



Nursing and Midwifery Collaboration in Promoting Breastfeeding and Maternal-Infant Bonding

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Abstract:

Nursing and midwifery collaboration plays a crucial role in promoting breastfeeding and fostering maternal-infant bonding, vital components of infant health and development. Nurses and midwives work together to provide comprehensive education and support for new mothers, emphasizing the importance of breastfeeding in enhancing the nutritional status of infants and strengthening maternal-infant attachment. By creating a supportive environment, they facilitate skin-to-skin contact immediately after birth, promote exclusive breastfeeding during the first few months, and offer ongoing guidance to address any challenges that mothers may face. This partnership is instrumental in helping mothers build confidence in their ability to breastfeed, thereby enhancing the overall breastfeeding experience. Moreover, effective collaboration between nurses and midwives extends beyond immediate postnatal care. By engaging in

shared decision-making and communicating consistently, they empower families through personalized care plans that consider cultural, social, and emotional factors influencing breastfeeding practices. This holistic approach not only supports maternal mental health but also contributes to the development of secure attachments between mothers and infants. Continued professional development and interdisciplinary training in lactation support are essential for both professions to remain current with best practices, ensuring that mothers receive the most effective care possible. Ultimately, this collaboration directly influences the breastfeeding rates and quality of maternal-infant bonding, providing a foundation for lifelong health outcomes.

1. Introduction

The journey from pregnancy through the postpartum period represents one of the most profound physiological, psychological, and social transitions in the human experience. At the heart of this transition lie two interconnected and critical processes: the establishment of successful breastfeeding and the formation of a secure maternal-infant bond. These are not merely discrete tasks but foundational pillars of public health, with demonstrable, lifelong implications for the well-being of both mother and child. Breastfeeding, as unequivocally endorsed by the World Health Organization and a vast body of scientific evidence, provides optimal nutrition, confers immunological protection, and reduces risks for a spectrum of acute and chronic conditions for the infant, while also offering significant health benefits to the mother, including reduced risks of certain cancers and improved metabolic health [1,2]. Concurrently, the process of maternal-infant bonding—the emotional tie and attuned relationship that develops—is crucial for the infant’s emotional, cognitive, and social development, setting the trajectory for future relational health and resilience [3].

However, the path to achieving these optimal outcomes is often fraught with biological challenges, logistical barriers, and socio-cultural complexities. Mothers frequently encounter difficulties such as perceived or real insufficient milk supply, latching problems, breast pain, and exhaustion, which can lead to early discontinuation of breastfeeding [4]. Similarly, factors like maternal mental health conditions, particularly postpartum depression, birth-related trauma, infant prematurity or illness, and lack of social support can significantly impede the natural progression of bonding [5]. In this vulnerable and pivotal context, the healthcare professionals who provide continuous, hands-on support—namely, nurses and midwives—emerge as the linchpins of success. Historically, the roles of nurses and midwives have evolved through distinct professional pathways, with midwifery focusing on the normality of pregnancy and birth as a lifecycle event and nursing providing holistic care across the wellness-illness

continuum. Yet, in the modern maternity care ecosystem, their spheres of practice and influence powerfully converge, particularly in the arena of postnatal and infant feeding support [3].

It is the central thesis of this discussion that the conscious, structured, and respectful collaboration between nursing and midwifery professionals is not merely beneficial but essential for maximizing positive outcomes in breastfeeding and maternal-infant bonding. This interprofessional partnership, grounded in shared goals but enriched by distinct and complementary skillsets, creates a cohesive safety net of support for families. When nurses and midwives engage in effective teamwork, they transcend the limitations of isolated practice, ensuring continuity of care, minimizing conflicting advice, and providing a consistent, evidence-based, and compassionate framework for new parents [6].

2. Understanding Bonding, Attachment, and Lactation Physiology

To appreciate the depth of intervention required from healthcare professionals, one must first understand the intricate biological and psychological processes at play. Maternal-infant bonding is a multifaceted construct often discussed alongside, but distinct from, the psychological theory of attachment. The initial process of bonding can be described as the mother’s emotional and cognitive “falling in love” with her infant, a process facilitated by neurohormonal changes around birth, skin-to-skin contact, and early caregiving interactions [6]. Oxytocin, frequently termed the “love hormone” or “bonding hormone,” plays a dual role: it stimulates uterine contractions and milk ejection while also promoting feelings of calm, connection, and focused attention on the infant [7]. Interruptions to this delicate neurohormonal cascade, such as a highly medicalized birth, separation of mother and infant, or high levels of maternal stress and catecholamines, can potentially disrupt the early bonding process.

