

## ORIGINAL ARTICLE

# Factors influencing exclusive breastfeeding for 6 months postpartum: A systematic review

Qian Wu RN, PhD Candidate<sup>1,2</sup>  | Nan Tang RN, PhD Candidate<sup>1,2</sup> |  
Chintana Wacharasin RN, PhD<sup>2</sup> 

<sup>1</sup> Faculty of Nursing, Jiangsu Vocational College of Medicine, Jiangsu, P. R. China

<sup>2</sup> Faculty of Nursing, Burapha University, Chon Buri, Thailand

## Correspondence

Chintana Wacharasin, Faculty of Nursing, Burapha University, Muang District, Chonburi 20131, Thailand.  
Email: [chintana@buu.ac.th](mailto:chintana@buu.ac.th)

## Funding information

Project of Yancheng Science and Technology Bureau, Grant/Award Number: YK2017056

## Abstract

**Purpose:** This systematic review aims to identify factors influencing exclusive breastfeeding (EBF) up to 6 months.

**Methods:** The databases including PubMed, MEDLINE, CINAHL, Scopus, EMBASE, CNKI, and WANFANG were searched to retrieve studies. Quantitative research were extracted and the preferred reporting items for systematic reviews were followed. Critical appraisal checklists of Joanna Briggs Institute were used to evaluate the quality of the included studies.

**Findings:** A total of 16 papers were eligible for this systematic review, comprising five cohort studies and 11 cross-sectional studies. Moderate to strong evidence supported that 6-month exclusive breastfeeding is affected by maternal working status, breastfeeding knowledge, delivery mode, parity, perception of insufficient human milk, mothers' infant feeding attitude, breastfeeding self-efficacy, and intention.

**Conclusions:** Factors influencing EBF up to 6 months postpartum play a key role in promoting mothers' health and reducing diseases in their infants.

**Implications for nursing practice:** Interventions based on related factors should be developed and taken into practice to assist mothers in exclusive breastfeeding for up to 6 months. Additional studies from different countries in different populations with high quality are needed to provide more reliable and richer findings.

## KEYWORDS

6 months, exclusive breastfeeding, factors, systematic review

## INTRODUCTION

Breast milk is recognized to be the optimal nutritional source for infants. Studies have demonstrated that breastfeeding (BF) mothers have a lower rate of breast and ovarian cancer as well as diabetes (Chowdhury et al., 2015). Excess fat accumulated during pregnancy can be consumed by BF. Mothers who breastfeed their infants are more likely to regain their prenatal weight (Del Ciampo & Del Ciampo, 2018). Globally, 74% of sudden infant deaths syndrome and 13% of infant mortality can be prevented by BF (Brahm & Valdés, 2017). Breastfed infants are reported to have decreased risk of childhood infectious and atopic diseases, as well as celiac disease (Brahm & Valdés, 2017). In

addition, breast milk had an association with a child's emotional and cognitive development and also has an effect on maternal mood, affect, stress, and maternal care (Krol & Grossmann, 2018; Safadi et al., 2016).

There is a dose-response effect between BF and health benefits. Health outcomes can be enhanced through a longer duration and a higher intensity of BF (Chantry et al., 2006). Meanwhile, BF can provide all the energy and nutrients which is needed for the growth of infants during the first 6 months in their life (De Jager et al., 2013). Since 2001, the World Health Organization (WHO) has recommended that all infants should be exclusively breastfed in the first 6 months of life, replacing its previous recommendation of exclusive breastfeeding (EBF) for 4–6 months (World Health Organization [WHO], 2001).

Compared with EBF for the duration of less than 6 months, the infants exclusively breastfed for 6 months appear to have a lower rate of gastrointestinal infection, and the mothers of these infants have longer locational amenorrhea (Kramer & Kakuma, 2012). Another study also supported that 27.37% of diarrhea, 13.24% of fever and 8.94% of acute respiratory infection among babies younger than 6 months could have been prevented through EBF (Khan & Islam, 2017). Data from WHO indicated that EBF for the first 6 months after birth can even prevent 800,000 infant deaths annually (Tshering et al., 2018). Compared with nonbreastfed child, the child receiving 6-month EBF are 14 times less likely to die in the first 6 months (Richardson & Walters, 2014). The risk reduction of breast cancer also become significant through EBF during the first 6 month after delivery (Ma et al., 2006; Unar-Munguía et al., 2017).

However, the current status of EBF for 6 months is not satisfactory and this situation is fairly consistent around the world. A study from the United States showed that only 34% and 9% of infants received EBF for 3 months and 6 months, respectively (Nnebe-Agumadu et al., 2016). The prevalence of 6-month EBF in Somaliland is only 20.47% (Jama et al., 2020). China is the world's most populous country with 1.45 billion people. The number of births in China reached 14.65 million in 2019. However, the EBF rate in China is even lower than the global average level and also other Asian countries (Wang & Zhou, 2019). A national representative survey conducted in China showed that the EBF rate in the first 6 months of infants' life was only 18.6% (Duan et al., 2018).

It calls for more attention on the improvement of EBF for 6 months. Understanding the factors influencing mothers to meet the WHO recommendation about EBF for 6 months is essential to guide nursing practice. However, factors predicting EBF for a duration of 6 months are still unclear and related systematic review is scarce. A systematic review published in 2013 demonstrated that the articles examining the effects of psychosocial factors on EBF for 6 months were very limited (De Jager et al., 2013). Another researcher examined the determining factors of EBF for 3 months, and found that mothers' educational attainment, living in a metropolitan city, intention of BF, and self-efficacy could predict EBF significantly (Tsai et al., 2015). Although there are also some other studies that have focused on the factors associated with BF exclusivity, the EBF outcome was measured at different time points and most of them did not focus on EBF for 6-month duration.

Therefore, it is significant to focus on factors influencing 6-month EBF. The purpose of this review was to comprehensively delineate factors related to 6-month EBF in general mothers, thus the healthcare providers can develop interventions to help mothers achieve the recommendation of the WHO for 6-month of EBF.

## METHODS

This systematic review adhered to the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2009).

**TABLE 1** Eligibility criteria

PICO reference	Eligibility criteria
Population	General mothers with healthy newborns
Intervention	Not used
Comparison	Not used
Outcome	Factors in relation to EBF for 6-month duration (measured quantitatively)
Study design	Cohort studies Cross-sectional studies

**TABLE 2** Search terms

String 1	Breastfeeding OR breast feeding OR lactation
String 2	Exclusive OR exclusively OR exclusivity
String 3	"6 months" OR "180 days"
String 4	Factor OR determinant OR predictor OR affect OR effect
Final research	(Breastfeeding OR breast feeding OR lactation) AND (exclusive OR exclusively OR exclusivity) AND ("6 months" OR "180 days") AND (factor OR determinant OR predictor OR affect OR effect)

## Eligibility criteria

Studies focusing on factors related to maintaining EBF up to 6 months in general mothers with healthy newborns, published in English or Chinese, using a quantitative research method, having clear and appropriate definitions of EBF were selected. The definition of EBF in this review is that infants only receive breast milk, without any other liquids or solids. The years of publication were not limited. Studies focusing on factors relating to the infants (e.g., low birth weight) and mothers in disadvantaged or abnormal groups (e.g., adolescent mothers, mothers with HIV) were excluded. Unpublished papers were excluded. Also, any interventional studies were excluded because the study interventions could make the association between factors and 6-months of EBF more complicated and opaque. The PICO framework is a mnemonic used in evidence-based practice to frame and answer health care related question. The PICO framework is also used to develop literature search strategies in systematic reviews. The specified eligibility criterion in this study is presented in Table 1 according to the PICO framework.

## Search strategy

Search terms were constantly modified and supplemented based on the retrieved data. Final suitable search terms, which can be seen in Table 2, were combined to conduct searches in PubMed, Medline, CINAHL, Scopus, EMBASE, CNKI and WANFANG in February 2020. Through consulting an experienced librarian, research strategies were adjusted to use in the seven electronic databases mentioned above. The snowball method was used to obtain more relevant literature through scanning reference lists of articles.

## Data extraction

The results searched from the databases mentioned above were imported into EndNote, and then all duplicates were removed. The titles and abstracts of these articles were independently screened by three authors. Full texts were read further if they were potentially eligible. The extractive data including author, publication year, country, participants, outcome measure, measure used, and findings based on the logistic regression analysis were extracted from the identified studies (Table 3). Any inconsistencies were resolved by discussions among the three review authors.

