 Phenomenology	Antenatal breastfeeding education improved breastfeeding knowledge, positive attitudes toward breastfeeding, and maternal

	(uptake, self-efficacy, knowledge & attitudes).					breastfeeding self-efficacy. Mothers who received antenatal education had higher breastfeeding initiation rates and continued breastfeeding for a longer duration.
Leeming et al. (2022) (64)	To re-examine qualitative UK research on receiving breastfeeding support, in order to explore the role of self-conscious emotions and related appraisals in interactions with professional and peer supporters.	34 studies.	UK.	Mothers who had experience of breastfeeding and/or receiving breastfeeding support.	Qualitative studies.	Breastfeeding support can evoke self-conscious emotions such as guilt, embarrassment, and feelings of failure. Women often manage interactions to avoid judgement. Supportive, validating relationships with healthcare professionals and peers increase confidence and positive maternal identity, whereas judgemental or disrespectful interactions can undermine emotional wellbeing and breastfeeding experiences.
Lojander et al. (2022) (79)	To review and synthesize the existing literature on maternal perceptions and experiences of breastfeeding support in Baby-Friendly hospitals. A sub-aim was to describe differences in breastfeeding support between Baby-Friendly hospitals and non-Baby-Friendly hospitals from maternal perspective.	17 studies.	US, Brazil, Taiwan, Australia, Saudi Arabia, Russia, Italy, Switzerland, UK, Croatia.	Postpartum and breastfeeding mothers in Baby-Friendly hospitals.	14 quantitative studies: 9 cross-sectional, 3 cohort, 2 quasi-experimental. 3 qualitative studies.	Breastfeeding support in Baby-Friendly hospitals was generally consistent with the Ten Steps, and mothers were mostly satisfied; however, support was sometimes inconsistent, focused mainly on the benefits of breastfeeding, and did not always adequately address breastfeeding difficulties. Mothers in Baby-Friendly hospitals reported more Ten Steps-compliant support than mothers in non-Baby-Friendly hospitals.

Lucas et al. (2014) (53)	To uncover information regarding emotional and other types of support required by mothers providing breast milk for infants in the neonatal intensive care unit (NICU).	32 studies.	NR.	Mothers of preterm or very low birth weight infants hospitalized in the NICU who were pumping breast milk and/or breastfeeding. Some studies also included NICU nurses, lactation consultants, peer counsellors, and other healthcare providers involved in breastfeeding support.	Randomised controlled trials, qualitative studies using semi-structured interviews, mixed-methods studies (interviews and surveys), chart review and survey studies and a case study.	Mothers pumping for NICU infants require ongoing emotional, educational, and practical support to maintain milk expression and transition to breastfeeding.
Lumbiganon et al. (2016) (81)	To assess the effectiveness of antenatal breastfeeding education for increasing breastfeeding initiation and duration.	24 studies	US, Australia, UK, Canada, Iran, Nigeria, Netherlands, Denmark, Singapore, Hong Kong.	Pregnant women.	RCTs	There was no conclusive evidence supporting antenatal education improving breastfeeding initiation or exclusive breastfeeding rates at 3 or 6 months. Multiple educational interventions, such as booklets plus videos plus lactation consultant support, were more effective than single-method interventions. Some evidence suggested that monthly breastfeeding sessions and weekly mobile reminders improved exclusive breastfeeding rates at 3 and 6 months. More research is needed, particularly in low- and middle-income countries.
Lyons et al (2019) (75).	To systematically identify and synthesise	5 studies	US, Scotland, UK, New Zealand,	108 participants: (74 women with	Qualitative studies.	Women with BMI ≥30 kg/m² experience greater

	the qualitative literature that explored the perceptions and experiences of women with a BMI ≥ 30 kg m2 who breastfed.			BMI ≥ 30 kg/m², 9 normal-weight comparison women, and 34 health professionals).		breastfeeding difficulties due to medical interventions, reduced confidence in their breastfeeding ability, and increased support needs.
MacVicar et al. (2015) (65)	To review the literature exploring how women from socioeconomically deprived backgrounds experience breastfeeding establishment and to identify factors associated with supportive practice.	8 studies	UK, Canada, US.	Low-income mothers from socioeconomically deprived areas and teenage/adolescent mothers (individual study sample sizes ranged from 7 to 53 participants).	Meta-synthesis of 8 qualitative studies including semi-structured interviews, focus groups, in-depth interviews, and a telephone survey.	Supportive breastfeeding practices for socially disadvantaged women should combine practical breastfeeding skills, confidence-building, and person-centred, culturally relevant support.
Meedya et al. (2017) (87)	To evaluate the effectiveness of professional educational and support interventions on long-term breastfeeding rates at 6 months or up to 2 years postpartum among primiparous women.	10 studies	US, Canada, Australia, Denmark, Italy, Jordan, Hong Kong	Primiparous women aged 18 years and over who had expressed their intention to breastfeed for the first time	RCTs	Interventions with only one antenatal or postnatal component were not effective in increasing breastfeeding rates at six months. However, based on 1 trial, a combined antenatal and postnatal education and support intervention doubled breastfeeding rates at six months postpartum (14% versus 7%, respectively, although this difference was not statistically significant). The review found no single intervention that was consistently effective, but multi-component interventions were beneficial.
Odeniyi et al. (2020) (54)	To identify, synthesise, and appraise the literature on	35 studies	UK, US, Australia, Norway, Netherlands, Italy,	African immigrant mothers aged 16–45 living in high-	Mixed-methods systematic review including 12 qualitative and 23 quantitative studies (e.g.,	Breastfeeding initiation rates were high (~90%) but EBF dropped significantly after

	breastfeeding knowledge and experiences of African immigrant mothers in high-income countries.		Ireland, Israel, Sweden, Spain, Canada, Denmark, Finland	income countries; includes Somali, Ethiopian, Moroccan, Congolese, Sierra Leonean, Liberian, Burundian, and other sub-Saharan African origins	cohort, cross-sectional, interviews, focus groups)	migration. Mothers were knowledgeable about breastfeeding benefits but had mixed understanding of EBF. Cultural beliefs, such as feeding water and avoiding colostrum, persisted post-migration. Migration-induced lifestyle changes, desire for bigger babies, and return to work led to early supplementation. Health professionals often lacked cultural competence; family and community influence could either support or hinder breastfeeding.
Oggero et al. (2024) (88)	To analyse the impact of antenatal breastfeeding education on breastfeeding duration beyond 12 weeks.	21 studies	US, Spain, Hong Kong, China, Denmark, Australia, Brazil, Lebanon, Croatia, Taiwan, Netherlands	Pregnant women	16 RCTs, 5 Quasi-experimental studies	Antenatal breastfeeding education improved breastfeeding duration when paired with psychological components such as coping planning. Interventions that included both antenatal education and postpartum support were the most effective. Studies focusing on psychological preparedness showed longer breastfeeding durations.
Oliveira et al. (2017) (98)	To determine the effectiveness of educational interventions for exclusive breastfeeding promotion up to 6 months directed at women and their social network.	11 studies	Australia (2), Belarus, Ghana, Kenya, Nigeria, Malaysia, Nepal, Singapore, Turkey, US	Pregnant and/or nursing mothers with or without others from their social network who either received routine guidance from health services (control)	RCTs	Overall, educational interventions were about twice as effective in promoting exclusive breastfeeding at 6 months compared to routine care (although 6 of the 11 studies included in the meta-analysis failed to show a significant effect) Most

				or a properly described education on breastfeeding (intervention).		interventions focused solely on women and did not address the five types of social support (informative, emotional, face-to-face, instructional and self-support) needed for breastfeeding success. Further research is needed on strategies that incorporate the woman's social network.
Schmied et al. (2012) (55)	To explore the diversity of migrant and refugee women's experiences and practices related to breastfeeding in a new country to inform health care policy and practice.	11 studies	England, Canada, US, Australia	Migrant and refugee women from countries including China, India, Pakistan, Thailand, Vietnam, Dominican Republic, Puerto Rico, and Mexico (N=322), plus 14 Asian grandmothers and 23 white British women.	8 qualitative studies and 3 mixed-methods studies (qualitative and quantitative) using ethnography, thematic analysis, descriptive, interpretative approaches.	Overarching theme: 'Breastfeeding in a new country: facing contradictions and conflict' with four sub-themes—Mother's milk is best; Contradictions in breastfeeding practices; Breast milk requires health; Role of female relatives. Breastfeeding was widely valued, though contradictions in practices (e.g. colostrum, duration, public breastfeeding) often created tension. Migrant women struggled with traditional postpartum rituals, believing these were essential to breastfeeding success. Influence of family—especially grandmothers and mothers-in-law—was central, often encouraging or discouraging breastfeeding based on cultural beliefs. Health professionals often lacked cultural competence; women preferred culturally sensitive care, materials in multiple languages, and peer support.

						Acculturation had mixed effects: increased time in host country reduced breastfeeding duration, but some second-generation women revived traditional practices.
Spencer & Grassley (2013) (60)	To present a comprehensive integrative literature review of factors that influence breastfeeding intentions, initiation, and duration in the African American population, including health disparities and related interventions.	37 studies	US	African American women, including adolescents, low-income groups, WIC participants, and women in various healthcare and community settings	Integrative review including quantitative and qualitative studies, theoretical articles, and literature reviews	African American women receive less breastfeeding information and support from healthcare providers compared to other groups. Intention to breastfeed is influenced by social support, older maternal age, income, education, and attending antenatal classes. Barriers include fear of pain, embarrassment, public stigma, concerns over milk supply, early return to work, and comfort with formula. Protective factors include intrinsic motivation, confidence, self-efficacy, and family history of breastfeeding. Effective interventions include Baby-Friendly Hospital Initiatives, peer counselling, breastfeeding education, and community-based support. A need exists for culturally specific and feminist-informed research approaches.
Stoodley et al. (2023) (132)	To explore interventions that have been provided by the midwife which support the development of the maternal-fetal or mother-infant	16 studies	Turkey, Norway, Italy, Japan, Sweden, Korea, Brazil, US, Switzerland, Colombia, Taiwan	Women in the pregnancy and early postnatal period (up to 6–8 weeks), over 18 years with term	7 RCTs, 5 observational/nonexperimental studies, 2 pre-post intervention without control, 2 qualitative studies	Interventions by midwives or nurses were grouped into three themes: Viewing the fetus as separate (3 studies): Abdominal palpation and fetal movement perception increased maternal

	relationship amongst a low-risk population from pregnancy, and up to six weeks postnatal. And to understand the types of interventions developed, format and delivery, outcomes measured and if cultural considerations had been incorporated.			births and no history of illness		awareness and significantly improved antenatal attachment. No cultural considerations were reported. Focused activities: Antenatal education, lullaby singing, and infant massage enhanced maternal-fetal or mother-infant attachment. Singing improved postnatal bonding at 3 months; infant massage increased attachment scores and maternal confidence. Lack of skin-to-skin contact negatively affected bonding. Only one study integrated cultural practices (Korean Taegyo). Targeted educational interventions: General parenting education and the Newborn Behavioral Observations (NBO) improved attachment, bonding, self-efficacy, and interaction quality. NBO increased maternal understanding of infant cues but had limited effect in well-functioning populations. Cultural inclusion was minimal, though several authors recommended it.
Uğurlu & Yavan (2016) (86)	To evaluate the effectiveness of breastfeeding education.	33 studies	Spain, France, Netherlands, Denmark, U.K, Scotland, Belarus, Turkey, Jordan, US, Canada, Taiwan, Singapore, China, Australia	Antenatal and postnatal women	Intervention study, RCT, Prospective cohort, Quasi-experimental studies, Cluster-randomised community-based trial	The evidence for breastfeeding education interventions delivered antenatally, postnatally, or across both antenatal and postnatal periods on breastfeeding duration and exclusive breastfeeding rates was mixed.

						Interventions that began in antenatal period and continued in postnatal period positively affected the initiation of breastfeeding. Education had a positive impact on breastfeeding knowledge.
Whitford et al., (2017) (96)	To assess the effectiveness of breastfeeding education and support for women with twins or higher order multiples.	10 studies	Australia, Scotland, England, US, Brazil, Tanzania, and Kenya.	Women with twins or higher order multiples	RCTs, cluster-RCTs, and quasi-randomised trials.	The evidence on the effectiveness of breastfeeding education and support for women with multiples is limited and of mixed quality. No specific interventions were designed for women with multiples, and the outcomes for multiples were not reported separately. There is a need for well-designed, adequately powered studies to determine effective interventions for this group.
Wong et al, (2021) (99)	To examine interventions that help sustain and improve breastfeeding self-efficacy in primiparous postnatal women and identify key characteristics of such interventions in terms of delivery time, format and mode, main components, use of theoretical framework and number of sessions.	13 studies	Canada, China, Hong Kong, Iran, Jordan, Thailand, Turkey, US	Primiparous women who gave birth vaginally, at or more than 37 weeks of gestation, to babies with normal birthweight.	RCT	Educational and supportive interventions increased exclusive breastfeeding at ≤2 and 6 months and enhanced partial breastfeeding rate and self-efficacy at ≤2 months. Such interventions were best to be delivered between antenatal to postnatal period, based on self-efficacy theory, have 3 or more sessions, have both individual and group basis and be multicomponent - involving antenatal education, postnatal breastfeeding coaching and telephone follow-ups.

Wong et al., (2015) (95)	To compare the effectiveness of group and individual professional antenatal education on breastfeeding exclusivity and duration.	19 studies	US, Australia, Canada, Singapore, Denmark, Chile, and UK	Pregnant women	RCTs, cluster-RCTs, and quasi-experimental studies.	The review found mixed results on the effectiveness of antenatal education. Four out of 12 studies supported the effectiveness of group education, while 4 out of 6 studies supported individual education. There is some evidence suggesting that individual education may be more effective for vulnerable populations, such as minority groups, low-income or low-education participants. Studies that examined the effect of antenatal education on low-risk, educated women failed to find significant effects. The methodological heterogeneity and small number of high-quality studies limited the ability to draw firm conclusions.
Wouk et al., (2017) (84)	To determine whether antenatal clinic- or hospital-based breastfeeding education increases breastfeeding initiation, duration, or exclusivity as per Step 3 of the BFHI Ten Steps.	38 studies	US, Ghana, Vietnam, Taiwan, Singapore, Iran, Denmark, Thailand, Australia, Canada, Kenya, and UK.	Not specified, but included ‘couples’	RCTs and quasi-experimental studies.	Antenatal interventions, especially those combining education with interpersonal support and involving partners or family, are effective at increasing breastfeeding initiation, duration, or exclusivity. However, varying study quality and lack of standardized assessment of participants' breastfeeding intentions limited the ability to recommend any single intervention as most effective. Future studies should measure the strength of breastfeeding

						intentions, assess the role of family members, compare the effectiveness of different providers, and include details about the time and cost of interventions.
Organisation for Economic Co-operation and Development (OECD); randomised controlled trial (RCT); exclusive breastfeeding (EBF); severe mental illness (SMI); perinatal mental health (PMH); antenatal breastmilk expression (AME); antenatal breastmilk expression (AME); neonatal intensive care unit (NICU); postnatal depression (PND); Baby-Friendly Hospital Initiative (BFHI); Newborn Behavioral Observations (NBO)						

Chapter Four: Summary table of empirical studies on antenatal preparation

Authors	Year & Country	Aim	Participants	Methods	Outcome Measures	Key Findings
Abbass-Dick et al. (128)	2015 (Canada)	Evaluate the effectiveness of a coparenting intervention on exclusive breastfeeding among primiparous couples.	214 couples (107 intervention; 107 control)	RCT multifaceted coparenting breastfeeding support program provided in addition to usual care, including: A hospital discussion with a lactation specialist, a coparenting workbook and breastfeeding booklet, a 11-minute educational video, access to a dedicated website and follow-up emails and phone call.	Breastfeeding duration, exclusivity rates, paternal breastfeeding attitudes and self-efficacy, maternal satisfaction with partner support	Intervention group demonstrated longer breastfeeding duration, higher paternal self-efficacy, and greater maternal satisfaction with partner involvement.
Addicks et al.(119)	2019 (USA)	Determine the effectiveness of a single antenatal motivational interviewing session to support breastfeeding among Appalachian women.	81 low-risk Appalachian women enrolled at 28-39 weeks of gestation.	RCT comparing motivational interviewing (MI) vs. psychoeducation	Breastfeeding initiation, exclusivity, and attitudes measured at pre–post and 1 month postpartum	Women in the MI group were more likely to report current breastfeeding at 1 month and showed improved breastfeeding attitudes (notably among primiparous women).

Aguila Gonzalez et al.(85)	2021 (USA)	Develop and evaluate a culturally and linguistically appropriate Spanish antenatal education curriculum (Spanish Baby Talk) for Hispanic communities.	15 pregnant Hispanic women (12 participated in interviews group)	Pilot interventional mixed methods study combining quantitative pre–post knowledge tests and qualitative focus groups/interviews	Participant knowledge, intentions, satisfaction, and emergent qualitative themes	Significant increases in knowledge (e.g., full-term pregnancy, breastfeeding benefits) and high satisfaction; identified areas for program improvement.
Alberdi et al. (100)	2018 (Ireland)	Evaluate the feasibility and acceptability of a multidimensional breastfeeding support intervention in both urban and rural settings in Ireland.	127 women (100 from an urban National Maternity Hospital; 27 from a rural general hospital)	Feasibility study incorporating an antenatal class, postnatal one-to-one consultation, helpline, online resources, and support group	Breastfeeding status at 3 months postpartum and participant feedback on intervention components	At 3 months, 70% (urban) and 60% (rural) of respondents were breastfeeding; one-to-one lactation consultation was seen as most beneficial; inclusion of support partners was valued.
Awosemusi et al. (129)	2024 (USA)	To examine whether implementing a clinic based- breastfeeding BFPC program improves breastfeeding initiation and exclusivity among low-income patients-.	302 patients receiving care at a teaching hospital–affiliated antenatal clinic (52.3% non-Hispanic Black; nearly all -Medicaid funded-).	Quasi-experimental time series study comparing outcomes at three time points: pre-implementation (2008), 1 year post (2009), and 5 years post (2014); review of clinical records.	Breastfeeding initiation and exclusivity prior to hospital discharge and at 6 weeks postpartum.	While initiation rates did not improve, exclusive breastfeeding during the postpartum hospitalization increased significantly over time—particularly among Black patients.
Elliott-Rudder et al. (121)	2013 (Australia)	Evaluate whether a primary care–based motivational interviewing intervention can improve exclusive breastfeeding maintenance.	330 (154 intervention and 176 control) breastfeeding women recruited from 15 rural family doctor offices	Cluster RCT with practice nurse–delivered motivational interviewing during immunisation visits	Exclusive breastfeeding and full breastfeeding rates at 4 and 6 months	Intervention group had significantly higher exclusive and full breastfeeding rates at 4 months; differences were not sustained at 6 months.

Forster et al. (138)	2011 (Australia)	To establish the feasibility of conducting an adequately powered RCT to evaluate the practice of antenatal milk expressing among women with diabetes in pregnancy (requiring insulin).	43 women with pre-existing or gestational diabetes (requiring insulin), planning to breastfeed, attending a public tertiary women's hospital	Pilot study (to inform the development of a RCT).	Feasibility and acceptability of antenatal milk expressing. Infant outcomes (use of formula, admission to special care nursery, hypoglycaemia). Maternal outcomes (colostrum volume, blood glucose levels, side effects, and acceptability).	No signs of fetal compromise after expressing; no maternal hypoglycaemia observed. 40% of infants received formula in the first 24 hours postpartum (compared to 56% in control audit). 90% of infants received some breast milk at 6 weeks, and 75% at 12 weeks. Median expressing duration: 14 days; median colostrum volume: 39.6 ml. 95% of women said they would express antenatally again if proven beneficial. Some women reported mild tightening or discomfort during expressing.
Forster et al. (139)	2017 (Australia)	To determine the safety and efficacy of antenatal expressing in women with diabetes in pregnancy	635 women with pre-existing or gestational diabetes in a singleton pregnancy between 34 and 37 weeks' gestation; (319 intervention, 316 to standard care).	Multicentre, two-group, unblinded, RCT (antenatal expressing group vs standard care)	Primary outcome: Proportion of infants admitted to the neonatal NICU. Secondary outcomes: Gestational age at birth; exclusive breastmilk feeding during the first 24 hours, from birth to discharge, and at 3 months; cost-effectiveness; maternal and fetal wellbeing; and time to lactogenesis II	Admission to NICU did not differ between groups (15% in the antenatal expressing group vs 14% in standard care; adjusted RR 1.06, 95% CI 0.66–1.46). No difference in gestational age at birth. More infants in the antenatal expressing group received breastmilk exclusively in the first 24 h (69% vs 60%; adjusted RR 1.15, 95% CI 1.02–1.28) and from birth to discharge (57% vs 49%; adjusted RR 1.16, 95% CI 0.99–1.33). No significant differences in exclusive breastfeeding at 3 months (60% vs 55%).

Franco-Antonio et al. (120)	2020 (Spain)	Assess the effect of a brief motivational intervention in the immediate postpartum period on breastfeeding self-efficacy.	Postpartum women who initiated breastfeeding within 1 hour after birth	RCT comparing brief MI vs. standard educational session	Breastfeeding self-efficacy scores measured at follow-up (e.g., 1, 3, and 6 months)	The intervention increased self-efficacy - especially among women with higher education - with general self-efficacy moderating the effect.
Furman et al. (101)	2016 (USA)	To describe a community–academic collaborative intervention ("Breast for Success") aimed at increasing breastfeeding among high-risk mothers.	602 high-risk mothers received intervention and had a one-month postpartum outcome (mean age 22.2 years; predominantly -African American; low educational attainment; mostly unmarried-) in Cleveland, OH.	Community-based participatory research, no control group. Intervention: CHW home visits, interactive breastfeeding education modules, postpartum lactation counsellor calls and visits, optional doula support.	Breastfeeding initiation and exclusivity at 1 month postpartum.	Intervention components (interactive modules and postpartum visits) were significantly associated with increased odds of both any and exclusive breastfeeding.
Gross et al. (102)	2016 (USA)	Determine the effects of a antenatal and postpartum obesity prevention intervention on infant feeding practices in low-income Hispanic families.	456 families enrolled in a RCT	RCT integrating antenatal/postpartum individual nutrition counselling and support groups into routine care	Exclusive breastfeeding prevalence at 3 months, maternal infant feeding knowledge, and feeding practices	Intervention led to higher exclusive breastfeeding (42.7% vs. 33%), increased proportion of breast milk feeding, and delayed introduction of complementary foods; effects were mediated by increased maternal feeding knowledge.

Hanafi et al. (123)	2014 (Saudi Arabia)	Explore the impact of health education on breastfeeding knowledge, attitudes, and practices among women attending primary health care centres in Saudi Arabia.	360 gravid women attending primary health care centres in Almadinah Almunawwarah	Controlled pre–post study comparing an intervention group receiving health education with a control group	Measures of breastfeeding knowledge, attitudes, and practices (e.g., early initiation, colostrum feeding, demand feeding)	Health education improved knowledge, attitudes, and practices; however, rates of early initiation and exclusive breastfeeding still required improvement.
Hui et al. (103)	2021 (Canada)	Determine the impact of remote antenatal education on program participation and breastfeeding initiation in rural and remote Indigenous communities.	First Nations pregnant women from three rural/remote communities in Manitoba	Pre–post comparison before and after implementation of a remote antenatal education program (via website, social media, and community support)	Participation rate in antenatal programs and breastfeeding initiation rates	Participation increased from 36% to 54%, and breastfeeding initiation improved from 34% to 50%; high-speed Wi-Fi availability was an important factor.
Iliadou et al. (124)	2018 (Greece)	Evaluate the effectiveness of a midwife-led antenatal breastfeeding education programme on knowledge, self-efficacy, attitudes, and perceived barriers among nulliparous women.	203 nulliparous pregnant women at a tertiary hospital in Athens, Greece	Quasi-experimental pre–post study with intervention and control groups	Breastfeeding knowledge (questionnaire), self-efficacy (Breastfeeding Self-Efficacy Scale), attitudes (Iowa Infant Feeding Attitude Scale), and perceived barriers	The intervention group showed significantly higher knowledge, improved self-efficacy and attitudes, and lower perceived barriers compared to controls.

Jacobson et al. (127)	2020 (USA)	Determine the effectiveness of a pilot breastfeeding educational intervention for high BMI pregnant women in improving breastfeeding knowledge and skills retention up to 6 weeks.	Pregnant women in second or third trimester with high BMI (predominantly overweight/obese) recruited from urban and rural settings	Longitudinal survey study (pre–post intervention design; no control group)	Knowledge of breastfeeding practices assessed via survey (e.g., latching, managing pain, infant feeding cues)	Post-intervention surveys revealed significant improvements in specific areas of breastfeeding knowledge and reported confidence in handling common challenges.
Karp et al. (113)	2013 (USA)	Examine breastfeeding initiation rates and related factors among multiparous women with a history of preterm birth within the context of a home-visit intervention.	130 multiparous women who gave birth at 35 or more weeks of gestation (subset from a larger RCT on home visits)	Secondary analysis of randomised trial data using descriptive statistics and logistic regression	Breastfeeding initiation at 48 hours postpartum	Although 85% intended to breastfeed, only 65% initiated by 48 hours postpartum; higher education, lower pregravid BMI, and increased home-visit time were associated with higher initiation rates; lower depressive symptoms and higher antenatal stress also played roles.
Kehinde et al. (134)	2024 (Ireland)	Explore the perspectives of postnatal mothers and healthcare professionals (midwives and lactation consultants) on antenatal breastfeeding education classes in Ireland, and how these classes influence mothers' breastfeeding decisions.	N= 10 healthcare professionals: lactation consultants/midwives. N=20 postnatal mothers (0–6 months postpartum).	Descriptive qualitative study using online semi-structured interviews.	Four major themes: From idealization to informed reality. Integrating interactivity and personalization. Consistency and quality of information. Integrating socio-cultural insights and partner involvement.	Antenatal breastfeeding education often portrays breastfeeding in an idealized way, creating a gap between expectations and real experiences. Participants expressed a need for more realistic, practical, and interactive content, including addressing potential breastfeeding difficulties. Online/virtual formats had limitations (e.g., impersonal, low interactivity) but also opportunities for improvement through technological tools.

						Participants emphasized the need for standardized and consistent information across educators. Socio-cultural factors and partner involvement were seen as important for effective education and breastfeeding support.
Kellams et al. (89)	2018 (USA)	To determine whether a antenatal breastfeeding education video prolongs the duration of any and exclusive breastfeeding among low-income- women.	522 (263 for intervention and 259 for control) low-income- pregn ant women recruited from four antenatal clinics; randomized to intervention (breastfeeding education video) or control (antenatal nutrition video).	Multicentre RCT; participants viewed a single video session in the clinic; follow-up- telephone interviews at 1, 3, and 6 months postpartum.	Duration of any breastfeeding and exclusive breastfeeding (cessation rates measured via Kaplan–Meier survival analysis).	A single viewing of the breastfeeding video did not significantly affect the duration or exclusivity of breastfeeding compared to the control video.
Lakhanpaul et al. (131)	2020 (UK)	Explore drivers of infant feeding and care practices in the British–Bangladeshi population in East London to inform the development of a tailored, community-based intervention (NEON programme).	141 participants including British–Bangladeshi mothers, fathers, grandparents, key informants,	Qualitative community-based participatory research using in-depth interviews and focus groups	Emergent themes related to infant feeding practices and wider socioecological determinants	Identified modifiable feeding practices (e.g., early introduction of solids, overfeeding) and highlighted cultural, environmental, and informational factors influencing infant feeding; findings will inform a culturally tailored intervention.

			and health professionals in Tower Hamlets, London			
Lau et al. (104)	2021 (USA)	To evaluate a perinatal education and support program designed to increase breastfeeding in a Chinese American community.	1,475 women receiving perinatal care at two community health centres (intervention vs. control sites).	Quasi-experimental design using a difference-in-differences regression analysis; program included bilingual education, hospital visits, and postpartum support.	Changes in any and exclusive breastfeeding at 4–6 weeks postpartum.	The program increased both any (by 17 percentage points) and exclusive breastfeeding (by 9 percentage points), with the largest gains among primiparous women and those in the USA>5 years.
Lewkowitz et al. (90)	2018 (USA)	Test whether a home-based lifestyle intervention (PAT+) can improve breastfeeding initiation among socioeconomically disadvantaged African American women with overweight/obesity.	118 African American women (59 in PAT+; 59 in standard PAT)	Secondary analysis of a RCT	Breastfeeding initiation rates and reported reasons for non-initiation/cessation	No significant difference in initiation rates between groups; both groups showed higher rates than national averages for African American women.
McGinnis et al. (117)	2017 (USA)	To examine the impact of paraprofessional home visitors on promoting breastfeeding initiation and	3,521 pregnant mothers at risk for poor child outcomes from 36 Healthy Families New York sites.	Secondary analysis of program data using logistic regression; data on home visit content and frequency.	Breastfeeding initiation and duration across postpartum months.	Increased breastfeeding initiation and longer duration were associated with more frequent and targeted breastfeeding discussions during home visits.

		continuation among high-risk mothers.				
Meedya et al. (105)	2014 (Australia)	To evaluate the effectiveness of the "Milky Way" midwifery intervention on any breastfeeding rates until 6 months.	Nulliparous women (≥19 years) planning to breastfeed; n=366 at a tertiary hospital in Sydney, Australia.	Quasi-experimental design comparing intervention vs. standard care; antenatal classes and two postnatal lactation consultation phone calls; data collected via phone interviews at 1, 4, and 6 months.	Breastfeeding rates at 1, 4, and 6 months postpartum.	Assignment to the intervention was associated with significantly higher breastfeeding rates at all time points compared to standard care.
Mersky et al. (114)	2020 (USA)	To test the effects of home visiting on both breastfeeding and bedsharing among a low-income urban sample.	139 women (72 HFA and 67 PNCC) were randomly allocated to two treatment groups and compared with each other and 100 other control participants. Low-income pregnant women referred to home visiting programs in Milwaukee,	Field trial with randomization (for HFA vs. PNCC) and a third non-enrolled comparison group; data collected at four time points up to 12 months postpartum.	Breastfeeding initiation and duration; bedsharing prevalence.	Home visiting was linked to increased breastfeeding initiation and duration. Notably, bedsharing rates varied by program type.

			WI; groups included women in HFA, PNCC, and a quasi-experimental comparison group.			
Mesters et al. (106)	2013 (The Netherlands)	To examine social cognitive changes (knowledge, attitudes, social support/pressure, self-efficacy-) following a breastfeeding education program among women with a family history of asthma.	89 families in the Netherlands with a positive family history of asthma.	Quasi-experimental- design with pre and postnatal home visits and distribution of a theory- based- bookl et; assessments conducted at multiple time points.	Exclusive breastfeeding rates at 6 months; measures of breastfeeding knowledge and attitudinal beliefs.	The intervention increased exclusive breastfeeding rates (48% vs. 27% in controls) and led to immediate improvements in knowledge and attitudes toward breastfeeding.
O'Reilly et al. (115)	2024 (Ireland)	To investigate the effectiveness of a multicomponent perinatal breastfeeding support intervention among women with BMI >25.	225 primiparous women (≥18 years) with BMI ≥25 kg/m² and their nominated support partners; recruited from four maternity centres in Ireland.	Multicentre RCT comparing a structured intervention (antenatal group education plus planned postnatal lactation assessment and telephone support) to standard care.	Any breastfeeding at 3 months postpartum (and additional time points).	There were no significant differences in breastfeeding rates between groups; unexpectedly, more women in the control group accessed private lactation support.

Otsuka et al. (122)	2014 (Japan)	Evaluate a breastfeeding self-efficacy workbook intervention and assess its effect on exclusive breastfeeding, with comparisons by hospital-routine type.	781 pregnant women from 4 hospitals in Japan (2 Baby-Friendly and 2 non–Baby-Friendly)	Intervention study with control group; stratified analysis by hospital type	Breastfeeding self-efficacy scores and exclusive breastfeeding rates at 4 weeks postpartum and infant feeding status.	The intervention improved self-efficacy and exclusive breastfeeding only in Baby-Friendly hospitals; no effect in non–Baby-Friendly settings.
Parry et al. (125)	2019 (USA)	Evaluate the “Ready, Set, BABY” antenatal breastfeeding education curriculum on maternal feeding intentions, knowledge, and attitudes.	416 expectant women across 7 sites in the USA and Puerto Rico	Pre–post intervention survey administered during group classes or individual sessions after practitioner training	Infant Feeding Intentions Scale scores, knowledge of Baby-Friendly maternity practices, and comfort with formula feeding	The curriculum significantly increased breastfeeding intentions and knowledge while decreasing comfort with the idea of formula feeding; materials were well rated.
Payaró et al. (107)	2016 (Spain)	To determine if a targeted breastfeeding intervention for young mothers increases breastfeeding duration and attendance at antenatal/postnatal educational programs.	Pregnant women ≤22 years old in Barcelona; total n=242 (131 intervention, 111 control).	Quasi-experimental study comparing participants in the Young Mothers (MJ) program with a specific breastfeeding intervention versus standard care.	Duration of breastfeeding and attendance at antenatal (EPN) and postnatal (EPP) education sessions.	Participants in the intervention group breastfed longer and attended more education sessions; EPN/EPP attendance was significantly linked to increased breastfeeding duration.
Pitcock et al. (108)	2021 (USA)	To determine if a culturally appropriate educational program (“¡Tengo Leche!”) combined with in-hospital- peer support increases exclusive breastfeeding among Hispanic women.	103 Hispanic, low-income, uninsured pregnant women in a community antenatal program (35 in education-plus-peer	Two-group quasi- experimental design with self--selection- into education plus peer support vs. peer support only; data gathered via chart review.	Exclusive breastfeeding rates at hospital discharge.	The education plus peer support group had significantly higher exclusive breastfeeding rates at discharge (46.7%) compared to the peer support only group (24.6%).

			support; 68 in peer- support-only-).			
Prado et al. (91)	2012 (USA)	To evaluate a telenovela (soap opera) approach to promote breastfeeding amongUSALatinas.	Pregnant Latina women participating in the WIC program (low-income population). 145 participants (69 intervention and 76 control)	Quasi-experimental design comparing standard WIC education with additional telenovela viewing.	Changes in attitudes toward breastfeeding measured before and after the intervention.	No statistically significant changes in attitudes were observed immediately, but the telenovela successfully engaged participants and spurred further discussion about breastfeeding.
Puharić et al. (109)	2019 (Croatia)	To assess the effect of a combined antenatal/postnatal intervention (proactive telephone support and written materials) on exclusive breastfeeding in primiparas.	355 primiparous women in Croatia randomized into three groups: intervention (N=129), active control (N=103), and standard care (N=123).	RCT with proactive telephone support and educational materials provided antenatally and postnatally.	Exclusive breastfeeding rates at 3 and 6 months; breastfeeding difficulties; self-efficacy and attitudes.	The intervention group showed significantly higher exclusive breastfeeding rates at both 3 (81% vs. 47%) and 6 months, along with improvements in self-efficacy, attitudes, and reduced difficulties.

Rempel et al. (130)	2012 (Canada)	To evaluate whether a peer-led antenatal breastfeeding class is as effective as a nurse-led class in promoting continued breastfeeding.	54 expectant mothers who attended a peer-led class compared to 55 mothers in a nurse-led class, recruited from community settings.	Quasi-experimental non-equivalent control group design; pre-class questionnaires and telephone interviews at 1 week, 1 month, and 6 months postpartum.	Breastfeeding intentions, duration, perceived success, and use of peer support.	Both classes were beneficial, but the peer-led class was rated as more helpful, with participants showing stronger intentions to continue breastfeeding at 6 months and greater uptake of peer support.
Reno et al.(118)	2018 (USA)	Determine whether the Dynamic Breastfeeding Assessment Process (D-BAP) increases antenatal breastfeeding self-efficacy among low-income African American women; to examine effects among those with no prior breastfeeding experience; and to compare changes between those with and without previous experience.	25 pregnant low-income African American women	Pre–post paired-samples design	Breastfeeding Self-Efficacy Scale scores	Participation in D-BAP was associated with a statistically significant increase in breastfeeding self-efficacy, notably among women with no prior experience.

Rosen-Carole et al.(92)	2022 (USA)	To evaluate whether a antenatal provider breastfeeding toolkit improves provider counselling, peer counsellor referrals, and breastfeeding outcomes.	Postpartum women receiving care at a antenatal practice serving low-income- patients in upstate New York; pre-intervention (n=71) and post-intervention (n=70) cohorts.	Pre-post- intervention study using surveys to assess changes in provider practices and maternal outcomes; analyses adjusted for secular trends.	Breastfeeding intentions, initiation, and 1-month duration (both any and exclusive).	Post-intervention, there were increases in provider counselling and uptake of peer counsellor referrals, with modest (non-significant) increases in breastfeeding initiation and exclusivity.
Ross-Cowdery et al.(126)	2017 (USA)	To evaluate the impact of a brief counselling intervention on women's knowledge of maternal health benefits of lactation and their breastfeeding intentions.	65 pregnant women (mean age 24; 72% African American; 50% multiparous – but only 21% previously breastfed-) at an urban university hospital.	Pre and post---counselling surveys surrounding a 5-minute counselling session delivered by student volunteers using a scripted infographic.	Maternal health benefit knowledge scores and breastfeeding intentions (assessed via Likert scales).	Counselling led to a significant improvement in knowledge (score increased from 19/35 to 26/35) and stronger intentions to breastfeed.

Schiller et al.(93)	2024 (Israel)	To evaluate whether targeted antenatal counselling in women with pregestational diabetes mellitus affects breastfeeding rates and maternal perceptions-.	52 women with pregestational diabetes between 32 and 36 weeks of gestation (randomized into -face-to-face- counselling vs. written information – N=36 each) and 38 non-diabetic- controls.	Cluster -RCT comparing two modes of targeted counselling delivered late in pregnancy; questionnaires at baseline and at 3, 6, and 12 months postpartum.	Breastfeeding rates up to 12 months postpartum; maternal confidence and perceptions regarding breastfeeding and diabetes management.	Breastfeeding rates were comparable across groups; however, counselling improved maternal knowledge and confidence in managing blood glucose while breastfeeding.
Schreck et al. (110)	2017 (USA)	Measure the effect of hospital-based antenatal and postnatal breastfeeding interventions on breastfeeding initiation and continuation rates in a low-income population.	650 Low-income women	Quasi-experimental pre/post intervention study. Antenatal intervention: 10-lesson breastfeeding curriculum delivered one-on-one by International Board Certified Lactation Consultants in the antenatal clinic waiting room. Postnatal intervention: peer-led hospital-based breastfeeding support group.	Breastfeeding initiation, continuation at ≥6 months, achievement of breastfeeding goals.	Breastfeeding initiation increased significantly from 51.5% (baseline) to 71.9% (postintervention) ($p<0.0001$). Continuation at ≥6 months did not differ overall between groups. Among postintervention women, those attending the support group were significantly more likely to continue breastfeeding to 6 months. Antenatal education influenced feeding decisions (92%) and helped prolong breastfeeding (79.5%).

Schwarz et al.(94)	2024 (USA)	To assess the effect of antenatal counselling on the maternal health benefits of lactation on postpartum knowledge, breastfeeding intentions, and behaviours.	411 nulliparous US-born pregnant women recruited online.	Individual-level RCT delivered via Zoom; a 10-minute virtual counselling session (maternal health benefits) versus an attention control session on smokefree homes; follow--up- surveys up to 12 months postpartum.	Changes in breastfeeding knowledge, intended duration, and actual infant feeding behaviours (any and exclusive breastfeeding).	Counselling significantly increased awareness of maternal health benefits and extended intended breastfeeding duration, though actual breastfeeding rates were similar between groups.
Soltani et al. (140)	2012 (UK)	To investigate the pattern of antenatal breast expression uptake and its relationship with birth outcomes in women with diabetes.	94 pregnant women with diabetes (type 1, type 2, or gestational diabetes)	Retrospective cohort study using self-administered questionnaires and review of maternity records.	Gestational age at birth Admission to special care baby unit (SCBU) Breastfeeding initiation and duration Mode of delivery Birth weight and Apgar score	37% (35/94) of women recalled being advised to express antenatally, and 17% (16/94) did so. Mean gestational age at birth was lower among those who expressed (37.1 weeks) compared to those who did not (38.2 weeks), mean difference −1.2 weeks (95% CI: −2.4 to 0.04, p = 0.06). A higher proportion of babies in the expression group were admitted to SCBU (33% vs 12%, p = 0.06). All women who expressed antenatally breastfed for their first feed, compared to 86% in the non-expression group (p = 0.19). No significant differences in birth weight, Apgar score, breastfeeding duration, or breast problems. associated with lower

Stein et al. (133)	2025 (Australia)	To explore women's experiences of breastfeeding education accessed during the antenatal period and its impact on breastfeeding preparedness.	N=178 completed survey (≥90% of questions).	Exploratory online survey with quantitative and qualitative questions. Recruitment via social media (snowball sampling). Quantitative data analysed descriptively	Main topics covered were benefits of breastfeeding and skin-to-skin, but practical instruction (e.g., positioning, latch, challenges) was lacking.	Breastfeeding education was often absent or insufficient during formal antenatal education. Labour and birth topics dominated, with breastfeeding content minimal or inconsistent. Two overarching themes emerged: "I didn't feel prepared for breastfeeding" – most participants felt unprepared, reporting unrealistic expectations, lack of practical information, omission of challenges, and feelings of being deceived. "I felt prepared for breastfeeding" – a smaller group reported positive experiences, highlighting the value of skilled educators, group learning environments, live demonstrations, and honest discussion of challenges. Participants expressed a strong desire for realistic and practical education, including exposure to real breastfeeding experiences and common difficulties.
Tender et al. (111)	2024 (USA)	To assess the feasibility of integrating a breastfeeding peer counsellor (BFPC) into an academic obstetric clinic and to evaluate its impact on breastfeeding self-efficacy and in-hospital breastfeeding rates among WIC-eligible women.	57 pregnant WIC-eligible women (predominantly Black; 86%) attending a Baby-Friendly academic obstetric clinic.	Quasi-experimental pilot study with randomization into two groups: an intervention group (received a 15-minute BFPC counselling session post-visit) and a comparison group (received usual antenatal care). Data were collected via	Changes in BFSES-SF scores (pre-to post-intervention) and in-hospital infant feeding outcomes (exclusive breastfeeding, exclusive formula feeding, and mixed feeding).	The integration of a BFPC was feasible. The intervention group showed a statistically significant improvement in overall BFSES-SF scores (increase of 0.69 vs. 0.21 in the comparison group, $p = .04$) and trended toward less exclusive formula feeding, though exclusive breastfeeding rates did not differ significantly between groups.

				pre- and post-intervention surveys (using the Breastfeeding Self-Efficacy Scale – Short Form) and chart reviews, with analyses performed using t-tests, Mann–Whitney U tests, and chi-square tests.		
Yeh et al. (112)	2020 (Taiwan)	Examine whether a hospital-based perinatal breastfeeding program can improve exclusive breastfeeding rates at discharge and one month postpartum.	60 mother–infant dyads in a Baby-Friendly hospital in Taiwan	Quasi-experimental design comparing a multi-strategy intervention (including antenatal education, kangaroo mother care, and continuous rooming-in) vs. routine care	Exclusive breastfeeding rates at hospital discharge and one month postpartum	Intervention group had markedly higher exclusive breastfeeding rates (93.3% at discharge vs. 53.3%; 83.3% at 1 month vs. 36.7% in controls).
randomised controlled trial (RCT); motivational interviewing (MI); neonatal intensive care unit (NICU); relative risk (RR); confidence interval (CI); community health worker (CHW); body mass index (BMI); special care baby unit (SCBU); breastfeeding peer counsellor (BFPC); Breastfeeding Self-Efficacy Scale–Short Form (BFSES-SF); Women, Infants, and Children (WIC); gestational diabetes mellitus (GDM); rapid weight gain (RWG); exclusive breastfeeding (EBF); breastfeeding (BF); quality improvement (QI); Parents as Teachers (PAT); enhanced Parents as Teachers (PAT+); Healthy Families America (HFA); Antenatal Care Coordination (PNCC).						

Chapter Five: Summary table of reviews on skin-to-skin and kangaroo care

Authors	Aim	Number of Included Studies	Countries of Included Studies	Population	Types of Studies	Key Findings
Akbari et al (2018)(163)	To examine the relationship between KC and infant/toddler biopsychosocial outcomes.	13	India, Canada, Colombia, Israel, Brazil, United Kingdom, United States, Japan, Iran	Infants/toddlers exposed to KC, including low birth weight and/or premature neonates.	Observational studies and randomised controlled trials.	KC was associated with improved infant self-regulation. No significant effects were found for cognitive, motor, socio-emotional, or temperament outcomes in main analyses. Duration of KC moderated cognitive and motor outcomes (longer KC associated with better outcomes). Motor development was also moderated by country-level mortality ratio and infant gender.
Almutairi et al (2024)(161)	To synthesise evidence on parents' and healthcare practitioners' perceptions, experiences, knowledge of, and attitudes toward KC of preterm babies in hospital settings, and to establish parents' satisfaction with KC.	37	Not specified (17 in high-income countries; 10 in upper-middle income counties; 8 in lower-middle-income counties; 2 in low-income countries)	Parents (mothers and fathers) and healthcare practitioners involved in KC of preterm babies in hospital settings.	Quantitative, qualitative, and mixed methods studies.	Healthcare practitioners generally had good knowledge of KC, though a minority lacked adequate understanding even after training. Parents, especially fathers, had limited prior knowledge of KC. Both parents and healthcare practitioners expressed positive attitudes toward KC. Little is known about parental satisfaction with KC, with limited evidence available. Findings highlight a need to improve parental education before neonatal admission and provide consistent training for healthcare practitioners.

Anderzén-Carlsson et al (2014)(143)	To describe parental experiences of providing SSC to their newborn infants.	29	Brazil, Denmark, England, Japan, Norway, South Africa, Sweden, Uganda, and the United States.	Parents (401 mothers and 94 fathers) providing SSC to newborn infants.	Qualitative studies.	Two overarching themes emerged: a restoring experience and an energy-draining experience. Parents described SSC as positive and restorative, including feelings of love, calm, bonding, learning, improved self-esteem, and a sense of doing good for the infant. SSC was also described as demanding, with parents at times feeling exposed, physically and emotionally burdened, uncertain, or afraid of hurting the infant. The review highlights the need for further research, particularly on fathers' experiences.
Anderzén-Carlsson et al (2014)(144)	To synthesise and interpret qualitative research findings focusing on parental experiences of SSC for newborn infants.	29	Brazil, Denmark, England, Japan, Norway, South Africa, Sweden, Uganda, and the United States.	Parents (401 mothers and 94 fathers) providing SSC to newborn infants.	Qualitative studies.	A theoretical model emerged: "Becoming a parent under unfamiliar circumstances." SSC is experienced as both restorative (feeling good, bonding, learning, improved self-esteem) and energy-draining (feeling exposed, physical/emotional burden, fear of hurting the infant, feeling insufficient toward other family members). A supportive environment (staff, family, physical space) facilitates restorative experiences. Obstacles in the environment make SSC energy-draining for parents. When experienced positively, SSC helps parents feel ready to assume full responsibility for their child.

Cai et al (2022)(175)	To provide a cogent summary of the evidence base on key barriers and facilitators to implementing KC.	6	Umbrella review including studies from multiple countries	Parents/caregivers of preterm infants; Healthcare workers; Low-birth-weight infants	Systematic reviews, Scoping reviews	Identified five factor themes affecting KC: environmental, professional, parent/family, access, cultural. Both barriers and facilitators were mapped across these domains. Emphasised need for leadership support, training, and family education.
Charpak et al (2021)(166)	To conduct a systematic review and meta-analysis to evaluate whether the duration of KC influences neonatal somatic growth.	13	United States, Ethiopia, Indonesia, Mexico, Australia, India, Malaysia, Kenya, Nepal	Preterm or low birthweight infants (<2500 g)	RCTs	KC effects on growth were directly related to duration. ≥6 hours/day KC improved weight, length, and head circumference. No growth benefit with ≤2 hours/day.
Chan et al (2015)(176)	To investigate factors influencing the adoption of kangaroo care in different contexts.	112	>30 countries, spanning low-, middle-, and high-income settings	Mothers, newborns or mother-newborn dyads who had practiced KC, and health-care providers, health facilities, communities and health systems that have implemented such care	Papers containing qualitative data	KC is a complex, behaviour-driven intervention whose successful adoption depends on health-system, social, and contextual enablers. SSC was consistently associated with improved bonding, infant stability, feeding, and caregiver confidence, but its duration and continuity were strongly shaped by factors such as non-separation policies, the ability of mothers to stay with their infants (including overnight), staff training, facility space, and cultural norms.

Cleveland et al (2017)(152)	To determine the effect of SSC, mother–infant holding, touch, and/or massage on full term, healthy newborns and their primary caregivers.	33 studies on SSC 7 studies on infant massage	Not stated	Full term, healthy newborns and their primary caregivers.	Unclear	SSC improves breastfeeding, thermoregulation, interaction, stress reduction, and pain response in healthy term infants. Massage may help sleep patterns and reduce jaundice, but evidence insufficient for routine use.
Cordolcini et al (2024)(155)	To systematically analyse paternal tactile behaviours (SSC and spontaneous touch) with full term infants, focusing on biophysiological, behavioural, and psychological outcomes in fathers and infants. To examine evidence from comparative studies assessing potential differences between fathers' and mothers' tactile behaviours.	14	Sweden, Italy, USA, Belgium, UK, Germany, Israel, Chile, Taiwan, Turkey.	Fathers (and sometimes mothers) of healthy full-term infants/toddlers aged newborn to 12 months.	Quantitative observational studies with cross-sectional or longitudinal designs	Paternal SSC/ST have positive effects on fathers and infants (bonding, physiology, reduced anxiety). Infants show more stable vitals, less crying, earlier feeding cues. Maternal vs paternal touch differ in style, but both are beneficial.

Cunningham et al (2018)(164)	To ascertain whether KC affects the weight of preterm/low birthweight infants in the neonatal hospital setting.	17	India, Kenya, Australia, USA, Malaysia, Ethiopia, Indonesia, Mexico, Iran, Zimbabwe, Egypt, Korea, Brazil	Preterm and/or low birthweight (LBW) infants in neonatal hospital settings.	RCTs (n=10). Other quantitative studies (n=7) (quasi-experimental, pretest/post-test, prospective cohort, and purposive sampling designs)	KC increased weight gain in most studies, with 10 RCTs showing positive effects, 6 statistically significant. All 17 studies reported weight gain improvements in KC groups except one study favouring conventional care. KC was consistently associated with higher exclusive breastfeeding rates, which may support weight gain.
Deys et al (2021)(168)	To synthesise research exploring women's experiences of immediate and uninterrupted SSC at caesarean section when mother and baby are well	13	USA, Australia, Canada, Germany, Brazil Iran	Well, full term women and their newborn babies undergoing caesarean section	Quantitative (6), Qualitative (5), Mixed methods (2)	Immediate SSC during caesarean section is safe, desired, and improves women's birth experience. Women report greater satisfaction, sense of control, and a feeling of the experience being more natural. SSC helps women feel less anxious, more connected, and reduces the negative effects of separation.
Durmaz et al (2023)(153)	To examine the effect of KC/SSC on infants' body temperature, oxygen saturation, respiratory rate, and heart rate.	13	Iran, South Korea, India, Saudi Arabia, Iraq, Egypt, Sweden, Germany, Australia, Turkey.	Term and preterm infants (no gestational age restrictions).	RCTs (5), Quasi-experimental studies (8), including prospective cohort and case–control designs	KC/SSC improved body temperature. Heart rate decreased after KC/SSC in pre/post studies. Oxygen saturation increased after KC/SSC. No effect on respiratory rate overall, but respiratory rate decreased after KC/SSC in pre/post studies.

Gajula et al (2024)(154)	To investigate the efficacy of KC in term and late preterm babies across outcomes including serum bilirubin level, vaccination pain, hypothermia prevention, and long-term neurodevelopment.	7	Iran, India, Pakistan, Zambia, Global	Term and late preterm neonates.	RCTs, Clinical trials, Cohort studies, Observational studies, Reviews	KC reduced serum bilirubin levels in term neonates. KC reduced vaccination pain scores. KC prevented hypothermia in term neonates. KC was associated with better long term neurodevelopmental outcomes in low birthweight and late preterm infants. KC promoted better weight gain and breastfeeding in late preterm infants.
Garg et al (2020)(157)	To evaluate the role of KC in reducing bilirubin levels and duration of phototherapy in term and preterm neonates.	5	Iran, China, USA	Healthy preterm and term neonates with neonatal hyperbilirubinemia.	RCTs	Two trials showed significant reduction in bilirubin levels with KC. Three trials showed significant reduction in duration of phototherapy. KC may reduce hospital stay and support improved outcomes, but evidence is limited by small sample sizes and heterogeneity
Ghojazadeh et al (2019) (170)	To evaluate the effect of KC on breastfeeding success.	20	India, USA, Australia, UK, Sweden, France, Pakistan, Madagascar, Spain, Malaysia, Italy	Mother–baby pairs; neonates in KC vs. conventional neonatal care groups. Includes a mix of preterm and term infants	RCTs	Breastfeeding success rate higher in the KC group, but not statistically significant overall (RR 1.11; 95% CI 0.93–1.34). Breastfeeding initiated significantly sooner in the KC group (mean difference –0.72 minutes; $p < 0.05$). IBFAT scores significantly higher in the KC group (MD 1.50; $p < 0.05$). Majority of included trials had high risk of bias

Gill et al (2021)(158)	To synthesise current evidence on barriers and enablers to KC, propose a conceptual framework for KC implementation, and identify strategies to improve uptake in neonatal units.	4 systematic reviews plus more recent original studies (exact number of studies not stated).	Not specified	Focuses on factors affecting parents, healthcare professionals, and healthcare systems in neonatal units.	Systematic reviews Qualitative studies Quantitative studies	A conceptual framework was developed encompassing parental, healthcare professional, and healthcare system factors influencing KC uptake. Identified multiple barriers and enablers related to knowledge, sociocultural factors, wellbeing, staff workload, training, policies, resources, and management. Successful KC implementation requires multilevel, multifactorial strategies. Suggested strategies include education, sociocultural support, reframing KC as standard care, and strengthening policies and system-level guidance.
Guo et al (2023)(147)	To assess and evaluate the impact of KC on neonatal mortality and length of hospitalisation in preterm and low birthweight infants.	24	UK, Colombia, Papua New Guinea, India, Taiwan, Malaysia, Kenya, Nepal, Indonesia, Bangladesh, USA, Brazil, Ecuador, Ghana, Malawi, Nigeria, Tanzania, Ethiopia, Mexico	Preterm and/or low birthweight (LBW) neonates (<2500 g; <37 weeks).	Prospective RCTs, Retrospective investigations	KC significantly reduced mortality in short term outcomes (within 2 months) (OR 0.65; p = 0.03). KC significantly reduced mortality in long term outcomes (3–12 months) (OR 0.72; p = 0.0007). No significant impact on length of hospital stay (OR −1.43; p = 0.05). High heterogeneity for hospital stay outcomes; further research needed.

Hashim et al (2025)(177)	To identify barriers and facilitators to implementing SSC during caesarean deliveries, evaluate its impact on maternal and neonatal outcomes, and synthesise global best practices adaptable to local contexts.	14	Australia, Brazil, Canada, China Finland, France, United Kingdom, United States of America	Studies focused on post-caesarean mothers and their newborns in the context of SSC implementation.	Primarily qualitative studies, including: Descriptive qualitative studies, Phenomenology Grounded theory, Mixed methods, Case study	SSC during caesarean deliveries was associated with improved breastfeeding initiation, greater maternal satisfaction, reduced stress, enhanced maternal-infant bonding, and improved neonatal outcomes, while barriers include logistical, institutional, staff, and cultural challenges.
Jafari et al (2019)(151)	To examine the effect of KC on hospital management indicators (length of stay, readmission, parent satisfaction, preference for same post-delivery care) compared with conventional neonatal care.	11	Australia, UK, Iran, France, India, Pakistan, US, Madagascar, Nepal, Italy, Malaysia.	Low birth weight (LBW) and very low birth weight (VLBW) neonates and their parents.	RCTs	KC showed non-significant improvements in length of stay, readmission, parent satisfaction, and preference for same post-delivery care.
Karimi et al (2023)(171)	To investigate the effects of KC on mother-infant attachment.	10	India, Turkey, South Korea, Iran	Mothers and their infants (preterm, low birth weight, and term infants depending on study).	RCTs	KC significantly increased mother–infant attachment compared with conventional care (SMD −1.33; p = 0.001). Effect remained robust across sensitivity analyses, despite heterogeneity and some publication bias. All included trials using the Maternal Attachment Scale showed higher attachment scores in the KC groups (except one study reporting no effect).

Louis et al (2023)(160)	To explore the literature on the impact of KC on caregivers' psychological health when their newborns are in the NICU.	23	Not specified	Caregivers (mothers and fathers) of newborns in the NICU.	Systematic reviews, RCTs, Quasi-experimental studies, Cohort studies, Qualitative studies	KC was associated with improved caregiver self-esteem, confidence, and increased involvement in infant care. KC helped reduce caregiver stress, anxiety, and depressive symptoms, often shown in lower stress scores, lower salivary cortisol, and improved mood. KC enhanced caregiver–infant bonding, with higher maternal and paternal attachment scores compared to standard care.
Mekonnen et al (2019)(169)	To estimate the pooled mean time to initiate breastfeeding among preterm and low birthweight infants receiving KC.	8	India, Brazil, Bangladesh	Preterm and low birthweight (LBW) infants.	RCTs	Infants receiving KC initiated breastfeeding 2.6 days earlier than those receiving conventional care. Seven of eight studies found earlier initiation of breastfeeding in KC groups. KC promotes early breastfeeding initiation compared with incubator/radiant warmer care.
Moore et al (2025)(141)	To assess the effects of immediate (<10 min) or early (10 min–24 h) SSC compared with standard hospital care on breastfeeding, and on maternal and infant physiology in healthy full term and late preterm infants and their mothers.	69	High income countries (32 trials) Upper-middle-income countries (25 trials) Lower-middle-income countries (12 trials: India, Nepal, Pakistan, Vietnam, Zambia)	Healthy full term or late preterm infants (≥34 weeks) and their mothers; infants healthy enough to remain with mothers (NICU admissions excluded).	RCTs including one cluster RCT.	SSC probably increases exclusive breastfeeding, both at discharge to 1 month and at 6 weeks to 6 months post birth. SSC improves infant physiological stability, including higher blood glucose levels and slightly higher axillary temperatures (not clinically significant). SSC may have little to no effect on maternal physiology, including placental separation time and postpartum blood loss (evidence low to very low certainty).

Moran et al (2023)(159)	To explore the content, experiences and outcomes of interventions designed to increase early SSC in high income settings.	10	USA, Canada, UK	Healthy, term infants and their mothers, in high income countries.	Randomised controlled trial (n = 1) Pre–post evaluations (n = 3) Process evaluation (n = 1) Quality improvement studies (n = 5)	Interventions produced some increase in SSC prevalence, but duration remained limited and often did not meet WHO recommendations (typically <15 min; one study 42.5 min). Breastfeeding rates improved modestly, but changes were generally not statistically significant. Mothers and healthcare professionals were positive about the interventions, but barriers such as staffing, knowledge gaps, and resistance to change were commonly noted.
Mu et al (2020)(162)	To synthesise available qualitative evidence on the experiences of parents who have used KC for preterm infants in the NICU.	9	Sweden, South Africa, Denmark, USA, Norway	Parents (mothers, fathers, or both) of preterm infants (24–37 weeks gestation) receiving KC in the NICU.	Qualitative studies, including: Phenomenology Hermeneutic phenomenology Qualitative descriptive research	Parents experienced fear, uncertainty and a sense of emptiness in their parental role when beginning KC. Preparation and support from nurses helped parents gain confidence and understand how to provide KC. KC enhanced parental competency and bonding, strengthening parental identity and relationship with their infant.
Narciso et al (2022)(150)	To evaluate the effectiveness of KC in reducing the length of hospital stay of preterm and/or low birthweight infants.	12	Nepal, India, Malaysia, Taiwan, Indonesia, Kenya, Colombia	Preterm infants (<37 weeks) and/or low birthweight infants	RCTs	KC reduced the length of hospital stay compared with conventional care (MD –1.75 days, 95% CI –3.22 to –0.28). Subgroup with <6 hours/day of KC showed a statistically significant reduction in stay (MD –4.66 days). Subgroup with >6 hours/day of KC did not show a statistically significant reduction (MD –0.81 days). Authors conclude KC is a safe, low-cost intervention effective in reducing hospital stay for preterm and/or LBW infants.

Pathak et al (2023)(173)	To investigate the effect of KC for low birthweight and preterm infants on parents' mental and physical health.	30	Australia, Brazil, China, Colombia, Germany, Ghana, India, Islamic Republic of Iran, Israel, Italy, Malawi, Nigeria, Republic of Korea, Sweden, Turkey, United Kingdom, United Republic of Tanzania, United States	Parents (mothers and fathers) of preterm infants (<37 weeks) or low birthweight infants (<2500 g).	RCTs (n = 18) Quasi-randomised trials (n = 12)	KC reduced the risk of moderate-to-severe postpartum maternal depressive symptoms (RR 0.76). KC reduced maternal stress (SMD −0.82) and anxiety (SMD −0.62). KC improved mother–infant attachment and bonding (SMD 1.19). Limited evidence suggested improved father–infant interaction, but no significant effect on paternal depression or stress. No trials reported parental physical health outcomes.
Ruiz et al (2023)(172)	To map the evidence on SSC in the third stage of labour for postpartum haemorrhage prevention.	13	Saudi Arabia, Australia, Iraq, Egypt, Spain, India, Iran, Japan, Serbia, Turkey.	Women during the third stage of labour (as defined by PCC criteria)	6 randomised controlled trials, 3 quasi-experimental studies, 3 cohort studies 1 cross-sectional study	SSC reduced the duration of the third stage of labour. Decreased maternal blood loss. Improved complete placenta delivery. Improved uterine contractility and physiological involution. Lower rates of uterine atony. Reduced erythrocyte and haemoglobin drop. Fewer absorbent pad changes and shorter hospital stay. Reduced need for synthetic oxytocin and/or ergometrine to control bleeding.

Saptaputra et al (2021)(174)	To provide an overview of the equipment supporting KC.	17	Netherlands, Nepal, Iran, India, Peru, Canada, USA, Indonesia, Malawi, Mozambique, Ethiopia, Uganda.	Mothers and preterm/low birthweight infants, Mothers post-C-section, NICU mothers and infants, Health workers/mothers using KC equipment	Both qualitative and quantitative studies	Most equipment reviewed improved the effectiveness and efficiency of KC, enhancing comfort, monitoring, or therapeutic support. Some equipment (e.g., ergonomic wraps, sensors, phototherapy devices) showed positive benefits, while three devices had no significant effect. Supportive equipment can help extend KC duration by improving maternal comfort and facilitating safe continuous skin-to-skin care.
Sharma et al (2019)(165)	To evaluate the role of KC on growth and breastfeeding rates in very low birth weight (VLBW) neonates.	13	Sweden, Nicaragua, Papua New Guinea, UK, Brazil, India, Iran, Malaysia, USA, Columbia, Egypt	Very low birth weight (VLBW) infants	RCTs	Most studies showed positive effects or no negative effects of KC on growth and breastfeeding rates in VLBW infants. KC generally improved weight, length, head circumference and increased breastfeeding rates across the majority of included studies. Overall conclusion: KC has a positive effect on growth and breastfeeding in VLBW infants.
Sivanandan et al (2023)(148)	To compare the effects of KC vs. conventional care, and early (within 24 hours) vs. late initiation of KC on neonatal mortality and other critical outcomes in preterm and low birthweight infants	31	25 studies were conducted in low and middle income countries; 7 studies were conducted in high income countries	Preterm and/or low birth weight infants (LBW <2500 g; includes VLBW and infants ≤34 weeks).	Individually randomised trials and cluster randomised trials	KC reduces neonatal mortality compared with conventional care (RR 0.68). Early KC (within 24 hours) further reduces mortality compared with later initiation. KC also reduces severe infection and hypothermia and increases exclusive breastfeeding at discharge

Solaz-García et al (2022)(156)	To systematically review scientific studies assessing oxygenation and physiological stability during KC in premature infants.	25	Not specified	Premature infants (<37 weeks gestational age).	22 prospective observational studies, 2 quasi-experimental studies,1 RCT	KC showed no significant changes in HR, SpO_2, $rScO_2$, or FtOE compared with incubator care. Cerebral oxygenation ($rScO_2$) remained stable, with a slight upward trend during KC. KC was concluded to be safe for stable preterm infants, including those with or without respiratory support.
Stefani et al (2022)(145)	To explore the barriers and facilitators to implementing KC in the UK through a realist synthesis.	4	United Kingdom	Full term and preterm infants in UK maternity and neonatal units	1 controlled trial, 1 review, 2 commentaries	Very limited KC research exists in the UK, with inconsistent definitions and poor quality evidence. Main barriers include lack of training, knowledge, confidence, and clear guidelines for staff and parents. KC/SSC (used as proxy) shows that education, clear guidelines, and supportive tools increase practice, highlighting opportunities to strengthen KC implementation
Stevens et al (2014)(167)	To evaluate evidence on immediate (within minutes) or early (within 1 hour) SSC after Caesarean section for healthy mothers and term newborns, and to identify facilitators, barriers, and associated maternal and newborn outcomes.	7	Italy, US, Sweden, UK	Healthy mothers and healthy term newborns following Caesarean section	RCTs, Qualitative studies, a quality improvement project	Immediate or early SSC after Caesarean section is feasible with appropriate staff collaboration and preparation. SSC may improve breastfeeding initiation, shorten time to first breastfeed, and reduce in-hospital formula supplementation SSC is associated with positive maternal experiences, enhanced bonding, and newborn relaxation/stability.
Vittner et al (2015) (142)	To describe the essence of healthcare providers' experiences in facilitating SSC through a meta-	8	Sweden, Australia, Brazil, the United States, Denmark,	Healthcare professionals/caregivers (primarily nurses) involved in facilitating SSC with hospitalised infants.	Descriptive qualitative, Phenomenology, Grounded theory, Mixed methods with	SSC facilitation is influenced by four overarching themes: Varying thresholds of getting started (differences in staff readiness, education, beliefs). Defining adequate resources (staffing levels,

	ethnographic synthesis of qualitative studies, to enhance understanding of SSC implementation		and Norway		qualitative components	physical space, leadership support). Navigating infant complexity (clinical stability, equipment, acuity). Balancing parental readiness with infant needs (parental confidence, cultural factors). Nurses generally value SSC but struggle with competing clinical demands, inconsistent guidance, and resource constraints. Findings highlight a need for practical strategies, education, and culture change to support consistent SSC implementation.
Zhu et al (2023)(149)	To determine the benefits of KC on clinical outcomes of low birthweight (LBW) and preterm infants during the first 28 days	17	Not specified	Low birthweight (LBW) and preterm infants.	RCTs	KC significantly reduced mortality between enrolment and 28 days (RR 0.80). KC shortened hospital stay (SMD −0.96). KC reduced hypothermia (RR 0.45). KC reduced sepsis (RR 0.79). KC increased exclusive breastfeeding at discharge and at the end of the neonatal period, but not significantly.

