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Factors and interventions that positively influence breastfeeding rates at six months postpartum: An integrative literature review

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ARTICLE INFO	A B S T R A C T
<i>Keywords:</i> Breastfeeding Breastfeeding Duration Factors Interventions Social media	 Background: Despite the health benefits of breastmilk, many women discontinue breastfeeding prior to six months postpartum. Previous work from 2010 has identified women's breastfeeding intention, self-efficacy, and support as the main modifiable factors that influence breastfeeding at six months postpartum. However, due to societal changes during the past decade, factors influencing women's decision to continue breastfeeding requires further exploration. Aim: To determine "what modifiable contemporary factors and interventions can positively influence women's decision to continue breastfeeding until six months postpartum?" Method: An integrative literature review was conducted based on Whittemore and Knafl's framework. Databases were searched using combinations of the following main key words: breastfeeding, duration, factors, and interventions. Studies addressing the research question and published in English language since 2010 were included. Interventional studies were limited to only randomised controlled trials. Results: Women's positive breastfeeding intention, self-efficacy, and support remained the key modifiable factors that could increase breastfeeding rates up to six months postpartum. The main effective interventions included education support or counselling when they targeted women's needs, intention, self-efficacy and support; and were held over multiple sessions commencing antenatally or immediately after birth. Contemporary effective strategies included digital communications such as phone calls, virtual meetings and messaging via social media including FacebookTM, WhatsAppTM and TelegramTM. Main conceptual frameworks were motivational interviewing, planned behaviour theory and cognitive behavioural therapy. Conclusion: Interventions that support breastfeeding up to six months should include contemporary strategies that target the main modifiable factors and are tailored based to women's needs and their sociocultural influences.

Statement of significance

Problem/Issue

Despite health professionals' efforts globally, the rates of breastfeeding at six months postpartum remain suboptimal.

What is already known

Women's breastfeeding intention, self-efficacy and support have been identified as the main modifiable factors that influence breastfeeding rates to six months postpartum. However, due to societal changes during the past decade, it is unclear what contemporary factors can influence women's decision to continue breastfeeding. What this paper adds

Breastfeeding intention, self-efficacy and social support remain key modifiable factors that positively influence exclusive breastfeeding rates at six months. Educational, support, and counselling interventions that are tailored to women's needs and held either digitally, face-to-face, or mixed modal, over multiple sessions commencing antenatally or immediately after birth are effective. Digital communication is a contemporary, and acceptable mode of delivery for effective interventions.

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Introduction

Human breastmilk is composed of over 200 constituents that support the developmental needs of newborns alongside the vast benefits of breastfeeding on women and maternal-infant bonding and attachment. [1,2] However, exclusive breastfeeding (EBF) rates remain at a suboptimal level globally compared to The World Health Organization (WHO) and United Nations Children's Fund's (UNICEF) recommendations of at least six months. [3] Exclusive breastfeeding is defined as an infant receiving only human breastmilk and no other mixed or supplementary feeding such as cow's milk, artificial formula, water, or solids. [3] For the purpose of this paper, EBF includes receiving breastmilk both at the breast or expressed form. In 2023, the global EBF rate at 6 months was recorded at 44%, which is below the World Health Assembly target of 50% by 2025. [3] In western countries such as Australia, the rate of breastfeeding initiation is high at 96%, [4] but rates of exclusive breastfeeding at six months have remained low for many years (15%) [5].

In 1991 the WHO and UNICEF developed The Baby Friendly Hospital Initiative (BFHI) with the goal of improving health outcomes for women and babies by promoting, supporting, and protecting breastfeeding. [6] The BFHI has since become an influential framework for encouraging breastfeeding initiation within an hour of birth and practicing exclusive breastfeeding until six months postpartum via the implementation of the Ten Steps to Successful Breastfeeding. [6] High initiation rates recorded at the time of postnatal discharge suggest that hospitals are successfully promoting early breastfeeding [7], however, in many places, this rate is not being sustained once families return home. [8]

The reasons for early breastfeeding cessation are multifactorial. [9] A previous review of the literature published in 2010¹⁰ demonstrated that older women with higher levels of education were more likely to breastfeed their babies for six months. [11,12] The main modifiable factors that influenced breastfeeding rates at six months were women's breastfeeding intention, self-efficacy, and support [10] by focusing on the modifiable factors, EBF rates and duration may be improved through interventions that employ health belief theoretical frameworks such as planned behaviour models [13], and self-efficacy theory [14] and midwifery theories such as birth territory and midwifery guardianship [15].

According to the planned behaviour model, an individual's behaviour is rooted in their intentions which are formed from attitudes, knowledge, subjective norms and perceived behaviour control (self-efficacy). [16] Women's breastfeeding self-efficacy is an important factor in long term breastfeeding [11] and according to Bandura is influenced by four sources of information: role mastery, verbal persuasion, vicarious learning, and physical arousal. [14] In the birth territory and midwifery guardianship theory breastfeeding behaviour is not considered a task. [15] The woman's body, mind and soul work together to find the balance between intrinsic power and extrinsic power to feel safe and cared for during breastfeeding. [17] Intrinsic power refers to the inner power that drives the woman to do what she feels is right, such as breastfeeding. [15] Extrinsic power is the external power that comes from health carers or a woman's support people telling her what is right for her to do. [15] In the birth territory and midwifery guardianship theory, care providers work as guardians to create a good balance for women to breastfeed their infants based on their inner desire, not based on pressure from significant others. [17]

Whilst research continues to play a significant role in supporting breastfeeding health initiatives, changes in society over the last 14 years may have influenced earlier findings, such as the impact of the COVID-19 pandemic [18] and ease of access to online resources such as digital media. [19] Hence, it is important to synthesise the literature that has explored contemporary factors and interventions influencing breastfeeding rates at six months since the last literature review was published on this topic in 2010.