## Critical appraisal

Critical appraisal checklists of Joanna Briggs Institute (JBI) were used to assess the quality of included studies. Eleven criteria (Joanna Briggs Institute [JBI], 2016) were used to assess for cohort study, including: (1) were the two groups similar and recruited from the same population? (2) were the exposures measured similarly to assign people to both exposed and unexposed groups? (3) was the exposure measured in a valid and reliable way? (4) were confounding factors identified? (5) were strategies to deal with confounding factors stated? (6) were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? (7) were the outcomes measured in a valid and reliable way? (8) was the follow up time reported and sufficient to be long enough for outcomes to occur? (9) was follow up complete, and if not, were the reasons to loss to follow up described and explored? (10) were strategies to address incomplete follow up utilized? (11) was appropriate statistical analysis used? Nine criteria (Munn et al., 2015) were used to assess for cross-sectional studies, including: (1) was the sample frame appropriate to address the target population? (2) were study participants sampled in an appropriate way? (3) was the sample size adequate? (4) were the study subjects and the setting described in detail? (5) was the data analysis conducted with sufficient coverage of the identified sample? (6) were valid methods used for the identification of the condition? (7) was the condition measured in a standard, reliable way for all participants? (8) was there appropriate statistical analysis? (9) was the response rate adequate, and if not, was the low response rate managed appropriately? Each item can be answered with "Yes, Unclear, No or Not Applicable." In this study, "Yes" was marked as 1 point, and the other options were marked as 0. Studies with an overall quality assessment score greater than 50% are considered as studies with good quality (Abebe et al., 2018).

## Level of evidence

An evidence synthesis used in a previous study (Korsten et al., 2019) was chosen to categorize the evidence grade of factors predicting 6-month EBF. The levels of evidence were defined as follows: (1) strong evidence means that consistent results were reported in at least two high quality studies, (2) moderate evidence means that consistent

results were reported in one study with high quality and at least one study with low quality or at least two studies with low quality, and (3) inconclusive evidence means that a factor was identified in only one study or inconsistent findings were reported in multiple studies.

## FINDINGS

### Study selection

The search was conducted in January 2020; 4745 articles were identified through searching the seven databases. With the function of automatic duplication in EndNote, 1651 articles were removed. Based on the title and abstract, 3094 articles were scanned and 41 articles were considered as potentially relevant. Six additional articles were found by checking the reference lists. After reading the full text of the remaining articles, 16 articles were found to meet the eligibility criteria of this systematic review. This literature selection process is shown in Figure 1.

### Study characteristics

Of the 16 articles, there were 33,009 participants: four prospective cohort studies, one retrospective cohort study, and 11 cross-sectional studies. There were three studies conducted in the United States, two in Saudi Arabia, two in China, and one in Canada, Australia, the Republic of Cyprus, Korea, Singapore, Ghana, India, Egypt and Cambodia, respectively. Most of the articles defined EBF as "infants receive only breast milk and no other liquids or solids, with the exception of drops or syrups containing vitamins, mineral supplements or medicine", which is consistent with the definition of the WHO. Two articles defined EBF as "infants receive only breast milk and no drink or food" (Al-sahab et al., 2010; Walsh et al., 2019). The sample size ranged from 77 mothers in India (Kishore et al., 2009) to 14077 mothers in China (Kang et al., 2007). The full description of the included studies can be seen in Table 3.

### Quality appraisal of the included articles

The quality appraisal for each study can be seen in Table 4. According to WHO recommendation of 6-month EBF, this review just focused on the factors related to EBF for 6-month duration. The studies that only focused on EBF for duration of less than 6 months were excluded. So, the 6th and 8th items in the checklist for the cohort studies were not applicable because the outcomes of included studies are unlikely to come before 6 months or follow-up time are enough for outcomes to occur. Most of the cohort studies did not provide details about the loss of follow-up and the strategies for these situations. Self-report measures were used for EBF outcome in all of these studies. The details of the investigators' training and (or) the comparability of their investigation were not available in some of the studies, although they used a uniform method for measuring subjects. Therefore, the option of the

**TABLE 3** Characteristics of the Included Studies

Author (Year)	Country	Design	Participants	Outcome measure	Measures used	Findings
De Roza et al. (2019)	Singapore	A prospective cohort study	400 English-speaking mothers with mean age 31.4 years	EBF at baseline, 3 and 6 months after birth	insufficient milk questionnaire, self-administered baseline questionnaire, and follow-up questionnaires on BF practices	Factors positively predicting EBF up to 6 months were tertiary education (OR: 2.65, 95% CI: 1.24–5.66), baseline BSES-SF above 50 (OR: 1.95, 95% CI: 1.07–3.54), perception of insufficient milk score above 20 (OR: 4.05, 95% CI: 2.35–6.97), and intention to breastfeed infants at least 6 months (OR: 6.81, 95% CI: 2.15–21.57), $p < 0.05$
Walsh et al. (2019)	USA	A cross-sectional study	195 mothers in the rural district with mean age 27.3 years	EBF and EBF during the first 6 months after birth	Community health workers administered questionnaire verbally to the mothers	EBF can positively predict EBF for 6 months (AOR: 1.35; 95% CI: 0.84, 2.18), $p < 0.05$
Hegazi et al. (2019)	Saudi Arabia	A cross-sectional study	420 mothers who had the last or the youngest healthy infant or child born as full term with age ranging from 6 months to 5 years. Mothers' mean age were 30.1 years	EBF for 6 months	Home based face to face interview and questionnaires related to EBF and KAP of BF mothers	The negative predicting factors of EBF for 6 months were perception of sufficient human milk (AOR: 2.89, 95% CI: 1.72–4.89), absence of nipple pain (AOR: 2.77, 95% CI: 1.72–4.45), and mothers without university education (AOR: 1.86; 95% CI: 1.15–3.01), $p < 0.05$
Economou et al. (2018)	Republic of Cyprus	A prospective cohort study	586 married or cohabiting mothers, aged 25–29, were in good health and not separated from their infants for any reason	BF and EBF at 1, 4, and 6 months postpartum	IFP questionnaire, self-reported BF status, self-administered WHO/UNICEF questionnaire, BSES-SF	Mothers with postgraduate education were more likely to breastfeed their infants until 6 months compared with those with secondary education (AOR: 2.4, 95% CI: 1.2–4.6, $p < 0.05$ )
Alzaheb (2017)	Saudi Arabia	A cross-sectional study	589 mothers aged 25–35 years with healthy infants aged between 6 and 24 months	EBF during the first 6 months after birth	A structured questionnaire	EBF for 6 months was less likely to be practiced by working mothers (OR: 0.04, 95% CI: 0.02–0.12, $p < 0.001$ ), Saudi nationals (OR: 0.52, 95% CI: 0.28–0.97, $p = 0.039$ ), and with cesarean delivery (OR: 0.53, 95% CI: 0.34–0.83, $p < 0.005$ ) or low birth weights (OR: 0.42, 95% CI: 0.21–0.82, $p = 0.011$ )
Dun-Dery and Laar (2016)	Ghana	A cross-sectional study	369 professional working mothers, aged between 24–30 years, had healthy infants aged between 6 and 24 months	EBF at 6 months after birth	Study-specific structured questionnaires	Mothers who received infant feeding recommendation from health workers (AOR: 0.45, 95% CI: 0.27–0.77) or had a normal delivery were more likely to practice EBF (AOR: 9.02, 95% CI: 2.85, 28.53); Mothers who had shorter duration of maternity leave were less likely to practice EBF (AOR: 0.09, 95% CI: 0.02–0.45), $p < 0.05$

(Continues)

TABLE 3 (Continued)

