

Review Article

Providing Linkage to Breastfeeding Support to Mothers on Discharge to Improve Breastfeeding Outcomes: A Systematic Review

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母乳育児のアウトカムを改善するために退院時の母親に母乳育児支援の情報を提供する —系統的レビュー—

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[Abstract]

Background: We conducted a systematic review to examine the evidence on the importance of providing linkage to breastfeeding (BF) support after discharge, Step 10 of the Ten Steps to Successful Breastfeeding, to improve BF outcomes. **Methods:** We searched CENTRAL, MEDLINE, CINAHL, EMBASE, the British Nursing Index, and the Web of Science on 26 June 2018. Randomised controlled trials (RCTs) were eligible if women received information about BF support at discharge. Methodologic quality was assessed using the Cochrane risk of bias tool 1.0 and the certainty in the evidence using GRADE. **Results:** We included three RCTs with a total of 11,172 participants. There was an increase in the proportion of women exclusively BF at four weeks among those who had scheduled visits compared to those without scheduled visits (and given breastmilk substitutes). Exclusive breastfeeding was significantly decreased at 14 and 24 weeks among women who received a pamphlet compared to those who did not, when there was no referral system or access to further BF support. Women were more likely to still be BF at three months when there was early postnatal home visit compared to when mothers were asked to visit the hospital instead. The provision of additional material improved maternal breast condition, but did not reduce infant morbidities. Evidence was of moderate to very low certainty. **Conclusion:** The evidence is limited and further research is needed to assess the most effective way of fostering the establishment and/or coordination of BF support after discharge from facilities to promote, protect, and support BF.

[Key words] Baby-Friendly Hospital Initiative, Ten Steps to Successful Breastfeeding, step 10, breastfeeding support, breastfeeding promotion

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【要 旨】

背景：母乳育児成功のための10か条のうち、ステップ10である退院後の母乳育児（BF）支援の情報を提供することが重要であることを示すかどうかを検証した。**方法：**2018年6月26日に複数のデータベースを検索した。女性が退院時にBF支援に関する情報を受け取っているランダム化比較試験を対象とした。バイアスの評価は、Cochrane risk of bias tool 1.0を用いて評価し、エビデンスの確実性はGRADEを用いて評価した。**結果：**3つのRCTを対象とし、合計11,172名の参加者が含まれた。定期的な訪問を受けた女性は、定期的な訪問を受けなかった女性と比較して、4週目に完全母乳実施者の割合が増加した。パンフレットを受け取った女性は、14週目および24週目に完全母乳育児が有意に減少した。産後早期に家庭訪問が行われた場合は、病院を訪問するように言われた場合に比べて、3か月後にも母乳育児を続けている女性が多かった。**結論：**エビデンスは（とても低いから中程度）と限られており、さらなる研究が必要である。

【キーワードズ】 赤ちゃんにやさしい病院イニシアティブ、母乳育児成功のための10か条、ステップ10、母乳育児支援、母乳育児促進

I. Background

To promote and support breastfeeding (BF) in facilities worldwide, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have introduced the Baby-friendly Hospital Initiative (BFHI)¹⁾. The "Ten Steps to Successful Breastfeeding" build the foundation of the BFHI and provide a guideline for the best maternity practice to achieve successful BF^{2, 3)}. Steps 1–9 promote and support the establishment of BF within the hospital setting while step 10 refers to "Foster the establishment of BF support groups and refer mothers to them on discharge from the hospital or clinic"¹⁾. Step 10 includes to talk and discuss with mothers the planned way of infant feeding after discharge, to follow-up with mothers once they returned home, and to give mothers contact information in case they need further support from the maternity facility or local BF support groups¹⁾.

Mothers often experience difficulties with BF when they return home which can lead to prematurely discontinued BF⁴⁾. To counteract on the decline in rates and duration of BF at home, social support and the knowledge on how and where to obtain help can be the key to continued BF at this stage.