Attachment, a concept pioneered by John Bowlby and Mary Ainsworth, develops over time as a result of consistent, responsive, and sensitive caregiving. It is the enduring emotional bond that shapes the infant’s internal working model of relationships [8].

Secure attachment, fostered by a parent who reliably meets the infant's needs, is linked to better emotional regulation, higher self-esteem, and healthier relationships later in life. The acts of breastfeeding—holding the infant close, responding to hunger cues, and providing comfort—are potent, repeated interactions that directly feed into the development of a secure attachment bond. Therefore, supporting breastfeeding is inherently a direct intervention to promote secure attachment. From a physiological standpoint, lactation is a supply-and-demand endocrine process governed primarily by prolactin and oxytocin. Effective, frequent milk removal from the breast in the early days and weeks is critical for establishing a robust milk supply [9]. This process is heavily dependent on a correct, comfortable latch, which is a skilled behavior that neither mother nor infant is innately perfect at executing. Challenges such as infant tongue-tie, flat or inverted nipples, engorgement, or mastitis are common and can derail the entire process if not expertly managed. Furthermore, the mother's confidence, mental state, and perception of support are powerful psychophysiological modulators; anxiety and pain can inhibit the oxytocin reflex, thereby physically preventing milk flow, creating a vicious cycle of frustration and perceived failure [10]. This complex interplay between mind and body underscores why support must be technically expert, psychologically astute, and continuous.

3. The Nursing Perspective

Registered nurses, particularly those specializing in pediatrics, neonatal intensive care, maternity, or community health, bring a unique and vital skill set to the care of the breastfeeding dyad and the facilitation of bonding. The nursing model of care is inherently holistic, viewing the patient (in this case, both mother and infant) within the context of their family, environment, and health-illness continuum. In the immediate postpartum period in a hospital setting, the bedside nurse is often the most consistent presence, providing 24-hour surveillance and support.

The nurse's role is multifaceted. First, they are crucial clinical assessors. They perform routine but essential assessments of the newborn's vital signs, weight, hydration status (via output monitoring), and jaundice, all of which provide objective data on the effectiveness of breastfeeding [11]. They monitor the mother's physical recovery, including vital signs, uterine involution, lochia, and pain levels, understanding that a mother in pain or distress will struggle to engage optimally with her infant. Second, nurses are primary educators. They

provide hands-on, repetitive instruction on breastfeeding positioning (cradle, cross-cradle, football hold), latch techniques, and signs of effective milk transfer. They educate on newborn behavior, interpreting hunger cues (rooting, hand-to-mouth movements) before crying escalates, which promotes responsive feeding and reduces stress for both parties [12].

Perhaps most importantly, nurses in hospital and community settings are pivotal in screening for and providing initial support for conditions that severely impact bonding and feeding. They are often the first to administer validated screening tools for postpartum depression and anxiety, initiating crucial conversations and referrals [13]. For infants admitted to the Neonatal Intensive Care Unit (NICU), the role of the neonatal nurse becomes even more critical. They are the architects of family-integrated care, guiding and empowering parents to participate in their fragile infant's care through kangaroo mother care (skin-to-skin contact), which is proven to stabilize the infant's physiology, improve breastfeeding outcomes, and strengthen parental bonding in the face of extreme stress and separation [14,15]. The nurse's expertise in managing complex medical equipment while facilitating intimate parental contact epitomizes the synthesis of technological care and humanistic, bonding-centered practice.

4. The Midwifery Perspective

The midwifery model of care is philosophically rooted in the normalcy of pregnancy, birth, and the postpartum period as natural, healthy processes. Midwives are autonomous professionals whose scope of practice is focused on providing holistic, woman-centered care, emphasizing informed choice, continuity, and minimal technological intervention unless required [16]. This philosophy profoundly shapes their approach to supporting breastfeeding and bonding, which they view not as medical events to be managed, but as integral parts of the physiological continuum of reproduction.