Chapter Six: Summary table of review on early hospital and community support

Authors	Aim	Number of Included Studies	Countries of Included Studies	Population	Types of Studies	Key Findings
Almohanna et al. (2020)(266)	To identify characteristics of internet-based breastfeeding interventions using electronic technologies and to investigate their effects on breastfeeding outcomes.	16	USA, Australia, Finland, Taiwan, Canada, Thailand, the Philippines and Ireland	Healthy pregnant and postnatal women (primiparous and multiparous) intending to breastfeed.	Mixed designs including randomised controlled trials, quasi-experimental studies, cohort studies, feasibility studies and qualitative studies.	Web-based interventions combining education with personalized support and online discussion forums were most effective in improving breastfeeding knowledge, exclusivity and duration up to 6 months; monitoring-only or tracking-based interventions were least effective; web-based delivery outperformed mobile apps and kiosks, and personalization and interactive support emerged as dominant strategies for improving outcomes
Bai et al. (2024)(49)	Synthesise qualitative studies on the breastfeeding experiences of women with multiple births to support the development of targeted interventions.	8	Canada, Turkey, New Zealand, Iceland, Ghana, China	Mothers with multiple births (twins, triplets) from diverse cultural backgrounds.	Phenomenology, ethnography, mixed methods, and qualitative descriptive studies	Strong breastfeeding intentions were driven by maternal identity and bonding. Challenges included physical and psychological burdens, immature feeding patterns, and work-breastfeeding conflicts. Stage-specific adaptation strategies ranged from intensive early management to individualized adjustments in mature stages. Support experiences varied; while family, medical, and social support were helpful, gaps in tailored professional and informational support were evident. Recommendations included developing multidisciplinary support teams, targeted antenatal education, and promoting co-parenting support frameworks

Balogun et al. (2016)(181)	To identify, describe and evaluate the effectiveness of interventions promoting breastfeeding initiation and early initiation within 1 hour after birth	28	USA, UK, Australia, Nicaragua, Malawi, Nigeria and Ghana	Pregnant women, mothers of newborns and women considering breastfeeding, including low-income, ethnic minority, adolescent, overweight/obese and elective caesarean groups.	Randomised controlled trials (individual and cluster)	Healthcare professional-led and non-healthcare professional-led education/support modestly increased breastfeeding initiation; no clear evidence of effect for early initiation or for multimedia, early mother–infant contact, combined interventions or community breastfeeding groups
Beggs et al. (2021)(33)	Synthesize empirical literature on women's perceptions about and experiences with breastfeeding, identify barriers they face, and supports they need to guide their breastfeeding choices.	59	Primarily UK, USA, Canada, Australia, Iceland, Ireland, Sweden, New Zealand, Netherlands, and Poland	Women of reproductive age who have breastfed or attempted to breastfeed, across a variety of socio-cultural contexts	Predominantly qualitative with some mixed methods and a few quantitative articles	Many women perceived breastfeeding as positive, natural, and beneficial but felt unprepared for its difficulties. Barriers included physical challenges (pain, latching, milk supply), inadequate support, public shaming, conflicting healthcare advice, and workplace inflexibility. Interpersonal influences (partners, family, social norms) were central in shaping decisions and experiences. Cultural values and local policies influenced perceptions and practices, with judgment reported when deviating from societal expectations. Supports such as peer groups, social media, professional counseling, and flexible public health messaging were found beneficial. The review emphasizes a shift from rigid 'breast is best' rhetoric toward realistic, individualized, and socially inclusive breastfeeding support

Bengough et al. (2022)(76)	Synthesise qualitative evidence on factors influencing women's engagement and satisfaction with breastfeeding support programmes to suggest strategies for improving support alignment with women's needs.	51	UK, USA, Australia, Ireland, Sweden, South Africa, Brazil, Malawi	Pregnant and postnatal women, including first-time and multiparous mothers, with diverse ethnic, educational, and socio-economic backgrounds	Qualitative studies using interviews, focus groups, observations, written responses, and think-aloud methods	Engagement with support is influenced by four overarching process factors: (1) Information provision, (2) Type of implementers, (3) Delivery modes, and (4) Maternal care pathways. Women preferred non-technical, experience-based information and disliked inconsistent advice. Trust and relatability of implementers (e.g., peers or culturally competent professionals) shaped engagement positively. Women valued personalised, flexible, and context-specific delivery modes (e.g., virtual, group-based, or home-based support). Continuity and timing of care, especially antenatal-to-postnatal transitions, influenced satisfaction and outcomes. Effective support needs to match individual women's situations, including cultural, emotional, and physical needs
Billings et al. (2024)(26)	Synthesise existing qualitative literature on breastfeeding experiences of women with a wide range of perinatal mental health conditions .	17	UK, USA, Canada, Ireland, Sweden, New Zealand, Australia, Ghana, DR Congo	Women with perinatal mental health (PMH) conditions including postnatal depression, PTSD, bipolar disorder, eating disorders, OCD, anxiety, and emotional distress.	Qualitative studies using phenomenology, ethnography, grounded theory, thematic analysis, and psychoanalytical methods.	Three major themes emerged: Vulnerabilities, Positive Outcomes, and Challenges. Vulnerabilities included a mismatch between expectations and reality, isolation, and self-perception as a mother. Positive outcomes included enhanced bonding, emotional healing, and sense of control through successful breastfeeding. Challenges included lack of consistent professional support, conflicting medication advice, and mental health stigma. Breastfeeding could both improve and worsen mental health, depending on experience and support received. Calls were made for better-informed healthcare support, culturally sensitive practices, and guidance on medication safety.

Blackmore at al. (2022) (282)	To critically review and statistically analyse the effectiveness of virtual lactation support on exclusive breastfeeding up to 6 months postpartum.	19 randomised controlled trials (16 included in the meta-analysis)	Canada, China, Scotland, Italy, Malaysia, Hong Kong, Australia, USA, Ecuador, Sweden, India, Brazil, Croatia, Nigeria.	Healthy postpartum mothers (varied parity), with infants generally full-term; some studies included preterm infants; mothers required access to ICT-based support.	Randomised controlled trials	Virtual lactation support significantly increased exclusive breastfeeding at 1 month (RR 1.21) and 6 months (RR 1.87), but not at 4 months; interventions with more frequent or sustained contact tended to show greater effectiveness
Brockway et al. (2017)(236)	To determine whether interventions that improve breastfeeding self-efficacy also improve breastfeeding rates in mothers of full-term infants.	11	Canada, USA, Japan, China, Brazil, Iran	Healthy mothers of full-term singleton infants, breastfeeding or intending to breastfeed	Randomised controlled trials and quasi-experimental studies.	Interventions increased breastfeeding self-efficacy at discharge, 1 month, and 2 months postpartum and increased likelihood of any breastfeeding at 1 and 2 months; each 1-point increase in BSE predicted a 10% increase in exclusive breastfeeding odds.
Chang et al. (2019)(71)	Examine breastfeeding barriers and support experienced by overweight or obese women, support shown to be effective in increasing breastfeeding among them, and perceptions of supporters such as professionals and family.	16	USA, UK, Singapore, France	Pregnant and postnatal women classified as overweight (BMI ≥ 25) or obese (BMI ≥ 30), and individuals providing them breastfeeding support, including healthcare professionals and family.	Mixed-methods systematic review of quantitative, qualitative, and experimental studies using an integrated methodology.	Physical barriers included large breasts, poor infant positioning, delayed lactation, and post-C-section complications. Psychological barriers included low confidence, negative body image, embarrassment, and stigma. Breastfeeding duration was often reduced due to discomfort and perceived milk insufficiency. Support from healthcare professionals and family significantly influenced outcomes; tailored education is needed for professionals. Research gaps exist in understanding experiences of supporters; further studies are needed to inform effective interventions.

Chang et al. (2022)(218)	To synthesise qualitative evidence on women's, peer supporters' and healthcare professionals' views and experiences of breastfeeding peer support	22	UK, USA, Australia, and Uganda	Primiparous and multiparous women, lay breastfeeding peer supporters, and healthcare professionals.	Qualitative studies following the JBI methodology.	Peer support was viewed as caring, non-judgmental and confidence-building, improving women's self-esteem and reducing isolation; peer supporters also benefited personally. Some tensions and role boundaries with healthcare professionals were identified. Barriers included access difficulties, recruitment and training delays, and resource limitations; effective support required clear communication, integration with services, and flexible delivery
Chepkirui et al. (2020)(219)	To explore how breastfeeding peer support strategies have been implemented for hospitalised infants globally and describe their implementation characteristics to guide future research and practice	18	USA, UK, Bangladesh, Kenya	Mothers of hospitalised infants (healthy and ill), including those with infants in NICU, paediatric wards, or postpartum wards	Scoping review including descriptive reports, randomised controlled trials, one pilot cohort study, and one practical guideline.	Peer support was feasible in hospital settings, commonly delivered one-to-one, with most peer supporters employed rather than volunteer. Training and supervision varied widely; evaluations generally showed improved breastfeeding outcomes, though implementation was inconsistent and standardisation is needed for scalability and comparability
Chua et al. (2023) (283)	To consolidate and synthesise evidence on telelactation interventions, including their effects on breastfeeding outcomes, uptake, and recommendations for future practice.	13	USA, Sweden, UK, Spain.	Breastfeeding mothers (any age), including rural mothers, low-income mothers, early-discharged mothers, mothers with breastfeeding concerns, and those initiating breastfeeding; also included partners and healthcare	Mixed-studies systematic review including quantitative, qualitative, and mixed-method studies, only two were RCTs	Telelactation was well-received and provided convenient, timely access to support, improved breastfeeding engagement and occasionally improved breastfeeding exclusivity and duration; receptivity was influenced by primiparity and perceived usefulness, with recommendations to improve platform usability, security, communication options, and continuity of care

				providers in some studies		
da Silva Tanganhito et al. (2020) (63)	Investigate the breastfeeding experiences, perceptions, and support needs of women with postnatal depression.	6	UK, USA, Canada, Sweden, Norway	Women with postnatal depression (PND), including both self-reported and clinically diagnosed cases, across high-income countries.	Qualitative studies using interviews, grounded theory, and semi-structured approaches.	Women expressed a strong desire to breastfeed, associating it with being a 'good mother', though this also led to guilt and feelings of failure when unsuccessful. Many struggled with breastfeeding, facing pain, fatigue, and emotional distress, with some reporting breastfeeding difficulties as a trigger for PND. Experiences of healthcare support were mixed; while some received empathetic care, others felt unsupported or judged, and faced conflicting advice. Practical and emotional support from family and peers was important, yet often lacking or insufficiently tailored. Fear of antidepressant effects on infants discouraged medication use, highlighting the need for informed support around treatment options. A bidirectional relationship was suggested between breastfeeding and PND, reinforcing the need for individualized, timely, and sensitive support from professionals.

Davie et al.(2020) (233)	To evaluate whether social-psychological interventions improve breastfeeding initiation, duration, exclusivity, and breastfeeding support among women with healthy term infants	20	Australia, Canada, China, Finland, France, Hong Kong, Jordan, Malaysia, Republic of Korea, Thailand, and the USA.	Women aged ≥18 years with healthy term singleton infants; mixed parity; some studies included partners	Randomised controlled trials, cluster RCTs, and quasi-experimental controlled trials	Interventions increased breastfeeding initiation but did not improve duration of any breastfeeding; exclusive breastfeeding initially appeared improved but became non-significant after accounting for publication bias; postnatal-only and first-time-mother interventions were most effective; overall evidence quality was low.
Düzgün et al. (2020) (246)	To determine the effect of music intervention on breast milk production in breastfeeding mothers	5	India, Thailand, Malaysia, and Brazil	Breastfeeding mothers aged ≥18 years	Randomised controlled trials	Music intervention had a small but positive effect on breast milk production (Hedges g = 0.39) with low heterogeneity; four trials showed increased milk production, and one showed no significant effect; music is an effective non-pharmacological method to support milk production.
Fan et al. (2024) (284)	To evaluate the effectiveness of text-messaging interventions on breastfeeding outcomes and identify moderators influencing intervention efficacy.	16	USA, China, Australia, Iran, Kenya, Indonesia, Myanmar, and Ethiopia.	Pregnant women and lactating mothers, including primiparous and multiparous participants	Randomised controlled trials and quasi-experimental studies	Text-messaging interventions significantly improved exclusive breastfeeding at <3 months, 3–6 months, and ≥6 months, and increased breastfeeding self-efficacy; interventions delivered weekly and spanning both antenatal and postnatal periods were most effective; no significant effects were found for any-breastfeeding rates
Flaherman et al. (2013) (257)	To provide a practical overview of milk expression methods and summarise evidence on techniques, effectiveness and considerations across different	Narrative review drawing on multiple cited studies (not a systematic review; no fixed	USA	Breastfeeding mothers including employed mothers, mothers of healthy term infants, mothers of preterm/critically ill infants, and mothers requiring	Randomised trials, observational studies, and practice guidelines.	Milk expression is common, with 85% of mothers expressing milk; electric pumps generally yield higher volumes and efficiency than manual methods; hand expression is useful early postpartum and may enhance breastfeeding outcomes; “hands-on pumping” increases milk volume, especially for mothers of preterm infants; early timing, adequate support, and proper technique are critical for establishing and maintaining supply.

	maternal–infant contexts	number of included studies)		support for milk expression		
Galipeau et al. (2018) (237)	To assess the effectiveness of educational, support, or breastfeeding-self-efficacy–based interventions on breastfeeding self-efficacy and perceived insufficient milk supply, and when reported, on breastfeeding duration and exclusivity	17	USA, Canada, China, Denmark, Japan, and Australia.	Healthy pregnant women intending to breastfeed or healthy breastfeeding mothers of term singleton infants; total sample	Experimental and quasi-experimental studies (majority RCTs	Interventions significantly improved breastfeeding self-efficacy in the first 4–6 weeks (SMD 0.40); self-efficacy–based interventions were most effective; interventions reduced cessation of breastfeeding and exclusive breastfeeding under six months; only one study reported improved perceived insufficient milk supply
Galvão et al. (2022) (280)	To identify the social media platforms most used by women seeking breastfeeding-related support and the types of content they most frequently access	10	USA, Sweden, New Zealand, Brazil, Australia, Indonesia, and Switzerland.	Women seeking breastfeeding information or support online, including pregnant women, postpartum mothers, and users of breastfeeding-related social media groups	Quantitative studies, qualitative studies, and descriptive cross-sectional designs	Women frequently use Facebook, apps, websites, online videos, podcasts, email, and forums to seek breastfeeding information; most accessed topics relate to breastfeeding management, infant nutrition, maternal health, work and breastfeeding, and common breastfeeding challenges; social media provides accessible support, encouragement, and information, but can also overwhelm users with excessive content and may distract from mother–infant interaction.

Gavine et al. (2022) (281)	To determine whether remotely provided breastfeeding support and education is effective for improving breastfeeding outcomes	29	USA, China, Australia, Iran, Kenya, Indonesia, Myanmar, Ethiopia	Pregnant or breastfeeding women, including primiparous and multiparous mothers, with some studies including adolescent mothers, low-income women, and mothers of preterm infants.	Randomised controlled trials	Remote breastfeeding support reduced stopping exclusive breastfeeding at 3 months, but showed no significant effect on any breastfeeding; effects at 4–8 weeks and 6 months were only significant when high-risk-of-bias studies were excluded; substantial heterogeneity and low certainty of evidence; limited impact on maternal satisfaction, mental health, or self-efficacy
Gómez et al. (2021) (244)	To assess evidence on the effectiveness of psychological interventions—including psychotherapy, relaxation, and stress-releasing techniques—in supporting breastfeeding among mothers experiencing perinatal difficulties.	20	Australia, Canada, China, Croatia, Denmark, India, Iran, Malaysia, Pakistan, UK, USA	Mothers from various settings, including mothers of preterm infants, healthy term infants, and women at differing levels of perinatal psychological risk.	Randomised controlled trials, quasi-experimental studies, case series, and pre–post design studies	Most studies (85%) showed psychological or stress-releasing interventions improved breastfeeding outcomes; relaxation techniques were particularly effective, psychotherapy had some positive impact, and self-hypnosis showed no benefit. No studies reported adverse breastfeeding outcomes.
Grant et al. (2022) (50)	Undertake a qualitative systematic review exploring autistic women's experiences of infant feeding using thematic synthesis.	22	USA, UK, Australia, Ireland	Autistic mothers and birthing parents; 324 mothers + 11 commentaries	Peer-reviewed qualitative studies, grey literature (blogs, commentaries, interviews)	Autistic mothers often face barriers to breastfeeding including poor support from services, sensory challenges, and lack of understanding from clinicians. Despite these, many are determined and knowledgeable about breastfeeding. Some reported positive experiences, while others found formula feeding calming. Services need to be better tailored to Autistic needs.

Grant et al. (2022)(80)	Undertake a qualitative systematic review investigating barriers and facilitators to breastfeeding in public in OECD countries	74	UK, US, Australia, Canada, Ireland, Mexico, Sweden, Global (social media), Finland, Italy, the Netherland, New Zealand, Spain	Pregnant women and/or mothers (including adoptive and nonbiological mothers); those who influence breastfeeding in any age of baby or child, including partners, family, friends, and health professionals; members of the public (observers or would be observers of breastfeeding in public).	Interviews, focus groups, surveys, documentary analysis, observations, ethnography/ autoethnography, diary.	Five core factors influenced mothers' thought processes and their breastfeeding in public behaviour: legal system; structural (in)equality; knowledge; beliefs and the social environment. Macro-level factors relating to legislation and inequality urgently require redress if breastfeeding rates are to be increased. Widespread culture change is also required to enhance knowledge, change hostile beliefs and thus the social environment in which mother/infant dyads exist. The sexualisation of breasts, disgust narratives and lack of exposure among observers to baby-led infant feeding patterns resulted in beliefs which created a stigmatising environment.Many mothers felt unable to breastfeed in public; those who breastfed outside the home were usually highly self-aware, attempting to reduce their exposure to conflict.Evidence-based theoretically informed interventions to remove barriers to breastfeeding in public are urgently required.
Gyamfi et al. (2021)(70)	Explore the breastfeeding experiences of african american women in the USA, focusing on cultural, sociological, and health dimensions through an equity lens.	26	USA	African American women in the USA, including diverse ages, socioeconomic backgrounds, and familial structures.	Qualitative, quantitative, and mixed-method peer-reviewed articles published within the last 5 years.	Three key dimensions emerged: (1) Cultural – Family, peers, and community networks strongly influence breastfeeding through education, support, and positive deviance; myths and misconceptions discourage exclusive breastfeeding; personal factors like self-efficacy, spirituality, and empowerment encourage breastfeeding, while pain, shame, and past experiences act as barriers. (2) Sociological – Racism, prejudice, sexualization of Black women’s bodies, workplace challenges, household composition, and socioeconomic status shape breastfeeding behaviors; role models and social support are critical. (3) Health – Supportive healthcare environments, timely and transparent communication from staff,

						culturally sensitive education, partner involvement, WIC, and Baby-Friendly Hospital Initiatives improve breastfeeding outcomes.
Haley et al. (2023) (226)	To examine how Black mothers use social media as a form of breastfeeding support and to assess how online social support relates to breastfeeding behaviours.	6	USA, UK	Black or African American mothers (postpartum or breastfeeding), with some studies including mixed demographics but reporting outcomes for Black mothers	Quantitative studies, qualitative studies, and one mixed-methods study.	Social media groups provided emotional, informational, and appraisal support, fostering community and cultural connection; increased breastfeeding self-efficacy and empowerment were consistently reported; social media support was linked to improved breastfeeding intention and longer duration among Black mothers.

Hedberg (2013) (73)	Identify barriers to breastfeeding and recommend guidelines for the WIC population.	24	USA	Women participating in the WIC program, including various subpopulations such as African American women, low-income mothers, adolescents, and women with limited education.	Systematic review using quantitative and qualitative studies evaluated via Evans' hierarchy of evidence.	Barriers to breastfeeding among WIC participants were categorized into five themes: lack of support (prenatal, hospital, postpartum), return to work, practical challenges (pain, milk supply fears), WIC-related program issues, and social/cultural barriers. Subpopulations most at risk of low breastfeeding rates include non-Hispanic mothers, obese women, those with depressive symptoms, and women with unplanned pregnancies. Effective interventions include peer counseling, improved hospital-WIC staff communication, lactation clinics, and restricting formula distribution in hospitals and WIC offices. Recommendations include culturally sensitive education, hospital policies supporting breastfeeding, community support, and shifting WIC's focus from formula to breastfeeding promotion.
Hiito et al. (2024) (221)	To explore what internet-based breastfeeding peer support offers to breastfeeding parents	19	USA, UK, Spain, Northern Ireland, Finland, Australia, New Zealand and Hong Kong.	Pregnant or breastfeeding parents (including first-time mothers, mothers of preterm infants, young mothers, and parents using online breastfeeding support groups)	Integrative review including qualitative (n=11), quantitative (n=6) and mixed-methods studies (n=2).	Internet-based peer support provided informational and emotional support, reassurance, shared experiences and timely, accessible help; participation enhanced breastfeeding confidence, decision-making and sense of belonging to a breastfeeding community, while highlighting the need for effective moderation to ensure evidence-based guidance

Hoy et al. (2021) (225)	To describe the nature and outcomes of hospital-based breastfeeding peer support interventions in high-income countries.	24 articles describing 12 interventions.	USA and UK	Mothers receiving in-hospital breastfeeding peer support, including NICU mother-infant dyads, Latinas, African American mothers, low-income women, obese/overweight women, and adolescent mothers.	Scoping review including RCTs, qualitative studies, retrospective analyses, pre–post studies, descriptive program analyses and cost-benefit analyses	Hospital-based peer support increased breastfeeding initiation, duration and exclusivity, with additional psychosocial benefits such as increased confidence, empowerment and emotional support; interventions were typically top-down in design, used psychological theories of peer support, and showed potential to improve infant health outcomes.
Izumi et al. (2024) (51)	Examine the experiences and perceptions of immigrant mothers who achieved successful exclusive breastfeeding in high-income countries and identify supportive factors enabling exclusive breastfeeding.	11	USA, UK, Australia, Ireland, Spain, Norway	Migrant mothers from low- and middle-income countries living in high-income countries, with diverse cultural and ethnic backgrounds	Qualitative studies including semi-structured interviews and focus group discussions	Five main themes emerged: (1) Recognising breastfeeding differences between home and host countries; (2) Breastfeeding knowledge, including health benefits and challenges; (3) Cultural identity's role in shaping attitudes; (4) Influence of social networks including family, healthcare providers, peers, and workplaces; (5) Autonomy and self-determination supporting sustained EBF. Mothers adapted practices during acculturation. Supportive environments and culturally aware healthcare professionals were critical to enabling successful EBF. Public stigma, lack of support, conflicting advice, and systemic barriers in host countries were major obstacles.

Jaynes et al. (2022) (267)	To synthesise evidence on the effects of technology-mediated education interventions within the first postpartum year on maternal health outcomes, and to evaluate participant perspectives and health equity considerations	21	USAnited States, Australia, New Zealand, UKnited Kingdom, Japan and Singapore	Postpartum women within the first year after birth; sample sizes ranged from 18 to 2,601 participants, with one study including couples.	Randomised controlled trials, plus non-randomised comparison, longitudinal, cross-sectional, prospective comparison, quasi-experimental, and pre/post designs.	Technology-mediated education interventions—primarily videos, texts, phone calls, websites and apps—improved mental health (self-compassion, coping, parenting self-efficacy), weight loss, breastfeeding outcomes, knowledge, and perineal care; effects on depression symptoms and substance use were limited; interventions were generally acceptable to participants and highlighted the need for attention to health equity and user-centred design.
Joanna Briggs Institute (2012) (77)	Synthesize the best available qualitative evidence on women's perceptions and experiences of professional and peer breastfeeding support.	31	Primarily UK and US	Primiparous and multiparous women who had initiated breastfeeding, including adolescents.	Qualitative studies and large-scale surveys that analyzed qualitative data from interviews or open-ended responses.	Four key categories emerged: authentic presence, disconnected encounters, facilitative approach, and reductionist approach. Women valued support characterized by trust, empathy, time, and relational continuity—commonly associated with peer support. Negative experiences included rushed care, lack of rapport, standardized advice, and feeling pressured or blamed. Facilitative support styles involving dialogue, realistic and detailed information, and hands-on help were seen as effective. Recommendations include improving midwifery/nursing communication skills, enhancing continuity of care, and expanding evaluated peer support schemes.

Johns et al. (2013) (254)	To systematically review evidence on the prevalence, reasons for, methods of, and outcomes related to breast milk expression among mothers of healthy term infants	22	Australia, USA, Singapore, and the UK	Mothers of healthy term infants (excluding studies focused solely on preterm or unwell infants)	Observational studies, longitudinal cohorts, retrospective cohorts, cross-sectional surveys, and randomised controlled trials.	Prevalence of expressing breast milk is increasing; reasons include breastfeeding difficulties, desire for flexibility, return to work, body image concerns, and cultural factors; methods range from hand expression to manual and electric pumps; outcomes are inconsistent, with some studies linking expressing to shorter breastfeeding duration and others reporting longer duration; definitions of breastfeeding versus breast milk feeding vary, contributing to contradictory evidence
Jolly et al. (2012) (230)	To examine the effect of setting, intensity and timing of peer support on breastfeeding continuation using a systematic review and metaregression of randomised controlled trials	17 trials included in the review; 15 included in quantitative synthesis	UK, USA, Canada, Brazil, Mexico, Bangladesh, Philippines, and sub-Saharan Africa (Burkina Faso, Uganda, South Africa).	Pregnant or postpartum women receiving antenatal and/or postnatal peer support compared with usual care	Randomised controlled trials	Peer support significantly increased breastfeeding continuation in low- or middle-income countries, especially exclusive breastfeeding; effects were small or absent in high-income countries, particularly the UK; higher-intensity (≥5 contacts) and postnatal-only support were more effective, while low-intensity support showed no significant impact
Lau et al. (2016) (261)	To evaluate the efficacy of e-technologies in improving breastfeeding outcomes among perinatal women through a meta-analysis	16	USA, Iran, Finland, China, France and Spain	Perinatal women (antenatal and postnatal); one study included childcare providers	Randomised controlled trials and quasi-experimental studies	E-technologies significantly improved exclusive breastfeeding initiation, exclusive breastfeeding at 4 weeks and 6 months, breastfeeding attitude and breastfeeding knowledge; CD-ROM, web-based programmes, SMS, e-prompts and interactive computer agents showed positive effects, while evidence for breastfeeding confidence, awareness and other outcomes was inconsistent or limited

Leeming et al. (2022) (64)	Re-examine qualitative UK research on receiving breastfeeding support, in order to explore the role of self-conscious emotions and related appraisals in interactions with professional and peer supporters.	34	UK	UK mothers receiving formal breastfeeding support (from midwives, health visitors, lactation consultants, trained volunteers, or peer supporters) for healthy term infants.	UK-based qualitative studies using interviews, focus groups, audio diaries, surveys with open-ended questions.	Self-conscious emotions such as shame, guilt, embarrassment, humiliation, and pride are common but often unspoken in breastfeeding support encounters. Three key themes emerged: (i) Breastfeeding 'support' could challenge mothering identity and emotional well-being; (ii) Women often manage interactions to avoid negative self-conscious emotions; (iii) Supporters can either validate and affirm women's experiences or contribute to emotional distress. Emotionally attuned support—recognizing hidden shame or self-judgment—was critical to effective support. The study emphasizes the importance of training breastfeeding supporters to develop emotional sensitivity ('emotional antennae') to prevent undermining women's identities.
Lenells et al. (2025) (231)	To assess the effects of breastfeeding support interventions, compared with standard perinatal care, on preventing postpartum depression and reducing depressive symptoms	10	USA, Canada, China, Iran, Spain, South Africa	Pregnant or postpartum women aged ≥18 participating in breastfeeding support interventions initiated during pregnancy or within six weeks postpartum	Randomised controlled trials	Psychosocial breastfeeding interventions may reduce incidence of postpartum depression in the short term (1–3 months) and may increase long-term breastfeeding duration, but evidence for effects on depressive symptoms, anxiety, stress, exclusivity, or alternative interventions is very uncertain
Levene et al. (2024) (245)	To appraise all available evidence on whether relaxation interventions provided to lactating individuals improve lactation	16	China, India, Iran, Malaysia, Spain, Thailand, Turkey, the UK, and the USA.	Lactating individuals with preterm, late-preterm, early-term, or term infants; mixture of direct breastfeeding and	Randomised clinical trials (parallel-group and crossover designs)	Relaxation interventions were associated with increased human milk quantity, increased infant weight gain, and small reductions in maternal stress and anxiety; no change in milk protein or infant length; low-certainty evidence for effects on feeding exclusivity and other outcomes

	outcomes and well-being			expressing parents.		
Li et al. (2021) (52)	Summarise existing data on c-section and breastfeeding to understand their relationship, explore maternal perceptions and experiences, and identify initiatives that support breastfeeding after c-section .	18	USA, UK, China, Nicaragua, Australia, Turkey, Iran, Bangladesh, South Africa, Canada, Italy	Mothers who delivered via C-section, including diverse age, socio-economic, and cultural backgrounds.	Quantitative (retrospective, cross-sectional, cohort, RCTs) and qualitative studies.	C-section is associated with delayed initiation and reduced duration of breastfeeding; planned C-sections particularly limit success. Maternal perceptions and barriers include pain, fatigue, negative emotions, and lack of support. Initiatives supporting breastfeeding include skin-to-skin contact, breast pumping, educational counseling, and preoperative carbohydrate intake. Breastfeeding success is influenced by physical recovery, confidence, familial and professional support, and cultural practices like 'Zuo Yue Zi'. Recommendations emphasize culturally sensitive, well-designed RCTs to improve breastfeeding outcomes post-C-section.
Li et al. (2024) (69)	Interpret mothers' experiences and perceptions while expressing breast milk during separation from their hospitalised infants, and to aid future development of targeted in-hospital strategies.	13	USA, China, Denmark, Spain, Canada, Finland, Australia	Mothers separated from their hospitalized preterm or low birth weight infants in the NICU	Qualitative and mixed-method studies, including phenomenology, grounded theory, ethnography, qualitative descriptive, and interpretive approaches.	Purpose and Motivation: Mothers expressed milk to compensate for early birth, ensure infant health, bond with infants, reinforce maternal identity, and prepare for eventual breastfeeding. Physical and Emotional Experiences: Frequent expression led to exhaustion, feelings of bereavement, isolation, stress, and a paradoxical experience combining dislike for pumping and love for the baby. Barrier Factors: Included physical conditions of mother or infant, negative perceptions or knowledge gaps, inadequate professional support, and cultural/family pressures. Coping Styles: Mothers relied on family support, mental strategies, expressing hope, and structured

						routines to maintain expression and emotional stability.
Li et al. (2024) (533)	Examine and synthesise the views and experiences of women, donors, recipient mothers, and healthcare professionals regarding human milk donation or sharing.	41	USA, UK, Canada, Australia, New Zealand, Brazil, Spain, India, Uganda, South Africa, Malaysia, Chile, Turkey, Singapore, Vietnam, Ireland	Women, donors, recipient mothers, healthcare professionals, HMB personnel, mothers without donation experience	Qualitative studies including phenomenology, grounded theory, ethnography, descriptive qualitative, and action research	All stakeholders benefit from human milk donation. Motivations for donating/receiving include surplus milk, altruism, grief processing, and trust in healthcare. Awareness and participation are shaped by informal vs. formal sharing, safety concerns, and cultural/religious values. Barriers include fear of disease transmission, milk insufficiency for donor's own child, emotional discomfort, and lack of knowledge. Informal sharing often involves trust and direct relationships, while formal sharing emphasizes safety and anonymity. Recommendations include increasing awareness, improving healthcare support, and respecting cultural nuances.
Lucas et al. (2014) (53)	Uncover information regarding emotional and other types of support required by mothers providing breast milk for infants in the nicu.	44	Primarily USA and other high-income countries	Mothers of preterm infants in the NICU who are pumping breast milk, including those experiencing extended hospitalization.	RCTs, qualitative interviews, mixed-methods, surveys, reviews, clinical recommendations.	Mothers face emotional and logistical challenges with prolonged pumping due to NICU admission, requiring targeted support. Early initiation and high frequency of pumping are critical for sustaining milk supply. Emotional support, privacy, peer counselors, and consistent education significantly impact maternal experience. Bundled interventions, including lactation consultants, milk diaries, hands-on support, and culturally sensitive staff training, are effective. Transitioning to direct breastfeeding requires maternal education, NICU staff training, and supportive environments. Mothers value the maternal role associated with milk provision and see their milk as life-giving.

Lyons et al. (2019) (75)	Systematically identify and synthesise the qualitative literature that explored the perceptions and experiences of women with a bmi ≥ 30 kg/m2 who breastfed.	5	USA, Scotland, England, New Zealand	Women with a BMI ≥ 30 kg/m2 who breastfed or attempted to breastfeed.	Qualitative studies using thematic or content analysis.	Theme: 'Weight amplifies breastfeeding difficulties' with three subthemes: (1) Psychological reactions to medical intervention – Women with BMI ≥ 30 kg/m2 often experienced birth complications and medical interventions that negatively influenced breastfeeding initiation and motivation. (2) Perception of body's ability to breastfeed – Women lacked confidence in their body's ability to produce milk, feared suffocating their infant, struggled with positioning and latching, and doubted the nutritional quality of their milk. (3) Additional need for support – Women required extended professional and social support but often did not access it due to discomfort, misunderstanding of its purpose, or feeling intimidated.
MacVicar et al. (2015) (65)	Review the literature exploring how women from socioeconomically deprived backgrounds experience breastfeeding establishment and to identify factors associated with supportive practice.	8	UK, Canada, Republic of Ireland, USA	Women from disadvantaged groups including low-income mothers and teenage mothers in the early postnatal period.	Qualitative studies using interviews, focus groups, surveys, and ethnographic approaches.	Three overarching themes: (1) Practical influences: Need for breastfeeding skills, realistic knowledge, consistent support, and tailored education. (2) Psychological influences: Self-efficacy, emotional vulnerability, encouragement, and mutual respect impacted maternal motivation. (3) Person-centered approach: Culturally relevant, individualized care, role of social norms, stereotypes, and relational support were key. Disadvantaged women benefited from trust-based, nonjudgmental, and supportive relationships.
Marcucci et al. (2018) (263)	To evaluate research evidence on the effectiveness of telehealth for delivering breastfeeding education and	11	USA, Spain, China, Australia, Finland	Postpartum women and infants receiving breastfeeding education or support via telehealth modalities	Randomised controlled trials, quasi-experimental studies, and observational studies	Most studies showed telehealth increased breastfeeding exclusivity and duration and was perceived as acceptable and beneficial; one study found no difference compared with face-to-face support; heterogeneity in sample sizes, telehealth modalities and content limits conclusions about which approaches are most effective

	support, focusing on breastfeeding exclusivity, duration and maternal perceptions					
Martins et al.(2019) (268)	To identify the contributions of mobile applications to breastfeeding practice	9	USA, Australia, Liberia, Denmark, India. One study did not report country	Pregnant and postpartum women, including primiparous women and their social networks; populations from various countries using breastfeeding-related mobile apps.	Descriptive studies, one qualitative study, one methodological study, one non-randomised experimental study, one randomised controlled trial	Mobile apps mainly provided informational support on breastfeeding promotion, infant feeding, alcohol use, and breastfeeding positions; several apps collected data on breastfeeding problems, frequency, formula initiation, and experiences; apps including social-network support or formal evaluation were less common; gaps were identified in information quality, usability, acceptability and evidence-based development
Matriano et al. (2021)(62)	Understand and synthesise the contemporary factors that influence women's decisions on infant feeding from the antenatal period and across the breastfeeding continuum .	14	America, Australia, Bangladesh, Brazil, Canada, Indonesia, Israel, Nigeria, Spain	Primiparous and multiparous women from diverse cultural backgrounds.	Qualitative, cross-sectional, and one cohort study.	Five main themes identified: (1) Women's own views—beliefs, knowledge, and maternal identity influence breastfeeding decisions; (2) Family and friend's preferences and advice—strongly shape infant feeding choices; (3) Health professional's advice and practice—can either support or hinder breastfeeding depending on quality and consistency; (4) Sociocultural norms—traditions, social status, and cultural rituals affect perceptions and practices; (5) Media representation—TV, internet, and social media significantly influence breastfeeding decisions. Framework of birth territory and midwifery guardianship

						used to interpret intrinsic and extrinsic power influencing women's decisions.
McArthur et al. (2018) (262)	To systematically review evidence on technology-based interventions - internet, mobile apps, and social media—for breastfeeding education and support, and their impact on breastfeeding initiation, duration, and exclusivity	19	USA, Canada, Australia, Taiwan, Hong Kong, Finland, France, Italy, China, Ghana	Pregnant and postpartum women seeking breastfeeding education/support via internet, mobile applications, or social media; sample sizes ranged from 13 to 1,347 across studies	Randomised controlled trials, quasi-experimental studies, cohort studies, descriptive and qualitative studies	Web-based interventions improved breastfeeding duration and exclusivity but did not influence initiation; successful internet searches correlated with better breastfeeding outcomes; social media provided valued peer support though evidence for effects on breastfeeding outcomes was limited; overall, technology-based interventions are accessible, low-cost, and promising when combined with standard care
Mieso et al. (2022)(276)	To map available evidence on mobile phone apps providing breastfeeding support and determine whether existing research and commercially available apps adequately address the needs of African-American mothers	15	USA, Australia, Thailand	Breastfeeding mothers using or evaluating breastfeeding apps; African-American representation varied from 0% to 100% across studies	App development studies, user-experience studies, and studies assessing breastfeeding outcomes associated with app use	Research specifically focused on African-American mothers is limited; only 3 studies aimed at this population. Of 77 breastfeeding apps reviewed, only one was both breastfeeding-focused and visually targeted toward African-American mothers. A substantial gap exists in app-based breastfeeding support for African-American women, indicating a racial disparity in both research attention and consumer app availability

Mitchell et al. (2023)(59)	Synthesise qualitative evidence about the factors that influence breastfeeding and infant feeding practices of aboriginal and torres strait islander women and their families..	7	Australia	Aboriginal and Torres Strait Islander women and their families.	Qualitative studies using methods such as yarning, interviews, and focus groups; reviewed using an Indigenous quality appraisal tool.	Ten themes identified across ecological levels: breastfeeding is culturally accepted but public breastfeeding is seen as shameful; formula feeding is normalised in some areas; culturally safe, supportive services are preferred; family and partner support crucial; individual knowledge, prior experiences, and concerns about milk supply influence decisions. Strong need for Aboriginal-led, culturally safe programs and policy development.
Miyauchi et al. (2025) (256)	To evaluate the effectiveness of breast pump–based nipple stimulation in the early postpartum period after cesarean section for promoting earlier lactation and improving breastfeeding outcomes.	4	USA, China, Thailand, Korea	Post-ceasarean women with healthy full-term infants in maternity facility settings	Randomised controlled trials and quasi-rando mised controlled trials	Early breast pump use (within 2–3 h post-surgery, 6–8 sessions/day) significantly shortened onset of lactation by ~19.6 hours; one study showed higher exclusive breastfeeding at discharge; two studies showed improved breastfeeding at one month, though evidence quality was low and results heterogeneous; delayed or low-frequency pumping showed no benefit
Moon et al. (2021) (227)	To synthesise evidence on mothers' experiences of online breastfeeding peer support, including motivations, attributes and effects	14	USA, UK, Finland, Australia, Brazil, Ireland and New Zealand.	Breastfeeding mothers using online peer support, including primiparous mothers, mothers of preterm infants, African American mothers, exclusively expressing mothers and	Qualitative studies, mixed-metho ds studies and quantitative studies including RCTs and one cross-section al survey	Mothers sought online peer support due to isolation, unmet needs from healthcare professionals and preference for accessible online help; online groups functioned as virtual communities offering shared experiences, emotional support and tailored information; peer support fostered empowerment and sometimes improved breastfeeding duration and exclusivity, though overall evidence of effectiveness remains inconclusive

				mothers breastfeeding beyond infancy		
Morse et al. (2022) (222)	To systematically review evidence on the benefits, challenges, and impacts of self-directed social media group use for breastfeeding support.	13	New Zealand, USA, Australia, UK, and Ireland.	Breastfeeding mothers using social media groups	Qualitative and mixed-methods studies, including interviews, focus groups, surveys, and content analyses.	Social media groups provide valued informational, emotional, and esteem support that improves confidence, self-efficacy, and may contribute to extended breastfeeding duration; mothers benefit from community belonging and real-time peer support but note concerns about reliability, judgement, and lack of regulation.
Nelson (2012) (66)	Synthesize the findings of qualitative research studies related to infant feeding decision making and contribute to an increased understanding of this phenomenon.	14	USA, UK, Australia	Mothers (primiparas and multiparas), including adolescents and women of various racial and socio-economic backgrounds	Qualitative studies including grounded theory, ethnography, phenomenology, focus groups, and semi-structured interviews	Two key processes emerged: making a personal choice and defending the choice. Six influential themes were identified: knowing ‘breast is best’; disapproval of public breastfeeding; sense of personal comfort; level of confidence/commitment; need for support; and perceived lifestyle compatibility. External pressure influenced decisions, especially among low-income and minority women. Personal beliefs, emotional readiness, social networks, and healthcare support shaped infant feeding choices. Mothers often sought to justify or defend their feeding decisions to maintain their identities as 'good mothers'.

Orchard et al. (2022) (224)	To systematically review empirical evidence on how social media influences breastfeeding decision-making, promotion, and support	22	USA, UK, Australia, Brazil, Canada, Finland, Saudi Arabia, New Zealand, and Thailand	Breastfeeding mothers, pregnant women, parents and prospective parents engaging with social media related to breastfeeding	Qualitative studies, quantitative studies, and mixed-methods studies.	Social media can enhance breastfeeding attitudes, awareness, and perceived support; private online communities offer valued informational and emotional support; effectiveness depends on content credibility, page popularity, and community dynamics; interventions using structured Facebook groups showed mixed impact on breastfeeding outcomes
Oriá et al. (2018) (285)	To evaluate the effectiveness of telephone-based educational interventions on breastfeeding duration and exclusivity.	10	USA, Malaysia, China, Denmark, and Nigeria	Pregnant or postpartum women with healthy full-term infants, including specific subgroups such as low-income mothers and obese mothers.	Randomised clinical trials	Telephone-based educational interventions were effective in six of ten studies, with long-term interventions and those delivered by trained lactation consultants producing the strongest improvements in breastfeeding duration and exclusivity; short-term and peer-delivered interventions showed limited or no effectiveness.
Putri et al. (2023)(260)	To explore the existing empirical literature on mHealth interventions to increase breastfeeding self-efficacy and exclusive breastfeeding practice.	12	Iran, Turkey, Myanmar, Malaysia, Brazil, Sweden and Australia.	Women who breastfed, including primiparous, multiparous, nulliparous women; some studies involved women with preterm or low birth weight infants.	Randomised controlled trials and quasi-experimental studies	mHealth interventions—including text messaging, videos, social media, smartphone applications and telephone support—increase breastfeeding self-efficacy and can improve exclusive breastfeeding practice
Reicher et al. (2024) (223)	To understand how specific populations engage with online breastfeeding, chestfeeding or lactation support groups, how these groups influence	10	UK, USA, Australia, Finland and Lebanon.	Specific groups including African American/Black parents, exclusively expressing parents, parents of preterm infants,	Qualitative studies, one randomised controlled trial and one mixed-methods study	Online groups helped parents overcome lack of real-world support, normalised unique feeding practices, provided practical and emotional support, increased self-efficacy, fostered social connection and sometimes extended breastfeeding duration; challenges included misinformation, judgment, and limited effect on outcomes in the single RCT.

	feeding outcomes, and whether use changed since COVID-19			parents breastfeeding beyond infancy, fathers/partners, physicians who are lactating parents and parents experiencing trauma		
Rosenbaum et al. (2024) (258)	To explore the prevalence, characteristics, practices, and outcomes of families using exclusive breast milk expression	27	USA, China, Singapore, Malaysia, Australia, Germany, Hong Kong, Israel	Families feeding infants exclusively expressed breast milk, including healthy term infants and infants in NICU or with medical conditions	Quantitative, qualitative, mixed-methods studies, and case reports	Exclusive expression prevalence ranged from 6.8% to 62% globally and was highest in NICU settings; most exclusively expressing parents had intended to breastfeed directly but encountered barriers; inconsistent advice and lack of provider knowledge were common; exclusive expressers had shorter human milk feeding duration and more frequent milk supply issues compared to mixed-feeding parents; exclusive expression was feasible with adequate support but often time-consuming and challenging

Schmied et al. (2012)(55)	Explore the diversity of migrant and refugee women's experiences and practices related to breastfeeding in a new country to inform health care policy and practice.	11	England, Canada, USA, Australia	Migrant and refugee women from countries including China, India, Pakistan, Thailand, Vietnam, Dominican Republic, Puerto Rico, and Mexico.	Qualitative studies and mixed-methods studies (qualitative and quantitative) using ethnography, thematic analysis, descriptive, interpretative approaches.	Overarching theme: 'Breastfeeding in a new country: facing contradictions and conflict' with four sub-themes—Mother's milk is best; Contradictions in breastfeeding practices; Breast milk requires health; Role of female relatives. Breastfeeding was widely valued, though contradictions in practices (e.g. colostrum, duration, public breastfeeding) often created tension. Migrant women struggled with traditional postpartum rituals, believing these were essential to breastfeeding success. Influence of family - especially grandmothers and mothers-in-law - was central, often encouraging or discouraging breastfeeding based on cultural beliefs. Health professionals often lacked cultural competence; women preferred culturally sensitive care, materials in multiple languages, and peer support. Acculturation had mixed effects: increased time in host country reduced breastfeeding duration, but some second-generation women revived traditional practices.
Shakya et al. (2017) (228)	To examine the effectiveness of community-based peer support for mothers on breastfeeding practices compared with no peer support.	47 studies in the systematic review; 22 included in meta-analyses	USA, Canada, UK, Turkey, India, Bangladesh, China, Philippines, Uganda, Malawi, Kenya, Burkina Faso, South Africa, Mexico and Brazil.	Mothers of children under five years of age receiving community-based peer support (one-to-one or group-based)	Randomised controlled trials, quasi-experimental studies, and observational comparative studies	Community-based peer support significantly increased exclusive breastfeeding duration up to 3–6 months in low- and middle-income countries, improved early initiation of breastfeeding, and reduced prelacteal feeding; effects in high-income countries were smaller and primarily evident at 3 months.

Spencer & Grassley (2013) (60)	Present a comprehensive integrative literature review of factors that influence breastfeeding intentions, initiation, and duration in the African American population, including health disparities and related interventions.	37	US	African American women, including adolescents, low-income groups, WIC participants, and women in various healthcare and community settings	Integrative review including quantitative and qualitative studies, theoretical articles, and literature reviews	African American women receive less breastfeeding information and support from healthcare providers compared to other groups. Intention to breastfeed is influenced by social support, older maternal age, income, education, and attending prenatal classes. Barriers include fear of pain, embarrassment, public stigma, concerns over milk supply, early return to work, and comfort with formula. Protective factors include intrinsic motivation, confidence, self-efficacy, and family history of breastfeeding. Effective interventions include Baby-Friendly Hospital Initiatives, peer counseling, breastfeeding education, and community-based support. A need exists for culturally specific and feminist-informed research approaches.
Sun et al. (2023) (264)	To evaluate the effect of Internet-based intervention models on breastfeeding knowledge, attitudes, self-confidence and exclusive breastfeeding rates	32	Turkey, Finland, Spain, Australia, France, USA, Iran, India, Myanmar, Taiwan and China	Adult women (≥18 years) who were pregnant or postpartum, enrolled in randomized controlled trials, receiving Internet-based breastfeeding interventions versus standard care	Randomised controlled trials	Internet-based interventions improved breastfeeding knowledge, attitudes, self-confidence, and increased exclusive breastfeeding rates from discharge up to 6 months postpartum
Tang et al. (2019) (265)	To provide a comprehensive overview of digital interventions supporting breastfeeding, examining system objectives, technology design,	30	Australia, Canada, China, Ecuador, Italy, Malaysia, Myanmar, Philippines, South Africa, Thailand, UK, USA	Healthy human subjects including mothers (primarily postnatal), pregnant women, fathers/partners, and health care professionals.	Systematic search and review including user-experience studies and clinical validation studies	Digital interventions such as web platforms, mobile apps, SMS, and telehealth improved breastfeeding knowledge and some behavioral outcomes; straightforward communication systems were more effective than complex technologies like games. Gaps remain in antenatal support and partner involvement.

	validation processes, and quality attributes from a human–computer interaction perspective					
Trickey et al. (2018) (220)	To explore heterogeneity in one-to-one breastfeeding peer support interventions, identify transferable lessons on context–mechanism–outcome relationships, and inform future intervention and evaluation design.	15	UK, USA and Canada	Mothers of full-term infants; interventions targeted mixed-parity women, including low-income, adolescent, and diverse ethnic groups depending on the study	Experimental evidence including randomised controlled trials, quasi-experimental studies and natural experiments	Breastfeeding peer support interventions were highly heterogeneous and generally under-theorised; effectiveness depended on alignment with local feeding norms, integration with health services, timely and proactive contact, peer competence and accessibility, and well-functioning peer–mother relationships; implementation challenges were common and often explained null trial results
Ulfa et al. (2023) (56)	Explore women's experiences of breastfeeding after a cesarean section using a meta-synthesis of qualitative studies.	7	England, Australia, South Africa, China, Indonesia	Women who underwent cesarean section deliveries across diverse ethnic and national contexts.	Qualitative studies using phenomenology, grounded theory, and interviews/focus groups.	Six categories emerged: (1) Perceived values of breastfeeding – seen as natural, rewarding, and demanding; (2) Emotional vulnerability – feelings of failure, disappointment, and low confidence impacted breastfeeding; (3) Physical difficulties – included low milk supply, pain, latching problems, and limited movement; (4) Inconvenient conditions – fatigue, sleep deprivation, environmental discomfort, and caring for other children; (5) Inadequate resources – inconsistent information, lack of skin-to-skin contact, early formula use, and insufficient equipment/support; (6) Support systems – effective breastfeeding was aided by healthcare provider support, grandmotherly

						influence, and post-cesarean skin-to-skin contact.
Yang et al. (2024) (217)	To systematically synthesise qualitative findings on mothers' experiences and perceptions of breastfeeding peer support to inform optimisation of peer support services	15	Australia, UK, Ireland, USA, Lebanon, Uganda, China (Hong Kong), and Scotland	Breastfeeding mothers receiving peer support (varied parity, backgrounds, and cultural contexts)	Qualitative studies and mixed-methods studies including qualitative components	Mothers experienced peer support as beneficial for emotional support, increased confidence, practical breastfeeding knowledge and skills, and positive behaviour change; they expressed varied expectations regarding timing, mode and reliability of support, and highlighted the need for personalised, culturally sensitive and better-standardised peer support services
Yas et al. (2023) (67)	Assess the breastfeeding needs of adolescent mothers through a systematic review of qualitative studies in low-, middle-, and high-income countries.	41	USA, UK, Canada, Brazil, Indonesia, Thailand, Ghana, South Africa, Iran, Iceland, Belgium, Australia	Adolescent mothers aged 12–18 with full-term, healthy newborns.	Qualitative and mixed-method studies using ethnography, phenomenology, grounded theory, content analysis, and descriptive approaches.	Breastfeeding needs were grouped into eight categories: (1) Social support from healthcare providers, partners, and families; (2) School support for breastfeeding mothers; (3) Breastfeeding counselling based on cultural sensitivities; (4) Educational assistance from health providers for adolescent mothers' families; (5) Changing harmful cultural values and judgments; (6) Additional home or outpatient visits post-discharge; (7) Peer support and counselling; (8) Economic needs. Adolescent mothers face physical, mental, social, and spiritual challenges that complicate breastfeeding. Supportive networks, cultural sensitivity, and educational reinforcement are critical for successful breastfeeding.

Chapter Six: Study table of empirical studies on early hospital and community support

Authors	Year & Country	Aim	Participants	Methods	Outcome Measures	Key Findings
Abbass-Dick et al.(128)	2015 (Canada)	To evaluate the effectiveness of a coparenting breastfeeding support intervention on exclusive breastfeeding among primiparous mothers and fathers.	214 primiparous couples (107 intervention, 107 control) recruited within 2 days postpartum in a large teaching hospital in Toronto, Canada	Randomised controlled trial comparing a coparenting breastfeeding support intervention with usual care; intervention included in-hospital session, booklets, video, website access, e-mails, and a follow-up phone call, with assessments at baseline, 6 weeks, and 12 weeks postpartum.	Exclusive breastfeeding at 6 and 12 weeks (primary), breastfeeding duration, paternal breastfeeding self-efficacy, maternal perceptions of partner support, and coparenting relationship scores	Intervention increased breastfeeding duration at 12 weeks, significantly improved paternal breastfeeding self-efficacy, increased partner involvement and maternal satisfaction with breastfeeding support, though exclusive breastfeeding rates did not significantly differ
Ahmed et al.(270)	2016 (USA)	To determine whether an interactive web-based breastfeeding monitoring system improves breastfeeding exclusivity, intensity, duration, and reduces postpartum depression symptoms after hospital discharge.	141 mother–infant dyads recruited before discharge; randomised into a control group (n=57) receiving usual care and an intervention group (n=49) using an interactive web-based breastfeeding monitoring system; all infants were healthy full-term singletons.	Two-arm randomised controlled trial in three Midwestern hospitals; intervention group used a web-based monitoring system for 30 days to log breastfeeding data and receive automated tailored feedback; follow-up surveys at 1, 2, and 3 months measured breastfeeding outcomes and postpartum depression.	Breastfeeding exclusivity, intensity, and duration at discharge, 1, 2, and 3 months; postpartum depression symptoms using the EPDS at 1, 2, and 3 months.	The intervention group had significantly higher exclusive breastfeeding rates at 1, 2, and 3 months compared with controls, with 84% still breastfeeding at 3 months versus 66% in controls; breastfeeding intensity was significantly higher, while postpartum depression symptoms decreased similarly in both groups with no significant between-group differences.
Ahmed et al. (271)	2020 (USA)	To determine the effects of an	141 mother–infant dyads randomised	Secondary analysis of a two-arm randomised	Breastfeeding self-efficacy scores	Interactive web-based breastfeeding monitoring

		interactive web-based breastfeeding monitoring system on breastfeeding self-efficacy and maternal satisfaction at 1, 2, and 3 months after hospital discharge	to intervention or control, with 57 completing in the control group and 49 completing in the intervention group; mothers of healthy full-term infants intending to breastfeed	controlled trial; intervention group received access to an interactive web-based breastfeeding monitoring system for 30 days post-discharge in addition to usual care; breastfeeding self-efficacy measured at 1, 2, and 3 months, and breastfeeding satisfaction at 3 months.	at 1, 2, and 3 months; breastfeeding satisfaction at 3 months; relationship between self-efficacy and satisfaction; breastfeeding exclusivity, intensity, and duration	significantly improved breastfeeding self-efficacy at 2 and 3 months, increased maternal breastfeeding satisfaction at 3 months, and self-efficacy was positively correlated with breastfeeding satisfaction and exclusivity.
Allen et al. (215)	2023 (Australia)	To assess the impact of implementing the Thompson physiological breastfeeding method on direct breastfeeding at hospital discharge and exclusive breastfeeding at 3 months.	13,667 mother–baby pairs in the interrupted time series analysis and 495 postnatal mothers in the survey component	Multi-method design using interrupted time series (24-month baseline and 15-month post-implementation) and surveys at discharge and 3 months postpartum to evaluate facility-wide implementation of the Thompson breastfeeding method	Direct breastfeeding at hospital discharge; exclusive breastfeeding at 3 months; secondary outcomes included partial/artificial feeding, nipple trauma, and poor attachment	Implementation of the Thompson method significantly reversed declining trends in direct breastfeeding at discharge, and for women discharged exclusively breastfeeding, reduced the risk of exclusive breastfeeding discontinuation by 3 months; overall 3-month exclusivity improvement was not statistically significant
Antoñanzas-Baztan et al. (239)	2020 (Spain)	To evaluate the efficacy, feasibility and acceptability of the SIALAC breastfeeding self-efficacy–promoting programme on	112 healthy pregnant women in Spain, ≥23 weeks gestation, intending to breastfeed and with no breastfeeding contraindications;	Exploratory multicentre controlled trial; intervention group received SIALAC, a three-stage breastfeeding self-efficacy–promoting programme delivered	Breastfeeding maintenance up to 6 months; breastfeeding survival time; breastfeeding dropout risk via Cox regression;	Breastfeeding maintenance at 6 months was significantly higher in the intervention group than the control group (67% vs. 55%), with breastfeeding dropout 3.3 times higher in the control group; programme was feasible and acceptable.

		6-month breastfeeding maintenance	allocated sequentially to control (n=55) or intervention (n=57)	during late pregnancy, post-birth hospitalisation, and via follow-up call; both groups received usual care; breastfeeding status and self-efficacy measured at baseline and at 4, 8, and 24 weeks postpartum	maternal breastfeeding self-efficacy scores at multiple postpartum time points	
Bick et al. (194)	2012 (UK)	To assess whether revising acute maternity care systems and processes using a Continuous Quality Improvement approach improved breastfeeding outcomes, maternal postnatal health, and women's experiences.	Women who gave birth in one English maternity unit and completed questionnaires at 10 days and 3 months postpartum: 741 pre-intervention and post-intervention at 10 days; 616 pre-intervention and 575 post-intervention at 3 months	Pre–post intervention study using a continuous quality improvement (CQI) approach to revise routine antenatal, intrapartum, and postnatal systems; outcomes assessed via longitudinal surveys at 10 days and 3 months postpartum	Breastfeeding initiation, duration of any breastfeeding, duration of exclusive breastfeeding at 10 days and 3 months; maternal physical and psychological health indicators; women's satisfaction and experiences of postnatal care	Post-intervention, breastfeeding initiation, any breastfeeding duration, and exclusive breastfeeding at 10 days significantly improved; women breastfed longer overall; maternal morbidity (e.g., offensive vaginal loss, constipation, mastitis) decreased; and women reported higher satisfaction with inpatient postnatal care.

Bunik et al. (272)	2022 (USA)	To determine whether the Mother's Milk Messaging (MMM) app and text messaging improve breastfeeding outcomes and to describe engagement and qualitative feedback.	346 primiparous women (English- or Spanish-speaking) expecting a healthy singleton birth, recruited nationally and randomized into two intervention groups (combined n=227) and an attention-control group (n=119)	Randomised controlled trial with three arms; intervention groups received daily breastfeeding text messages plus access to the Mother's Milk Messaging app (one arm also included a physician-moderated private Facebook group, later combined due to minimal activity); control group received injury-prevention text messages; outcomes assessed at baseline, 3 and 6 months using validated breastfeeding, knowledge/attitude, confidence, and social-support measures; qualitative interviews conducted with a subsample.	Primary outcome was exclusive breastfeeding at 3 and 6 months; secondary outcomes included breastfeeding duration, breastfeeding self-efficacy, perceived breastfeeding support, attitudes, perceived barriers, and social support scores, along with qualitative themes on app use and engagement	Randomized controlled trial with mixed-methods

Dagla et al. (240)	2021 (Greece)	To investigate whether a 12-month perinatal intervention combining long-term midwife-led breastfeeding support and psychosocial support is associated with breastfeeding initiation, exclusivity and duration, and to identify factors related to exclusive and any breastfeeding duration	1080 pregnant women in Greece attending a 12-month perinatal health intervention, aged over 18, not using drugs, and without mental health conditions requiring hospitalisation.	Non-randomised controlled perinatal health intervention over five years (2014–2019); participants received long-term midwife-led breastfeeding education/support plus psychosocial and mental-health screening/treatment; data collected via medical and psychosocial histories, psychometric tools, and postpartum follow-up to 12–24 months; analyses included MANOVA and logistic regression	Breastfeeding initiation, exclusivity at 6 months, duration of any breastfeeding, duration of breastfeeding without formula; factors associated with exclusivity and duration, including midwife-led support quantity and maternal mental health status	Greater midwife-led support was associated with higher exclusive breastfeeding at 6 months and longer any breastfeeding duration; psychosocial wellbeing (absence of mental health symptoms and minimal psychotherapy need) was associated with longer breastfeeding duration; exclusive breastfeeding in hospital and at 1 month strongly predicted exclusivity at 6 months.

Dienelt et al.(275)	2019 (Australia)	To investigate mothers' use and experiences of infant feeding tracker apps, including reasons for downloading, how information is used, the role of the app, and perceived benefits and disadvantages	Nine Australian breastfeeding mothers who had used an infant feeding (IF) tracker app within the previous 12 months; median age 35 years; infants aged 3 weeks to 2 years	Qualitative study using semi-structured in-depth interviews conducted in person or by phone; transcripts coded deductively and inductively; thematic analysis conducted until data saturation reached at interview nine.	Mothers' experiences and perceptions of infant feeding tracker apps, including reasons for downloading, how app data were used, perceived benefits, perceived disadvantages, and the role of the app in infant feeding decisions	Apps provided objective data that helped mothers feel more in control, confident, and reassured about feeding; supported decision-making and understanding infant patterns; some negative experiences included over-reliance, feeling overwhelmed by data, difficulty using apps during feeding, and concerns about information credibility
Dinour et al. (269)	2022 (USA)	To characterise breastfeeding apps, compare higher- and lower-rated apps on tracking and non-tracking features, and analyse whether features predict user ratings.	Eighty-two breastfeeding smartphone apps identified from the Apple App Store and Google Play Store, including 40 iPhone and 42 Android apps	Cross-sectional content analysis of app features using an 87-item coding schema grouped into nine feature indices; descriptive statistics, Mann-Whitney U tests, Spearman correlations, linear regression, and logistic regression used to examine associations with user star ratings	User star ratings; number and type of tracking and non-tracking features; associations between feature indices and app ratings, including predictors of higher vs lower user ratings.	Higher-rated apps offered more tracking features, particularly for breastfeeding, solid foods, infant health, and infant care; breastfeeding and solid-food features significantly predicted higher user ratings; solid-food tracking increased likelihood of an app being higher-rated; user ratings appeared driven mainly by tracking rather than informational or interactive features

Elliott-Rudder et al. (121)	2014 (Australia)	To increase maintenance of breastfeeding through improved primary care support using a motivational interviewing–based intervention delivered by practice nurses	330 breastfeeding women attending 15 rural general practices in Australia; 154 in the intervention group and 176 in the control group.	Cluster randomised controlled trial in which practice nurses delivered a motivational-interviewing-based breastfeeding support intervention during routine infant immunisation visits at 2, 4 and 6 months; breastfeeding outcomes assessed by telephone follow-up at 4 and 6 months	Exclusive, full/predominant, and any breastfeeding at 4 and 6 months (24-hour recall and since-birth recall), with primary outcomes being exclusive and full breastfeeding rates at 4 months	Motivational interviewing increased exclusive and full breastfeeding at 4 months but showed no effect at 6 months; intervention feasible for primary care nurses following structured training
Flaherman et al.(257)	2012 (USA)	To compare bilateral electric breast pumping with hand expression among mothers of healthy term newborns feeding poorly at 12–36 hours postpartum, assessing milk transfer, maternal experience, and breastfeeding outcomes	68 mothers of healthy term newborns aged 12–36 hours who were latching or sucking poorly	Randomised controlled trial comparing 15 minutes of bilateral electric breast pumping with 15 minutes of hand expression under supervision, with follow-up at 1 week, 1 month and 2 months.	Expressed milk volume, maternal pain, breastfeeding confidence (BSES-SF), breast milk expression experience (BMEE), and breastfeeding rates at 2 months	Hand expression and pumping produced similarly small early milk volumes; maternal pain and confidence did not differ; mothers randomised to hand expression were more comfortable expressing around others; breastfeeding rates at 2 months were significantly higher in the hand expression group (96.1%) versus the pumping group (72.7%).