Methods

The aim of this literature review was to identify contemporary modifiable factors and interventions that influenced women decision to continue breastfeeding to six months postpartum. Guided by five stages of Whittemore and Knafl's framework, [20] an integrative review was conducted by a) problem identification, b) literature search, c) data evaluation, d) data analysis and e) data presentation (findings).

Based on the aim of the study, the literature review consisted of two parts. In the first part, we reported non-interventional studies that focused on the modifiable factors that can influence breastfeeding rates to six months postpartum. In the second part, we reported the findings of the interventional studies that were limited to only randomised controlled trials. The quality of the non-interventional studies was assessed based on the Mixed Methods Appraisal Tool (MMAT) to enable the methodological quality of quantitative, qualitative and mixed method studies. [21] The interventional studies were appraised using the Joanna Briggs Institute (JBI) critical appraisal checklist for randomised controlled trials to be evaluated. [22] The Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklist (PRISMA) [23] was used to report the findings. Due to lack of consistency on the interventional strategies and assessing outcome measures, it was not possible to run a meta-analysis.

Research question

After identifying the problem, the following research question was developed:

"What are the contemporary modifiable factors and interventions that can positively influence women's decision to continue breastfeeding until six months postpartum?"

The search strategy employed the use of MEDLINE Complete, APA PsycINFO, CINAHL Complete, and Cochrane Library databases. The search terms were tabled in a PICO (Population, intervention and context) format; [24] included combinations of the following keywords with their synonyms: breastfeeding, initiation, duration, cessation, factors, strategies, intervention, intention, behaviour, education, support, and social media. Synonyms, truncation, wildcards, phrase searching, Boolean operators, and Medical Subject Headings were implemented to refine the search (Supplementary Table 1). The search was limited to primary research papers published in English language, between 2011 and 2024 as it aimed to update a previous literature review published in 2010. [10]

From the database search, 10,235 citations were generated and

Table 1 Inclusion and exclusion criteria

	Inclusion	Exclusion
Population	Healthy pregnant women and new mothers Healthy neonates/ newborns Singleton pregnancies and newborns	Maternal health conditions (i.e. hypertension, diabetes, obesity, lupus, metabolic disorders, breast surgery etc.) Neonatal health conditions (i.e. congenital birth defects, tongue-tie, babies of multiple births, Intrauterine Growth Restriction, prematurity, jaundice etc.) Any condition, maternal or neonatal, requiring medication
Intervention/ Exposure	Aims to improve breastfeeding Identifies modifiable factors	Medication and placebo interventions Marketing of supplementary feeding i.e. artificial formula
Control	Receives standard care or modified intervention	Control group negatively impacted by study participation
Outcome	Exclusive breastfeeding rate	Unclear classification of breastfeeding Breastfeeding not recorded at six months

organised into EndNote software to undergo deduplication and screening guided by the inclusion and exclusion criteria (Table 1). The main inclusion criteria were for studies to report on exclusive breastfeeding rates at six months among women and babies with no chronic health conditions and singleton pregnancies. The secondary outcome measure was any type of breastfeeding at six months postpartum.

Fig. 1 presents the process for identifying and screening articles for the final review underpinned by the Preferred Reporting Items for Systematic reviews and Meta-Analyses. [23] In total, 56 articles were included in the review comprising of quantitative and qualitative studies for identification of factors (n = 38), and randomised controlled trials (n = 18) to identify interventions.

Each study was assessed against the critical appraisal checklist criteria and scored accordingly. Considering that Hong et al. (2018), [21] discourages assigning a quality score when the MMAT tool is used,

we added stars next to each non-intervention studies appraisal score to represent the quality of their methods. For RCTs, using the JBI critical appraisal checklist, the mean quality score minus one standard deviation was adopted as the threshold for defining studies of adequate quality. [22] Based on the criteria for quality assessment, the calculated mean quality score was 14.0. Any disagreements that arose between the reviewers were resolved through discussion. Of the 18 RCTs, all received a score of over 14 points and were included for the formal data analysis.

Findings

We included 38 non-interventional studies [25–61] and 18 RCTs. [62–79] to answer the research question: "What are the contemporary modifiable factors and interventions that can positively influence women's decision to continue breastfeeding until six months



Fig. 1. PRISMA flow diagram [23].

postpartum?"

Of the 38 non-interventional studies, 20 were cross sectional studies, [25-43] 11 cohort studies, [44-54] four qualitative studies, [55-58] two longitudinal studies [59,60] and one was a mixed method study. [61] All interventional studies (n=18) were RCTs. [62-79]

The non-interventional studies were conducted mainly in European [26,31,40,43,48,49,52,53,57,58] and African countries. [25,29,30,32, 34,37,38,42,44,55,61] One study was conducted in the United States of America (USA), [60] one in Canada, [39] three in Australia, [46,47,54] two in New Zealand, [45,56] three in South America, [33,50,51] four in South Asia [35,41,59,80] and three in the Middle East. [27,28,36] The interventional studies were mainly from Europe, [67,68,71,73,76,81] and South Asia. [64,72,74,77,82] The remaining RCTs were conducted in America, [63] United Kingdom (UK), [79] Australia, [75] South America [62] and the Middle East. [69,70,78]

Considering that the non-interventional studies included high and low-income countries, we looked at the main socio-demographic factors that could influence exclusive breastfeeding rates at six months in those countries. The findings of the studies that were conducted in Canada, [39] England, [47] Australia, [46,47,54,57] New Zealand, [45,56] and Singapore [59] demonstrated that being older and having a tertiary education [39,45,59] were associated with higher rates of breastfeeding at six months postpartum. Whereas, studies from Turkey (n=1041) [26] and Ethiopia (n=634) [30] found that younger mothers who lived in geographically rural areas and had lower education levels breastfed their babies exclusively and for longer than women who had higher education levels. The findings of two studies, one conducted in Egypt [25] and the other in Vietnam [35] demonstrated that having a male infant was associated with long-term EBF.