BF is the best way of infant feeding. Women may encounter challenges to BF their children up to two years of age and beyond as recommended by WHO and UNICEF^{5–7)}. The lack of adequate support after discharge may be one such challenge. Therefore, we aimed to systematically review the evidence on giving women information and providing linkage to BF sup-

port and/or support groups after discharge to improve BF outcomes.

II. Methods

This systematic review was registered at the International Prospective Register of Systematic Reviews (PROSPERO), number CRD42016041273 (22 June 2016).

1. Search strategies

We searched the following databases from inception to 26 June 2018: the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, CINAHL, EMBASE, the British Nursing Index, and the Web of Science. The example search strategy in MEDLINE is shown in Table 1 and was adapted for each database. Additionally, we screened the reference lists of retrieved studies, hand-searched additional journals, grey literature as well as unpublished or ongoing studies. No limits were applied in terms of publication date or language.

2. Study inclusion criteria

We included any randomised controlled trial (RCT) and quasi-RCTs. Other study designs were not eligible for inclusion.

The study population considered included women given birth (vaginally or with caesarean section) in a hospital or maternity facility to a healthy term infant, preterm or very preterm infant, post-term infant; normal-, low-, or very-low-birth-weight infant. Women who breastfed, exclusively breastfed, or not breastfed were eligible for inclusion. Studies assessing women who had

Table 1. Example search strategy in MEDLINE via Ovid

1	Breast Feeding/
2	breast?fe*.tw.
3	(breast* adj (fed or feed*or lactation)). tw.
4	breastfe*.tw.
5	or/1-4
6	Education/
7	Health Education/
8	exp Education, Nursing/
9	Maternal health services/
10	Health Promotion/
11	(education* or train* or instruction* or support*). tw.
12	or/6-11
13	5 and 12
14	exp Health Personnel/
15	exp Peer group/
16	(midwi* or nurse* or (birth* adj attendant*) or (peer* adj1 (counsel* or train* or support*)) or (lactation adj2 consul- tant*)). tw.
17	((health* or matern*) adj2 (staff* or personnel or assis- tant* or worker* or service* or professional* or support* or train* or volunteer* or counsel* or provid*)). tw.
18	or/14-17
19	13 and 18
20	randomized controlled trial.pt.
21	controlled clinical trial.pt.
22	randomi?ed.ab.
23	placebo.ab.
24	clinical trials as topic.sh.
25	randomly.ab.
26	trial.ti.
27	groups.ab.
28	or/20-27
29	19 and 28
30	exp animals/ not humans.sh.
31	29 not 30
32	remove duplicates from 31

not given birth in facilities were excluded.

We included any study that reported on providing information on linkage to BF support for women at discharge compared with no linkage to BF support after discharge from the facility. We excluded interventions that started at the antenatal period.

3. Outcomes

Primary outcomes included exclusive BF (EBF) at 1, 3, and 6 months, any BF up to 12 and 24 months, duration of EBF and any BF. Secondary infant outcomes included weight change within the first week and month of birth, physiological indicators (e.g. temperature, heart rate), morbidity (e.g. respiratory infections, diarrhoea, others), and all-cause mortality. Secondary

maternal outcomes included maternal satisfaction, maternal mental health, successful or positive BF experience, breast condition (such as endorsement and nipple cracks), and adverse events.

4. Study selection and data collection

Three review authors with the help of two additional authors independently assessed potential studies for inclusion using the systematic review software Covidence or Rayyan^{8, 9)}. Disagreements were resolved through discussion.

Two review authors independently extracted the following study information: country and study period, study design and setting, research question, population characteristics and sample size, intervention and comparison, and outcomes.

5. Risk of bias and certainty in the evidence

Methodological quality of included studies was independently assessed by two review authors using the Cochrane Collaboration's risk of bias assessment tool 1.0¹⁰⁾. We resolved any disagreements through discussion.

We used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to assess the certainty in the evidence related to the primary outcomes¹¹⁾. The GRADEpro software was used for assessment and generation of the summary of findings table¹²⁾.