A midwife's support for breastfeeding and bonding begins long before the birth. During prenatal visits, midwives engage in anticipatory guidance, discussing the benefits and mechanics of breastfeeding, addressing fears and misconceptions, and exploring the mother's personal and cultural context. This relationship-building establishes trust, which becomes invaluable in the vulnerable postpartum period. During labor and birth, midwives employ practices that inherently promote optimal starting conditions for both feeding and bonding. This includes supporting non-pharmacological pain relief, facilitating freedom of

movement, and most significantly, championing immediate, uninterrupted skin-to-skin contact after birth, regardless of the mode of delivery [17]. This golden hour practice, mediated by innate newborn reflexes, facilitates self-attachment and the first feed, regulates the infant's temperature and glucose, and triggers the maternal release of oxytocin, benefiting uterine contraction and bonding simultaneously [18].

In the postnatal period, midwives provide continuity of care, often through home visits or dedicated postnatal clinics. This allows them to assess the breastfeeding dyad in their home environment, identifying challenges like positioning in the mother's own bed or chair that may not be apparent in a hospital setting. Their deep knowledge of lactation physiology allows them to manage common concerns like engorgement, blocked ducts, and mastitis with hands-on techniques and detailed feeding plans. Furthermore, midwives are particularly skilled in providing psychological and emotional "mothering of the mother." They validate the mother's experience, offer reassurance, and help reframe challenges, thereby protecting maternal confidence—a key determinant of breastfeeding duration [19]. Their care extends to supporting the mother's rest, nutrition, and integration of the newborn into the family, all of which are foundational for sustained breastfeeding and positive bonding.

5. Models and Strategies for Effective Collaboration

The true potential for improving outcomes is realized not when nurses and midwives work in parallel, but when they engage in intentional, integrated collaboration. This requires moving beyond simple co-existence to structured interprofessional practice characterized by mutual respect, clear communication, and shared goals. Several models and strategies facilitate this synergy.

Continuity of care models, such as midwifery-led group practices or integrated maternity care pathways, naturally foster collaboration. In these models, a known midwife provides care from pregnancy through the postpartum period, but seamlessly interfaces with hospital-based nurses during birth and postnatal stays. Because the midwife carries the longitudinal relationship, she can provide crucial context to the nursing staff about the woman's preferences, fears, and social situation, enabling personalized care. Conversely, the nurse provides detailed handover about the intrapartum and immediate postpartum events to

the community midwife, ensuring a smooth transition home [20]. This closed-loop communication prevents families from having to repeat their story and eliminates the dangerous scenario of receiving contradictory advice.

Interprofessional education (IPE) is a foundational strategy for building collaborative capacity. When nursing and midwifery students learn together—through shared simulations, case studies, and workshops on breastfeeding support and perinatal mental health—they begin to understand each other's roles, values, and lexicons from the start of their professional careers [21]. This breaks down stereotypes and builds a culture of teamwork. In clinical settings, regular interprofessional case conferences or ward rounds focused on complex feeding or bonding cases allow nurses and midwives to jointly problem-solve, contributing their respective expertise to create a unified, comprehensive care plan [22].

The development and use of shared, evidence-based clinical protocols is another powerful tool. When an institution has a single, agreed-upon protocol for managing initial breastfeeding, performing kangaroo care in the NICU, or screening for postpartum depression, it creates a standard of care that all professionals uphold. This does not erase professional judgment but provides a common framework, reducing variation and confusion for parents. For instance, a protocol that mandates offering skin-to-skin contact after a cesarean section requires the coordinated efforts of the midwife, obstetrician, anesthesia provider, and recovery room nurse—a clear exercise in collaborative practice for the benefit of bonding [23].

Technology can also enhance collaboration. Secure shared electronic health records allow community midwives to see hospital nursing notes and vice versa. Digital platforms for consultation, such as secure messaging or telehealth huddles, enable a community midwife to quickly consult with a hospital-based lactation consultant (often a nurse with advanced training) or a pediatric nurse about a struggling infant without the family needing to travel [24]. This creates a virtual circle of support around the family.