The results of the search are presented into two sections. The first section relates to the able factors that influence breastfeeding rates to six months postpartum. These factors were reported under biophysical and psychosocial factors (Supplementary Table 2). The second section focuses on the effective strategies seen in breastfeeding intervention studies (Table 2).

Biophysical factors

Biophysical factors such as having a healthy Body Mass Index (BMI), [39] and non-smoking status, [26,40] were associated with higher rates of EBF at six months and were considered as modifiable factors that can positively influence EBF up to six months.

Psychosocial factors

Psychosocial factors including breastfeeding knowledge and attitude, [28,29,31,32,42,44–46,54,55,58,60] breastfeeding intention, [27, 35,44,45,47,54,59] breastfeeding self-efficacy, [41,44,45,47,48,50–52, 57–60] and social support [26,27,33,34,38,39,45,50,53–58,60,80] were reported as modifiable factors influencing breastfeeding rates at six months.

Breastfeeding intention

Maternal intention to breastfeed remained a strong predictor of breastfeeding success at all stages postpartum. [27,35,44,45,47,54,59] For instance, in an international study among 124 Australian, 24 North American, and 26 European Union women, antenatal intention to exclusively breastfeed was a significant predictor of exclusive breastfeeding rates at six months postpartum (p < 0.01). [47] These findings were similar to a Saudi Arabian study (n=322) where women's prenatal breastfeeding intention was a significant predictor of exclusive breastfeeding rates at six months (OR: 7.31; 95% CI: 2.24 – 23.84). [27]

Antenatal intention was reported to be influenced by women's breastfeeding attitudes, knowledge, and social norms. [45,54] In a New Zealand cohort study, Maori women (n= 1,060) were more likely to exclusively breastfeed until 6 months postpartum when they held

positive breastfeeding attitudes and knowledge on EBF. [45] Whereas the likelihood of breastfeeding at six months postpartum was low if the women did not feel Maori's cultural breastfeeding practices were of high importance (95% CI: 0.55 - 2.51). [45] In one Australian study (n=1, 155), women's knowledge of the EBF recommendations (95% CI: 0.60 - 0.90), and its benefits (95% CI: 0.55 - 0.82), with antenatal intention (95% CI: 0.63 - 0.93), were seen to positively influence their EBF practices at six months postpartum. [54]

Breastfeeding self-efficacy

A high level of breastfeeding self-efficacy has been seen as positive indicator in the achievement of a longer breastfeeding duration and EBF at six months. [83] Having a higher level of breastfeeding self-efficacy suggests a higher ability to cope with and manage breastfeeding challenges. For instance, the authors of a study which included 447 Lithuanian mothers found that self confidence in breastfeeding skills and self-efficacy improved the likelihood of exclusively breastfeeding until six months postpartum (95% CI 1.41 - 4.06). [48] Likewise, the findings of a longitudinal study with 400 Singaporean women who demonstrated higher breastfeeding self-efficacy scores in the early postpartum period which were measured using the BSES-SF tool [84] were associated with higher odds of exclusive breastfeeding at six months postpartum (OR (95% CI) = 1.95 (1.07-3.54), p-value =.03).

Social support

In the non-intervention studies, social support was seen as a key factor to EBF success at six months postpartum in. [27,39,45,53,54, 56–58] Across all nine studies, social support was seen at various levels including family and close friends, colleagues and employers, healthcare practitioners, and through governing policy. For many, the positive perception of support at these varying levels was influential in EBF at six months. A qualitative study on 14 Chinese mothers living in Ireland highlighted that mothers were more likely to continue EBF until six months if they felt supported in their personal relationships, workplaces, and by government policies. [58] Another study of 1,155 women in Sydney also demonstrated that support from caregivers was beneficial in EBF continuation at six months postpartum (95% CI 0.43 – 0.96). [54] Social support was also seen to be influential when experienced through digital platforms. In an international qualitative study of 153 Australian, 64 Irish, and 139 Swedish women, authors reported that informal support both face-to-face and online were seen as an important part of women's outer social network for EBF support at six months. [57]

Interventions

The interventional studies [62–79] had three main components: education, [62–74,77,78] support, [63,64,66,67,79] and counselling. [62,64,69,73–77] Each strategy varied in structure and delivery mode. Some studies used the BFHI recommendations to develop their educational content or train their staff, [66,71,72,79] involved partners or families, [64,69–73,77] and included self-efficacy theory, [62,67,68,73] motivational interviewing [62,75,76] or other behaviour change models [66,69,77] (Table 2).