Franco-Antonio at al.(242)	2022 (Spain)	To analyse the impact of a brief motivational intervention to promote breastfeeding on the development of postpartum depression and to explore whether breastfeeding duration and breastfeeding self-efficacy mediate or moderate this effect	88 women in two public hospitals in Spain who had vaginal births, healthy newborns, and initiated breastfeeding within the first hour; randomised to brief motivational intervention (n=44) or breastfeeding education control (n=44	Randomised controlled multicentre parallel-group trial; immediate postpartum brief motivational intervention (20–30 min) plus 1-month booster call compared with a standard breastfeeding education session; follow-up at 3 months with telephone data collection; postpartum depression, breastfeeding duration, and breastfeeding self-efficacy assessed	Edinburgh Postnatal Depression Scale scores at 3 months; duration of breastfeeding (exclusive and non-exclusive); breastfeeding self-efficacy (BSES-SF) at baseline and 3 months; mediation/moderation analyses assessing whether breastfeeding duration or self-efficacy mediated effects on postpartum depression	Brief motivational intervention increased breastfeeding duration and significantly reduced postpartum depression scores; part of the effect on depression was mediated by breastfeeding duration

Franco-Antonio et al.(241)	2020 (Spain)	To evaluate the effectiveness of a brief motivational intervention in increasing breastfeeding and exclusive breastfeeding duration in the first 6 months postpartum, and to explore the moderating/mediating role of general and breastfeeding self-efficacy	88 postpartum women in two Spanish public hospitals, all with vaginal births who initiated breastfeeding within the first hour; randomized to intervention (n=44) or control (n=44).	Multicentre randomised controlled trial; intervention group received a 20–30 minute brief motivational interview in the immediate postpartum plus telephone boosters at 1, 3, and 6 months; control group received standard breastfeeding education; breastfeeding status and self-efficacy measured at discharge, 1, 3, and 6 months.	Duration of exclusive and any breastfeeding over 6 months; risk of breastfeeding abandonment via survival analysis (Kaplan–Meier, Cox regression); breastfeeding self-efficacy and general self-efficacy as potential mediators/moderators.	Brief motivational intervention reduced risk of abandoning exclusive breastfeeding by 63% and any breastfeeding by 61%, and significantly increased both exclusive and overall breastfeeding duration up to 6 months; increases partly associated with breastfeeding self-efficacy
Griffin et al. (277)	2021 (USA)	To determine whether higher usage of breastfeeding smartphone applications improves breastfeeding initiation, exclusive breastfeeding, and sustained breastfeeding rates among low-income women.	169 English-speaking, nulliparous, low-income women with singleton pregnancies, randomised to either a novel interactive breastfeeding app (BFF) or a control app containing digital breastfeeding handouts.	Secondary analysis of a randomised controlled trial; participants received a study-provided smartphone with preloaded app and internet access; embedded usage trackers recorded app openings; highest-quartile app users were compared with lowest-quartile users; breastfeeding initiation, exclusivity, and sustained breastfeeding were assessed via surveys at 2 days, 6 weeks, 3 months, and 6 months postpartum	Breastfeeding initiation; exclusive breastfeeding at 2 days, 6 weeks, 3 months, and 6 months; sustained breastfeeding at the same time points; reasons for supplementation; preferred breastfeeding resources postpartum	Higher app usage did not improve breastfeeding initiation, exclusive breastfeeding, or sustained breastfeeding through 6 months; apps were the most preferred breastfeeding resource at 6 weeks postpartum, and over half of participants in both groups preferred technology-based breastfeeding support after discharge

Henshaw et al. (210)	2024 (USA)	To test the effect of the *Happy, Healthy, Loved* tailored text-message program for mother–partner dyads on breastfeeding self-efficacy and maternal mood.	Primiparous mother–partner dyads (n = 62 couples) recruited 2–3 days postpartum from three Midwestern hospitals; intending to exclusively breastfeed, English-speaking, and without recent depressive episode or NICU admission	Randomised controlled trial comparing the *Happy, Healthy, Loved* tablet-based educational session plus 6 weeks of tailored text messages versus usual care with attention-control infant-development texts; surveys at baseline, 6 weeks, and 6 months assessed breastfeeding self-efficacy, mood, and partner support; ANCOVA and chi-square used for analysis	Breastfeeding self-efficacy at 6 weeks and 6 months; exclusive breastfeeding at 6 weeks; maternal depressive symptoms; partner depressive symptoms; perceived postpartum partner support	The intervention improved breastfeeding self-efficacy at 6 months but not at 6 weeks; no significant effects on exclusive breastfeeding, partner support, or maternal depression at either time point
Howell et al.(232)	2014 (USA)	To evaluate whether a 2-step behavioral educational intervention increased breastfeeding duration among Black and Latina mothers after delivery.	540 self-identified Black and Latina mothers in a New York City hospital, aged ≥18, with healthy term infants (≥2500 g, Apgar ≥7), randomized to intervention (n=270) or control (n=270)	Randomised controlled trial comparing a 2-step behavioural educational intervention—an in-hospital session plus a 2-week follow-up call—with enhanced usual care; data collected at baseline and by phone at 3 weeks, 3 months, and 6 months postpartum	Breastfeeding duration (weeks) up to 6 months; cessation risk via Kaplan–Meier and Cox regression; breastfeeding initiation and support variables; secondary outcome from parent trial included postpartum depressive symptoms	Intervention mothers breastfed longer than controls (median 12.0 vs 6.5 weeks) and were less likely to stop breastfeeding by 6 months (HR 0.79; 95% CI 0.65–0.97); no difference in exclusive breastfeeding at 6 months

Hoyt-Austin et al.(259)	2023 (USA)	To estimate the effect of providing a manual breast pump during birth hospitalisation on exclusive and any breastfeeding among low-income, first-time mothers, and to explore participant attitudes toward manual pumps and breastfeeding	60 low-income, primiparous, WIC-eligible mothers randomised during birth hospitalisation; 59 included in baseline characteristics; follow-up completed by 37 at 6 weeks and 31 at 12 weeks.	Pilot randomised controlled trial comparing provision of a manual breast pump versus an attention control (infant board book) during birth hospitalisation, with breastfeeding outcomes assessed via surveys at 6 and 12 weeks and qualitative interviews at 12 weeks.	Exclusive breastfeeding at 12 weeks (primary); exclusive and any breastfeeding at 6 weeks; pump use (manual, electric, hand expression); qualitative themes on breastfeeding experience and pump use	Providing a manual pump increased manual pump use at 6 weeks but did not improve exclusive or any breastfeeding at 12 weeks. Participants reported mixed breastfeeding experiences and highlighted a strong need for early and ongoing breastfeeding support
Kao et al.(250)	2015 (USA)	To examine whether the ROSE interpersonal psychotherapy-based group intervention, originally designed to prevent postpartum depression, also improved breastfeeding initiation and duration among low-income women	99 pregnant low-income women at risk for postpartum depression, recruited at 20–35 weeks' gestation and randomized to ROSE intervention (n=53) or standard care (n=46)	Randomised trial of a 4-session group interpersonal psychotherapy–based psychoeducational program plus a postpartum booster, compared with standard antenatal care; breastfeeding initiation measured at 2 weeks postpartum and breastfeeding duration at 3 months postpartum	Breastfeeding initiation (yes/no) at 2 weeks; breastfeeding duration in days at 3 months; Edinburgh Postnatal Depression Scale scores at 2 weeks for exploratory analysis of potential mediators	Intervention did not increase breastfeeding initiation but significantly extended breastfeeding duration (median 54 days vs 21 days); twice as many women in ROSE breastfed at 3 months postpartum compared to controls

Laws et al.(279)	2023 (Australia)	To assess the feasibility, acceptability and preliminary impact of the *My Baby Now* mHealth app on breastfeeding knowledge, attitudes, confidence and intentions during pregnancy and early postpartum, including differences by maternal education.	266 first-time pregnant women in Australia, 20–30 weeks gestation, owning a smartphone, with no breastfeeding contraindications; 169 completed late-pregnancy follow-up and 157 completed postpartum follow-up	Mixed-methods pre–post feasibility study; participants used the *My Baby Now* breastfeeding support app from pregnancy to 8–12 weeks postpartum; surveys at baseline, late pregnancy, and postpartum assessed breastfeeding knowledge, attitudes, confidence, and intentions; app analytics measured engagement; qualitative interviews conducted with 24 participants	Breastfeeding knowledge, attitudes, confidence, and exclusive-breastfeeding intentions; perceived impact and acceptability of the app; breastfeeding initiation and exclusivity at ~8–12 weeks postpartum; quantitative changes from T1 to T2/T3 and associations with app engagement	The app was feasible and acceptable, with higher perceived usefulness among women without university education; breastfeeding knowledge, attitudes, confidence and exclusive breastfeeding intentions improved from baseline to late pregnancy and postpartum; app engagement predicted improved attitudes in women without university education; a full randomised trial is recommended.
Lewkowitz et al.(278)	2021 (USA)	To evaluate whether the BreastFeeding Friend (BFF) smartphone app improves exclusive breastfeeding rates among low-income, first-time mothers intending to exclusively breastfeed	87 low-income, first-time mothers in the USA who planned to exclusively breastfeed, randomized to the BFF app (n=41) or control app (n=46).	Exclusive and sustained breastfeeding rates from 2 days to 6 months postpartum; breastfeeding initiation; self-reported breastfeeding challenges; reasons for formula use; perceived best breastfeeding resource at each time point	Exclusive and sustained breastfeeding rates from 2 days to 6 months postpartum; breastfeeding initiation; self-reported breastfeeding challenges; reasons for formula use; perceived best breastfeeding resource at each time point	The BFF app did not increase exclusive breastfeeding rates from 2 days to 6 months postpartum; however, BFF users were more likely to report no breastfeeding challenges and more often rated the app as the best breastfeeding support at home, especially at 6 weeks postpartum

Lojander et al.(79)	2022 (Finland)	Examine maternal perceptions of postnatal breastfeeding support in the hospital before and after designation to the bfhi, and investigate associated maternal and infant characteristics	Postpartum mothers giving birth in one public birth hospital before (n = 162) and after (n = 163) BFHI designation	Quasi-experimental two-group pre/post design in one postnatal ward and one NICU in Finland; convenience sample of mothers before (n=162) and after (n=163) BFHI designation; data from a 20-item questionnaire and medical records; analysed using descriptive statistics, non-parametric tests, and multiple linear regression	Maternal perception of breastfeeding support measured via a 20-item summed 1–7 scale; individual BFHI-related practice items; associations with maternal and infant characteristics	Support scores were higher after BFHI designation (6.1 vs 5.0, $p<0.001$); 15/20 practices improved; largest improvements among multiparas, older mothers, and those with prior breastfeeding duration of 6–12 months; no improvement for caesarean or preterm births; pre-BFHI, multiparas and low Apgar infants' mothers reported lower support; post-BFHI, mothers of preterm infants reported lower support; regression showed post-test group, primiparity, and higher Apgar scores predicted higher perceived support

Lucas et al. (211)	2019 (USA)	To test the preliminary efficacy of a Breastfeeding Self-Management (BSM) intervention on breast and nipple pain, general pain, and breastfeeding duration in the early postpartum period	60 postpartum women intending to breastfeed, enrolled within 48 hours of birth and randomised to the Breastfeeding Self-Management (BSM) intervention (n=30) or control (n=30); 56 completed the study	Pilot randomised controlled trial; the intervention group received educational modules on breast/nipple pain, biweekly nurse-text coaching, and a daily breastfeeding journal, while the control group received routine postpartum care; pain and breastfeeding outcomes assessed at baseline, 1, 2, and 6 weeks postpartum.	Breast and nipple pain (VAS), general pain intensity and pain interference (Brief Pain Inventory), and breastfeeding duration to 6 weeks	BSM participants reported significantly less breast and nipple pain at 1 and 2 weeks and lower general pain at 2 weeks; no significant difference in breastfeeding duration between groups. Text-based support and education were well-received
Nardella et al.(255)	2024 (USA)	To quantify the association between breast pump use and breastfeeding duration using large, weighted US surveillance data	19,719 mothers (weighted n = 723,808) from PRAMS in Maine, Michigan, New Mexico, and Utah (2016–2021) who initiated breastfeeding and had complete data on pump use and breastfeeding duration.	Cross-sectional analysis of weighted PRAMS survey data; breastfeeding duration modeled using Cox proportional hazards regression; pump use defined as ever using a breast pump; covariates included demographic, socioeconomic, maternal, and infant health factors; interaction by race/ethnicity tested	Breastfeeding duration in weeks; hazard of breastfeeding cessation; median breastfeeding duration; interaction effects by race/ethnicity showing differential associations between pump use and breastfeeding cessation.	Pump use was associated with a 37% lower hazard of breastfeeding cessation and 21 additional weeks of breastfeeding on average; strongest associations occurred among non-Hispanic Black and Native American mothers; pump use was widespread (90.6%) and varied by socioeconomic and demographic factors

Ozturk et al.(253)	2023 (Turkey)	To evaluate the effect of a mandala and technology-based breastfeeding program on breastfeeding self-efficacy and mother–infant attachment in primiparous women	66 primiparous pregnant women (32–37 weeks gestation) in a Turkish university hospital, randomized to intervention (n=33) or control (n=33), along with their healthy term infants (37–42 weeks, 2500–4000 g)	Randomised single-blind parallel-group trial; intervention group received a mandala-based and technology-delivered breastfeeding program (WhatsApp modules, Zoom-based training, and weekly art-therapy mandala tasks) from late pregnancy through 2 months postpartum; controls received routine care; data collected online via Google Forms and follow-ups at 1 week, 1 month, and 2 months postpartum.	Breastfeeding self-efficacy (BSES-SF), maternal attachment (Maternal Attachment Scale), state anxiety (STAI), infant feeding status (exclusive vs mixed breastfeeding), and infant growth (weight, height, head circumference z-scores) at 1 week, 1 month, and 2 months postpartum.	At two months postpartum, intervention participants had higher breastfeeding self-efficacy, stronger maternal attachment, lower anxiety, and higher exclusive breastfeeding rates; infants showed better weight and head-circumference z-scores than controls.
Perez-Blasco et al.(252)	2013 (Spain)	To examine the effectiveness of an 8-week mindfulness-based intervention on maternal self-efficacy, mindfulness, self-compassion, well-being, and psychological distress in breastfeeding mothers.	26 breastfeeding mothers in Spain, randomly assigned to an 8-week mindfulness-based intervention (n=13) or control group (n=13; 5 later lost to follow-up)	Randomised controlled pilot study with pre- and post-test design; the intervention consisted of weekly 2-hour mindfulness sessions for 8 weeks based on MBSR/MBCT/MSC, incorporating guided meditations and mindful parenting exercises conducted with infants present; control group received no intervention.	Maternal self-efficacy (Parental Evaluation Scale), mindfulness (Five Facet Mindfulness Questionnaire), self-compassion (Self-Compassion Scale), psychological distress including depression, anxiety and stress (DASS-21), satisfaction with life (SWLS), and	Mothers receiving the intervention showed higher maternal self-efficacy, increases in several mindfulness and self-compassion dimensions, and significant reductions in anxiety, stress, and psychological distress compared with controls

					subjective happiness, measured pre- and post-intervention	
Quifer-Rada et al. (273)	2023 (Spain)	To assess the usability and utility of LactApp as a mobile application for breastfeeding support	1,191 LactApp users who completed the full survey, predominantly from Spain (91%), mostly primiparous, with infants averaging 4.9 months of age; 83% were exclusively breastfeeding	Prospective cross-sectional online survey sent to LactApp users registered between January and September 2022; questionnaire included the modified mHealth App Usability Questionnaire (mMAUQ) plus demographic, clinical, and breastfeeding-related items; descriptive statistics and non-parametric tests used to analyse usability, utility, and satisfaction	mMAUQ usability scores (total and subscales); perceived usefulness and support provided by the app; user satisfaction with breastfeeding support from health professionals, family, and society; associations between user characteristics and usability scores	LactApp was rated highly usable and useful; most users felt supported in their breastfeeding experience, found it helpful for managing breastfeeding, and were satisfied with the app overall (mean mMAUQ score 5.9/7)

Santamaría-Martín et al.(180)	2022 (Spain)	To evaluate the effectiveness of the PROLACT group educational intervention in primary care for increasing exclusive breastfeeding at 6 months compared with usual care	434 mother–child dyads who were exclusively breastfeeding in the first 4 weeks postpartum and attended one of 10 primary healthcare centres in Madrid; 219 assigned to the intervention group and 215 to the control group.	Multicentre cluster-randomised clinical trial comparing the PROLACT group educational intervention (six weekly 120-minute breastfeeding workshops) with usual primary care; follow-up at 2, 3, 4, 5, and 6 months; primary analysis by intention-to-treat.	Exclusive breastfeeding at 6 months (primary); type of feeding at 6 months; duration of exclusive breastfeeding; reasons for breastfeeding abandonment; adherence to sessions; satisfaction with the intervention	Exclusive breastfeeding at 6 months was 22.4% in the intervention group vs 8.8% in controls (RR 2.53). The intervention increased any breastfeeding and showed an NNT of 7; factors supporting EBF included receiving the intervention, older maternal age, higher income, and previous breastfeeding experience
Shukri et al. (248)	2019 (Malaysia)	To investigate the effects of a breastfeeding relaxation intervention on maternal psychological state, breast milk intake, milk cortisol, and infant behavior and growth.	64 primiparous mothers in Malaysia with healthy term infants, exclusively breastfeeding at 2 weeks postpartum, randomised to relaxation audio intervention (n=33) or control (n=31).	Randomised controlled trial where the intervention group listened to a guided relaxation audio while breastfeeding for 12 weeks; home visits at 2, 6, 12, and 14 weeks postpartum measured maternal stress/anxiety, milk cortisol, infant milk intake via stable isotope dilution, infant behaviour (3-day diary), and growth	Maternal stress (Perceived Stress Scale), maternal anxiety (Beck Anxiety Inventory), breast-milk cortisol, infant milk intake (g/day), infant behaviour (sleep, feeding, distress), infant anthropometry (weight, BMI SDS), and body composition	Relaxation therapy reduced maternal stress, lowered hindmilk cortisol acutely, increased infant sleep duration, and led to higher infant weight and BMI gain; adjusted analyses showed higher milk intake in the intervention group

Sreekumar et al. (251)	2018 (India)	To test the effectiveness of a single session of cognitive breastfeeding counseling in the third trimester compared with routine counseling for improving LATCH scores	52 pregnant women in their third trimester in an Indian medical college; randomised to cognitive breastfeeding counselling (n=26) or routine counselling (n=24), with 50 mother–infant dyads assessed postpartum	Single-session antenatal counselling comparing cognitive-behavioural-based breastfeeding counselling versus routine counselling; LATCH breastfeeding assessment performed within the first 24 hours postpartum by an assessor blinded to group allocation	LATCH breastfeeding score (0–10), categorised as ≤7 (poor) or >7 (good), used to evaluate early breastfeeding effectiveness	Cognitive counseling significantly reduced the proportion of poor LATCH scores (3.8% vs 29.2%), indicating improved early breastfeeding success compared with routine counseling.
van Dellen et al.(201)	2019 (Netherlands)	To evaluate whether the Breastfeeding Support Programme (BSP)—a structured, evidence-based lactation consultant programme—improves breastfeeding duration and exclusivity compared with a control group.	138 pregnant women intending to breastfeed, with 66 in the Breastfeeding Support Programme group and 72 in the control group.	Quasi-experimental pre-/post-test design comparing a structured six-consult lactation-consultant-led support programme (from pregnancy to 10 weeks postpartum) with usual care; breastfeeding duration and exclusivity measured via online questionnaires; analysis using Cox proportional hazards models controlling for baseline differences	Duration of any breastfeeding; duration of exclusive breastfeeding; risk of cessation of any and exclusive breastfeeding over time	BSP significantly reduced the risk of cessation of any breastfeeding by 66% and exclusive breastfeeding by 54%; mothers in the BSP group breastfed longer and more exclusively at every time point compared with controls

Vila-Candel et al. (274)	2024 (Spain)	To assess whether use of the LactApp® mobile application increases breastfeeding maintenance at 6 months postpartum compared with standard care	270 pregnant women recruited from four public hospitals in Spain; 164 included in the per-protocol analysis after exclusions and adherence checks.	Multicentre parallel-group randomised controlled trial (Jan 2022–Jan 2023); intervention group received access to the LactApp mobile app; control group received standard breastfeeding counselling; follow-up at discharge, 15 days, 6 weeks, 3 months, and 6 months postpartum	Breastfeeding status at discharge, 15 days, 6 weeks, 3 months, and 6 months; exclusive vs mixed vs supplementary feeding; breastfeeding abandonment at each time point.	Use of LactApp® did not increase breastfeeding rates at 6 months compared with standard care, though it may slightly reduce early breastfeeding abandonment in the first 15 days postpartum
Wilhelm et al.(243)	2015 (USA)	To evaluate whether a motivational interviewing intervention could help rural Mexican-America n mothers continue breastfeeding and to assess feasibility issues, particularly attrition	53 rural Mexican-American breastfeeding mothers in Nebraska, randomly assigned to motivational interviewing (n=26) or attention-control (n=27)	Two-group repeated-measures experimental design with home-visit assessments at 3 days, 2 weeks, and 6 weeks postpartum, plus a phone follow-up at 6 months; motivational interviewing sessions delivered at each visit, compared with attention-control sessions on infant safety; outcomes measured prior to each session.	Intent to breastfeed for 6 months, breastfeeding self-efficacy (Breastfeeding Self-Efficacy Scale-Short Form), and duration of breastfeeding to 6 months	High attrition prevented full evaluation; no significant differences were found between groups in breastfeeding intent, self-efficacy, or duration. Both groups had low breastfeeding continuation at 6 months, although MI mothers breastfed slightly longer on average.

Chapter Seven: Summary table of reviews on keeping parents and infants close

Author	Aim	No. Included studies	Countries	Population	Types of studies	Key findings
Curley et al. (2023) (356)	Examine the barriers to nurses and midwives providing couplet care for infants requiring additional care in postnatal wards and nurseries.	20 studies	Australia, USA, UK, Canada, Netherlands India, Saudi Arabia, Sweden	Mother–infant dyads where infants required additional care and may otherwise have experienced separation from their mothers.	3 systematic reviews, 1 pilot study, 1 quantitative unit-based study, 2 mixed-methods studies, 2 interview studies, 2 pre–post intervention studies, 4 retrospective chart reviews, 2 scoping reviews, and 3 commentaries.	Five main barriers to implementing couplet care were identified: (1) Models of care: lack of integrated postnatal-neonatal models and sustainability challenges of transitional care beds; (2) Systems and structural issues: absence of clear policies, inadequate staffing, and reliance on criteria-led admissions; (3) Safety: concerns over fatigue, bed-sharing, and neonatal risks in non-NICU settings; (4) Resistance: midwives' lack of confidence and perceived competence in managing infants with additional needs; and (5) Education: widespread educational gaps in neonatal care among midwives and nurses, with successful implementations requiring extensive cross-training and upskilling. The review calls for further qualitative research focused on Australian midwifery perspectives.
Doede et al. (2018) (299)	Review literature comparing how SFR versus OPBY NICU	13 studies	USA, Denmark, Australia	Nurses working in NICUs with either SFR or OPBY layouts	8 quasi-experimental studies, 2 case–control studies, 2 post-test-only survey studies, and 1 qualitative	SFRs improved the physical environment (noise, lighting, privacy), perceived care quality, parent interaction, and reduced nurse stress/burnout. However,

	layouts affect nurses' work.					nurses reported greater reliance on technology, physical strain from layout, and emotionally taxing family interactions. Challenges included reduced team communication, isolation, safety concerns, and limited infection control. Trade-offs between privacy and visibility affected collaboration and care. Effects varied over time; most studies used non-validated surveys.
Jaafar et al. (2016) (338)	Assess the effect of mother-infant rooming-in versus separation on the duration of breastfeeding (exclusive and total).	1 RCT (178 mother-infant dyads)	Russia	Healthy mothers and their full-term newborns following vaginal delivery	1 RCT (4-arm factorial design, grouped into rooming-in vs. separate care)	Rooming-in significantly increased exclusive breastfeeding at day four postpartum (86% vs. 45%; RR 1.92; 95% CI 1.34 to 2.76). No difference in the proportion of infants receiving any breastfeeding at six months (RR 0.84; 95% CI 0.51 to 1.39). Duration of any breastfeeding was similar (median 4 months). No data on exclusive breastfeeding duration or key maternal/neonatal outcomes. Overall, evidence was low quality and limited to one small study.
Miah (2013) (314)	Assess whether transitional care improves neonatal and maternal health outcomes.	10 studies	UK	Moderately compromised preterm infants (≥33 weeks, >1.4 kg) and their mothers.	6 literature reviews/audits/reports, 2 surveys (unpublished), 2 observational/descriptive.	Transitional care was associated with shorter hospital stays, improved mother–infant bonding and attachment, enhanced parenting skills, family-centred care, and increased maternal involvement. The "mother as main carer"

						model reduced infection risk and supported emotional well-being. Breastfeeding support was strong, though duration results were mixed. It also freed neonatal resources and was cost-effective for moderately compromised infants. Practices varied across UK units. Evidence quality was mostly moderate to high, but more consistent implementation and rigorous research are needed.
Ng et al. (2019) (333)	Evaluate the effect of continuous or intermittent rooming-in during hospital stay, compared to nursery care, on breastfeeding duration.	7 studies	Russia, Sweden, Nicaragua, Mexico, Brazil	Healthy mothers and full-term newborns (primiparous and multiparous), following uncomplicated vaginal delivery	2 RCTs, 5 non-randomised prospective controlled studies	No significant differences in full breastfeeding at 3 months (RR 1.14; 95% CI 0.84–1.54), 4 months (RR 0.99; 95% CI 0.73–1.33), or 6 months (RR 0.95; 95% CI 0.57–1.58). Rooming-in was associated with a modest increase in partial breastfeeding at 3–4 months (RR 1.31; 95% CI 1.06–1.61). Breastfeeding frequency was higher in rooming-in groups though not meta-analysed. No significant effect on maternal-reported breastfeeding problems. All evidence rated very low to low quality due to risk of bias, co-interventions, and imprecision.
O' Callaghan et al. (2019) (296)	Identify NICU design features linked to better neonatal, parental, and staff outcomes.	29 studies	USA, Sweden, Denmark, Brazil, Turkey, Taiwan, Italy	Preterm and VLBW infants, parents, and NICU staff.	19 cohort, 7 cross-sectional, 2 qualitative, 1 RCT.	SFRs were linked to better infant outcomes (weight gain, feeding, fewer infections/procedures, less stress, shorter stays) and mixed neurodevelopmental findings (some improved

						attention/behaviour; others lower language/motor scores). Parental outcomes included higher presence, bonding, and satisfaction, with mixed results on maternal stress. Staff reported improved satisfaction and care quality but faced challenges with visibility, walking, and teamwork early on. SFRs offered better control of sound, light, and temperature. Infection control improved with better room/sink design. Breastfeeding was more sustained, though duration findings were mixed. Costs were comparable or lower than OBUs, with fewer rehospitalizations. Design considerations included proximity to delivery rooms, family/staff spaces, and infection/water safety infrastructure.
Servel et al. (2016) (297)	Evaluate the impact of SFRs on preterm newborns, their families, and healthcare staff.	12 studies	USA	Preterm newborns (<37 weeks GA), their parents, and NICU staff.	1 RCT, 5 prospective cohort studies, 3 before-after, 1 case-control, 2 not specified.	SFRs were linked to shorter hospital stays, fewer apnoea's, reduced infections, better weight gain, improved feeding, and higher breastfeeding rates. Parental outcomes included greater satisfaction, bonding, confidence, and reduced stress, anxiety, and depression. Staff reported better work satisfaction and less stress, though concerns about isolation and reduced team communication

						emerged. Environmental benefits included lower light/noise levels. Cost was comparable or lower than open-bay units.
Shahheidari et al. (2012) (307)	Examine NICU design features (especially SFRs versus OBUs) and their impact on outcomes for infants, parents, and staff.	12 studies	USA, Sweden, Taiwan, Turkey, Denmark	Preterm infants (<37 weeks gestation), parents, and NICU staff.	1 RCT, 4 prospective comparative, 3 before–after, 3 cross-sectional/descriptive, 1 qualitative	Single-family rooms (SFRs) linked to improved outcomes: lower infection rates, shorter hospital stays, fewer apnoea's, reduced noise exposure, and fewer rehospitalizations. Parents reported higher satisfaction, comfort, privacy and engagement in care (more skin-to-skin, breastfeeding). Staff perceived better infection control and privacy but also reported increased walking, workload, and reduced team communication. Design suggestions included clustering rooms, decentralizing nurses' stations, and using technology to enhance teamwork and communication.
Soleimani et al. (2020) (298)	Investigate the effects of SFRs in NICUs on clinical and environmental outcomes for infants, and on parents' and staff perspectives.	16 studies	USA, Iran	Preterm infants admitted to NICUs, their parents, and NICU staff	5 cohort studies, 5 review articles, 5 questionnaire-based studies, and 1 quasi-experimental study.	FRs were linked to better clinical outcomes: improved weight gain, fewer hospital-acquired infections and medical procedures, less stress/pain, better feeding, and shorter hospital stays. Environmental benefits included lower noise/light levels; some studies noted improved infant sleep and maternal calm. Neurodevelopment and maternal stress findings were

						mixed. Parental and staff feedback was largely positive—greater satisfaction and privacy, but some nurses reported increased workload and isolation. One study suggested better feeding coordination in open wards. Overall, SFRs were cost-effective.
van Veenendaal et al. (2020) (319)	Assess whether the physical design of a NICU, specifically SFRs versus OBUs, impacts the well-being and participation of parents of preterm infants during the hospital stay.	11 studies	USA, Sweden, Norway, Turkey, Australia, Multiple European countries (across 11 NICUs)	Parents (mothers and fathers) of preterm infants (e.g., average gestational ages ranging from ~26 to 34 weeks) admitted to NICUs	1 RCT, 8 NRPI, 2 before-after studies.	Compared to OBUs, SFRs were linked to greater parental presence, involvement, and skin-to-skin contact. Meta-analysis showed lower NICU-related stress in SFRs (SMD = -0.30; 95% CI: -0.50 to -0.09; $p < 0.004$), especially for NICU-specific stress (SMD = -0.42; 95% CI: -0.61 to -0.23; $p < 0.0001$). SFRs were also associated with higher parental empowerment, satisfaction, and perceived FCC. No significant differences in anxiety, depression (up to 29% symptomatic), self-efficacy, or bonding. PTSD not assessed.
Neonatal Intensive Care Unit (NICU), Single Family Rooms (SFRs), Open Bay Units (OBUs), Randomised Controlled Trial (RCT), Not Reported (NR)						

Chapter Seven: Summary table of empirical studies on keeping parents and infants close

Author	Year & Country	Aim	Participants	Methods	Outcome Measures	Key Findings
Adcock et al.(310)	2021 (New Zealand)	To give voice to the experiences, views and attributions of whanau of preterm Māori infants.	N=19 whanau (including 19 mothers, 9 fathers, and 13 non-parent whanau) of 21 preterm Māori infants (born 24+0–36+0 weeks gestation)	A cross-sectional interpretative phenomenological analysis of first interviews from qualitative longitudinal study of preterm birth.	Focused life story interviews were based around four topic areas: their journey, explanations they had been given, responsiveness of care, and their feelings/coping.	Preterm birth profoundly disrupts Māori whānau, but culturally safe, relational, whānau-centred care can transform the NICU experience. When health practitioners honour whakapapa, support whānau autonomy, and build authentic relationships, they help quieten the “storm” of preterm birth and restore calm, connection, and confidence.
Al-Kohji et al. (339)	2012 (Qatar)	Assess the breastfeeding practices of Arab mothers by measuring breastfeeding indicators, and to identify the determinants affecting these practices in Qatar	N = 770 Arab mothers with children <24 months attending primary health care centres in Qatar (2009). Majority under 35 years old (87.4%), mostly unemployed (64.4%), and about half had university education.	Cross-sectional	Early initiation, exclusive breastfeeding <6 months, continued breastfeeding at 1 year; Optional and health facility indicators.	43.9% practiced rooming-in. Rooming-in was significantly associated with early initiation of breastfeeding (76.1% vs. 43.3%; $p < 0.001$). No significant association with exclusive breastfeeding <6 months ($p = 0.370$).

Alrasheedi et al. (340)	2023 (Saudi Arabia)	Investigate the prevalence and factors associated with early initiation of breastfeeding in public hospitals.	N = 519 Mothers who delivered in 5 public hospitals.	Cross-sectional	Early initiation of breastfeeding (≤1 hour).	91.7% of mothers practiced 24-hour rooming-in. Significant predictors of early initiation of breastfeeding (within 1 hour of birth) were vaginal delivery (aOR = 0.014 for Caesarean section; 95% CI: 0.003–0.059), 24-hour rooming-in (aOR = 6.26; 95% CI: 1.31–29.8), encouragement to initiate breastfeeding (aOR = 3.05; 95% CI: 1.71–5.43), and help with positioning the baby (aOR = 3.5; 95% CI: 1.62–7.57). Supports BFHI implementation.
Axelin et al.(331)	2022 (International – 15 countries - 13 in Europe, 1 in Australia and 2 in Canada)	To examine the potential association of family-centred care as perceived by parents during a NICU stay with parents' depressive symptoms at discharge and at 4 months corrected for infant age	Parents (n = 635 mothers, n = 466, fathers) of infants (n = 739) born be -fore 35 weeks of gestation and admitted to the participating NICUs.	A longitudinal, prospective multicentre cohort study with parents from 23 participating NICUs in 15 countries	During the study period, a log of all admissions of infants younger than 35 gestational weeks was kept at each participating unit (data including infants' gestational age, birthweight, length of hospital stay etc); Edinburgh Postnatal Depression Scale; two methods to capture parents' experiences of family-centred care; Digi Family-Centred Care: Parent (DigiFCC-P) version survey; Family-Centred Care Questionnaire (FCCQ); sociodemographic characteristics of the	More positive perceptions of family-centred care were associated with fewer parental depressive symptoms at discharge and 4 months corrected age. Key contributors to family-centred care included parental participation in infant care and decision-making, emotional support from staff, unrestricted parental access to the unit, and parent-friendly amenities.

					parents and infants; unit background questionnaire	
Azzeh et al. (342)	2018 (Saudi Arabia)	Identify determinants related to not breastfeeding and those associated with delayed early initiation of breastfeeding.	N = 814 mothers (aged 17–44 years) with children aged 2–3 years	Cross-sectional	Not breastfeeding at all; delayed initiation of breastfeeding (>1 hour).	70.8% practiced rooming-in. Not rooming-in was associated with: Not breastfeeding: OR = 2.37; 95% CI: 1.66–3.41 and delayed BF: OR = 2.2; 95% CI: 1.52–3.18 (both p < 0.001).
Barrera et al. (358)	2018 (USA)	Assess national trends in hospital rooming-in practices from 2007 to 2015 and reasons for separation of healthy, full-term, breastfed infants from mothers.	Census of all maternity hospitals in the USA and territories (response rate: 82–83% per cycle)	Biennial cross-sectional surveys (mPINC) conducted by CDC; data reported by hospital staff knowledgeable about infant feeding practices.	% of hospitals where ≥90% of healthy, full-term infants roomed-in >23 hrs/day ("ideal practice"); reasons for removing infants from mothers' rooms.	Ideal rooming-in increased from 27.8% (2007) to 51.4% (2015). Even among non-ideal hospitals, 91.8% brought infants to mothers at night for feedings (2015). Most common reasons for separation (2015): hearing test (73.2%), heel stick (65.6%), bath (40.2%), paediatric rounds (35.5%), photos (25.4%). Teaching and larger hospitals less likely to separate infants.
Bodack et al. (293)	2016 (Germany)	Assess parents' perceptions of care in SFRs compared to open-ward rooms in a NICU.	N = 35 parent pairs (of 40 preterm and newborn infants); infants had varying birth weights (580–4240g) and lengths of stay; only parents	Cross-sectional. Standardized questionnaire distributed to parents.	Parental perceptions of privacy, environmental disturbances, communication with staff, parental involvement, and feelings of security.	Parents perceived single rooms positively for privacy (97%), bonding/stress reduction (91%), confidentiality (94%), fewer disturbances (91%), and involvement in care (89%). Staff were seen as slightly more focused (86%) and better

			whose children experienced both room types were included.			at guiding parents (89%). Communication (94%) and individualized care (91%) were similarly rated across room types. Downsides included less parent interaction (66%) and lower perceived monitoring/safety (34%). Parents of very low birthweight infants felt safer in open wards but more supported in single rooms; those with heavier infants valued the added privacy.
Brand et al.(304)	2021 (USA)	Compare psychological and physiological stress in NICU nurses working in SFR vs. OBY units, and on day vs. night shifts.	N = 72 full-time NICU nurses; 39 worked in SFR and 24 in OBY units.	Comparative cross-sectional study	Psychological stress (Nurse Stress Scale); physiological stress (salivary cortisol levels).	No significant difference in psychological or physiological stress between SFR and OBY units. Day-shift nurses had significantly lower final cortisol levels than night-shift nurses, suggesting greater physiological stress on night shift.
Broom et al.(306)	2019 (Australia)	Explore the impact of transitioning from an OP to a dual occupancy DO NICU on staff workflow, activity, and perceptions.	N = 100 staff invited (nurses, medical, allied health, and support staff); participation rates: OP (n=84), DO 6 months post (n=62), DO 24 months post (n=68)	Prospective longitudinal study (2011–2014); time-and-motion observations at 3 time points.	Walking distance, time spent in various care activities, and staff perceptions of NICU environment and interactions.	DO design did not increase walking distances or reduce time on direct neonatal care. Staff reported the DO design improved developmentally appropriate care, parent–staff communication, and family involvement. However, staff interaction and education opportunities were

						reduced, especially in the early phase of transition. Increased indirect care time (paperwork, communication with staff) was observed in DO. Staff satisfaction improved over time but did not fully return to pre-transition levels.
Chooniedass et al. (347)	2021 (Canada)	Identify factors associated with breastfeeding initiation and continuation in Canadian-born and non-Canadian-born women.	N = 3010; 75.4% Canadian-born, 24.6% non-Canadian-born women	Prospective cohort study (CHILD Study); data from questionnaires, hospital records.	Breastfeeding initiation and continuation at 6 months; influence of socio-demographic, birth, and hospital factors (including rooming-in).	Rooming-in was linked to higher breastfeeding initiation in Canadian-born women (aOR = 1.84), but not in non-Canadian-born (aOR = 0.37). No significant link to breastfeeding at 6 months in either group. Rooming-in may support early initiation but not long-term continuation.
Cox et al. (348)	2014 (Australia)	Determine the rate of breastfeeding initiation and identify the factors associated with exclusive breastfeeding at discharge from hospital for rural mothers	N = 427 mothers from regional hospitals	Prospective cohort study (Rural Infant Feeding Study); self-administered questionnaires completed before or shortly after discharge	Breastfeeding initiation and exclusive breastfeeding at discharge.	97.7% initiated breastfeeding; 82.7% exclusively breastfeeding at discharge. Rooming-in was significantly associated with exclusive breastfeeding (aOR = 2.31, 95% CI: 1.15–4.62).
Crump et al. (313)	2023 (Canada)	Examine parents' perceptions of factors affecting the transition from a 6-bed pod to a SFR in a mixed-room design NICU.	N = 17 parents (10 mothers, 7 fathers); infants born preterm with various conditions (e.g., RDS, BPD, IUGR); average	Qualitative; semi-structured interviews conducted 4–13 days after transition	Parental perceptions of what helped or hindered the transition from pod to SFR.	Parents' experiences of moving from a 6-bed pod to a SFR were shaped by how staff framed and communicated the change—positive framing (e.g., step toward discharge) and advance

			infant hospital stay was 63.3 days.			notice eased the transition, while inconsistent info caused anxiety. Parents appreciated the privacy, comfort, and quieter environment, noting benefits for bonding and infant health, but some felt less supported due to reduced staff visibility and lower nurse ratios. Physical/emotional readiness affected coping; support from familiar nurses boosted confidence. Those with prior NICU or parenting experience adapted more easily.
Dadiz et al. (359)	2020 (USA)	Identify LSTs using in situ simulation-based operations testing before moving into a new single-family-room NICU, and to determine which LSTs remained unresolved 1 year after occupancy.	N = 111 healthcare professionals	Qualitative study using 12 in situ simulation scenarios and structured debriefings	Number and nature of LSTs; resolution status of LSTs 1-year post-occupancy.	Identified 305 LSTs, grouped into 4 major themes: relay of information, workplace design, workflow processes, and family/staff focus. 91% of threats were resolved within 1 year. Many LSTs were linked to challenges introduced by the new SFR NICU design, including communication breakdowns, alarm response delays, and reduced visibility. Simulation enhanced team readiness and supported safer system transitions.

Dagestad et al. (305)	2025 (USA)	Implement and evaluate a model of care that keeps mothers and NICU-admitted newborns together in LDRP/NICU suites, and to assess its impact on satisfaction, engagement, breastfeeding, and clinical outcomes.	N = 555 NICU families (311 pre-implementation, 244 post-implementation); mothers of NICU-admitted infants; surveys collected at infant discharge.	Pre-post implementation study; two years before and after model implementation.	Parent satisfaction, employee engagement, breastfeeding rates, NICU admissions, birth volumes, care transitions, and length of stay.	Post-implementation, parent satisfaction scores increased slightly (e.g., involvement in care: 9.34 to 9.51); employee engagement scores improved across all departments (NICU percentile: 1st to 93rd). NICU admission rate decreased (14% to 10.7%), and birth volumes increased (>200). Breastfeeding rates increased (86.3% to 87.1%). Care transition scores improved (94th to 95th percentile).
Dani et al. (354)	2022 (Italy)	Compare the frequency of NICU admission and breastfeeding rates of LPIs managed with initial rooming-in strategy versus direct admission to SCU/NICU.	N = 430 LPIs born at 35+0 to 36+6 weeks gestation.	Retrospective study at two hospitals with different management strategies	NICU/SCU admission rate; breastfeeding rate at discharge (exclusive, mixed, none); complications; rehospitalization.	Rooming-in care significantly reduced SCU/NICU admissions (43% vs. 81% SCU; 10% vs. 20% NICU) without negatively affecting weight at discharge, hospital stay, or 7-day rehospitalization. Exclusive breastfeeding was initially lower (22% vs. 36%), but similar when adjusting for clinical conditions (35% vs. 31%). Among SCU/NICU infants, rates were lower with rooming-in (10% vs. 41%). Rooming-in was not associated with adverse outcomes and appears safe when selectively

						applied based on clinical condition
De Bernardo et al. (327)	2018 (Italy)	Test the hypothesis that rooming-in duration impacts neonatal stress response in hospitalized newborns.	N = 40 term newborns SG (N=20) had 24h rooming-in; CG (N=20) had 14h	Comparative observational study.	Salivary cortisol levels measured in ng/dl on the 3rd day of life.	Median salivary cortisol levels were significantly lower in the 24h rooming-in group (258 ng/dl) than in the 14h group (488.5 ng/dl) ($p = 0.048$), indicating reduced neonatal stress with full rooming-in.
Doede et al. (294)	2020 (USA)	Describe the emotional work of neonatal nurses in a single-family room NICU.	N = 15 nurses (11 interviewed, 8 observed (4 participated in both).	Qualitative. 110 hours of observation and 11 one-hour interviews.	Emotional demands and stress-related experiences of nurses in relation to NICU layout and patient care dynamics.	Four main themes: (1) Parents living on the unit increased emotional exposure; (2) Infant isolation in private rooms caused distress; (3) Privacy enabled deeper nurse-parent bonding and trust; (4) Nurses and parents were sheltered from stressful unit events, reducing emotional strain. NICU layout influenced both positive and negative aspects of emotional work.
Doughty (329)	2024 (USA)	Assess the relationships between couplet care exposure and both breastfeeding outcomes and maternal NICU-related stress.	N = 38 mother-infant dyads (19 exposed to NICU couplet care, 19 received traditional postpartum care). Infants ≥32 weeks gestation,	Prospective cohort study at a level IV NICU.	Breastfeeding outcomes (percent of breastmilk feeds, feeds at breast, staff-fed vs. parent-fed, exclusive breastfeeding, any breastfeeding); maternal stress.	Couplet care associated with lower maternal stress, particularly in parent-infant relationship domain ($P < 0.001$), more breastmilk and at-breast feeds, and fewer staff-fed feeds (all $P < 0.01$). aOR for higher tertile of breastmilk feeds:

			low respiratory support needs.			7.29 (95% CI 1.45–36.65). Exclusive breastfeeding low in both groups.
Fay et al.(302)	2022 (USA)	Understand the use of DNS, corridors, and huddle stations as places for teamwork and multidisciplinary care in the NICU.	Pre-move survey: N=81; post-move survey: N=131. Participants included NICU staff.	Pre/post electronically distributed surveys	Survey: Teamwork, stress and well-being, job satisfaction, and design satisfaction (Likert scale); Observations: frequency and nature of multidisciplinary interactions by location (DNS, corridor, huddle space).	The SFR NICU improved staff perceptions of efficiency, workspace design, and unit satisfaction, especially when implemented with a neighbourhood layout and decentralized nurse stations
Fay et al.(315)	2023 (USA)	Understand the impact of SFR NICUs on efficiency factors such as unit design, visibility and proximity, staff time, and workspace usage by various health professionals.	Pre-move survey: N=81; post-move survey: N=131; included nurses, physicians, technicians, therapists, and NICU managers.	pre/post surveys, 40 hours of time-use observation, visibility assessments, and 6 focus groups.	Staff time allocation, workspace occupancy by role and location, peer visibility, conversation length, staff perceptions of spatial efficiency	SFR design improved efficiency perceptions, DNSs most used workspaces outside patient rooms, 54% of work was done alone, focus groups emphasized importance of supply proximity, standardization, and neighbourhood design.
Feeley et al. (295)	2019 (Canada)	Compare NICU-stress, symptoms of depression, perceptions of nurse-parent support and family-centred care, sleep disturbances, breastfeeding self-efficacy, and readiness for discharge in mothers	N=150; 70 mothers in the OW group and 80 in the pod/SFR group.	Pre-post quasi-experimental study in the same hospital before and after unit transition.	Stress, depressive, symptoms, support, family-Centred care, and sleep disturbances. In the week prior to discharge, self-efficacy and readiness for discharge. Presence in the NICU at enrolment and again prior to discharge.	Combined Pod/SFR mothers reported less NICU stress (sights/sounds, role restriction), more staff respect, greater NICU presence (49 to 84 hrs/week vs. 38 to 44), and higher infant discharge readiness (adjusted) than OW

		of infants cared for in an OW to those cared for in a unit that includes both pods and SFRs,.				mothers. No group differences were found in depression (45–50% above cut-off), nurse support, sleep disturbance (65–74%), breastfeeding (~66%), or overall family-centred care.
Feeley et al. (303)	2020 (Canada)	Compare NICU nurses' work stress, satisfaction, obstacles, support, team effectiveness, ability to provide family-centred care, and satisfaction with noise, light, and sightlines in an open ward with a new unit of pods and SFRs.	N=54 nurses (52 female, 2 male); all worked in both units pre- and post-transition in the same Level 3 NICU.	Pre-post design: data collected in 2014 (open ward) and in 2017 (12 months after transition to pod/SFR)	Nurse Stress Scale; Performance Obstacles ICU Nurses Questionnaire; Family-Centered Care Questionnaire—Staff; Global Measure of Work Satisfaction; Job Content Questionnaire (Support); Team Effectiveness Tool; Adapted noise/light/sightlines questionnaire.	Nurses reported no differences in total stress (OW= 1.68, SFR =1.69), team effectiveness (OW=13.15, SFR= 13.98), work satisfaction (OW=14.38, SFR=13.57), or family-centred care. Organizational obstacles were lower (17.1to15.7), while environmental (11.2to12.4) and technological (19.3to21.6) obstacles were higher in the pod/SFR unit. Supervisor support improved (2.95to3.13); colleague support unchanged. Satisfaction with noise (5.17to12.4) and light (10.0to17.0) increased; sightlines worsened in SFRs (22.8to15.8). Medication (−61%), diet (−75%), and treatment (−52%) errors decreased. Nurses valued quiet and space but noted isolation and supply access issues.

Grundt et al. (335)	2021 (Norway)	Compare maternal milk production, breastfeeding self-efficacy, the extent to which infants received mother's milk, and rate of direct breastfeeding in a SFR to an OBY NICU.	N = 77 infants and 66 mothers; 35 infants (30 mothers) in SFR unit and 42 infants (36 mothers) in OBY unit; inclusion: infants born at 28–32 weeks gestational age	Longitudinal, prospective observational study in two NICUs (SFR vs. OBY)	Timing of first milk expression and breastfeeding attempt (hours postpartum), milk volume at Days 7, 14, and 34 weeks PMA, rate/type of mother's milk feeding and direct breastfeeding (per WHO categories), BSES–SF.	SFR care was associated with earlier milk expression (6 vs. 30 hrs, p<.001), earlier breastfeeding attempt (48 vs. 109 hrs, p<.001), infants were fed a greater amount of mothers' milk (.4 (95% CI [.2, 1.0], p = 0.04). greater likelihood of exclusive direct breastfeeding at discharge (63% vs. 10%, p<.001), and higher odds of sustaining exclusive direct breastfeeding to 4 months corrected age (OR=6.8, 95% CI [2.4, 19.1]); no significant differences in milk volume produced or breastfeeding self-efficacy.
Hakala et al. (345)	2018 (Finland)	Describe rooming-in, according to mothers and maternity-ward staff in maternity hospitals, and the factors associated with its implementation.	N=111 mothers and 1554 maternity-ward staff responses	Cross-sectional study in 8 Finnish hospitals	Mothers' and staff perceptions of rooming-in, its implementation and duration, barriers to rooming-in, associated factors (e.g., room type, birth mode, staff training), and breastfeeding supplementation; evaluated through Likert scales, dichotomous and open-ended questions.	Rooming-in used after 91% of births; more common after vaginal birth and among multiparous mothers; barriers included maternal fatigue, caesarean recovery, NICU admission; rooming-in associated with less infant formula use (p=0.025); factors positively associated included skin-to-skin contact, staff training, staff experience, room type, and adequate time for breastfeeding counselling; BFHI-certified

						hospitals did not outperform non-certified ones in rooming-in use.
Handelzalts et al.(337)	2021 (Israel)	Examine the association of full versus partial rooming-in and maternal bonding to her infant during the post-childbirth hospital stay, while considering mothers' pre-delivery intentions.	N = 293 postpartum women in a maternity ward of a large tertiary health care centre. 124 practiced full rooming-in as intended, 123 partial rooming-in as intended, 46 intended full but practiced partial.	Longitudinal questionnaire study: participants completed surveys in-hospital (T1, Days 1–4 postpartum) and again at 2 months postpartum (T2).	Postpartum Bonding Questionnaire at both time points, Childbirth Experience Questionnaire, sociodemographic, and obstetric data.	Rooming-in mode did not significantly predict bonding at 1–4 days postpartum. However, full rooming-in significantly predicted better bonding at 2 months postpartum only for women who followed their original intention ($\beta = 0.12$, $p < .05$). No significant effect when including those who had to change plans.
Heinemann et al.(311)	2013 (Sweden)	To describe parents' experiences of factors that influenced their stay with their extremely preterm infants in a neonatal intensive care unit (NICU).	N = 14 7 couples: mothers and fathers of extremely preterm infants (born at a gestational age (GA) of 27 weeks or less) who received care in the NICU.	A qualitative descriptive design with an inductive approach.	Interviews based on a conversation guide to explore issues such as experiences of the NICU environment and of providing infant care.	The content analysis of the interview data resulted in two major themes: 'Coping with a new and unexpected situation' and 'Becoming a parent'. Each theme was divided into categories and subcategories.
Hoyt-Austin et al.(301)	2022 (USA)	To explore the experience of using videoconferencing with one's hospitalized premature infant while expressing breast milk.	N = 17 Lactating parents of premature (<34 weeks) hospitalized infants who were admitted to the study site NICU.	Inductive thematic analysis with a constant comparative approach.	Semi-structured interviews using an interview guide with 14 open-ended questions regarding the breast milk expression experience.	Data were organised into themes. (1) Videoconferencing promotes bonding and connection with the hospitalised infant, (2) videoconferencing provides motivation to

						pump, (3) videoconferencing reminds participants of the realities of separation from their infant, and (4) videoconferencing connects the whole family to the hospitalised infant.
Hung et al.(349)	2024 (Taiwan)	Examine Taiwanese women's intentions, knowledge, and considerations regarding rooming-in and breastfeeding during their hospitalization, and to assess the influence of prenatal SDM on postpartum rooming-in and exclusive breastfeeding practices.	N = 932 healthy postpartum women (621 in 2017, 311 in 2019) who delivered full-term neonates at a BFHI-accredited medical centre; 236 women in the 2019 cohort completed PDAs	Retrospective electronic medical record cohort study comparing data from 2017 (before SDM) and 2019 (after SDM)	Maternal and newborn demographics, knowledge, considerations, and prenatal intentions about rooming-in and breastfeeding (via PDAs); actual practices of rooming-in and exclusive breastfeeding during hospitalization, and at 1 and 2 months postpartum.	After SDM was introduced, rooming-in during hospitalization decreased from 42.2% (2017) to 25.6% (2019, p<.001), and exclusive breastfeeding at discharge dropped from 45.9% to 35.7% (p=0.01); only 40.7% intended 24-h rooming-in, and 40.7% intended exclusive breastfeeding prenatally. BF at 1 month postpartum declined slightly from 46.4% in 2017 (n=571) to 44.3% in 2019 (n=264), and at 2 months from 45.5% (n=591) to 40.2% (n=308). According to 2019 PDAs responses (n=236), only 40.7% of women intended 24-hour rooming-in and the same proportion intended EBF. Women who chose partial/separate care were more likely to be older (p<0.001), have a graduate degree (p=0.02), work full-time (p=0.04), and express concerns

						about rest disruption (p<0.001). SDM revealed knowledge gaps, especially regarding rooming-in and the effects of mixed feeding.
Hourigan et al. (325)	2018 (USA)	Compare the infant gut and skin microbiota, resistome (antibiotic resistance genes), and virulome (virulence genes) between infants cared for in a shared-space NICU versus a single-family room NICU.	N = 32 infants (14 from the shared space "old NICU", 18 from the single-family room "new NICU"); data collected at 2 weeks of life and at discharge.	Pilot observational study comparing two NICU environments within the same hospital campus	Stool and skin microbiota composition (genus-level), antimicrobial resistance genes, virulence-associated genes, alpha diversity (Chao1), and environmental microbial content; metagenomic sequencing data analysed with CosmosID platform.	No gut microbiota or alpha diversity differences between cohorts; skin and environmental microbiota differed significantly (p=0.0001, p=0.0003). More antibiotic resistance genes and virulence genes were found in the new NICU across all sample types, despite lower antibiotic use. No infants developed infections. Findings may reflect the impact of a newly built NICU environment rather than room design alone.
Itoshima et al. (309)	2025 (Finland)	Evaluate the effect of couplet care on early parent–infant closeness among preterm infants.	N = 106 preterm infants born <35 weeks' gestation; 40 infants in the pre-intervention group (2018), 66 in the post-intervention group (2022–2024); families excluded if infant's stay <3 days, critical condition	Before-and-after implementation	Timing of first skin-to-skin contact, duration of parental presence and overnight stays in NICU, and skin-to-skin/holding per day; logistic and linear regression for changes.	After introducing couplet care, first skin-to-skin contact occurred significantly earlier (median 4h vs. 24h, p<.001); more infants received it within 2h (45.5% vs. 8.6%, OR=13.8 [3.6–62.8]); parental presence doubled (21.2 vs. 10.8 hrs/day); overnight stays increased (6.4 vs. 1.7 nights/week); fathers' participation in early contact rose

						significantly; duration of skin-to-skin and holding did not significantly change.
Jansen et al.(323)	2021 (Netherlands)	Examine the effect of SRU versus OBYs on the incidence of NIs, including CLABSI, in preterm neonates.	N = 712 preterm infants (<32 weeks gestation); 367 admitted during the open-bay period, 345 during the single-room period	Retrospective cohort study comparing 2-year periods before and after NICU transition	Primary outcomes: incidence density (NIs per 1000 patient-days), cumulative incidence (NIs per 100 neonates), CLABSI per 1000 central-line days; secondary outcomes: antibiotic exposure, infection-related mortality, and risk factors.	No significant difference in NI incidence density (13.68 vs. 12.62/1000 patient-days, p=0.62) or cumulative incidence (23.97% vs. 22.02%, p=0.59) between OBY and SRU; CLABSI rate decreased 25% (14.0 to 10.6 per 1000 line-days, p=0.51); no change in antibiotic use or mortality; only longer mechanical ventilation duration was a significant NI risk factor (HR=1.03, p=0.01); single-room design did not significantly reduce infection risk.
Jansen et al.(324)	2022 (Netherlands)	Evaluate the impact of SRU versus OBU care on the risk of neonatal morbidity and mortality in preterm neonates.	N = 699 neonates born <32 weeks' gestation; 343 in the SRU and 356 in the OBU	Retrospective cohort study at a Level III NICU comparing 2-year periods before and after transition to SRU	Primary outcomes: major morbidities (sPDA, BPD, ROP ≥ stage 2, high-grade IVH, cPVL) and in-hospital mortality; composite morbidity defined as presence of any major outcome.	No significant differences between SRU and OBU in most outcomes (mortality, BPD, ROP, IVH, transfusion needs); SRU was independently associated with a lower risk of sPDA (aOR 0.54, 95% CI 0.31–0.95); no other outcomes showed independent associations with room type; composite morbidity and mortality not significantly different.

Jones et al (317)	2016 (Australia)	Examine how neonatal nursery design influences interactions between mothers and nurses, comparing OBY and SFR nurseries.	N = 66 mothers (26 OB, 40 SFR) and 51 nurses (22 OB, 29 SFR)	Natural quasi-experimental design; data collection via semi-structured interviews and the Special Care Nursery: Mothers' Evaluation Tool (SCN: MET); thematic analysis and t-tests used to analyse qualitative and quantitative data.	SCN: MET subscales (supportive mothering actions, facilitative nurse actions, facilitative nurse interactions, inhibitive nursing behaviour); interview themes on nurse–mother and mother–mother interactions.	Mothers in OBY nursery reported more supportive mothering actions from nurses than SFR mothers ($p < .05$). SFRs enhanced maternal control, bonding, and breastfeeding, but reduced informal interactions with nurses and other mothers. Nurses in SFRs reported improved communication quality but fewer spontaneous interactions. Mothers in OBY nursery valued community and observational learning; SFRs provided privacy but were associated with isolation and less perceived nurse support.
Joshi et al. (360)	2017 (Netherlands)	Determine the factors that modulate nurse responsiveness to critical patient monitor and ventilator alarms in the context of a private room neonatal intensive care setting.	N = 10 infants' video-monitored for ~2400 hours; N = 56 nurses completed questionnaires	Mixed-method observational study including questionnaire on alarm perception and video monitoring to assess alarm response	Nurse response rate and response time to critical alarms (video), alarm types (desaturation, bradycardia, ventilator, etc.), and questionnaire responses on alarm perception, interference, and prioritization; odds ratios from regression analysis.	Only 26% of critical alarms received a nurse response within 90s (median time = 55s); nurses were already in the room for 34% of alarms; response was more likely for bradycardia alarms (OR = 1.47) and less likely for ventilator alarms (OR = 0.35); odds of response increased with alarm duration (OR = 1.15 per 20s); chronic illness reduced response odds, while acute illness increased it; nurses found critical alarms relevant but did not always act

						immediately; private room layout was not perceived to reduce alarm fatigue.
Joshi et al. (361)	2018 (Netherlands)	Determine differences in alarm pressure between two otherwise comparable NICUs differing in architectural layout—one with a SFR design and the other with an OBY area design.	N = 328 infants; 158 in the SFR NICU and 170 in the OBY NICU; over 4,000 patient-days analysed (2126 in SFR, 2035 in OBY)	Retrospective audit of alarm data collected over ~150 days in each unit	Alarm frequency and duration per infant per day (red, yellow, INOP alarms), ventilator alarm counts, SpO_2 and heart rate thresholds, alarm interaction patterns (silencing, pausing, resounding), and total noise exposure from alarms.	OBA NICU generated 44% more total alarms per infant per day; SFR NICU had more red alarms (esp. desaturations) due to shorter alarm delay; OBY NICU had more yellow alarms (esp. SpO_2 and HR); SFR NICU produced more ventilator alarms due to integrated systems; nurses in SFR paused alarms more, while OBA nurses silenced more; OBY NICU had higher overall noise exposure; architecture and alarm delay settings contributed significantly to alarm pressure differences.
Koskinen et al. (353)	2014 (Finland)	Explore the relationship between maternity hospital practices and breastfeeding self-efficacy in Finnish primiparous and multiparous women during the immediate postpartum period.	N = 573 mothers (307 primiparous, 266 multiparous); recruited from 3 urban maternity hospitals in Southern Finland; inclusion: age ≥18, healthy, Finnish-speaking, singleton full-term birth with no	Cross-sectional survey study using self-report questionnaires distributed within 7 days postpartum: part of the longitudinal "Urban Parenthood" research project.	Breastfeeding Self-Efficacy Scale–Short Form (BSES–SF), questionnaire on breastfeeding advice from staff, maternity care practices (skin-to-skin contact, rooming-in, supplementation, breastfeeding initiation and experience).	Higher breastfeeding self-efficacy was associated with early and successful breastfeeding initiation, rooming-in, exclusive breastfeeding in hospital, and positive first breastfeeding experience; no association with reason/method/frequency of supplementation. Multiparous women had higher self-efficacy than

			major complications.			primiparous; previous breastfeeding experience length and positivity also increased self-efficacy. Breastfeeding advice from staff correlated positively with self-efficacy.
Lai et al. (363)	2015 (Taiwan)	Compare women's postpartum fatigue, baby-care activities, and maternal–infant attachment following vaginal and cesarean births in rooming-in settings.	N = 120 postpartum women (60 vaginal birth, 60 cesarean birth); recruited from two BFHI-accredited hospitals	Descriptive cross-sectional study using structured questionnaires administered 2–3 days postpartum	Visual Analogue Scale (VAS) for postpartum fatigue, Difficulty in Baby-Care Activities Scale (17 items), Maternal–Infant Attachment Inventory (MAI, 26 items).	Women with caesarean birth had significantly higher postpartum fatigue than vaginal birth group (adjusted p = .002); postpartum fatigue positively correlated with baby-care difficulty in both groups (r ≈ .30); baby-care difficulty negatively correlated with maternal–infant attachment (r ≈ –.30); no significant group differences in baby-care difficulty or attachment scores; fatigue did not directly correlate with attachment; authors recommend flexible rooming-in policies, especially post-caesarean.
Larsen et al. (357)	2024 (Denmark)	To explore healthcare professionals' (HCPs) expectations, concerns and educational needs regarding preparing for implementing the concept of couplet care, keeping newborns in need of	Neonatologists, obstetricians, midwives and nurses (n=21)	Qualitative focus group study	Participant expectations, concerns and educational needs related to couplet care for mothers and newborns.	Overarching theme of building bridges in relation to HCPs' expectations, concerns and educational needs and five subthemes: Enhancing meaningfulness through increased teamwork; compromising or improving patient safety; challenging professional

		intensive care together with their mothers in need of obstetrical care				comfort zones; encountering other cultural and ethical values; and recognising educational requirements.
Lebel et al. (320)	2022 (Canada)	Determine whether factors such as NICU length of stay, maternal parity, NICU stress, family-centred care, and breastfeeding self-efficacy were associated with how ready mothers felt for their infant to be discharged from a NICU	N = 132 mothers of preterm infants; 70 from an open ward NICU (2014) and 62 from a pod/single-family room NICU (2017–2018); inclusion: infants stable and hospitalised ≥2 weeks; exclusion: multiples, major anomalies, sensory handicap, non-parental caregivers, or language barrier.	Secondary analysis of a comparative study using self-report questionnaires and medical record data; statistical methods included Pearson correlations and hierarchical multiple regression analysis.	Readiness for Hospital Discharge Scale, Family-Centred Care Questionnaire, Breastfeeding Self-Efficacy Scale–Short Form, Parental Stressor Scale: NICU; infant and maternal demographic/clinical data.	Readiness for discharge was significantly associated with greater perceived family-centred care during early hospitalisation (B = 33.15, p = .01) and greater breastfeeding self-efficacy before discharge (B = 0.72, p = .04); NICU stress was negatively associated (r = –0.24, p = .01); NICU unit design (open vs. pod/SFR) had no significant effect. Regression model explained 25% of variance in readiness for discharge.
Legge et al. (300)	2023 (Australia)	Determine (1) the attitudes of parents and staff toward web cameras in the NICU and (2) compare parental depression, anxiety, and stress levels using validated scales before and after web camera implementation.	N = 94 parents (43 pre-implementation, 51 post-implementation) and 109 staff members (42 pre, 67 post); conducted at a tertiary NICU in Sydney; inclusion: parents of NICU-admitted	Pre–post intervention survey study using the NICVIEW camera system; surveys included validated scales (DASS-21, PSS:NICU), demographics, attitudes, and web camera use; data analysed via descriptive	DASS-21 (Depression, Anxiety, Stress Scale–21 items), Parental Stressor Scale: NICU (post only), parent and staff Likert and open-ended survey items on web camera attitudes and usage.	Web camera use was supported by 98% of parents and 96% of staff post-implementation. No significant changes in parent depression, anxiety, or stress (DASS-21), but PSS:NICU post-implementation scores were significantly lower than published comparison group. Web cameras were associated

			infants and all staff during survey periods.	statistics and Mann–Whitney U test.		with enhanced bonding, reduced stress, and increased parent confidence in staff. Staff concerns about privacy and workload decreased post-implementation. Cameras were used by 95% of parents; most viewed overnight and allowed family access.
Lehtonen et al.(312)	2020 (International – 11 high-income countries)	Evaluate the proportion of NICUs with infant-parent rooms and assess whether the availability of such rooms (allowing 24-hour parental presence) is associated with neonatal outcomes in extremely preterm infants.	N = 4662 infants <29 weeks' gestation admitted to 159 NICUs across 7 neonatal networks in 2015; 1319 infants (28%) were cared for in units with infant-parent rooms.	International survey of 331 NICUs and linked cohort study using patient-level data; survey assessed unit design and parental facilities; outcomes linked from neonatal databases; multivariable logistic and linear regression used.	NICU design features (presence of infant-parent rooms), composite outcome of mortality or major morbidity, individual morbidities (sepsis, BPD, IVH, ROP), and length of hospital stay.	Only 13.3% of NICUs had infant-parent rooms. Infants in these units had significantly lower odds of death or major morbidity (aOR = 0.76, 95% CI: 0.64–0.89), lower odds of sepsis (aOR = 0.80) and BPD (aOR = 0.72), and a 3.4-day shorter adjusted hospital stay. No significant differences were found for IVH or ROP.
Lester et al. (328)	2016 (USA)	To determine whether the single-family room (SFR)-neonatal intensive care unit (NICU) is associ ated with improved 18-month neurodevelopmental outcome, especially in infants of mothers with high maternal involvement	N=216 infants and their parents (data set taken from a larger cohort study) – 93 in OBUs and 123 in SFRs (all infants were >30 weeks gestational age)	18 month-follow-up study - Infants were divided into high vs low maternal involvement based in the SFR and open-bay NICUs were compared on key measures.	Bayley-III Cognitive, Language, and Motor Composite scores, Receptive and Expressive Communication scores, and Fine and Gross Motor subtest scores. Pervasive Developmental Disorders Screening Test for autism spectrum disorders (ASDs). Maternal, infant, and medical characteristics from the original study were abstracted from the	Infants with greater maternal involvement had better cognitive and language outcomes. Maternal involvement was higher in single-family room NICUs and was associated with shorter hospital stays and fewer autism-related symptoms.

					electronic medical records. Parental Stressor Scale: NICU Beck Depression Inventory. Maternal involvement was a composite variable based on kangaroo care (skin-to-skin), breast-feeding, bottle feeding, and maternal care (eg, bathing/diapering/holding). Each interaction was counted and aggregated by day and then by week.	
Liu et al. (291)	2019 (Canada)	Explore support for mothers and fathers in SFRs of a NICU.	N = 15 parents (9 mothers, 6 fathers) of 14 infants in a Level III NICU with both pod and SFR design	Qualitative descriptive study; parents recorded thoughts and feelings using the HAPPY mobile app over a 48-hour period during step-down care in SFRs	Parental experiences of support and non-support, including actions of care, care delivery, and influence of SFR design	Parents felt supported when nurses coached collaboratively, fostered positivity, provided situational help, and ensured consistency and presence. Support also depended on communication quality and inclusion in care decisions. SFRs promoted autonomy, privacy, infection prevention, and bonding, but some parents felt isolated or lacked access to staff and materials. Staff availability and communication were critical to perceived support.

Lyngstad et al.(355)	2022 (Norway)	To describe the implementation of SFR and how they have contributed to a cultural change among the interprofessional staff.	Doesn't specify numbers; data captured from healthcare professionals and parent/infant practices.	Plan-Do-Study-Act (PDSA) cycle approach.	Various and detailed activities.	The SFR model shifted care from staff-directed, task-focused care in a shared environment to individualised, family-centred care characterised by continuous parental presence, greater parental responsibility, enhanced emotional support, structured pain management, and ongoing support into the home environment.
Machry et al. (290)	2023 (USA)	Understand how the interior design of SFRs in NICUs can support family engagement behaviours, from passive presence to active caregiving.	N = 20 families and 30 staff members from two Level III NICUs in the USA; 214 hours of observation, 284 observation logs, and 50 interviews were conducted	Multicase qualitative study (observations, physical assessments of SFRs, and semi-structured interviews with families and staff)	Types of family engagement behaviours (presence, care, information exchange, caregiving); corresponding built environment features (e.g., family zones, storage, bathrooms, information boards); patterns derived through inductive coding and pattern matching.	SFR features such as private bathrooms, family zone partitions, positive distractions (TV, lighting), family storage, and visible information boards supported various family behaviours—home-like (resting, childcare), educational (classes, info boards), collaborative (discussions with staff), and caregiving (feeding, hygiene). Family empowerment and sense of control were enhanced when rooms supported autonomy, privacy, and communication; barriers included insufficient storage, visibility/privacy limitations, and clutter.