6. Data analysis

Included studies reported different outcomes or different time points; therefore, we were unable to perform meta-analysis. We estimated the effect size using the data provided in the trials. Data were analysed using the Review Manager (RevMan 5.3) software¹³⁾. For dichotomous data, we presented results as odds ratio (OR) or risk ratio (RR) with the corresponding 95% confidence interval (CI). In the cluster RCTs, we adjusted the sample sizes according to the methods described in the Cochrane handbook¹⁰⁾ using an estimate of the intracluster correlation coefficient (ICC) of 0.03 derived from McLachlan et al.¹⁴⁾.

III. Results

1. Search Results

The comprehensive database search identified a total of 1911 records. The study selection process is shown in Figure 1. Finally, three studies were included in the narrative synthesis.

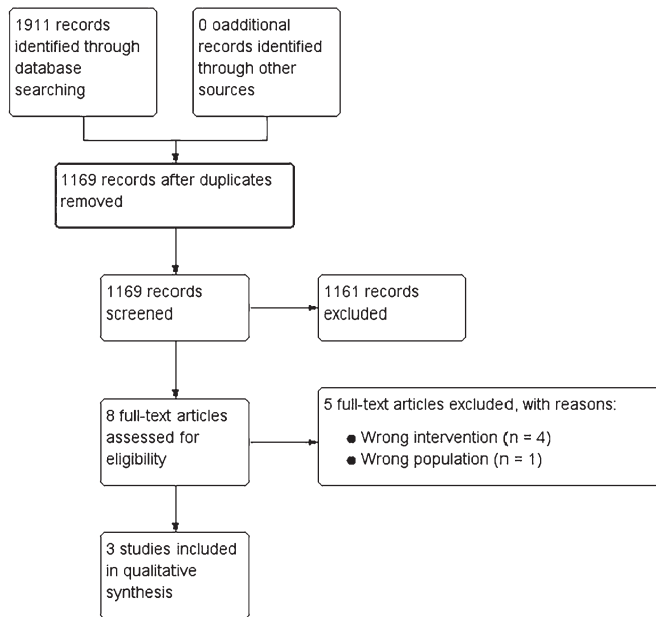


Figure 1. PRISMA flow diagram of study selection.

2. Study characteristics

We included three studies conducted in Australia, DR Congo, and USA between 2004 and 2013 with a total of 11,172 participants^{14–16}. Study characteristic are presented in Table 2. All included studies were RCTs while two trials used a cluster design with three arms^{14, 16}. Participants in all studies were women who gave birth in a hospital or health care facility. Two trials^{15, 16} indicated the birth of healthy, low-risk infants while one trial¹⁴ did not mention the health status of the infants. Interventions and comparisons varied across the studies as well as reported outcomes.

3. Risk of bias

The assessment of the methodologic quality of the included trials is shown in Figure 2. Random sequence generation and allocation concealment was adequate while selective reporting (differences between study protocol and report) and imbalances in baseline characteristics between groups were problematic in all tri-