Education

Women in the effective interventions received breastfeeding education over multiple sessions. [62,64–71,76,77] Of the effective educational interventions, some included support [64,66,67] or counselling components. [62,64,69,77] The sessions were held over multiple sessions during both the antenatal and postnatal periods [64–67,69–71] or held immediately after birth with frequent follow up until six months postpartum. [77] Any interventions with only one session [72] or that lacked sessions between one week and two months postpartum [73,75, 78] were not effective.

The effective interventions were offered either solely face-to-face,

Table 2

Summary Table: Inte	ervention study character	istics and results.			
Author Year Country	Study design Participants	Aim	Method	Findings	Appraisal score with JBI RCT tool
Dayana Dodou [62] 2022 Brazil Postnatal Education and counselling	RCT 240 postpartum women with singleton, full term babies in Brazil	To assess the effectiveness of telephone based motivational interviewing and breastfeeding education on breastfeeding practices	Intervention: Multiple phone call based postnatal education & counselling. Content: Brief motivational interviewing combined with breastfeeding and newborn care education. Mode of delivery: Telephone calls held individually. Structure of sessions: 10-minute sessions at 7, 30 90, and 150 days postpartum. A total of four (4) sessions. Expertise of facilitators: Nurse researcher with breastfeeding experience. Conceptual model: Self-efficacy and motivational interviewing.	EBF at 6 months Intervention Group = 39.5% Control Group = 16.3% 95% CI 1.4–8.2; p = 0.005 Any BF at six months Not reported	17
Efrat et al. [63] 2014 America Antenatal and postnatal Education and Support	RCT 298 pregnant, low- income Hispanic women	To assess whether a phone based breastfeeding intervention delivered by lactation educators influenced EBF at 6 months	 Control group: Standard materinity Carle. Intervention: Multiple- phone call based antenatal-postnatal education & support. Content: Breastfeeding, newborn care, and pregnancy education, skills, and problem solving. Mode of delivery: Telephone calls held individually. Structure of sessions: Four (4) antenatal phone calls beginning in the third trimester and seventeen (17) postnatal phone calls lasting until 6 months postpartum. Phone calls lasted between 5 and 20 minutes. A total of 21 sessions were received. Expertise of facilitators: Non-clinical and unlicensed lactation educators. Conceptual model: Nil. Control group: Received the same intervention except content only included newborn care and pregnancy education. 	EBF at 6 months Intervention Group = 22.2% Control Group = 8.2% , $p = 0.06$ Any BF at 6 months Intervention Group = 72.2% Control Group = 77.6% P = 0.08	16
Elliott-Rudder et al. [75] 2014 Australia Postnatal Counselling	RCT 330 breastfeeding women of singleton, full term infants	To improve rates of maintained EBF at 6 months postpartum through improved primary care breastfeeding support and motivational interviewing.	 Strictly no breastfeeding education. Intervention: Multiple face-to-face based postnatal counselling. Content: Motivational interview. Mode of delivery: Individual and face-to-face. Structure of sessions: A total of three (3) sessions held at 2, 4, and 6 months postpartum during infant immunisation appointments. Expertise of facilitators: Primary care health professionals. Conceptual model: Motivational interviewing, Control group: Standard postnatal care. 	EBF at 6 months Intervention Group = 15% Control Group = 15% 95% CI 0.4–3.5; $p = 0.875$ Any BF at six months Intervention Group = 79% Control Group = 79% 1.1 95% CI 0.5–2.2, p = 0.889	20
Franco-Antonio et al. [76] 2020 Spain Postnatal Counselling	RCT 88 postpartum women	To evaluate the effectiveness of Brief Motivational Interviewing (BMI) on the continuation of EBF at 6 months	Intervention: Multiple face-to-face and phone call based postnatal counselling (BMI) Content: Motivational interview. Mode of delivery: Individually held with the first session face-to-face and the following as phone calls. Structure of sessions: First session 20–30 minutes in the immediate postpartum. Following sessions held in 15 minutes at 1, 3, and 6 months postpartum. A total of four (4) sessions. Expertise of facilitators: BMI trained midwives Conceptual model: Brief Motivational Interviewing Control group: Received the same schedule of sessions of breastfeeding education with no counselling. Women in both groups received postnatal education and a booklet on breastfeeding information.	p = 0.009 EBF at 6 months Intervention Group = 56.1% Control Group = 20% p = 0.001 Partial BF at 6 months Intervention Group = 22.0% Control Group = 22.5% p > 0.05	19

(continued on next page)

Table 2 (continued)