McRae (365)	2019 (USA)	Measure the relationship between exclusive breastfeeding and 24-hour rooming-in for low-risk primiparous women with uncomplicated vaginal births at term.	N = 89 primiparous women	Descriptive correlational study with a qualitative component	IIFAS, breastfeeding status at 2, 6, and 12 weeks postpartum, reasons for newborn separation, total rooming-in hours.	All participants requested some newborn separation despite intending 24-hour rooming-in. Mean separation time was 3.62 hours. No statistically significant relationship was found between total separation time and exclusive breastfeeding at 12 weeks. Most common reason for separation was maternal exhaustion. IIFAS scores were positively associated with exclusive breastfeeding but not significantly so at 12 weeks. Findings emphasize importance of maternal informed choice over strict adherence to rooming-in policies.
Molmen Lichter et al. (334)	2021 (Israel)	Examine the associations between insecure attachment styles (anxious and avoidant), rooming-in practices (full vs. partial), and PPD at 2 months postpartum, and whether rooming-in moderates these associations.	N = 312 postpartum women	Longitudinal study; self-report questionnaires at two time points (T0: in-hospital; T1: 2 months postpartum)	Experiences in Close Relationships Scale (ECR) for anxious/avoidant attachment (T0), Edinburgh Postnatal Depression Scale (EPDS, T1), demographic and obstetric questionnaires.	Both anxious and avoidant attachment significantly predicted higher PPD (β = .28 and .26, respectively, $p < .01$). Rooming-in alone was not significantly associated with PPD. However, rooming-in moderated the attachment–PPD link: insecure attachment was associated with PPD only among women in partial rooming-in, not full rooming-in. Full rooming-in may buffer the negative

						effects of insecure attachment on PPD risk.
Noble et al. (352)	2023 (USA)	Evaluate the impact of breastfeeding in the first hour of life and rooming-in on high breastfeeding intensity among low-income, multi-ethnic mothers intending to breastfeed.	N = 149 postpartum mothers of healthy, full-term singletons; 128 completed follow-ups at 3 months	Prospective cohort study: structured interviews conducted in-hospital and by phone at 1 and 3 months	HBI: >80% of feeds as breast milk at birth, 1 month, and 3 months; self-reported timing of first breastfeeding and rooming-in; demographic and clinical covariates.	Breastfeeding in the first hour was associated with increased HBI in hospital (AOR = 11.6), at 1 month (AOR = 3.6), but not at 3 months. Rooming-in was associated with higher HBI at hospital (AOR = 9.3), 1 month (AOR = 2.4), and 3 months (AOR = 2.7). Vaginal delivery and Hispanic ethnicity were linked to greater early breastfeeding. The findings support inclusion of these BFHI steps to improve breastfeeding among vulnerable populations.
Puumala et al. (321)	2020 (USA)	Examine outcomes in a SFR NICU compared to an OBY within a public safety-net hospital.	N = 9995 NICU encounters over 5 years (5964 pre-move; 4031 post-move); included preterm and term/post-term infants	Retrospective cohort study	LOS, growth during NICU stay (weight), time to first oral feeding, and sepsis incidence.	For preterm infants, LOS decreased over time but not specifically due to the SFR move; for term/post-term infants, LOS increased post-move ($p < .001$). Time to first oral feed was shorter post-move (HR = 0.75, $p < .001$), but reflected a broader ongoing trend. No

						difference in growth between groups. Sepsis incidence increased in term/post-term infants post-move (p = .001) but decreased in extremely preterm infants (p = .02). Overall, minimal outcome differences attributable solely to SFR design; results suggest broader contextual and demographic factors may influence outcomes.
Ragusa et al. (351)	2020 (Italy)	Assess the prevalence of breastfeeding and the factors influencing maternal choice during postpartum hospitalization in various types of birthing hospitals.	N = 3813 mothers; recruited from 7 of 10 birthing hospitals (public and private) from 2016 to 2018; inclusion: mothers of healthy newborns, discharged from hospital after delivery.	Observational cross-sectional study	Breastfeeding initiation and exclusivity, timing of first breastfeeding, rooming-in use, delivery type, maternal education, attendance at prenatal classes, and sources of breastfeeding information.	88% of mothers initiated breastfeeding; 45% practiced exclusive breastfeeding. Exclusive breastfeeding was lower after caesarean section (35%) vs. vaginal birth (51%, p<.001). Rooming-in (91% overall) was not associated with higher breastfeeding rates. Highest exclusive breastfeeding (75%) occurred in a public hospital with dedicated lactation staff; lowest (12%) in a private hospital with 100% rooming-in. Higher maternal education and prenatal course attendance were linked to more exclusive breastfeeding. Midwives were the most influential professional source; family

						and internet were key informal sources.
Ragusa et al. (350)	2021 (Italy)	Explore the prevalence of breastfeeding at birth points in Sicily and identify factors influencing the adoption of exclusive breastfeeding during postpartum hospitalization.	N = 3368 postpartum women from 7 hospitals	Retrospective observational study	Exclusive breastfeeding status at discharge, timing of breastfeeding initiation, rooming-in, delivery mode, maternal education, parity, prenatal class attendance, hospital type.	Exclusive breastfeeding at discharge was reported by 48% of women. Significant protective factors were rooming-in (OR = 0.07), breastfeeding within 1 hour (OR = 0.58), and tertiary education (OR = 0.60). Caesarean delivery increased the risk of not exclusively breastfeeding (OR = 1.74). A specialized hospital with a breastfeeding support program had significantly better outcomes; private hospitals showed the highest risk of abandoning exclusive breastfeeding.
Swanson et al.(362)	2012 (Scotland)	Explored the impact of preterm birth on maternal confidence to understand women's experiences of infant feeding behaviours in the NNU context.	N = 19 Primaparous mothers of preterm babies.	Cross-sectional, qualitative study in an inner-city tertiary NNU	Asked mothers about their experience of different feeding behaviours.	Maternal self-efficacy grows when mothers feel connected, supported, capable, and actively involved in their baby's care. Breastfeeding, positive feedback, and opportunities for hands-on caregiving are key drivers of this confidence.

Taha et al. (343)	2020 (United Arab Emirates)	Examine the prevalence of rooming-in during hospital stay among mothers with infants six months old and below, and identify associated factors in Abu Dhabi, UAE.	N = 804 mothers with infants ≤6 months old; subsample from a larger cross-sectional study (N = 1822); participants recruited from public maternal and child health centres and the community; majority were Emirati or Arab, mean maternal age 30.3 years.	Cross-sectional multi-centre study; structured interviews using a pre-tested questionnaire; statistical analysis included t-tests, chi-square tests, and multivariable logistic regression.	Rooming-in (yes/no), maternal/infant demographics, breastfeeding initiation (timely/delayed), exclusive breastfeeding, BMI, gestational age, delivery mode, breastfeeding support and advice.	Rooming-in prevalence was 97.5%. Factors significantly associated with **not rooming-in** were: younger maternal age (AOR = 1.15), low gestational age (AOR = 1.90), abnormal pre-pregnancy BMI (AOR = 3.77), and delayed breastfeeding initiation (AOR = 4.47). No significant associations found for mode of delivery, nationality, or exclusive breastfeeding in multivariate analysis. Rooming-in was linked to higher confidence and knowledge about infant care and breastfeeding.
Taha et al. (344)	2021 (United Arab Emirates)	Evaluate the prevalence and determinants associated with delayed initiation of breastfeeding among mothers with children under two years of age in Abu Dhabi.	N = 1610 mother–child pairs; participants recruited from seven governmental maternal and child health centres and the community	Cross-sectional multicentre study	Delayed breastfeeding initiation (>1 hour after birth); maternal sociodemographic, delivery mode, rooming-in, birth order, breastfeeding advice/support, gestational age, and birth weight.	37.5% of mothers reported delayed initiation. Significant predictors of delayed initiation included: non-Arab nationality (AOR 1.30), caesarean delivery (AOR 2.85), non-rooming-in (AOR 2.82), first birth order (AOR 1.34), and low birth weight (AOR 3.30).
Tandberg et al. (330)	2019 (Norway)	Compare emotional distress (depression, anxiety, stress, and attachment) among parents of very preterm infants cared for in a SFR vs an OBY unit.	N = 132 parents (of 77 infants born 28 0/7–32 0/7 weeks gestation); 60 from the SFR unit, 72 from the OBY unit	Prospective cohort study with repeated measures at four timepoints (Day 14, discharge, term date, and 4	EPDS (depression), STAI-SF (anxiety), PSS:NICU and PSI-SF (stress), MPAS (attachment); daily parental presence and SSC.	Parents in SFR were present ~21 hours/day (vs. 7 hours in OB); fathers present 93% of days >12h in SFR (vs. 0% OBY). Mothers in SFR had significantly lower depression scores (mean

				months corrected age)		difference –1.9, 95% CI: –3.6 to –0.1), and only 14% scored above the EPDS cutoff vs. 52% in OBY. Stress scores (PSS:NICU) were significantly lower in SFR for both parents, especially for parental role alteration and environment stress. No differences were found in anxiety or attachment scores post-discharge.
Tavoulari et al.(341)	2015 (Greece)	Investigate the association between breast-feeding initiation and socio-demographic, lifestyle-related, clinical, and lactation-related factors.	N = 428 mothers who gave birth in a tertiary university hospital	Cross-sectional study: structured face-to-face interviews conducted at least 24 hours after childbirth and before discharge	Initiation of exclusive or any breastfeeding (vs. artificial milk), maternal sociodemographic (age, BMI, education, immigrant status), clinical/lifestyle factors (mode of birth, parity, smoking), lactation-related factors (information, encouragement, previous breastfeeding, rooming-in).	Exclusive breastfeeding was initiated by 44.4%, partial by 47.7%, and artificial milk by 7.9%. Exclusive breastfeeding was negatively associated with maternal pre-pregnancy BMI (OR = 0.93), and caesarean section (OR = 0.54). Positively associated factors included previous breastfeeding experience (OR = 2.29), receiving breastfeeding information (OR = 2.38), and rooming-in (OR = 1.62). Any breastfeeding was positively associated with encouragement (OR = 5.42), information (OR = 6.92), rooming-in (OR = 6.93), and immigrant status (OR = 7.97); caesarean section

						negatively associated (OR = 0.11).
Toivonen et al. (318)	2017 (Finland)	Examine the effects of SFRs on nurse–family, nurse–parent, and nurse–infant interaction time in a NICU.	N = 20 nurses observed over 46 work shifts (total 388 hours: 194 before and 194 after the move to SFRs)	Quantitative comparative observational study; direct observations before and after transition to SFR NICU;	Duration and number of nurses–parent, nurse–infant, and nurse–family interaction episodes per shift.	Nurse–parent interaction time increased significantly after move to SFRs (mean 117 vs. 35 min/shift, p = .001); nurse–family interaction time also increased (261 vs. 138 min/shift, p < .0001); nurse–infant interaction duration did not significantly change (166 vs. 119 min/shift, p = .073); number of interaction episodes did not significantly change. Individual interaction episodes became longer post-move, suggesting less fragmented care.
van der Hoeven et al. (322)	2022 (Netherlands)	Examine the effect of SRU versus OBU NICU design on the incidence of colonization with MDROs and third-generation cephalosporin-resistant bacteria (3G-CRB) in infants.	N = 1293 NICU infants (675 OBU, 618 SRU) admitted two years before and two years after the NICU transition	Retrospective cohort study	Colonization incidence (percent and per 1000 patient-days) of MDROs and 3G-CRB; presence of infections caused by these organisms; compliance with hygiene protocols.	No significant difference in MDRO colonization between OBU (2.5%) and SRU (4.0%), or in 3G-CRB colonization (17% OBU vs. 20% SRU); incidence density also not significantly different (MDRO: 1.56 vs. 2.63 per 1000 patient-days). Infection rates with MDROs or 3G-CRB were low and did not differ between unit designs.

						Compliance with hygiene protocols was higher in SRU (80% vs. 59%). Transition to SRU design was not associated with a reduction in colonization or infection rates.
van Veenendaal et al. (336)	2022 (Netherlands)	Study the association of a FICare model with maternal mental health outcomes at discharge among mothers of preterm infants, compared with SNC	N = 296 mothers (141 in FICare model, 155 in SNC); infants born preterm and admitted to level-2 neonatal units	Prospective multicentre cohort study; compared outcomes between a FICare site (SFRs with couplet care) and two standard care sites OBUs); mediation analysis conducted to assess whether parent participation explained mental health effects.	Parental Stress Scale: NICU (PSS-NICU), Hospital Anxiety and Depression Scale, Postpartum Bonding Questionnaire, Perceived Maternal Parenting Self-Efficacy Scale, EMPATHIC-N (satisfaction), and CO-PARTNER (parent participation).	Mothers in the FICare model had significantly lower stress scores at discharge (adj. mean difference −12.24), especially for separation and parental role stress. They were more present (>8 hrs/day: 84% vs. 36.5%) and participated more in care. Participation mediated beneficial effects on depression (−0.133), bonding (−0.169), and self-efficacy (+1.855). No differences were found in satisfaction with care. FICare reduced stress independently of participation, suggesting both design and engagement are key.
van Veenendaal et al. (308)	2020b (Netherlands)	Evaluate the effect of FICare in SFRs compared to standard care in OBUs on LOS in preterm infants and explore mediators of this effect.	N = 1,046 preterm infants (468 in SFRs, 578 in OBUs); infants <37 weeks' gestation admitted ≥3 days to a level 2 neonatal ward	Retrospective before-after cohort study	LOS; Secondary: use of PVCs, CVCs, PN, length of hospital stay, weight gain, and exclusive breastfeeding at discharge.	SFR care was associated with significantly lower odds of LOS (adjusted OR = 0.486, 95% CI: 0.293–0.807, p = .005) and shorter hospital stay (adjusted β = –0.088, p = .016). PN was identified as the main mediator of the reduced LOS risk, with

						PVCs and CVCs also contributing. Use of PN, PVCs, and CVCs was lower in SFRs. No significant differences were found in weight gain or exclusive breastfeeding at discharge.
Vohr et al.(326)	2017 (USA)	Determine the effects of human milk and social/environmental disparities on developmental outcomes of preterm infants cared for in SFR versus OBY NICUs.	N = 691 inborn infants with birth weight ≤1250g (394 in OBY NICU, 297 in SFR NICU)	Retrospective cohort stud	Bayley III cognitive, language, and motor composite scores; human milk provision and volume; neonatal outcomes (NEC, sepsis, length of stay); demographic data (insurance, maternal education, race).	Infants in the SFR NICU had significantly higher Bayley III cognitive (+2.6) and language (+3.7) scores; received more human milk at weeks 1 and 4, and higher volume at week 4. Every 10 mL/kg/day increase in human milk at 4 weeks predicted 0.29–0.34-point increases in Bayley scores. Medicaid, non-white race, and low maternal education were associated with lower scores. SFR care and human milk had independent positive effects. Effects varied by insurance status: human milk benefits persisted for Medicaid-insured infants (cognitive score), SFR NICU benefits stronger for privately insured infants.

Wataker et al. (332)	2012 (Norway)	Assess the impact of a FC program offering 24-hour parental presence in the NICU on maternal confidence and breastfeeding compared to traditional care.	N = 61 mothers (31 FC group, 30 control group) in two comparable level II NICUs; FC group had access to family rooms	Prospective comparative cohort study	Maternal confidence in caregiving, understanding infant cues, empowerment, breastfeeding at discharge and 3 months post-discharge.	Mothers in the FC group reported significantly higher confidence in caregiving without staff, better understanding of infant feeding cues, greater empowerment, and more knowledge about breastfeeding before discharge. At 3 months, more FC mothers continued any (74% vs. 43%, p = .04) and full breastfeeding (70% vs. 43%, trend p = .07) and reported lower need for additional information about infant behaviour and breastfeeding. FC enhanced maternal confidence and breastfeeding maintenance.
Winner-Stoltz et al. (316)	2018 (USA)	Examine the impact of moving from an open pod to a SFR NICU design on staff nurse perceptions of their work environment and the care they provide to patients and families.	N = 64 NICU staff nurses from an urban, nonprofit, Magnet-recognized hospital	Prospective cohort mixed-methods study	Nurse perceptions across eight domains: environmental quality/control, privacy/interruption, support for individual work, teamwork, walking time, patient safety, family-centred care, and overall unit design.	Quantitative results favoured SFR design for environmental quality, privacy, support for individual work and teamwork, and family-centred care (all p < .001). Walking time favoured open-pod design. No significant differences in patient safety or satisfaction with unit design. Open-ended responses revealed SFR perceived as isolating for staff but better for

						developmental and family-centred care. Staff felt less safe when interacting with families under duress in SFR.
Wu et al. (346)	2022 (Taiwan)	Investigate the associations between full rooming-in and continual exclusive breastfeeding among first-time mothers at a postpartum care centre.	N = 160 first-time mothers with full-term, healthy infants (20 practiced full rooming-in, 140 practiced partial rooming-in)	Cross-sectional	Exclusive breastfeeding rates at discharge, 1 month, and 3 months postpartum; mode of rooming-in (full vs. partial); prenatal breastfeeding decision; prenatal education class attendance.	At 3 months postpartum, 85% of full rooming-in mothers were exclusively breastfeeding vs. 0% in the partial rooming-in group. Full rooming-in was significantly associated with exclusive breastfeeding at 1 month (OR = 0.90, $p < 0.001$) and 3 months (OR = 0.73, $p < 0.001$). Full rooming-in was also associated with prenatal decision to breastfeed, vaginal delivery, and attending both rooming-in and breastfeeding prenatal classes. The findings support rooming-in as a strategy to promote exclusive breastfeeding in postpartum care settings.
Wu et al. (364)	2023 (Taiwan)	Investigate the experiences in implementing the rooming-in policy among first-time mothers at a postpartum care centre.	N = 20 first-time mothers; mean age 31.1 years; (3 practiced full-time rooming-in, 17 partial)	Qualitative (face-to-face interviews)	Mothers' perceptions and experiences of implementing full-time rooming-in, categorized into emergent themes and subthemes.	Three major themes emerged: (1) **Rooming-in opposes postpartum rest**—conflicts with traditional "doing-the-month" customs and physical need for rest; (2) **Negative perceptions and myths**—stress and misconceptions about

						rooming-in being only for breastfeeding, pressure from healthcare staff; (3) **Postpartum care centre service content affects willingness**—belief that professional care is safer than maternal care, and that paid services should be utilised. These findings reveal cultural, physical, and institutional barriers to full-time rooming-in among first-time mothers in Taiwan.

Adjusted Odds Ratio (aOR); Adjusted Risk Ratio (aRR); Assessment of Preterm Infants' Behaviour (APIB); Baby-Friendly Hospital Initiative (BFHI); Body mass index (BMI); Breastfeeding Self-Efficacy Scale–Short Form (BSES–SF); Bronchopulmonary Dysplasia (BPD); Bronchopulmonary Dysplasia (BPD); central venous catheters (CVCs); central-line-associated bloodstream infections (CLABSI); central-line-associated bloodstream infections (CLABSI); Control Group (CG); Cystic Periventricular Leukomalacia (cPVL); Decentralized Nursing Stations (DNS); Dual Occupancy (DO); Edinburgh Postnatal Depression Scale (EPDS); electronic medical records (EMR); Family care (FC); Family Integrated Care (FICare); gestational age (GA); Hazar Ratio (HR); High breastfeeding intensity (HBI); Infant and Toddler Feeding Practices Study–2 (ITFPS-2); Inoperative alarm (Inoperative alarm); Intrauterine Growth Restriction (IUGR); Intrauterine Growth Restriction (IUGR); Intraventricular Haemorrhage (IVH); Iowa Infant Feeding Attitude Scale (IIFAS); kin-to-skin contact (SSC); Late Preterm Infants (LPIs); Latent Safety Threats (LSTs); late-onset sepsis (LOS); Length of stay (LOS); Maternal Postnatal Attachment Scale (MPAS); Maternal–Infant Attachment Inventory (MAI); multidrug-resistant organisms (MDROs); necrotizing enterocolitis (NEC); Neonatal Infant Stressor Scale (NISS); Neonatal Intensive Care Unit (NICU); nosocomial infections (NIs); Open Bay (OBY); open bay unit (OBU); Open Plan (OP); Open Ward (OW); open-bay unit (OBU); Parental Perception Scale (likely meant by PPS) (PPS); Parental Stressor Scale (PSS); Parental Stressor Scale: Neonatal Intensive Care Unit (PSS:NICU); parenteral nutrition (PN); Parenting Stress Index – Short Form (PSI-SF); Patient Decision Aids (PDAs); Peripheral capillary oxygen saturation (SpO_2); peripheral venous catheters (PVCs); Postmenstrual Age (PMA); postpartum depression (PPD); Respiratory Distress Syndrome (RDS); Retinopathy of Prematurity (ROP); Sense of Coherence (SoC); shared decision-making (SDM); shared decision-making (SDM); Single Room Maternity Care (SRMC); single room unit (SRU); Single-Family Room (SFR); Single-room unit (SRU); Special Care Unit (SCU); Standard Group (SG); standard neonatal care (SNC); State-Trait Anxiety Inventory – Short Form (STAI-SF); Symptomatic Patent Ductus Arteriosus (Spda); Traditional Maternity Care (TMC); Visual Analogue Scale (VAS)

Chapter Eight: Summary table of reviews on responsive feeding

Author	Aim	Number of included Studies (Number of Participants)	Countries of Included Studies	Population	Types of Studies	Key findings
Almaatani et al. (2023) (378)	Association between parents' stress (both general and parenting stress) and parental feeding practices and styles among parents of children ≤ 5 years old.	17 (estimated total participants: 15,376 longitudinal studies, 4705 cross-sectional studies)	High-income settings, including the US, Australia, the UK, Iceland, and Spain.	Parents of children ≤ 5 years old	6 longitudinal, 11 cross-sectional studies	A very small correlation was found between general stress and restrictive feeding practices (meta-analysis: 5 comparisons from 4 studies, N≈ 1,200–1,300 participants; r = 0.06 [95% CI: 0.01 - 0.012], I^2=0.00%). No correlation found between parenting stress and feeding pressure (3 comparisons from 3 studies N ≈ 984 participants, r=0.06 [95%CI: -0.02 TO 0.15], I^2= 53.49%). General and parenting stress linked to suboptimal breastfeeding and unresponsive (e.g., uninvolved) feeding styles. Parenting stress associated with less RF practices. Evidence quality ranged from very low to moderate.
Andries et al. (2018)(386)	Broad review of the BLW method.	13 (3,181)	UK, USA, New Zealand, Canada	Mothers of healthy infants (mostly 6–24 months)	10 quantitative (7 cross-sectional, 2 cohort, 1 case-control), 3 qualitative (interviews)	BLW infants were less likely to be overweight, more likely to eat with family and self-regulate intake. Mothers practicing BLW had higher education levels and were more likely to have breastfed longer. No increased choking risk found. Health professionals showed hesitation due to lack of familiarity.
Babik et al. (2021) (393)	Association of early infant feeding practices	22 (35,317, 155	Mostly from high- and very high-	At outcome assessment range of 18	21 observational studies and 1 RCT (BLISS)	No strong evidence that early feeding practices (e.g., breastfeeding duration, timing or

	(breastfeeding duration, timing of complementary feeding, and feeding techniques) with feeding difficulties in children older than 1 year.	participants from RCT)	income countries, including the UK, US, Australia, the Netherlands, Brazil, Turkey, Thailand, and Italy.	months up to 6 to 7 years. One study investigated feeding difficulties in adolescents.		method of complementary feeding) significantly influence parent-reported feeding difficulties like picky eating, food refusal, or neophobia after age 1. Observed associations were generally weak, inconsistent, or statistically insignificant. One study found BLW linked to less fussiness, but findings were not robust overall. Many studies had methodological limitations.
Bergamini et al. (2022)(398)	How caregivers' feeding practices (BLW, BLISS, RF, NRCF and TCF) affect children's growth and health outcomes (growth, overweigh/obesity, risk of choking, dental caries, type 2 DM, and hypertension)	35	UK, Turkey New Zealand, US, Australia, Canada	Healthy term-born infants (4-24 months), breastfed and/or formula-fed	8 RCTs, 1 CTs, 7 Cohort studies, 19 cross-sectional studies.	No evidence that BLW or BLISS improves weight/length gain (meta-analysis: 3 studies, N=NR, OR = 1.36 [95% CI: 0.18–10.51]). BLW showed lower obesity risk in observational studies (3 studies, N=969, OR = 0.37 [95% CI: 0.25–0.55]), but RCTs showed no effect (2 studies RR = 0.15 [95% CI: 0.00–17.79]). RCF was associated with reduced overweight risk (2 RCTs, RR = 0.41 [95% CI: 0.24–0.71]) and lower BMIs at 13 months (p = 0.01). No significant difference in choking risk across CFPs. No evidence linking CFPs to DM2, hypertension, or caries. BLW/BLISS may risk nutrient deficiencies; monitoring is advised.
Bocquet et al. (2022)(387)	Benefits and risks of BLW	38 (7,729 from cross-sectional, 486 from RCTs)	UK, New Zealand, Canada, Turkey, and France.	Healthy, term-born infants (mostly 6–24 months), and their caregivers.	11 cross-sectional studies, 2 RCTs, 7 secondary analyses of RCT (BLISS). 18 articles were other types of	BLW may support prolonged breastfeeding, shared family meals, and satiety recognition. However, it poses potential risks for iron, zinc, vitamin, and energy deficiency, and possible excess intake of protein, saturated fat, salt, and sugar. BLW does not show consistent

					publications (e.g., descriptive reports, methodological papers, guidelines, or background literature) that informed the review.	advantages in BMI or growth, and nutrient adequacy varies greatly. The quality of evidence generally low to very low for most key findings.
Boswell et al. (2021)(388)	Benefits and risks associated with BLW.	29 (7719)	New Zealand, UK, Australia, Canada, Turkey and the US	Healthy infants (birth to 6.5 years, with most samples being between 6 and 24 months); caregivers (mostly mothers)	23 were empirical studies (1 RCT (BLISS), 12 cross-sectional, 2 prospective cohort, 5 qualitative, 1 pilot intervention, 1 case–control, 1 retrospective), and 6 were other publications (e.g., commentaries or descriptive reports).	Eating behaviours: BLW is associated with lower food fussiness, greater food enjoyment, and improved satiety responsiveness, potentially supporting healthier eating patterns and lower obesity risk. Nutritional outcomes: Energy intake appears comparable to traditional feeding. While some studies raise concerns about lower iron and zinc intake, no consistent evidence of nutritional deficiencies has been found. Growth outcomes: Most studies report no difference in growth metrics; some suggest reduced overweight risk, though concerns remain about possible underweight in some BLW infants. Choking risk: Despite common parental fears, research does not indicate a higher choking risk with BLW. Early exposure to finger foods may support oral motor skill development. Evidence gaps: Inconsistent definitions of BLW and reliance on self-reported data limit

						comparability. More rigorous, long-term studies are needed to assess outcomes more reliably.
Calabuig bono et al. (2021)(396)	Broad review of the BLW method.	20 (N/A)	Specific countries not detailed, likely includes the UK, US, Australia, and Spain	Healthy infants transitioning into complementary feeding	1 meta-analysis, 1 systematic review, 5 RCTs, 1 non-randomized experimental study, 10 descriptive cross-sectional studies, and 2 qualitative studies	BLW is considered beneficial for infants, with most achieving age-appropriate weight and a minimal choking incidence. However, an increased risk of iron deficiency was noted compared to traditional feeding. In contrast, BLISS showed no significant difference in iron intake. Nutritional intake overall was comparable to traditional spoon-feeding, though BLW encouraged greater variety in textures and flavours. Mothers reported BLW as less stressful and more enjoyable, appreciating the opportunity for infants to participate in family meals. The review also highlighted a need for better professional guidance to address parental concerns and ensure adequate nutrient intake
Cameron et al. (2012)(204)	BLW impact on developmental readiness, parental practices, and health.	7 (5,115)	UK, New Zealand	Parents (primarily mothers) with infants aged 6-18 months, and some HCPs.	6 cross-sectional studies (2 also included qualitative interviews) and 1 case-control study.	Observational studies link BLW to: longer breastfeeding duration; delayed introduction of complementary foods (aligning with WHO guidelines); increased infant involvement in family meals and consumption of family foods; Healthier eating patterns, with a preference for healthier foods and more RF practices (e.g., less pressure, restriction, and monitoring) Parents often report positive experiences like convenience, cost-effectiveness, and reduced

						mealtime stress. HCPs raise concerns about: Choking risks; Inadequate iron and energy intake and lack of clear BLW definitions, leading to inconsistent use. Low quality of evidence as mostly qualitative or cross-sectional.
D'Auria et al. (2018)(401)	Broad review of the BLW method	12 (7,457)	UK, New Zealand, Australia, Italy	Healthy, term-born infants aged 4–24 months and their caregivers. Some studies involved pregnant mothers followed until infants were 24 months old.	10 observational cross-sectional studies 2 RCTs	Choking Risk: No significant difference between BLW and TSF, though choking can still occur. BLISS may reduce risk. Energy Intake & Growth: Results are mixed. BLW may risk lower intake or underweight, though one RCT found no difference in growth. Iron Intake: BLW can risk low iron; BLISS addresses this by promoting iron-rich foods. Satiety & Weight: Some studies link BLW with better satiety responsiveness and lower BMI, but findings are inconsistent. Food Preferences: BLW may foster a preference for carbohydrates and family foods, while spoon-fed children might prefer sweets. Diet Quality: BLW can expose infants to high-sodium family foods unless parents receive proper guidance. Family Meals: Limited evidence suggests BLW encourages participation in family meals but may not change overall family eating patterns. Maternal Anxiety: Some studies report lower anxiety and more positive feeding attitudes in BLW mothers.

						Start of Complementary Feeding: BLW is often associated with starting solids at 6 months.
Gomez et al. (2020)(402)	Risks and benefits of the BLW	17 (9,851)	UK, New Zealand, Australia	Healthy term-born infants (6-12 months) and their caregivers (mostly mothers). Some studies included health professionals.	11 Cross-sectional studies 5 Longitudinal studies 1 RCT	Self-Regulation & Satiety: BLW infants show better appetite control, lower obesity risk, and less maternal feeding anxiety; Weight: Healthier weight profile with fewer overweight cases than spoon-fed infants. Family Meals: Fosters shared mealtimes and positive mealtime behaviours. Food Preferences: Linked to higher intake of fruits, vegetables, and complex carbs. Breastfeeding Duration: Associated with prolonged exclusive breastfeeding. Choking: Present risk but no consistent differences vs. spoon-feeding. Infants under 8 months may face higher risk. Iron & Micronutrients: Lower iron, zinc, and vitamin B12 in strict BLW groups; delay in introducing iron-rich foods noted. Energy Intake: Total energy similar to TSF, though BLW diets may have higher fat content. Healthcare Provider Concerns over limited evidence and safety often deter formal endorsement.
Hurley et al. (2011)(367)	Associations between RF and child weight status in high-income countries	31 (10581)	US, UK, Australia, France	Children (aged 0-5 years), along with their parents or caregivers	25 cross-sectional, 3 longitudinal, 1 repeated-measures, 2 studies using	Most studies (24/31) reported an association between non-RF and higher child weight/BMI. Restrictive feeding was frequently tied to higher child BMI. Pressuring the child to eat was

					both cross-sectional and longitudinal designs	often tied to lower BMI. Indulgent feeding was also linked to higher BMI. Evidence is mostly cross-sectional, so causal direction is uncertain; more longitudinal and interventional research is needed.
Joseph et al. (2019) (58)	To understand maternal infant feeding experiences pre- and post-resettlement for the benefit of policy and healthcare practice.	14 (372)	Australia	Migrant and refugee mothers	14 Qualitative studies	One overarching theme emerged: "Fitting-in" to nurture a healthy child in a new homeland. Two main themes: (1) Beliefs about breast milk and breastfeeding, and (2) Beliefs about complementary feeding. Before resettlement, infant feeding was shaped by intergenerational cultural norms and family networks. Post-resettlement, exposure to Western technology, healthcare systems, and hospital policies led to shifts in infant feeding perceptions and practices. Breastfeeding was traditionally the norm, but infant formula was perceived in Australia as a modern, Western, and sometimes superior option. Hospital policies, lack of cultural sensitivity, language barriers, and disconnection from family support networks negatively affected breastfeeding practices. Complementary feeding practices adapted over time, often shifting from traditional foods to packaged and manufactured options available in Australia. Migrant and refugee women navigated tensions between

						traditional cultural expectations and Australian norms when deciding how to feed their infants
Martinón-Torres et al. (2021) (397)	BLW v TSF on infant weight gain	8 (2,875)	UK, New Zealand, Turkey	Healthy term infants (0-78 months)	2 RCTs and 6 observational (3 cross-sectional, 2 longitudinal, 1 case-control)	1 RCT found no difference in BMI z-scores at 12 or 24 months. 1 RCT reported no overweight cases in BLW group. Some studies noted more underweight in BLW. Breastfeeding and timing of food introduction may affect outcomes but were not consistently controlled across studies. All studies showed moderate to high risk of bias.
Matvienko-Sikar et al. (2018)(410)	Effects of early child feeding interventions delivered by HCPs on parental feeding practices, dietary intake, child weight outcomes (up to 2 years old). Special focus was given to RF interventions.	16 (3,700) of which 6 included RF components	USA, Australia, New Zealand	Healthy full-term infants (0-2 years)	9 RCTs, 2 non-RCT	RF interventions showed more consistent and positive effects on parental feeding practices than those without. Interventions on RF led to: reduced pressure to eat, emotional feeding, and instrumental feeding (e.g., using food as a reward). Increased recognition of hunger and satiety cues. Better support for child autonomy during feeding. RF interventions were more effective in promoting healthier feeding behaviours and possibly improving weight-related outcomes, yet inconsistencies remained across studies.
Matzeller et al. 2024 (403)	Nutrient intake (energy, macro- and micronutrients) and infant growth in BLW Vs conventional weaning	19 (4973)	UK, New Zealand, Australia, Turkey, USA, Germany, Canada	Healthy term infants (5-24 months). Some studies included parents or caregivers.	1 RCT, 5 secondary analyses of RCT (BLISS cohort), 9 observational studies (8 cross-sectional, 1 longitudinal), 1 pilot intervention	Energy Intake: Generally similar across BLW and CW, with only minor, inconsistent differences reported. Macronutrients: BLW infants tended to consume more fat and saturated fat, while CW infants often had more total protein; carbohydrate intake was

					study, 1 case-control, 1 qualitative, 1 narrative review (excluded from participant count)	inconsistent, though BLW involved more red meat. Micronutrients: Iron, zinc, and vitamin B12 intakes were typically lower in BLW, and sodium was higher (likely from family meals). Growth: Findings were mixed; some studies showed heavier/longer CW, others no difference. No evidence of growth faltering. Demographic & Feeding Behaviours: BLW was more common with higher maternal education/SES, later solid introduction, family food consumption, and reliance on social media vs. healthcare guidance.
Redsell et al. (2021)(377)	Identify the barriers and enablers that affect caregivers' ability to engage in RF practices during the first two years of life, using the COM-B model to inform future obesity prevention interventions.	43 studies (264 from qualitative studies, 9837 from quantitative studies)	USA, Australia, UK, New Zealand, Norway and Sweden	Healthy infants and children under 2 years	5 RCTs, 8 Cohort studies, 11 cross-sectional, 1 case–control, 1 within-subject experimental study, 1 quasi-experimental study, 6 secondary analyses, 9 qualitative studies	Key Enablers: Recognising infant cues (hunger/satiety) was a major skill that supported RF. Feeding knowledge and education increased confidence in feeding and reduced controlling behaviours. Social support, particularly from family/friends and peer networks, encouraged responsive approaches. Flexible caregiver attitudes—trusting the infant's internal regulation—supported healthy feeding behaviour. Key Barriers: Conflicting feeding information, especially formula feeding guidelines and cultural norms, confused caregivers. Controlling feeding styles, such as overriding satiety cues, limited responsiveness. Lack of time or

						resources, maternal distraction, and feeding in non-home environments limited responsiveness. Professional advice sometimes failed to support or conflicted with RF messages.
Sampige et al. (2024)(379)	Relationship between parental anxiety symptoms and non-RF behaviours (e.g., restriction, pressure to eat, emotional feeding) in caregivers of typically developing children aged 6 months and older.	10 (2,224)	UK, USA, Australia	Predominantly mothers of typically developing children aged ≥6 months to ~6 years	7 cross-sectional, 3 longitudinal studies	7 studies found a positive association between parent anxiety (mostly maternal) and non-RF behaviours, including restriction, pressure to eat, emotional feeding. One study found only weak predictive power of anxiety for restriction. One study found an association only when anxiety co-occurred with other symptoms like depression. 3 studies reported no significant association between anxiety and feeding behaviours. Feeding behaviours linked to anxiety were often controlling or emotionally driven, which are risk factors for: Disrupted self-regulation in children and increased obesity risk
Tauriello et al. (2023)(382)	Association between child temperament (specifically negative reactivity, surgency, and regulation/effortful control) and early childhood feeding, eating, and weight outcomes.	121 (29,478)	USA, UK, Australia, Norway, Germany, China, Canada, Finland, Israel, Switzerland, Ghana, Iran, Italy, Bangladesh, Philippines,	Children 0-5 years	43 cross-sectional, 51 longitudinal, 12 prospective cohort, 9 intervention-based, observational, 6 with multiple time points	Difficult temperament, emotionality, and low self-regulation were consistently linked to poorer feeding, eating, and weight outcomes. Difficult temperament related to non-RF, emotionality to emotional overeating and picky eating. Weight findings were mixed. Links were stronger in infancy; non-cross-sectional studies showed more significant associations.

			Turkey, Poland,			
Utami et al. (2019)(395)	Risk of choking, iron and zinc deficiency, and growth faltering related to BLW. Knowledge about BLW in mothers and HCPs.	9 studies (2,648)	Canada, New Zealand, Turkey, UK	Healthy, term-born infants (mostly 6–24 months), and their caregivers.	2 RCTs, 3 secondary analyses of RCT (BLISS cohort), 4 cross-sectional studies	Mothers typically start BLW at 5–8 months, often without formal guidance. BLW supports infant independence, self-feeding, and family meal participation. BLW infants generally have normal weight, lower BMI, more fat/sodium intake, and less iron/zinc. Choking risk is similar to TSF; gagging is more common but normal. Partial BLW may increase choking risk. BLISS improves nutrient intake and safety. Mothers rely on peers/social media; HCPs are cautious and often under-informed.
Baby-Led Weaning (BLW); Baby-Led Introduction to SolidS (BLISS); Body Mass Index (BMI); Cue-Based Feeding (CBF); Complementary Feeding Practice (CFP); Confidence Interval (CI); Capability, Opportunity, Motivation – Behaviour model (COM-B); Conventional Weaning (CW); Type 2 Diabetes Mellitus (DM2); Healthcare Professional (HCP); Low Birth Weight (LBW); Neonatal Intensive Care Unit (NICU); Non-Responsive Caregiver Feeding (NRCF); Odds Ratio (OR); Randomized Controlled Trial (RCT); Responsive Feeding (RF); Risk Ratio (RR); Socioeconomic Status (SES); Traditional Complementary Feeding (TCF).						

Chapter Eight: Summary table of empirical studies on responsive feeding

Authors	Year (Country)	Aim (as reported by the author)	Number of Participants (N=) and Characteristics	Methods	Outcome Measures	All Key Findings
Adams (412)	2019 (USA)	Describe how often different soothing strategies were used, capture frequency and patterns of using food to soothe, test the effects of a RP intervention on this during early infancy, and explore whether maternal use of food to soothe differed by time of day, the frequency of infant fussiness, and/or feeding mode.	N = 157 primiparous, English-speaking mothers aged ≥20 years with full-term singleton infants (≥37 weeks, ≥2500 g)	EMA via smartphones (surveys sent every 4hrs between 10am-10pm in 5-8 day bursts) at infant ages 3 and 8 weeks; randomized clinical trial comparing RP to a safety control group.	Use of food to soothe (Fed First vs. Not Fed First); frequency and type of soothing strategies; infant fussiness; and feeding mode.	The RP group had lower odds of feeding first compared to the control group at both 3 and 8 weeks. RP mothers more frequently used alternative soothing strategies first (3 weeks: 58.1% vs 41.9% respectively, 8 weeks: 57.1% vs 42.9% respectively). Fewer fusses from responsive group were soothed best by feeding than in controls. Mothers were more likely to feed first during nighttime than daytime. Fed First was more likely to occur when infants had fussed less frequently. With predominantly breastfed infants, the control group had greater odds of having Fed First compared to RP.
Arden and Abbott (392)	2015 (UK)	Investigate the reported experiences and feelings of	N = 15 UK mothers with infants aged 9–15 months who had	Qualitative semi-structured interviews	Thematic findings related to feeding practices and maternal experiences.	Four main themes emerged: (1) Trusting the child—mothers trusted infants to self-regulate

		mothers using a BLW approach to understand the experiences of the mother and infant, the benefits and challenges of the approach, and the beliefs that underpin these experiences.	tried BLW (even if mixed with other approaches); recruited via parenting forums; mostly breastfeeding mothers.	conducted via five email exchanges.		intake and timing; (2) Parental control and responsibility—despite BLW ideals, mothers still monitored intake, nutrition, and timing; (3) Precious milk—breastfeeding was seen as highly important and sufficient nutrition until age one; (4) Renegotiating BLW—mothers often adapted BLW principles in practice, combining with traditional weaning
Białek-Dratwa et al. (389)	2022 a (Poland)	Compare complementary feeding among mothers using and not using the BLW method, including frequency of spoon feeding, family table eating, food consistency, and occurrence of vomiting, gagging, or choking.	N = 646 mothers of children aged 6–36 months across Poland. Groups included mothers using BLW (M-BLW), not using it (M-TS), and unaware of the method (M-NoBLW).	Cross-sectional survey conducted online using a validated questionnaire; CAWI method via forums and Facebook.	Feeding practices (e.g., spoon-feeding, family table foods), child self-feeding, incidence of vomiting, gagging, choking, and breastfeeding duration.	63.93% of mothers used BLW. Compared to spoon-fed children, BLW infants more often began solids after 6 months (63.68% vs. 47.67%, $p < 0.001$), ate family foods (67.31% vs. 9.30%, $p < 0.001$), and self-fed before age 1 (88.14% vs. 45.35%, $p < 0.001$). Gagging (51.90% vs. 29.10%), vomiting reflex (34.90% vs. 25.23%), and spitting out food (62.19% vs. 51.86%) were more frequent in BLW children ($p < 0.001$). Choking rates were similar (6.94% vs. 5.42%), and exclusive breastfeeding to 6 months was more common in the BLW

						group (54.48% vs. 39.53%, p < 0.001).
Białek-Dratwa et al. (390)	2022 b (Poland)	Verify the knowledge of mothers of children under 3 years of age about the BLW feeding model and their practical implementation of this method.	N = 699 mothers of children aged 0–3 years, recruited randomly from nurseries and paediatric outpatient clinics	Exploratory cross-sectional study using a validated and pilot-tested questionnaire; face-to-face administration by trained interviewers.	Knowledge and use of BLW, child feeding practices, introduction of family foods, spoon-feeding, child autonomy in eating decisions, products introduced, cooking methods, and observed advantages/disadvantages.	Among surveyed Polish mothers, 78% were aware of the BLW method, mainly through the Internet. Of those, 74.82% reported using BLW during complementary feeding. From this subgroup (n = 699) was analysed further: 34.62% followed BLW fully, while 65.38% used a modified version. Full BLW was more common among mothers with higher education (41.85% vs. 27.60%, p = 0.0003), aged 26–30 (p = 0.0162), and those living in urban areas (72.27% vs. 63.87%, p = 0.0374). Full BLW users were more likely to let infants self-feed from the start (87.39% vs. 53.41%, p < 0.0001), decide what (62.18% vs. 46.09%, p = 0.0002) and how much to eat (93.70% vs. 85.82%, p = 0.0047), and used paps less often (71.43% vs. 87.61%, p < 0.0001). Exclusive breastfeeding for 6 months was more common (52.10% vs. 38.69%, p = 0.0021). Mothers noted benefits

						like child independence, and drawbacks such as mess and choking concerns (11.1%).
Chen et al. (380)	2020 (Taiwan)	Examine maternal depression and infant growth status as predictors of maternal responsive feeding, and to explore other associated factors during the first 3 months postpartum in Taiwan.	N = 438 mothers aged ≥20 years with singleton pregnancies, recruited in their second trimester from hospitals and clinics in Taipei; followed up at 1 and 3 months postpartum.	Prospective cohort study with self-administered questionnaires and clinical data; responsive feeding measured at 3 months; EPDS used for depressive symptoms; infant growth based on Weight for Length Z scores from birth to 3 months.	Maternal responsive feeding (10-item scale), maternal postpartum depressive symptoms (EPDS), infant growth (WLZ changes from birth to 3 months).	Responsive feeding was positively associated with younger maternal age (≤29 years) and exclusive breastfeeding at 1 month. It was negatively associated with primiparity, maternal depressive symptoms, and decrease to underweight WLZ status from birth to 3 months. The model explained 13% of the variance in responsive feeding. Health professionals should focus support on first-time, older, and non-exclusively breastfeeding mothers, as well as those with depressive symptoms and infants becoming underweight.
Daniels et al. (404)	2023 (New Zealand)	Determine whether selenium (Se) intakes and plasma Se concentrations differ between 12-month-old toddlers who followed baby-led approach to complementary feeding versus	N = 101 toddlers (50 BLISS, 51 Control) from the Baby-Led Introduction to SolidS (BLISS) RCT; recruited during third trimester from Dunedin, NZ; infants born after 37 weeks and no	Participants randomised into control or BLISS intervention groups; Questionnaire to collect demographic data; Secondary analysis of RCT; 3-day weighed diet records when	Selenium intake (μg/day), plasma selenium concentration (μmol/l), food group contributions to Se, maternal/infant predictors of Se status.	There were no differences in selenium intake or plasma Se between BLISS and Control groups. Over half of toddlers had Se intake below the EAR (63% Control, 60% BLISS). Breast milk was the largest contributor to Se intake among consumers but was associated with

		traditional spoon-feeding, identify food sources contributing to Se intakes, and examine predictors of plasma Se.	physical condition or intellectual disability that would affect growth and development	child was 12 months; non-fasting venous blood samples for Se analysis; linear and logistic regression.		lower plasma Se concentrations. Maternal smoking and lower seafood intake were also negatively associated with Se status. Breads and cereals and meat contributed most Se among non-milk food groups.
Di Prete et al. (408)	2023 (Italy)	Investigate whether maternal responsiveness to infant feeding cues at 8 and 12 months differs depending on self-reported complementary feeding approach (BLW, PLW, Mixed), and whether responsiveness is associated with observed infant self-feeding.	N = 178 Italian mother-infant pairs assessed at 8 and 12 months; infants were full-term and monolingual; recruited from prenatal or early postnatal stages.	Longitudinal observational study; self-report survey and video-recorded mealtime observations coded using the Responsiveness to Child Feeding Cues Scale (RCFCS).	Responsiveness to infant receptiveness and fullness cues (5-point scale); proportion of observed self-feeding.	Maternal responsiveness did not differ significantly by self-reported feeding method (BLW, PLW, or mixed), but higher observed infant self-feeding was linked to greater responsiveness to fullness cues (OR = 3.31, p = .002). At 8 months, mean self-feeding proportions were 0.48 (SD = 0.39) for BLW, 0.29 (SD = 0.37) for mixed, and 0.01 (SD = 0.05) for PLW; at 12 months, 0.70 (SD = 0.33), 0.58 (SD = 0.37), and 0.31 (SD = 0.31), respectively. Mothers were more responsive to receptiveness than fullness cues at both ages (8 months: 3.38 vs. 2.18; 12 months: 3.97 vs. 2.65 on a 5-point scale; all p < .001). Findings suggest infant self-feeding may promote

						responsiveness to satiety cues, supporting self-regulation.
Dogan (400)	2018 (Turkey)	To determine whether BLW can be an alternative complementary feeding type without increasing the risk of iron deficiency, choking, or growth impairment, and to compare infant growth, iron intake, and haematological parameters between BLW and TSF	280 healthy infants (142 girls, 138 boys) aged 5–6 months at enrolment. Gestational age 38–42 weeks, birthweight >2,500 g, exclusively breastfed, no congenital anomalies or chronic conditions	RCT BLW vs. TSF. BLW participants received additional training and home visits; modified BLW (BLISS) used to minimize choking and low iron risk.	Baseline, 6 months and 12 months: Weight, length, head circumference. Serum haemoglobin, haematocrit, MCV, RDW, transferrin saturation, ferritin. Dietary iron intake (mg/day from complementary foods). Incidence of choking	At 12 months, TSF infants were significantly heavier (11.1 ± 0.5 kg) than BLW infants (10.4 ± 0.9 kg) (P < 0.001). Weight-for-length z-scores: BLW group 98% normal weight, 2% underweight; TSF group 83% normal weight, 17% overweight. All overweight infants were in TSF. Iron intake was similar: BLW 7.97 ± 1.37 mg/day vs. TSF 7.90 ± 1.68 mg/day (P = 0.76). Hematologic parameters (Hb, Hct, MCV, RDW, TS, ferritin) were not significantly different between groups. Choking incidence was low and not significantly different (BLW n=2; TSF n=3).
Fangupo et al. (406)	2016 (New Zealand)	Determine whether a modified baby-led approach to complementary feeding BLISS alters the risk of choking and gagging compared with	206 healthy infants (101 control, 105 BLISS)	RCT LISS group received 8 additional contacts (antenatal to 9 months) including lactation consultant and home visits, with resources and support to	Frequency of choking and gagging episodes. Exposure to foods posing a choking risk. Parent-reported “most serious” choking events. Outcomes collected via: Questionnaires at 6, 7, 8, 9, 12 months Daily gagging/choking calendars at 6 and 8 months	35% of infants choked at least once between 6–8 months; no significant differences between groups (all Ps > .20). BLISS infants gagged more often at 6 months (RR 1.56; 95% CI 1.13–2.17) but less often at 8 months (RR 0.60; 95% CI

		traditional spoon-feeding.		minimize choking risk. Control group received usual care (free well-child health care).	3-day weighed diet records at 7 and 12 months	0.42–0.87) compared with controls. At 7 months, 52% of infants were offered choking-risk foods; at 12 months, 94%. No significant group differences (7 months: RR 1.12, 95% CI 0.79–1.59; 12 months: RR 0.94, 95% CI 0.83–1.07). Of 129 detailed “most serious” choking episodes, only 23% involved foods classified as high risk; 84% occurred during self-feeding; 58% involved whole foods. 51% of choking events resolved without assistance; only 3 required health professional involvement (2 milk-related, 1 parent-fed food). At 11 months, BLISS infants were more likely to be supervised while eating (65% vs. 44%, RR 1.97; 95% CI 1.09–3.56).
Fernandes et al. (394)	2023 (Portugal)	Analyse differences in emotional and feeding responsiveness between caregivers who previously	N = 179 caregivers (mostly mothers) of children aged 3–5 years from Lisbon; 70.4% used Traditional Spoon-Feeding	Cross-sectional study using retrospective self-report of feeding method, the Comprehensive Feeding Practices Questionnaire	Parental feeding practices (e.g., pressure to eat, modelling), emotional responsiveness (e.g., minimization, problem-focused responses).	70.4% of caregivers used TSF, 16.8% BLW, and 12.8% both. Participants were grouped into “traditional” (TSF) and “mixed” (BLW or both). Mixed-method caregivers were significantly

		implemented traditional vs. non-traditional (BLW or mixed) complementary feeding approaches.	(TSF), 16.8% used BLW, and 12.8% used both.	(CFPQ), and the Coping with Children's Negative Emotions Scale (CCNES) to record their child's distress.		younger, more likely to be first-time parents, and had children spending less time at school ($p < 0.05$). They reported lower pressure to eat ($M = 2.43$ vs. 2.80; $p = 0.03$; $\beta = -0.16$, $p < 0.05$) and fewer minimization responses to negative emotions ($M = 2.49$ vs. 2.95; $p = 0.004$). While healthy feeding practices did not differ significantly, trends favoured the mixed group. TSF users more often employed problem-focused regulation ($M = 6.12$ vs. 5.76; $p = 0.031$).
Fernandez-Medina et al. (409)	2023 (Spain)	To describe and understand the experiences and opinions of paediatricians and paediatric nurse specialists of the implementation of the BLW approach.	N = 20 (7 paediatricians, 8 paediatric nurse specialists, 5 paediatric nurse residents); 13 participated in interviews, 7 in focus group	Qualitative study using interviews and a focus group	Perceptions and experiences of healthcare professionals regarding BLW implementation, safety, training, and barriers.	BLW perceived as natural, safe, promotes chewing, improves growth and sensory and motor developments. Healthcare professionals recognized a lack of formal BLW training, which they considered a major barrier to best practice. Family education delivered by healthcare professionals may avoid risks and allay parental anxieties about safety.
Gelmini et al. (415)	2024 (Australia)	Test the efficacy of a brief 2-hour parenting	N = 82 parents of infants aged 4–18 months with at	Randomized controlled trial with repeated	Parental feeding practices (responsive, pressuring, restrictive), feeding beliefs,	The intervention group showed reduced controlling feeding

		intervention (Baby Healthy Living Triple P) in increasing healthy feeding practices and reducing risk factors for infant obesity.	least two risk factors for obesity; randomized into intervention (n=42) or control group (n=40).	measures (baseline, postintervention, 6-month follow-up); questionnaires and anthropometric measurements.	mealtime environment, self-efficacy in feeding, emotional eating, food restraint, body satisfaction, child weight status.	practices (pressuring and restrictive) and nonresponsive behaviours, and improved feeding beliefs with small-to-medium effect sizes. No significant effects were found for responsive feeding, mealtime environment, self-efficacy, emotional eating, food restraint, body satisfaction, or child weight status. Parent satisfaction with the intervention was high.
Globus et al. (418)	2019 (Israel)	To examine whether professional behavioural and nutritional training for first-time mothers can improve feeding interaction at age 12 months.	N = 128 mother-infant dyads: 86 in the intervention group and 42 in the control group. All were first-time mothers after healthy full-term pregnancy, with a mean maternal age of 30 years. Infants were 12 months old at assessment.	Quasi-experimental design. MI-FI group received 4 weekly workshops (age 4–6 months) plus online support; control group received standard municipal care. Feeding interactions were videotaped and evaluated using the CFS; coders were blinded to group assignment.	CFS scores: dyadic reciprocity, dyadic conflict, talk and distraction, struggle for control, maternal non-contingency	Significant improvements in 4 of 5 CFS dimensions: Dyadic conflict (MI-FI: 4.69 vs control: 8.38), Talk/distraction (3.75 vs 4.90), Struggle for control (2.30 vs 4.88), Maternal non-contingency (1.61 vs 2.75); all $p < .01$. No sig. difference in dyadic reciprocity. MI-FI mothers were more likely to wait for infant cues, avoid negative statements, and position infants appropriately. Infants in control group showed more food refusal, crying, and distress behaviours. Interrater reliability: ICC = 0.75–0.85. Education level was controlled in

						analysis due to group difference (p = .013).
Hernandez et al. (414)	2022 (USA)	Test the effects of a RP intervention on infant feeding practices among African American mothers, and explore moderation by feeding mode, maternal age, and pre-pregnancy BMI.	N = 194 primiparous African American mother-infant dyads; full-term, singleton infants; recruited from Augusta, GA and randomized to RP or control group.	Randomized controlled trial (Sleep SAAF); home visits at 1, 3, 8, and 16 weeks; intervention adapted from INSIGHT; data collected via questionnaires at 16 weeks.	Feeding practices: pressure to feed, responsiveness to cues, food used to soothe, bottle-feeding practices, timing of introduction of beverages/solids.	RP mothers reported significantly less pressure to finish/soothe and marginally less pressure with cereal. They were more likely to report letting the baby decide how much to eat. RP mothers were significantly less likely to use beverages other than breast milk/formula to soothe. No significant differences were found in bottle-feeding practices or early introduction of beverages/solids. Feeding mode and maternal age moderated intervention effects, with stronger outcomes for mothers ≥20 years and those using any breast milk.
Jawad et al. (383)	2025 (Australia)	To explore responsive feeding practices among Arabic and Mongolian-speaking migrant mothers in Australia.	N = 40 migrant mothers (20 Arabic-speaking and 20 Mongolian-speaking); children under 2 years or pregnant.	Semi-structured telephone interviews in native languages.	Descriptions and comparisons of responsive feeding behaviours, hunger/satiety cue recognition, feeding routines, and cultural influences.	Arabic-speaking mothers generally exhibited more responsive feeding than Mongolian mothers, except those formula-feeding who followed fixed routines. Difficulty identifying hunger/satiety cues reported by both groups, leading to pressure feeding. Cultural beliefs (e.g., preference

						for chubby babies in Mongolia) contributed to pressure feeding. Use of digital devices during meals reported in both groups. Arabic mothers sometimes used food-based rewards. Differences in settling techniques: Mongolian mothers more often used feeding to soothe; Arabic mothers used other methods (toys, singing, cuddling).
Lindholm et al. (373)	Sweden (2020)	Examine nutrition- and feeding practice-related risk factors for RWG during the first year of life	Final study population: 1,780 infants (902 boys, 878 girls). Population-based birth cohort from Halland County.	Longitudinal birth cohort; weight measured at 0–1, 3–4, 6, and 12 months; parent questionnaires on feeding; RWG defined as > 0.67 SDS change;	RWG at 0–3–4 months, 0–6 months, and 6–12 months. Breastfeeding (predominant, partial, none) Bottle-feeding Nighttime meals and content (breast milk, formula milk, milk cereal drink) Milk cereal drink consumption at 6 and 12 months	Bottle-feeding at birth and 3–4 months: positively associated with RWG at 0–3–4 months ($p < 0.001$). Nighttime formula milk: positively associated with RWG at 0–3–4 months ($p < 0.001$). Nighttime breast milk: negatively associated with RWG at 0–3–4 months ($p < 0.001$). Bottle-feeding at birth, 3–4, and 6 months: positively associated with RWG at 0–6 months ($p < 0.001$). Breastfeeding at 3–4 and 6 months: negatively associated with RWG at 0–6 months ($p < 0.001$). Nighttime breast milk at 3–4 and 6 months:

						negatively associated with RWG; nighttime formula at 3–4 months positively associated. Bottle-feeding at 3–4 months was the only feeding factor significantly associated with RWG during 6–12 months ($p < 0.05$). Other risk factors: Higher maternal pre-pregnancy weight, gestational weight gain, and paternal weight were positively associated with RWG at 0–3–4 and 0–6 months. Paternal smoking was associated with RWG during 6–12 months.
Markides et al. (381)	2022 (Australia)	To explore how parents' feeding practices and driving social cognitive factors cluster based on parents' concern for fussy eating.	N = 630 self-identified parents of fussy eaters; 1542 Reddit posts from r/toddlers subreddit between 2016–2019 were analysed.	Mixed-methods thematic cluster analysis using latent Dirichlet allocation and hierarchical clustering; qualitative coding of Reddit posts; abductive thematic analysis.	Feeding practices (responsive, coercive, indulgent, instrumental, structured/unstructured), concern for fussy eating, parental self-efficacy, agency, self-regulation, feeding goals, and beliefs about hunger and child autonomy.	Five clusters emerged: (1) Concerned, nonresponsive; (2) Concerned, mixed strategies; (3) Low concern, responsive; (4) Low concern, mixed strategies; (5) Low concern, indulgent. Higher concern was linked with coercive and indulgent feeding and lower trust in children's hunger regulation. Parents with low concern and responsive practices had greater self-regulation, longer-term feeding goals, and belief

						in child autonomy. Distrust in child hunger regulation and emotional responses were common barriers to responsive feeding. Interventions should address parental concern, feeding beliefs, and support long-term feeding goals and self-regulation.
McLean et al. (405)	2024 (New Zealand)	Evaluate the relationship between the use of baby food pouches and BLW at around 6 months of age and subsequent iron status in infants aged 7–10 months.	N = 625 infants aged 6.9 to 10.1 months; recruited from Dunedin and Auckland; 364 provided complete iron status data; participants were diverse in ethnicity and socioeconomic status.	Observational cross-sectional study (First Foods New Zealand); parent questionnaires, 24-hour dietary recalls, infant anthropometrics, and blood samples to assess iron status.	Infant feeding approach (baby food pouch use, BLW), body iron concentration, plasma ferritin, haemoglobin, iron sufficiency (defined using BRINDA-adjusted biomarkers).	Suboptimal iron status was observed in 23% of infants; baby food pouch use and BLW were not significantly associated with poorer iron status after adjustment. Non-frequent pouch users had higher body iron and odds of iron sufficiency compared to non-users, but associations attenuated after adjustment. Late introduction to solids (≥7 months) was associated with significantly poorer iron status. Findings suggest current practices of pouch use and BLW in New Zealand are not linked to poor iron status but highlight overall risk of suboptimal iron nutrition.
Ortega-Ramírez et al. (391)	2024 (Spain)	Investigate whether breastfeeding	N = 1215 children aged 3–6 years from the CORALS	Cross-sectional analysis from a longitudinal cohort	Child eating behaviours (food fussiness, enjoyment of food, etc.) measured via CEBQ;	Children breastfed for ≥4 months had lower food fussiness (FF) scores at

		duration and the method of initiating complementary feeding are associated with eating behaviour in preschool children.	cohort in seven Spanish cities; data collected via parental questionnaires.	study (CORALS); breastfeeding duration and complementary feeding method were self-reported; eating behaviour assessed via the Child Eating Behaviour Questionnaire (CEBQ).	breastfeeding duration (<1, 1–3, ≥4 months); complementary feeding method (traditional/spoon, mixed, BLW).	3–6 years compared to those breastfed for <1 month. Compared to traditional spoon-fed children, those introduced to solids via BLW or mixed methods had significantly higher enjoyment of food (EF) and lower FF scores. BLW was also associated with lower desire to drink (DD), and the mixed method with higher emotional undereating (EUE). These findings suggest early feeding practices, especially responsive methods, may promote healthier eating behaviours.
Pearce and Rundle (407)	2022 (UK)	Explore the meaning and individual characterisation of BLW amongst parents using UK-based parenting forums	N=Not specified; participants were anonymous parents posting on three UK parenting forums; characteristics such as age, gender, and socio-economic status were not collected	Interpretive thematic analysis of forum threads related to complementary feeding; data collected from 3 UK parenting forums within 6 months of May 2020	Themes and subthemes related to BLW meaning, practice, challenges, and ethos were identified from qualitative data.	BLW described as an ethos of trusting the baby, role modelling, building confidence with food, and sharing meals. BLW was seen as a deliberate alternative or a default when babies refused purees or spoon feeding. For some, it felt like a natural, low-effort progression; for others, it caused anxiety, stress, choking fears, and mess. Many struggled with the lack of clear guidance. Finger foods were often equated with BLW,

						though many blended elements of BLW and TW.
Richardson et al.(375)	2024 (USA)	Understand the experiences of WIC counsellors discussing responsive bottle-feeding during counselling, and WIC participants' knowledge, understanding, and use of responsive bottle feeding.	N = 23 participants: 8 WIC counsellors and 15 WIC-enrolled mothers of bottle-fed infants; recruited from five WIC clinics across North Carolina.	Qualitative descriptive study; semi-structured Zoom interviews; content analysis using NVivo; collaborative coding and thematic analysis.	Knowledge, support, and use of responsive bottle feeding; counsellor practices and training; participant awareness of hunger/fullness cues and feeding strategies.	WIC participants received responsive feeding support, mostly in the context of breastfeeding. Counsellors taught feeding cues but had limited training in responsive bottle feeding and struggled with balancing breastfeeding promotion and bottle-feeding support. Participants recognized hunger and fullness cues but often associated responsive feeding only with breastfeeding. Bottle feeding was perceived as less complex, and guidance on paced feeding was rare. Both groups highlighted the need for more training, time, and culturally relevant support for responsive bottle feeding. Findings support the development of targeted interventions for bottle-fed infants.
Ruggiero et al. (413)	2020 (USA)	Examine the spillover effect of the INSIGHT RP intervention on maternal feeding practices with	N = 117 mother–second-born infant dyads (57 RP group, 60 control); participants from	Observation-only cohort study (SIBSIGHT); maternal feeding practices assessed at 3, 16,	Use of food to soothe, feeding beliefs and behaviours, structure vs. control-based practices (e.g., pressure, restriction, routines), bottle-feeding practices.	Mothers who received the RP intervention with their firstborn used less contextual and emotional food to soothe, less pressure to finish or

		second-born infants, and to test whether birth spacing moderates these effects.	the INSIGHT RCT with firstborns; second-borns were healthy singletons born ≥36 weeks gestation.	28, and 52 weeks via validated questionnaires (Baby's Basic Needs, Infant Feeding Styles, Structure and Control in Parent Feeding).		soothe with food, and more consistent feeding routines with second-borns at 1 year compared to controls. No differences were found for bottle-feeding practices (e.g., adding cereal, bedtime bottles), restriction, or perceived efficacy of food to soothe. Birth spacing did not moderate intervention effects. Findings suggest RP training with firstborns can positively influence feeding practices with subsequent children.
Shloim et al.(368)	2017 (UK)	To explore the perceptions and experiences of first-time mothers with regard to infant feeding, appetite and weight during the first year of life.	N = 20 first-time mothers from North West England; infants aged 0–12 months. Participants were White British, aged 20–37 years, mostly middle-class, varied feeding methods (breast, formula, mixed).	Qualitative study using in-depth semi-structured interviews; thematic analysis based on Braun and Clarke's method.	Perceptions and practices related to infant feeding, appetite, growth, and weight monitoring.	Mothers relied on infant cues but often doubted their adequacy, especially with formula feeding. Weight gain perceived as a key indicator of successful parenting and infant health. Concerns about under- and overfeeding were common. Health visitors' advice was both helpful and anxiety-inducing. Many mothers reported conflicting feelings—trusting instincts vs. pressure to conform to guidelines. Maternal identity closely

						linked to infant's weight and feeding success.
Taylor et al. (399)	New Zealand (2017)	To determine whether a baby-led approach to complementary feeding BLISS reduces the risk of overweight and improves eating behaviours compared with traditional spoon-feeding.	206 women enrolled during pregnancy and their infants (born at ≥37 weeks' gestation, healthy, without congenital abnormalities affecting feeding or growth) Randomized to BLISS (n=101) or control (n=105)	RCT BLISS group: 8 extra contacts (antenatal to 9 months), including education on delaying solids to 6 months, self-feeding, safe foods, and iron intake Control: usual care (national well-child health program)	Anthropometry measured at 6, 12, and 24 months: BMI z score at 12 and 24 months (primary) Prevalence of overweight/obesity Eating behaviour traits (satiety responsiveness, food fussiness, enjoyment of food)	No significant differences between BLISS and control in BMI z score at 12 months (mean difference −0.11; 95% CI, −0.35 to 0.13) or 24 months (mean difference 0.07; 95% CI, −0.19 to 0.33). Prevalence of overweight/obesity at 12 months: BLISS 8% vs. control 7% (RR 1.09; 95% CI, 0.42–2.83); at 24 months: BLISS 10% vs. control 9% (RR 1.09; 95% CI, 0.46–2.57). No group differences in satiety responsiveness, food fussiness, or enjoyment of food at 12 or 24 months. Conclusion: A baby-led approach to complementary feeding did not reduce BMI or overweight risk compared with traditional spoon-feeding, nor did it improve eating behaviours up to 2 years of age.
Thompson et al. (384)	2021 (USA)	Categorize infant feeding style patterns using LPA, test predictors of	N = 270 African American mothers and their infants from the Mothers and Others Study;	Longitudinal randomized controlled trial with LPA across three time points;	Feeding style profiles (responsive, pressuring, restrictive, indulgent, laissez-faire), breastfeeding status at	Four feeding style profiles were identified across time: Positive, Less Responsive, High Controlling, and High

		profile membership, and examine associations with infant feeding practices and weight outcomes in African American mother–infant dyads participating in a responsive feeding intervention.	randomized to treatment or control groups; infants were full-term, singletons; data collected prenatally and at 3 and 15 months postpartum.	surveys (IFBQ, IFSQ), anthropometric measurements, and feeding assessments using validated tools.	3 months, infant WAZ at 15 months.	Indulgent. The RP intervention increased the likelihood of remaining in or moving into the Positive profile. Mothers in the Positive group were more likely to be breastfeeding at 3 months, and infants in the High Controlling group had higher WAZ at 15 months. Maternal characteristics (age, education, depressive symptoms) and infant temperament predicted profile membership and transitions. Results support early interventions promoting responsive feeding to improve long-term infant growth outcomes.
Ventura et al. (370)	2015 (USA)	To pilot test whether using opaque, weighted bottles—designed to remove visual and weight cues—improves mothers' sensitivity and responsiveness to infant cues and reduces infant formula intake during bottle-feeding, particularly among	N = 25 mothers and their infants (1.6 to 23.8 weeks); healthy, full-term, formula-fed infants.	Within-subject experimental design; infants were fed formula from opaque weighted vs. clear conventional bottles on separate days; intake measured.	Formula intake, feeding duration	Infants consumed significantly less formula from opaque weighted bottles (M = 143.6g) than from clear bottles (M = 156.9g); p = .01. No significant difference in feeding duration. Mothers reported no difference in infant satisfaction between bottle types. Suggests reducing visual/tactile cues may support more responsive bottle-feeding by limiting overfeeding.

		mothers with pressuring feeding styles.				Pilot supports feasibility of larger trials using modified bottle design to reduce overfeeding risk.
Ventura et al. (371)	2024 (USA)	To examine feasibility, adherence, acceptability, and preliminary effectiveness of an intervention in which families received clear vs opaque bottles.	Mothers (N = 76) with young infants (2.9 ± 1.4 months old) Clear group, n = 38 Opaque group, n = 38	A pilot feasibility randomised controlled trial.	The feasibility of recruitment and retention, participant perceptions of study bottles, participant adherence to the intervention, maternal sensitivity to cues, infant intake (mL and mL/kg), and infant weight-for-length z-scores (WLZ).	Opaque bottle use was associated with a significantly lower weight-for-length z-score at follow-up (mean difference 0.47, 95% CI 0.08-0.86, $\eta p^2 = 0.17$), while no significant differences were found for feeding cue responsiveness, milk intake, adherence, or attrition.
Ventura et al. (374)	2017 (USA)	To study individual differences in infants' intake and satiation behaviours during bottle-feeding and assess maternal and infant characteristics that relate to feeding outcomes.	N = 21 mother–infant dyads (infants: 13 girls, 8 boys; avg. age 4.8 months; formula-fed; born full-term; no feeding-interfering conditions). Mothers: avg. age 28 years; 62% non-Hispanic Black.	Within-subject experiment with two feeding conditions: ML vs. infant-led IL; video-recorded feedings; behavioural coding; questionnaires on feeding style and infant temperament.	Formula intake (mL), rate of feeding (mL/min), meal duration, number and latency of satiation behaviours, temperament, MFS.	Infants consumed 42% more formula in ML vs. IL condition (p=0.03). Intake variation (−52.8% to 268.9%) linked to infant age, temperament (less rhythmicity/adaptability, more positive mood), and lower maternal restrictive and responsive feeding. Satiation behaviours consistent across conditions; fewer leaning/arching behaviours in ML vs. IL (p=0.01). Regression model explained 75.4% of intake variation (p=0.0021). Bottle-feeding and responsive

						feeding are not mutually exclusive.
Ventura et al. (376)	2022 (USA)	Assess whether PSE strategies for promoting responsive bottle-feeding within WIC are associated with reduced risk of RWG among infants.	N = 246 mother–infant dyads (124 in PSE clinics, 122 in control clinics); recruited from six WIC clinics in Los Angeles County between May and August 2019; infants <60 days old, full-term, singleton.	Matched-pair cluster randomized trial; PSE clinics implemented tailored responsive bottle-feeding interventions including revised assessments of mothers and infants at 3 and 6 months of age, education materials, and texting; control clinics continued usual care.	4. Neonatal Feeding, RWG (WAZ change >0.67 from birth to 3–6 months), MFS (responsive and pressuring), encouragement of bottle-emptying, breastfeeding and bottle-feeding prevalence, WIC experience (identified through questionnaire)	Infants in PSE clinics had a 64% lower likelihood of RWG than those in control clinics. No significant differences were found in MFS or bottle-emptying encouragement, though pressuring decreased over time in both groups. PSE strategies did not reduce breastfeeding rates and were associated with increased perceived support for bottle-feeding and greater intention to remain in WIC. Findings suggest PSE strategies can effectively promote healthy bottle-feeding without compromising breastfeeding support.
Wasser et al. (422)	2020 (USA)	Test the efficacy of “Mothers & Others,” a home-based responsive feeding and care intervention for non-Hispanic Black (NHB) families, on infant size and growth from birth to 15 months.	N = 430 NHB pregnant women aged 18–39; randomized to obesity prevention (n=214) or injury prevention control (n=214); all English-speaking, recruited at <28 weeks gestation in North Carolina.	Randomized controlled trial; 6 home visits by peer educators from pregnancy to 12 months postpartum, with additional lactation support available; follow-ups at birth, 3, 6, 9, 12, and 15 months.	Infant WAZ, overweight prevalence (WAZ ≥ 2 SD), and trajectory of WAZ across time.	Infants in the intervention group (obesity prevention) had slightly lower WAZ at all time points compared to controls, but differences were not statistically significant. In non-ITT models, infants with higher or lower WAZ at birth showed WAZ changes associated with number of completed

						home visits, but interaction effects were also not significant. The intervention had no significant impact on infant growth, though results suggest potential benefits of peer support. High attrition before 3 months postpartum and systematic differences in length measurements limited analysis of WLZ.
Whitfield and Ventura (369)	2019 (Canada)	Assess maternal responsiveness to infant feeding cues during breastfeeding versus bottle feeding of breast milk using a within-subject design.	N = 9 mother–infant dyads; infants ≤6 months; all mothers were partnered, college-educated, with mean age 33.2 years; recruited from Halifax, Nova Scotia.	Within-subject observational pilot study; video-recorded home feeding sessions (breast and bottle); scored using NCAST Feeding Scale and behavioural coding of infant satiation cues.	NCAST maternal sensitivity scores, number and latency of infant satiation cues, duration of feeding behaviours.	Mothers were significantly more sensitive to infant cues during breastfeeding than bottle feeding ($p = 0.016$). Latency to first satiation cue was longer during breastfeeding (3:00 vs. 0:45 min; $p = 0.038$), but the number of cues and infant responsiveness did not differ. Study highlighted differences in responsive feeding by feeding modality, even with the same milk, suggesting modality influences maternal sensitivity. Findings warrant further study with larger, more diverse samples.
Zhou et al. (385)	2015 (USA)	Understand food-related parenting practices among Chinese immigrants in the	N = 22 Chinese immigrant mothers with preschool-aged children (3–5	Qualitative study using four Mandarin-language focus groups; thematic	Parental feeding practices: both pre-existing (e.g., restriction, child control) and culturally emphasised	Thirteen feeding practice themes were identified: Nine matched existing measures (e.g., restriction for health,

		US using qualitative focus groups.	years); all first-generation immigrants from Mainland China, living in Maryland, average 11 years in the US highly educated.	framework analysis following five stages; emic, meaning-centred approach.	practices (e.g., spoon-feeding, social comparison).	pressure to eat, monitoring, child involvement) and four were culturally specific (regulating routines and food energy, spoon-feeding, using social comparison, and cooking specific foods). Mothers showed a dual approach of granting autonomy and using control, often due to cultural beliefs about nutrition and health. Practices were shaped by both traditional Chinese values and acculturation. Highlights need for culturally appropriate measures and interventions tailored to Chinese immigrant families.