Table 2. Characteristics of included studies

Study (country and study period)	Study design and setting Research question	Sample size and population characteristics	Interventions and comparison	Outcomes of interest
Hopkinson 2009 ¹⁵ (Houston, Texas, USA, Jan – Dec 2004)	RCT, hospital To assess if the assignment of mother with mixed-fed infants to a breastfeeding (BF) clinic within one week after birth will increase exclusive breastfeeding (EBF) at one month among Hispanic immigrants.	522 women Mothers who had low-risk infants, were mixed feeding in hospital, had telephones, and access to transportation.	Intervention: Scheduled visits to the hospital-based BF clinic at 3 to 7 days postpartum. An appointment reminder card was included with the discharge papers. BF counselling at the BF clinic and additional visits and/or telephone consultations were provided if deemed necessary Comparison: Routine care (4 hours or more of mother – infant separation immediately after delivery, bedside BF assistance before discharge, and free formula discharge packs, telephone number of the hospital's BF clinic and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) office with instructions to call for BF assistance if needed)	EBF at 4 weeks, any BF at 4 weeks, maternal breast condition during the first 4 weeks: engorgement, sore nipples, pain in breast
McLachlan 2016 ¹⁴ (Victoria, Australia, July 2012 – March 2013)	Three arm cluster RCT, local government areas (LGA) units of randomisation To assess if early support at home would increase BF duration in Victorian LGAs with low BF rates.	10 LGAs; 9675 women from 99 maternal and child health (MCH) centres LAGs having a lower rate of any BF at discharge from hospital than the Victorian state average; and more than 450 births per year.	Interventions: 1) Early home visits in addition to usual MCH care, 2) early home visits plus access to BF drop-in centre in addition to usual MCH care [†] Comparison: Usual MCH care (visit of hospital midwife 1-2 days after discharge with a general focus on the well-being of mother and infant)	Any BF at 3, 4, and 6 months
Yotebieng 2015 ¹⁶ (Kinshasa, DR Congo, May 24 – Aug 25, 2012)	Three arm cluster RCT, health care facilities To assess the effect of the implementation of the Ten Steps to Successful Breastfeeding on BF outcomes.	6 clinics; 975 mother-infant pairs enrolled All mothers who gave birth to one healthy child in one of the participating facilities and who intended to attend well-baby clinic visits in the same facility.	Interventions: 1) Implementation of the Baby-Friendly Hospital Initiative steps 1-9 alone, 2) steps 1-10 (included the well-baby clinic staff in the intensive training and women received flyers before discharge to address BF) [†] Comparison: Clinics with standard care	EBF at 14 and 24 weeks, diarrhoea at 14 and 24 weeks of age, respiratory illness (fever with cough) at 14 and 24 weeks of age

[†] For the purpose of this review, only intervention 1 and 2 were compared. BF: breastfeeding; EBF: exclusive breastfeeding; LGA: local government area; MCH: maternal and child health; RCT: randomised controlled trial; WIC: Special Supplemental Nutrition Program for Women, Infants, and Children.

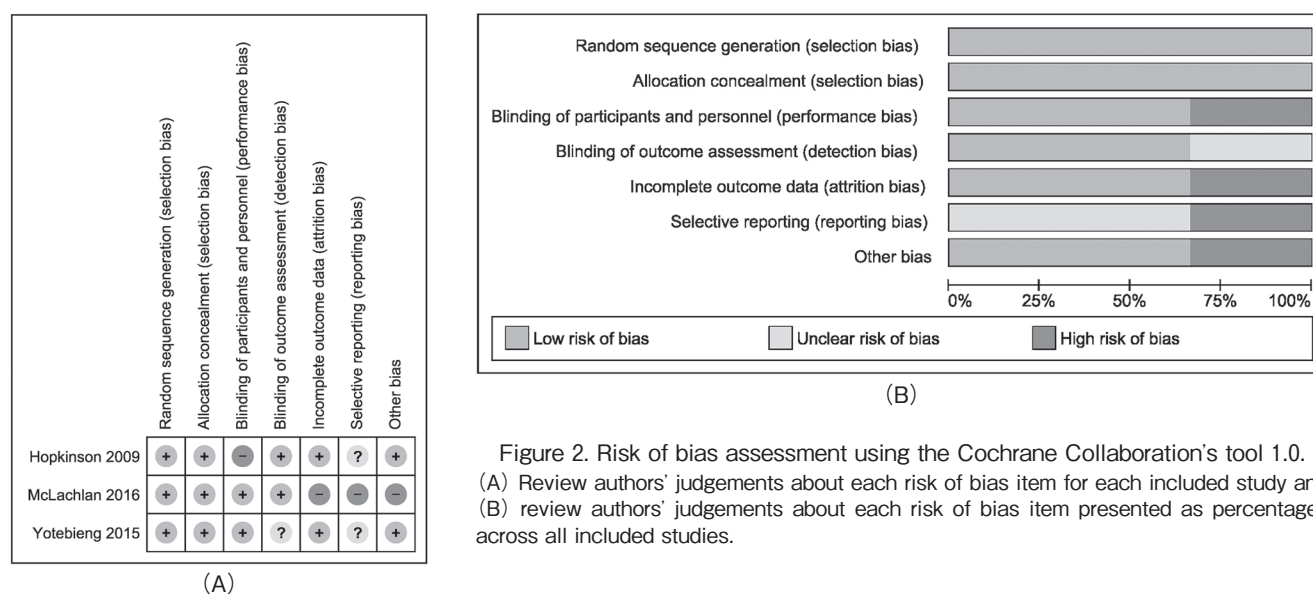


Figure 2. Risk of bias assessment using the Cochrane Collaboration's tool 1.0. (A) Review authors' judgements about each risk of bias item for each included study and (B) review authors' judgements about each risk of bias item presented as percentages across all included studies.