Author Year Country	Study design Participants	Aim	Method	Findings	Appraisal score with JBI RCT tool
Gu et al. [77] 2016 China Postnatal education and counselling	RCT 352 primiparous mothers	Investigate the effectiveness of an intervention programme based on the theory of planned behaviour	Intervention: Multiple postnatal education & counselling via face-to-face group session and followed by virtual and phone calls Content: Theory of Planned Behaviour counselling alongside breastfeeding and newborn care education and discussion on partner involvement. Mode of delivery: Face-to-face, digital (phone call), individual, and group sessions. Structure of sessions: First session immediate postpartum, 60 min session day 2, twice weekly phone calls for two weeks, phone call weekly from week 3–6, 30 min session at 6 weeks, fortnightly phone calls from 6 weeks to 3 months, various schedule from 3–6 months in preparation for return to work. Totalling 16 sessions. Experise of facilitators: Experienced maternity nurses trained in the Theory of Planned Behaviour Control group: Control group received routine care	EBF at 6 months Intervention Group = 42% Control Group = 10.2% 95% CI 22.0-40.7; <i>p</i> < 0.001	19
Gupta et al. [64] 2019 India Antenatal and postnatal counselling, (education and support)	RCT 300 pregnant women with singleton pregnancies considering breastfeeding.	To evaluate the effect of breastfeeding counselling and breastfeeding support by trained counsellors during the ante-natal period at health facility and postnatal period at home.	 routine care. Intervention: Multiple face-to-face face based antenatal, postnatal education, support, & counselling. Content: Breastfeeding education, and breastfeeding support including family involvement. Mode of delivery: Home based, individual, face-to-face. Structure of sessions: Two antenatal sessions during the second trimester and at 36 weeks. Postnatal sessions at days 3, 7, 15, and months 2, 3, 4, 5, and 6. A total of 10 sessions. Expertise of facilitators: Breastfeeding experienced infant nutritionists Conceptual model: Nil. Control Group: Received standard maternity 	EBF at 6 months Intervention Group = 88.1% Control Group = 50% 95% CI 3.98–13.92, p < 0.05 Any BF at six months Not reported	16
Hmone et al. [65] 2023 Myanmar Antenatal and postnatal Education	RCT 353 pregnant women of healthy singleton pregnancies	To assess the influence of text message based breastfeeding education and promotion on EBF at 6 months.	Intervention: Multiple antenatal and postnatal educational text messages (38 weeks to six months). Content: Breastfeeding promotion and education appropriate to gestation and age. Mode of delivery: Only text messages sent directly to participant's phone. Structure of sessions: Three text messages sent per week from 38 weeks' gestation until 6 months postpartum. Approximately 78 text messages in total. Expertise of facilitators: Evidence-based breastfeeding literature. (Baby-Friendly Hospital Initiative accredited hospital). Conceptual model: Nil. Control group: Received maternal and child health related messages unrelated to breastfeeding once a week from 38 weeks' gestation until 6 months postnartum	EBF at 6 months Intervention Group = 43.4% Control Group = 15.3% 95% CI 1.79 - 4.19; p <0.001 Any BF at 6 months Intervention Group = 318.8% Control Group = 28.7% RR: 10.69, 95% CI: 0.57, 0.84; P < 0.05)	20
Jolly et al. [79] 2012 United Kingdom Antenatal and postnatal Support	RCT 2,724 pregnant women	To assess the impact of a peer support worker (PSW) in breastfeeding continuation.	Intervention: Multiple face-to-face antenatal and postnatal peer support. Content: Peer breastfeeding support. Mode of delivery: Face-to-face and individually. Structure of sessions: Two antenatal sessions and one postnatally. Additional sessions were needs based in the postnatal period in which mothers were to request sessions. Total of three (3) guaranteed sessions. Expertise of facilitators: Peer support workers trained for the study under the Baby Friendly breastfeeding management course adopted from BFHI model. No other	EBF at 6 months Intervention Group = 17.8% Control Group = 19.6% 95% CI 0.58–1.39; $p > 0.05Any BF at 6monthsIntervention Group = 34.3\%Control Group = 38.8\%$	17

(continued on next page)

Author Year Country	Study design Participants	Aim	Method	Findings	Appraisal score with JBI RCT tool
			experience disclosed. Conceptual model: Nil. Control group: Received standard maternity	OR 1.06, 95% CI 0.71–1.58; <i>p</i> > 0.05	
Khresheh et al. [78] 2011 Jordan Postnatal Education	RCT 90 primiparous women of healthy term singleton babies born vaginally.	To evaluate the effectiveness of educational program to improve EBF at 6 months	Intervention: Multiple face-to face and phone call based postnatal education (two and four months). Content: Breastfeeding education Mode of delivery: Individually both face-to- face and telephone. Structure of sessions: One face-to-face session in the immediate postpartum. Two phone call sessions at two and four months postpartum. Total of three (3) sessions. Expertise of facilitators: Maternal child health nurse. Conceptual model: Nil Control group: Received standard postnatal care.	EBF at 6 months Not reported Full BF at 6 months Intervention Group = 39% Control Group = 27% 95% CI -0.9 – 30; p > 0.05 Any BF at six months Not reported	16
Nilsson et al. [73] 2017 Denmark Postnatal Education & counselling	RCT 3,541 postpartum women	To examine a self-efficacy-based intervention on exclusive breastfeeding rates.	Intervention: Face-to face postnatal education with follow up call 24hrs after discharge. Content: Breastfeeding counselling and education, including the role of partners. Mode of delivery: Face-to-face and individually. Structure of sessions: Two sessions. One in the immediate postpartum with written material and one phone call. Expertise of facilitators: Health care professionals Conceptual model: Self-Efficacy Control group. Beceived standard care	EBF at 6 months Intervention Group = 7.3% Control Group = 6.1% 95% CI 1.20 (0.48–2.98); <i>p</i> = 0.70 Any BF at six months Not reported	16
Puharic et al. [66] 2020 Croatia Antennal and postnatal Education & support	RCT 400 primiparous women	To assess the effectiveness of combined antenatal and postnatal breastfeeding education and support.	 Control group: Received statuatic care. Intervention: Multiple phone call based antenatal and postnatal education & support with extra breastfeeding booklet. Content: Breastfeeding education, support, and parenting education. The content of the booklet was based on BFH recommendations. Mode of delivery: Booklets for breastfeeding education and phone calls for discussion and follow up. Structure of sessions: Booklets received antenatally with a 2 week follow up to discuss materials during antenatal period. Postnatally three phone calls at 2, 6, and 10 weeks. Four (4) sessions total. Expertise of facilitators: Registered nurse working in primary care obstetrics. Conceptual model: Michie's Behaviour Change technique. Control group: a) Same schedule with general pregnancy booklet only and b) Received attended motomit even 	EBF at 6 months Intervention Group = 64% Active Control Group = 16% Control Group = 3% 95% CI 9.1–27.1, p < 0.05 Any BF at 6 months Intervention Group = 19% Active Control Group = 47% Control Group = 37% p < 0.05	18
Rodriguez-Gallego et al. [67] 2024 Spain Antenatal and postnatal Education & support	RCT 382 postpartum women of full-term singleton babies	To evaluate the effectiveness of a breastfeeding group intervention in promoting EBF at 6 months and improving self-efficacy.	Intervention: Multiple face-to-face and digital or phone call based antenatal and postnatal education & support Content: Breastfeeding education support group based on BFHI recommendations. Mode of delivery: Face-to-face and digitally. Both individual and group-based interactions Structure of sessions: Antenatal breastfeeding education after 35 weeks' gestation. Monthly 2-hour group sessions postpartum with unlimited access to social communication within intervention participants and midwives via phone and text using virtual group meeting, Facebook and WhatsApp. Seven (7) scheduled sessions. Expertise of facilitators: Registered Midwives (Baby Friendly Hospital Initiative). Conceptual model: Self-efficacy Control group: Received standard maternity care	EBF at 6 months Intervention Group = 63.4% Control Group = 47.9% P = 0.01 Any BF at six months Intervention Group = 21.4% Control Group = 31.3% , p < 0.05	16