Responsive Parenting (RP); Randomized Controlled Trial (RCT); Baby-Led Weaning (BLW); Mothers using Baby-Led Weaning (M-BLW); Mothers using Traditional Spoon-Feeding (M-TS); Mothers unaware of Baby-Led Weaning (M-NoBLW); Computer-Assisted Web Interview (CAWI); Edinburgh Postnatal Depression Scale (EPDS); Weight-for-Length Z Score (WLZ); Weight-for-Age Z Score (WAZ); Baby-Led Introduction to SolidS (BLISS); Parent-Led Weaning (PLW); Responsiveness to Child Feeding Cues Scale (RCFCS); Odds Ratio (OR); Standard Deviation (SD); Traditional Spoon-Feeding (TSF); Mean Corpuscular Volume (MCV); Red Cell Distribution Width (RDW); Transferrin Saturation (TS); Relative Risk (RR); Confidence Interval (CI); Comprehensive Feeding Practices Questionnaire (CFPQ); Coping with Children's Negative Emotions Scale (CCNES); Mother–Infant Feeding Interaction (MI-FI); Feeding Scale (CFS); Intraclass Correlation Coefficient (ICC); Body Mass Index (BMI); Infant Feeding Style Questionnaire (IFSQ); Infant Feeding Beliefs Questionnaire (IFBQ); Infant Feeding Practices Study II (IFPS II); Year 6 Follow-Up (Y6FU); Maternal Feeding Style (MFS); Child Eating Behaviour (CEB); Rapid Weight Gain (RWG); Standard Deviation Score (SDS); Neonatal Intensive Care Unit (NICU); Infant-Driven Feeding (IDF); Latent Profile Analysis (LPA); Auditory, Tactile, Visual, Vestibular (ATVV); Dyadic Mutuality Code (DMC); Non-Hispanic Black (NHB); Intention-To-Treat (ITT); Cohort for Obesity, Risk, and Lifestyle Study (CORALS); Child Eating Behaviour Questionnaire (CEBQ); Policy, Systems, and Environmental strategies (PSE); Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); Biomarkers Reflecting Inflammation and Nutritional Determinants of Anaemia (BRINDA).

Chapter Nine: Summary table of reviews on bedsharing

Author	Aim	Number of included Studies	Countries of Included Studies	Population	Types of Studies	Key findings
Baddock et al. (427)	To understand the underlying physiology of the risks and benefits of bedsharing.	59	USA, UK, The Netherlands, New Zealand, Brazil, Australia, Germany, Russia, Barbados, China, Ireland, Japan, Sweden, Switzerland, Thailand, plus one multi-country internet-based study (five predominantly Caucasian and 12 predominantly Asian countries).	Healthy infants under two years old bed-sharing with an adult family member or caregiver.	31 cohort studies, 19 case–control, seven cross-sectional, one mixed-methods, and one randomised controlled trial.	Bed-sharing was associated with increased behavioural arousals, warmer in-bed temperatures, and longer breastfeeding duration. Differences were found in infant sleep architecture, cardiorespiratory control, and cortisol responses compared to cot-sleeping. Objective and subjective studies showed that many effects are context-specific and influenced by parental and cultural values. No consistent evidence of increased SIDS risk when bed-sharing in the absence of smoking or alcohol consumption. Breastfeeding duration and frequency were consistently higher among bed-sharing infants. Bed-sharing infants had higher peripheral temperatures and more frequent arousals. Some physiological differences (e.g., increased heart rate, desaturation events) occurred but were generally within normal infant ranges. Potential risks included impaired maternal or infant responsiveness (e.g., due to smoking, alcohol, drugs, illness) and increased head covering events.
Barry and D'Souza (449)	To determine whether there is a predictive relationship between maternal	14	USA, Australia, Barbados, Canada, Israel, UK, and one study including participants from 59 countries.	Mothers reporting on their infants (aged up to 24 months; one study included preterm and	7 longitudinal studies and 7 cross-sectional studies.	Five studies showed no relationship between ISL and MDS; one found bedsharing reduced MDS; five found cosleeping related to higher MDS (with mixed or unclear directionality); and three found associations only for some ages or populations. Variations in study

	depressive symptoms (MDS) and infant sleep location (ISL).			full-term infants).		design, definitions, and measures prevented consistent conclusions.
Barry and McKenna (436)	To highlight the scientific evidence behind the reasons mothers, give for their decision to bedshare, focusing on how mothers' decisions about infant sleep location influence infant behavior and development.	NR	USA, UK, Japan, China, Italy, New Zealand, and others	Mothers and infants; focus on mother-infant dyads.	Narrative review including studies from anthropology, pediatrics, sociology, social work, public health, medicine, neurobiology, epigenetics, family studies, and psychology.	Bedsharing is linked with longer breastfeeding duration, increased maternal-infant contact, reduced infant crying, improved attachment security, and physiological synchrony between mother and infant. The review argues that when practiced under safe conditions, bedsharing confers developmental, emotional, and physiological benefits for infants and mothers, and that blanket recommendations against it ignore these benefits and the cultural and biological motivations for bedsharing.
Dixley and Ball (442)	To investigate the effect of swaddling on the sleep of infants up to 1 year of age using a narrative synthesis approach.	6	NR	Infants under 12 months of age (excluding premature infants).	1 randomized controlled trial, 3 quasi-experimental studies, and 2 self-report (qualitative) studies.	Swaddling was associated with increased duration of quiet sleep and reduced number of sleep state changes among infants naïve to the intervention. No consistent outcomes were found among routinely swaddled infants. Results varied due to differences in study design, environment (home vs. lab), feeding method, and swaddle technique. The review concluded that swaddling may increase risk of SUDI in swaddle-naïve infants by producing conditions unfavourable to arousability.

Dixley and Ball (443)	To critically examine research conducted on the impact of swaddling upon breastfeeding.	NR	NR	Breastfeeding babies and their mothers (discussion focuses on healthy full-term infants; effects for premature/tube-fed infants unknown).	NR	Swaddling immediately after birth is linked to delayed initiation of breastfeeding, less successful suckling, reduced breast-milk intake, and greater neonatal weight loss; swaddling obscures feeding cues and reduces crying, leading to fewer feeds that may impede maternal milk production and infant growth; some trials frame swaddling as a weight-regulation tool, but evidence is insufficient for robust recommendations and there is potential to undermine breastfeeding; further studies directly examining swaddling's impact on breastfeeding and lactation are needed.
Kruse et al. (435)	To examine and synthesize the available literature on the attitudes about parent–child co-sleeping that people encounter, their origins, and their effects on parents' own attitudes and behaviours.	33	Mostly Western countries (including USA, UK, Australia, Canada, Norway, New Zealand, and several others).	Parents or caregivers (mainly mothers); some studies also included pregnant women, healthcare professionals, or mixed populations.	23 qualitative, 7 quantitative, and 3 mixed-methods studies.	Parents and caregivers encountered attitudes toward co-sleeping from healthcare professionals, extended family, cultural traditions, friends, partners, literature, and media. Encouraging attitudes (mostly from family and culture) promoted co-sleeping and feelings of confidence, while discouraging attitudes (mostly from healthcare professionals) often led to avoidance, concealment, or conflict. The review highlighted inconsistent definitions of co-sleeping, predominance of discouraging attitudes in Western contexts, and a need for clearer distinctions and culturally sensitive approaches to sleep guidance.
Manková et al. (447)	To map the relationship between infant feeding method and	35	Mainly from the USA, Israel, and China; others not specified.	Infants up to 12 months of age without health problems, and their mothers without	Quantitative studies including 17 cross-sectional, 10 longitudinal, 6 cohort, and 2	Most studies agreed that breastfed infants wake more often at night. Total sleep time and WASO did not differ between breastfed and non-breastfed infants or their mothers. No difference in maternal sleep quality was observed.

	total sleep time (TST), number of nocturnal awakenings, awakenings after sleep onset (WASO) of mothers and infants, and sleep quality of mothers.			psychiatric or health conditions.	prospective designs.	Differences in results were influenced by measurement methods, study design, and infant age. Night waking is a complex behaviour not solely explained by feeding method.
Mileva-Seitz et al. (428)	To integrate and critically review the extensive literature on parent–child bed-sharing, examining its prevalence, correlates, and purported risks and benefits, and to identify conceptual and methodological gaps.	659	45 countries from low-, middle- and high-income countries	Children under 18 years (mostly infants) and their parents.	Original research, meta-analyses, and reviews	Bed-sharing prevalence varied widely higher in African and Asian countries and lower in Western nations. Reasons for bed-sharing included tradition, breastfeeding facilitation, convenience, and infant sleep problems. Distinction between **intentional** and **reactive** bed-sharing was often absent but critical for interpretation. Evidence suggested bed-sharing promotes breastfeeding but may be associated with sleep problems and maternal depressive symptoms, though causality is unclear. Cultural context strongly influenced practices and interpretations. Physiological, cognitive, behavioural, and health outcomes showed mixed or inconclusive findings. Risks such as SIDS and infection lacked consistent evidence; confounding factors (e.g., smoking, alcohol, sleep surface) were key. Overall, the literature was methodologically limited, inconsistent, and biased toward Western contexts. Authors call for interdisciplinary collaboration (“psychoanthropediatrics”)

						to better understand how parent–infant proximity affects development.
Thompson et al. (437)	To assess the associations between duration of breastfeeding and risk of sudden infant death syndrome (SIDS) using individual participant data from international studies.	8	New Zealand, USA, Germany, Scotland, Ireland, England, and 20 European regions (ECAS study).	Infants included in case-control SIDS studies; controls were age- and region-matched infants.	8 case-control studies (individual participant data meta-analysis).	Breastfeeding for less than 2 months was not protective against SIDS (aOR 0.91; 95% CI 0.68–1.21). Breastfeeding for 2–4 months halved the risk (aOR 0.60; 95% CI 0.44–0.82), with further protection at 4–6 months (aOR 0.40; 95% CI 0.26–0.63) and 6+ months (aOR 0.36; 95% CI 0.22–0.61). Exclusive breastfeeding showed similar trends, with ≥2 months needed for protection. Exclusive breastfeeding did not provide greater protection than partial breastfeeding. Protective effects were robust after adjusting for confounders. Authors concluded that breastfeeding for at least 2 months reduces SIDS risk by approximately half, regardless of exclusivity.
Ward, (432)	To systematically review the international literature on reasons parents' bed-share, the cultural context of bed-sharing, and implications for interventions and future research.	34	USA, Canada, Europe, Australia, New Zealand, and other regions.	Parents of infants ≤12 months; studies included both qualitative and quantitative designs.	Qualitative and quantitative studies	Parents bed-share for multiple, interrelated reasons, primarily to facilitate breastfeeding, provide comfort to the infant, promote bonding, monitor the baby, improve maternal or infant sleep, and respond to crying. Additional motives included environmental or practical reasons (e.g., limited space, warmth, protection, or lack of a crib), cultural or familial traditions, disagreement with danger messages, and a belief that bed-sharing is natural or instinctive.

Not Reported (NR); Sudden Infant Death Syndrome (SIDS); Maternal Depressive Symptoms (MDS); Infant Sleep Location (ISL); Sudden Unexpected Death in Infancy (SUDI); Total Sleep Time (TST); Wake After Sleep Onset (WASO); Adjusted Odds Ratio (aOR); Confidence Interval (CI); European Concerted Action on SIDS (ECAS).

Chapter Nine: Summary table of empirical studies on bedsharing

Author	Year (Country)	Aim	Number of Participants and Characteristics	Methods	Outcome Measures	Key Findings
Ball et al. (430)	2016 (UK)	To explore the link between breastfeeding duration and bed-sharing frequency among women reporting a prenatal intention to breastfeed.	N=870 mothers recruited at mid-pregnancy in northeast England; mean maternal age 31.43 years (SD 5.51); 91% White; 54% had university-level education; 47% were primiparous; 25% had cesarean delivery; 83% initiated breastfeeding; all had prenatal intention to breastfeed.	Secondary analysis of data from a randomized controlled on infant sleep location and breastfeeding. Participants reported weekly on breastfeeding and bed-sharing behavior for 26 weeks via an automated telephone system. Bed-sharing patterns were classified based on frequency across six 4-week blocks.	Frequency of bed-sharing (≥1 hour per week at home), time to cessation of any breastfeeding, and time to cessation of exclusive breastfeeding.	Of 678 mothers with complete data, 44% rarely/never bed-shared, 28% intermittently, and 28% often. Frequent bed-sharers were more likely to report strong prenatal breastfeeding intent and to value breastfeeding as highly important. No significant differences were found across groups in marital status, income, infant gestational age, maternal age, or delivery mode. Median breastfeeding duration was 14 weeks (rarely), 24 weeks (intermittently), and over 26 weeks (often). Exclusive breastfeeding lasted 3, 5, and 10 weeks respectively ($p<0.0001$). Women who bed-shared frequently were significantly more likely to continue breastfeeding at six months.
Ball et al.(451)	2020 (UK)	To develop and evaluate 'Sleep, Baby & You', an intervention supporting parental well-being and responsive infant caregiving.	N=164 practitioners (health visitors, community workers, clinical staff, peer supporters, and others) field-tested the	Mixed-methods approach including stakeholder consultations, iterative intervention design, practitioner training, and qualitative and quantitative feedback collection via online surveys and telephone interviews.	Practitioner and parent feedback on the usefulness, clarity, and acceptability of the 'Sleep, Baby & You' discussion tool (a 14-page illustrated booklet).	Practitioners found the materials easy to explain, aligned with responsive parenting, and useful for addressing parental fatigue and sleep concerns. Parents reported improved understanding of normal infant sleep and reduced

			intervention with at least 535 parents and babies across five UK locations; initial stakeholder meetings involved 15 practitioners and 6 parents.			stress. Seventy percent of parents sustained behavioural changes for at least two weeks. No harms were reported.
Blair et al. (439)	2014 (UK)	To quantify whether there is a risk of sudden infant death syndrome (SIDS) associated with co-sleeping in the absence of known hazards and explore interactions with other significant predictors of SIDS.	N=400 SIDS infants and 1386 controls from two population-based case-control studies in England (1993–1996 and 2003–2006).	Combined individual-level analysis of two case-control studies using questionnaires, interviews, and medical record data. Logistic regression was used to estimate univariable and multivariable odds ratios adjusted for infant, maternal, and sleep-related variables.	Occurrence of SIDS in relation to different co-sleeping environments: sofa-sharing, bed-sharing with alcohol use, bed-sharing with smokers, and bed-sharing without hazards.	Co-sleeping prevalence: 36% of SIDS cases vs 15% of controls were co-sleeping at time of death/interview. Risk estimates (multivariable): Sofa-sharing: OR = 18.3 (95% CI 7.1–47.4). Bed-sharing with alcohol use: OR = 18.3 (95% CI 7.7–43.5). Bed-sharing with smokers: OR = 4.0 (95% CI 2.4–6.8). Bed-sharing without these hazards: OR = 1.1 (95% CI 0.6–2.0) — NS. Age interaction: Infants <3 months: OR = 1.6 (95% CI 0.96–2.7), NS. Infants ≥3 months: OR = 0.1 (95% CI 0.01–0.5), indicating a protective association. Other interactions: Dummy use was strongly protective among co-sleepers (OR = 0.3, 95% CI 0.2–0.5). Prone sleeping increased risk only among infants sleeping alone, not among co-sleepers. Preterm infants who co-slept had a higher OR (7.0 vs 3.9 in

						non-co-sleepers), though this interaction was not statistically significant. Including “sleeping in a separate room” in the model increased the ORs for co-sleeping but did not alter the non-significant effect of bed-sharing without hazards. Sensitivity analysis: No evidence that bed-sharing without hazards independently increased SIDS risk once confounders were controlled for.
Brown & Harries ((448)	2015 (UK)	To assess infants' typical night wakings and night feeds alongside any breastfeeding and frequency of solid meals.	N= 715 mothers with an infant 6–12 months of age	Cross-sectional survey study design	Self-report data including infant milk feeding, solid food introduction, nighttime feeding/sleeping habits, and demographic information	Night waking was common at 6–12 months and did not differ between breastfed and formula-fed infants. Greater daytime milk/solid intake was associated with fewer night feeds, but not fewer night wakings.
Chénier-Leduc et al (450)	2022 (Canada)	To compare parental attitudes regarding sleeping arrangements between mothers and fathers and to explore associations between sleeping arrangements, the discrepancy between expected and actual sleeping arrangements, and depressive	N=92 parents (82 participants) of 6-month-old infants.	Quantitative study; home visits with self-administered questionnaires.	Infant sleeping arrangements (solitary, room sharing, bedsharing), discrepancy between expected and actual sleeping arrangements, parental attitudes toward co-sleeping, and depressive symptoms (CES-D).	Mothers were more favourable toward co-sleeping than fathers. Actual sleeping arrangement was not associated with depressive symptoms. Greater discrepancy between expected and actual sleeping arrangements was associated with more depressive symptoms for both mothers and fathers. Lower paternal education and more children were linked with fewer paternal depressive symptoms. Parental attitudes

		symptoms in both parents.				toward co-sleeping were not significantly associated with depressive symptoms.
Cole et al. (445)	2020 (Australia)	To describe contemporary infant care practices and adherence to national “Safe Sleeping” messages among families.	N = 3,341 caregivers of infants aged ~3 months, sampled via birth registry.	Cross-sectional postal and online survey.	Infant sleep position, environment, room sharing, breastfeeding, smoke exposure, adherence to national safe sleep messages.	Only 13 % of families practised all six national recommendations. 34 % had used a non-supine sleep position at some time. 38 % used potentially hazardous sleep environments with soft or bulky items. Nearly half used non-recommended sleep surfaces for day or night sleeps. 84 % were smoke free before and after birth. Room sharing at night was reported by 75 % of families. 17 % of infants were no longer receiving breastmilk at 8 weeks.

Huber et al. (446)	2024 (UK)	To examine parental perspectives on the implementation and impact of the Sleep, Baby & You (SBY) intervention across multiple local authorities in England.	N=321 parents (92% mothers) with infants aged 0–18 months who received SBY support through 13 English local authorities.	Mixed-methods process evaluation including online surveys (quantitative) and open-text qualitative responses. Quantitative data analysed descriptively; qualitative data analysed thematically.	Parental feedback on perceived usefulness, timing, delivery format, and impact of the SBY intervention on understanding of infant sleep and coping with fatigue.	Eighty-five percent of parents rated SBY as useful or very useful; 88% felt it helped them better understand infant sleep; 82% reported improved coping with tiredness. Parents valued normalising information about infant sleep and appreciated the reassurance that waking was typical. Some preferred receiving information earlier, during pregnancy. Online delivery was acceptable but less personal than in-person discussions. SBY was considered practical, supportive, and beneficial for parental well-being and responsive caregiving.

Landa-Rivera et al. (440)	2022 (Spain)	To explore breastfeeding and bed-sharing practices in the study population and their relationship with risk factors for SIDS.	N=285 Healthy mother–child dyads registered in the Marina Baixa Health Area, Alicante. Children younger than 2 years. Inclusion required single delivery and no health conditions preventing breastfeeding.	Cross-sectional observational study using an anonymous telephone survey	Breastfeeding (with or without formula supplementation). Bed-sharing (overall, usual, occasional). Infant sleeping position (supine, prone, side). Parental tobacco and alcohol use. Use of pacifiers. Association between these factors and SIDS risk factors.	Breastfeeding rate: 47.0% (35.4% breastfed without formula, 41.4% formula only). Bed-sharing: 66.3% overall; higher among breastfeeding mothers (OR = 7.72; 95% CI 3.75–15.9). Infants <6 months: breastfeeding rate 73.9% among those bed-sharing vs. 33.3% among those not bed-sharing ($p < 0.001$). Sleeping position: Prone position was less common among breastfed infants (3.5%) than formula-fed infants (5.8%). Risk factors: Lower frequencies of maternal smoking, alcohol use, non-supine sleeping positions, and pacifier use were observed among breastfeeding and bed-sharing families. Protective factor: Babies sleeping supine were 4.4 times more likely to be breastfed. Negative associations: Maternal smoking was negatively associated with bed-sharing (OR = 0.19, 95% CI 0.04–0.92); nighttime pacifier use and prone sleeping position were negatively associated with breastfeeding.

Lau and Hall (434)	2016 (Canada)	To explore Canadian mothers' experiences with infant sleep safety.	N=14 mothers 93% breastfeeding, middle-class households.	Inductive qualitative descriptive study with some grounded theory elements. Semi-structured face-to-face interviews (60 minutes each) were conducted between December 2012 and July 2013. Data were analysed using concurrent data collection and constant comparative analysis to develop themes.	Mothers' experiences and perceptions regarding infant sleep safety and their adherence to safe sleep recommendations.	The core theme "Infant Sleep Safety Cycle" described a cyclical process encompassing prenatal to six months postpartum, including expectations of sleep safety, struggles with reality, modifications of expectations, rationale for choices, and shifts in views of infants' developmental capabilities. Four factors influenced mothers' experiences: perceptions of everyone's needs, familial influences, judgments from outsiders, and resource availability. Mothers often reframed safety guidelines, downplayed SIDS risk, and adjusted practices to meet family needs. They felt overwhelmed by information, frustrated by inconsistent advice, and reluctant to disclose unsafe practices to healthcare providers.
Lerner et al. (454)	2020 (USA)	To examine the links between mother-infant bed-sharing practices at 3 months and infant affect and behavior during a dyadic challenge task at 6 months, and to test whether nighttime mother-infant contact mediates these associations.	N=63 African American mother-infant dyads (34 male, 29 female) from the Triangle area of North Carolina; infants aged 3 and 6 months; 89% born at term; 33% mothers held a college degree;	Observational study using home-based video recordings (videosomnography) to classify bed-sharing practices and laboratory-based Still-Face Paradigm (SFP) at 6 months. Regression and path analyses controlling for maternal education, breastfeeding, infant gender,	Infant affect (positive and negative), gaze, and self-regulation during the still-face and reunion episodes of the SFP; nighttime mother-infant close and casual contact as potential mediators.	Infants who bed-shared (fully or partially) at 3 months displayed significantly greater self-regulatory behaviors during the still-face episode at 6 months compared to non-bed-sharers. Full bed-sharers showed significantly less negativity during the reunion episode, and trends toward greater gaze toward mothers during the still-face episode. Nighttime mother-infant

			51% breastfed at 3 months.	prematurity, temperament, and concurrent bed-sharing.		contact did not mediate these associations. Findings suggest early bed-sharing may be linked to enhanced infant emotional regulation and less negativity during mother-infant interaction. No significant associations were found for positive affect, and mediation analyses indicated that nighttime mother-infant contact did not explain the observed effects.
Little et al. (431)	2018 (USA)	To test whether mother–infant physical contact predicts feeding in response to early hunger cues versus feeding on a schedule or after signs of distress among US breastfeeding mothers.	N=626 (Study 1) USA breastfeeding mothers of infants 0–24 months; N=96 (Study 2) breastfeeding mothers logging ≥12 feeds over 3 days with infants 0–12 months.	Online questionnaire (Study 1) on proximal care practices (babywearing, co-sleeping), beliefs, and feeding philosophy; three-day feeding log (Study 2) recording pre-feed contact (physical, visual, none) and reason for feeding; analyses used logistic and mixed-effects regressions controlling for demographics and beliefs.	Responsive feeding (on-demand) vs scheduled/mixed; exclusive breastfeeding (first 6 months); breastfeeding frequency (feeds/day); planned breastfeeding duration (months); proportion of feeds for early cues vs distress; infant-led vs mother-led non-hunger reasons.	Mothers who both babywore and co-slept were more likely to report responsive feeding; responsive feeding was associated with higher likelihood of exclusive breastfeeding in the first six months, more daily feeds, and longer planned breastfeeding duration; in feeding logs, physical contact—but not visual proximity—predicted initiating feeds for early hunger cues rather than distress and for infant-led (comfort) rather than mother-led (schedule) reasons.
Mileva-Seitz et al. (452)	2016 (The Netherlands)	To test whether mother–infant bed-sharing is associated with increased secure infant–mother attachment.	N=550 Caucasian mothers from a population-based cohort (Generation R Study, Rotterdam).	Questionnaires at 2 months assessed frequency of bed-sharing and nighttime comforting measures; infant–mother attachment was assessed with the Strange Situation Procedure at 14 months.	Bed-sharing frequency (never vs. any; and trichotomous frequency) and types of maternal comforting behaviors were measured. Attachment security was measured categorically	Solitary sleeping at 2 months was associated with greater odds of insecure attachment (adjusted OR=1.50, 95% CI=1.02–2.20), especially resistant attachment (adjusted OR=1.74, 95% CI=1.10–2.76), and with lower attachment security score

					(secure/insecure) and continuously (Richters score).	(β=−0.12, p=.009). No dose–response association was found when using bed-sharing frequency. Findings suggest some evidence that solitary sleeping is associated with insecure attachment, but further experimental studies are needed before drawing conclusions.
Mitchell et al. (453)	2015 (New Zealand)	To evaluate the association between bed-sharing and maternal–infant bonding.	N=172 mothers (43% response rate) of infants aged 6 weeks to 4 months.	Cross-sectional postal questionnaire including sleep practices and the Postpartum Bonding Questionnaire (PBQ; factors 1 and 2).	Bed-sharing practices (“last night,” “usually,” “last 2 weeks”) and PBQ factor 1 (impaired bonding) and factor 2 (rejection and anger) scores.	Infants of mothers scoring above the PBQ factor 1 cut-off (9%) were more likely to have bed-shared last night, usually, and in the past 2 weeks; bed-sharing mothers scored higher on PBQ items such as feeling annoyed or irritated by the baby. No mothers scored above the cut-off for PBQ factor 2, although bed-sharers had higher mean scores on several PBQ factor 2 items.
Rudzik & Ball (438)	2016 (UK)	To investigate women’s understandings of the nature of infant sleep and their perceptions of links between infant feeding method and sleep, and to explore how these perceptions influence infant feeding and sleep practices.	N=39; seven focus groups with mothers of infants under one year old from two UK regions (North East and East Midlands), including young mothers, breastfeeding support groups, and mother–baby groups.	Qualitative focus group study using semi-structured discussions; transcripts were thematically coded and analyzed through an interpretative, experience-near approach.	Perceptions of infant sleep and feeding; strategies used to manage infant and maternal sleep.	Breastfeeding mothers viewed fragmented infant sleep as natural and adopted flexible, cue-based caregiving and bed-sharing to maximize sleep. Formula-feeding mothers perceived fragmented sleep as a problem and prioritized routines and “cry-it-out” methods to restore pre-baby sleep patterns. Two contrasting narratives emerged: breastfeeding mothers favoured a

						“biologically natural” infant-led approach, while formula-feeding mothers favoured a “societally normative” routine-based approach. Maternal perceptions of infant sleep influenced feeding and sleep practices in the first year of life.
Salm Ward (433)	2023 (USA)	To gain a more in-depth understanding of decision-making around infant sleep practices, and barriers and facilitators to adopting safe infant sleep recommendations.	N=22 families (20 mothers and 2 mother–father dyads) of infants under 6 months.	Qualitative prospective study using semi-structured in-home interviews; transcripts analyzed through inductive thematic analysis.	Infant sleep practices (surface, location, position), intentions, and maternal decision-making.	Six themes emerged: (1) Plans changed when baby came — many mothers changed intended sleep practices after birth; (2) Trying things to figure out what works — decisions guided by infant preferences; (3) Safety concerns — influenced surface and position choices; (4) What’s comfortable for me — maternal preferences and instincts shaped sleep arrangements; (5) They say… — external advice considered but not always followed; (6) Trying to be careful — mothers used strategies to reduce perceived risks, some increasing actual risk. Knowledge alone was insufficient for adherence; decision-making was dynamic and ongoing, influenced by multiple interacting factors.
Tully & Ball (444)	2012 (UK)	To test the effect of side-car bassinets (3-sided bassinets attached to the maternal bed) on	N=35 mother–infant dyads (20 allocated to side-car, 15 to stand-alone);	Randomized controlled trial; mothers prenatally allocated to side-car or stand-alone bassinets; second postpartum night interactions	Infant location, breastfeeding frequency and effort, maternal-infant contact, sleep states,	Median breastfeeding frequency was 0.6 bouts/hour for side-car vs. 0.4 bouts/hour for stand-alone groups (p = 0.09). Mothers expressed

		breastfeeding frequency and other maternal–infant behaviors compared to stand-alone bassinets following cesarean birth.	nonsmoking mothers of healthy, term singletons who initiated breastfeeding after nonlabour cesarean birth at a tertiary hospital in northeastern England.	were filmed (4–8 hours); pre- and post-filming interviews conducted; data analyzed via intention-to-treat and nonparametric tests.	midwife presence, bassinet acceptability, and infant risk.	preference for side-cars, describing them as facilitating access, closeness, and breastfeeding; stand-alone bassinets were viewed as awkward and painful to use. More infant risks—including pillow use during bed-sharing and unsafe handling—were observed in the stand-alone group ($p = 0.009$ and $p = 0.003$, respectively).
Standard Deviation (SD); Sudden Infant Death Syndrome (SIDS); Odds Ratio (OR); Confidence Interval (CI); Not Significant (NS); Centre for Epidemiologic Studies Depression Scale (CES-D); Sleep, Baby & You (SBY); Still-Face Paradigm (SFP); Postpartum Bonding Questionnaire (PBQ); Postpartum Bonding Questionnaire factor 1 – Impaired Bonding (PBQ factor 1); Postpartum Bonding Questionnaire factor 2 – Rejection and Anger (PBQ factor 2).						

Chapter Ten: Summary table of reviews on neonatal care

Author	Aim	Number of Included Studies	Countries of Included Studies	Population	Types of Studies	Key Findings
Adama et al. (2022) (499)	To explore the current available evidence to describe and understand the support needs of parents of infants in the NICU.	24	Jordan, Sweden, Canada, Germany, Ireland, Vietnam, Australia, France, Norway, Iran, Netherlands, Denmark, China, Singapore, Spain, UK, USA, Lithuania	Parents of infants admitted to the NICU	15 qualitative studies (Phenomenology; qualitative interview; focus group discussion; qualitative descriptive; interpretive description; qualitative survey; semi-structured interviews (various forms) 8 quantitative studies (Cross-sectional survey; descriptive cross-sectional; prospective cohort; exploratory survey; descriptive correlational) and 1 mixed methods.	Six core support needs of parents with infants in the NICU: clear and consistent informational support, emotionally intelligent staff who communicate with empathy, practical hands-on support to build caregiving confidence, targeted support acknowledging the distinct needs of mothers and fathers, substantial emotional and psychological support including reassurance and respect, and practical/infrastructural needs such as family-friendly facilities and opportunities for peer support.
Ahlqvist-Björkroth et al. (2025) (466)	To describe the content of the Close Collaboration with Parents program, its implementation, and research on its effectiveness	7	Finland	Neonatal intensive care unit staff, parents, and preterm infants involved in units implementing the Close Collaboration with Parents program.	3 Pre–post studies,1 qualitative studies, and 2 historical cohort studies, 1 mixed method	The program improved family-centred care practices, increased parents' presence and parent–infant skin-to-skin contact, improved infant growth and shortened hospital stays, and reduced mothers' long-term depressive symptoms.

Allen et al. (2021) (480)	To identify the effects of avoiding bottle feeds during establishment of breastfeeding on the likelihood of successful breastfeeding, and to assess the safety of alternatives to bottle feeds.	7	Australia, Brazil, England, Turkey, USA.	Preterm infants (<37 weeks' gestation) whose mothers planned to breastfeed	7 RCTs	Avoiding bottles may increase full breastfeeding at discharge and probably increases any breastfeeding at discharge. It likely increases full breastfeeding at 3 months and may increase full breastfeeding at 6 months post-discharge. Most benefit seen with cup feeding. No clear differences found for length of hospital stay, weight gain, or infection.
Alves et al. (2013) (463)	To analyse and summarise what is known about parents' views on factors that help or hinder breast milk supply during infants' hospitalisation NICU.	7	Sweden (2), USA (2), England (1); two studies did not report country.	Parents (primarily mothers; fathers included in one study) of infants hospitalised in NICU	5 qualitative descriptive studies, 2 mixed-methods and 1 cross-sectional	Successful breast milk supply depends on accurate knowledge of techniques and benefits, reinforcement of mothers' motivation, and alignment between NICU routines and parents' needs. Parents identified their own breastfeeding experience as both a main facilitator and barrier; parents–professionals relationships were the second group of facilitators but the fourth group of barriers; NICU characteristics were more relevant as barriers than facilitators

Barnes et al. (2024) (472)	To examine the effectiveness and family experiences of interventions promoting partnerships between families and the multidisciplinary health care team in paediatric and neonatal intensive care units.	48	Multiple countries (21 countries represented)	Families (parents and other defined family members) of infants or children hospitalised in NICU or PICU.	19 RCTs, 23 quasi-experimental studies 6 qualitative studies	Partnership interventions showed improvements in parental anxiety, stress, and satisfaction with family-centred care, with no conclusive effects on attachment or depression. Qualitative findings indicated that partnership interventions improved family experience and caregiving capacity, while ICU hospitalisation had significant emotional impact.
Bedroni et al. (2023) (519)	To address whether it is beneficial for preterm infants to experience the first oral nutritive experience as direct breastfeeding and whether this impacts long-term exclusive breastfeeding.	11	Not reported	Medically stable preterm infants (<35 weeks gestation) in neonatal intensive care units.	2 retrospective, 1 prospective longitudinal, 2 RCTs, 1 descriptive cross-sectional, 1 quality improvement project, 1 quasi-experimental, 2 clinical practice guidelines, 1 meta-analysis.	Medically stable infants begin oral feeding only when the infant is stable, typically indicated by steady heart rate, breathing, and oxygen saturation. SSC: Supports early breastfeeding, stabilises vitals, boosts milk supply, and reduces maternal-infant stress. Direct breastfeeding lowers contamination risk, maintains physiological stability, supports exclusivity, and benefits long-term health. NNS, particularly on an empty breast, improves exclusive breastfeeding at discharge and eases transition from gavage to oral feeds.

						Feeding based on readiness cues, not volume goals, speeds oral feeding progression and lowers stress; tools like the Infant Driven Scale aid assessment. SSC, NNS, and cue-based feeding enhance weight gain and growth in preterm infants
Carpay et al. (2021) (490)	To identify barriers and facilitators to breastfeeding in moderate and late preterm infants (MLPIs) and to evaluate interventions (such as education, parental support, skin-to-skin care, and cup feeding) aimed at improving breastfeeding initiation, duration, and exclusivity in this population.	17	Egypt, Brazil, Turkey, Spain, US, Sweden, Italy, Ireland, France, UK	Preterm infants and their mothers during hospitalisation in neonatal intensive care units.	9 Cohort studies, 2 cross-sectional, 4 RCTs, 2 Non-RCT	Barriers: Infant immaturity (weak suck, fatigue), medical complications, maternal stress/lack of confidence, inconsistent professional support.

Cartwright et al. (2017) (481)	To synthesise evidence on the barriers and enablers of breastfeeding in late preterm infants (34–36 weeks gestation) and identify interventions that support breastfeeding in this group.	13	US, Norway, Turkey, Sweden, Finland, India.	Late preterm infants and their mothers during the early postnatal period and hospitalisation.	Mixed designs – qualitative studies, observational studies, randomised controlled trials, retrospective studies, prospective cohort studies (numbers not specified for each type).	Breastfeeding interventions for late preterm infants generally improved exclusivity and duration, with strongest evidence for skin-to-skin care, rooming-in, and targeted education. Skin-to-skin enhanced stability, feeding cues, and milk production; rooming-in built maternal confidence and cue recognition; education increased initiation and continuation. Second-line strategies like cup feeding supported transition to exclusivity, while nipple shields had mixed or negative effects; overall, these strategies had inconsistent exclusivity benefits but often prolonged duration. Combining interventions yielded mixed results, and post-discharge support was rarely studied.
Chen et al.(2024) (529)	To assess and provide a qualitative synthesis of available literature reporting the effects of donor human milk (DHM) vs. mother's own milk (MOM) on gut microbiota composition in preterm infants	8	Spain, USA, Canada, Portugal	Preterm infants born <37 weeks gestation	7 Prospective observational cohort studies.1 Randomised, controlled, open-label trial	DHM-fed infants showed lower or unchanged alpha diversity, with consistent beta-diversity separation from MOM from ~day 10. DHM was associated with higher Staphylococcaceae and Clostridiaceae, and lower Bifidobacterium and Bacteroidetes. Some studies noted altered faecal metabolites

						(↑propionate, ↓acetate) and higher calprotectin, and one study reported poorer growth and higher composite morbidity compared with MOM.
Chen et al. (2025) (474)	To assess the impact of family-integrated care on preterm infants and inform neonatal clinical practices.	13	Mainly China and Canada (reported in limitations).	Preterm infants (<37 weeks gestation).	13 RCTs	Family-integrated care significantly increased breastfeeding rates, promoted greater weight gain, and extended sleep duration in preterm infants. It also reduced one-month readmission rates. Across 13 RCTs (n=3,005), benefits were consistent despite heterogeneity in interventions, indicating that structured parent participation in NICU care improves feeding, growth, and early post-discharge outcomes.
Ding et al. (2019) (473)	To systematically review English and Chinese randomised controlled trials evaluating the effects of family-centred care interventions on preterm infants' and parental outcomes in NICUs and to	19	USA, UK, Sweden, Taiwan, Denmark, Iran, India, Canada, Australia, New Zealand, China	Preterm infants ≤37 weeks gestational age and their parents.	19 RCTs	Across 19 RCTs, family-centred care interventions improved preterm infants' outcomes—showing higher daily weight gain and significantly reduced readmission rates. Parent-reported outcomes also improved, including substantially higher satisfaction and marked increases in parental skills

	conduct a meta-analysis.					and knowledge. Follow-up data indicated reductions in parental anxiety, depression, and stress. No significant effects were found for neurobehavioral development or length of stay
Flacking et al. (2021) (538)	To summarise the evidence on interventions promoting parent–infant closeness and their effects on parents and infants in neonatal units.	14	Sweden, Norway, Finland, Canada, US, England	Parents (mainly mothers) and their preterm or sick newborns hospitalised in neonatal units.	14 qualitative studies	Attunement (a positive breastfeeding experience) was supported by trusting the body's capacity, believing in breast milk's benefits, feeling comfortable holding the infant, relaxation, reassurance, and mutual positive responses. Facilitators included skin-to-skin contact, privacy, cue-based feeding, and skilled, respectful, individualised support from staff and peers. The findings highlight breastfeeding as both a physical and emotional process, with care environments and practices playing a crucial role in enabling enjoyable, confidence-building experiences

Fry et al. (2018) (521)	To examine and synthesise the outcomes of quality improvement initiatives related to cue-based feeding of preterm infants.	7	United States (5) and Canada (2)	Preterm infants in NICU settings; some studies included infants with bronchopulmonary dysplasia or complex surgical anomalies	7 Quality improvement (QI) initiatives using retrospective baseline data and implementation of cue-based feeding protocols/algorithms	Across seven QI initiatives, cue-based feeding was associated with improved outcomes: five studies reported reduced hospital length of stay, two noted increased weight gain or weight-gain velocity, and most showed earlier attainment of full oral feedings. Multidisciplinary teams and feeding 'champions' were common facilitators, and parent education was frequently incorporated.
Hard et al. (2019) (530)	To examine differences in the composition of raw maternal breastmilk and pasteurised donor milk and possible health effects on preterm infants.	Not reported	Not stated	Preterm infants (very preterm / extremely preterm).	Not stated. Paper is a non-systematic review	Raw maternal milk contains numerous bioactive components reduced or abolished in pasteurised donor milk; maternal milk associated with reduced NEC and other morbidities and promotes growth and neurodevelopment; donor milk reduces NEC compared with formula but is inferior to maternal milk in supporting growth and development of very preterm infants

Hilditch et al. (2024) (478)	Systematically review evidence regarding effects of interventions undertaken in neonatal units to increase breastfeeding in preterm infants	7	Conducted in a wide range of countries, most high or middle income	Preterm infants (<37 weeks' gestation) and/or low birthweight infants (<2,500 g); GA and birthweight varied across included reviews.	70 trials (randomised or quasi), 16 quality improvement studies	Avoidance of bottles during breastfeeding establishment, KC (any timing), quality improvement bundles, and cup feeding showed clear or possible benefit (mostly from low- to moderate-quality evidence) for increasing breastfeeding rates at discharge and, in some cases, up to 6 months post-discharge. Evidence for early-onset KC compared with conventional care, and for exclusive breastfeeding outcomes in quality improvement bundles, was very low quality and uncertain. Non-nutritive sucking, oral stimulation, and oropharyngeal colostrum had insufficient evidence of effectiveness.
Hodgson et al. (2025)(475)	To synthesise recent evidence (2019–2024) on infant and parent outcomes and experiences related to family-centred care interventions in the NICU.	20	India, Iran, US, Germany, Finland, Canada, China, Denmark, France, Norway, Sweden.	Parents/primary caregivers of infants in NICUs; primarily parents of preterm or low/very-low-birth-weight infants.	16 quantitative studies (4 cross-sectional, 10 quasi-experimental, 2 RCTs) 3 qualitative studies 1 mixed-methods study	FCC interventions showed improvements in infant feeding, weight, and length of stay (one study), with no worsened infant outcomes. Parent outcomes improved in participation, experience, satisfaction, and mental health (stress, depression, PTSD, coping). Qualitative findings showed positive experiences. More RCTs and consistent outcome measures are needed.

Hodgson et al. (2024) (477)	To conduct a narrative synthesis of contemporary published research on the effectiveness of family-centred care (FCC) interventions for paediatric inpatients and to critique studies evaluating child or parent outcomes.	16	US, Canada, Korea, Indonesia, Iran, Switzerland.	Parents of hospitalised children (infants through adolescents); one study also included child outcomes.	11 Quantitative (8 quasi-experimental,2 observational cross-sectional, 1 observational longitudinal), 3 qualitative and 2 mixed-methods.	FCC interventions improved parent knowledge, well-being, satisfaction, communication, participation in care, and reduced stress/anxiety. One study reported no difference in child outcomes (feeding, length of stay). No harms were reported. Many studies were low–moderate quality and lacked validated measures.
Li et al. (2024) (533)	To examine and synthesise the views and experiences of women, donors, recipient mothers and healthcare professionals regarding human milk donation or sharing.	41	USA, UK, Canada, Australia, New Zealand, Brazil, Spain, India, Uganda, South Africa, Malaysia, Chile, Turkey, Singapore, Vietnam, and Ireland.	Women (primiparous and multiparous), human milk donors, recipient mothers, healthcare professionals, human milk bank representatives, and mothers without experience of milk sharing	41 qualitative studies including grounded theory, phenomenology, ethnography, action research, qualitative interviews and focus groups	Six themes were synthesised: benefits of milk donation for donors, recipients and families; motivations to receive or donate; awareness and participation shaped by formal versus informal sharing and external influences; concerns about disease transmission, bonding, jealousy and traits; challenges for donors, recipients, staff and milk banks; suggestions to promote milk donation including awareness-raising and education.

Li et al. (2022) (528)	To conduct a systematic review and meta-analysis to evaluate the nutritional effects of donated breast milk on preterm infants compared with formula.	11	Not stated	Preterm or low birth weight infants (<37 weeks gestation or <2500 g) included in randomised controlled trials comparing donated breast milk with formula.	11 RCTs	Donated breast milk reduced the incidence of NEC, duration of parenteral nutrition, and time to full enteral feeding; formula promoted greater weight gain, head growth and body length growth, and reduced time to regain birth weight.
Li et al. (2024) (69)	To interpret mothers' experiences and perceptions while expressing breast milk during separation from their hospitalised infants through critically appraising and synthesising qualitative evidence	13	China, Denmark, Spain, Canada, Finland, Australia, USA	Mothers separated from their hospitalised infants in the NICU who expressed breast milk	12 qualitative studies and 1 mixed methods	Four synthesised findings: Purpose and motivation; Physical and emotional experiences; Barrier factors; Coping styles
Liu et al (2024) (536)	To systematically evaluate barriers to breastfeeding among preterm infants in neonatal intensive care units (NICUs).	32	Canada, Germany, South Korea, India, Greece, China, US, Latvia, Ethiopia, Turkey, Spain, Iceland, Brazil, Sweden, Italy, Denmark, Morocco	Preterm infants (<37 weeks' gestation) admitted to NICU and receiving breastfeeding	12 cohort; 7 case–control; 13 cross-sectional	Main barriers identified were low GA (OR 1.36, 95% CI 1.06–1.75), lower maternal education (OR 1.64, 95% CI 1.39–1.93), insufficient breast milk (OR 2.09, 95% CI 1.40–3.12), multiple births (OR 1.615, 95% CI 1.18–2.210), smoking (OR 2.906, 95% CI 2.239–3.771), and single motherhood (OR 1.439, 95% CI 1.251–1.654)

Lucas et al. (2014) (53)	To uncover information regarding emotional and other types of support required by mothers providing breast milk for infants in the NICU.	44 sources included; 32 were research studies	Not stated	Mothers who pump breast milk for preterm or high-risk infants in the neonatal intensive care unit (NICU).	2 RCTs, 16 qualitative studies with semi structured interviews, 8 mixed-methods studies, 5 chart review/survey studies; plus 12 clinical recommendations or reviews	Emotional and practical support needs of NICU pumping mothers differ from other breastfeeding mothers; early initiation of pumping and skin-to-skin care support milk supply; mothers face challenges such as pain, inadequate support, and NICU environmental barriers; positive interactions with staff, peer counsellors, and lactation consultants increase pumping continuation; bundled interventions may best support mothers pumping for prolonged periods
McFadden et al. (2021)(527)	To synthesise evidence on the components, characteristics, theoretical basis, behaviour change techniques, infant and parent outcomes, and any economic evaluations of cue-based feeding interventions for preterm infants.	25	USA, Canada, Italy, Australia, Sweden, UK.	Developmentally normal, clinically stable preterm infants transitioning from tube to oral feeding.	10 RCTs, 9 quality improvement projects, 6 observational studies.	Evidence in favour of cue-based feeding is low quality and should be interpreted cautiously; most included studies were at high risk of bias; interventions commonly used cue-based feeding protocols and staff/parent training; 41 different outcomes were reported with inconsistent effects; conclusions did not change those of the earlier Cochrane review.

Ma et al. (2021) (510)	To investigate whether very low birth weight infants (VLBWs) can benefit from oropharyngeal colostrum (OC) therapy in terms of reducing complications such as VAP, NEC, BPD, sepsis, and death.	8	US, Egypt, Brazil, China, India, Korea	VLBW infants (<1500g and/or <32 weeks gestation)	8 RCTs	OC significantly reduced ventilator-associated pneumonia (VAP) (OR=0.39, 95% CI: 0.17–0.88, p=0.02), shortened time to full enteral feeding (MD=−2.66 days, 95% CI: −4.51 to −0.80, p=0.005), showed potential significance in reducing NEC (OR=0.51, 95% CI: 0.26–0.99, p=0.05), and trends toward reducing mortality (OR=0.60, 95% CI: 0.34–1.08, p=0.09) and proven sepsis (OR=0.64, 95% CI: 0.40–1.01, p=0.06).
Mariani et al. (2024) (471)	To synthesise characteristics of family-centred care (FCC) interventions, related outcomes and measurement methods in randomised controlled trials in neonatal intensive care units, and to provide menus of options to support implementation and further research.	146	Not stated	Parents, infants, siblings (two RCTs), and health workers (one RCT), all within NICU settings.	RCTs	A large variety of FCC interventions, outcomes and measurement methods were identified, with substantial heterogeneity and a lack of head-to-head RCTs. Educational interventions were most common, outcomes were inconsistently measured, and research gaps include limited evaluation of fathers, siblings and staff, as well as poor reporting of staff education and minimal physician involvement.

McKinney et al. (2016) (484)	To synthesise the entire body of evidence on neonatal cup feeding.	28	USA, Turkey, Switzerland, Australia, Brazil, UK, Egypt, Taiwan, India, Canada, Sweden	Neonates (preterm and full-term) receiving cup feeding in the neonatal period.	10 RCTs, 11 non-randomised intervention studies, 11 observational	Cup feeding appears physiologically safe; intake may be lower and spillage higher than bottle/tube feeding. Slightly higher proportions of cup-fed infants breastfed at discharge; exclusive breastfeeding more common in cup-fed infants. Compliance and acceptability vary and may be problematic in some settings.
Mohandas et al. (2023) (482)	To synthesise evidence on interventions to manage breastfeeding difficulties in mothers or caregivers of infants with growth faltering to improve breastfeeding practices and breastmilk intake.	7	Turkey, India, Egypt, Canada	Preterm infants (<37 weeks gestation) and their mothers in neonatal intensive care units or postnatal settings.	5 RCTS, 2 NRCTs	Evidence was limited and of low to very low quality. NNS on the breast slightly improved breastfeeding behaviour scores versus finger sucking and may improve EBF at discharge versus pacifier use, with no long-term effect. Cup feeding increased EBF at discharge, three and six months compared to bottle feeding, without weight gain benefits. Spoon feeding delayed full breastfeeding without anthropometric gains, while syringe feeding shortened transition time but had no effect on weight or long-term breastfeeding. Supplemental feeding tube devices showed no advantage over bottle feeding. Overall, evidence

						was uncertain, with no mortality or morbidity data, mostly from preterm neonates.
Penny et al. (2018) (485)	To review the available evidence on the use of supplemental feeding tube devices (SFTDs) as an alternative method of supplementation for breastfed infants.	5	US, India, Romania.	Mothers experiencing lactation difficulties, adoptive mothers inducing lactation, and their breastfed infants (term and preterm).	1 qualitative naturalistic inquiry; 1 prospective study (with random assignment to two groups); 1 multiple case series (8 separate case studies); 2 single case studies	Evidence on SFTDs is extremely limited, consisting mainly of small qualitative and case studies. Available research suggests they may be an acceptable supplementation method that can help preserve or attain breastfeeding relationships in contexts such as relactation and adoptive breastfeeding. Reported challenges include device complexity, time-consuming use, and the need for user training and support.
Srichalerm et al. (2026) (458)	To synthesise qualitative evidence on the breastfeeding experiences of mothers of preterm infants during their infant's hospital stay.	53 studies	20 countries spanning 6 continents	Mothers of preterm infants who provide their own milk during their infants' hospital stay.	Eligible studies are qualitative studies including qualitative components of mixed methods studies.	4 themes: i) Mothers drive breast milk feeding decisions for preterm infants. ii) Mothers face unique personal challenges in providing breast milk for their preterm infants. iii) External factors can support and hinder breastfeeding and milk provision. iv) Comprehensive support systems improve breastfeeding practices and outcomes.

Tao et al. (2020) (511)	Assess the effects of OAC on the incidence of NEC, LOS, and death in preterm infants.	9	US, Egypt, Brazil, India, China, South Korea	Preterm infants with GA <34 weeks or Birth weight <1500g	9 RCTs	OAC in preterm infants was associated with a non-significant reduction in NEC (RR=0.59, 95% CI: 0.33–1.06, p=0.08), LOS (RR=0.78, 95% CI: 0.60–1.03, p=0.08), and mortality (RR=0.63, 95% CI: 0.38–1.05, p=0.07). However, OAC significantly reduced the time to achieve full enteral feeding by 3.6 days (MD=−3.60, 95% CI: −6.55 to −0.64, p=0.02) and the length of hospital stay by 10.4 days (MD=−10.38, 95% CI: −18.47 to −2.29, p=0.01).
Talej et al. (2022) (525)	To evaluate the effect of responsive versus scheduled feeding on morbidity, mortality, growth, and neurodevelopment in preterm and low birth weight infants.	11	US, Canada, Iran, Israel	Preterm (<37 weeks) and low birth weight (<2.5 kg) infants.	11 RCTs	Responsive feeding may decrease in-hospital weight gain and may slightly decrease duration of hospitalisation; evidence was insufficient for effects on mortality, morbidity, linear growth, or neurodevelopment.
Watson et al. (2016) (522)	To assess the effect of feeding preterm infants on a responsive basis versus feeding prescribed volumes at scheduled intervals on growth rates, parent satisfaction, and	9	All included trials were undertaken in North America.	Clinically stable preterm infants in the transition phase from intragastric tube to oral feeding, generally between 32 and 36 weeks' postmenstrual age.	8 RCTs and 1 quasi-randomised trials.	Trials provided low-quality evidence. Responsive feeding resulted in slightly slower weight gain, slightly lower milk intake, and earlier establishment of full oral feeding by about five days, but did not show consistent effects on duration of hospital stay.

	time to hospital discharge.					No trials reported parent, caregiver, or staff views.
Webber et al. (2025) (464)	To identify the barriers and enablers to fathers' involvement in family-centred care in the neonatal unit.	17	Australia, Denmark, Iran, Italy, Israel, Singapore, South Korea, Sweden, USA	Fathers of premature or unwell infants in neonatal units.	11 qualitative, 1 quantitative, 5 mixed method studies.	Three themes identified: seeking information, emotional needs, and staff relations; fathers experienced barriers in family-centred care and required individualised support from neonatal staff.
Williams et al. (2016) (531)	To determine the effects of donor human milk (DHM) provision on own mother's milk (OMM) use during neonatal admission and on breastfeeding rates at discharge.	10	USA, Spain, UK, Australia.	Infants admitted to neonatal units (typically very preterm or very low birth weight infants; specific gestational age and birthweight criteria varied across studies).	8 retrospective observational studies; 1 prospective interventional study and 1 prospective cohort study	Mixed effects were observed. Aggregated data suggested a significant increase in any breastfeeding on discharge after DHM introduction, but no significant effect on exclusive breastfeeding on discharge or exclusive OMM use in the first 28 days. One study showed a decrease in OMM use after DHM introduction. Overall, DHM was not found to adversely affect breastfeeding rates.
Yu et al. (2019) (476)	To evaluate the effects of family-centred care on hospitalised preterm infants.	4	United States, Sweden, China	Preterm infants (<37 weeks gestational age) hospitalised in NICUs; parents (mothers/fathers, one grandmother in one study). Infants with	4 RCTs	Family-centred care shortened total hospital stay and NICU stay. Evidence was insufficient regarding effects on morbidity, feeding, growth,

				congenital abnormalities were excluded.		and neurobehavioral performance.
Zhang et al. (2025) (523)	To systematically evaluate the effect of cue-based feeding (CBF) on feeding outcomes in preterm infants.	14	US, China, Iran, Canada.	Hospitalised preterm infants with gestational age ≤37 weeks.	6 RCTs, 8 quasi-experimental studies	CBF shortened the time to full oral feeding; no significant effect on time to first oral feeding, milk intake or number of daily feeds; reduced incidence of feeding intolerance; increased parental satisfaction and involvement; high healthcare-provider acceptance.

Chapter Ten: Summary table of empirical studies on neonatal care

Authors	Year & Country	Aim	Participants	Methods	Outcome measures	Key findings
Acuña-Muga et al. (539)	2014 (Spain)	To estimate the volume of milk obtained by mothers of very low-birth-weight infants in relation to proximity to the infant and use of kangaroo mother care (KMC) during expression.	26 mothers of very low-birth-weight infants who completed 10 days of milk-expression records.	Prospective cohort study in which mothers recorded location and circumstances of each milk expression and volume obtained over 10 consecutive days.	Volume of milk expressed in different locations and circumstances (far from infant, beside incubator, during KMC, after KMC, kangaroo father care).	Milk volume was higher when mothers expressed in proximity to the infant, especially during or immediately after kangaroo mother care; lowest volumes occurred when expressing far from the infant.
Adcock et al. (310)	2021 (New Zealand)	To give voice to the experiences, views, and attributions of whānau of preterm Māori infants and support service transformation.	19 whānau collectives including 19 mothers, 9 fathers, and 13 non-parent whānau members caring for 21 preterm Māori infants.	Prospective qualitative Kaupapa Māori study using interpretative phenomenological analysis (IPA) of first interviews conducted soon after birth.	Emergent themes describing lived experiences of preterm birth, NICU care, cultural needs, and whānau wellbeing.	Preterm birth disrupted the birth imaginary and created emotional turmoil; whānau experienced isolation, loss of autonomy, and cultural unsafety; love, intimacy, whakapapa, culturally safe care, familiarity, and strong support networks enabled coping and the development of parental expertise.

Bjork et al. (500)	2012 (Sweden)	To illuminate mothers' experiences of breastfeeding a preterm infant in a neonatal ward.	12 mothers of preterm infants (<37 weeks GA) discharged from a neonatal ward.	Qualitative study using protocol writing and thematic analysis.	Mothers' experiences of breastfeeding a preterm infant on a neonatal ward.	Breastfeeding a preterm infant was emotionally complex and often stressful; mothers felt exposed, compared milk volumes with others, experienced dependence on weighing scales, and blamed themselves when breastfeeding was difficult; privacy, proximity to the infant, and sensitive professional support were crucial for sustaining breastfeeding.
Boone et al. (488)	2024 (USA)	To evaluate a single-centre quality improvement initiative designed to increase provision of mother's own milk at discharge for very low birth weight infants while addressing perinatal health disparities.	284 mothers and 320 very low birth weight infants admitted to a single-centre NICU across pre- and post-intervention periods	Pre–post quality improvement study comparing baseline data (August 2021–February 2022) with intervention and sustainment periods (March–December 2022), using multiple QI interventions, EMR data extraction, IBCLC documentation, and statistical analysis of process and outcome measures.	Pump initiation, pumping within 6 hours postpartum, pump frequency and milk volume at two weeks, coming to volume, discontinuation of pumping, and percentage of infants receiving mother's own milk at discharge	Pump initiation increased from 86% to 97%, discontinuation of pumping decreased from 49% to 35%, pump frequency increased from 4.0 to 5.1 sessions/day, and infants receiving mother's own milk at discharge increased from 36% to 58% (all significant improvements).

Bower et al.(457)	2017 (USA)	To describe mothers' experiences expressing milk for very-low-birth-weight (VLBW) infants.	17 mothers of VLBW infants (≤1500 g) in a level III NICU	Qualitative phenomenological study; in-depth interviews; Colaizzi's seven-step analysis	Lived experience of milk expression and its emotional meanings	Mothers experienced intense pressure to provide milk, viewing it as their "one job"; expression was highly time-consuming, exhausting, and emotionally distressing; fear of failing the infant and self-blame were prominent; reinforcing the value of *any* amount of expressed milk and reducing performance pressure were suggested to support maternal well-being.
Briere et al.(534)	2015 (USA)	To describe characteristics of direct-breastfeeding and identify factors associated with direct-breastfeeding in the NICU.	88 infants born <34 weeks gestational age whose mothers provided human milk.	Retrospective chart review with chi-square analyses and logistic regression.	First oral feeding method, days between first breastfeed and first bottle, percentage of oral feedings that were direct-breastfeeding, and presence of direct-breastfeeding at discharge.	Mothers with specific breastfeeding goals and older age were more likely to provide ≥1 direct-breastfeed per day; infants with more days between first breastfeed and bottle and shorter lengths of stay had higher direct-breastfeeding ; direct-breastfeeding

						at discharge was more likely among non-Hispanic, primiparous mothers with specific goals and infants with shorter stays.
Broom et al.(495)	2022 (Australia)	To assess the impact of a permanent lactation consultant on staff confidence in providing breastfeeding education, maternal access to lactation support, and availability of mothers' own milk in a neonatal unit.	Neonatal staff completing pre- and post-LC surveys (35 pre, 56 post) and all infants admitted to the NICU/SCN during May–June 2016 (n=82) and May–June 2017 (n=79).	Pre/post staff survey and retrospective clinical chart audit with statistical analysis using t-tests and chi-squared tests.	Staff access to lactation education, confidence, ability to organise LC support, maternal access to LC appointments, breast pump education by day 3, and proportion of infants receiving >50% mothers' own milk at key time points (12 h, days 7, 28, discharge).	Introduction of an LC significantly improved staff access to lactation education, confidence, ease of organising support, maternal access to LC appointments, and provision of early mothers' own milk at 12 hours, though no improvement beyond day 7 to discharge.
Brown et al.(460)	2024 (UK)	To assess changes in parental anxiety and depression before and after receiving donor human milk within a community-based lactation support programme.	80 parents (77 mothers, 3 fathers) who requested donor human milk for 83 infants between January 2020 and April 2021.	Mixed-methods pre–post study using online surveys with HADS, demographic and feeding data, matched milk-bank records, and thematic analysis of open-ended responses.	Hospital Anxiety and Depression Scale (HADS) pre- and post-donor milk, plus qualitative accounts of donor milk experiences.	Anxiety and depression significantly decreased after receiving donor milk; greater volume predicted larger reductions, and parents attributed improvements to reduced worries about infant health, feeling supported,

						and having feeding preferences respected.
Brown et al.(461)	2022 (UK)	To explore how receiving screened donor human milk (DHM) for their infant affected parental wellbeing.	107 UK parents (102 mothers, 5 fathers) of infants aged 0–12 months who had received screened DHM.	Mixed-methods online questionnaire including demographic items, Likert scales, and open-ended questions; quantitative descriptive statistics and qualitative thematic analysis.	Perceived impact of DHM on infant health and development, parental mental and physical health, and family wellbeing (Likert scales) plus qualitative descriptions of experiences.	Parents reported overwhelmingly positive impacts of DHM on infant health, maternal mental wellbeing, reduced pressure in early feeding, feelings of being supported and listened to, and emotional protection when unable to breastfeed; some mixed emotions and guilt were also noted.
Casavant et al.(479)	2015 (USA)	To explore breastfeeding practices of mothers of VLBW infants in the NICU and identify caregiving factors associated with feeding mode at discharge.	96 very-low-birth-weight preterm infants (≤1500g) and 87 mothers admitted to a level IV NICU over a 24-month period.	Retrospective chart review replicating previous work; descriptive statistics and logistic regression analyses performed	Receiving any breastmilk at discharge; variables included first oral feed at breast, number of direct-to-breast feeds, gestational age, maternal factors, and infant comorbidities	Infants whose first oral feed was at breast were more likely to receive breastmilk at discharge (adjusted OR 8.7); multiple daily direct-to-breast feeds also increased likelihood of breastmilk

						provision at discharge.
Ericson et al.(498)	2019 (Sweden)	To describe how mothers of preterm infants in Sweden experience breastfeeding support during the first 12 months after birth.	151 mothers of preterm infants (<37 weeks gestation).	Qualitative study using open-ended questionnaire responses and telephone interviews analysed with inductive thematic network analysis and a hermeneutic approach.	Mothers' reported experiences and perceptions of breastfeeding support across neonatal, postnatal, and community care settings.	Mothers experienced breastfeeding support as either strengthening when sensitive, individualised and emotionally aware, or diminishing when controlling, inconsistent or lacking knowledge; overall support varied greatly depending on the individual health professional, described as "being thrown into a lottery."