Author (Year)	Country	Design	Participants	Outcome measure	Measures used	Findings
Cox et al. (2015)	Australia	A prospective cohort study	427 women (mean age 30.2 years) and their infants in rural area	IFA and BF duration for a period of 12 months after birth	Data collection tools based on the RIFS were modified with few additional questions	Mothers' IFA were a strong positive predictor of EBF to six months (aHR: 1.81, 95% CI: 1.30-2.51, $p < 0.05$ )
El Shafei & Labib (2014)	Egypt	A cross-sectional study	1000 eligible women having infants aged less than 2 years in rural Egyptian communities. Mothers' mean ages were 25 years	Determinants that affect exclusivity of BF	A semistructured pretested questionnaire	The significant positive predictor for 6-month EBF was receiving of health education about BF (AOR: 9.4, 95% CI: 4.0-22.4, $p = 0.001$ ), BF knowledge score more than 2 (AOR: 2.2, 95% CI: 1.3-3.6, $p = 0.005$ ), maternal age ( $< 25$ years) (AOR: 3.4, 95% CI: 1.3-9.3, $p = 0.02$ )
Kim et al. (2013)	Korea	A cross-sectional study	404 mothers with mean age 30.5 years	EBF at 1, 3, 6, 9, 12 months after birth	Data coming from the recent National Health and Nutrition Examination Survey	Younger maternal age (OR: 0.85, 95% CI: 0.79-0.92), higher maternal education level (OR: 2.29, 95% CI: 1.17-4.46), and living in a capital city (OR: 0.64, 95% CI: 1.46-4.75) were positive predictors of 6-month EBF, $p < 0.05$
Nnebe-Agumadu et al. (2016)	USA	A retrospective cohort study	1895 mothers of healthy singleton pregnancies who reported a prenatal intention to exclusively breastfeed in the first few weeks postpartum	EBF duration at 6 months postpartum	Demographic, prenatal, postnatal follow-up and neonatal questionnaires	Women who reported that they strongly value EBF had more than twice the odds of EBF for 6 months (AOR: 2.49, 95% CI: 1.76-3.53, $p < 0.05$ )
Zhu et al. (2019)	China	A prospective cohort study	1918 mothers who gave birth in hospital between January and March, 2016. Mothers' mean ages were 28.6 years	EBF at 1, 3, 6 months after birth	A self-made questionnaire including basic information of mother and child, infant feeding methods, knowledge of BF, confidence in BF and BF at 1-6 months	BF knowledge score above 25 (OR: 2.61, 95% CI: 1.18-4.27), confidence in BF score above 120 (OR: 2.53, 95% CI: 1.29-4.93), non-Xiaogan region (OR: 4.43, 95% CI: 2.81-6.98), multipara (OR: 1.26, 95% CI: 1.10-1.42), gestational age above 37 weeks (OR: 1.93, 95% CI: 1.29-2.62), birth weight more than 4000g (OR: 2.66, 95% CI: 1.21-4.12), husbands bachelor degree (OR: 1.80, 95% CI: 0.92-3.90), standardized prenatal examination (OR: 2.06, 95% CI: 1.63-2.58), and high school or college degree (OR: 1.80, 95% CI: 1.06-3.06) had positive effects on EBF for 6 months, $p < 0.05$ ; cesarean delivery (OR: 0.83, 95% CI: 0.69-0.96), complications of pregnancy negatively impact 6-month EBF (OR: 0.89, 95% CI: 0.80-0.97)
Kang et al. (2007)	China	A cross-sectional study	14077 mother-infant pairs in the counties of western China. Infants' mean ages were under 3 years	EBF for 6 months	Semistructured questionnaires	negative predictors of EBF for 6 months were higher education of the mothers (OR: 0.765, 95% CI: 0.709-0.826), the fourth rural level (the poorest level) (OR: 0.753, 95% CI: 0.697-0.815) and minority mothers (OR: 0.518, 95% CI: 0.438-0.612), $p < 0.05$

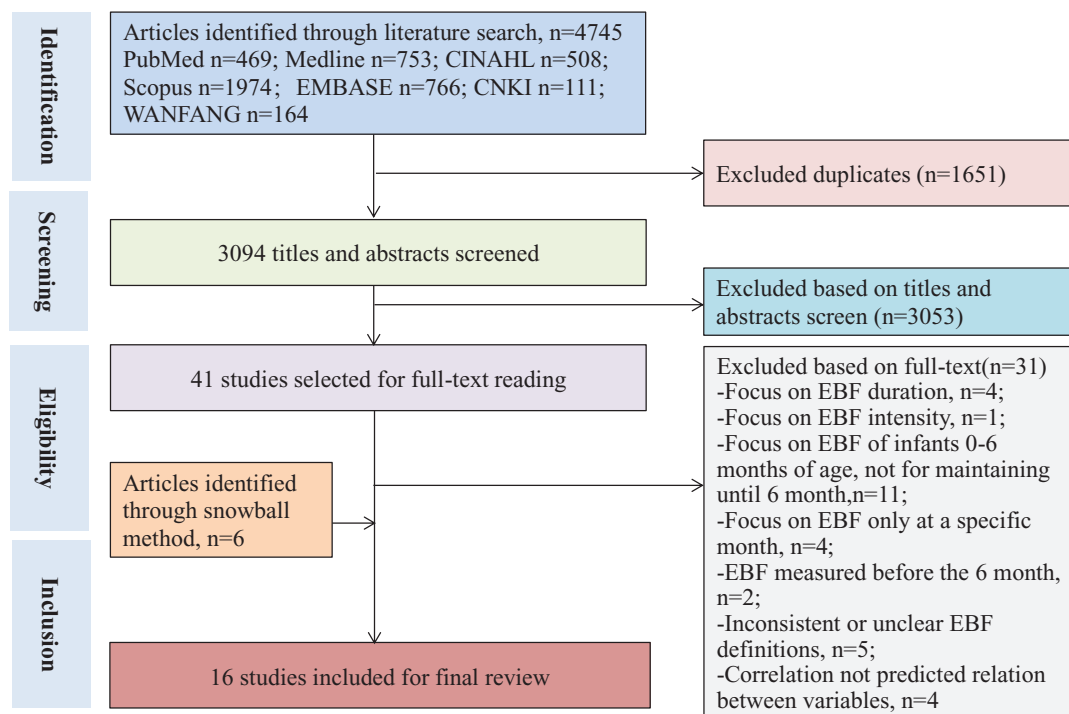
(Continues)



TABLE 3 (Continued)

Author (Year)	Country	Design	Participants	Outcome measure	Measures used	Findings
Al-Sahab et al. (2010)	Canada	A cross-sectional study	5615 mothers, aged $\geq 15$ years, had babies aged $\geq 6$ months at the time of interview	6-month EBF	Self-reported information, Newton and Hunt's life events inventory, EPDS	Mothers with higher years of education (OR:1.08, 95%CI:1.05–1.12), residing in the Northern territories (OR:3.02, 95%CI:2.21–4.12) /Western Prairies (OR:1.81, 95%CI:1.38–2.38) /Western British Columbia (OR: 1.94, 95%CI:1.42–2.64), living with a partner (OR:1.61, 95%CI: 1.03–2.52), having had previous pregnancies (OR:1.16, 95%CI: 1.09–1.23), having lower pre-pregnancy body mass index (OR:0.97, 95%CI: 0.95–0.99) and giving birth at older age (OR: 1.05, 95%CI:1.03–1.07), delivering at home (OR: 5.29, 95%CI:2.95–9.46) were more likely to practice 6-month EBF. Those smoked during pregnancy (OR:2.11, 95%CI:1.36–3.27), had caesarean birth (OR:1.25, 95%CI:1.01–1.53), infant's admission to the intensive care unit (OR:1.51, 95%CI:1.12–2.03) and maternal employment status before 6 months of infant's age (OR:1.55, 95%CI: 1.14–2.10) were less likely to practice EBF, $p < 0.05$
Sasaki et al. (2010)	Cambodia	A cross-sectional survey	312 mothers with children aged between 6 and 24 months. Mothers were aged between 18 and 45 years	Infant feeding practices	A semistructured questionnaire	Lack of a maternal antenatal EBF plan (AOR:10.01, 95%CI:3.68–27.24, $p < 0.001$ ), working mothers (AOR:4.71, 95%CI: 2.77–8.01, $p < 0.001$ ), and lack of paternal attendance at breast-feeding classes (AOR:1.93, 95%CI:1.13–3.28, $p < 0.05$ ) had positive effect on the cessation of EBF during the first 6 months of infant life
Kishore et al. (2009)	India	A cross-sectional study	77 mothers lived in rural area, and their infants were aged between 0 and 6 months	EBF till 6 months	Structured and semistructured interviews with an interview schedule	Lack of BF counseling had a negative effect on EBF till 6 months ( $p = 0.002$ )
Langellier et al. (2012)	USA	A cross-sectional study	4,725 mothers with mean age were 29.9 years and their children aged older than 5 months	EBF at 6 months and any BF at 6, 12, and 24 months	Questionnaires programmed into computer assisted telephone interviewing system	Non-Hispanic White mothers (OR:2.859, 95%CI:1.292–6.329) and mothers reporting a prenatal intention to breastfeed (OR:7.401, 95%CI: 3.269–16.75) were more likely to EBF for 6 months. Receipt of a formula discharge pack in the hospital (OR:0.541, 95%CI: 0.393–0.744), mothers who returned to work within 3 months postpartum (OR:0.456, 95%CI: 0.251–0.828) were less likely to EBF, $p < 0.01$

Abbreviations: ASI, Acculturative Stress Index; BF, breastfeeding; BFSE, breastfeeding self-efficacy; BSES-SF, Breastfeeding Self-Efficacy Scale (Short form); EBF, exclusive breastfeeding; EPDS, EIBF, early initiation of breastfeeding; Edinburgh Postpartum Depression Scale; IFA, infant feeding attitude; IFP, infant feeding practice; KAP, knowledge, attitude and practice; MAF, Multidimensional Assessment of Fatigue Scale; RIFS, Rural Infant Feeding Study; SE, self-efficacy; SPS, Social Provisions Scale; STAI, State-Trait Anxiety Inventory.