6. Addressing Barriers and Challenges to Collaborative Practice

Despite its clear benefits, effective nursing-midwifery collaboration is not a universal reality. Significant systemic, professional, and interpersonal barriers can impede teamwork. Historically rooted professional tribalism and role ambiguity can lead to tensions. Nurses may

perceive midwives as overly dogmatic or dismissive of hospital routines, while midwives may view some nursing practices as inflexible or overly medicalized [25]. These perceptions are often fueled by a lack of understanding of each other's educational preparation, scope of practice, and philosophical underpinnings.

Workload pressures and fragmented care systems are formidable structural barriers. Understaffing on postnatal wards can leave nurses with minimal time for intensive, one-on-one breastfeeding support, leading them to rely on brief, task-focused interactions. In many healthcare systems, the community midwifery service is entirely separate from the hospital, with poor communication channels and no shared governance, making continuity and collaboration a matter of individual effort rather than a system-designed process [26]. Furthermore, the dominance of the medical model in many hospitals can marginalize both nursing and midwifery knowledge, positioning their inputs as less valuable than those of physicians, thereby undermining the confidence and authority needed for collaborative leadership in areas like breastfeeding support.

To overcome these challenges, intentional leadership and cultural change are required. Institutional leaders must actively champion interprofessional collaboration, allocating resources for joint training and creating formal liaison roles, such as a "Breastfeeding Coordinator" who is either a nurse or a midwife and acts as a bridge between hospital and community services [27]. Creating physical and temporal spaces for collaboration, such as joint staff rooms and protected time for handover meetings, signals its organizational priority. Ultimately, fostering a culture of respect where the unique contributions of both professions are valued—where the nurse's vigilant clinical assessment is as respected as the midwife's expertise in normal physiology—is the bedrock upon which successful collaboration is built.

7. Global and Cultural Contexts:

The imperative and manifestation of nursing-midwifery collaboration vary across global contexts, influenced by resources, healthcare infrastructure, and cultural norms surrounding birth and infant feeding. In high-resource countries with established but sometimes siloed healthcare systems, the challenge is often one of integration and breaking down professional barriers, as previously discussed. The collaboration may focus on managing complex cases, such as supporting breastfeeding after breast surgery or for infants with cardiac anomalies, requiring close coordination

between specialist nurses, midwives, lactation consultants, and medical teams.

In low- and middle-resource settings, where the burden of maternal and infant mortality is higher, the collaboration between nurses and midwives (or their community health worker analogues) can be a literal lifesaving strategy. Here, the focus is often on scaling up basic, evidence-based practices. For example, the Baby-Friendly Hospital Initiative (BFHI), a global program promoting breastfeeding, relies heavily on the trained action of both nurses and midwives to implement its Ten Steps to Successful Breastfeeding [28]. In community-based programs, a midwife might train and supervise a network of community health nurses or peer supporters to provide ongoing breastfeeding counseling and monitor for danger signs in mothers and newborns, effectively extending the reach of professional care [29]. In these settings, their collaborative work is not only about promoting bonding but also a critical component of child survival strategies, protecting against diarrhoea and pneumonia through exclusive breastfeeding.

Cultural competency is a non-negotiable aspect of effective collaboration in any setting. Both nurses and midwives must collaborate not only with each other but also with the family's cultural framework. This means jointly understanding and respecting traditional postpartum practices, beliefs about colostrum, and family structures. A unified, culturally sensitive approach from both professionals prevents families from being caught between a traditional practice encouraged by elders and a clinical recommendation, thereby building trust and enhancing the effectiveness of their support [30].

8. Case Studies and Evidence of Impact

The theoretical benefits of collaboration are strongly borne out by empirical evidence and practical case studies. Research consistently shows that care models characterized by continuity and collaboration, such as midwifery-led continuity of care, result in higher rates of breastfeeding initiation and continuation at six months, along with greater maternal satisfaction [31,32]. For instance, a study of an integrated care model where midwives and pediatric nurses conducted joint home visits post-discharge found significantly lower rates of breastfeeding problems and higher maternal confidence compared to standard care [33].