Ericson et al. (503)	2018 (Sweden)	To evaluate the effectiveness of person-centred proactive telephone support for breastfeeding mothers of preterm infants up to 14 days after NICU discharge.	493 mothers of preterm infants (<37 weeks gestation) discharged from six Swedish NICUs; 231 intervention, 262 control.	Multicentre randomised controlled trial using stratified block randomisation; intervention group received daily proactive calls for up to 14 days, control group had access to reactive support; outcomes assessed via telephone follow-up and questionnaires at eight weeks post-discharge.	Exclusive breastfeeding at eight weeks (primary); maternal breastfeeding satisfaction, maternal–infant attachment, parental stress, and maternal quality of life (secondary)	Proactive support did not increase exclusive breastfeeding or improve breastfeeding satisfaction, attachment, or quality of life; however, mothers receiving proactive support reported significantly lower parental stress.
Estalella et al.(501)	2020 (Spain)	To evaluate the effect of a specific breastfeeding support intervention for late-preterm infants on breastfeeding rates at discharge and breast-pump use in a maternity service.	373 late-preterm infants whose mothers initiated breastfeeding (212 control; 161 intervention).	Quasi-experimental study comparing routine care with an enhanced breastfeeding support intervention, using data extracted from clinical records between 2012–2015.	Feeding rate at discharge; breast-pump use after feeds; infant morbidities; weight evolution; hospital-stay length	The intervention group had higher exclusive breastfeeding at discharge (68.4% vs 50.7%) and greater breast-pump use, with no significant differences in morbidities or weight loss; hospital stay was longer only among infants requiring phototherapy.

Gharib et al.(496)	2017 (USA)	To determine whether the provision of full-time lactation support in the neonatal intensive care unit (NICU) improves quantitative breastfeeding measures in premature infants.	422 infants ≤30 weeks' gestational age admitted to a level IV NICU (after exclusions from 485 admissions).	Longitudinal retrospective nonexperimental chart review across three epochs of differing lactation support levels.	Feeding practices (e.g., any human milk, expressed human milk volume, breastfeeding attempts, feeding method at discharge), lactation consult frequency, sequence of feeding introduction.	Full-time dedicated NICU lactation support was associated with increases in quantitative breastfeeding outcomes, including increased odds of infants receiving any human milk and greater likelihood of going to breast for first oral feeding.
Grundvig et al.(459)	2020 (Sweden)	To describe parents' experiences of feeding their extremely preterm children during the first 2–3 years of life.	12 parents of nine extremely preterm children born at 22–27 weeks' gestation, aged 2–3 years at interview	Qualitative study using semi-structured interviews analysed with qualitative content analysis	Parents' reported experiences, perceptions, and challenges related to feeding during infancy to age 2–3 years	All parents reported feeding difficulties at some stage and described the process as difficult and frustrating; variation in onset of problems made support difficult to obtain; parents expressed a need for more specialised, consistent support during NICU stay and after discharge.
Harding et al.(507)	2014 (UK)	To determine whether parent-delivered non-nutritive sucking (NNS) supports transition to full oral feeding, improves early communication	59 premature infants born at 26–35 weeks' gestation recruited from a London neonatal unit.	Randomised non-blinded controlled study with three groups (NNS pre-tube, NNS at onset of tube feeds, control); parent training in	Days to full oral feeding, days in hospital, sucking patterns (NOMAS), gestational age at oral feeding, readmissions, and receptive/expressive language at 6 months.	NNS did not reduce time to full oral feeding or affect later language development; all groups showed maturation of sucking patterns;

		interpretation, and influences later language development.		infant state recognition; interventions delivered until full oral feeding; follow-up at 6 months.		NNS groups had significantly fewer hospital days; parents reported improved confidence in interpreting infant communication.
Hayashi et al.(486)	2022 (USA)	To improve mother's own milk (MOM) provision at NICU discharge/transfer for infants <34 weeks' gestation from 61% to >80% over 19 months through standardised lactation education and an SMS support program (BLOSSoM).	Mothers of preterm infants <34 weeks' gestation admitted to a level III NICU; 76 mothers baseline, 72 in education/documentation period, 47 participating in BLOSSoM.	Quality improvement (QI) study using PDSA cycles, implementation of standardised education, documentation changes, and an SMS intervention (BLOSSoM); retrospective and prospective data extraction from EMR; statistical analysis including SPC charts.	Primary outcome: percentage of mothers providing any MOM at NICU discharge/transfer. Additional measures: maternal satisfaction, video-viewing completion, interpreter use, willingness to participate, donor breast milk use.	MOM provision improved from 61% to 81% after interventions; 87% of BLOSSoM participants completed evaluations, with 83% rating the program as most supportive; video viewing increased to 94%; donor milk use did not increase.
Heinemann et al. (311)	2013 (Sweden)	To explore parents' experiences of factors in the NICU that made it easier or more difficult for them to stay with their extremely preterm infant.	7 mothers and 6 fathers of extremely preterm infants (≤27 weeks GA).	Qualitative descriptive design using semi structured interviews with qualitative content analysis.	Themes and categories derived from parent interview transcripts regarding facilitators and barriers to parental presence.	Kangaroo mother care and active involvement in care empowered parents and increased their presence; high noise, bright illumination, low staffing and dismissive staff attitudes hindered presence, while supportive

						communication and opportunities for overnight stay facilitated it.
Hendricks-Muñoz et al.(487)	2023 (USA)	To evaluate challenges and successes of feeding strategies—including donor milk and a MOM bundle—in counteracting declining rates of mothers' own milk at NICU discharge among VLBW infants.	616 inborn VLBW infants who survived to discharge from 2010–2020 and their mothers	Retrospective review of prospectively collected feeding data and medical records across three feeding-strategy epochs (Baby Friendly, donor milk program, MOM bundle) with descriptive and comparative statistical analysis	Type of feeding during hospitalisation (MOM, DM, formula) and feeding type at discharge, including racial/ethnic differences; lactation support timing; and DM utilisation.	Donor milk eliminated early formula feeding but coincided with a decline in mothers' own milk at discharge, especially among African American and Hispanic mothers; implementation of a focused MOM bundle improved MOM rates at discharge, though disparities persisted.
Hoban et al.(497)	2021 (Canada)	To determine differences in human milk outcomes between reactive and proactive lactation care models in a referral NICU.	981 infants admitted ≤7 days of age (509 reactive model; 472 proactive model).	Retrospective, longitudinal, two-group comparison study using EMR feeding data and milk room storage records.	Proportion of infants receiving exclusive or any mother's milk; number and volume of pumped mother's milk bottles stored.	Proactive lactation care increased any mother's milk from 74.3% to 80.2% and increased monthly stored bottle numbers from 5,153 to 6,620.

Htun et al.(520)	2025 (Global survey; majority respondents from the United States)	To examine global NICU oral feeding practices with emphasis on cold milk feeding for dysphagia; determine feeding initiation age; and identify respiratory-support contexts in which oral feeding is permitted.	210 neonatal healthcare professionals (attending neonatologists, neonatal therapists, fellows/APPs) from Level II–IV NICUs.	Cross-sectional global electronic survey distributed via professional society listservs and online groups (June 2023–2024); descriptive analysis of responses.	Presence and type of feeding protocols; gestational age for oral-feeding initiation; awareness and use of cold milk feeding; feeding practices during nCPAP and HFNC.	72% reported having feeding protocols, mainly cue-based; oral feeding typically began at 33–34 weeks; 16% used cold milk feeding though only one institution had a protocol; most did not feed on nCPAP (12%), while feeding on HFNC was common (78%); substantial variability across practices and limited standardisation identified.
Hurst et al.(514)	2013 (USA)	To understand the experiences of mothers of very preterm infants regarding their daily breast-milk pumping routine in the NICU.	14 mothers of very preterm infants (16 infants, including two twin sets), all using hospital-grade breast pumps.	Qualitative ethnographic study using sequential semi-structured interviews, observational field notes, and thematic analysis managed in Atlas.ti.	Mothers' narrated experiences, patterns of pumping behaviour, themes relating to separation–connection and negotiation, and pumping logs documenting milk volume and frequency.	Mothers experienced a paradoxical relationship with the breast pump, viewing it simultaneously as a connection to and separation from their infant; they intensely disliked pumping yet relied on adaptive strategies to cope, revealing complex emotional, physical, and environmental negotiations

						influencing their lactation experience.
Jang et al.(491)	2020 (South Korea)	To evaluate the effects of an infant-care education program for mothers of late-preterm infants on parenting confidence, breastfeeding rates, infant growth, and readmission rates.	53 mothers of late-preterm infants (26 experimental, 27 control) from a NICU in a general hospital.	Quasi-experimental non-equivalent control group, non-synchronised design with an education intervention delivered in three sessions during hospitalisation and weekly follow-up via phone/SNS for one month post-discharge; data analysed using t-tests, chi-square tests, and repeated-measures ANOVA.	Parenting confidence; breastfeeding rate (WHO classification); infant growth (weight, length, head circumference) at birth, discharge, and 1 month post-discharge; readmission within 4 weeks.	Parenting confidence and breastfeeding rates at 1 month were significantly higher in the intervention group; no significant differences were found in infant growth or readmission rates.
Jang et al.(502)	2021 (South Korea)	To examine the effects of a breastfeeding coaching program on growth and neonatal jaundice in late preterm infants.	40 late preterm infants and their mothers; 21 in the experimental group and 19 in the control group.	Quasi-experimental, non-randomised time-series design with home- and web-based breastfeeding coaching over 5 sessions post-discharge.	Feeding method (breastfeeding vs formula), infant body weight, length, head circumference, and transcutaneous bilirubin levels.	Breastfeeding rates remained stable in the intervention group but declined in controls; head circumference increased more in the intervention group; no significant differences in weight, length, or

						bilirubin trends between groups.
Kantorowska et al.(532)	2016 (USA)	To examine whether donor human milk availability in NICUs was associated with breastfeeding at discharge and necrotising enterocolitis rates in very low birth weight infants.	42,532 very low birth weight infants admitted to California NICUs from 2007–2013.	Population-based cohort study linking individual clinical data from the California Perinatal Quality Care Collaborative with hospital-level donor milk availability data; descriptive analyses, paired t-tests, and multivariable logistic regression	Breastfeeding at NICU discharge and incidence of necrotising enterocolitis.	Availability of donor milk increased over time and was associated with a 10% absolute increase in breastfeeding at discharge and a 2.6% absolute decrease in necrotising enterocolitis rates; donor milk availability remained a significant predictor after adjustment.
Levene et al.(512)	2024 (UK)	Assess the relationship of time to first expression after very preterm birth and mothers' own milk quantity.	132 mothers of single or twin infants born at 23+0 to 31+6 weeks postmenstrual age.	Cohort study nested within a randomised trial conducted in four neonatal units in the UK.	24-hour mother's own milk yield on days 4, 14 and 21 after birth; exclusive and any mother's own milk at 36 weeks' PMA	Expressing within 6 hours of birth increased milk yield on days 4 and 14 but not day 21; expressing within 2 hours did not provide additional benefit; increased frequency improved yield only when expression began within 6 hours.

Levene et al. (513)	2024 (UK)	To examine the association of breastmilk-expressing patterns - frequency, gaps, circadian timing and duration - with lactation outcomes after very premature birth.	132 mothers of infants born 23+0 to 31+6 weeks' gestation, recruited from four UK neonatal units.	Cohort study using 24-hour expressing logs on days 4, 14 and 21; linear regression and multilevel modelling adjusting for relevant confounders.	24-hour milk yield and per-session milk yield.	Higher expressing frequency was strongly associated with increased milk yield, with ~30–94 g higher 24-hour yield per additional expressing session; expressing ≥8 times/day supported achieving the 750 g target but yields were similar to 6–7/day; longest gap >6 hours was linked to lower yield; night-time expressing had no inherent benefit once time since previous session was accounted for; prior breastfeeding ≥6 months was associated with substantially higher yields.
Malak et al.(492)	2022 (Poland)	To determine the impact of neurobehavior on sucking reflexes and feeding ability in very preterm infants, and to evaluate whether parental education influences these outcomes.	18 very preterm neonates (<32 weeks gestation, <1500 g birthweight) hospitalised in a Polish neonatal unit.	Infants were assessed twice using the Neonatal Behavioural Assessment Scale (NBAS); parents received structured education on infant handling, feeding, positioning, and regulatory strategies.	NBAS motor system cluster, NBAS autonomic nervous system cluster, sucking ability scores, and oral vs. tube feeding status.	Sucking ability correlated positively with motor development - especially activity level. Parental education significantly improved motor cluster scores and enabled all infants to transition from

						tube to full oral feeding at follow-up.
Marino et al.(517)	2019 (UK)	To improve post-discharge growth of exclusively breastfed preterm infants ≤1.8 kg birthweight by implementing home use of breast milk fortifier until 48 weeks' gestational age.	Preterm infants ≤1.8 kg at birth discharged from a tertiary neonatal unit; 29 infants included in the retrospective audit (mean gestation 29.7±2.8 weeks, birthweight 1.23±0.32 kg).	Quality improvement project using PDSA cycles, development of parent information sheets, questionnaires for parents and dietitians, and a retrospective audit of growth from July 2015–September 2017.	Change in SDS for weight, length and head circumference from birth to 35 weeks, discharge, 48 weeks PMA and 1 year corrected age; breastfeeding rates; parental and dietitian survey responses.	Home BMF use improved growth trajectories, with more positive SDS changes for weight, length and head circumference at discharge and 1 year; BMF was viewed as acceptable, feasible and safe by parents; breastfeeding continuation at 8 weeks post-term was 37.5%.
McLeish et al.(537)	2024 (England)	To explore and compare health professionals' experiences of barriers and facilitators to their role in supporting breast milk feeding and breastfeeding for very preterm babies across the patient	12 health professionals from 4 neonatal units in England (3 per unit; mixture of nurses, doctors, allied health professionals, and midwives)	Qualitative comparative interview-based study using semi-structured telephone interviews analysed with comparative thematic analysis, informed by	Themes describing staff experiences of supporting breast milk feeding and breastfeeding for very preterm babies across different time points in the feeding journey	Large variations existed between neonatal units in staffing, leadership, training, culture, and coordination with maternity services, which influenced the consistency and effectiveness of support for mothers

		pathway in neonatal units in England		phenomenological social psychology		initiating and sustaining expressing and transitioning to direct breastfeeding; units with dedicated infant-feeding roles, strong leadership, whole-team responsibility, and integrated care achieved better support and higher breast milk feeding at discharge.
Nelson et al.(292)	2016 (USA)	To describe the meaning and significance of mothering a preterm infant receiving NIDCAP care in a level III NICU.	7 mothers of preterm infants ≤30 weeks' gestation, admitted to a level III NICU.	Qualitative existential–phenomenological study using Colaizzi's method; single semi-structured interviews analysed for themes.	Maternal experiences captured through significant statements, formulated meanings, thematic clusters, and fundamental structure.	Mothers parented "with permission," navigated participation challenges, managed relationships with staff, and developed confidence and maternal identity through NIDCAP; inconsistent adherence to NIDCAP recommendations among staff was the main source of frustration.
Perugi et al.(493)	2024 (Italy)	To evaluate the effect of the structured PROBREAST programme on	152 very preterm infants: PROBREAST group n=72 (2018–2019) and historical control n=80 (2017–2018). Infants	Prospective observational cohort study comparing breastfeeding	Exclusive and direct breastfeeding at discharge; post-discharge breastfeeding rates; weight and head	Exclusive breastfeeding at discharge increased from 16% to 42% after programme

		breastfeeding rates in very preterm infants.	born <32 weeks or ≤1500 g, surviving to discharge, whose mothers intended to breastfeed.	outcomes before and after programme implementation; data collected on feeding type, growth, and neurodevelopment up to 24 months corrected age.	circumference z-scores at discharge, 12 and 24 months; Bayley-III cognitive, language and motor scores.	introduction; exclusive breastfeeding was associated with lower weight z-score at discharge but not later, and with higher cognitive score at 24 months; infants discharged with direct breastfeeding maintained higher direct breastfeeding rates post-discharge.
Rayfield et al.(494)	2015 (UK)	To examine the association between different forms of breastfeeding support and breastfeeding at 10 days and 6 weeks in late preterm and term infants.	15,104 singleton infants ≥34 weeks' gestation from the UK 2010 Infant Feeding Survey (14,525 term; 579 late preterm).	Cross-sectional secondary analysis of survey data using weighted logistic regression, analysing sociodemographic, perinatal and breastfeeding support variables.	Breastfeeding status at 10 days and at 6 weeks (any breastfeeding).	Receiving enough help with breastfeeding in hospital and being given contact details for community support groups increased likelihood of breastfeeding at 10 days for term and late preterm infants, and at 6 weeks for term infants; late preterm infants had significantly lower breastfeeding rates at 6 weeks than term infants.

Spagnoli et al.(524)	2023 (USA)	To evaluate whether implementing a cue-based feeding protocol reduced time to first nipple feed, time to full oral feeds, and length of stay in very-low-birth-weight infants.	272 infants in the pre-protocol cohort and 314 infants in the post-protocol cohort, all very-low-birth-weight infants in a Level III NICU.	Retrospective cohort study comparing pre-implementation (2013–2016) and post-implementation (2017–2019) periods using demographic and feeding outcome data; statistical analysis with Mann–Whitney and chi-square tests.	Post-menstrual age at first nipple feed; post-menstrual age at full oral feeds; length of stay in NICU.	
Swanson et al.(362)	2012 (UK)	To explore how preterm birth impacts maternal confidence and how mothers develop self-efficacy for infant feeding in the neonatal unit.	19 primiparous mothers of preterm infants (<37 weeks) in a Scottish neonatal unit.	Cross-sectional qualitative study using semi-structured interviews and thematic analysis combining inductive and a priori self-efficacy themes.	Mothers' descriptions of experiences, emotions, and behaviours relating to feeding preterm infants, mapped to self-efficacy constructs (mastery, modelling, persuasion, affect/physiology).	Mothers experienced loss, disruption, reduced autonomy, and anxiety following preterm birth; feeding-related behaviours (expressing milk, tube feeding, early breastfeeding attempts) functioned as key mechanisms for developing self-efficacy, with positive feedback, physical closeness, and supportive staff enhancing confidence, while inconsistent advice and emotional distress undermined it.

Thomas et al.(526)	2021 (USA)	To implement cue-based feeding for preterm infants and assess its effects on time to achieve full oral feedings, length of stay, and parents' involvement.	249 preterm infant medical records reviewed (82 before implementation, 167 after) from 23 0/7–31 6/7 weeks' gestation.	Quality improvement project using a pre–post evidence-based practice implementation design with retrospective medical record review.	Time to achieve full oral feedings; length of stay; parents' involvement in the feeding process.	Cue-based feeding decreased time to full oral feedings, decreased length of stay, increased parents' involvement, and resulted in cost savings.
Vittner et al.(604)	2018 (USA)	To examine changes in salivary oxytocin and cortisol in infants and parents during skin-to-skin contact and assess whether these changes relate to parental anxiety and parent–infant synchrony.	28 mother–father–preterm-infant triads recruited from three NICUs in Connecticut.	Randomised crossover study over 3 days with maternal SSC on one day and paternal SSC on the other; saliva samples taken pre-, during, and post-SSC; parental anxiety assessed; parent–infant interaction videos scored using the Dyadic Mutuality Code.	Salivary oxytocin, salivary cortisol, parental anxiety scores (VAS), and parent–infant synchrony/responsiveness scores.	Oxytocin increased significantly during SSC for mothers, fathers, and infants; infant cortisol significantly decreased during SSC; parental anxiety decreased during SSC; higher parental oxytocin during SSC was associated with more synchronous and responsive parent–infant interactions.

White-Traut et al. (508)	2013 (USA)	To examine the impact of the H-HOPE intervention on mother–preterm infant interaction patterns during feeding and play at 6-weeks corrected age.	198 premature infants (29–34 weeks gestation) and their mothers with ≥2 social-environmental risk factors; 149 dyads retained for follow-up	Two-group randomised clinical trial comparing H-HOPE to an attention control condition; intervention delivered in hospital and at home; interactions assessed via video at 6-weeks corrected age	NCAST Feeding Scale (maternal behaviours, infant behaviours, total score) and Dyadic Mutuality Code during play	H-HOPE dyads showed higher overall NCAST scores, significantly higher infant clarity of cues scores, and higher likelihood of high responsivity on the Dyadic Mutuality Code compared with controls (significant or marginally significant after adjustment).
White-Traut et al.(509)	2015 (USA)	To examine whether premature infants receiving the maternally administered H-HOPE intervention had more rapid weight gain and growth, improved feeding progression and reduced length of hospital stay compared with controls.	Premature infants born at 29–34 weeks gestational age and their mothers with at least two social-environmental risk factors; randomised to H-HOPE (n=88) or attention control (n=94).	Balanced two-group randomised clinical trial with H-HOPE applied twice daily during hospitalisation; data abstracted from medical records including growth measures, feeding progression and length of stay.	Weight, length, head circumference, daily proportion of oral to gavage intake, days to full oral feeding, length of hospital stay.	H-HOPE infants gained weight more rapidly and grew in length more rapidly than controls; no differences in length of stay, postmenstrual age at discharge or feeding progression.

Glover Williams et al.(489)	2022(UK)	To improve implementation of an 11-element perinatal care bundle for births <34 weeks' gestation using quality improvement methodology, and to evaluate changes in bundle uptake, barriers/enablers, and impacts on staff psychological safety and teamwork.	Mother–baby dyads <34+0 weeks' gestation across 12 NHS Trusts in South West England and West of England; perinatal staff completing surveys and interviews	Quality improvement project using retrospective and prospective data collection via the PERIPrem Optimisation Tool; mixed-effects logistic and linear modelling; staff surveys on psychological safety and teamwork; qualitative semi structured interviews.	Rates of individual bundle element implementation; proportion of fully optimised dyads; optimisation score; staff psychological safety, teamwork, communication, and reported barriers/enablers.	Full bundle implementation increased from 3% to 29% between 2019 and 2021; individual element uptake increased from 55% to 78%; significant improvements found in team function, situation monitoring, and communication; multiple elements showed statistically significant improvement during the implementation period.
Wormald et al.(535)	2021 (Chile, Argentina, Paraguay; NEOCOSUR Network)	To measure breast milk production at two timepoints during neonatal hospitalisation and examine its association with maternal anxiety, depression, and breastfeeding self-efficacy in mothers of very low birth weight infants.	118 mothers of very low birth weight infants (500–1500 g) across 9 NICUs in the NEOCOSUR Network.	Prospective observational multicentre study measuring daily expressed breast milk volume and administering STAI, BDI, and ALMA self-efficacy scales at 14 days and 36 weeks postmenstrual age.	Breast milk production (mL/day), anxiety scores (STAI), depression scores (BDI), breastfeeding self-efficacy scores (ALMA), and biosocial variables.	Breastfeeding self-efficacy was significantly associated with higher milk production at both timepoints; no significant association was found with anxiety or depression. Depression and anxiety scores decreased over hospitalisation.

Yildiz et al.(462)	2025 (Turkey)	To describe parents' emotions, readiness for discharge and needs while their preterm infants are in the NICU.	15 parent pairs (30 interviews) of preterm infants born <37 weeks in a state hospital NICU	Qualitative Gadamerian-based hermeneutic study using purposive sampling and in-depth semi-structured interviews	Thematic findings derived from interview transcripts exploring emotions, caregiving experiences, bonding, fears, and discharge readiness	Parents experienced anxiety, fear of harming their infant, challenges with bonding and breastfeeding, and differing adaptation patterns between mothers and fathers; readiness for discharge was low, especially with very preterm infants, and parents emphasised the need for structured education, emotional support, and continued professional guidance after discharge.

Chapter Eleven: Summary table of reviews on close and loving relationships

Author	Aim	Number of included Studies	Countries of Included Studies	Population	Types of Studies	Key findings
Braune, Krickau et al. (2021) (637)	To explore the impact of parental mobile device use through technoference or absorption on parental sensitivity and responsiveness within parent–child interactions in the early years (0–5).	12	US Israel Canada Australia Netherlands Germany	Parents of children aged 0–5 years	Experimental studies (6), naturalistic observational studies (5), mixed methods (2). Some studies used mixed approaches (e.g., Mangan 2018 and Wolfers 2020), so the total of categories is slightly higher than the total number of studies.	There are indications that parental smartphone use in the presence of babies or young children might be associated with decreases in parental sensitivity and responsiveness. Parental absorption in their devices seems to have a stronger impact on parental sensitivity and responsiveness than technoference (interruptions per se). In naturalistic studies, higher and prolonged smartphone use was associated with ignoring or delayed responding to children's bids for attention and less emotional support. In experimental studies, adapted still-face paradigms showed similar infant reactions to parental smartphone absorption as in classic still-face experiments (increased distress, negative affect, and attempts to re-engage the parent). Occasional short phone use was found to be less disruptive. There is a need for more longitudinal research with larger samples to fully understand the impact.
Fallon et al. (2016) (572)	To examine the relationship between postpartum anxiety (PPA) and infant-feeding outcomes.	33	Australia Barbados, Brazil Canada France Germany Italy Japan, Turkey US, UK	Postpartum women (within the first year after birth) with self-reported symptoms or clinical diagnosis of anxiety, excluding mothers of premature or	19 cross-sectional studies, 14 cohort studies.	Women experiencing PPA are less likely to exclusively breastfeed, more likely to terminate breastfeeding earlier, and in some cases less likely to initiate breastfeeding. PPA is linked to increased formula supplementation, reduced breastfeeding self-efficacy, more breastfeeding difficulties, negative maternal-infant feeding behaviours, and possible changes in breast milk composition. Findings are heterogeneous, but overall evidence indicates negative effects of PPA on recommended feeding practices.

				very low birth weight infants and infants with medical problems affecting feeding.		
Gibson & Kilcullen (2020) (594)	To explore the impact of using web-cameras upon parent-infant attachment in the NICU environment.	3	US, UK	Parents of infants admitted to the neonatal intensive care unit (NICU)	2 qualitative studies, 1 mixed methods study	Web-camera use in NICUs was generally described as enhancing parents' feelings of closeness to their infants, increasing parental responsiveness, and reducing stress and anxiety. No study directly measured attachment, but one study found a significant correlation between bonding scores and total minutes of camera viewing at the third time point. Parents reported feeling more connected, emotionally stable, and able to engage in caregiving activities such as breast milk expression. Some parents experienced increased stress when the camera was turned off or when they witnessed distressing events remotely. A small proportion of parents reported negative impacts, including hypervigilance and heightened anxiety.
Gomez et al. (2021) (244)	To assess effectiveness of psychological interventions to facilitate breastfeeding for mothers facing difficulties around the time of delivery.	20	Australia Canada China UK, US Croatia Denmark India Iran Malaysia Pakistan	Mothers in the peripartum period, defined as beginning sometime during the final month of pregnancy through about five months postpartum.	1 RCT, 4 quasi-experimental studies, 3 case series reports, 2 pre–post design studies	Most studies supported a positive effect of psychological interventions on breastfeeding outcomes. No adverse breastfeeding outcomes were reported in any study. Three studies found no association between psychological procedures and improved breastfeeding outcomes (specifically those involving self-hypnosis, interpersonal psychotherapy, or milk sIgA levels). Relaxation and psychotherapy interventions (e.g., cognitive-behavioural therapy, interpersonal psychotherapy, music therapy, manual relaxation, guided imagery) generally improved breastfeeding initiation, duration, or milk yield. Strongest evidence was for mothers of preterm infants, where simple

						relaxation interventions significantly increased milk volume expressed. Self-hypnosis was not associated with improvements in breastfeeding outcomes.
Komechen Brecailo & Saldan (2013) (617)	To explore the relationship between maternal depression and postpartum depression and their consequences on children's health care and feeding.	13	US Denmark Canada Brazil, UK, India Pakistan	Mothers with symptoms of maternal depression or postpartum depression and their children, mainly under 3 years of age.	Observational studies (prospective cohorts, case-control studies, telephone surveys, health service data analyses).	Children of mothers with depressive symptoms show a higher prevalence of failure to gain weight, increased risk of malnutrition, early interruption of exclusive breastfeeding, higher rates of hospitalization, lower use of preventive health services, and delays in vaccination. The relationship between maternal depression and childhood overweight is not conclusive. The repercussions of maternal depression on child health, nutrition, and development can persist beyond early childhood.
Leppänen et al (2024) (602)	To explore early psychosocial parent–infant interventions that aim to promote parent–infant relationships during the first year after preterm birth.	22	US, UK Norway AustraliaThe Netherlands, Japan Germany Switzerland France	Parents and their preterm-born infants (< 37 weeks of gestation); some studies also included fathers	19 RCTs, 3 case–control studies	Four main types of psychosocial parent–infant interventions were identified: counselling (67%), emotional support (17%), psychotherapy (11%), and education (6%). Most studies excluded infants with additional health risks or very low gestational age, and mothers with psychosocial risk factors. Most interventions were short-term, delivered during hospital stay or shortly after discharge, with few longitudinal approaches. Seventeen of 22 studies (77%) reported positive effects on parent–infant relationship outcomes, including increased sensitivity, bonding, and attuned interaction, although the measures and timing varied widely.
Mascheroni et al. (2019) (645)	To describe the effectiveness of interventions addressing parent-infant bonding during the postpartum period.	13	Sweden, US, UK, Canada, South Africa, Switzerland, The Netherlands, Italy	Parents of preterm infants, parents of healthy infants, mothers with postpartum depression, immigrant and	5 RCTs, 1 non-RCT, 1 open-label single-arm pilot study, 1 mixed-methodology pilot study, 1 quasi-experimental study with intervention and control group, 1 multiple-baseline single case series study, 1 observational single	Most interventions were conducted in at-risk populations; seven studies used educational and behavioural interventions, three psychosocial interventions, two interventions teaching specific techniques, and one used neurostimulation. Several interventions (e.g., infant massage, singing lullabies, NIDCAP, VIG) showed improvements in bonding. Some interventions (e.g., internet-based and telephone interventions) showed no significant

				socially-isolated mothers, mothers with HIV, mothers with abuse-related PTSD, mothers with pregnancy complications during preterm labour.	cohort study, 1 single case study, 1 prospective cohort study, 1 concurrent cohort study. Some studies used more than one design element (e.g., concurrent cohort or mixed methodology).	effects. The review found high heterogeneity in methods, outcomes, and sample sizes, limiting comparability and generalization. Fathers were included in only two studies. The authors highlight the need for more standardized methodologies, inclusion of fathers, face-to-face interventions starting antenatally, and interventions targeting parents of children with chronic conditions.
Mendu et al. (2024) (646)	To explore the long-term effects of early maternal-infant bonding during the sensitive period immediately after birth, primarily through skin-to-skin contact and early breastfeeding initiation.	5	Sweden, Germany US	Neonates and their mothers during the immediate postpartum period.	3 observational studies, 2 RCTs	Early SSC within the first hour after birth was associated with improved maternal sensitivity, infant self-regulation, affectionate behaviours, and increased breastfeeding attempts compared to delayed contact. Separation immediately after birth was linked to harsher maternal behaviours, fewer breastfeeding attempts, and weaker early bonding indicators. The findings support the existence of a sensitive period that may be important for establishing optimal mother-infant interaction and potentially long-term psychosocial and emotional benefits. However, evidence is limited, based on only five small-scale and partly outdated studies with mixed long-term results, emphasising the need for more robust and contemporary research.
Monks & Palanisamy (2021) (566)	To explore the potential long-term effects of peripartum synthetic oxytocin exposure on maternal and child outcomes.	Postpartum depression: 9 studies, Breastfeeding difficulties: 5 studies, Neurodevelopmental disorders: 6 studies	USA, Germany Switzerland, Canada, Czech Republic DenmarkFinland, Spain,	Pregnant women exposed to synthetic oxytocin during labour or postpartum and their infants.	Observational studies, retrospective database analyses, case-control studies, prospective cohort studies, animal studies.	Postpartum depression: Some studies reported increased risk, others decreased or no association, with results likely confounded by underlying maternal mental health and obstetric factors. Breastfeeding: Exposure was frequently linked to impaired neonatal reflexes and reduced breastfeeding success, though definitions and controls varied. Neurodevelopment: Modest and conflicting

			Portugal, UK.			associations with autism spectrum disorder and ADHD were reported, with sibling analyses suggesting non-causal links; lack of cumulative dose data was a major limitation. Persistent pain: Evidence for analgesic and anti-hypersensitivity effects came mainly from animal models, potentially explaining low chronic pain rates post-caesarean.
Nagel et al. (2022) (635)	To explore the relationships between maternal psychological distress and lactation and breastfeeding outcomes in pregnancy and postpartum, and the possible physiological mechanisms that facilitate these relationships.	7	US, Canada, Europe, Australia were considered	Mothers in pregnancy and postpartum.	Study design of studies included in the review (indicating how many of each type if information given): 7 systematic reviews, 1 meta-analysis.	Evidence supports a role for psychological distress in multiple breastfeeding outcomes, including delayed secretory activation and decreased duration of exclusive breastfeeding. Psychological distress may impair oxytocin release, which plays a critical role in milk ejection, leading to decreased milk production. Elevated serum cortisol and decreased insulin sensitivity associated with distress may also contribute to decreased milk production. The relationship between psychological distress and breastfeeding is likely bidirectional, with breastfeeding potentially reducing maternal distress. The quality of the evidence is limited by heterogeneity in measures and study design. Interventions to support lactation in women experiencing psychological distress may benefit maternal and infant health.
Querido et al. (2022) (647)	To explore nursing interventions that promote bonding in newborns in need of hospitalisation.	53	Countries of included studies not consistently specified	Hospitalised newborns (term or preterm) up to 28 days of life and their parents or caregivers.	24 quantitative studies, 8 qualitative studies, 4 quasi-experimental, 3 RCTs, 1 non-RCT, 1 prospective study, 12 literature reviews	Nursing interventions promoting bonding were grouped into two categories: (1) promoting interaction between parents and newborn (physical proximity, Kangaroo Mother Care/skin-to-skin contact, massage, breastfeeding support, active involvement in newborn care, and use of web cameras to maintain closeness), and (2) promoting interaction between parents and nursing staff (effective communication, emotional support, early guidance during first visits, non-judgmental attitudes, inclusion of both parents—especially fathers—and collaborative

						care planning). These interventions were associated with improved parental confidence, reduced anxiety, enhanced breastfeeding success, and stronger parent-newborn relationships, helping families overcome bonding barriers created by hospitalisation (Querido et al., 2022).
Ryan et al. (2025) (575)	To explore the relationship between perinatal maternal stress and the human milk, maternal, and infant gut microbiomes.	7	US, Netherlands, Finland, Ecuador.	Mothers from conception up to 6 months postpartum and their exclusively breastfed infants under 6 months old.	6 cross-sectional and 1 longitudinal.	Maternal stress during the perinatal period is generally linked to increased abundance of potentially pathogenic bacteria (e.g., Erwinia, Serratia, Bacteroides) and decreased beneficial bacteria (e.g., Lactobacillus, Akkermansia) in maternal and infant gut microbiomes. Some studies reported opposite associations, with certain beneficial taxa (e.g., Lactobacillus, Lactococcus) enriched under high stress, though often not significant after adjusting for confounders. Stress was associated with both reduced and increased microbial diversity depending on study design and timing, with effects varying across infant ages. Overall, maternal stress may alter microbiome composition and diversity, influencing vertical transmission to infants and potentially shaping long-term metabolic and immune health outcomes.
Shorey et al. (2023) (562)	To explore the associations of parental oxytocin concentration levels with parenting behaviour and bonding within the past 20 years.	33	Israel, US, Japan, UK, Canada, Austria, Netherlands, AustraliaHong Kong	Mothers, fathers, and their children aged 3 days to 6 years	26 observational studies, 6 cross-over studies, 1 RCT	Current evidence strongly suggests that parental oxytocin levels are positively related to parental touch, parental gaze, affect synchrony, and observer-coded parent–infant bonding. No gender differences were found in oxytocin levels between fathers and mothers, but oxytocin strengthens affectionate parenting in mothers and stimulatory parenting in fathers. Child oxytocin levels were positively associated with parental oxytocin levels. Studies using exogenous oxytocin found increased positive paternal behaviours, while evidence for maternal behaviours was mixed. Parent–child

						synchrony and bonding showed positive associations with higher oxytocin levels, but findings for gaze and affect were mixed. Self-reported bonding often showed no association, whereas observer-coded bonding showed positive relationships.
Skowron et al. (2025) (573)	To explore the relationship between a mother's mental state (stress, anxiety, postpartum depression) and the biochemical profile of human breast milk, focusing on nutrients, hormones, immune factors, and microbiota.	38	Not specified	Human lactating mothers and in some cases their infants' microbiota.	Observational studies involving validated psychological assessment tools (e.g., EPDS, STAI, PSS).	Findings indicate that maternal psychological distress (stress, anxiety, and postpartum depression) has been linked with alterations in breast milk composition. Elevated cortisol and changes in melatonin and prolactin levels were observed, along with variable immune responses (e.g., changes in secretory immunoglobulin A and TGFβ2). Lower levels of docosahexaenoic acid and other polyunsaturated fatty acids were reported in mothers with depression. Psychological distress may also alter microbiota diversity in maternal milk and infant gut. Evidence highlights the importance of mental health support during the postpartum period to optimize breast milk composition and infant development.
Sliwerski et al. (2020) (621)	To explore the influence of maternal depression on child attachment security measured before 24 months after birth.	29	US, Denmark Netherlands, Australia, Switzerland, South Africa, Israel, Germany UK, Canada, Italy, Sweden.	Mothers experiencing prenatal, postnatal, or major depression and their infants up to 24 months old.	25 longitudinal study design, 3 cross-sectional, and 1 intervention study (non-randomised).	Findings showed mixed evidence regarding maternal depression and infant attachment security. Links to insecure or disorganized attachment were more often observed when depression was diagnosed by structured clinical interviews, particularly in cases of early postpartum depression (≤6 months), comorbid conditions, or low maternal sensitivity. Many studies using self-report questionnaires reported no significant relationship. Protective factors like maternal sensitivity and social support appeared to buffer negative effects, while some studies found no impact of depression on attachment security at all.

Slomian et al. (2019) (622)	To evaluate both the infant and the maternal consequences of untreated maternal postpartum depression (PPD).	122	US, Nigeria, Turkey, Canada, Brazil, Portugal, Italy, Mexico, Japan, AustraliaIceland, New Zealand, Sweden, UK, China, Belgium, Singapore, Israel, Zambia, France	Mothers aged 13–49 years suffering from untreated postpartum depression and their children aged 0–3 years.	Observational studies: cohort and cross-sectional designs (including 1 qualitative study).	Findings suggest that untreated maternal postpartum depression (PPD) can negatively affect both mothers and infants, although the strength and consistency of evidence vary across outcomes. Maternal consequences include postpartum weight retention, reduced quality of life, relationship difficulties, risky behaviours (such as smoking relapse, alcohol use, and suicidal ideation), and persistent depressive symptoms. Infant consequences may include impaired growth (especially in low- and middle-income settings), higher morbidity and mortality, sleep problems, and potential delays in motor, cognitive, language, emotional, social, and behavioural development, though results are mixed and often influenced by environmental and caregiving factors. Mother–child interactions can be disrupted, with studies reporting weaker bonding, lower maternal confidence and sensitivity, altered perceptions of infant behaviour, early breastfeeding cessation, and occasional reports of increased maltreatment risk. Early detection and treatment of PPD are important to reduce these potential adverse outcomes.
Stoodley et al., 2023 (132)	To explore interventions that have been provided by the midwife which support the development of the maternal-fetal or mother-infant relationship amongst a low-risk population from pregnancy,	16	Turkey, Norway, Italy, Japan, Sweden, Korea, Brazil, US, Switzerland, Colombia, Taiwan	Low-risk pregnant women and mothers up to six weeks postnatal	3 RCTs, 3 quasi-randomised, 1 quasi-experimental pre-test/post-test, 1 longitudinal cluster-controlled, 1 prospective survey, 1 pre-experimental pre/post, 1 single-blind multiple time series, 1 pilot pre/post, 1 cross-sectional, 1 feasibility, 1 explorative, 1 phenomenology.	Interventions fell into three themes: (1) viewing the fetus as separate from the mother, (2) focused activities, and (3) targeted educational interventions. Abdominal palpation and perception of fetal movement were associated with significantly higher prenatal attachment scores. Focused activities such as prenatal education, Taegyo-focused classes, lullaby singing, and infant massage enhanced maternal-fetal attachment and/or postnatal bonding. Lack of skin-to-skin contact negatively influenced bonding. Educational interventions, including health counselling, psycho-education, parenting education, and the use of the

	and up to six weeks postnatal.					Newborn Behavioural observations, improved mother-infant relationship indicators such as attachment, bonding, self-efficacy, and interaction quality. Cultural considerations were largely absent, with only one study integrating traditional Korean practices.
Szymanska et al. (2017) (567)	To determine the psychophysiological role of oxytocin (exogenous and endogenous) in close parent-child interactions.	47	NR	Studies of healthy populations were analysed to examine the effects of oxytocin specifically in the context of parent-child interactions.	NR	Oxytocin administration may increase parent-child prosocial interaction, exerting beneficial effects on bonding, sensitivity, and synchrony. Endogenous oxytocin levels are associated with parental sensitivity and affectionate caregiving, with differences observed between mothers and fathers. Oxytocin influences bonding through emotional regulation, reduced stress, and increased reward system activation. Exogenous oxytocin promotes responsiveness to child cues, reduces amygdala activation, and enhances reward-related brain activity. Caregiving behaviours are linked to activation of reward circuits rich in oxytocin receptors, with sex-specific patterns of neural activation. Oxytocin is associated with synchrony between parent and child, with synchronised hormonal and behavioural responses. Factors such as genetic variation (e.g., OXTR, CD38), steroid hormones, sex, attachment style, and context (e.g., maltreatment, presence of strangers) moderate oxytocin's effects. Oxytocin can also produce adverse or antisocial effects (e.g., anxiety, defensive behaviours) under certain contexts. The authors note the therapeutic potential of oxytocin for parent-child interaction disorders but highlight gaps in long-term safety and methodological standardisation.
Van Sielegh em et al. (2022) (629)	To investigate whether maternal childbirth-related PTSD (CB-PTSD) symptoms are	35	UK, Iran, Italy, France, Canada, Switzerlan	Mothers aged 18–52 years who experienced childbirth-	20 cross-sectional studies and 15 longitudinal/prospective cohort studies; 2 RCTs on	Maternal childbirth-related PTSD (CB-PTSD) symptoms were most consistently associated with problems in mother–infant bonding, insecure attachment, and more difficult child behaviour or temperament, although these

	associated with a negative mother-child relationship and/or child developmental outcomes for children aged 0–5 years, and whether maternal trauma-focused therapy can positively impact mother and child outcomes.		d, Norway, Israel, US, Croatia, Turkey, China	related PTSD symptoms and their children aged 0–2 years.	trauma-focused therapy interventions.	associations were often attenuated when adjusting for maternal depression or other confounders. Evidence linking CB-PTSD symptoms to breastfeeding difficulties, child sleep problems, socio-emotional development, and growth outcomes was based on very few studies and showed limited and inconsistent findings. Only two randomized controlled trials assessed early trauma-focused interventions (<3 days postpartum): both reduced maternal CB-PTSD symptom severity, but effects on mother–child relationships were inconsistent, and no robust evidence was found for benefits on broader child developmental outcomes. Overall, findings suggest a potential impact of CB-PTSD on early mother–child interactions, while evidence for other child outcomes and treatment effects remains scarce, inconsistent, and of low methodological quality.
Ventura (2017) (577)	To explore associations between mothers' feeding experiences and responsive feeding in an attempt to clarify the nature of associations between feeding mode and responsive feeding.	43	Developed and/or high-income countries	Mothers and infants	Cross-sectional (16), retrospective or longitudinal (12), prospective longitudinal (number not fully stated but includes multiple studies), RCTs (2)	Cross-sectional studies consistently reported greater responsiveness among breastfeeding mothers than among formula-/bottle-feeding mothers. Longitudinal studies showed that longer breastfeeding durations predicted lower use of nonresponsive feeding practices during later childhood, and some, but not all, found that breastfeeding mothers showed greater increases in responsiveness across infancy. A limited number of longitudinal studies also reported that greater responsiveness during early infancy predicted longer breastfeeding durations. Two randomized clinical trials aimed at promoting maternal responsiveness did not find effects of the intervention on breastfeeding outcomes, though findings were limited by how breastfeeding outcomes were assessed. Overall, there is consistent evidence for an association between breastfeeding and

						responsive feeding, but causal mechanisms remain unclear.
Vizzari et al. (2023) (590)	To explore the feeding challenges faced by late preterm infants and the impact of these issues on maternal mental health and the mother–infant relationship.	19	Eight conducted in North America, six in Europe, one in Asia; the rest not specified individuall y.	Late preterm infants (born between 34 and 36 weeks of gestation) and their mothers.	17 observational studies, 1 qualitative study, 1 mixed-method study.	Feeding difficulties are highly prevalent among late preterm infants due to immature physiological functions and oromotor dysfunctions, leading to lower breastfeeding rates and earlier cessation compared to full-term infants. These difficulties negatively impact maternal mental health, contributing to increased stress, anxiety, depression, and feelings of failure. Altered maternal self-efficacy and impaired bonding are linked to reduced breastfeeding success. Targeted interventions and professional support are needed to improve feeding skills, promote maternal well-being, and strengthen the mother–infant relationship.
Weinstei n et al. (2023) (569)	To explore oxytocin and oxytocin receptor genetic and epigenetic variation in relation to breastfeeding, maternal caregiving behaviour, and maternal mental health.	23	US, Canada, UK, Spain, Australia Germanyl srael, Malaysia Switzerlan d, Brazil.	Mothers during pregnancy or postpartum (up to 12 months) and in some cases mother–infant dyads.	19 cohort studies and 4 cross-sectional studies (some retrospective and secondary data analyses).	Findings suggest that genetic and epigenetic variation in the oxytocin system is associated with maternal caregiving behaviour and mental health, often interacting with early life adversity or social stress. The most studied SNP (rs53576) was linked to a higher risk of postpartum depression symptoms in G-allele carriers under stress exposure. Epigenetic variations (e.g., DNA methylation at CpG −934) were related to maternal depression and caregiving behaviour. Evidence on breastfeeding outcomes was limited and inconsistent, with some studies suggesting that genetic variants (e.g., rs53576, rs2254298) may increase nipple pain sensitivity in early postpartum weeks, potentially influencing breastfeeding cessation. Results highlight complex gene–environment interactions influencing maternal mental health and caregiving postnatally.

Zhang et al. (2014) (601)	To describe the key components in early interventions for preterm infants and their mothers in both NICU and home settings and to evaluate the effects of intervention on maternal emotional outcomes, mother-infant interaction, and infant developmental outcomes.	12	Australia Canada, England, Japan, Norway, and the US.	Mothers aged 26.0–34.2 years; approximately 43% first-time mothers; infants preterm (<37-week gestation) and/or low-birth weight (<2500 g); average gestational age 27.4–33.3 weeks; some studies included very low-birth weight (<1500 g) infants.	12 RCTs	Interventions, mostly parent education programs, had limited effects on maternal stress and mother-infant interaction, but positive effects on maternal anxiety, depressive symptoms, and coping. Positive and clinically meaningful effects were observed in some physiological and psychological outcomes of mothers and preterm infants, including shorter hospital stay and higher breastfeeding rates. Early interventions showed beneficial short-term effects on maternal well-being and infant development, highlighting the importance of fostering close mother-infant contact and increasing maternal competence during and after hospitalization.
Not reported (NR); Neonatal Intensive Care Unit (NICU); Postpartum Anxiety (PPA); Randomized Controlled Trial (RCT); Newborn Individualized Developmental Care and Assessment Program (NIDCAP); Video Interaction Guidance (VIG); Skin-to-Skin Contact (SSC); Attention Deficit Hyperactivity Disorder (ADHD);Infant-Toddler Social and Emotional Assessment (ITSEA); Fractional Anisotropy (FA); Growing Up in Singapore Towards healthy Outcomes (GUSTO); State-Trait Anxiety Inventory (STAI); Edinburgh Postnatal Depression Scale (EPDS); Perceived Stress Scale (PSS); Transforming Growth Factor Beta 2 (TGFβ2); Postpartum Depression (PPD); Oxytocin Receptor Gene (OXTR);Childbirth-Related Post-Traumatic Stress Disorder (CB-PTSD); Single Nucleotide Polymorphism (SNP); Cytosine-phosphate-Guanine site (CpG).						

Chapter Eleven: Summary table of empirical studies on close and loving relationships

First Author Surname	Year (Country)	Aim (as reported by the author)	Number of Participants (N=) and Characteristics	Methods	Outcome Measures	All Key Findings
Abargil et al. (610)	2023 (Israel)	Investigate the phenomenon of breastfeeding pain in mothers and its association with maternal and infant behavioural regulation.	N=71 mother infant dyads (50 dyads with breastfeeding mothers reporting varying levels of pain and 21 non-breastfeeding mothers).	Questionnaires on breastfeeding pain and participated in a 2-minute free interaction with their infants, videotaped at home or community centres. Interactions were coded.	Maternal and infant affective expressions (valence, intensity) and gaze during interactions.	Mothers with severe breastfeeding pain maintained less focused gaze and showed weaker affective expressions during infant engagement and play compared to mothers with no or moderate pain. Pain did not affect maternal responses during infant distress. Infants of mothers with severe pain expressed weaker affective expressions and maintained longer focused gaze. Breastfeeding pain was thus associated with altered maternal and infant behaviours during interactions, suggesting potential negative implications for bonding and development.
Alvarez Gutierrez & Ventura (642)	2021 (US)	Examine associations between maternal technology use during mother-infant interactions and indicators of mother-to-infant attachment during early infancy.	N=332 mothers of infants aged 2 to 6 months.	Cross-sectional online survey using validated questionnaires.	Maternal technology use, infant temperament (negative affectivity, orienting/regulatory capacity, positive affectivity/surgency), and indicators of mother-to-infant attachment (attachment quality, absence	Greater maternal technology use during mother–infant interactions was associated with greater perceived infant negative affectivity ($\beta = 0.26$, $p < .0001$, $f^2 = 0.09$), lower attachment quality ($\beta = -0.21$, $p < .0001$, $f^2 = 0.10$), and greater hostility toward motherhood ($\beta = -0.39$, $p < .0001$, $f^2 = 0.19$). These associations remained after controlling for infant negative affectivity. Technology use did not predict maternal pleasure in interactions ($\beta = -0.07$, $p = .214$,

					of hostility, pleasure in interactions).	$f^2 = 0.01$). Infant negative affectivity did not mediate associations between technology use and attachment outcomes.
Bacom & Napolitano (625)	2024 (UK)	Explore the relationship between coping, optimism and mental health, and their impact on breastfeeding duration.	N=612 women who had breastfed within the previous 5 years. Mean age 35.6 years; 78.3% White; 96.1% married/cohabiting; 78.1% educated to at least undergraduate level; none first-time mothers.	Cross-sectional online survey. Participants recruited via a breastfeeding research database. Measures included Hospital Anxiety and Depression Scale, Cognitive Emotion Regulation Questionnaire, Brief COPE inventory, and Life Orientation Test.	Breastfeeding duration, maternal anxiety, depression, coping strategies, optimism.	Breastfeeding duration was directly associated with higher depression but not anxiety. Optimism mediated the relationship between anxiety and breastfeeding duration ($\beta = -0.01$, 95% CI –0.02 to –0.004), with higher optimism linked to longer breastfeeding despite anxiety. Longer breastfeeding was also predicted by higher education, fewer children, being married/cohabiting, higher optimism, higher depression, greater other-blame, and lower acceptance and instrumental support (Nagelkerke $R^2 = 0.20$). Adaptive coping strategies (planning, positive reappraisal, positive refocus) were negatively associated with anxiety and depression, while maladaptive strategies (self-blame, rumination, catastrophising, substance use) were positively associated. Acceptance coping was higher among women breastfeeding <3 months and was linked to greater distress. Women breastfeeding longer reported higher depression. Reasons for cessation differed: feeding complications and lack of support (<6 months), natural weaning and personal choice

						(~12 months), and time apart from the child across groups.
Bascom et al. (623)	2016 (US)	Examine the breastfeeding behaviours of women with PDS to identify potential motivations for early breastfeeding cessation.	N=1271 women from the IFPS2, recruited from US households; mean maternal age 28.8 years; 30.9% met criteria for mild PDS.	Secondary analysis of IFPS2 longitudinal survey data (2005–2007). PDS measured at 2 months postpartum with EPDS (cutoff ≥9). Breastfeeding duration, exclusivity, and reasons for cessation collected via mailed questionnaires through 12 months postpartum.	Breastfeeding duration (any and exclusive), early cessation (<24 weeks), and primary reasons for breastfeeding cessation. PDS status (EPDS).	Women with PDS had shorter overall (18.4 vs 21.8 weeks, p=.001) and exclusive breastfeeding duration (3.6 vs 4.7 weeks, p=.012) than women without PDS. 68.7% of women with PDS stopped breastfeeding before 6 months vs 57.2% without PDS (p<.001). PDS predicted higher odds of citing “too many household duties” as a primary reason for early cessation (OR=1.90, p=.011). After adjustment, women with PDS breastfed 2.4 weeks less on average (p=.025). Authors conclude that PDS is prevalent and associated with shorter breastfeeding duration and higher early cessation, emphasising the need for improved screening and lactation support.
Bernier et al. (543)	2016 (US)	Investigate if normative variations in parenting relate to brain development among typically developing children.	N = 352 mother–infant dyads (185 girls); final N = 215 at 24 months.	Longitudinal study with data collection when infants were 5, 10, and 24 months of age. Mother–infant interaction: Videotaped 2-minute unstructured play session at 5 months. Maternal behaviours coded every 30 seconds using a 4-point scale across	Primary outcome: Infant frontal resting EEG power (alpha 6–9 Hz and theta 4–6 Hz bands). Secondary outcome: Age-related increases in EEG frontal power from 5 to 10 months and	Higher maternal positive affect at 5 months predicted: Higher frontal EEG power (alpha and theta) at 10 and 24 months. More pronounced increases in EEG power between 5 and 10 months and between 10 and 24 months. Maternal intrusiveness was not significantly related to EEG power. Effects were specific to frontal scalp sites; associations with

				four dimensions: sensitivity, intrusiveness, positive affect, and physical stimulation.	from 10 to 24 months.	other regions were mostly nonsignificant. The unique contribution of maternal behaviour remained significant after controlling for maternal age, education, infant sex, and prior EEG power. The effect sizes were modest but consistent: maternal behaviour contributed significantly in 9 of 12 regression models and marginally in 1. The findings support the hypothesis that normative variation in parenting quality contributes to brain development among typically developing infants.
Bilgin & Wolke (591)	2017 (UK)	Determine the influence of maternal sensitivity on infant feeding problems in VP/ VLBW and FT infants.	N=178 infants (73 VP/VLBW and 105 FT). VP/VLBW: mean gestational age 29.4 weeks, mean birth weight 1285.8 g; FT: 37–42 weeks, no neonatal medical problems.	Longitudinal study. Feeding problems and maternal sensitivity were assessed at term, 3 and 18 months.	Infant feeding problems (oral-motor difficulties, faddy eating/food refusal) and maternal sensitivity (observed during play and caregiving).	VP/VLBW infants had more oral-motor difficulties at term (40.3% vs 18.1%, $p < 0.01$) and 18 months (39.4% vs 35.7%, $p < 0.05$), and more faddy eating/food refusal at 18 months (34.2%, $p < 0.05$), incl. picky eating (57.8%, $p < 0.05$) and refusing lumpy food (28.1%, $p < 0.05$). No group differences in maternal sensitivity. In VP/VLBW, feeding problems at term predicted lower maternal sensitivity at 3 months ($\beta = -0.27$, $p < 0.05$), and at 3 months predicted lower sensitivity at 18 months ($\beta = -0.36$, $p < 0.05$), with no reciprocal effects. In FT, reciprocal associations occurred from 3–18 months: lower maternal sensitivity at 3 months

						predicted more feeding problems at 18 months (β = –0.25, p < 0.05), and feeding problems at 3 months predicted lower sensitivity at 18 months (β = –0.32, p < 0.05). No significant associations from term to 3 months.
Binda et al. (619)	2019 (Chile)	Assess the association between PDS and their severity, with the quality of mother–infant interaction and compare the quality of mother–infant interaction and severity of the symptoms depending on the presence or absence of antenatal depressive symptoms ADS.	N=177 psychosocial risk mother–infant dyads; infant age 2–12 months; mean maternal age 25.3 years	Observational study. Baseline data from a randomized clinical trial. Antenatal depressive symptoms assessed retrospectively.	Maternal sensitivity and interaction style (sensitive, intrusive/controlling, unresponsive/passive); infant interaction style (cooperative, difficult, compulsive–compliant, passive); severity of depressive symptoms (EPDS scores); presence of antenatal depressive symptoms.	Mothers with PDS had lower maternal sensitivity and higher intrusive/controlling interaction styles compared to those without PDS. Severity of symptoms was not associated with lower sensitivity. Mothers with both ADS and PDS showed intrusive/controlling interaction style and more severe depressive symptoms, while mothers with only PDS showed a nonresponsive/passive interaction style and less severe symptoms. Infants of mothers with PDS were less cooperative and more compulsive–compliant. Presence of ADS increased the likelihood of severe PDS threefold. Findings highlight that antenatal depressive symptoms influence later interaction styles and symptom severity, emphasising the need for early treatment and dyadic interventions.
Braithwaite et al. (631)	2021 (UK)	Test whether maternal postnatal depressive symptoms (EPDS at 9 weeks) are	N=857 mother–infant pairs from the Wirral Child Health and Development Study	Prospective epidemiological study. Mothers completed the EPDS And reported	EPDS, breastfeeding status (breastfed vs non-breastfed), infant distress to	At 9 weeks, maternal postnatal depressive symptoms were positively associated with infant distress to limits, not moderated by sex or breastfeeding. At 14

		associated with infant negative emotionality (IBQ-R "distress to limits") at 9 weeks and 14 months, and whether associations are moderated by breastfeeding status and infant sex.		breastfeeding status and infant behaviour at 9 weeks; infant distress to limits measured again at 14 months using the IBQ-R.	limits (IBQ-R at 9 weeks and 14 months).	months, maternal postnatal depression predicted greater distress to limits in breastfed females, smaller but significant effect in non-breastfed females, and no significant association in males. Female infants breastfed by mothers with high depressive symptoms showed highest negative emotionality, while those breastfed by mothers with very low symptoms showed lowest negative emotionality. Findings suggest effects of postnatal depression on infant emotional outcomes are moderated by breastfeeding and differ by sex.
Brown et al. (612)	2015 (UK)	Examine the relationship between specific reasons for stopping breastfeeding and depressive symptoms in the postnatal period.	N=217 mothers with infants aged 0–6 months who had initiated breastfeeding at birth but stopped before 6 months	Cross-sectional self-report survey. Mothers completed questionnaires on breastfeeding duration.	Breastfeeding duration, reasons for cessation (physical difficulty, pain, inconvenience, body image, embarrassment, pressure from others, lack of support, medical reasons), and maternal depressive symptoms (EPDS score).	Shorter breastfeeding duration and multiple reasons for cessation were associated with higher depression scores. Regression analyses showed only physical difficulty and pain remained predictive of higher EPDS scores. Stopping for psychosocial reasons (embarrassment, body image) was not associated with depressive symptoms. Duration of breastfeeding itself did not predict depression once reasons were considered. Findings highlight that women who stop due to pain and physical difficulties are at greater risk of postnatal depression, emphasising the need for targeted support.