**FIGURE 1** PRISMA Flow diagram of selection process

**TABLE 4** Critical appraisal of the included studies assessed with Joanna Briggs Institute appraisal checklist

Authors	1	2	3	4	5	6	7	8	9	10	11	Score
*De Roza et al. (2019)	Y	Y	Y	Y	Y	N/A	U	N/A	Y	N	Y	7
*Nnebe-Agumadu et al. (2016)	Y	Y	Y	Y	Y	N/A	U	N/A	N	N	Y	6
*Cox et al. (2015)	Y	Y	Y	Y	Y	N/A	U	N/A	Y	N	Y	7
*Economou et al. (2018)	Y	Y	Y	Y	Y	N/A	U	N/A	N	N	Y	6
*Zhu et al. (2019)	Y	Y	U	Y	Y	N/A	U	N/A	N	N	Y	5
△El Shafei & Labib (2014)	Y	Y	Y	Y	Y	U	Y	Y	Y			8
△Kang et al. (2007)	Y	Y	Y	Y	Y	U	Y	Y	Y			8
△Kim et al. (2013)	Y	N	Y	Y	U	U	U	Y	U			4
△Langellier et al. (2012)	Y	Y	Y	Y	U	U	Y	Y	N			6
△Al-Sahab et al. (2010)	Y	Y	Y	Y	Y	U	U	Y	Y			7
△Sasaki et al. (2010)	Y	N	Y	Y	U	U	U	Y	Y			5
△Kishore et al. (2009)	Y	Y	N	Y	Y	U	U	Y	Y			6
△Hegazi et al. (2019)	Y	Y	Y	Y	U	U	Y	Y	U			6
△Walsh et al. (2019)	Y	Y	Y	Y	U	U	Y	Y	Y			7
△Alzaheb. (2017)	Y	Y	Y	Y	U	U	U	Y	Y			6
△Dun-Dery & Laar (2016)	Y	Y	Y	Y	U	U	U	Y	Y			6

Abbreviations: Y, yes; N, no; U, unclear; N/A, not applicable

\*represents the cohort study and numbers 1–11 correspond to the criteria 1–11 of JBI Appraisal Checklist for cohort study

△represents the cross-sectional study and numbers 1–9 correspond to the criteria 1–9 of JBI Appraisal Checklist for cross-sectional study

**TABLE 5** Overall evidence for each factor

Factors	Number of studies (quality)	Evidence level
<b>Demographic and socioeconomic factors</b>		
Working status	5 (high quality)	Strong
Multipara	2 (1 in high quality and 1 in low quality)	Moderate
maternal age; parental education; residential address; nationality; living with a partner; race; minority; economic performance; prepregnancy body mass index; deliver at home; smoking during pregnancy; recipients of a formula discharge pack in the hospital	/	Inconclusive
<b>Biomedical and clinical factors</b>		
Delivery mode	4 (3 in high quality and 1 in low quality)	Strong
EBF; lack of paternal attendance at BF classes; prenatal examination; lack of BF counseling; complications of pregnancy; infant's admission to NICU; infant birth weight; gestational age; nipple pain	/	Inconclusive
<b>Belief and cognitive factors</b>		
Perception of insufficient human milk	2 (high quality)	Strong
Mothers' Infant feeding attitude	2 (high quality)	Strong
Breastfeeding self-efficacy	2 (1 in high quality and 1 in low quality)	Strong
Breastfeeding knowledge	2 (1 in high quality and 1 in low quality)	Moderate
<b>Behavioral intention factor</b>		
Breastfeeding intention	2 (high quality)	Strong

7th item in the checklist for a cohort study in regards to the reliability of outcome measurement was unclear. Also, the 6th and 7th items of the checklist for a cross-sectional study were unclear in some studies. In terms of cross-sectional studies, some of these studies did not use the random sampling method, so the representativeness of the samples was affected. The details of unresponsive participants and whether the coverage of the identified sample was sufficient or not in some studies were not described in detail as well. One cohort study and one cross-sectional study have an overall score below 50% (Kim et al., 2013; Zhu et al., 2019).

## Factors investigated

Theory of Planned Behavior is a theory which can be used to predict behaviors. It contains three components: belief variables (attitude toward the behavior, subjective norm, and perceived control), intention, and behavior (Ajzen, 1991). According to Theory of Planned Behavior and other literature, those factors were grouped together into four categories: demographic and socioeconomic factors, biomedical and clinical factors, belief and cognitive factors, behavioral intention factors. The evidence level of each category can be seen in Table 5. The relationship between each factor and 6-month EBF is described as follows:

### Demographic and socioeconomic factors

Thirteen of the included articles described the characteristic of the mothers' ages (Al-Sahab et al., 2010; Alzaheb, 2017; Cox et al., 2015;

De Roza et al., 2019; Dun-Dery & Laar, 2016; Economou et al., 2018; El Shafei & Labib, 2014; Hegazi et al., 2019; Kim et al., 2013; Langelier et al., 2012; Sasaki et al., 2010; Walsh et al., 2019; Zhu et al., 2019). Eight of these studies showed that the mean age of the mothers ranged from 25 to 31 years (Cox et al., 2015; De Roza et al., 2019; El Shafei & Labib, 2014; Hegazi et al., 2019; Kim et al., 2013; Langelier et al., 2012; Walsh et al., 2019; Zhu et al., 2019). Three studies limited participants to English-speaking mothers (De Roza et al., 2019), professional working mothers (Dun-Dery & Laar, 2016), and mothers with a singleton pregnancy and EBF intention (Nnebe-Agumadu et al., 2016), respectively. The mothers in five studies came from rural areas (Cox et al., 2015; El Shafei & Labib, 2014; Kang et al., 2007; Kishore et al., 2009; Walsh et al., 2019).

Thirteen out of 17 studies reported on the predicting association between demographics and EBF for 6 months (Al-Sahab et al., 2010; Alzaheb, 2017; De Roza et al., 2019; Dun-Dery & Laar, 2016; Economou et al., 2018; El Shafei & Labib, 2014; Hegazi et al., 2019; Kang et al., 2007; Kim et al., 2013; Langelier et al., 2012; Sasaki et al., 2010; Walsh et al., 2019; Zhu et al., 2019). Seven papers found that parental education attainment has an effect on the EBF practice, but with inconsistent findings (Al-Sahab et al., 2010; De Roza et al., 2019; Economou et al., 2018; Hegazi et al., 2019; Kang et al., 2007; Kim et al., 2013; Zhu et al., 2019). There were four studies that showed that higher maternal education was a facilitator to EBF (Al-Sahab et al., 2010; De Roza et al., 2019; Economou et al., 2018; Kim et al., 2013). In contrast, three studies found that mothers with lower education were more likely to practice EBF for 6 months (Hegazi et al., 2019; Kang et al., 2007; Zhu et al., 2019). In addition, Zhu et al. (2019) also found that the educational levels of husbands were very important



and those with a bachelor's degree can promote mothers' EBF (Zhu et al., 2019). Five articles examined the association between maternal working status and 6-month EBF (Al-Sahab et al., 2010; Alzaheb, 2017; Dun-Dery & Laar, 2016; Langellier et al., 2012; Sasaki et al., 2010). Compared with unemployed mothers, employed mothers were less likely to maintain EBF until 6 months (Al-Sahab et al., 2010; Alzaheb, 2017; Sasaki et al., 2010). Maternal leave for the duration of less than 3 months was an important predictor for discontinuing EBF (Dun-Dery & Laar, 2016; Langellier et al., 2012).

In addition, multipara (a woman who has given birth to more than one living child) (Al-Sahab et al., 2010; Zhu et al., 2019), non-Saudi nationalities (Alzaheb, 2017), non-minority mothers (Kang et al., 2007), non-Hispanic whites (Langellier et al., 2012), living with a partner (Al-Sahab et al., 2010), no recipients of a formula discharge pack in the hospital (Langellier et al., 2012), and better economic performance (Kang et al., 2007) were favorable factors predicting 6-month EBF. Al-Sahab et al. (2010) also reported that lower prepregnancy body mass index (a person's weight in kilograms divided by the square of height in meters), delivery at home and non-smoking during pregnancy have a positive effect on 6-months EBF (Al-Sahab et al., 2010). The results of two studies conducted in Korea (Kim et al., 2013) and Egypt (El Shafei & Labib, 2014) indicated that a younger maternal age had a positive effect on EBF, while Al-Sahab et al. (2010) reported the opposite in their study (Al-Sahab et al., 2010). The predicting effect of residential address on EBF was also inconsistent and inconclusive (Al-Sahab et al., 2010; Kim et al., 2013; Zhu et al., 2019).