In the NICU environment, where the threat to bonding is acute, structured collaborative programs have demonstrated remarkable outcomes. Programs that formally train both neonatal nurses and

midwives to support and empower parents in providing kangaroo care and expressing milk show increased rates of breast milk feeding at discharge, reduced parental stress, and stronger parental attachment scores [34,35]. The synergy here is clear: the nurse ensures the infant's medical stability during skin-to-skin care, while the midwife supports the mother's physical and emotional experience of pumping and connecting with her fragile baby. Furthermore, collaborative approaches to perinatal mental health, where midwives and nurses use shared screening tools and have clear referral pathways to specialist mental health nurses or psychologists, lead to earlier identification and treatment of postpartum depression, a condition notoriously detrimental to both bonding and breastfeeding [36,37]. When both professions are attuned to the signs and speak a common language about mental health, they create a safety net that can catch struggling mothers who might otherwise slip through the cracks.

9. Lactation Consultants and Advanced Practice Roles

The landscape of breastfeeding support has been further specialized with the emergence of the International Board Certified Lactation Consultant (IBCLC). This credential can be held by nurses, midwives, dietitians, or other health professionals who undergo additional rigorous training and examination. The IBCLC often acts as a supreme catalyst for collaboration, serving as a clinical expert and educator for the entire interprofessional team [38]. A nurse or midwife who is also an IBCLC can bridge any remaining knowledge gaps, provide advanced problem-solving for complex cases like relactation or infant tongue-tie, and develop staff education programs, thereby raising the competency of the entire nursing and midwifery workforce.

Similarly, the growth of advanced practice nursing roles, such as the Nurse Practitioner in Pediatrics or Women's Health, and advanced midwifery roles creates new opportunities for collaborative leadership. These clinicians can prescribe for conditions like mastitis, perform minor procedures like frenotomies for tongue-tie, and manage complex maternal-infant dyads in an outpatient setting, working in close partnership with their midwifery and nursing colleagues to provide a seamless continuum of expert care [39].

10. Conclusion:

In conclusion, the promotion of breastfeeding and maternal-infant bonding stands as a cornerstone of

preventive medicine and holistic family health. It is a complex endeavor that defies simplistic, unilateral solutions. The challenges faced by new families are multifaceted, intertwining the physical and the emotional, the physiological and the psychological. No single profession, working in isolation, possesses the complete toolkit to navigate this terrain successfully. The distinct yet profoundly complementary expertise of nursing and midwifery creates a powerful synergy when harnessed through intentional collaboration.

Nurses, with their holistic assessment skills, vigilant monitoring, and expertise in managing wellness and illness across settings, provide the essential safety net and clinical foundation. Midwives, with their philosophy of normalcy, expertise in physiological processes, and commitment to continuity and woman-centered care, provide the empowering, confidence-building framework. Together, they can ensure that evidence-based practice is delivered consistently, that care is continuous across the transition from hospital to home, that the mother's physical and emotional needs are met, and that the infant's nutritional and relational requirements are fulfilled. The path forward requires a steadfast commitment from educational institutions, healthcare administrators, and the professions themselves to break down silos, invest in interprofessional education and practice models, and champion a culture of mutual respect. The goal is a unified, coherent system of support where families experience not conflicting voices, but a harmonious choir of expertise guiding them through one of life's most significant passages. By strengthening the collaboration between nursing and midwifery, we do more than improve breastfeeding rates or bonding scores; we invest in the foundational health of individuals, families, and societies, fostering resilience and well-being that echoes across generations. This collaborative imperative is not merely a clinical strategy—it is a moral commitment to nurturing the very beginnings of human life and love.