Table 2 (continued)					
Author Year Country	Study design Participants	Aim	Method	Findings	Appraisal score with JBI RCT tool
Santamaria-Martin et al. [68] 2022 Spain Postnatal group Education and support	RCT 434 postpartum women with healthy full term singleton babies	To evaluate the effectiveness of the PROLACT group education intervention on EBF at 6 months	Intervention: Multiple face-to-face based postnatal education. Content: PROLACT based education. Mode of delivery: Face-to-face group sessions Structure of sessions: Six weeks of 120 mins weekly sessions from four weeks postpartum. Six (6) sessions total. Expertise of facilitators: Registered Midwives. Conceptual model: Self-efficacy. Control group: Received standard maternity care.	EBF at 6 months Intervention Group = 22.4% Control Group = 8.8% 95% CI 6.84 - 20.23 , $p < 0.05$ Any BF at six months Intervention Group = 77.2% Control Group = 58.2% , $p < 0.05$	17
Sikander et al. [69] 2015 Pakistan Antenatal and postnatal Education & counselling	RCT 452 women with healthy singleton pregnancies	To test the effectiveness of cognitive- behavioural counselling on the rate and duration of exclusive breastfeeding until 6 months.	 Intervention: multiple face-to-face based Antenatal and postnatal education & counselling. Content: Cognitive Behavioural Therapy and breastfeeding education including partner and family support. Mode of delivery: Face-to-face individually. Structure of sessions: Seven (7) sessions beginning during pregnancy until six months postpartum. Unspecified gestations and ages. Expertise of facilitators: Lady Health Worker's trained in Cognitive Behavioural Therapy Control group: Received the same schedule of sessions by Lady Health Workers focused on education without the Cognitive Behavioural Therapy 	EBF at 6 months Intervention = 59.6% Control = 28.6% 95% CI 0.27-0.60; <i>p</i> <0.001 Any BF at six months Not reported	18
Taheri et al. [70] 2022 Iran Antenatal Education	RCT 72 nulliparous pregnant women	To evaluate the impact of distance education using Telegram application on mothers' breastfeeding empowerment and EBF at 6 months	 Interapy element. Interapy element. Intervention: Multiple digital educational resource sent via Telegram application antenatally. Content: Breastfeeding education including partner support. Mode of delivery: Via distance booklets Structure of sessions: Booklets sent out weekly via Telegram App (Social media platform) from 32 to 37 weeks' gestation. Six (6) booklets in total. Expertise of facilitators: Education was developed from evidence-based literature and the Ministry of Health in Iran. Conceptual model: Nil 	EBF at 6 months Intervention Group = 81.8% Control Group = 57.1% p = 0.028 Any BF at six months Not reported	19
Tahir & Al-Sadat [74] 2013 Malaysia Postnatal Counselling	RCT 357 postpartum mothers of term singleton babies born vaginally.	To study the effectiveness of telephone lactation counselling on breastfeeding rates.	 Control group: Received standard care Intervention: multiple phone call based postnatal counselling Content: Breastfeeding education and counselling Mode of delivery: Telephone communication held individually. Structure of sessions: Fortnightly calls beginning early postpartum until six months. Twelve (12) sessions were anticipated. Expertise of facilitators: Lactation counsellor Conceptual model: Nil. Control group: Received standard postnatal lactation care. 	EBF at 6 months Intervention Group $= 12.5\%$ Control Group $= 12\%$ p = 0.879 Any BF at six months Intervention Group $= 90.6\%$ Control Group $= 86.1\%$ p = 0.266	16
Wong et al. [72] 2014 Hong Kong One single Antenatal Education	RCT 469 pregnant primiparous women of healthy singleton pregnancies	To evaluate the effectiveness of a support and education intervention on EBF duration	Intervention: Single face-to face antenatal education. Content: Breastfeeding education including partner involvement. Content of the education was based on BFHI recommendation. Mode of delivery: Face-to-face individually with take home handouts after session. Structure of sessions: Single (1) session 20–30 mins after antenatal clinic appointment from 35 weeks. Expertise of facilitators: Registered nurse trained in the Baby Friendly breastfeeding	EBF at 6 months Intervention Group = 14.6% Control Group = 12.7% 95% CI -0.09-0.17; p = 0.55 Any BF at six months Intervention group = 37.3% Control Group = 40.7% (continu	16 ued on next page)