## Biomedical and clinical factors

Delivery mode was a major factor affecting 6-month EBF. Compared with spontaneous delivery, mothers with cesarean section were significantly at a greater risk of stopping EBF before 6 months (Al-Sahab et al., 2010; Alzaheb, 2017; Dun-Dery & Laar, 2016; Zhu et al., 2019). Lack of professional support can significantly predict the early cessation of EBF, like lack of infant feeding recommendation and health education from health workers (Dun-Dery & Laar, 2016; El Shafei & Labib, 2014), prenatal examinations (Zhu et al., 2019), and BF counseling (Kishore et al., 2009). The existence of complications during pregnancy (El Shafei & Labib, 2014; Zhu et al., 2019) can prevent EBF up to 6 months as well.

The poor health status of both mother and baby was also found to have a negative impact on EBF for 6 months. Two studies respectively mentioned that nipple pain of mothers (Hegazi et al., 2019) and infant's admission to the neonatal intensive care unit (NICU) (Al-Sahab et al., 2010) were significant predictors of stopping EBF before 6 months postpartum. Mothers of infants with a low birth weight (babies who are born weighing less than 2500 g) (Alzaheb, 2017) or smaller gestational age (Zhu et al., 2019) were significantly at a greater risk of ending EBF before 6 months. While early initiation of breastfeeding (EIBF) was found to be a positive predictor of EBF for 6 months in one study conducted in the USA (Walsh et al., 2019).

## Belief and cognitive factors

According to the theory of Planned Behavior, attitude and self-efficacy can be regarded as belief variables, predicting a particular behavior (Ajzen, 1991). Strong evidence supported by two studies showed that mothers' infant feeding attitude (IFA) had a positive effect on 6-month EBF (Cox et al., 2015; Nnebe-Agumadu et al., 2016). A study coming from Singapore found that breastfeeding self-efficacy (BFSE) can significantly predict EBF up to 6 months (De Roza et al., 2019). Confidence in BF also played an important role in sustaining EBF for 6 months (Zhu et al., 2019).

As an important cognitive factor, BF knowledge (El Shafei & Labib, 2014; Zhu et al., 2019) was a favorable factor predicting 6-month EBF. Two high quality studies examined the effect of mothers' perception of sufficient human milk on EBF outcome (De Roza et al., 2019; Hegazi et al., 2019). Mothers with a perception of insufficient human milk can negatively affect the maintenance of EBF up to 6 months.

## Behavioral intention factor

Two studies examined the effect of intention to breastfeed on EBF practice, and reported strong predictive power of maternal intention to breastfeed for 6-month EBF (De Roza et al., 2019; Sasaki et al., 2010). Women with the intention to breastfeed were more likely to insist on EBF for 6 months.

## DISCUSSION

This systematic review adds to the current understanding of factors related to 6-month EBF with quantitative research. An understanding of these factors can guide future studies on EBF and help healthcare providers promote EBF to meet the WHO recommendation through establishing effective measures. Although the included studies in this review found a number of related factors, the main ones supported by moderate to strong evidence were working status, BF knowledge, delivery mode, multiparous mothers, mothers' perception of insufficient human milk, IFA, BFSE, and intention to BF. The associations between these predicting factors and EBF for 6 months will be further discussed as follows:

### Demographics of mothers

There is strong evidence to support the significant effect of maternal work status on EBF to 6 months. In line with a previous study in Egypt (Abou-ElWafa & El-Gilany, 2019), this review also found that working mothers, especially those who returned to work before 6 months, were less likely to exclusively breastfeed their infants. Another study coming from Hong Kong indicated that short maternity leave increased the

discontinuous risk of BF (Tarrant et al., 2002). This could be universal simply due to the fact that unemployed mothers have more time to accompany their infants and practice EBF than working mothers. The length of maternity leave varies greatly in different countries. Mothers in the United Kingdom can enjoy 52 weeks maternity leave (Vilas, 2018), while those living in Thailand and China only have 90 and 98 days for maternity leave, respectively. The extension of maternity leave was associated with the duration of BF. Similarly, Chai et al. (2018) found that a 1-month increase in the duration of paid maternity leave can result in a 5.9% increase in EBF (Chai et al., 2018). A BF policy brief proposed in WHA Global Nutrition Targets 2025 suggests that mandatory paid maternity for 6 months should be enacted to empower women to exclusively breastfeed their infants, and it stipulates that the workplace needs to provide facilities and places to support EBF (WHO, 2014). It is also a practical way to provide professional support about the knowledge and skills of maintaining EBF (e.g., expressing and storing breast milk) for mothers returning to work.

Moderate evidence supports multipara as another important predictor of 6-month EBF. Multipara had extensive BF experience and higher motivation to exclusively breastfeed their infants (Whipps, 2017). First-time mothers may meet many difficulties in BF due to the lack of knowledge and experience, resulting in a frustrating experience. A qualitative research studied the early BF experience of first-time mothers and found that mothers have problems in motherhood transition, understanding baby behavior, as well as forming a correct perception of sufficient milk supply (Kronborg et al., 2015). Chu et al. (2019) found that an information-motivation-behavioral skills model (IMB) intervention was helpful in improving both BF knowledge and BFSE for primiparous mothers (Chu et al., 2019). Mothers especially first-time mothers should be given more professional support.

## Biomedical and clinical factors

Cesarean delivery was an important barrier for maintaining EBF up to 6 months, which is supported by strong evidence. Cesarean births have become more common globally. The rate of cesarean delivery in the United States was 31.9% in 2018, which went well beyond the WHO goal of 10%–15% (Burke & Allen, 2020). From 2008–2014, the rate of cesarean sections in China also increased year by year, reaching 34.9% (Li et al., 2017). Certain types of anesthesia have a negative effect on lactation, leading to the delayed initiation of BF and the early introduction of formula in hospitals (Chen et al., 2018; Kling et al., 2016). A prospective study coming from India also reported that a cesarean delivery was an independent predictor of delayed BF initiation, which increased the risk of EBF cessation (Raghavan et al., 2013). Pain can increase the discomfort of BF. Each 1-point increase in the average score of postoperative pain resulted in a 21% reduction in EBF (Babazade et al., 2019). Increasing evidence suggest that early skin-to-skin contact is good for improving BF outcomes after caesarean delivery, but it is still something uncommon in clinical practice (Stevens, 2018). As a special group, nurses and mid-wives must pay more attention to BF in parturient women undergoing a caesarean section, help-

ing them to initiate BF early and achieve EBF through incorporating interventions like skin-to-skin care into routine nursing. More evidence about improving EBF rate after cesarean delivery is needed for future studies.

## Belief and cognitive factors

Mothers' perception of insufficient human milk, IFA, and BFSE were psychological factors predicting EBF. A cross-sectional study indicated that 44% of mothers had a perception of insufficient breast milk, which was a common barrier to BF (Hendaus et al., 2018). Infants crying after BF are considered as insatiable cues, and mothers with a perception of insufficient breast milk might worry that their babies' needs cannot be met without adding formula milk (Tang, 2019). The introduction of formula milk would reduce the frequencies of nipple sucking in turn, and then the amount of lactation would decrease. Anticipatory guidance about the perception of insufficient breast milk and related behaviors affecting the milk supply should be provided during prenatal, in-hospital, and early postpartum guidance. Twells et al. (2016) mentioned that maternal attitudes were more predictive of BF duration than sociodemographic factors (Twells et al., 2016). Mothers who believe the breast milk is the economic, convenient, and optimal source of nutrition rather than formula are more predisposed towards BF (Cox et al., 2015). The prenatal value of mothers on BF is strongly associated with the initiation and duration of EBF (Nnebe-Agumadu et al., 2016). Maternal attitude toward EBF is a modifiable factor through a multi-component intervention. A meta-analysis indicated that education and supportive interventions based on e-technology like the Internet, and mobile phone can significantly improve the BF attitude of mothers (Lau et al., 2016). Maternal attitude toward BF can be a strong focus of future intervention programs improving the BF attitude of mothers.