Browne et al. (576)	2019 (Netherlands and Spain)	Explore whether maternal postnatal psychosocial distress was related to alterations in the relative abundances of specific bacteria and to milk microbial diversity	N = 77 mothers (N = 51 with complete data); healthy breastfeeding mothers after full term pregnancies	longitudinal cohort; breast milk samples collected at 2, 6, and 12 weeks postpartum; maternal questionnaires on stress, anxiety, and depressive symptoms at 6 weeks; DNA extraction, 16S rRNA gene sequencing (V3–V4 region) using Illumina MiSeq technology; bioinformatics analyses in QIIME	Relative abundance of bacterial phyla and genera in milk, microbial diversity (Shannon and Simpson indices), maternal psychosocial distress (stress, anxiety, depressive symptoms)	Overall increase in milk microbial diversity over the first 3 months postpartum explained by increased Lactobacillus and other minor genera and decreased Staphylococcus; no significant differences in relative abundance of major genera between high (n = 13) and low (n = 13) psychosocial distress groups; significant changes over time in Firmicutes (decrease), Proteobacteria (increase), and Bacteroidetes (increase) in the low distress group but not in the high distress group; Lactobacillus, Acinetobacter, and Flavobacterium increased over time only in the low distress group; higher psychosocial distress associated with significantly lower bacterial diversity at 3 months postpartum; stress, anxiety, and depressive symptoms individually were not related to specific bacterial profiles.
Buss et al. (544)	2012 (US)	To prospectively examine the association between maternal cortisol concentrations over the course of gestation with subsequent measures of child hippocampus and amygdala volumes	N=65 mother–child dyads. Mothers were recruited in early gestation from obstetric care provider clinics.	Prospective longitudinal study. Maternal saliva samples were collected serially during pregnancy to assess cortisol concentrations; MRI brain scans at 7 years; CBCL for affective problems.	Maternal salivary cortisol concentrations during pregnancy (early, mid-, late gestation); child brain volumes (hippocampus and amygdala) measured with MRI at 7 years; affective problems	Higher maternal cortisol levels at 15 weeks gestation were associated with larger right amygdala volume in girls (a 1 SD increase in cortisol associated with 6.4% increase in right amygdala volume), but not in boys. No association was found between maternal cortisol and hippocampus volume. Higher maternal cortisol in early gestation was associated with

		and affective function.			measured using CBCL affective subscale (T-scores).	more affective problems in girls, and this association was mediated in part by right amygdala volume. No associations were observed for cortisol in mid- and late gestation with child brain volumes or affective problems. Findings indicate sex-specific and gestation-timing-specific associations between maternal cortisol and child brain structure and affect.
Coo et al. (624)	2020 (Chile)	Explore the association between breastfeeding practices and maternal mental health, with an emphasis on maternal anxiety.	N=229 pregnant women in their third trimester recruited from two public primary health centres	Prospective cohort study. Women assessed in third trimester and followed at 3 and 6 months postpartum.	Maternal depression (EPDS), maternal anxiety (PASS), breastfeeding exclusivity at 3 months, breastfeeding continuation at 6 months.	Higher prenatal depression predicted nonexclusive breastfeeding at 3 months. At 3 months, higher anxiety and depression were associated with nonexclusive breastfeeding. Exclusive breastfeeding at 3 months strongly predicted breastfeeding continuation at 6 months (OR = 21.12, 95% CI 4.62–96.56). At 6 months, discontinued breastfeeding was associated with higher depressive symptoms but not anxiety. Findings indicate that maternal depression and anxiety negatively affect breastfeeding, highlighting the importance of early screening and intervention.
Coo et al. (578)	2024 (Chile)	Examine the contribution of exclusive breastfeeding at 3 months postpartum to the quality of the mother-infant	N=80 pregnant women recruited in their third trimester from two public health centres; mean age categories: 22.5%	Longitudinal observational study with three time points: third trimester, 3 months postpartum, 6 months postpartum.	Maternal depression and anxiety (EPDS, PASS), breastfeeding exclusivity at 3 months,	Exclusive breastfeeding at 3 months predicted higher maternal sensitivity (OR=7.86) and cooperation (OR=4.77) at 6 months, independent of maternal mental health. Lower prenatal depressive symptoms predicted

		relationship at 6 months postpartum, controlling for maternal mental health.	18–24, 61.3% 25–34, 16.2% >35; 79.5% Chilean, 15.4% Venezuelan, 5.1% other Latin American; 41.3% primiparous; 56% caesarean births; all full-term infants.		breastfeeding continuation at 6 months, maternal sensitivity and cooperation (Ainsworth scales).	higher sensitivity and cooperation. Prenatal anxiety, and postnatal anxiety or depression did not predict outcomes. Maternal mental health did not predict exclusive breastfeeding at 3 months.
Coyne et al. (636)	2022 (US)	Understand mothers' reasons for using media while feeding their infant and to longitudinally examine the relationship between caregiver media use during feeding and attachment, parent-infant relationship, and dyadic dysfunction.	Study 1: N=19 mothers, average age 26.5 years, 89.5% White, infants average age 5.4 months, feeding methods included exclusive breastfeeding (47.4%), exclusive bottle-feeding (10.5%), and mixed feeding (42.1%). Study 2: N=249 families (244 mothers, 5 fathers), average parental age 31 years, racially diverse (63% White, 20.6% Hispanic, 9.3% Black, 5.6% multiracial, 2% Asian), infants average age 5.9 months, 54% exclusively breastfed, 32% exclusively bottle-	Mixed-method design. Study 1: Four focus groups, semi-structured interviews on media use during feeding, transcribed and coded thematically. Study 2: Longitudinal study (Project M.E.D.I.A.), data collected at two waves one year apart, including surveys, home visits, and observational free-play sessions	Parental media use during feeding, parent-infant attachment security, parent-infant relationship quality (warmth, positive feedback), parent-child dysfunction.	Most parents reported using media while feeding. Focus group themes: coping (pain, frustration, boredom), productivity, information gathering, and connection, shaped by time of day and infant age. Cross-sectionally, more media use was linked to greater parent–child dysfunction (β=.15). Longitudinally, media use was unrelated to attachment, warmth, or infant positive feedback, but predicted lower dysfunction one year later (β=−.14). Breastfeeding mothers reported more media use and greater warmth at follow-up. Media use during feeding appears common, adaptive, and not harmful to attachment or interaction quality.

			fed, 13% mixed feeding.			
Davis & Sclafani (586)	2022 (UK)	Examine the relationship between subjective birth experiences and breastfeeding outcomes, and explored whether breastfeeding affected mother-infant bonding.	N=3,080 mothers up to three years postpartum recruited through online mother and baby forums; children aged 0–36 months.	Cross-sectional online survey	Perceptions of birth experience (CPS), satisfaction with clinical care (SSQ), breastfeeding initiation and duration, mother-infant bonding (CPRS).	Mothers with more positive birth experiences were more likely to initiate breastfeeding and breastfeed longer (over 12 months). Negative birth experiences predicted higher likelihood of formula or early combination feeding. Exclusive breastfeeding beyond 12 months was associated with more positive CPS scores and higher SSQ satisfaction. No significant associations were found between feeding method or duration and bonding outcomes; a small effect for dependence was negligible. Findings suggest positive childbirth perceptions support breastfeeding, while bonding is not dependent on feeding method.
Dimitraki et al. (634)	2016 (Greece)	Investigate the effect of physical and psychological stress that mothers and newborns undergo during labour, in lactogenesis and lactation.	N=95 women delivering at A University Hospital (34 nulliparous, 61 multiparous); all term.	Observational study (2009–2010). Stress hormones (maternal and cord blood cortisol, glucose) measured immediately after delivery. Mothers completed PANAS (positive/negative affect), PTSD scale, and Mother-to-Infant Bonding Scale postpartum. Breastfeeding	Maternal cortisol and cord glucose; maternal exhaustion, positive/negative affect, PTSD score, bonding; breastfeeding outcomes (first feed, breast fullness, milk volume day 4, feeding frequency).	Nulliparous women had longer labour (11.4 vs 6.2 h), later breast fullness (83.6 vs 45.0 h), lower milk volume day 4 (557 vs 719 ml), and fewer feeds than multiparas. Longer labour correlated with higher maternal cortisol, cord glucose, exhaustion, negative affect, PTSD, weaker bonding, and delayed lactogenesis. Epidural analgesia associated with lower maternal cortisol (27.1 vs 55.5 μg/dL), less exhaustion, lower PTSD, better bonding, and

				outcomes recorded: time to first feed, breast fullness, day 4 milk volume, infant meal frequency. Comparisons by parity and epidural analgesia. Statistical analyses included correlations, t-tests, regression.		earlier first breastfeeding (difference not statistically significant). Positive affect correlated with higher milk volume and more feeds; negative affect and PTSD correlated with delayed lactogenesis. Authors conclude that nulliparity, long stressful labour, and high maternal/neonatal stress are risk factors for delayed lactogenesis.
Doulougeri et al. (633)	2013 (Greece)	Explore the impact of maternal stress on initiation, and establishment of breastfeeding.	N=95 women who delivered naturally at >38 weeks in a university hospital; healthy, singletons; all intended to breastfeed exclusively for ≥1 month	Observational study. Maternal stress measured objectively with plasma cortisol (maternal and umbilical cord blood 10 min after delivery) and subjectively with self-report questionnaires 1 h and 4 days after delivery.	Maternal cortisol and self-reported stress (PDSS); breastfeeding initiation (hours), duration of first feeding (minutes), milk volume (ml at day 4), frequency of feeds (times/day).	Mean initiation 51 min, milk volume 661 ml, frequency 9/day. Higher post-delivery stress score was significantly associated with delayed initiation, lower milk volume, less frequent feeds, and shorter first feeding. Positive maternal emotions were associated with greater feed frequency and milk volume. Cortisol levels were not significantly related to breastfeeding outcomes. Findings indicate maternal stress after delivery hinders successful establishment of breastfeeding.
Edwards et al. (564)	2024 (Australia)	Investigate the association between exogenous oxytocin administered to induce or augment labour and quality of observed mother-infant bonding.	N=38 primiparous mother-infant dyads; infants aged 2–5 months (mean 3.7); 71% exclusively breastfeeding.	Observational study. Recruited via social media, mother's groups, parenting expo.	Exogenous oxytocin administration (dose, duration, total IU); maternal and infant salivary oxytocin; maternal depression, anxiety, stress, social support; quality of observed mother-	Receiving exogenous oxytocin to induce/augment labour was significantly positively associated with higher quality of mother-infant bonding (β=5.28, p=0.029) after adjusting for infant sleep difficulty. Dose of oxytocin for induction/augmentation correlated positively with bonding (r=0.335, p=0.040). No association was found between total intrapartum oxytocin dose

					infant bonding (RIT score).	(including for PPH management) and bonding, nor between salivary oxytocin concentrations and bonding. Findings suggest intrapartum exogenous oxytocin may enhance mother-infant bonding, warranting further research into central versus peripheral oxytocin receptor mechanisms.
Fan et al. (628)	2024 (US)	Examine the relationships between clinically meaningful increases in maternal anxiety symptoms and perceptions of infant feeding behaviours and weight-for-length.	N=237 mothers with singleton pregnancies ; 35.4% primiparous; 92% reported any breastfeeding in first 6 months.	Prospective Cohort study (PREDICT). Maternal anxiety symptoms measured during pregnancy (~25 weeks gestation) and 6 weeks postpartum via PROMIS-6A.	Maternal anxiety symptoms (prenatal, postpartum, and increase ≥3 T-scores), maternal feeding beliefs and practices (IFQ seven factors), infant weight-for-length percentile at 6 months.	Prenatal anxiety symptoms were unrelated to IFQ factors. Postpartum anxiety symptoms predicted concern for infant undereating/underweight. Clinically meaningful increases in anxiety predicted greater concern for infant hunger, overeating/overweight, undereating/underweight, and stronger preference for scheduled feeding, independent of infant weight. Anxiety symptoms were not associated with infant weight-for-length. IFQ concerns about underweight were inversely related to infant weight-for-length, while concerns about overweight were positively related. Increasing maternal anxiety was a better predictor of non-health-promoting feeding beliefs than prenatal or postpartum symptoms alone.
Fernández Medina et al. (599)	2018 (Spain)	Describe and understand the experiences of mothers who have extremely preterm	N=16 mothers of extremely preterm infants (<28 weeks gestation, <1000 g) hospitalized in	Interpretive qualitative research using Gadamer's hermeneutics. Data collected J via one	Maternal experiences of bonding with extremely preterm infants: emotions,	Two main themes: (1) Premature labour and technological environment, a distorted motherhood — subthemes: feelings of emptiness and

		infants admitted in NICUs with regard to their bonding process.	NICU for at least 30 days; 75% single gestation; 68.7% caesarean births; mean gestational age 25.9 weeks; mean birth weight 793.1 g; mean NICU stay 51.5 days.	focus group (5 women, 87 min) and eleven in-depth semi-structured interviews (35 min average). Data analysed using thematic hermeneutic analysis.	barriers, facilitators, role of NICU environment, professional and peer support.	emotional crisis; complexity of NICU environment and care generating emotional swings. (2) Learning to be the mother of an extremely preterm infant — subthemes: difficulty relating to "a stranger"; forming the bond despite difficulties. Mothers reported shock, guilt, fear, and crisis, perceiving NICU as hostile. Bonding hindered by separation, machines, lack of privacy, and infant fragility. Physical contact, breastfeeding, kangaroo care, and massage facilitated bonding. Nurses and other mothers were key supports. Bonding interrupted by prematurity and NICU context, but can be fostered by supportive care, early contact, and maternal involvement.
Fernández-Tuñas et al. (574)	2023 (Spain)	To examine how maternal perinatal stress affects breast milk production, its macronutrient composition, and the milk and infant gut microbiota in very preterm newborns.	N=45 mothers of 52 very preterm newborns (≤32 weeks gestation and/or ≤1500 g birthweight) recruited in a tertiary hospital NICU in Spain; ; 67% caesarean births; 15.4% twins.	Prospective observational study.	Maternal stress (PSS:NICU total and subscales), breast milk volume, macronutrient content, microbiota composition in milk and neonatal faeces, faecal calprotectin levels.	Higher maternal stress was inversely associated with breast milk production in the first days postpartum (p=0.012). Stress was greatest for the maternal role/bond subscale. Stress decreased with early kangaroo care (p=0.011) and higher maternal education (p=0.032). Faecal calprotectin decreased with age and was lower at 7 days in infants receiving antibiotics (p=0.027). High maternal stress was linked to progressive decreases in Firmicutes and increases in Proteobacteria in both milk and infant faeces over

						15 days. Macronutrient content of milk was not affected by stress.
Figueiredo et al. (630)	2021 (Portugal)	Determine the moderating role of exclusive breastfeeding at 3 months on the association between prenatal and postpartum depression.	N=334 participants (70 depressed and 264 non-depressed) recruited at public health services in northern Portugal; 78.1% primiparous; 85.6% married/cohabiting; 64.7% vaginal births.	Prospective, longitudinal, comparative design with three assessment waves. Participants completed the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy (2nd–3rd trimester) and at 3–6 months postpartum.	Prenatal and postpartum depression symptoms (EPDS), exclusive vs. non-exclusive breastfeeding at 3 months postpartum.	Exclusive breastfeeding at 3 months moderated the association between prenatal and postpartum depression. Women with prenatal depression who exclusively breastfed had fewer symptoms and lower rates of postpartum depression compared to those not exclusively breastfeeding. Among women without prenatal depression, exclusive breastfeeding did not significantly affect postpartum depression symptoms or rates. Findings suggest exclusive breastfeeding protects against postpartum depression in prenatally depressed women.
Foligno et al. (593)	2020 (Italy)	Determine if the rate of breastfeeding can be influenced by stress induced by infants' hospitalization.	N=87 mothers of hospitalized infants (NICU, semi-intensive, general paediatric wards)	Preliminary observational non-randomized study.	Maternal stress (PSS:NICU scores), breastfeeding rate (exclusive, complementary, predominant), hospital ward type, duration of hospitalization, breastfeeding information/support provided.	High maternal stress (PSS ≥85) was significantly associated with reduced breastfeeding during hospitalization (p=0.048; OR=2.865, 95% CI=1.008–8.146), independent of maternal demographics. Stress scores decreased from hospitalization to discharge (90.1 vs. 85.2, p=0.028). Longer stays (>20 days) were linked to higher stress (p=0.028). NICU admission correlated with high stress (p=0.003). 66.7% breastfed less during hospitalization than at admission; 52.9% reported reduced milk

						production; 82.2% found the hospital environment uncomfortable. 60.9% received no help, and 24% no information on breastfeeding. Findings show hospitalization-related maternal stress reduces breastfeeding rates, especially with NICU admission and prolonged stays.
Fukui et al. (584)	2021 (Japan)	Examine the bidirectional relationship between breastfeeding method, maternal mental health, and maternal–infant bonding in the early postpartum period.	N=2020 postpartum women (1029 primipara, 991 multipara; mean age 32.2 ± 4.8 years) recruited from 33 obstetric institutions; assessed at 1 month postpartum.	Cross-sectional analysis	Breastfeeding method (exclusive vs non-exclusive); maternal depression (HADS-depression); maternal anxiety (HADS-anxiety); maternal–infant bonding (MIBS lack of affection; MIBS anger/rejection).	Path analysis showed breastfeeding method did not significantly affect depression, anxiety, or maternal–infant bonding. Women with higher anxiety scores were more likely to use mixed or formula feeding. Depression was associated with poorer bonding (lack of affection and anger/rejection). Parity was a confounder: primiparas were more likely to use non-exclusive feeding, had higher anxiety and depression, and poorer bonding scores. Findings suggest exclusive breastfeeding is not associated with maternal–infant bonding in the early postpartum period when considering depression, anxiety, and parity.
García et al. (626)	2024 (Chile)	Analyse the association between psychosocial and breastfeeding variables and maternal mental health.	N=107 first-time mothers; infants born at mean gestational age 38.5 weeks, mean weight 3311 g.	Repeated-measures observational study, secondary analysis of a digital intervention trial. Participants recruited in two public health centres, assessed at 6 weeks and 5 months postpartum.	Breastfeeding difficulties (pain, mastitis, cracked nipples, insufficient milk, infant refusal), exclusive breastfeeding at 6 weeks and 5 months, maternal	76% reported breastfeeding difficulties. Difficulties were linked to higher depressive and anxiety symptoms and lower parental self-efficacy at 6 weeks, but not at 5 months. Exclusive breastfeeding at 5 months was associated with fewer early difficulties and higher self-efficacy, but not with maternal

				Measures: breastfeeding status/difficulties, EPDS, PASS, Parental Evaluation Scale, MSPSS. Analyses included chi-square tests, correlations, t-tests, multiple and logistic regression.	depression (EPDS), maternal anxiety (PASS), parental self-efficacy (PEE), perceived social support (MSPSS).	mental health. Low perceived social support and more difficulties predicted higher depression, anxiety, and lower self-efficacy at 6 weeks. Mothers who received support for breastfeeding difficulties reported fewer difficulties and better mental health outcomes. Findings highlight early lactation and social support as protective factors for maternal well-being.
Gradman & Shai (587)	2023 (Israel)	Examine the role of maternal subjective feeding experiences in predicting maternal bonding, beyond feeding type and characteristics.	N=99 community-based mothers in central Israel, aged 23–42 years; all intended to breastfeed during pregnancy and initiated breastfeeding postpartum.	Longitudinal study with three time points: pregnancy (T1), three months postpartum (T2), six months postpartum (T3). Data collected via self-report questionnaires and phone interviews on demographics, feeding characteristics, feeding experiences, prenatal bonding, postpartum depression, and maternal-infant bonding.	Maternal subjective feeding experiences (positive/negative) , initial breastfeeding difficulty, feeding characteristics (duration, exclusivity, bottle-feeding, other feeders), maternal bonding (MAAS, MPAS), postpartum depression (EPDS).	Feeding experiences at three months predicted maternal bonding at six months: more positive and less negative experiences were associated with stronger bonding. Feeding characteristics (e.g., breastfeeding duration, exclusivity) did not uniquely predict bonding. Initial breastfeeding difficulties predicted more negative feeding experiences, which in turn weakened bonding (mediation effect). Positive experiences were linked to bonding but were not predicted by initial difficulties. Prenatal bonding and postpartum depression also significantly contributed to bonding. Overall, feeding experiences explained 23% of the variance in maternal bonding at six months. Findings suggest maternal subjective feeding experiences, rather than feeding type, are central to bonding.

Gu et al. (565)	2016 (Canada)	Examine the long-term effects of synOT administration on the endogenous oxytocin system and concomitant indices of functional status, specifically breastfeeding and emotional well-being.	N=386 women recruited during pregnancy or within 48 hours postpartum.	Longitudinal study combining two cohorts (perinatal mental health study and PTSD study). Women were visited at home 2 months postpartum, completed questionnaire gave blood samples for oxytocin assay, and hospital charts were reviewed for synOT dose.	Intrapartum synthetic oxytocin dose, plasma oxytocin levels at 2 months, breastfeeding status (exclusive, mixed, formula), maternal depressive, anxiety, PTSD, and somatization symptoms.	Higher intrapartum synOT dose was positively correlated with endogenous oxytocin levels at 2 months. Exclusively breastfeeding women received significantly less synOT (M=33.4 IU) than mixed (M=43.8 IU) or formula-feeding mothers (M=44.3 IU). Higher synOT dose predicted greater depressive, anxiety, and somatization symptoms, but not PTSD. Findings suggest synOT has lasting effects on oxytocin physiology, breastfeeding, and maternal mental health.
Hairston et al. (583)	2019 (Israel)	To confirm whether a positive association between breastfeeding and bonding exists and whether breastfeeding may be protective against the negative consequences of mood and sleep disturbances on bonding.	N=271 mothers of healthy full-term infants aged 1–9 months (mean maternal age 31.9 years, range 21–46).	Cross-sectional community survey. Mothers completed online questionnaires including demographic data, breastfeeding status and duration, Postpartum Bonding Questionnaire (PBQ), EPDS, and Pittsburgh Sleep Quality Index (PSQI). Statistical analyses included ANOVAs, correlations, hierarchical regression, and Bayesian analysis.	Breastfeeding status (exclusive, partial, past, never), mother-infant bonding (PBQ), maternal mood (EPDS), maternal sleep quality (PSQI).	Breastfeeding was not associated with bonding; Bayesian analysis showed strong evidence for the null hypothesis. Breastfeeding was linked to greater daytime fatigue but not other sleep problems. Bonding correlated with depression and fatigue only among women currently breastfeeding. Findings suggest breastfeeding is not central to bonding nor protective against mood/sleep-related bonding difficulties.
Hardin et al. (579)	2021 (US)	Examine the interactive effects of maternal depression and	N=113 mother–infant dyads at 1 month, 81 dyads returned at 3	Quasi-experimental longitudinal design with lab visits at 1 and 3 months.	Maternal depression (CES-D), feeding method (breast	Breastfeeding positively impacted affectionate touch in both depressed and nondepressed dyads; depressed

		breastfeeding on mother and infant affectionate touch and infant temperament and cortical maturation patterns across early development.	month. Dyads classified into 4 groups: depressed-breastfeeding, nondepressed-breastfeeding, depressed-bottle-feeding, nondepressed-bottle-feeding.	Feeding sessions video-recorded for affectionate touch coding.	vs. bottle/mixed), maternal and infant affectionate touch during feeding, infant temperament (IBQ-R), infant EEG asymmetry and power (frontal, central, parietal, occipital regions).	breastfeeding mothers and infants showed touch patterns similar to nondepressed dyads, while depressed bottle-feeding dyads showed the lowest affectionate touch. At 3 months, infants of depressed mothers who breastfed had left frontal EEG asymmetry (neurotypical pattern), while infants of depressed mothers who bottle-fed had right frontal asymmetry (linked to negative affect). Longer breastfeeding duration and infant positive temperament predicted greater infant affectionate touch. Findings suggest breastfeeding buffers the negative impact of maternal depression on affectionate touch and infant neurodevelopment.
Hood et al. (643)	2024 (Australia)	To explore how and why families with infants use mobile touch screen devices; what influence they perceived this use had on their parent–child attachment; and the mechanisms by which device use may have influenced attachment.	N = 30 mothers; all from families enrolled in the ORIGINS Project	Qualitative study using an interpretive description approach with semi-structured one-on-one interviews (audio or video calls).	Maternal perspectives on parent–infant attachment and perceived influences of smartphone and tablet use on that attachment and other family relationships.	Families regularly used smartphones and tablets, with two-thirds of infants involved in family video calls and one-third using devices for other purposes. Device use had dual effects: it enhanced connection (e.g., through shared activities like viewing photos or video calls, accessing parenting support, or learning songs) but also increased distraction and reduced parental responsiveness. Mothers described love and strong attachment to their infants but noted challenges (e.g., postnatal anxiety, fatigue, multitasking).

						Devices sometimes supported bonding (e.g., shared viewing, communication during separations) but also disrupted quality time and attention.
Huber et al. (556)	2023 (US)	To examine the relationship between measures of parent and child language, obtained from naturalistic home recordings at child ages 6, 10, 14, 18, and 24 months, and estimates of white matter myelination, derived from quantitative MRI at age 2 years.	N = 22 children (14 female).	Naturalistic home language recordings with the Language Environment Analysis System (LENA) collected at 6, 10, 14, 18, and 24 months; manual coding of adult word counts, child-directed speech, child vocalizations, and conversational turns. Quantitative MRI (macro-molecular proton fraction mapping and diffusion imaging) at age 2 years.	Adult word counts, child-directed speech, child speech vocalizations, parent–child conversational turns, and macro-molecular proton fraction (MPF) estimates in white matter tracts (left arcuate fasciculus, superior longitudinal fasciculus, plus exploratory analyses in other tracts).	Conversational turns (CT) during infancy uniquely predicted myelin density estimates in the left arcuate fasciculus and superior longitudinal fasciculus at age 2 years. Effects were independent of total adult speech exposure and child vocalizations. CT effects were evident starting at 6 months and were strongest at 18 months, showing anatomical specificity to left dorsal language pathways. Growth in CT from 6 to 24 months correlated with 26-month MPF. Exploratory analyses found vocabulary at 24 months correlated with MPF in right inferior longitudinal fasciculus and inferior fronto-occipital fasciculus.
Inoue et al. (639)	2021b (Japan)	Examine mothers' habitual use of smartphones and their observations of their infants during breastfeeding and identifies changes in the relationship between mother's breastfeeding habits and bonding with their infants.	N=195 Japanese mothers raising 1–3-month-old infants at first survey.	Quantitative descriptive longitudinal study using online questionnaires at two time points: 1–3 months postpartum (September 2017) and 7–9 months postpartum (March 2018). Measures included demographics, feeding methods,	Mother–infant bonding (MIBS-J total score), maternal smartphone use during breastfeeding, maternal observation of infant during breastfeeding, breastfeeding method.	Smartphone use during breastfeeding was habitual (68.2%) and stable from 1–3 to 7–9 months. Infant observation decreased slightly (95.4% to 88.7%). Most smartphone use involved low-attention tasks (browsing, shopping, notifications). Only 2.1% used smartphones without observing infants at both surveys. Bonding problems (MIBS-J total ≥3 or anger/rejection ≥1) were found in 11.1% at 1–3 months, 6.7% at 7–

				breastfeeding behaviours (infant observation, smartphone use), details of smartphone activities, and the Mother-to-Infant Bonding Scale Japanese version (MIBS-J). Statistical analyses with Wilcoxon signed-rank, χ^2, Mann–Whitney U, Kruskal–Wallis, and Spearman's correlation.		9 months, with some new cases emerging. No significant associations between smartphone use and later bonding problems were found. Smartphone use did not interfere with infant observation or predict bonding difficulties.
Inoue et al. (640)	2021 (Japan)	Explore maternal smartphone use during breastfeeding and examine its impact on the quality of mother–infant interactions.	N=13 mother–infant dyads in Japan; mothers aged 31–41 years (M=35.9, SD=3.8); infants aged 10–20 weeks (M=13.1, SD=3.5); 54% male; 77% exclusively breastfed.	Within-subject experimental design. Each dyad observed in two breastfeeding sessions: control (no smartphone use) and experimental (smartphone use). Sessions video-recorded with gaze-tracking and fixed cameras.	Mother–infant interaction quality (AMIS), maternal visual responsiveness to infant attention bids, distracted breastfeeding time, mother–infant bonding (MIBS-J).	Smartphone use significantly increased distracted feeding time ($p<.001$). No significant differences in AMIS scores or MIBS-J scores between smartphone and control conditions. Prolonged smartphone use (>28 seconds) hampered maternal visual responsiveness, leading to delayed or absent responses to infant bids for attention. Shorter or brief smartphone use did not impair responsiveness. Findings suggest everyday smartphone use during breastfeeding does not reduce overall interaction quality or bonding but prolonged use may hinder maternal responsiveness to infant cues.

Jones et al. (589)	2020 (UK)	To examine the differential effects of antenatal breastfeeding intention (BI) and breastfeeding practice (BP) on maternal postnatal responsiveness.	N=962 mother–infant dyads from the Avon Longitudinal Study of Parents and Children (ALSPAC); subsample from the Children in Focus group; mothers' mean age ~29 years; 76% initiated breastfeeding.	Secondary analysis of ALSPAC longitudinal cohort data. BI measured at 32 weeks' gestation; BP measured up to 18 months postpartum; maternal responsiveness observed at 12 months with Thorpe Interaction Measure (picture-book sharing task).	Breastfeeding intention during pregnancy, breastfeeding practice and duration postpartum, maternal responsiveness (nonverbal positive vs neutral behaviours).	Breastfeeding intention was associated with higher odds of maternal responsiveness at 12 months (adjusted OR=2.34, 95% CI 1.42–3.86), independent of BP. Breastfeeding practice was not independently predictive once BI was accounted for (OR=0.93, 95% CI 0.55–1.57). Life-course analyses indicated responsiveness was most positive when both BI and BP were present.
López-Fernández et al. (585)	2023 (Spain)	Examine the effect of breastfeeding on maternal attachment, and explored the moderating role of maternal stress and child behaviour in this relationship, in a sample of Spanish mothers with children aged between 2 and 7 years.	N=432 mothers (380 breastfed, 52 formula-fed; 276 prolonged breastfeeding >12 months, 104 non-prolonged ≤12 months); recruited via convenience and snowball sampling.	Cross-sectional online survey (2018). Exclusion criteria: mixed feeding, preterm delivery, chronic child health problems, postpartum depression. Instruments: Maternal Attachment Inventory (short Spanish form), Perceived Stress Scale, Strengths and Difficulties Questionnaire, Parenting Scale, demographics.	Maternal attachment, breastfeeding status and duration, maternal stress, child behavioural problems, dysfunctional parenting, demographic and perinatal covariates.	Breastfeeding mothers showed higher attachment scores than formula-feeding mothers ($b = 5.34$, $p < .001$), but duration > 12 months was not significant ($b = 0.69$, $p = .298$). Maternal stress moderated the relationship ($b = −0.19$, $p = .001$): with higher stress, attachment increased among formula-feeding mothers, narrowing the gap. A significant three-way interaction with child behaviour ($b = 0.06$, $p < .001$) indicated moderation only when behavioural problems were low or moderate. Model $R^2 = 0.19$.
López-Fernández et al. (581)	2025 (Spain)	To examine the associations of both infant feeding practices (i.e., breast, formula, or mixed feeding) and	N=610 mothers; mean age 38.10 ± 4.25 years; recruited in Spain with children aged 2–7 years; groups:	Retrospective cross-sectional study; convenience sampling (snowball approach); online questionnaires;	Infant feeding practice (breast, formula, mixed), breastfeeding duration; Maternal Attachment	Breastfeeding vs formula: Higher maternal attachment ($a_2 = 0.09 \pm 0.03$, $p < 0.01$); attachment inversely related to behavioural problems ($b = –2.22 \pm 0.95$, $p < 0.05$). Indirect effect on

		breastfeeding duration with child behaviour, and examined the mediating role of maternal attachment on these associations.	formula feeding (n=47), mixed feeding (n=107), breastfeeding (n=456), further classified by duration <12 months (n=136), 12–24 months (n=122), >24 months (n=198).	STROBE guidelines followed.	Inventory (short form); Strengths and Difficulties Questionnaire (Total Difficulties, Prosocial Behavior); Parenting Scale; Perceived Stress Scale.	behavioural problems significant (ab = –0.20, 95% CI [–0.55, –0.01]); direct effect not significant. Prosocial behaviour: Direct positive effect (c'_2 = 0.82 ± 0.21, p < 0.001); indirect effect via attachment also significant (ab = 0.12, 95% CI [0.01, 0.27]). Breastfeeding duration: Longer duration associated with higher attachment (a_4 = 0.08 ± 0.02, p < 0.001). Attachment mediated reductions in behavioural problems (ab = –0.16, 95% CI [–0.40, –0.04]) and increases in prosocial behaviour (ab = 0.08, 95% CI [0.03, 0.15]) when comparing >24 months vs <12 months.
Lyons et al. (551)	2016 (US)	To assess whether disorganization of the attachment relationship in infancy was related to amygdala volume in adulthood.	N = 18 (8 males, 10 females); low-income young adults, mean age at follow-up 29.33 ± 0.49 years; first observed as infants at 8.5 ± 5.6 months; 72% referred for parent-infant clinical services during the first 18 months of life.	Longitudinal study; infant attachment and maternal interaction assessed using the Strange Situation Procedure at 18 months; MRI imaging in adulthood using a 3T TIM Trio scanner and FreeSurfer 5.1 for volumetric analysis.	Amygdala volume (left and right); hippocampus, caudate, and thalamus volumes (controls); disorganized infant attachment behaviour and disrupted maternal communication at 18 months; severity of childhood maltreatment; attachment quality in adolescence; psychiatric	Greater overall attachment disturbance at 18 months (infant disorganization and/or maternal disrupted communication) was strongly associated with increased left amygdala volume in adulthood (partial r = .679, p = .004), but not right amygdala volume. Left amygdala volume was also associated with dissociation (partial r = .586, p = .017) and limbic irritability (partial r = .770, p = .001). Later stressors, including severity of childhood maltreatment and attachment disturbance in adolescence, did not account for the association. Maternal withdrawing behaviour and

					outcomes in adulthood including dissociation and limbic irritability.	contradictory communication contributed most strongly to the relation with left amygdala volume. Left amygdala volume mediated the relation between early attachment disturbance and limbic irritability in adulthood.
McSweeney et al. (649)	2025 (England)	To qualitatively explore barriers and enablers to commissioning parent-infant relationship (PAIR) services.	N = 9; Participants were individuals with commissioning responsibilities relating to PAIR, employed by Local Authorities or NHS Clinical Commissioning Groups (later Integrated Care Systems) in the North East North Cumbria region; portfolios included responsibilities for children and young people, maternal, perinatal, mental health, and broader mental health services.	Qualitative semi-structured interviews conducted online (Microsoft Teams); framework analysis informed by the COM-B model and Behaviour Change Wheel.	Barriers and enablers to commissioning PAIR services (e.g., commissioning process, collaboration, funding, service impact, importance of infant mental health, maternal and parent-infant support, Covid-19 impact).	Barriers included lack of awareness of infant mental health, confusion around concepts, funding constraints (short-term funding, national priorities not matching local needs), difficulty demonstrating service impact and value for money, workforce shortages, and increased demand during Covid-19. Enablers included shared goals to reduce health inequalities, collaborative working, understanding local population needs, relationships with providers and other commissioners, awareness of baby brain development, and quicker response times during the pandemic. Commissioners highlighted gaps in knowledge about PAIR services, limited awareness of evidence, and perceived lack of dedicated commissioning. Findings informed the co-development of a commissioning support toolkit focusing on behaviour change interventions (education, training, communication, and marketing).

Mira et al. (592)	2024 (Chile)	Describe the impact of having a moderate preterm infant hospitalised in the NICU on the mothers' mental health and how this relates to the interaction between the dyad.	N=85 mother–infant dyads; mothers aged 18–45 years (mean 29 ± 6.40); 81.2% Chilean, remainder other Latin American nationalities; infants born 32–34 weeks gestation (mean 33.2 ± 0.88); mean birthweight 2089.6 g; mean hospitalisation 18.9 days.	Correlational study; data collected between May 2019–February 2020 in a public hospital NICU in Santiago, Chile; inclusion/exclusion criteria applied; self-report questionnaires and observational assessments; non-parametric analyses (Mann–Whitney U, Spearman correlations).	Parental Stress Scale for NICU (PSS: NICU), EPDS, Observation Scale of Mother-Baby Bond in NICU (N-EOV-INC); infant/maternal sociodemographic and medical variables; breastfeeding and skin-to-skin practices.	38.8% of mothers scored above the EPDS cut-off for depression during hospitalisation; 92% reported NICU hospitalisation as stressful, with 'Parental Role' the most stressful aspect. Stress was significantly correlated with depressive symptoms and with less frequent/reciprocal mother–infant interactions. Mothers of small-for-gestational-age infants showed poorer interaction scores. Dyads practicing skin-to-skin had higher interaction scores but also reported higher parental role stress. Exclusive breastfeeding rates were very low (4.7%); most infants received mixed feeding (85.9%). Findings highlight the link between maternal stress, depression, and reduced quality of mother–infant interactions in the NICU.
Moutsiana et al. (552)	2014 (UK)	To examine the influence of early infant attachment to the mother, a key marker of early experience, on neural regulation of emotional states in young adults.	N = 54; 24 females and 30 males; mean age 22 years; participants recruited from a longitudinal cohort of offspring of mothers with postnatal depression and non-depressed controls; secure attachment n = 31 and insecure attachment n = 23 at 18 months.	Longitudinal study; attachment measured using Ainsworth's Strange Situation at 18 months; fMRI during an emotion regulation task at age 22.	Emotion regulation task contrasting "increase" versus "attend" to positive pictures and "decrease" versus "attend" to negative pictures; fMRI BOLD response in predefined regions of interest including orbitofrontal cortex, cingulate	Infant attachment security at 18 months predicted neural responding during regulation of positive affect 20 years later. Insecure attachment was associated with greater activation during up-regulation of positive emotion in the rostral anterior cingulate cortex, dorsal medial prefrontal cortex, and bilateral anterior prefrontal cortex/frontal pole. Insecure attachment also showed reduced co-activation of the nucleus accumbens with prefrontal regions, indicating relative inefficiency in neural

					gyrus, superior, middle and inferior frontal gyri, amygdala and nucleus accumbens; behavioural self-report ratings of emotion and compliance.	regulation. No significant effects were observed for down-regulation of negative affect. Behaviourally, insecurely attached participants tended to be less effective in up-regulating positive emotions. Effects were independent of maternal PND, current depressive symptoms, and gender, and were not explained by later maternal parenting.
Moutsiana et al. (553)	2015 (UK)	To examine hippocampal and amygdala volumes in adulthood in relation to early infant attachment status, an important indicator of the quality of the early caregiving environment.	N = 59; participants were derived from a prospective longitudinal study of the impact of maternal postnatal depression on child development. Final sample: 29 females and 30 males, mean age 22 years. Infant attachment status (24 Secure; 35 Insecure) observed at 18 months.	Longitudinal study; infant attachment assessed at 18 months using Ainsworth's Strange Situation Procedure; MRI assessments at 22 years; volumetric analyses using FSL FIRST.	Hippocampal and amygdala volumes measured via high-resolution 3D MRI; infant attachment security status.	Insecure versus secure infant attachment status was associated with larger amygdala volumes in young adults, an effect not accounted for by maternal depression history. No significant effects were found for hippocampal volume. The attachment effect remained significant after controlling for maternal postnatal depression. No attachment × laterality interaction observed. Maternal depression and participant's lifetime depressive disorder were related to hippocampal but not amygdala volume.
Myers et al. (558)	2015 (USA)	To assess the impact of Family Nurture Intervention (FNI) on cortical function in preterm infants at term age.	N = 105 preterm infants (26–34 weeks postmenstrual age at birth); SC group (N = 49), FNI group (N = 56); infants were studied at 37–44 weeks postmenstrual age.	Randomised controlled trial; NICU-based intervention; EEG acquisition with 124-lead nets; analysis of EEG coherence in ten frequency bands during two sleep states (active, quiet).	EEG coherence (functional brain connectivity) within and between 12 brain regions, across ten frequency bands (0–48 Hz), during quiet and active sleep.	FNI infants showed significantly lower EEG coherence (1–18 Hz) largely within and between frontal regions compared to SC infants. Coherence levels were negatively correlated with postmenstrual age in both groups. Significant reductions in

						coherence were observed in the left and right frontal polar regions (notably at 10–12 Hz during quiet sleep). Coherence decreases were also observed at longer distances between brain regions. Negative correlations between age and coherence were significant within and between frontal polar regions in both groups. Intervention effects on coherence remained significant after controlling for EEG power. Findings suggest that FNI may accelerate brain maturation, particularly in frontal brain regions associated with attention, cognition, and emotion regulation.
Nakic et al. (620)	2024 (Croatia)	To test whether parental sensitivity and responsiveness were mediators between postpartum mental health (depression, anxiety, and stress) and parent-infant bonding in mothers and fathers.	N = 597 (427 mothers and 170 fathers) of infants aged up to 1 year.	Online cross-sectional study using self-administered questionnaires and an objective task.	Postpartum depression measured with EPDS; anxiety and stress with Depression, Anxiety, and Stress Scale (DASS-21); parental responsiveness with Maternal Infant Responsiveness Instrument (MIRI); parental sensitivity with City Infant Faces	Higher levels of parental mental health problems (depression and anxiety) were associated with lower levels of responsiveness, which were, in turn, associated with poorer bonding. In mothers, responsiveness mediated the relationship between depression symptoms and all three bonding dimensions; non-responsiveness mediated depression and anxiety about care. In fathers, non-responsiveness mediated the relationship between anxiety and lack of enjoyment and affection. Facial expression recognition did not mediate the relationship between mental health and

					Database (CIFD); parent-infant bonding with Postpartum Bonding Questionnaire (PBQ: impaired bonding, anxiety about care and parental distress, lack of enjoyment and affection).	bonding but directly affected bonding in mothers (lower accuracy associated with higher lack of enjoyment). Parental sex was a significant moderator, indicating different paths in mothers and fathers.
Narita et al. (554)	2012 (Japan)	To examine the associations among PBI scores, stimulated cortisol concentration in response to the DEX (0.5 mg)/CRH test, and GM volume focusing on the hippocampus by magnetic resonance imaging (MRI) with voxel-based morphometry (VBM)	N = 40; aged 18–35 years (mean 27.2 ± 5.2); 20 fema	Cross-sectional design; DEX/CRH test (neuroendocrine challenge), psychological questionnaires (PBI, SDS, HTQ, JNART), cognitive testing (CANTAB), MRI scanning (1.5 T Siemens Symphony, T1-weighted), voxel-based morphometry analysis (SPM5, VBM5.1).	PBI scores (care and overprotection factors), cortisol response (basal cortisol and AUCnet cortisol), ACTH, hippocampal GM volume (total and regional), cognitive performance (CANTAB tests)	Parental overprotection scores significantly negatively correlated with AUCnet cortisol ($p < 0.05$). Total hippocampal GM volume significantly positively correlated with AUCnet cortisol ($p < 0.05$) but no significant correlation with PBI scores after adjustment. ROI analysis showed a significant positive correlation between AUCnet cortisol and GM volume in the left hippocampus (FWER-corrected $p < 0.05$). No significant association between PBI scores and hippocampal GM volume. Parental low-overprotection groups had significantly higher AUCnet cortisol than high-overprotection groups; however, hippocampal GM volume differences did not remain significant after adjustments.
Nöcker-Ribaupierre et al. (603)	2015 (Germany)	To examine whether auditory stimulation of preterm infants with	N=48 preterm infants (24 intervention, 24 controls);	Prospective randomized study; 24 infants exposed to 30-minute recordings	Griffiths Development Quotient (5 and 20 months),	Stimulated infants had significantly higher Griffiths Development Quotients at 5 months (95 ± 15 vs 80 ± 20,

		recordings of their mothers' voices could improve their language and overall development.	gestational age 24–30 weeks; birth weight 650–1440 g; all with surfactant deficiency; matched by sex, birth weight, and gestational age.	of their mother's voice (speaking, reading, singing) five times daily for 6–10 weeks starting 1–3 weeks after birth; 24 matched controls received standard care; developmental follow-up assessments conducted at 5 and 20 months, 56 months, and 6 years; maternal interviews recorded mood and breastfeeding.	Columbia Mental Maturity Scales, active vocabulary, logopedic test of understanding (56 months), Heidelberg Test of Speech Development (6 years); maternal mood and breastfeeding reports; clinical and neurological assessments.	p=0.007) and achieved milestones earlier (e.g., sitting, two-word sentences). At 6 years, they showed significantly better language comprehension scores. Mothers of stimulated infants reported less fear, discontent, and family burden, and were more often still breastfeeding at 5 months (50% vs 12.5%). Stimulated infants had fewer severe motor and mental abnormalities at 5 and 20 months.
Nomkin & Gordon (638)	2021 (Israel)	Explore the effects of smartphone use and smartphone distractions on maternal attention and physiological function during two types of interactions with her infant: breastfeeding and face-to-face interaction.	N=20 mothers and their 3–6 month old infants (8 boys, 12 girls; 65% firstborns); mean maternal age 30.2 years.	Laboratory experiment; mothers completed baseline questionnaires and were monitored with electrodermal activity (EDA), impedance cardiography (CO), and mobile eye-tracking glasses; experimental design with two phases (breastfeeding and face-to-face) each including three smartphone conditions (use, sound on in bag, mute in bag).	Maternal gaze patterns (eye-tracking: dwell time/fixations), electrodermal activity (tonic skin conductance level, tonic period), cardiac output, Smartphone Addiction Scale (SAS).	Mothers gazed longer at smartphones than infants during breastfeeding, but longer at infants during face-to-face interactions. Cardiac output was higher during breastfeeding compared to face-to-face. Electrodermal activity was higher when the smartphone was muted compared to in use. Higher maternal smartphone addiction scores were correlated with lower EDA across conditions. During breastfeeding, longer gaze fixation to the smartphone was associated with higher cardiac output and tonic period.
Palmer (632)	2019 (Sweden)	To explain the phenomenon of breastfeeding	N=8 women (aged 20–37 years) with severe initial	Reflective lifeworld hermeneutical approach;	Focus on lived experiences of previous	Previous breastfeeding difficulties constituted an existential trauma etched into

		difficulties in order to understand how women's previous experiences of breastfeeding difficulties relate to their decisions about future breastfeeding.	breastfeeding difficulties; recruited through maternity wards and/or breastfeeding clinics; 15 lifeworld interviews conducted (seven women interviewed twice, one once).	phenomenological interviews conducted in Swedish.	breastfeeding difficulties and relation to future breastfeeding decisions.	women's lives as embodied memories. Two intertwined pathways emerged: fear of breastfeeding (avoidance, mistrust of care, reawakened traumatic memories, loss of closeness with child) and longing for breastfeeding (desire for closeness, learning from experience, taking command, telling one's story, reformulating meaning of breastfeeding). Fear and longing were ambiguously intertwined in individual women's lives. Objectifying or inadequate care exacerbated trauma and avoidance, while reflective storytelling and lifeworld-led caring practices could ease suffering, support future breastfeeding, or help reconcile decisions not to breastfeed.
Parfitt et al. (618)	2013 (UK)	To examine the effect of fathers' and mothers' pre- and postnatal mental health on mother–infant and father–infant interactions. Mental health was broadly defined to include anxiety, depression and PTSD.	N = 84 participants (44 mothers and 40 fathers from 45 families). Couples were expecting their first baby, cohabiting, fluent in English, and over 18 years old.	Prospective study. Parents completed questionnaires on mental health (late pregnancy and 3 months postpartum). Observations and videotaped mother–infant and father–infant interactions were conducted three months postpartum. Interactions were analysed using the CARE-index.	Outcome measures: Parental sensitivity, control, unresponsiveness; infant cooperation, difficulty, compulsiveness, passivity (CARE-index). Anxiety and depression (HADS), PTSD AND Posttraumatic	No significant mean-level differences were found between mother–infant and father–infant interaction patterns. 34% of mother–infant and 20% of father–infant interactions were categorized as inept or at risk. Maternal prenatal anxiety was associated with less optimal mother–infant interaction (higher maternal control, lower maternal unresponsiveness, and infant passivity). Paternal prenatal affective symptoms predicted lower paternal control, higher paternal unresponsiveness, higher infant passivity, and lower

					Stress Diagnostic Scale.	infant difficulty. Paternal postnatal affective symptoms were associated with higher infant difficulty. Maternal postnatal affective symptoms were associated with higher paternal unresponsiveness. Maternal and paternal interaction scores were significantly correlated within couples. Fathers' prenatal symptoms were more strongly associated with parent–infant interaction outcomes than postnatal symptoms.
Perone et al. (557)	2019 (US)	To inform our understanding of relations between qualities of parent-infant interactions and functional connectivity.	N=51 infants aged 6 to 11 months; final sample included 4 six-month-olds, 11 seven-month-olds, 11 eight-month-olds, 12 nine-month-olds, 7 ten-month-olds, and 6 eleven-month-olds. Infants were full-term, without developmental delays or disabilities.	Parent-infant interactions: two-minute free play session coded for responsiveness, reciprocity, and emotional tone on 7-point Likert scales; EEG recorded from 32 electrode sites during 60 s of Baby Einstein video viewing; EEG processed using EEGLab, ERPLab, and FieldTrip; functional connectivity measured via weighted Phase Lag Index (wPLI) for theta (3–6 Hz), alpha (6–9 Hz), beta (9–30	Outcome measures: parent-infant interaction scores (responsiveness, reciprocity, emotional tone) and infant EEG functional connectivity (theta, alpha, beta, gamma bands) between frontal and posterior sites.	Frontal-posterior theta connectivity was inversely related to responsiveness ($r = -.34$, $p = .008$), reciprocity ($r = -.37$, $p = .005$), and emotional tone ($r = -.29$, $p = .014$). Frontal-posterior alpha connectivity was positively related to emotional tone ($r = -.35$, $p = .007$). Gamma connectivity was positively related to responsiveness ($r = .30$, $p = .016$). Beta connectivity was unrelated. Relations were generally limited to long-range connectivity. Exploratory analyses showed similar topography, with theta inversely and gamma/alpha positively associated with parent-infant interaction dimensions.

				Hz), and gamma (30–50 Hz)		
Qiu et al. (545)	2013 (Singapore)	To examine the consequences of antenatal and postnatal exposure to maternal anxiety upon early infant development of the hippocampus, a key structure for stress regulation.	N=175 neonates at baseline (175 underwent MRI at birth) and N=35 infants at follow-up (6 months). Participants were infants (gestational age ≥35 weeks, birth weight >2000 g, 5-min APGAR >9) from the GUSTO birth cohort.. Mothers were pregnant Asian women attending antenatal ultrasound clinics.	Prospective longitudinal birth cohort; maternal anxiety assessment using State-Trait Anxiety Inventory (STAI) at 26 weeks of pregnancy and 3 months postpartum; MRI acquisition (T2-weighted) at birth and at 6 months; hippocampal delineation using manual and automated segmentation.	Bilateral hippocampal volume at birth and at 6 months; hippocampal growth from birth to 6 months; maternal trait anxiety scores (antenatal and postnatal).	Antenatal maternal anxiety was not associated with bilateral hippocampal volume at birth or at 6 months. Higher antenatal maternal anxiety was associated with slower growth of both left and right hippocampus in the first 6 months of life, with the effect on right hippocampal growth becoming stronger when controlling for postnatal maternal anxiety. Higher postnatal maternal anxiety was associated with smaller left hippocampal volume at 6 months and greater right hippocampal growth in the first 6 months of life (significant after controlling for antenatal anxiety). An increase in maternal anxiety from pregnancy to postpartum was associated with significantly greater right hippocampal growth. Left and right hippocampi showed distinct responses to postnatal maternal anxiety.
Qiu et al. (546)	2015 (Singapore)	To examine the association between prenatal maternal depressive symptomatology and infant amygdala functional connectivity and to	N=24 infants (gestational age ≥ 35 weeks, birth weight > 2000 g, 12 male and 12 female, Chinese/Malay/Indian ethnic background). Mothers were part	Structural MRI and resting-state fMRI at 6 months of age; EPDS at 26 weeks gestation and 3 months postpartum.	Amygdala functional connectivity measured by rs-fMRI; prenatal and postnatal maternal depressive symptomatology	At 6 months, the amygdala showed functional connectivity to widespread brain regions forming emotional regulation, sensory and perceptual, and emotional memory networks. After controlling for postnatal depressive symptoms, infants born to mothers with higher prenatal depressive symptoms

		thus establish the neural functional basis for the transgenerational transmission of vulnerability for affective disorders during prenatal development.	of the GUSTO birth cohort.		measured by EPDS.	showed greater left amygdala functional connectivity with the left temporal cortex, insula, and bilateral anterior cingulate, medial orbitofrontal and ventromedial prefrontal cortices. These patterns are consistent with connectivity observed in adolescents and adults with major depressive disorder. Prenatal maternal depressive symptoms, independent of postnatal symptoms, were positively associated with left amygdala connectivity in emotional regulation (mPFC, ACC, OFC, vmPFC), sensory/perceptual (temporal cortex) and emotional memory (entorhinal cortex) networks. Confounders such as income, birth weight, and sex did not alter these associations.
Riem et al. (555)	2015 (Netherlands)	To examine the effects of maltreatment experiences reported during the Adult Attachment Interview on hippocampal volume in female twin pairs, and to test through a meta-analysis of 49 studies whether the association between childhood maltreatment and	N = 44 participants (female, right-handed, 21 from monozygotic twin pairs, 23 from dizygotic twin pairs; mean age 29.05 years, SD = 7.48, range 22–49). Participants were screened for hearing impairments, MRI contraindications, pregnancy, psychiatric or	Adult Attachment Interview to assess attachment representations and experiences of maltreatment; coding with Modified Maltreatment Classification System; Posttraumatic Diagnostic Scale for traumatic events; MRI (3-T Philips Achieva) to assess hippocampal volume;	Hippocampal volume (left and right), unresolved trauma and loss (AAI), traumatic experiences (PDS), age at maltreatment, severity of maltreatment, timing of maltreatment.	Reduced hippocampal volume was significantly related to childhood maltreatment (left hippocampus: $z = –2.01$, $p = .04$). PDS scores were significantly associated with right hippocampal volume ($z = –2.51$, $p = .01$). Age at maltreatment was negatively correlated with hippocampal volume (left: $r = –.58$, $p < .01$; right: $r = –.73$, $p < .001$), indicating that maltreatment at older ages was associated with smaller hippocampal volumes. Meta-analysis confirmed a significant

		hippocampal volume is replicable across studies and dependent on sensitive age periods.	neurological disorders, alcohol and drug use, and did not have children of their own.	statistical analysis using multilevel regression models.		overall association between childhood maltreatment and hippocampal volume reduction (r = .08, 95% CI 0.03–0.12, p < .01). The effect was stronger when maltreatment occurred in middle childhood (0–12 years) compared to early (0–5 years) or late childhood/adolescence (7–18 years). Multiple maltreatment types had the strongest association with hippocampal volume reduction.
Sansone et al. (249)	2024 (Australia)	To conduct an in-depth exploration of pregnant women's experiences of a nine-session Prenatal Mindfulness Relationship-Based (PMRB) program to support maternal mental health and the mother–baby relationship during pregnancy and post-partum.	N=13 pregnant women in Australia, aged 25–40 years (M=32.5); all first-time mothers at ≥20 weeks gestation; most married (85%), highly educated; 12 provided post-partum follow-up data.	Qualitative study within a feasibility trial; participants recruited via online pregnancy support groups; attended an online nine-session PMRB program (eight weekly prenatal sessions, one postpartum session at 10–12 weeks); qualitative data collected through group sharing, birth stories, and responses to an open-ended question; thematic analysis applied.	Focus on experiences of PMRB program and influence on maternal mental health, pregnancy, labour/birth, postpartum, and mother–baby relationship.	Fifteen themes were identified in four categories: expectations/motivations (healthy pregnancy, intervention-free birth, contributing to the field); experiences of PMRB (positive/shared experiences, mindfulness practice engagement, stress/pain/anxiety management); changes attributed to mindfulness (increased mindfulness, self-awareness, "stop-look-listen," embracing the present, acceptance); changes attributed to PMRB (new responses to challenges, trusting the process, connecting to body–breath–baby, awareness of baby as a sentient being). All mothers breastfed at follow-up, though satisfaction varied (41% very satisfied, 8% very dissatisfied). Women reported mindfulness skills helped with pregnancy stress, pain management, labour,

						breastfeeding challenges, bonding, and communication with the baby. Awareness of the unborn baby as a sentient being was a strong motivator and facilitated maternal connection and engagement. Findings suggest the PMRB program may enhance maternal well-being, coping, and mother–baby relationship.
Scarborough et al. (611)	2022 (UK)	To better understand the bidirectional relationship between breastfeeding and maternal mental health, and to explore factors influencing this relationship.	N=109 women aged 20–45 years who had attempted to breastfeed; recruited through social media; 24 also took part in telephone interviews; predominantly White British (97.2%), mean age 30.1 years.	Mixed-methods design with two stages: (1) online survey with 17 closed and open-ended questions (n=109); (2) semi-structured telephone interviews (~30 minutes, n=24)).	Breastfeeding experiences (initiation, duration, difficulties, support), maternal mental health (self-reported antenatal, perinatal, postnatal mental health issues, Likert scales), attachment.	Five main themes were identified: (1) pressure to breastfeed (internal pressure, pressure from healthcare professionals, and societal “breast is best” messages); (2) provision of information and support (information often focused on benefits, with inadequate preparation for pain and difficulties, and variable breastfeeding and mental health support); (3) mixed impact of breastfeeding on mental health (positive experiences described as empowering and rewarding; negative experiences associated with guilt, failure, exhaustion, depression and anxiety); (4) mental health impacting breastfeeding (pre-existing or postnatal mental health difficulties and related issues such as poor nutrition affecting milk supply and leading to early cessation; lack of support in inpatient mental health settings); (5) attachment (positive

						breastfeeding experiences strengthened bonding and sense of being a “good mother”; painful, pressured or distressing breastfeeding sometimes hindered bonding and led to resentment)
Soe et al. (549)	2016 (Singapore)	To investigate the relationships between pre- and early post-natal maternal depression and their changes with frontal electroencephalogram (EEG) activity and functional connectivity in 6- and 18-month olds, as well as externalizing and internalizing behaviours in 24-month olds.	N = 258 mother–child dyads. Participants were recruited from a longitudinal Singaporean prospective birth cohort study (Growing Up in Singapore Towards Healthy Outcomes). Inclusion criteria were healthy term born infants with a gestational age ≥ 37 weeks, birth weight > 2500 g, and a 5-min APGAR score ≥ 9. Participants were of Chinese, Malay or Indian ethnic background. 174 infants had EEG data at 6 months, 157 at 18 months, and 143 had CBCL data at 24 months.	Longitudinal cohort study; EEG recording using a 128-channel Geodesic Sensor Net at 6 and 18 months; maternal depressive symptoms assessed prenatally (26 weeks gestation) and postnatally (3 months postpartum); Child Behavior Checklist at 24 months.	Outcome measures: frontal EEG activity (left, right, asymmetry); frontal functional connectivity (left, right, asymmetry); externalizing and internalizing behaviours (CBCL).	Neither prenatal nor postnatal maternal depressive symptoms independently predicted frontal EEG activity or functional connectivity in 6- and 18-month infants. However, increasing maternal depressive symptoms from prenatal to postnatal period predicted greater right frontal activity and relative right frontal asymmetry in 6-month infants but not at 18 months. Increasing depressive symptoms predicted lower right frontal connectivity in 18-month infants but not at 6 months. Both prenatal and early postnatal maternal depressive symptoms independently predicted higher externalizing and internalizing behaviour scores at 24 months. These effects were observed in the full sample and female sample but not in the male sample. Lower bilateral frontal functional connectivity at 18 months predicted higher externalizing scores, and lower right frontal functional connectivity was marginally associated with higher internalizing scores at 24 months.

Tidemann & Melinder (644)	2022 (Norway)	To investigate the nature of infants' sensitivity to a shift in the attention of the interaction partner, and whether a simulated smartphone-like interruption during interaction between caregiver and infant affects infant behaviour.	N = 51 infants (21 at 6 months [M = 6.31, SD = 0.36; 9 girls], 17 at 9 months [M = 9.18, SD = 0.45; 7 girls], and 13 at 12 months [M = 12.42, SD = 0.41; 6 girls]); all born within two weeks of due date, with no known disease. Parent participants: 44 mothers, 7 fathers.	Cross-sectional experimental design using the Smartphone Procedure (SPP) modelled after the still-face paradigm; 3 phases (baseline, interruption, reunion) were conducted in a lab setting with video recording and coded infant behaviours.	Infant behavioural codes (protest, object/environment engagement, social monitoring, social positive engagement) measured by proportion of time per phase.	Significant main effect of experimental phase on protest ($F(2,46)=43.65$, $p<.05$, $\eta^2=.66$), object engagement ($F(1.57,75.33)=7.26$, $p<.05$, $\eta^2=.13$), social monitoring ($F(2,46)=18.49$, $p<.05$, $\eta^2=.45$), and social positive engagement ($F(2,46)=24.88$, $p<.05$, $\eta^2=.52$). Protest increased significantly from baseline (M=0.17, SE=.03) to interruption (M=0.59, SE=.05) and decreased in reunion (M=0.35, SE=.05) but did not return to baseline. Social monitoring decreased from baseline (M=0.17, SE=.02) to interruption (M=0.03, SE=.01) and returned to baseline in reunion (M=0.14, SE=.02). Positive engagement decreased from baseline (M=0.23, SE=.03) to interruption (M=0.00, SE=.00) and returned to baseline in reunion (M=0.23, SE=.04). Object engagement decreased from baseline (M=0.44, SE=.04) to reunion (M=0.29, SE=.04). No significant effects of age group or interaction effects. Findings indicate increased protest and decreased positive social engagement and monitoring during interruption, partially recovering during reunion, consistent with still-face effects.
Tomalski et al. (550)	2013 (UK)	To investigate how differences in resting EEG activity	N = 45 infants (31 girls, 14 boys), aged 178–300 days	Resting baseline EEG recording using a 128-channel	Absolute EEG power in gamma frequency bands	Infants from low-income families showed significantly lower frontal gamma power than those from

		are associated with infants' socioeconomic background.	(M = 226.4, SD = 44.3).	Hydrocel sensor net; Bayley Scales of Infant Development (BSID-II); parent interview on demographics; Brief Infant Sleep Questionnaire.	(21–30 Hz and 31–45 Hz) across frontal, temporal left, temporal right, and posterior scalp regions; gross family income; parental occupation; infant sleep parameters.	higher-income families (21–30 Hz: $F(1, 43) = 4.75$, $p = .035$; 31–45 Hz: trend $p = .072$). Similar differences were found for maternal occupation, with lower occupational status associated with lower frontal gamma power (31–45 Hz: $F(2, 42) = 3.70$, $p = .034$; 21–30 Hz: trend $p = .063$). No significant differences were found in other scalp locations. Regression analyses confirmed associations between family income and frontal gamma power ($R^2 = .239$ and $R^2 = .228$, both $p = .002$). No associations were found with infant sleep, parental education, gestation, birth weight, smoke exposure, or bilingualism. These results indicate that effects of socioeconomic disparities on brain activity can be detected in early infancy.
Tomfohrde et al. (641)	2016 (US)	To address the social media and technology habits of breastfeeding mothers while they are breastfeeding.	N = 309 breastfeeding mothers; mean age group 26–30 years;	Descriptive cross-sectional study using a self-administered online Qualtrics survey with 13 questions; recruitment via social media (e.g., Facebook).	Technology and social media use while breastfeeding (frequency and type), platforms used, reasons for use, demographic information, breastfeeding practices.	96 % used social media while breastfeeding; 92 % used Facebook. 49 % "often" and 28 % "all the time. Other platforms: Pinterest, Twitter, Instagram, Baby Center, Glide. Top reasons: entertainment (76 %), connect with friends (34 %), other breastfeeding mothers (31 %), family (28 %), work (7 %); other responses like "stay awake," "avoid watching the clock," "distraction from discomfort,"

						"seek news/community," and "find information on breastfeeding/infant care.
Treherne et al. (598)	2017 (Canada)	To discover parents' perceptions of closeness to and separation from their preterm infants in the NICU.	N=20 parents (13 mothers, mean age 32.2; 7 fathers, mean age 37.3; 65% first-time parents; 50% university educated) of preterm infants (n=16; gestational age 24–33.5 weeks; mean birthweight 1466 g).	Qualitative descriptive study; maximum variation sampling; parents recruited from an urban Level III NICU; data collected using a smartphone application (HAPPY) to record verbal reflections of closeness/separation events over 24 hours.	Parents' perceptions and experiences of closeness and separation with their preterm infants in the NICU.	Five themes identified: (1) Having a role as a parent (autonomy, decision-making) fostered closeness; (2) Providing for and getting to know the infant (feeding, holding, interacting, breastfeeding, SSC) strengthened closeness; (3) Support from staff influenced closeness/separation depending on behaviours (team inclusion, supportive shadowing, nurse–parent knowledge sharing); (4) Leaving the infant's bedside was the most difficult separation, evoking guilt, sadness, and anxiety; (5) The NICU environment (open bay, noise, equipment) contributed to separation, while quiet/private moments fostered closeness. Parents emphasized autonomy as key to feeling close; NICU staff played central roles in minimizing separation and supporting closeness.
Viglione et al. (600)	2022 (US)	To examine the associations between maternal milk provision in the NICU with maternal connection to her infant using three validated factors: maternal sensitivity, emotional concern,	N=70 mothers of singleton preterm infants born <1500 g and/or <32 weeks' gestation.	Cross-sectional analysis of the Parenting in the NICU study (2015–2017); maternal milk intake data extracted from medical records; mother–infant connection measured with	Maternal milk provision category (exclusive, predominant, mixed); maternal sensitivity, emotional concern, positive interaction/engag	Mothers providing exclusive maternal milk reported greater maternal sensitivity (β=2.00, 95% CI: 0.76–3.24, p=0.002) compared with mixed group, and greater emotional concern compared with both predominant and mixed groups. Greater milk provision was associated with improved sensitivity but also with

		and positive interaction/engagement.		Maternal Attachment Scale (Nagata et al.) and adapted Parental Beliefs Scale (Melnyk).	ement (validated factors).	greater emotional concern regarding infant needs. Exclusive MM provision was more common among White, older, higher-SES, and more educated mothers.
Wang et al. (542)	2019 (Singapore)	This study examined maternal behaviour, especially maternal sensitivity, at 6 months postpartum in relation to anterior and posterior hippocampal functional networks of children at age 4 and 6 years.	N = 61 (4-year-old sample: 33 girls and 28 boys) and N = 76 (6-year-old sample: 46 girls and 30 boys). Participants were part of the GUSTO birth cohort, included children with gestational age ≥ 34 weeks, birth weight ≥ 2 kg, and a 5-min APGAR score ≥ 9.	Maternal sensitivity was assessed using the Mini-MBQS-V at 6 months postpartum based on 15-min mother–infant interaction videos. Resting-state fMRI was performed at 4 and 6 years of age. MRI preprocessing involved standard steps (slice time correction, motion correction, skull stripping, intensity normalization, motion exclusion criteria, global signal regression, band-pass filtering). Functional connectivity analysis was performed using seed regions in anterior and posterior hippocampus.	Outcome measures: anterior and posterior hippocampal functional connectivity (rs-fMRI), maternal sensitivity score, covariates (maternal education and ethnicity, age at MRI scan, maternal depressive symptoms, framewise displacement).	Maternal sensitivity assessed at 6 months postpartum predicted the right anterior hippocampal (aHPC) functional networks at both 4 and 6 years. At 4 years, maternal sensitivity was positively associated with right aHPC connectivity with the right precentral gyrus, left postcentral gyrus, and right postcentral gyrus (sensorimotor network), and negatively associated with connectivity with the left dorsolateral prefrontal cortex (top-down cognitive control network).At 6 years, maternal sensitivity was positively associated with right aHPC connectivity with the left and right calcarine cortex, right lingual gyrus, and left cuneus (visual-processing network). No significant findings were observed for bilateral posterior hippocampus or left anterior hippocampus. Maternal sensitivity and sex interaction was not significant. Findings remained significant after excluding premature subjects. The study suggests that maternal sensitivity in infancy has a long-term impact on anterior

						hippocampal functional networks in preschool children.
Weaver et al. (582)	2018 (US)	To conduct a longitudinal investigation of the potential effects of breastfeeding duration on maternal sensitivity over the following decade. This study also examined whether infant attachment security at 24 months would mediate longitudinal relations between breastfeeding duration and changes in maternal sensitivity over time.	N = 1,272 families. Participants were families in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD). Recruited shortly after child's birth from hospitals at 10 sites	Longitudinal observational study using data from NICHD SECCYD. Assessments were conducted multiple times between 1 month and 11 years of age.	Maternal sensitivity (observed during structured tasks and free-play/problem-solving scenarios at 8 time points between 6 months and age 11); breastfeeding duration (maternal self-report up to 3 years); attachment security (Attachment Behavior Q-Set at 24 months); covariates (maternal neuroticism, parenting attitudes, education, partner presence, ethnicity/race).	Longer breastfeeding duration predicted increases in observed maternal sensitivity up to child age 11, after accounting for covariates. Breastfeeding status at 6 weeks and 6 months predicted higher attachment security at 24 months. However, attachment security did not mediate the relationship between breastfeeding duration and maternal sensitivity. Associations did not differ by child gender. Breastfeeding behaviour did not predict changes in father sensitivity. The effects were small but significant and persisted after adjusting for maternal and demographic factors.
Weber et al. (648)	2018 (US	Determine if factors related to human milk, touch, or stressor exposure are related to plasma oxytocin trajectories in premature infants.	N=33 premature infants, gestational age 25–28 6/7 weeks at birth; recruited from three Midwestern Level III NICUs; exclusions included congenital/chromos	Prospective, longitudinal observational cohort study; plasma collected at 14 days of life then weekly until 34 weeks CGA; nurse-guided variables (human	Infant plasma oxytocin trajectories; volume of mother's milk and total enteral feeds; hours of SSC and swaddled holding;	Same-day SSC was significantly associated with higher plasma oxytocin at 27 weeks CGA (β=0.938, p=0.002), but also with a decline in oxytocin over time (β=−0.177, p=0.001). Volume of mother's milk was not significantly related to plasma oxytocin. Volume of enteral feeds

			omal abnormalities, severe IVH, HIE, metabolic disorders, NEC requiring surgery, maternal drug abuse.	milk and enteral feeding volumes, SSC, swaddled holding, stressor exposure) extracted from electronic medical records.	Neonatal Infant Stressor Scale scores.	and stressor exposure showed trends but were not significant in the final model. Swaddled holding was not related to oxytocin. Infants were exposed to low levels of touch and high numbers of stressors during hospitalization. Findings suggest SSC influences premature infant oxytocin system function and may facilitate maturation, highlighting SSC as a key nursing intervention for neurodevelopment.
Weisman et al. (570)	2013 (Israel)	To examine the effects of intranasal oxytocin administered to the parent on parent's and infant's cortisol levels following parent–child interaction that included a social stressor, and to test whether the degree of parent–infant synchrony moderates this effect.	N=35 fathers (mean age 29.7 ± 4.2 years, range 22–38) and their 5-month-old infants (SD = 1.25 months, range 4–8 months; 18 girls; 68.5% firstborns). Fathers were healthy, educated middle-class, married, non-smokers without chronic illness or medication; infants were healthy, full-term, singletons.	Double-blind, placebo-controlled, within-subject design. Fathers self-administered 24 IU intranasal oxytocin or placebo (counterbalanced order, one week apart). Parent–infant interactions were recorded using the face-to-face-still-face paradigm and micro-coded for social gaze synchrony. Salivary cortisol was repeatedly collected from fathers and infants; parental stress assessed with the Parenting Stress Index; affect measured with PANAS.	Outcome measures: salivary cortisol (HPA reactivity) in fathers and infants; infant social gaze toward father during still-face episode; parental stress and affect.	Oxytocin increased fathers' overall cortisol response to the stress paradigm. Among infants, oxytocin effects depended on parent–infant synchrony: in high-synchrony dyads, oxytocin elevated infants' HPA reactivity and increased social gaze toward the father during still-face; in low-synchrony dyads, parental oxytocin reduced infants' stress response and social gaze. Fathers' baseline cortisol correlated negatively with neutral affect, proprioceptive touch, and gaze synchrony.