Table 2 (continued)

Author Year Country	Study design Participants	Aim	Method	Findings	Appraisal score with JBI RCT tool
Yilmaz & Aykut [71] 2021 Turkey Antenatal and postnatal Education	RCT 120 Primiparous women with singleton pregnancies	To determine the effect of breastfeeding training on mothers' knowledge, behaviours, and EBF at 6 months	course based on BFHI recommendations Conceptual model: Nil Control group: Received standard care. Intervention: Multiple antenatal and postnatal education & support. Content: Content of the education was based on BFHI recommendation. Additional information was about newborn baby behaviour, milk supply perception and partner's role. Mode of delivery: Face-to-face group and individual sessions: Structure of sessions: Two 45 min antenatal group classes and one 30 min postnatal breastfeeding discussion at <24hrs post birth. Three (3) sessions in total. Expertise of facilitators: Registered midwife from a private BFHI hospital Conceptual model: Nil. Control group: Received two antenatal 45 min group classes on newborn education and 30 min postnatal training <24hrs post birth on newborn care. No breastfeeding education.	95% CI 20.13–0.06, <i>p</i> = 0.46 EBF at 6 months Intervention = 26.5% Control Group = 3.3% <i>p</i> < 0.015 Any BF at six months Not reported	16

[64,68,71] digitally, [62,65,66,70] or in a combination of both. [66,67, 76,77] Digital communication included telephone calls, [62,63,66,67, 74,76–78] SMSs, [65,67] virtual meetings and messaging via Facebook and WhatsApp [67] and TelegramApp^{TM70} For instance, Rodriguez-Gallego et al., [67] incorporated both face-to-face and digital communications to deliver the education and support intervention, resulting an increased rate of EBF at six months among women in the intervention group by 15% compared to the control group (63.4% vs 47.9% respectively; p = 0.01). [67]

Educational interventions that included breastfeeding content in conjunction with other parental educational sessions [62–71] and involved partners to be engaged in the session were also effective. [64, 69–71]. For instance, Yilmaz & Aykut, [71] conducted an intervention of 120 primiparous women involving their partners in Turkey on breastfeeding and newborn education. At six months, 26.5% of the intervention group remained exclusively breastfeeding compared to 3.3% in the control group (p < 0.015). [71]

Support

In three of the five studies, the authors specifically mentioned support as a component of their interventions which was provided both antenatally and postnatally. [64,66,67] Support interventions were mainly individual based and were delivered face-to-face, [64] digitally, [66] or in a combination of both. [67] There was no standalone support intervention. For instance, in, one RCT (n=300) in India, [64] the supportive intervention was reported as multiple postnatal home visits by trained nutritional counsellors who provided breastfeeding education and practical support to women and their families The findings of this study that included a combination of education and support via counselling demonstrated a 30% increase in EBF rates at six months for the intervention group (88.1%) compared to the control group (50%) (95% CI 3.98 – 13.92). In another study, [67] support was referred to women's peer support group that they developed using FacebookTM and WhatsAppTM. In this digital peer support platform, women communicated with each other and discussed their issues within the group and with their midwife who was allocated to the group [67].

Counselling

Five of the eight studies utilising counselling were effective in increasing exclusive breastfeeding rates at six months. [62,64,69,76,77]

Three different counselling models were identified in the effective studies. One model was Motivational Interviewing [62,76] where women were asked open-ended questions and guided to explore and resolve their ambivalence in order to enhance their intrinsic motivation to change (in this model counsellors avoid giving advice). [85] Another model was based on the Theory of Planned Behaviour where the intervention targeted a) enhancing women's breastfeeding knowledge and attitude, b) educating their significant other (subjective norms), and c) fostering breastfeeding skills and problem solving counselling (perceived control/self-efficacy). [77] The third model involved Cognitive Behavioural Therapy. [69] In the Cognitive Behaviour Therapy model, a group of trained staff probed the cycle of unhelpful thinking (cognitions) among women and their families and stimulated alternative ideas via culturally appropriate images. (imagery techniques). Any associated undesirable feelings and actions (behaviour) were altered by skill workshops and problem solving activities that were tailored for the women and their families. [69] There was one effective intervention with nutritional counsellors who mainly provided antenatal education and postnatal practical support and did not use any specific conceptual framework. [64]

Effective counselling sessions were held either entirely through digital communication, [62] face-to-face, [64,69] or a combination of both. [76,77] For instance, in a Brazilian study (n= 240), women, received multiple motivational interview telephone calls on day seven, 30, 90 and 150 with no face-to-face session during the postpartum period. [62] The findings from this study demonstrated EBF rates of 39.5% at six months among the intervention group compared to 16.3% in the control (95% CI: 1.4 - 8.2; p = 0.005). [62]

Discussion

This integrative literature review aimed to analyse modifiable factors and interventions which positively influence exclusive breastfeeding rates at six months postpartum. Women's breastfeeding intention, selfefficacy and support remained as the main modifiable factors that influenced breastfeeding rates at six months postpartum. Breastfeeding interventions were based on education, support, and counselling when they delivered via multiple sessions beginning in the antenatal period or after birth continuing through postpartum until six months. [62,64–71, 76,77]