Breastfeeding self-efficacy is the mothers' confidence in BF their infants. BFSE was positively related to BF intention. Mothers who believe that they are capable to exclusively breastfeed their infants were more likely to intend to breastfeed (De Jager et al., 2014). Otsuka et al. (2014) found that BFSE has a predicting effect on BF duration and exclusivity, since mothers with high self-efficacy can overcome difficulties of BF their infants (Otsuka et al., 2014). A study from Vietnam indicated that mothers with less social support might experience a diminished sense of BFSE (Ngo et al., 2019). While a systematic review reported that for every point increase in self-efficacy score, the rate of EBF increased by 10% (Brockway et al., 2017). A self-efficacy-based BF educational program including BF workshop during pregnancy and 2-week telephone counseling after birth can significantly increase the BFSE of mothers (Chan et al., 2016).

Breastfeeding knowledge is a modifiable factor supported by moderate evidence. A lack of knowledge about BF can lead to mothers making hasty decisions and easily giving up on EBF. Mothers who lacked information on BF during antenatal care were at high risk of early termination of EBF for 6 months (Raheel & Tharkar, 2018). It is reported that professional support was a strong predictor in the improvement of knowledge related to BF, while inconsistent communication among

healthcare providers and gaps in practice were noted (Hamze et al., 2019). There is a need to strengthen BF education from prenatal to postpartum, from hospital to home, and together with the training and supervision of health caregivers, making sure that mothers can receive timely, accurate, and adequate information or knowledge for maintaining EBF.

## Behavioral intention factor

Maternal BF intention was consistently identified as a strong predictor of EBF intensity and duration (Al-Barwani, 2017). Mothers with a husband who prefers BF, previous BF experience, and attendance to prenatal BF classes are more likely to intend to exclusively breastfeed their infants (Lok et al., 2017). It is better to conduct BF education involving the social network of mothers, like a spouse or partner and grandmothers, and also the mothers' emotional states should be taken into consideration when developing interventions to maximize BF support for mothers and to encourage them to insist on EBF for 6 months.

## Limitations

There are some limitations to this review. First, the language of this review is limited to English and Chinese, and most of the included studies are from high income countries. Additional studies coming from high burden countries or non-English speaking countries may enrich the findings of this systematic review. Second, some participants in the cross-sectional studies were well beyond 6 months after birth, leading to recall bias. Some studies did not provide details about loss of participants or low response rates which might also result in bias. Third, this study focused on EBF for 6 months in healthy mothers, but not on the effects of maternal and child-related factors on EBF in nonhealthy conditions. Fourth, heterogeneity and missing information were common in the characteristics of the mothers, spouses, and infants, which may also have effects on the findings about factors related to 6-month EBF. Fifth, this study only focused on quantitative research, the inclusion of multiple types of literature with a consistent definition of EBF, such as qualitative studies, can help us better understand the factors predicting EBF for 6 months.

## Implications

### Implications for practice

Based on the factors affecting 6-month EBF found in our systematic review, we proposed some suggestions regarding nursing practice for promoting EBF up to 6 months:

- Belief and behavioral intention related factors play important roles in maintaining EBF for 6 months. Nurses need to conduct dynamic assessments of mothers' attitudes, self-efficacy, perception of insuff-

ficient human milk, and intentions to breastfeed with reliable instruments, and look for related causes so as to develop targeted interventions.

- Healthcare providers should have sufficient knowledge of EBF, including 6-month EBF related determinants, to guide mothers and even their families to breastfeed their infants exclusively. Therefore, there is a need for training healthcare providers to help them update their knowledge and ideas about EBF, thus they can provide more professional guidance to the mothers and their families.
- Although the working status of mothers, delivery mode, and parity cannot be modified for most of the time, it does not mean that the healthcare providers can do nothing for them.

For mothers who return to work before 6 months postpartum, nurses can provide technical guidance on maintaining EBF at the workplace, such as maintenance of lactation, pumping, and storing human milk. Helping mothers with cesarean sections to initiate BF early, to increase the intensity of BF, and to achieve EBF as far as possible is also an important part of the work provided by nurses. As novices, first-time mothers need more support in terms of BF knowledge and skills, which is essential for them to improve their self-efficacy and achieve EBF. In nursing practice, nurses should identify mothers in these special groups early and provide adequate professional support to them.

## Implementations for research

Although there is wealth of literature exploring the factors that influence EBF, literature that focuses on the maintenance of EBF for 6 months is limited. Future research from different countries in different populations with rigorous and scientific design are needed, thus achieving more authentic and richer data about EBF. Also, according to the factors found in our systematic review, targeted anticipatory guidance or evidence-based interventions from prenatal to postpartum should be developed in the future studies, contributing to improving maternal and child health outcomes.

## CONCLUSION

Breastfeeding is closely related to both maternal and infants' health. The WHO recommends 6-month EBF as the most optimal option for feeding infants, however, the present situation does not reflect this which is unacceptable. This review identifies that 6-month EBF is influenced by multiple factors. With these determinants, healthcare providers can better understand the reasons for discontinuing EBF before 6 months. Among these factors, belief and behavioral intention related factors are supported by more articles and stronger evidence than other modified factors, which suggest that changes of maternal belief and intention towards BF during the process of maintaining EBF are worthy of our attention. No matter whether these factors can be corrected or not, healthcare professionals should take targeted measures in many ways to help mothers successfully achieve 6-month EBF.

## AUTHOR CONTRIBUTIONS

Study design: Qian WU, Chintana WACHARASIN.

Data collection and analysis: Qian WU, Chintana WACHARASIN, Nan TANG.

Manuscript writing: Qian WU, Chintana WACHARASIN.

## ACKNOWLEDGMENTS

This review was supported by Project of Yancheng Science and Technology Bureau, Jiangsu province of China (grant number: YK2017056).