Welch et al. (560)	2015 (US)	To evaluate effects of FNI in the NICU on neurobehavioral outcomes of preterm infants at 18 months corrected age.	N = 150 preterm infants (26–34 weeks gestational age) born to 115 mothers at Morgan Stanley Children's Hospital of New York; randomized to FNI (FNI, n = 78 infants from 59 mothers) or SC (SC, n = 72 infants from 56 mothers).	RCT; infants assigned at birth to FNI or standard care; follow-up at 18 months corrected age; data collected through standardized assessments administered by blinded psychologists or parent reports.	Outcome measures: Bayley Scales of Infant Development III (Bayley-III) assessing cognitive, language, and motor development; Child Behavior Checklist (CBCL 1.5–5) assessing behavioural problems; Modified Checklist for Autism in Toddlers (M-CHAT) assessing social-relatedness and autistic traits.	FNI infants scoring >85 on Bayley-III had significantly higher cognitive ($p = .039$) and language ($p = .008$) scores than SC infants; motor score difference was nonsignificant ($p = .061$). FNI infants had fewer attention problems on CBCL ($p = .028$). FNI infants failed significantly fewer M-CHAT items (27% vs 76% of SC, $p < .001$); none of the FNI infants failed critical or social-relatedness M-CHAT items, compared to 21% and 36% of SC infants ($p < .02$ and $p < .001$ respectively). Effects on cognitive, language, and social outcomes remained after controlling for skin-to-skin care. FNI improved social-relatedness, attention, and neurodevelopment across multiple domains at 18 months.
Welch et al. (559)	2014 (US)	To evaluate the effects of the FNI on electroencephalographic (EEG) activity of preterm infants at term age.	N = 134 infants (71 FNI, 63 SC)	RCT parallel-group design. Mothers in the FNI group engaged in calming sessions with Nurture Specialists throughout the NICU stay, including reciprocal scent cloth exchange, gentle touch, emotional speaking, eye contact, and skin-to-skin or clothed holding.	EEGs were recorded near term age (37–44 weeks postmenstrual age) during quiet and active sleep. EEG power (μV^2) across 124 electrode leads, analysed in 10 frequency bands (0–3 Hz to 37–48 Hz) and 12 brain regions (bilateral frontal, temporal,	FNI infants exhibited significantly higher EEG power, especially in the frontal polar region (10–48 Hz range), compared with standard care infants. The largest differences (+36%) occurred in low gamma frequencies (25–36 Hz) during quiet sleep. Effects were independent of sex, gestational age, singleton/twin status, and birthweight.

					central, parietal, occipital) during two sleep states.	
Wen et al. (548)	2017 (Singapore)	To examine the effects of maternal sensitivity and postnatal maternal depression on frontal EEG asymmetry of offspring at 6 months of age, while considering the amount of time the infants spend with their mothers.	N=111 mother–infant dyads; healthy term-born infants (≥37 weeks gestation, ≥2.5 kg birth weight, 5-min APGAR ≥ 9).	Longitudinal cohort study (GUSTO); maternal depression measured via EPDS; maternal sensitivity coded from 15-min mother–infant play video using Mini-MBQS-V; infant EEG recorded with 128-channel system.	Infant frontal EEG asymmetry (6–9 Hz alpha band); maternal postnatal depression (EPDS score); maternal sensitivity (Mini-MBQS-V); percentage of time infants spent with mothers; infant negative emotionality at 12 months (ITSEA).	No significant effects of postnatal maternal depression, maternal sensitivity, or their interaction on infant EEG asymmetry in the full sample. Among infants who spent ≥ 50% of daytime with mothers, both lower maternal sensitivity and higher postnatal maternal depression predicted greater relative right frontal EEG asymmetry. Greater right frontal EEG asymmetry at 6 months predicted greater negative emotionality at 12 months. Findings indicate that, with sufficient maternal exposure, maternal sensitivity and depression independently influence early brain development.
Wen et al. (547)	2017 (Singapore)	To examine contributions of prenatal and postnatal maternal depressive symptoms to the volume and microstructure of the amygdala in 4.5-year-old boys and girls.	N = 235 mother–child dyads (113 boys, 122 girls) from the GUSTO (Growing Up in Singapore Towards healthy Outcomes) cohort; included children born at ≥34 weeks gestation, ≥2 kg birth weight, and 5-min APGAR score ≥8.	Prospective cohort study; maternal depressive symptoms assessed with the EPDS at 26 weeks of pregnancy and 3 months postpartum, and the Beck's Depression Inventory-II (BDI-II) at 1, 2, 3, and 4.5 years; child MRI and diffusion tensor imaging (DTI) at age 4.5 years.	Amygdala volume and fractional anisotropy (FA) measured via MRI/DTI; maternal depressive symptoms measured using EPDS and BDI-II scores.	Greater prenatal maternal depressive symptoms were associated with larger right amygdala volume in girls, but not in boys. Increased postnatal maternal depressive symptoms were associated with higher right amygdala FA in the overall sample and in girls, but not in boys. No interaction effects between prenatal and postnatal depression were found. Findings indicate independent and differential effects of prenatal and postnatal maternal depression on right amygdala structure,

						suggesting timing of exposure and gender-specific influences on brain development.
Wheeler et al. (613)	2025 (UK)	To explore how mothers' experiences of breastfeeding following birth trauma might impact their mental health.	N=159 mothers who described their birth experience as traumatic; mean age 30.7 years (range 17–49); recruited via social media and breastfeeding organisations in the UK.	Qualitative study; online survey using open-ended questions about breastfeeding, birth, and mental health; convenience sampling; data collected Jan–Feb 2021, re-analysed in 2023.	Self-reported birth trauma, breastfeeding experiences (positive/negative), perceived impacts on mental health and bonding.	Breastfeeding after birth trauma had both positive and negative impacts on maternal mental health. Negative impacts included pain (most cited difficulty), exhaustion, low milk supply, anxiety, guilt, and postnatal depression (25 mentions), often exacerbated by lack of support. Positive impacts included improved bonding (67 references) and promotion of mental health (58 references), with some mothers attributing breastfeeding to healing from trauma or even "saving their life." Overall, a "positive cycle of breastfeeding" was identified, where successful breastfeeding promoted maternal wellbeing and bonding, potentially mitigating effects of birth trauma.
Whipps et al. (580)	2020 (US)	To examine the associations between breastfeeding intensity and underexplored features of maternal-child interaction quality, over and above the influence of breastfeeding initiation.	N=396 Medicaid-eligible mothers and their infants; majority Hispanic (49.9%) or African American (40.6%); 31.6% less than high school education; 21.5% married; 10.6% reported moderate depressive symptoms.	Secondary analysis of a multi-site randomized controlled trial (Smart Beginnings parenting program); mother-infant dyads enrolled at birth; breastfeeding initiation, intensity, and exclusivity assessed at 6 months; mother-child interaction quality	Breastfeeding initiation, intensity (0–4 scale from exclusive formula to exclusive breastfeeding), exclusivity at 6 months; maternal sensitivity, intrusiveness, detachment (observed play interaction); self-	Breastfeeding initiation was associated with lower maternal intrusiveness. Greater breastfeeding intensity at 6 months was significantly associated with higher maternal sensitivity (β=0.12, p=0.004) and lower intrusiveness (β=−0.10, p=0.045), but not with detachment or verbal responsiveness. Exclusive breastfeeding at 6 months was also associated with higher maternal sensitivity (β=0.37,

				assessed with videotaped 5-min free-play task coded using Parent-Child Interaction Rating Scales–Infant Adaptation; self-reported maternal verbal responsiveness assessed with StimQ-I PVR subscale.	reported verbal responsiveness.	p=0.013) and lower intrusiveness (β=−0.37, p=0.034). Associations were consistent across sites, race/ethnicity, infant difficultness, and poverty indicators.
Woolhouse et al. (627)	2016 (Australia)	To explore associations between maternal depressive symptoms at three months postpartum, and breastfeeding status over the first six months postpartum.	N=1258 nulliparous women recruited from six public hospitals; mean gestation at enrolment 15 weeks; maternal age range 18–50 years (mean 30.9).	Prospective cohort study; women recruited in early pregnancy (≤24 weeks gestation).	Maternal depressive symptoms (EPDS ≥13 at 3 months); breastfeeding initiation and continuation at 1–6 months postpartum.	Of the 1,176 women who initiated breastfeeding (94.3%), 893 (75.9%) were still breastfeeding at 3 months and 711 (60.5%) at 6 months postpartum. Depressive symptoms at 3 months (EPDS ≥ 13) were reported by 6.6% (83/1,256) of women. At 6 months postpartum, 49% of women with depressive symptoms were breastfeeding compared with 61% of those without (adjusted OR = 0.55; 95% CI 0.34–0.90). Other independent predictors of not breastfeeding at 6 months included younger maternal age (18–24 years: aOR = 0.32, 95% CI 0.21–0.50; 25–29 years: aOR = 0.56, 95% CI 0.41–0.76), lower education (≤ Year 12: aOR = 0.54, 95% CI 0.40–0.73), and smoking during pregnancy (smoker: aOR = 0.45, 95% CI 0.29–0.69).

Wormald et al. (535)	2021 (Chile/Argentina/Paraguay)	o measure breast milk production (BMP) at two points during neonatal hospitalization and examine its association with anxiety, depression, and breastfeeding self-efficacy among mothers of VLBW infants.	N=118 mothers of VLBW infants (500–1500 g) recruited from 9 NEOCOSUR Network centres in South America; mean maternal age 30 years; 47% primiparous; 78% C-section; infants mean gestational age 28 weeks, mean birthweight 1067 g.	Prospective, observational, multicentre study; BMP measured at 14 days and 36 weeks postmenstrual age.	Breast milk production (mL/day, categorized as low/medium/high), maternal anxiety (STAI), depression (BDI), breastfeeding self-efficacy (ALMA), biosocial variables (maternal age, parity, education, delivery mode, infant sex, birth weight, Apgar).	Mean BMP = 169 mL/day at 14 days and 285 mL/day at 36 weeks. Higher self-efficacy scores were consistently associated with greater BMP at both time points ($p < 0.001$). Depression showed a non-significant trend toward lower BMP at 14 days; no association with anxiety. Higher infant birth weight predicted high BMP at 14 days, and male sex predicted medium BMP at 36 weeks. Only 6.3% of mothers produced ≥ 500 mL/day at 14 days, rising to 17% at 36 weeks.

postnatal depressive symptoms (PDS); Infant Feeding Practices Study II (IFPS2); Edinburgh Postnatal Depression Scale (EPDS); odds ratio (OR); confidence interval (CI); executive functioning (EF); socioeconomic status (SES); Peabody Picture Vocabulary Test–Third Edition (PPVT-3); intraventricular haemorrhage (IVH); hypoxic–ischemic encephalopathy (HIE); necrotizing enterocolitis (NEC); corrected gestational age (CGA); skin-to-skin contact (SSC); Neonatal Intensive Care Unit (NICU); Family Nurture Intervention (FNI); standard care (SC); electroencephalogram (EEG); false discovery rate (FDR); randomized controlled trial (RCT); Bayley Scales of Infant Development III (Bayley-III); Child Behavior Checklist (CBCL); Modified Checklist for Autism in Toddlers (M-CHAT); functional magnetic resonance imaging (fMRI); medial prefrontal cortex (mPFC); anterior cingulate cortex (ACC); orbitofrontal cortex (OFC); ventromedial prefrontal cortex (vmPFC); amygdala functional connectivity (AFC); Adult Attachment Interview (AAI); magnetic resonance imaging (MRI); antenatal depressive symptoms (ADS); Home Observation for Measurement of the Environment (HOME); latent change score (LCS); Infant Behavior Questionnaire–Revised (IBQ-R); Post-Traumatic Stress Disorder (PTSD); Hospital Anxiety and Depression Scale (HADS); State-Trait Anxiety Inventory (STAI); Mother-to-Infant Bonding Scale (MIBS); Multidimensional Scale of Perceived Social Support (MSPSS); grey matter (GM); Attachment Q-Sort (AQS); Statistical Parametric Mapping (SPM); Computational Anatomy Toolbox (CAT12); Capability, Opportunity, Motivation–Behavior model (COM-B); parent–infant relationship (PAIR); Beck Depression Inventory II (BDI-II); State-Trait Anxiety Inventory–State (STAI-S); area under the curve (AUC); Postpartum Bonding Questionnaire (PBQ); Depression, Anxiety, and Stress Scales–21 (DASS-21); Maternal Infant Responsiveness Instrument (MIRI); City Infant Faces Database (CIFD); Parental Bonding Instrument (PBI); dexamethasone (DEX); corticotropin-releasing hormone (CRH); Self-Rating Depression Scale (SDS); Harvard Trauma Questionnaire (HTQ); Japanese National Adult Reading Test (JNART); Cambridge Neuropsychological Test Automated Battery (CANTAB); voxel-based morphometry (VBM); Perinatal Anxiety Screening Scale (PASS); Parental Stress Scale for NICU (PSS: NICU); Observation Scale of Mother–Baby Bond in NICU (N-EOV-INC); Nursing Child Assessment Feeding Scale (NCAFS); weighted Phase Lag Index (wPLI); very low birth-weight (VLBW); South American Neonatal Network (NEOCOSUR); Quality Insights in Microbiome Ecology (QIIME); deoxyribonucleic acid (DNA); ribonucleic acid (RNA); Strengthening the Reporting of Observational Studies in Epidemiology (STROBE); Growing Up in Singapore Towards Healthy Outcomes (GUSTO); Family-wise error rate (FWER); FMRIB Software Library (FSL); Integrated Registration and Segmentation Tool (FIRST); Avon Longitudinal Study of Parents and Children (ALSPAC); Maternal Antenatal Attachment Scale (MAAS); Maternal Postnatal Attachment Scale (MPAS); Parental Evaluation Scale (PEE); Assessment of Mother–Infant Sensitivity (AMIS); Language Environment Analysis system (LENA); macromolecular

proton fraction (MPF); region of interest (ROI); National Health Service (NHS); very preterm (VP); hypothalamic–pituitary–adrenal axis (HPA); Positive and Negative Affect Schedule (PANAS); Patient-Reported Outcomes Measurement Information System–6A (PROMIS-6A); Infant Feeding Questionnaire (IFQ); Ainsworth Maternal Sensitivity Scales (Ainsworth); Perceived Stress Scale (PSS); prenatal mindfulness relationship-based program (PMRB)

Chapter Twelve: Summary table of reviews for Code implementation

Author	Aim	Number of Included Studies	Countries of Included Studies	Population	Types of Studies	Key Findings
Becker et al. (2022)(654)	Systematically examine and summarise the published research evidence of exposure to violations of the Code worldwide, to identify the available research on the topic, examine the settings where exposure occurred, who was targeted, what the marketing activities were, and what products were involved.	153	At least 95 countries Albania, Angola, Argentina, Australia, Austria, Bangladesh, Belgium, Benin, Bhutan, Bolivia, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada, Chile, China, Columbia, Costa Rica, Cote d'Ivoire, Croatia, Curaçao, Denmark, Dominican Republic, Ecuador, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Germany, Ghana, Guatemala, Hungary, Iceland, India, Indonesia, Israel, Italy, Japan, Kenya, Kuwait, Laos, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Maldives, Mauritius, Mexico, Mongolia, Mozambique, Myanmar, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Republic of Korea,	Parents of infants and young children, pregnant women, health professionals, policy makers and government officials, retail staff, school children, general public.	84 observational tool (checklist), 75 interviews/questionnaires, 58 media scan/internet search, 26 documents and records, 5 other (focus groups, laboratory analysis). Some studies use multiple methods.	Persistent violations of the Code continue globally despite widespread adoption of related policies. Common violations include advertising (TV, social media, print), misleading labels and health/nutrition claims, free samples/gifts, in-store and healthcare promotion, and cross-promotion (e.g., toddler milk with infant formula). Violations occur at points-of-sale, in mass media, health facilities, and public/emergency programs. Digital marketing violations have increased since 2000. Product types involved: infant formula (81%), follow-up formula (53%), toddler milk (45%), bottles, teats, and other products. Violations surged during COVID-19. The study calls for stronger Code implementation and monitoring, a global tracking database, and better protection for

			Romania, Russia, Senegal, Singapore, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Tanzania, Thailand, Togo, Turkey, UAE, Uganda, UK, Uruguay, USA, Venezuela, Vietnam, Western Samoa, Zambia.			families from commercial influence.
Franco-Lares et al. (2023)(656)	Systematically identify and summarise worldwide legislation implemented to regulate breast-milk substitutes marketing on digital and social media, and to identify opportunities for strengthening and improving these legal measures.	28 legal measures documents	24 countries Africa: Botswana, Ethiopia, Kenya, Madagascar, Malawi, Nigeria, South Africa Americas: Bolivia, Brazil, Honduras South-East Asia: Bangladesh, Cambodia, India, Indonesia, Myanmar, Maldives Eastern Mediterranean: Afghanistan, Lebanon, Saudi Arabia Western Pacific: Cook Islands, Lao People's Democratic Republic, Philippines, Vietnam Europe: Kyrgyzstan	N/A, review national governments' legislative frameworks	Legal measures documents such as laws, regulations, administrative orders, and decrees.	Out of 127 legal measures, only 28 explicitly regulated digital/social media breast-milk substitute marketing; 23 prohibited it, 5 required prior approval. Age scope: 0–36 months (14 countries), 0–24 months (9), 0–12 months (2), unspecified (3). All included commercial formula; most also covered follow-up formula, toddler milk, bottles, teats, pacifiers. Frequently mentioned digital media: internet, electronic media, email; rarely: apps, baby clubs, smart devices, social media. Only 14 countries (58%) included monitoring; 22 (91.6%) defined sanctions; 17 (70%) specified an enforcing entity. Regulations lag evolving digital strategies, especially influencer marketing and targeted

						ads. Stronger, clearer legislation and transnational frameworks are urgently needed, along with transparent, independent monitoring systems.
Georgiou et al (2026)(678)	To determine whether and to what extent UPF intake is linked to metal health in children and adolescents	20	Not stated	Children and adolescents aged 3–19 years	cross-sectional (*n* = 17), prospective cohort studies (n=2) and case–control study (n=1)	Most findings revealed a positive association between high UPF consumption and mental health problems such as anxiety, depression, irritability or nervousness, sleep disturbances and suicidal ideation. However, variations were observed depending on the country, sex and the assessment tools used.
Jones et al. (2022) (657)	Understand the scope and impact of digital marketing for the promotion of breast-milk substitutes globally, particularly in light of the International Code of Marketing of breast-milk substitutes which prohibits such marketing.	29	USA, UK, Australia, Brazil, China, India, Indonesia, Mexico, Hong Kong, South Africa, Thailand, Nigeria, Vietnam, Malaysia, Singapore, Mongolia, Myanmar, Sri Lanka, Philippines, Cambodia, New Zealand, European countries (unspecified), Global/multinational studies	Parents of children (0-3 years), pregnant women, health professionals, marketing professionals, policy makers. Some studies did not include population.	9 content analysis, 5 cross-sectional, 3 cohort, 4 mixed-methods, 3 qualitative, 5 policy analysis	Digital marketing of breast-milk substitutes is widespread and strategically integrated across platforms like social media, websites, apps, blogs, streaming services, and messaging apps. Common marketing strategies include Discounts, gifts, samples, influencer marketing, personalized targeting using data mining and AI, idealized messaging and imagery. Exposure to marketing is high but research on it's impact is limited. Yet where

						studies digital marketing is linked to lower breastfeeding initiation and intention. Case reports from marketing industry confirm increased brand engagement and sales resulting from these strategies.
Lane et al. (2024)(680)	A systematic umbrella review of existing meta-analyses to evaluate the associations between exposure to ultra-processed foods, as defined by the Nova food classification system, and adverse health outcomes.	14	Not stated	Most pooled analyses included adults as the main population, except for 5, which included children and adolescents in examining mental health outcomes and respiratory conditions.	Pooled analyses included estimates from original research articles that comprised either prospective cohorts (n=18), mixed study designs (n=15), or cross sectional designs (n=12).	Greater exposure to ultra-processed food was associated with a higher risk of adverse health outcomes. The strongest available evidence pertained to direct associations between greater exposure to ultra-processed foods and higher risks of all cause mortality, cardiovascular disease related mortality, common mental disorder outcomes, overweight and obesity, and type 2 diabetes. Evidence for the associations of ultra-processed food exposure with asthma, gastrointestinal health, some cancers, and intermediate cardiometabolic risk factors remains limited and warrants further investigation.

Topothai et al. (2024)(655)	Synthesise evidence on the outcomes of implementing the International Code of Marketing of Breast-milk Substitutes as national law, across countries where it has been adopted, using a structured implementation science framework.	60	28 countries Africa: South Africa, Côte d'Ivoire, Burkina Faso, Senegal, Ethiopia, Zambia, Ghana, Nigeria Americas: Mexico, Brazil, Uruguay, Ecuador, Chile South-East Asia: India, Nepal, Bangladesh, , Indonesia, Vietnam, Myanmar Western Pacific: China, Philippines, Cambodia, Australia, Malaysia Europe: UK, Turkey, Russia Eastern Mediterranean: Pakistan	Mothers of infants and young children, Health professionals, Retailers and shop staff, CMF companies, Public and private healthcare settings	33 quantitative studies, 19 qualitative studies, 8 mixed methods Legal compliance (57), acceptability (5), feasibility (1)	Legal implementation of the Code was most effective in restricting media promotion of infant formula for 0–12 months. However, compliance was weaker at point-of-sale, in healthcare settings, and in product labelling. Unregulated products like toddler milk were widely promoted using cross-promotion and digital marketing, particularly on platforms like Facebook and Instagram. Health worker compliance varied, often influenced by training and incentives. Acceptability of laws was mixed, and feasibility (assessed in Cambodia) depended on training, resources, and monitoring tools. The review calls for stronger legislation, better enforcement, and modern monitoring strategies, including AI tools.
UNICEF (2025)(676)	To synthesise the global evidence on ultra-processed foods (UPFs), sugar-sweetened beverages (SSBs), and commercial	200+	Not stated	Children and adolescents aged 0–19 years	National dietary surveys, prospective cohort studies, cross-sectional studies, longitudinal studies, randomised controlled trials, systematic reviews, meta-analyses, qualitative studies, market and sales analyses, policy	UPF consumption is high and increasing globally, with children in many high-income countries obtaining more than 60% of their energy intake from these foods. Higher UPF intake is associated with poorer diet quality, obesity, micronutrient deficiencies,

	foods for infants and young children (CFIYC), examining trends in consumption, impacts on nutrition and health, drivers of consumption, and effective policy responses for children and adolescents.				evaluations, and food environment assessments.	adverse mental health outcomes, dental caries, and increased risk of later chronic disease. Key drivers include affordability, convenience, widespread availability, and intensive marketing. The review calls for stronger policies, including marketing restrictions, front-of-pack labelling, taxation, healthier school food environments, and tighter regulation of commercial baby foods.

Chapter Twelve: Summary table of empirical studies on Code implementation

Author	Year & Country	Aim	Participants	Methods	Outcome Measures	Key Findings
Baker et al.(651)	2021 (Global with specific reference to countries such as the US, China, Thailand, Ecuador, Canada, and others)	Understand the strategies used by the baby food industry to shape 'first-foods systems' and drive global milk formula consumption	N/A	Theoretically guided synthesis review combining qualitative and quantitative data; included literature searches, company data, trade flows, and lobbying records	Global milk formula sales growth, corporate lobbying expenditures, participation in regulatory bodies, and influence over public health policies.	Global milk formula sales rose from US$1.5B in 1978 to US$55.6B in 2019, driven by expansion into new markets (especially the Global South) and product diversification. The industry uses sophisticated marketing via health systems, digital media, and science-based claims, to shape feeding norms. It also lobbies, forms partnerships, and leverages trade rules to weaken regulations like the Code, undermining breastfeeding and requiring stronger public health action to curb corporate influence.
Barry et al.(36)	2024 (Canada)	Examine mothers' exposure to violations of the International Code of Marketing of Breast-Milk Substitutes (IC) in a region with low breastfeeding rates.	119 mothers of children ≤ 2 years	Cross-sectional online survey using questions adapted from IBFAN's Code Monitoring Kit	Exposure to IC violations (e.g., receiving formula samples, coupons, or marketing contact) Type, frequency, and source/location of violations	87% of participants reported exposure to at least one IC violation 94% of this group (N= 104) received formula coupons, 88% free samples, 79% direct marketing contact Most common violation sites: doctor's offices (79%), supermarkets (75%), pharmacies (71%) Violations occurred regardless of infant feeding method or demographic factors
Bozkir et al (674)	2025 (UK)	Evaluate the compliance of UK commercial baby food products with WHO Nutrient and Promotion Profile Model (NPPM) guidelines	N/A (469 baby food products)	Cross-sectional survey	Nutritional composition and labelling information were assessed using the NPPM criteria.	While 75% of products met the minimum energy content criteria, compliance with total sugar content and protein requirements was 59% and 94%, respectively. Overall, only 45% of products adhered to NPPM nutritional standards. Promotional assessments revealed that no products met the requirements for

						appropriate nutrient, health, or marketing claims. Only 5% of products included adequate statements in support of breastfeeding.
Conway et al. (663)	2023 (UK)	Examine the on-package labelling of formula products in GB, assess use of marketing messages, and evaluate compliance with legislation and government guidance.	71 formula products	Content analysis of infant, follow-on, growing-up, and specialist formula packaging available for sale in GB (April–October 2020).	Presence of nutrition and health claims, similarity scores between product types and compliance with DHSC and EU labelling guidelines	41% of formula products included nutrition claims; 18% had non-permitted health claims; 72% of infant and follow-on formula packs were highly similar, enabling cross-promotion; 94% of infant formula packs advertised follow-on or growing-up formula; breastfeeding superiority statements were present but hard to locate; emotional, natural, and scientific imagery was widespread; many marketing practices fell outside existing legislation, supporting calls to close regulatory loopholes.
Conway et al.(661)	2023 (UK)	Understand how mothers use commercial milk formula (CMF) labels to inform their feeding choices and explore their beliefs about differences between CMF products	25 mothers of children under 3 years old currently using CMF	Qualitative study using semi-structured one-on-one online interviews and a product mapping exercise and thematic analysis.	Mothers' perceptions of CMF labels, brand influence, understanding of formula stages and specialist products, and interpretation of imagery and on-pack messaging.	Mothers were heavily influenced by brand familiarity and packaging appearance; many believed formula stages signalled necessity; label messaging created confusion and anxiety; references to nature, science, and breastfeeding were interpreted as signals of product superiority or similarity to breast milk; mothers desired clearer guidance from healthcare professionals; current labelling regulations allow misleading marketing cues.
Feldman-Winter et al.(667)	2012 (USA)	Examine the impact of removing industry-sponsored formula sample packs on breastfeeding outcomes and hospital practices	527 breastfeeding mothers (284 control,	Prospective cohort study	Receipt of formula sample packs Any and exclusive breastfeeding at	Removal of formula sample packs increased any breastfeeding at 10 weeks (49% vs 45%, P = .03); no significant difference in exclusive breastfeeding (10% vs 8%, P = .46); contamination occurred as 36%

			243 interventi on)		1 and 10 weeks postpartum	received formula. Mothers who did not receive any formula from the hospital were significantly more likely to exclusively breastfeed at 10 weeks. Staff resistance and misconceptions about low-income mothers' feeding choices hindered change.
Haiek et al.(671)	2012 (Canada)	Assess compliance with the Baby-Friendly Initiative (BFI)—including the Ten Steps, the Seven Point Plan, and the International Code in hospitals and community health centres	60 hospitals and 140 communi ty health centres; 1,375 mothers from hospital/b irthing centres and 1313 mothers from CHC	Cross-sectional evaluation	Composite compliance scores for Ten Steps, Seven Points, and Code Differences by facility type, region, and BFI designation status	Compliance scores (out of 10) were low: hospitals 4.54, CHCs 3.13, Code 0.69. BFI-designated facilities scored higher. Implementation varied by region and facility type. Rooming-in poorly done as 83% of mothers said infants were taken without medical reason. Staff often overestimated compliance vs. mothers/external reports. Steps 6, 7, and 10 (formula use, rooming-in, post-discharge support) had lowest compliance.
Kantorova et al.(672)	2023 (Czech Republic)	Improve breastfeeding support, and more specifically, to increase compliance with the Baby-Friendly Hospital Initiative (BFHI) and the requirements of the Code	95 mothers, 25 health care providers , 1 hospital director, 1 neonatal nurse, 20 facility departme nts/phar macy assessed	JBBI Evidence implementation framework. Online surveys, training, follow-up audits.	Compliance with BFHI Ten Steps and Code, assessed through audit criteria.	Compliance improved across all audited criteria. Full compliance achieved for Code adherence, written infant feeding policy, staff skills, antenatal breastfeeding discussions, and coordination with community services (0% to 100%). Improvements among mothers' reported experiences: Skin-to-skin contact (67.9% to 83.6%). Staff assistance with breastfeeding (67.9% to 82.1%). Exclusive breastfeeding during stay (50% to 58.2%).

			for Code complian ce			Rooming-in (57.1% to 61.2%). Feeding on demand (50% → 64.2%). Information on community support (32.1% to 62.7%).
Khoury et al.(677)	2024 (Spain)	To investigate the association between UPF consumption and cardiometabolic risk factors in the Childhood Obesity Risk Assessment Longitudinal Study (CORALS).	1426 participa nts (mean [SD] age, of 5.8 [1.1] years	Longitudinal study using food frequency questionnaires	Energy-adjusted UPF consumption (in grams per day) and based on the NOVA food classification system.	Compared with participants in the lowest tertile of energy-adjusted UPF consumption, those in the highest tertile showed higher *z* scores of BMI (β coefficient, 0.20; 95% CI, 0.05-0.35), waist circumference (β coefficient, 0.20; 95% CI, 0.05-0.35), fat mass index (β coefficient, 0.17; 95% CI, 0.00-0.32), and fasting plasma glucose (β coefficient, 0.22; 95% CI, 0.06-0.37) and lower *z* scores for HDL cholesterol (β coefficient, −0.19; 95% CI, −0.36 to −0.02).
Lutter et al.(670)	2022 (Chile, Ecuador, Mexico, Panama, Uruguay, Nigeria, Philippines, and Thailand)	To summarise the extent and nature of Code violations across eight countries using the WHO/UNICEF NetCode periodic assessment protocol	3,124 mothers and 862 health care providers	Multi-country cross-sectional analysis using NetCode periodic assessment protocol	Exposure to CMF promotions Contact between health workers and CMF companies Product label compliance Retail promotion presence	64% of mothers reported exposure to CMF promotion (mostly outside health facilities); 21% of health providers had contact with CMF reps; 63% of stores had promotions; 49% of labels had nutrition/health claims, 33% idealized bottle feeding. 20% of mothers with infants <6 mo. were advised by health workers to use CMF. Violations were higher in countries with weaker Code legislation; over 50% of Latin American providers had no knowledge of the Code or national law.
Ottino-González et al.(679)	2026 (USA)	To examine whether cumulative UPF intake from infancy through early childhood is associated with cognitive performance at 24 and 72 months and	1 month: 430 6 months: 368	Prospective birth cohort study using multiple 24-hour recall dietary assessment	Cognitive performance was assessed at 24 and 72 months, and subcortical brain volumes were	Cumulative UPF intake was not associated with cognitive performance at either 24 months (n=144, 57% girls) or 72 months (n=93, 59% girls). In contrast, cumulative UPF intake from 6 to 72 months (n=79, 58% girls) was inversely associated with the

		with subcortical brain volumes at 72 months	12 months: 339 24 months: 315 72 months: 140		derived from T1-weighted MRI scans at 72 months.	volumes of the bilateral accumbens, left amygdala, bilateral pallidum, left putamen, and bilateral thalamus (all FDR-adjusted $p < 0.05$). On average, a 10% higher proportion of cumulative UPF intake was associated with a 1.92% lower subcortical volume (CI95% -3.29, -0.58). Associations were consistent across exposure windows (6–24 months compared with 72 months) and UPF subtypes (e.g., snacks, fast food).
Pomeranz et al.(660)	2023 (USA)	Analyse how breastmilk substitute manufacturer websites in the US portray breast-feeding/breastmilk versus infant formula (IF) feeding.	678 website screenshots	Content analysis of 5 CMF manufacturer websites (Similac, Enfamil, Gerber, Earth's Best, Happy Baby)	Frequency and type of messaging regarding: Benefits/issues of breastmilk vs. IF, and marketing practices (e.g., discounts, comparisons, expert access)	Websites more often discussed benefits of IF (44%) than of breastfeeding (26%). Breastfeeding often framed with problems (e.g., pain, supply issues). 29% promoted IF discounts; 49% provided access to "support" reps. Some websites compared IF favourably to breastmilk. Overall messaging encouraged IF use and discouraged breastfeeding in subtle and overt ways.
Qassin et al.(669)	2021 (Australia, New Zealand, USA, Canada, and UK)	Assess whether national maternity care provider associations had policies on CMF marketing and to identify any financial support received from CMF manufacturers	28 professional maternity care association websites	Online cross-sectional review of publicly available websites and materials from national or regional associations	Presence of CMF-related policy or position statements. Evidence of financial support from CMF industry (e.g., sponsorships, advertising).	50% of associations had a policy on CMF marketing; 21% received CMF financial support via event sponsorship (14%) and ads (18%). UK had the highest policy coverage (100%), and USA were most likely to receive CMF funding (43%). Obstetric groups had highest CMF ties (50%), midwifery (25%). Some with policies still received funding, sometimes via indirect links. These ties risk conflicts of interest and may undermine breastfeeding promotion.

Rollins et al. (652)	2023 (includes analysis from 126 countries and multi-country case studies)	Describe how CMF marketing operates as a global system influencing parents, health professionals, science, and policy, and undermining breastfeeding	Multiple data sources (126 national datasets, 1 scoping review, 2 multi-country studies, multiple company reports and case studies)	Mixed-method synthesis: analysis of global marketing and sales data, systematic/scoping reviews, case studies, and commissioned research on experiences with CMF marketing	Trends in CMF sales and advertising expenditure Code violations Influence on feeding practices, professional advice, policy, and public understanding	CMF marketing is a powerful, well-resourced global system that distorts science, targets vulnerable groups, influences health professionals, and circumvents regulations; digital marketing, health claims, and emotional appeals promote formula use over breastfeeding; evidence of widespread Code violations persists globally; recommends a global framework convention to end CMF marketing and protect breastfeeding.
Romo-Palafox et al. (662)	2020 (USA)	Assess USA caregivers' provision of infant formula and toddler milks and how agreement with marketing claims may influence these decisions.	1,645 caregivers of infants (6–11 months) and toddlers (12–36 months)	Cross-sectional online survey	Types of milk-based products served to children. Caregiver agreement with expert recommendations and marketing claims. Appropriateness of product use	Many caregivers believed formula/toddler milk offers unique nutrition (52–62%). Misuse was common (11% infants given toddler milk; 39% toddlers given infant formula). Agreement with marketing increased odds of serving these products (45% infants, 59% toddlers). Use was higher among college-educated, Asian, Black, and more-acculturated Hispanic caregivers. Those serving regular milk were less likely to use substitutes. Messaging often conflicted with expert advice, raising public health concerns.
Sadacharan et al.(666)	2014 (USA)	Determine whether the type of hospital discharge bag (formula, coupon, breastfeeding supplies, or no bag) is associated with exclusive breastfeeding up to 6 months	2,294 mothers (from the Infant Feeding Practices Study II,	Cohort study using existing survey data	Exclusive breastfeeding at 10 weeks and 6 months Type of discharge bag received	81.4% received formula bags; mothers who received breastfeeding supplies or no bag were significantly more likely to exclusively breastfeed at 10 weeks and 6 months; adjusted OR for exclusive breastfeeding at 6 months was 1.58 (95% CI: 1.06–2.36) for those receiving breastfeeding

			2005–2007)			supplies/no bag vs formula/coupon bags; findings support limiting distribution of formula-sponsored discharge bags to promote breastfeeding.
Tarrant et al.(668)	2015 (Hong Kong)	Investigate the effect of public hospitals stopping the acceptance of free infant formula on in-hospital formula supplementation and breastfeeding duration.	2,560 mother–infant pairs (1,320 before and 1,240 after policy implementation)	Prospective cohort study across four public hospitals comparing outcomes before and after policy change; follow-up over 12 months or until breastfeeding stopped	In-hospital formula supplementation rates. Rates of exclusive breastfeeding during hospital stay. Duration of any and exclusive breastfeeding.	After Hong Kong hospitals stopped accepting free formula, exclusive breastfeeding rose (17.7% → 41.3%), formula feeds dropped (2.7 to 1.17), and breastfeeding duration increased (8 to 12.5 weeks). Risk of stopping breastfeeding fell 20%. More in-hospital formula predicted shorter breastfeeding; high use raised risk of stopping by 73%. Exclusive breastfeeding duration didn't improve, despite greater intent.
Tarrant et al.(665)	2016 (Hong Kong)	Examine whether public hospitals paying market price for infant formula increases mothers' exposure to Baby-Friendly Hospital steps and improves breastfeeding duration.	2,470 breastfeeding mother–infant pairs (Cohort 1: 1,262; Cohort 2: 1,208)	Prospective cohort study at 4 public hospitals (pre- and post-policy implementation); participants followed for up to 12 months postpartum	Exposure to 6 Baby-Friendly steps. Timing of breastfeeding initiation. Duration of any and exclusive breastfeeding.	Exposure to all 6 Baby-Friendly steps increased from 4.8% to 20.5% after the policy; breastfeeding initiation within first hour rose from 28.7% to 45%; exclusive breastfeeding in hospital rose from 17.9% to 41.4%; early initiation improved; experiencing more Baby-Friendly steps was linked to longer breastfeeding duration; each additional step reduced the risk of stopping breastfeeding by 8%.
Threapleton et al (675)	2025 (UK)	Evaluate nutritional content of commercial baby foods and conduct survey to understand how parents use commercial baby and toddler foods and their perceptions of marketing tactics	632 baby and toddler food products	Market analysis, focus groups, parent survey	Nutrient content and parental use of of commercial baby foods	Many products failed WHO standards for energy density, sugar, sodium, and portion size, while marketing practices were poor, with all products containing promotional claims, 12% marketed from 4 months of age, and 92% lacking breastfeeding-support statements. Fruit-based pouches were often high in sugar and low in energy density, and parent survey data (n=1,008) showed strong

						concerns about product quality, misleading marketing, and difficulties identifying healthier options.
Thurston et al.(659)	2013 (USA)	Describe sources of infant formula samples during the perinatal period and assess their associations with breastfeeding outcomes at 1 month postpartum	61 women who initiated breastfeeding (mostly white, married, college-educated and planned exclusive breastfeeding)	Prospective observational study; data collected via prenatal and 1-month postpartum surveys	Any breastfeeding at 1 month and exclusive breastfeeding at 1 month	87% of participants received formula samples, mainly from hospitals (66%) and mail (67%). Women who planned to exclusively breastfeed were significantly more likely to receive formula samples by mail compared to those planning mixed feeding 74% vs. 36%, P = .016. No significant association between formula sample receipt and breastfeeding outcomes at 1 month postpartum. Small sample size and demographic homogeneity likely limited statistical power and generalizability.
Topothai et al.(664)	2024 (Singapore)	Explore experiences of mothers and health workers with commercial milk formula (CMF) marketing in Singapore after the 2019 tightening of marketing restrictions.	34 total: 14 mothers of infants under 5 months and 20 health workers (doctors, nurses, lactation consultants, researchers).	Qualitative study using semi-structured interviews	Participant-reported exposure to CMF marketing tactics; attitudes and behaviours related to infant feeding and CMF brand choice	Despite 2019 restrictions, CMF marketing remained widespread in Singapore via digital ads, samples, gifts, and branding—especially in private hospitals. Companies used loopholes (e.g., toddler/maternal milk, sponsorships). Mothers' choices were shaped by endorsements, price, claims, and branding. Some health workers partnered with CMF firms or equated CMF with breastmilk. Current regulations (SIFECS) were insufficient; stricter alignment with the International Code is needed.
Waite and Christakis (658)	2016 (USA)	Determine whether receiving a free sample of infant formula in the mail impacts	3,031 mothers and infants	Cohort study using existing survey data	Any breastfeeding through 12 months	57.4% received infant formula sample in mail. No impact on 'any' breastfeeding and 'exclusive' breastfeeding until 5 months.

		breastfeeding duration and exclusivity	(drawn from the Infant Feeding Practices Study II conducted 2005–2006)		Exclusive breastfeeding through 6 months	Receiving formula in the mail reduced likelihood of exclusive breastfeeding at 6 months (OR = 0.57, CI: 0.37–0.89) No impact on duration of any breastfeeding through 12 months.

Chapter Thirteen: Summary table of reviews on workforce education

Author	Aim	No. Included studies	Countries	Population	Types of studies	Key findings
Balogun (2017) (687)	Provide evidence about the effect of training healthcare staff in hospitals and birth centres on breastfeeding outcomes, specifically in relation to Step 2 of the BFHI	6	Australia, Brazil, Canada, Sweden, USA	Hospital and birth centre HCPs including midwives, nurses, paediatricians, obstetrician	2 cluster and 1 individual RCTs, 3 CBA studies.	Training healthcare staff improved knowledge and attitudes toward breastfeeding. Two studies reported increased compliance with BFHI practices. Only one study reported breastfeeding outcomes and found increased exclusive breastfeeding rates at the intervention site. Significant methodological variation across studies (training content, outcome measures, assessment tools) precluded meta-analysis. Most studies focused on knowledge and attitudes rather than breastfeeding outcomes. Overall evidence quality was moderate to low due to study design limitations and risk of bias.
Boss et al. (2021) (686)	Synthesise the literature on health interventions designed to support clinical decision making for medical practitioners in the specific context of lactation care.	13	USA, UK, Spain and Canada	Medical practitioners in general practice/primary care, paediatrics, obstetrics and gynaecology, family medicine, medical students, and faculty members.	10 quantitative non-randomised studies, 1 mixed-methods study, and 2 noncomparative studies	All interventions aimed to address inadequacies in breastfeeding knowledge and education among medical practitioners. Most studies used multiple implementation strategies such as educational materials, meetings, interprofessional education, and patient-mediated interventions. Implementation outcomes commonly reported were acceptability, appropriateness, feasibility, and adoption. However, none of the studies reported on sustainability, and few addressed fidelity, cost, or coverage. The overall quality of study methodology was poor, with most studies meeting less than half of the criteria for good empirical research. Risk of bias was serious or critical in all studies, primarily due to confounding and measurement issues. As a result, no firm conclusions could be drawn about the effectiveness of the interventions or the success of their implementation. The review

						highlighted the urgent need for high-quality research using robust implementation frameworks to guide and sustain evidence-based lactation care among medical practitioners.
Bowdler et al. (2022) (700)	Explore preregistration nursing students' breastfeeding knowledge and the sources they used to develop that knowledge	14	USA, Spain, Hong Kong, Saudi Arabia, Taiwan, and Egypt	Preregistration nursing students	11 quantitative studies, 2 qualitative studies, and 1 mixed-methods study.	Nursing students had sufficient knowledge of the physiology of lactation and WHO recommendations on breastfeeding initiation and duration. However, they had insufficient knowledge regarding practical aspects of breastfeeding, such as positioning, latch, sore nipples, mastitis management, and the impact of pacifiers or supplemental feeding. Two main sources of knowledge were identified: informal knowledge through personal experience (e.g. breastfeeding their own children or observing family and friends) and formal education through university coursework and clinical placements. The review highlighted the need to better align informal experiences with structured formal education and suggested that using theoretical frameworks could help bridge this gap. It also emphasised the importance of clinical placements and practical learning to build confidence and competence in supporting breastfeeding women.
Campbell (2022) (684)	Scoping review to explore the literature for the educational resources, methods, and curriculum used in the education of undergraduate health students	29	USA, UK, South Africa, China, India, Australia, Turkey, Mexico and Chile	Undergraduate students in nursing, medicine, midwifery, pharmacy, and dietetics	7 descriptive, 5 experience reports, 4 pre/post-test studies, 2 RCTs, 2 quasi-experimental, 1 qualitative, 1 cross-sectional pilot, 1 case study, 1 post-test only, 1 cohort, 1 prospective, 1 guideline, 1 policies	Educational resources and methods were generally based on best practice standards. Many studies incorporated experiential learning, such as clinical practice, simulation, and role-play. Students showed improvements in knowledge and attitudes (59% of studies), breastfeeding support skills (45%), and confidence (10%). However, even in programs focused on skill development, confidence did not always improve. There was a lack of consistency across disciplines and limited methodological rigor in measuring outcomes.

	related to lactation.				and recommendations, 1 quantitative descriptive.	The review emphasised the importance of combining didactic and practical learning, integrating breastfeeding education throughout undergraduate curricula, and using innovative teaching methods such as online modules and simulations.
Chuisano & Anderson (2020) (682)	Scoping review to critically assess the types of application-based breastfeeding management learning tools reported in medical and nursing professions and the evaluation methods of learner and patient outcomes	10	USA, Hong Kong, India, Turkey	Residents in family medicine, paediatrics, obstetrics/ gynaecology, medical faculty, baccalaureate nursing students, perinatal nurses, women's health nursing students, auxiliary nurse-midwives, anganwadi workers	All educational intervention studies (not RCTs).	All studies combined application-based (i.e. clinical practice with real patients, role play, or standardised patients) with didactic teaching using curricula based on established resources, although there is a lack of standardisation in curricula and evaluation across institutions. All studies reported positive effects on knowledge, confidence, skills, and supportive attitudes toward breastfeeding. Some found improvements in breastfeeding initiation and duration rates. Standardised patients and simulation often led to higher skill gains than skills labs or lectures. There was limited evidence on long-term retention and patient outcomes.
Gavine et al. (2017) (689)	Determine whether education and training programs for healthcare staff have an effect on their knowledge and attitudes about supporting breastfeeding women. A	4	Brazil, Denmark, and Sweden	Midwives, postnatal nurses, health visitors, paediatricians, obstetricians, and nurses. One study did not specify the professional roles of the participants.	3 cluster RCTs and 1 individually randomised RCT.	Key findings showed small but significant positive effects on breastfeeding knowledge in two studies. Attitudes towards breastfeeding were measured in two studies, but results were inconsistent and varied in how they were assessed. One study reported a small but significant improvement in compliance with BFHI step 5 (demonstration of breastfeeding). However, none of the studies assessed adherence to the International Code of Marketing of Breastmilk Substitutes. Overall, the quality of the studies was low, with high or unclear risk of bias across most domains. The

	secondary aim was to identify whether differences in the type of training or the discipline of staff influenced outcomes.					review concluded that there is a critical need for high-quality research to inform effective breastfeeding education and training for healthcare staff.
Higman et al. (2018) (681)	Review educational interventions for neonatal clinicians (NICU staff) that evaluated the effect on clinician knowledge of breastfeeding practices in neonatal care	4	USA, UK.	Nurses, doctors, rehabilitation therapists, social workers, respiratory therapist, nurse practitioner, and other health professional	1 Pre/post-test design with control group, 1 pre/post-test design with audit, 1 quasi-experimental time series (multiple follow-ups), 1 post-test only with retrospective audit	All studies showed short-term improvements in clinician breastfeeding knowledge after education, though methods of assessment were unvalidated and varied. Nurses' beliefs, attitudes, and intentions to support breastfeeding improved, but long-term retention was inconsistent. There were small increases in breastfeeding rates (one study), breastfeeding initiation (one study), or breastfeeding at discharge (one study).
Mulcahy et al. (2022) (683)	Identify, analyse and evaluate studies on breastfeeding skills education for healthcare professional	11	USA, UK, Brazil, Croatia, and Australia	Registered midwives, health visitors, nursery nurses, managers, service users, nutritionists, care coordinators, clinical educators, student nurses, student midwives, medical students, paediatric, and obstetrics and	8 pre- and post-test designs, 2 quasi-experimental studies, and 2 observational studies.	Breastfeeding education incorporating practical skills training was more effective than classroom-based theoretical instruction alone. Teaching strategies that included observational or experiential components led to better outcomes in knowledge, confidence, and practice. However, there was a lack of standardisation across curricula, educator qualifications, and assessment methods. Most studies did not include prerequisite training, and few assessed long-term outcomes or systemic influences. Risk of bias was high in all but one study, suggesting findings should be interpreted with caution. The review concluded that breastfeeding

				gynaecology, residents.		education for healthcare professionals should be interdisciplinary, include practical components, and be supported by systemic changes in healthcare settings to improve breastfeeding support for families.
Sandhi (2023) (685)	Examine the effectiveness of breastfeeding educational interventions in improving the knowledge, attitudes, and skills of nursing, midwifery, and medical students; and to identify key factors that influence the effectiveness of these interventions	33	USA, Australia, Taiwan, Hong Kong, Indonesia, Pakistan, Thailand, Turkey, Croatia, UK, and Spain.	Undergraduate students in nursing, midwifery, and medicine	33 quasi-experimental studies	Educational interventions significantly improved students' breastfeeding knowledge, attitudes, and skills. Meta-analysis revealed that students in intervention groups had higher scores in knowledge compared to control groups. Clinical practicums were identified as a significant moderator for improvements in both knowledge and skills. However, only a few studies described the use of an educational framework, and its impact on outcomes was inconclusive.
Wang (2023) (690)	Evaluate the effects of breastfeeding training programmes for midwives on their knowledge, attitudes, and practices (KAP) towards breastfeeding, as well as on breastfeeding initiation,	10	Sweden, UK, USA, Croatia, Bangladesh, Taiwan, and China	Midwives and nurses (for the primary outcome of KAP) and postnatal mothers cared for by midwives.	5 RCTs and 5 quasi-experimental studies.	Breastfeeding training programmes significantly improved midwives' knowledge, skills and attitudes towards breastfeeding. For postnatal mothers, the training programmes led to longer durations of exclusive breastfeeding, fewer breastfeeding challenges such as milk insufficiency, higher satisfaction with breastfeeding counselling, and reduced use of breast milk substitutes in the first week of life without medical reasons. However, the programmes had limited effects on breastfeeding initiation and rates.

	duration, and rates among postnatal mothers.					
Yang (2018) (688)	Describe nursing and other health professional students' knowledge and attitudes towards breastfeeding, and to examine educational interventions designed to increase breastfeeding knowledge and attitudes among health professional students.	14	USA, Australia, Hong Kong, Sweden, India, Egypt, Saudi Arabia.	Nursing students, medical students, and general practice registrars.	7 cross-sectional surveys, 2 qualitative studies, 1 mixed-methods study, and 4 quasi-experimental studies	Health professional students often had limited knowledge about breastfeeding, particularly in relation to assessment and management. Standard curricula sometimes improved knowledge but not consistently. Educational interventions, including lectures, online modules, and clinical placements, generally increased students' breastfeeding knowledge but had limited impact on attitudes. Factors influencing knowledge and attitudes included year of study, personal breastfeeding experience, gender, cultural practices, and government policies. Confidence in supporting breastfeeding mothers was not always aligned with actual knowledge levels.
Baby-Friendly Hospital Initiative (BFHI); Healthcare Professionals (HCPs); Randomised Controlled Trials (RCTs); Controlled Before–After (CBA); Neonatal Intensive Care Unit (NICU); Knowledge, Attitudes, and Practices (KAP); Confidence Interval (CI); Standardised Mean Difference (SMD); Objective Structured Clinical Examinations (OSCEs).						

Chapter Thirteen: Summary table of empirical studies on workforce education

Author	Year & Country	Aim	Participants	Methods	Outcome Measures	Key Findings
Blixt, 2014 (697)	2014, Sweden	Evaluate the effects of a process-oriented training in breastfeeding support counselling for midwives and child health nurses on women's satisfaction with breastfeeding counselling, and on problems such as insufficient breast milk and nipple pain, in relation to exclusive breastfeeding (EBF) duration shorter or longer than three months.	N=540 first-time mothers of full-term babies.	Longitudinal intervention study	Women's satisfaction with breastfeeding counselling, perception of coherent counselling, and reported breastfeeding problems such as insufficient breast milk and nipple pain. These were analysed in relation to whether women exclusively breastfed for less than or more than three months.	Women who exclusively breastfed for less than three months reported clearer benefits from the intervention. In this group, women cared for by health professionals who had received process-oriented training were significantly more satisfied with their breastfeeding counselling and perceived it as more coherent compared with women in the control groups. They also reported fewer problems with insufficient breast milk. However, there were no group differences for nipple pain or nipple sores. Among women who exclusively breastfed for three months or longer, there were no significant differences between intervention and control groups in satisfaction with counselling, coherence of counselling, or breastfeeding problems. Across all groups, women who breastfed for at least three months were more likely to achieve the breastfeeding duration they had planned, whereas those who breastfed for less than three months were less likely to do so.
Blumenfeld & Miller, 2023 (692)	2023, USA	Investigate the knowledge and attitudes of Spanish-	N=7 Spanish-speaking Latina housekeeping staff	Pilot project using a pre- and	Changes in scores on the IIFAS, which measures attitudes	All participants increased knowledge and more positive attitudes toward breastfeeding

		speaking Latina housekeeping staff regarding breastfeeding before and after implementing a lactation education programme, and to explore their potential informal role in influencing breastfeeding culture within a Baby-Friendly Hospital Initiative (BFHI)-designated hospital.	working in the maternity units of the hospital.	post-intervention design	toward breastfeeding and formula feeding, and the knowledge test assessing understanding of BFHI policies and breastfeeding benefits.	after the intervention; 4 moved from neutral to positive attitudes; participants initially positive toward formula improved the most; knowledge improved across all items, especially BFHI policies and risks of formula. Participants valued the Spanish-language delivery, felt more informed and planned to change interactions with breastfeeding patients. Authors suggest training/education of non-clinical staff (housekeeping) in BFHI context can impact on breastfeeding culture in the hospital.
Cato et al. (703)	2025, Sweden	To explore healthcare professionals' perceptions and appraisal of an interprofessional breastfeeding training programme	N=237 healthcare professionals including midwives, registered nurses, specialist registered nurses, assistant nurses, doctors, psychologists	Descriptive study of a breastfeeding education programme	Interest in breastfeeding support, view of importance of their professional role in breastfeeding support, views of the training programme, perceptions of own knowledge and skills.	Healthcare professionals from several disciplines reported high baseline interest in breastfeeding and perceived their role in breastfeeding support as important, with differences between professions. After the interprofessional training, professionals reported increased interest, new knowledge and practical tools, and improved confidence in breastfeeding support. They valued the structured, interactive format and mixed-profession discussions. Suggested improvements included more practical guidance, fewer case scenarios, broader professional participation, and improved working conditions to support breastfeeding in clinical practice.

Flores-Antón et al. (699)	2012, Spain	Report the creation and implementation of a regional plan to promote and improve the quality of breastfeeding care in public hospitals in Madrid, based on the standards of the BFHI.	N= 19 public maternity hospitals that were not BFHI-designated at the start of the intervention. Health professionals from these hospitals, including paediatricians, gynaecologists, midwives, nurses, and assistants, participated in training programs.	Descriptive study of a quality improvement intervention.	Number of hospitals with breastfeeding committees, compliance with the Ten Steps to Successful Breastfeeding, attainment of BFHI accreditation stages, and EBF rates during the hospital stay.	By the end of the 32-month intervention, all 19 hospitals had established breastfeeding committees. Nine training courses were held, producing 271 trainers who delivered 50 basic breastfeeding courses to 1423 professionals. Compliance with several BFHI steps improved significantly, especially steps 1, 2, and 10. Two hospitals achieved full BFHI accreditation, and eight others reached partial accreditation stages. EBF rates increased in the hospitals that provided post-intervention data. The study concluded that a structured regional approach was effective in promoting BFHI implementation and improving breastfeeding care in public hospitals.
Hallowell (701)	2022, USA	Explore the relationships between the hospital work environment and the implementation of the Baby-Friendly USA Ten Steps breastfeeding policy, and how these factors influence nurses' self-efficacy in supporting breastfeeding.	N= 55 registered nurses in labour and delivery, newborn nursery, postpartum, and NICU	Descriptive, cross-sectional study	Nurses' self-efficacy scores, degree of implementation of the Ten Steps policy, and scores on the PES-NWI subscales.	Both the work environment and the implementation of breastfeeding policy had separate and independent effects on nurses' self-efficacy. Nurses reported high self-efficacy overall, especially in providing evidence-based breastfeeding information, but lower confidence in resolving unfamiliar breastfeeding issues. Step 4 (initiation of breastfeeding within one hour of birth) and Step 10 (referral to breastfeeding support groups) were the least implemented. The PES subscale 'Nursing

						Foundations for Quality Care' was most strongly correlated with self-efficacy. The findings suggest that improving the work environment and investing in nurse education and certification can enhance breastfeeding support and policy implementation. The study also highlighted the need for better post-discharge support and community linkage to sustain breastfeeding beyond hospital care.
Kwah et al. (691)	2018, UK	Evaluate the Small Wonders Change Programme (SWCP), an intervention designed to increase clinician knowledge and confidence in supporting parents with breastfeeding, kangaroo care, and positive touch in neonatal units.	N= 47 clinicians from two NICUs. Of these, 18 clinicians also participated in follow-up semi-structured interviews.	Pre–post cohort intervention study with matched pairs and a long-term follow-up (three years).	Clinician knowledge and confidence. Knowledge was assessed through 36 multiple-choice questions, and confidence was measured using a nine-item scale covering both confidence in knowledge and confidence in practice.	The intervention significantly increased overall clinician knowledge and confidence. Improvements were observed in knowledge related to physiology of lactation, breast milk expression, breastfeeding practices, kangaroo care, and positive touch. Confidence increased in both knowledge and practice domains. Interview data supported these findings, with clinicians reporting that the intervention enhanced their understanding, motivated changes in practice, and improved their ability to support parents. The intervention was found to be effective and potentially replicable in other neonatal care settings.
Mäkelä et al. (693)	2022, Finland	Assess healthcare professionals' breastfeeding attitudes and	131 healthcare professionals working in a public Level II hospital including nurses,	Quasi-experimental pretest–posttest study design	Breastfeeding attitude scores among healthcare professionals and	After the implementation of BFHI and Neo-BFHI, healthcare professionals' breastfeeding attitudes became generally more

		breastfeeding-related hospital practices before and after the implementation of the Baby-Friendly BFHI and its neonatal adaptation (Neo-BFHI).	midwives, paediatricians, obstetricians from labour and delivery, maternity care, and NICUs.		improvements in hospital practices such as skin-to-skin contact, early breastfeeding initiation, EBF rates, and reduction in medically indicated supplementation.	favourable, with significant improvements in the facilitating and disempowering attitude factors and decreased breastfeeding antipathy. However, these changes were not significant across all professional groups or units. Improvements in breastfeeding-related practices were mixed: immediate skin-to-skin contact and early breastfeeding initiation increased, and EBF rates improved in the maternity unit only, while no significant change occurred in the NICU. Several other practices, such as supplementation for medical reasons, breastfeeding counselling, written guidelines, and pumping instruction, did not show significant improvement. The study concluded that BFHI and Neo-BFHI positively influenced breastfeeding attitudes and some care practices, but emphasized that continued training and monitoring are needed to sustain progress.
Rossau et al. (694)	2024, Denmark	Assess the effect of a breastfeeding education programme on health visitors' knowledge, self-efficacy, and action competence in providing breastfeeding	N= 315 health visitors from 21 Danish municipalities, with 11 allocated to the intervention group and 10 to the control group. At baseline, 158 participants were in the control group and 157 in the	Cluster randomised pre- and post-test study design	The main outcomes were changes in scores for knowledge (12 items), self-efficacy (11 items), and action competence (9 items), measured using validated	The education programme significantly improved health visitors' self-reported knowledge (mean treatment effect 0.5 points), self-efficacy (2.4 points), and action competence (1.4 points). The factor structures for all three constructs were confirmed. Improvements were

		support. The study also aimed to confirm the factor structure of these three constructs.	intervention group. Follow-up data were collected from 125 and 117 participants respectively.		scales. Each item was scored and summed to produce total scores for each construct.	observed even though baseline scores for self-efficacy and action competence were already high. The study concluded that the education programme was effective in enhancing breastfeeding support competences among health visitors and recommended further research to explore which construct most influences practical support and how to tailor education for more experienced professionals.
Sato et al. (698)	2022, Japan	Evaluate the effectiveness of a breastfeeding support education programme for nurses and midwives in improving their self-efficacy, social skills, and knowledge and skills necessary to support breastfeeding for healthy late preterm infants (LPIs).	N= 69 nurses and midwives working in maternity wards. Inclusion criteria included at least two years of clinical experience and prior experience supporting breastfeeding for LPIs.	Parallel-group RCT	Changes in Self-Breastfeeding Scale (SBS), Social Skills (SS); Knowledge–Skills Test (K-S) scores over time and between groups.	The programme significantly improved participants' breastfeeding-related knowledge and skills compared with the control group. Self-efficacy and social skills increased over time in both groups, but there were no significant between-group differences for these measures. While the intervention group improved across all three outcomes over time, these time-related improvements were not greater than those of the control group for SBS or SS. Improvements in K-S scores were consistent regardless of participants' years of experience.
Shotton et al. (702)	2024, UK	Evaluate the use and impact of the breastfeeding memory aide CHINS (Close, Head free, In-line, Nose to Nipple, Sustainable) among	N=115 survey respondents including midwives, university academics, health visitors, and UNICEF Baby Friendly Initiative educators. A subset of 16	Concurrent, convergent mixed methods design	Participants' valuation and experience of using CHINS, confidence and satisfaction with breastfeeding education, and	CHINS was widely used and highly valued by practitioners, who highlighted its simplicity, ease of integration, and contribution to a standardised approach to positioning for effective breastfeeding. Most

		breastfeeding practitioners and academics in the UK, focusing on its integration into practice and its role in supporting breastfeeding education and care.	participants took part in focus groups.		factors associated with CHINS implementation and modification. Survey items measured familiarity, integration, shared understanding, and perceived value of CHINS. Focus groups explored deeper insights into its use, impact, and adaptability.	participants felt confident using CHINS and regarded it as a legitimate part of their role. UNICEF Baby Friendly Initiative training was the most common source of CHINS awareness, and longer clinical experience was associated with greater confidence in breastfeeding education. Participants described CHINS as a helpful tool for structuring advice and improving consistency in practice. Some adapted CHINS to suit their local context, and there was interest in developing a complementary memory aide for attachment.
Wallace et al. (696)	2018, UK and China	Evaluate the effectiveness of short educational videos used as an adjunct to BFHI workshops in improving practitioners' knowledge and confidence in supporting breastfeeding, specifically in the skills of positioning and attachment and hand expression.	In Phase 1, 117 midwives, health visitors, doctors, and support staff in the UK participated.	Phase 1: randomised quasi-experimental trial.	Knowledge Clinical Useful Breastfeeding Assessment–Education Scale (CUBA-ES) scores related to positioning and attachment and hand expression; and changes in self-reported confidence Clinical Useful Breastfeeding Skills Self-Efficacy Scale (CU-BSSES) in applying these skills in practice.	Viewing the short videos significantly improved practitioners' confidence in both positioning and attachment and hand expression across all three phases. In Phase 1, conducted in the UK after participants had completed a BFHI workshop, knowledge scores increased modestly overall, with significant gains mainly in hand expression, and there was no difference in improvement between those who viewed the role-play video and those who viewed the clinical demonstration video.
Zakarija-Grković et al. (695)	2012, Croatia	Evaluate the impact of the UNICEF/WHO 20-hour	773 mothers (388 in the pre-training group and 385 in the post-training	Before-after birth cohort followed prospectively	The study assessed compliance with six BFHI steps (Steps	Following the training, there was a significant improvement in three BFHI practices: early

		breastfeeding training course for maternity staff on hospital practices and breastfeeding rates during the first 12 months of life.	group) who had delivered healthy, term infants weighing at least 2500 g. Mothers were interviewed at discharge and followed up at 3, 6, and 12 months postpartum. At least 80% of maternity medical and nursing staff completed the training.		4–9), EBF rates during the first 48 hours, at discharge, and at 3, 6, and 12 months postpartum. Data were collected using standardized BFHI monitoring questionnaires and hospital feeding records.	initiation of breastfeeding (Step 4), rooming-in (Step 7), and feeding on demand (Step 8). The proportion of newborns exclusively breastfed during the first 48 hours increased from 6% to 11.7%. However, no significant differences were found in EBF rates at discharge or at 3, 6, or 12 months postpartum. High rates of in-hospital supplementation persisted, which may have contributed to the lack of improvement in breastfeeding exclusivity and duration after discharge. The study concluded that while training improved some hospital practices and early breastfeeding rates, institutional support and commitment are necessary for full implementation of Baby-Friendly practices and sustained improvements in breastfeeding outcomes.
Baby-Friendly Hospital Initiative (BFHI); Infant Feeding Attitude Scale (IIFAS); Process-Oriented Training in Early Childcare Support System (PRECESS); Training of Trainers (TOT); World Health Organization (WHO); Exclusive Breastfeeding (EBF); Neonatal Intensive Care Unit (NICU); Practice Environment Scale–Nursing Work Index (PES-NWI); Practice Environment Scale (PES); Small Wonders Change Programme (SWCP); Neonatal Baby-Friendly Hospital Initiative (Neo-BFHI); Late Preterm Infants (LPIs); Breastfeeding Support for Late Preterm Infants programme (BSLPI); Non-Technical Skills (NTS); Self-Breastfeeding Scale (SBS); Social Skills (SS); Knowledge–Skills Test (K-S); Close, Head free, In-line, Nose to nipple, Sustainable (CHINS); United Nations Children's Fund (UNICEF); Clinical Useful Breastfeeding Assessment–Education Scale (CUBA-ES); Clinical Useful Breastfeeding Skills Self-Efficacy Scale (CU-BSSES).						

Appendix 7 – Participant characteristics

Participant characteristics – parent interviews and surveys

Parent characteristics	Interviews (n=35)	Survey (n=180)
Site		
Site 1	10 (28.6%)	49 (27.2%)
Site 2	9 (25.7%)	66 (36.7%)
Site 3	8 (22.9%)	43 (23.9%)
Site 4	8 (22.9%)	22 (12.2%)
Ethnicity		
White British	30 (85.7)	156 (86.7%)
White other	1 (2.9%)	0 (0%)
Asian/British Asian	2 (5.7%)	18 (10%)
Black British/ Black African	1 (2.9%)	1 (0.56%)
Mixed ethnicity	0 (0.0%)	1 (0.56%)
Other ethnicity	1 (2.9%)	2 (1.1%)
Did not answer	0 (0.0%)	2 (1.1%)
Age (years)		
16-20	4 (11.4%)	0 (0%)
21-25	6 (17.1%)	13 (7.2%)
26-30	9 (25.7%)	49 (27.2)
31-35	9 (25.7%)	74 (41.1%)
36-40	7 (20.0%)	30 (16.7%)
41-45	0 (0.0%)	10 (5.6%)
Did not answer	0 (0.0%)	2 (1.1%)
Neonatal unit experience (most recent baby)		
	4 (11.4%)	-
Infant feeding at interview‡		
Breastfeeding*	24 (68.6%)	--
Mixed feeding	6 (17.1%)	--
Formula feeding	4 (11.4%)	--
Cow's milk	1 (2.9%)	--
Infant feeding – survey		
Ever breastfed		
Yes	--	166 (92.2%)
No	--	11 (6.1%)
Did not answer	--	2 (1.1%)
Currently breastfeeding		
Yes	--	134 (74.4%)
No	--	40 (22.2%)
Did not answer	--	6 (33.3%)
Breastfeeding as long as intended		
Yes	--	131 (72.7%)
No	--	38 (21.1%)
Did not answer	--	11 (6.1%)

Baby's age at interview/survey		
0-3 months	14 (40.0%)	30 (16.7%)
3-6 months	10 (28.6%)	49 (27.2%)
6-11 months	6 (17.1%)	47 (26.1%)
12-18 months	5 (14.3%)	24 (13.3%)
18-24 months	0 (0%)	24 (13.3%)
Relationship status		
Married	20 (57.1%)	--
Living together	12 (34.3%)	--
In a relationship	1 (2.9%)	--
Single	2 (5.7%)	--
Number of children		
1	15 (42.9%)	103 (57.2%)
2	11 (31.4%)	50 (27.8%)
3	7** (20%)	21 (11.7%)
4	1 (2.9%)	3 (1.7%)
5+	1 (2.9%)	1 (0.6%)
Did not answer	0 (0%)	2 (1.1%)
Specific support needs†	16 (45.7%)	--

‡ Interview participant responses include infants also receiving solid foods (n=11 in total)
*Includes two interview participants giving only expressed breast milk
**Including one set of twins
†Specific support needs not detailed to protect participant anonymity. They include participants who were neurodivergent, were living with a chronic health condition, had experienced perinatal medical/health issues for mother or infant, were in a same-sex relationship and/or inducing lactation; had specific cultural and/or religious needs; whose most recent birth was twins; were seeking asylum. Note some participants had two or more specific support needs.
Note that different questions were asked in interviews and surveys in relation to infant feeding, relationship status, neonatal experience

Parent interviews; area deprivation

Area deprivation measure	
IMD	***N=18***
Quintile 1=most deprived	
Quintile 1	5 (27.7%)
Quintile 2	2 (11.1%)
Quintile 3	7 (38.9%)
Quintile 4	1 (5.6%)
Quintile 5	3 (16.7%)
SIMD	***N=9***
Area 1=most deprived	
Area 1	1 (11.1%)
Area 2	3 (33.3%)
Area 3	3 (33.3%)
Area 4	1 (11.1%)
Area 5	1 (11.1%)
NIMDM2017	***N=8***
Rank 0= most deprived	

Rank 0-178	1 (12.5%)
Rank 179-356	1 (12.5%)
Rank 357-534	1 (12.5%)
Rank 535-712	3 (37.5%)
Rank 713-890	2 (25.0%)

IMD, Indices of Multiple Deprivation (England); SIMD, Scottish Indices of Multiple Deprivation; NIMDM2017, Site 3 Multiple Deprivation Measure 2017