als^{14–16}).

4. Effects of interventions

We estimated the effect sizes using the data presented in the trials (Table 3) and assessed the certainty in the evidence of our primary outcomes (Table 4).

Primary outcomes. Hopkinson et al. showed that assigning immigrant Hispanic mothers to BF counseling within one week after delivery increased the odds of EBF at four weeks by 70% (OR 1.70, 95% CI 0.99–2.90, *low-certainty evidence*) but decreased the odds of any BF (OR 0.69, 95% CI 0.48–1.00, *low-certainty evidence*) compared with women receiving routine care¹⁵. Yotebieng et al. found that the implementation of BFHI steps 1–10 resulted in 62% lower odds of EBF at 14 weeks (OR 0.38, 95% CI 0.17–0.81, *very low-certainty evidence*) and 73% at 24 weeks (OR 0.27, 95% CI 0.11–0.71, *very low-certainty evidence*) compared with implementation of BFHI steps 1–9 alone in six health facilities¹⁶. In McLachlan et al., women receiving early home visits plus access to BF drop-in centre in addition to usual maternal and child health (MCH) care had 20% lower odds of any BF at three months (OR 0.80, 95% CI 0.65–0.98, *moderate-certainty evidence*) compared with women receiving early home visits in addition to usual MCH care¹⁴. There was no clear difference between groups at four months (OR 1.06, 95% CI 0.86–1.30, *moderate-certainty evidence*) and six months (OR 1.03, 95% CI 0.83–1.26, *moderate-certainty evidence*).

Secondary outcomes. Maternal breast condition during the first four weeks was reported in Hopkinson et al.¹⁵. There were no clear differences between inter-

vention and control group for engorgement and sore nipples. However, women receiving scheduled visits to the BF clinic within one week postpartum had a lower risk of experiencing breast pain during the first four weeks compared with women receiving routine care. Infant outcomes were only reported by Yotebieng et al.¹⁶. There was no difference between diarrhoea at 14 and 24 weeks of age and respiratory illness at 14 and 24 weeks of age between the BFHI steps 1–10 and BFHI steps 1–9 group.

IV. Discussion

This systematic review explored the effectiveness of step 10 of the Ten Steps to Successful Breastfeeding and included three RCTs^{14, 16} with a total of 11,172 women. Evidence was of moderate to very low certainty and derived from one study each.

Interventions and comparisons differed substantially and outcomes were reported at different time points, excluding the possibility to perform meta-analysis. Hopkinson et al. showed that mothers scheduled to visit a BF clinic within the first week after birth increased EBF at four weeks (*low-certainty evidence*), even though mixed feeding was initiated in the hospital¹⁵. The intervention reduced the proportion of mothers supplementing with water or herbal tea but not formula¹⁵. In the cluster RCT conducted in DR Congo by Yotebieng et al., the proportion of mothers exclusively BF at 14 weeks (*very low-certainty evidence*) and 24 weeks (*very low-certainty evidence*) from clinics assigned to BFHI steps 1–10 was smaller than those