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ORCID

Qian Wu RN, PhD Candidate  <https://orcid.org/0000-0002-7747-3338>

Chintana Wacharasin RN, PhD  <https://orcid.org/0000-0002-1266-6120>

## REFERENCES

- Abebe, Z., Takele, W. W., Anlay, D. Z., Ekubagewargies, D. T., Getaneh, Z., Abebe, M., & Melku, M. (2018). Prevalence of anemia and its associated factors among children in Ethiopia: A protocol for systematic review and meta-analysis. *EJIFCC*, 29(2), 138–145.
- Abou-ElWafa, H. S., & El-Gilany, A. H. (2019). Maternal work and exclusive breastfeeding in Mansoura, Egypt. *Family practice*, 36(5), 568–572. <https://doi.org/10.1093/fampra/cmy120>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Al-Barwani, S. (2017). Employing the theory of planned behavior to predict breastfeeding intention and intensity in Oman. [Doctoral thesis, The University of North Carolina]. Carolina Digital Repository. <https://cdr.lib.unc.edu/concern/dissertations/xw42n850j>
- Al-Sahab, B., Lanes, A., Feldman, M., & Tamim, H. (2010). Prevalence and predictors of 6-months exclusive breastfeeding among Canadian women: a national survey. *BMC Pediatrics*, 10(1), 20–28.
- Alzaheb, R. A. (2017). Factors influencing exclusive breastfeeding in Tabuk, Saudi Arabia. *Clinical Medicine Insights: Pediatrics*, 11, 1–8. <https://doi.org/10.1177/1179556517698>
- Babazade, R., Vadhera, R. B., Krishnamurthy, P., Varma, A., Doulattram, G., Saade, G. R., & Turan, A. (2019). Acute postcesarean pain is associated with in-hospital exclusive breastfeeding, length of stay and postpartum depression. *Journal of Clinical Anesthesia*. <https://doi.org/10.1016/j.jclinane.2019.109697>
- Brahm, P., & Valdés, V. (2017). The benefits of breastfeeding and associated risks of replacement with baby formulas. *Revista Chilena de Pediatría*, 88(1), 7–14. <https://doi.org/10.4067/s0370-41062017000100001>
- Brockway, M., Benzie, K., & Hayden, K. A. (2017). Interventions to improve breastfeeding self-efficacy and resultant breastfeeding rates: A systematic review and meta-analysis. *Journal of Human Lactation*, 33(3), 486–499. <https://doi.org/10.1177/1077724217707957>
- Burke, C., & Allen, R. (2020). Complications of Cesarean birth: Clinical recommendations for prevention and management. *MCN: The American Journal of Maternal/Child Nursing*, 45(2), 92–99. <https://doi.org/10.1097/NMC.0000000000000598>
- Chai, Y., Nandi, A., & Heymann, J. (2018). Does extending the duration of legislated paid maternity leave improve breastfeeding practices? Evidence from 38 low-income and middle-income countries. *BMJ Global Health*, 3(5). <https://doi.org/10.1136/bmjgh-2018-001032>
- Chan, M. Y., Ip, W. Y., & Choi, K. C. (2016). The effect of a self-efficacy-based educational programme on maternal breast feeding self-efficacy, breast feeding duration and exclusive breast feeding rates: A longitudinal study. *Midwifery*, 36(2016), 92–98. <https://doi.org/10.1016/j.midw.2016.03.003>
- Chantray, C., Howard, C., & Auinger, P. (2006). Full breastfeeding duration and associated decrease in respiratory tract infection in US children. *Pediatrics*, 117(2), 425–432. <https://doi.org/10.1542/peds.2004-2283>
- Chen, C., Yan, Y., Gao, X., Xiang, S., He, Q., Zeng, G., Liu, S., Sha, T., & Li, L. (2018). Influences of cesarean delivery on breastfeeding practices and duration: A prospective cohort study. *Journal of Human Lactation*, 34(3), 526–534. <https://doi.org/10.1177/0890334417741434>
- Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., Bahl, R., & Martines, J. (2015). Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatrica*, 104(467), 96–113. <https://doi.org/10.1111/apa.13102>
- Chu, J. Y., Jiang, B., Gao, Y. P., Li, L., Yang, M. J., Ma, F. F., & Liu, X. L. (2019). Evaluation on the effect of exclusive breastfeeding among women with primipara, using the Information-motivation-behavioral skills model intervention model. *Zhonghua Liu Xing Bing Xue Za Zhi*, 40(12), 1639–1644.
- Cox, K. N., Giglia, R. C., & Binns, C. W. (2015). The influence of infant feeding attitudes on breastfeeding duration: Evidence from a cohort study in rural Western Australia. *International Breastfeeding Journal*, 10(1), 25–33. <https://doi.org/10.1186/s13006-015-0048-3>
- De Jager, E., Skouteris, H., Broadbent, J., Amir, L., & Mellor, K. (2013). Psychosocial correlates of exclusive breastfeeding: a systematic review. *Midwifery*, 29(5), 506–518. <https://doi.org/10.1016/j.midw.2012.04.009>
- De Jager, E., Broadbent, J., Fuller-Tyszkiewicz, M., & Skouteris, H. (2014). The role of psychosocial factors in exclusive breastfeeding to six months postpartum. *Midwifery*, 30(6), 657–666. <https://doi.org/10.1016/j.midw.2013.07.008>
- Del Ciampo, L. A., & Del Ciampo, I. R. L. (2018). Breastfeeding and the benefits of lactation for women's health. *Revista Brasileira de Ginecologia e Obstetrícia / RBGO Gynecology and Obstetrics*, 40(6), 354–359. <https://doi.org/10.1055/s-0038-1657766>
- De Roza, J. G., Fong, M. K., Ang, B. L., Sadon, R. B., Koh, E. Y. L., & Teo, S. S. H. (2019). Exclusive breastfeeding, breastfeeding self-efficacy and perception of milk supply among mothers in Singapore: A longitudinal study. *Midwifery*, 79(2019), 102532. <https://doi.org/10.1016/j.midw.2019.102532>
- Duan, Y., Yang, Z., Lai, J., Yu, D., Chang, S., Pang, X., Jiang, S., Zhang, H., Bi, Y., Wang, J., Scherpier, R., Zhao, L., & Yin, S. (2018). Exclusive breastfeeding rate and complementary feeding indicators in China: a national representative survey in 2013. *Nutrients*, 10(2), 249–257. <https://doi.org/10.3390/nu10020249>
- Dun-Dery, E. J., & Laar, A. K. (2016). Exclusive breastfeeding among city-dwelling professional working mothers in Ghana. *International Breastfeeding Journal*, 11(1), 23–31. <https://doi.org/10.1186/s13006-016-0083-8>
- Economou, M., Kolokotroni, O., Paphiti-Demetriou, I., Kouta, C., Lambrinou, E., Hadjigeorgiou, E., Hadjiona, V., Tryfonos, F., Philippou, E., & Middleton, N. (2018). Prevalence of breast-feeding and exclusive breast-feeding at 48 h after birth and up to the sixth month in Cyprus: The BrEaST start in life project. *Public Health Nutrition*, 21(5), 967–980. <https://www.cambridge.org/core/journals/public-health-nutrition/article/prevalence-of-breastfeeding-and-exclusive-breastfeeding-at-48-h-after-birth-and-up-to-the-sixth-month-in-cyprus-the-breast-start-in-life-project/CDEA82745B5CBF12A472C767F9755ED9>
- El Shafei, A. M. H., & Labib, J. R. (2014). Determinants of exclusive breastfeeding and introduction of complementary foods in rural Egyptian communities. *Global Journal of Health Science*, 6(4), 236–244. <https://doi.org/10.5539/gjhs.v6n4p236>
- Hamze, L., Mao, J., & Reifsnider, E. (2019). Knowledge and attitudes towards breastfeeding practices: a cross-sectional survey of postnatal mothers