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References

1. Malm MC, Hildingsson I, Rubertsson C, Radestad I, Lindgren H. Prenatal attachment and its association with foetal movement during pregnancy - A population based survey. *Women Birth*. 2016;29(6):482–6. doi: 10.1016/j.wombi.2016.04.005.
2. Agishtein P, Brumbaugh CC, CULTURAL, VARIATION IN ADULT ATTACHMENT: THE IMPACT OF ETHNICITY, COLLECTIVISM, AND COUNTRY OF ORIGIN *J Social Evolutionary Cult Psychol*. 2013;7:384–405. doi: 10.1037/h0099181.
3. Rubin R. Maternal tasks in pregnancy. *Maternal-Child Nurs J*. 1975;4:143–53.
4. Celik M, Ergin A. The effect on pregnant women's prenatal attachment of a nursing practice using the first and second Leopold's maneuvers. *Jpn J Nurs Sci*. 2020;17(2):e12297. doi: 10.1111/jjns.12297.
5. Razurel C, Antonietti J-P, Rulfi F, Pasquier N, Domingues-Montanari S, Darwiche J. The impact of pre- and post-natal psycho-educational intervention on the construction of parenthood. *Archives of Women's Mental Health*. 2017;20(3):469–472.
6. Hoifodt RS, Nordahl D, Landsem IP, Csifcsak G, Bohne A, Pfuhl G, et al. Newborn behavioral Observation, maternal stress, depressive symptoms and the mother-infant relationship: results from the Northern Babies Longitudinal Study (NorBaby) *BMC Psychiatry*. 2020;20(1):300. doi: 10.1186/s12888-020-02669-y.
7. Tichelman E, Westerneng M, Witteveen AB, van Baar AL, van der Horst HE, de Jonge A et al. Correlates of prenatal and postnatal mother-to-infant bonding quality: A systematic review. *PloS one*. 2019;14(9).
8. Pollock D, Davies EL, Peters MDJ, Tricco AC, Alexander L, McInerney P, et al. Undertaking a scoping review: a practical guide for nursing and midwifery students, clinicians, researchers, and academics. *J Adv Nurs*. 2021;77(4):2102–13. doi: 10.1111/jan.14743.
9. Gürol A, Polat S. The effects of baby massage on attachment between mother and their infants. *Asian Nurs Res*. 2012;6(1):35–41. doi: 10.1016/j.anr.2012.02.006.
10. Trombetta T, Giordano M, Santoniccolo F, Vismara L, Della Vedova AM, Rollè L. Pre-natal attachment and Parent-To-Infant attachment: a systematic review. *Front Psychol*. 2021;12:620942. doi: 10.3389/fpsyg.2021.620942.
11. Bicking Kinsey C, Hupcey JE. State of the science of maternal–infant bonding: a principle-based concept analysis. *Midwifery*. 2013;29(12):1314–20. doi: 10.1016/j.midw.2012.12.019.
12. Helk Souza L, Sperli G, Soler ZA, Sperli G, Santos ML, Sperli G, Marin Dos Santos Sasaki N. Puerperae bonding with their children and labor experiences. *Investigacion Educ Enferm*. 2017;35(3):364–71. doi: 10.17533/udea.iee.v35n3a13.
13. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*. 2009;339(7716):e78–336.
14. Kim P, Strathearn L, Swain JE. The maternal brain and its plasticity in humans. *Horm Behav*. 2016;77:113–23. doi: 10.1016/j.yhbeh.2015.08.001.
15. Nishikawa M, Sakakibara H. Effect of nursing intervention program using abdominal palpation of Leopold's maneuvers on maternal-fetal attachment. *Reprod Health*. 2013;10:12. doi: 10.1186/1742-4755-10-12.
16. Cheetham NB, Hanssen TA. The neonatal behavioral Observation System: a tool to enhance the transition to motherhood. *Vård i Norden*. 2014;34(4):48–52.
17. Bellieni CV, Ceccarelli D, Rossi F, Buonocore G, Maffei M, Perrone S, et al. Is prenatal bonding enhanced by prenatal education courses? *Minerva Ginecol*. 2007;59(2):125–9.
18. Perrelli JGA, Zambaldi CF, Cantilino A, Sougey EB. Mother-child bonding assessment tools. *Revista paulista de pediatria*. 2014;32(3):257–65. doi: 10.1590/0103-0582201432318.
19. Peters MDJ, Marnie C, Tricco AC, Pollock D, Munn Z, Alexander L, et al. Updated methodological guidance for the conduct of scoping reviews. *JBIEvid synthesis*. 2020;18(10):2119–26. doi: 10.11124/JBIES-20-00167.
20. Linde K, Lehnig F, Nagl M, Kersting A. The association between breastfeeding and attachment: a systematic review. *Midwifery*. 2020;81:102592. doi: 10.1016/j.midw.2019.102592.
21. Persico G, Antolini L, Vergani P, Costantini W, Nardi MT, Bellotti L. Maternal singing of lullabies during pregnancy and after birth: Effects on mother-infant bonding and on newborns' behaviour. *Concurrent cohort study*. *Women Birth*. 2017;30(4):e214–e20. doi: 10.1016/j.wombi.2017.01.007.
22. Hill R, Flanagan J. The maternal–infant bond: clarifying the Concept. *Int J Nurs Knowl*. 2020;31(1):14–8. doi: 10.1111/2047-3095.12235.
23. Tichelman E, Westerneng M, Witteveen AB, Van Baar AL, Van Der Horst HE, De Jonge A, et al. Correlates of prenatal and postnatal mother-to-infant bonding quality: a systematic review. *PLoS ONE*. 2019;14(9):e0222998. doi: 10.1371/journal.pone.0222998.