Table 3. Effect estimates to assess breastfeeding outcomes

Outcome	Participants	Effect estimate	95% CI	p-value	Study
Primary outcomes					
Exclusive breastfeeding (EBF) at 4 weeks	522 women	OR 1.70	0.99–2.90	0.05	Hopkinson et al. ¹⁵⁾
EBF at 14 weeks	111 women	OR 0.38	0.17–0.81	0.01	Yotebieng et al. ¹⁶⁾ †
EBF at 24 weeks	111 women	OR 0.27	0.11–0.71	0.008	Yotebieng et al. ¹⁶⁾ †
Any breastfeeding (BF) at 4 weeks	522 women	OR 0.69	0.48–1.00	0.05	Hopkinson et al. ¹⁵⁾
Any BF at 3 months	1486 women	OR 0.80	0.65–0.98	0.03	McLachlan et al. ¹⁴⁾ †
Any BF at 4 months	1486 women	OR 1.06	0.86–1.30	0.60	McLachlan et al. ¹⁴⁾ †
Any BF at 6 months	1486 women	OR 1.03	0.83–1.26	0.81	McLachlan et al. ¹⁴⁾ †
Secondary outcomes					
Maternal breast condition: engorgement during the first 4 weeks	522 women	RR 0.96	0.83–1.11	0.60	Hopkinson et al. ¹⁵⁾
Maternal breast condition: sore nipples during the first 4 weeks	522 women	RR 0.90	0.78–1.03	0.11	Hopkinson et al. ¹⁵⁾
Maternal breast condition: pain in breast during the first 4 weeks	522 women	RR 0.87	0.77–0.99	0.03	Hopkinson et al. ¹⁵⁾
Diarrhoea at 14 weeks of age	111 infants	RR 1.57	0.37–6.68	0.54	Yotebieng et al. ¹⁶⁾ †
Diarrhoea at 24 weeks of age	111 infants	RR 2.12	0.76–5.92	0.15	Yotebieng et al. ¹⁶⁾ †
Respiratory illness (fever with cough) at 14 weeks of age	111 infants	RR 1.18	0.25–5.58	0.84	Yotebieng et al. ¹⁶⁾ †
Respiratory illness (fever with cough) at 24 weeks of age	111 infants	RR 1.62	0.70–3.71	0.26	Yotebieng et al. ¹⁶⁾ †

† Sample sizes adjusted for cluster effect. BF: breastfeeding; CI: confidence interval; EBF: exclusive breastfeeding; OR: odds ratio; RR: risk ratio.

Table 4. Summary of findings of the primary outcomes exclusive and any breastfeeding

Step 10 compared to usual care for improving breastfeeding (BF) outcomes						
Patient or population : Women given birth						
Setting : Hospital or health care facility in Australia, DR Congo, and USA						
Intervention: Provision of linkage to BF support after discharge from facility						
Comparison : Usual care						
Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No. of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with usual care	Risk with Step 10				
EBF at 4 weeks	94 per 1,000	149 per 1,000 (93 to 231)	OR 1.70 (0.99 to 2.90)	522 (1 RCT)	⊕⊕○○ LOW ^{ab}	
EBF at 14 weeks	650 per 1,000	414 per 1,000 (240 to 601)	OR 0.38 (0.17 to 0.81)	111 (1 RCT)	⊕○○○ VERY LOW ^{bcd}	
EBF at 24 weeks	367 per 1,000	135 per 1,000 (60 to 291)	OR 0.27 (0.11 to 0.71)	111 (1 RCT)	⊕○○○ VERY LOW ^{bcd}	
Any BF at 4 weeks	723 per 1,000	643 per 1,000 (556 to 723)	OR 0.69 (0.48 to 1.00)	522 (1 RCT)	⊕⊕○○ LOW ^{ab}	
Any BF at 3 months	567 per 1,000	511 per 1,000 (459 to 562)	OR 0.80 (0.65 to 0.98)	1486 (1 RCT)	⊕⊕⊕○ MODERATE ^e	
Any BF at 4 months	428 per 1,000	443 per 1,000 (392 to 493)	OR 1.06 (0.86 to 1.30)	1486 (1 RCT)	⊕⊕⊕○ MODERATE ^e	
Any BF at 6 months	378 per 1,000	385 per 1,000 (335 to 434)	OR 1.03 (0.83 to 1.26)	1486 (1 RCT)	⊕⊕⊕○ MODERATE ^e	

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).