- in China. *Midwifery*, 74(2019), 68–75. <https://doi.org/10.1016/j.midw.2019.03.009>
- Hegazi, M. A., Allebdli, M., Almohammadi, M., Alnafie, A., Al-Hazmi, L., & Alyoubi, S. (2019). Factors associated with exclusive breastfeeding in relation to knowledge, attitude and practice of breastfeeding mothers in Rabigh community, Western Saudi Arabia. *World Journal of Pediatrics*, 15(6), 601–609. <https://doi.org/10.1007/s12519-019-00275-x>
- Hendaus, M. A., Alhammadi, A. H., Khan, S., Osman, S., & Hamad, A. (2018). Breastfeeding rates and barriers: a report from the state of Qatar. *International Journal of Women's Health*, 10, 467–475. <https://doi.org/10.2147/IJWH.S161003>
- Jama, A., Gebreyesus, H., Wubayehu, T., Gebregyorgis, T., Teweldemedhin, M., Berhe, T., & Berhe, N. (2020). Exclusive breastfeeding for the first six months of life and its associated factors among children age 6–24 months in Burao district, Somaliland. *International Breastfeeding Journal*, 15(1), 5–12. <https://doi.org/10.1186/s13006-020-0252-7>
- Kang, Y. J., Yan, H., Wang, J. L., Li, Q., Xiao, S. B., Bi, Y. X., & Xie, H. (2007). The introduction of breastfeeding in children under age of three in the counties of western China in 2005. *China Journal of Epidemiol*, 28(2), 109–114.
- Khan, M. N., & Islam, M. M. (2017). Effect of exclusive breastfeeding on selected adverse health and nutritional outcomes: A nationally representative study. *BMC Public Health*, 17(1), 889–895. <https://doi.org/10.1186/s12889-017-4913-4>
- Kim, M. J., Kim, Y. M., & Yoo, J. H. (2013). Factors affecting exclusive breastfeeding during the first 6 months in Korea. *Pediatrics International*, 55(2), 177–180. <https://doi.org/10.1111/ped.12004>
- Kishore, M. S. S., Kumar, P., & Aggarwal, A. K. (2009). Breastfeeding knowledge and practices amongst mothers in a rural population of North India: A community-based study. *Journal of Tropical Pediatrics*, 55(3), 183–188. <https://doi.org/10.1093/tropej/fmn110>
- Kling, D., Haile, Z. T., Francescon, J., & Chertok, I. (2016). Association between method of delivery and exclusive breastfeeding at hospital discharge. *The Journal of the American Osteopathic Association*, 116(7), 430–439. <https://doi.org/10.7556/jaoa.2016.087>
- Korsten, L. H., Jansen, F., de Haan, B. J., Sent, D., Cuijpers, P., Leemans, C. R., & Verdonck-de Leeuw, I. M. (2019). Factors associated with depression over time in head and neck cancer patients: A systematic review. *Psycho-Oncology*, 28(6), 1159–1183. <https://doi.org/10.1002/pon.5058>
- Kramer, M. S., & Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. *Cochrane Database of Systematic Reviews*, 2012(8). <https://doi.org/10.1002/14651858.cd003517>
- Krol, K. M., & Grossmann, T. (2018). Psychological effects of breastfeeding on children and mothers. *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, 61(8), 977–985. <https://doi.org/10.1007/s00103-018-2769-0>
- Kronborg, H., Harder, I., & Hall, E. O. C. (2015). First time mothers' experiences of breastfeeding their newborn. *Sexual & Reproductive Healthcare*, 6(2), 82–87. <https://doi.org/10.1016/j.srhc.2014.08.004>
- Langellier, B. A., Chaparro, M. P., & Whaley, S. E. (2012). Social and institutional factors that affect breastfeeding duration among WIC participants in Los Angeles County, California. *Maternal and Child Health Journal*, 16(9), 1887–1895. <https://doi.org/10.1007/s10995-011-0937-z>
- Lau, Y., Htun, T. P., Tam, W. S., & Klainin-Yobas, P. (2016). Efficacy of e-technologies in improving breastfeeding outcomes among perinatal women: A meta-analysis. *Maternal & Child Nutrition*, 12(3), 381–401. <https://doi.org/10.1111/mcn.12202>
- Li, H. T., Luo, S., Trasande, L., Hellerstein, S., Kang, C., Li, J. X., Zhang, Y., Liu, J. M., & Blustein, J. (2017). Geographic variations and temporal trends in cesarean delivery rates in China, 2008–2014. *Jama*, 317(1), 69–76. <https://doi.org/10.1001/jama.2016.18663>
- Lok, K. Y. W., Bai, D. L., & Tarrant, M. (2017). Family members' infant feeding preferences, maternal breastfeeding exposures and exclusive breastfeeding intentions. *Midwifery*, 76(OCE4). <https://doi.org/10.1016/j.midw.2017.07.003>
- Ma, H., Bernstein, L., Pike, M. C., & Ursin, G. (2006). Reproductive factors and breast cancer risk according to joint estrogen and progesterone receptor status: A meta-analysis of epidemiological studies. *Breast Cancer Research*, 8(4), 1–11. <https://doi.org/10.1186/bcr1525>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine*, 151(4), 264–269. <https://doi.org/10.7326/0003-4819-151-4-200908180-00135>
- Munn, Z., Moola, S., Lisy, K., Riitano, D., & Tufanaru, C. (2015). Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data. *International Journal of Evidence-Based Healthcare*, 13(3), 147–153. <https://doi.org/10.1097/xe.0000000000000054>
- Ngo, L. T. H., Chou, H. F., Gau, M. L., & Liu, C. Y. (2019). Breastfeeding self-efficacy and related factors in postpartum Vietnamese women. *Midwifery*, 70(2019), 84–91. <https://doi.org/10.1016/j.midw.2018.12.014>
- Nnebe-Agumadu, U. H., Racine, E. F., Laditka, S. B., & Coffman, M. J. (2016). Associations between perceived value of exclusive breastfeeding among pregnant women in the United States and exclusive breastfeeding to three and six months postpartum: A prospective study. *International Breastfeeding Journal*, 11(1), 8–17. <https://doi.org/10.1186/s13006-016-0065-x>
- Otsuka, K., Taguri, M., Dennis, C.-L., Wakutani, K., Awano, M., Yamaguchi, T., & Jimba, M. (2014). Effectiveness of a breastfeeding self-efficacy intervention: Do hospital practices make a difference? *Maternal and Child Health Journal*, 18(1), 296–306. <https://doi.org/10.1007/s10995-013-1265-2>
- Raghavan, V., Bharti, B., Kumar, P., Mukhopadhyay, K., & Dhaliwal, L. (2013). First hour initiation of breastfeeding and exclusive breastfeeding at six weeks: Prevalence and predictors in a tertiary care setting. *The Indian Journal of Pediatrics*, 81(8), 743–750. <https://doi.org/10.1007/s12098-013-1200-y>
- Raheel, H., & Tharkar, S. (2018). Why mothers are not exclusively breastfeeding their babies till 6 months of age? Knowledge and practices data from two large cities of the Kingdom of Saudi Arabia. *Sudanese Journal of Paediatrics*, 18(1), 28–38. <https://doi.org/10.24911/sjp.2018.1.5>
- Richardson, L., & Walters, T. (2014). *Infant and young children feeding in emergencies: Guidance for programming*. European Commission.
- Safadi, R. R., Abushaikh, L. A., & Ahmad, M. M. (2016). Demographic, maternal, and infant health correlates of post-partum depression in Jordan. *Nursing & Health Sciences*, 18(3), 306–313. <https://doi.org/10.1111/nhs.12268>
- Sasaki, Y., Ali, M., Kakimoto, K., Saroeun, O., Kanal, K., & Kuroiwa, C. (2010). Predictors of exclusive breast-feeding in early infancy: A survey report from Phnom Penh, Cambodia. *Journal of Pediatric Nursing*, 25(6), 463–469. <https://doi.org/10.1016/j.pedn.2009.04.010>
- Stevens, J. R. (2018). Facilitators, barriers and implications of immediate skin-to-skin contact after caesarean section: An ethnographic study. [Doctoral thesis, Western Sydney University]. ProQuest. <https://www.proquest.com/openview/e8050dcf869239209ca88a406f94e499/1?pq-origsite=gscholar&cbl=2026366>
- Tang, R. H. (2019). *Analysis of factors influencing breastfeeding*. [Master's thesis, Nanchang University]. CNKI. <https://chkdx.cnki.net/kns/brief/result.aspx?dbprefix=CDMH>
- Tarrant, M., Dodgson, J. E. J., & Tsang Fei, S. (2002). Initiating and sustaining breastfeeding in Hong Kong: Contextual influences on new mother's experiences. *Nursing & Health Sciences*, 4(4), 181–191. <https://doi.org/10.1046/j.1442-2018.2002.00125.x>
- The Joanna Briggs Institute. (2016). *Joanna Briggs institute reviewers' manual: 2016 Edition*. The Joanna Briggs Institute. <https://joanna-briggs-institute-reviewers-manual-2016-edition.pearx.com/>
- Tsai, T. I., Huang, S. H., & Lee, S. Y. D. (2015). Maternal and hospital factors associated with first-time mothers' breastfeeding practice: A prospective study. *Breastfeeding Medicine*, 10(6), 334–340. <https://doi.org/10.1089/bfm.2015.0005>

- Tshering, D., Gurung, M. S., Wangmo, N., Pelzom, D., Tejavivaddhana, P., & Dzied, L. (2018). Prevalence of exclusive breastfeeding and factors associated with exclusive breastfeeding of children in Trongsa District, Bhutan. *Asia Pacific Journal of Public Health*, 30(4), 369–377. <https://doi.org/10.1177/1010539518768573>
- Twells, L. K., Midodzi, W. K., Ludlow, V., Murphy-Goodridge, J., Burrage, L., Gill, N., Halfyard, B., Schiff, R., & Newhook, L. A. (2016). Assessing infant feeding attitudes of expectant women in a provincial population in Canada: Validation of the Iowa Infant Feeding Attitude Scale. *Journal of Human Lactation*, 32(3), 9–18. <https://doi.org/10.1177/0890334414559647>
- Unar-Munguia, M., Torres-Mejia, G., Colchero, M. A., & Gonzalez de Cosio, T. (2017). Breastfeeding mode and risk of breast cancer: a dose-response meta-analysis. *Journal of Human Lactation*, 33(2), 422–434. <https://doi.org/10.1177/0890334416683676>
- Vilas, V. (2018). Preparing for staff to go on maternity leave: why there is no need to panic. *Journal of Aesthetic Nursing*, 7(4), 223–225. <https://doi.org/10.12968/joan.2018.7.4.223>
- Walsh, S. M., Cordes, L., McCreary, L., & Norr, K. F. (2019). Effects of early initiation of breastfeeding on exclusive breastfeeding practices of mothers in rural Haiti. *Journal of Pediatric Health Care*, 33(5), 561–567. <https://doi.org/10.1016/j.pedhc.2019.02.010>
- Wang, Y., & Zhou, C. (2019). China should take more measures to raise its breastfeeding rate. *Bioscience Trends*, 13(4), 358–360. <https://doi.org/10.5582/bst.2019.01240>
- Whipps, M. D. (2017). Education attainment and parity explain the relationship between maternal age and breastfeeding duration in US mothers. *Journal of Human Lactation*, 33(1), 220–224. <https://doi.org/10.1177/0890334416679385>
- World Health Organization. (2001, March 28–30). Report of the expert consultation of the optimal duration of exclusive breastfeeding. (Report No. WHO/NHD/01.09). World Health Organization. <https://apps.who.int/iris/handle/10665/67219?locale-attribute=zh&show=full>
- World Health Organization. (2014). *Global nutrition targets 2025: Breastfeeding policy brief*. World Health Organization. [http://www.who.int/nutrition/publications/globaltargets2025\\_policybrief\\_breastfeeding/en/](http://www.who.int/nutrition/publications/globaltargets2025_policybrief_breastfeeding/en/)
- Zhu, H. X., Jiang, P., Zhu, Y. X., Lei, J., Liu, Y., & Zhang, B. Y. (2019). Logistic regression analysis on influencing factors of exclusive breastfeeding in 1918 pairs of mothers and infants. *Maternal and Child Health Care of China*, 34(3), 648–654.

**How to cite this article:** Wu, Q., Tang, N., & Wacharasin, C. (2022). Factors influencing exclusive breastfeeding for 6 months postpartum: A systematic review. *International Journal of Nursing Knowledge*, 1–14. <https://doi.org/10.1111/2047-3095.12360>