Modifiable factors such as breastfeeding intention, self-efficacy and support have been targeted by some interventional studies when the authors used psychology based theoretical frameworks. In our literature review, motivational interview models, [62,77] cognitive behaviour therapy [69] and self-efficacy enhancing strategies such as verbal persuasion, vicarious learning and role mastery were used to increase EBF rates at six months. [77] Despite these strategies, the ways that health professionals are perceived by women and influenced their thoughts and feelings were not reported or researched. There is evidence that demonstrates women initiate breastfeeding in order to avoid judgment from their healthcare providers or support people. [86] In a cohort study of 232 American women, postpartum parents have reported experiencing intrusive thoughts and obsessions about producing enough breastmilk. [87] In other studies women reported feeling pressured to breastfeed by health professionals [86,88] In contrast, women reported long-term breastfeeding practices when they were internally motivated and felt supported, and cared for externally. [89]

Safe interaction between the women and health professionals is well supported under the midwifery theory of "birth territory and midwifery guardianship". Under this conceptual framework, breastfeeding territory can be perceived as a sanctum where the woman feels safe and comfortable to breastfeed her child with love and care. [17] When perceived to be under surveillance, it creates emotional distress with autosomal arousal which can inhibit the woman's mind and body from breastfeeding successfully. Based on the birth-territory framework, women's feelings do not need a rationale. [15] A woman may choose to continue breastfeeding based on a pure inner feeling of bonding with her baby and giving her own milk to the loved one while she feels respected and supported continuously by her support people and care providers referred as midwifery guardianship. [17] Therefore, there is a need for interventional studies that use midwifery guardianship as part of their conceptual framework to tailor the intervention strategies based on women's need and their feelings. [90]

The effective interventions in our literature review included education, support and counselling when delivered via multiple sessions. Interventions that held over a single session [72] or beginning after one month postpartum were not effective. [75] The reason for ineffectiveness is that a single session cannot influence a long-term breastfeeding health behaviour change when breastfeeding attitudes already having been established. [16] In contrary, multiple sessions with breastfeeding education, support and counselling can be successful due to the consistency, ongoing support and synergistic effect. [91] In a systematic review of the effectiveness of interventions on breastfeeding initiation and continuation, the results of the meta-analysis demonstrated that concurrent counselling and education significantly promoted continued breastfeeding rates (RR 1.97, 95% CI 1.74–2.24) and approached statistical significance when delivered in health systems alone (RR 1.15, 95% CI 0.99–1.35).

The findings suggest that digital communications alone can be effective in the delivery of breastfeeding interventions. The resourcefulness of digital communication throughout the interventions was shown to be an effective mode of delivery, both in conjunction with faceto-face sessions and as a standalone delivery mode. Digital communications are a convenient and cost-effective method of health information sharing [92], and from this review, its efficacy in delivering breastfeeding education, support, and counselling interventions have been shown. This is an update from previous research, published in 2010, where the use of digital communication was not identified as a strategy for delivering breastfeeding interventions. [10] The results of the current review and the increased use of digital communications such as telehealth, phone, applications and social media for accessing maternity services information [92] suggest that digital communication may be an effective and appropriate measure for delivering interventions aimed at improving EBF rates at six months postpartum. But at the same time, it must be perceived acceptable and tailored based on women's need. [93]

Strengths and limitations of the study

One of the strengths of this review is that the included studies were from variety of the countries across the world which can be helpful to identify the modifiable factors among women with different social and cultural background. Another strength was the inclusion of only RCTs for the interventional studies to produce high level of evidence. whilst we did not exclude any studies based on their quality appraisal, they were all considered to be of acceptable quality.

The main limitation of this study was the lack of clarity on definitions of education, support and counselling and the lack of details on standard care. Therefore, it was hard to distinguish the effect of each interventional strategy without overlapping impact. None of the RCTs reported their findings based on intention-to- treat with including participants who had withdrawn from the study. The last limitation was that none of the studies specifically highlighted the impact of health care providers on women's perspectives and feelings.

Recommendations for practice

Future interventions may benefit from being centred around breastfeeding and parenting education beginning in the antenatal period and continuing throughout the early postpartum until at least six months. Education interventions encompassing support and counselling may be more effective in encouraging health behaviour change and breastfeeding retention when they use theoretical frameworks that are focused on women's need and their breastfeeding intention, selfefficacy, and support. Strategies to improve the effectiveness of an intervention may include education, support, and counselling with motivational interviewing through a combination of face-to-face and digital communication. These strategies should align with women's preferred social media platforms and be tailored to their diverse sociocultural norms and social influences.

Conclusion

Breastfeeding intention, self-efficacy and social support remain key modifiable factors positively influencing exclusive breastfeeding rates at six months duration. Interventions that are tailored to women's needs and concerns are deemed more successful when hosted during both the antenatal and postnatal periods, held either digitally, face-to-face, or mixed modal, over multiple sessions. Digital communication is a contemporary mode of delivery for interventions that can be embedded within education, support, and counselling. Mixed models of communication can be convenient and accessible for those engaging with maternity services whilst being successful in delivering health interventions.

Author's contribution to the paper

Xanthe Whittaker: conducted the literature review, writing the original draft, data curation, editing. Shahla Meedya: Corresponding author, instigated the concept, supervising, review, revising the manuscript and editing. Tanya Capper: Resources, supervising, review and editing.

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Ethical statement

No ethical statement has been made for this review of the literature.

Conflict of interest

None declared.

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Appendix A. Supporting information

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