24. Shreffler KM, Spierling TN, Jespersen JE, Tiemeyer S. Pregnancy intendedness, maternal–fetal bonding, and postnatal maternal–infant bonding. *Infant Ment Health J.* 2021;42(3):362–73. doi: 10.1002/imhj.21919.
25. Hairston IS, Handelzalts JE, Lehman-Inbar T, Kovo M. Mother-infant bonding is not associated with feeding type: a community study sample. *BMC Pregnancy Childbirth.* 2019;19(1):125. doi: 10.1186/s12884-019-2264-0.
26. Waldrop J, Baker M, Salomon R, Moreton E. Parenting interventions and secondary outcomes related to maternal Mental Health: a systematic review. *Matern Child Health J.* 2021;25(6):870–80. doi: 10.1007/s10995-021-03130-6.
27. Mihelic M, Morawska A, Filus A. Effects of early parenting interventions on parents and infants: a Meta-Analytic Review. *J Child Fam stud.* 2017;26(6):1507–26. doi: 10.1007/s10826-017-0675-y.
28. Chang S, Park S, Chung C. Effect of Taegyo-focused prenatal education on maternal-fetal attachment and self-efficacy related to childbirth. *Taehan Kanho Hakhoe Chi.* 2004;34(8):1409–15. doi: 10.4040/jkan.2004.34.8.1409.
29. Midtsund A, Litland A, Hjalhmult E. Mothers’ experiences learning and performing infant massage-A qualitative study. *Journal of Clinical Nursing.* 2018.
30. Üstüner Top F, Yigitbas C, Cantürk P, Yüksel F. The effects of health counselling and follow-up care on maternal-infant attachment. *Early Child Development and Care;* 2020.
31. Rollè L, Giordano M, Santoniccolo F, Trombetta T. Prenatal attachment and Perinatal Depression: a systematic review. *Int J Environ Res Public Health.* 2020;17(8):2644. doi: 10.3390/ijerph17082644.
32. Millar S, Bear R. Midwifery partnerships. In: Pairman STS, Dahlen H, Dixon L, editors. *Midwifery: Preparation for Practice.* 4. Sydney: Elsevier; 2018. pp. 299–326.
33. Johnson K. Maternal-infant bonding: a review of literature. *Int J childbirth Educ.* 2013;28(3):17.
34. Gholampour F, Riem MME, van den Heuvel MI. Maternal brain in the process of maternal-infant bonding: review of the literature. *Soc Neurosci.* 2020;15(4):380–4. doi: 10.1080/17470919.2020.1764093.
35. Feldman R, Gordon I, Zagoory-Sharon O. Maternal and paternal plasma, salivary, and urinary oxytocin and parent-infant synchrony: considering stress and affiliation components of human bonding. *Dev Sci.* 2011;14(4):752–61. doi: 10.1111/j.1467-7687.2010.01021.x.
36. Śliwerski A, Kossakowska K, Jarecka K, Świtalska J, Bielawska-Batorowicz E. The effect of maternal depression on infant attachment: a systematic review. *Int J Environ Res Public Health.* 2020;17(8):2675. doi: 10.3390/ijerph17082675.
37. Tricco AC, Lillie E, Zarin W, O’Brien KK, Colquhoun H, Levac D et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. 2018.
38. Mesman J, Van Ijzendoorn MH, Sagi-Schwartz A. Cross-cultural patterns of attachment. *Handbook of attachment: Theory, research, and clinical applications.* 2016:852 – 77.
39. Peters M, Godfrey C, McInerney P, Munn Z, Tricco A, Khalil H. Scoping reviews. Online: *Online JBI;* 2020. pp. 407–46.