BF: breastfeeding; CI: Confidence interval; EBF: Exclusive breastfeeding; OR: Odds ratio

GRADE Working Group grades of evidence

High certainty: We are very confident that the true effect lies close to that of the estimate of the effect **Moderate certainty:** We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different **Low certainty:** Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect **Very low certainty:** We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

Explanations: a. Wide 95% CI crossing the line of no effect. b. Small sample size from one study. c. High risk of detection bias. d. Wide 95% CI. e. High risk of attrition bias.

from clinics assigned to BFHI step 1-9 alone¹⁶⁾. In this trial, the addition of educational material provided to mothers at discharge and intensive training of well-baby clinic staff in the Ten Steps of Successful Breastfeeding did not improve EBF. The unexpected outcome could be partially the result of misunderstood messages or less helpful advice by family members to support mother's BF and staff at well-child clinics inadequately addressed conflicting advice¹⁶⁾. Supporting evidence comes from a recent Cochrane review, where women receiving professional support were less likely to stop EBF up to six months after birth however, the effect was reduced if women received lay support or both professional and lay support^{16, 17)}. Yotebieng et al. also reported that when the analysis was restricted to mother-infant pairs who attended well-child clinics, where counselling from nurses was possible, the prevalence of EBF at six months in the BFHI steps 1-10 group was significantly higher compared with standard care¹⁶⁾. These findings indicate that women's access to additional support after discharge was positively associated with EBF. The authors further explained the low rate of EBF in the BFHI steps 1-10 group with the type of content of the WHO material which primarily focused on BF initiation and to a lesser extent on BF difficulties at later time points¹⁶⁾. The method of providing information to access continuing BF support is very important. Insufficient, incorrect, or misleading information or one that is not relevant to the setting may fail to provide adequate linkage to further support after discharge¹⁶⁾.

In McLachlan et al., the proportion of women with any BF at three months (*moderate-certainty evidence*) after birth was higher in the hospital visit group compared with the intervention group who received home visits while there was no difference between groups at four months (*moderate-certainty evidence*) or six months (*moderate-certainty evidence*)¹⁴⁾. The intervention was implemented in a large study area and although the study team showed extensive efforts to reach all women, early BF support could often not be achieved¹⁴⁾. Time constraints of the study may have limited the establishment of drop-in centres resulting in staff shortage as well as unawareness and infrequent attendance by mothers¹⁴⁾. Similar results were observed in the Breastfeeding in Groups (BIG) trial, a cluster RCT conducted in Scotland, assessing the effectiveness of setting up new BF support groups on any BF at six

to eight weeks¹⁸⁾. While BF rates increased in control localities, rates declined in localities with new support groups due to staff shortage and increased workload, poor attendance, and unsatisfactory teamwork and communication between midwives and mothers¹⁸⁾.

Our secondary outcomes were underrepresented. In Hopkinson et al., women in the intervention group reported less breast pain during the first four weeks indicating that counselling at BF clinics early after discharge may have adequately addressed BF problems compared with controls who received the phone number of the BF clinic, but were less likely to seek for help¹⁵⁾. In Yotebieng et al., there were no differences in the prevalence of diarrhoea and fever with cough at 14 and 24 weeks of infants' age between the BFHI steps 1-10 group and steps 1-9 group¹⁶⁾. However, diarrhoea at 24 weeks was significantly reduced in the steps 1-9 groups compared with standard care. Similar results were reported in the PROBIT trial conducted in Belarus¹⁹⁾. In sites receiving BF promotion modelled on the BFHI, the risk of gastrointestinal tract infections was significantly reduced and there was no evidence of a difference in respiratory tract infections compared with sites assigned to standard care¹⁹⁾. The positive effect on gastrointestinal tract infections was probably attributed to the higher proportion of infants initially breastfed¹⁹⁾.

An improvement in EBF or any BF was not clearly shown by the limited number of included trials¹⁴⁻¹⁶⁾, making it difficult to assess the effectiveness of providing linkage to additional BF support at discharge. Except for EBF at four weeks, there was an indication that the intervention may have caused unfavourable BF outcomes. This was also shown by the BIG trial¹⁸⁾. The so called 'BF support paradox' of step 10²⁰⁾ could be the result of inadequate advice to mothers about BF and during difficulties, setting high expectations and additional stress to the new mother which led to early discontinuation of BF. Furthermore, untimely support, messages that do not take contextual factors into account or exclude woman's family and community may contribute to the limited effectiveness of step 10. Studies about BF support for mothers after discharge showed that the existence of a community support system plays a significant role in the continuation of EBF and any BF at home²¹⁾. In agreement, if step 10 was not strongly implemented into the BFHI and support for women was insufficient, duration and rate of EBF after

discharge was decreased^{21, 22)}. Various trials have shown the effectiveness of steps 1-9 of the Ten Steps to Successful BF in increasing BF outcomes^{16, 19)}. Taking off the pressure of hospitals to establish and promote BF support after discharge may save costs and may even allow the implementation of step 1-9 on a wider scale¹⁶⁾.

V. Conclusion

This review was able to identify three studies to address the effectiveness of providing linkage to BF support after discharge from facilities for improving BF outcomes. The results of the included trials demonstrated the difficulties hospitals face in linking mothers to BF support. Further research is needed on the effect of providing adequate and timely information to women about BF support. This includes information about support systems from the maternity facility, contact to local support groups, lactation consultants, or other health services offered by the community.

This systematic review focused exclusively on step 10 of the BFHI. However, the evidence is intended to inform WHO BFHI policy guidance and implementation practice globally. It is important to identify what influences women's decision and success of BF after discharge. Policies to train and encourage maternity facility staff to link women to BF support groups may improve BF outcomes when all steps of the initiative are adequately integrated into the hospital routine.

VI. Disclosure

There is no conflict of interest to disclose.

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and interpretation of systematic reviews, or formulation of recommendations.

The source of funding had no role in study design, data collection, analysis, and interpretation, or writing of the systematic review.

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Declaration

The authors alone are responsible for the views expressed in this article and they do not necessarily represent the views, decisions, or policies of the institutions with which they are affiliated.

References

- 1) WHO & UNICEF. Protecting, promoting, and supporting breastfeeding in facilities providing maternity and newborn services: the revised Baby-friendly Hospital Initiative. WHO Press. 2018.
- 2) WHO. Evidence for the Ten Steps to Successful Breastfeeding. 1998.
- 3) WHO. Guideline: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. Licence: CC BY-NC-SA 3.0 IGO. 2017.
- 4) Brand E, Kothari C, Stark MA. Factors related to breastfeeding discontinuation between hospital discharge and 2 weeks postpartum. *J Perinat Educ*. 2011 ; 20(1) : 36-44.
- 5) Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding: a systematic review. *Adv Exp Med Biol*. 2004 ; 554 : 63-77.
- 6) WHO. The optimal duration of exclusive breastfeeding: report of an expert consultation. 28-30 March 2001, Geneva. 2002.
- 7) WHO & UNICEF. Global Strategy for Infant and Young Child Feeding. Geneva: World Health Organization. 2003.
- 8) Covidence. Covidence systematic review software. Melbourne, Australia: Veritas Health Innovation [Internet]. www.covidence.org [cited 2021-08-20]
- 9) Ouzzani M, Hammady H, Fedorowicz Z, et al. Rayyan-a web and mobile app for systematic reviews. *Syst Rev*. 2016 ; 5(1) : 210.
- 10) Higgins JPT, Green, S. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. (The Cochrane Collaboration, 2011).

- 11) Guyatt GH, Oxman AD, Schunemann HJ, et al. GRADE guidelines : a new series of articles in the Journal of Clinical Epidemiology. J Clin Epidemiol. 2011 ; 64(4) : 380-2.
- 12) GRADEpro. GRADEpro Guideline Development Tool [Software]. McMaster University. 2015 [Internet]. www.grade-pro.org [cited 2021-08-20]
- 13) Cochrane. Review Manager (RevMan). The Nordic Cochrane Centre, the Cochrane Collaboration. Copenhagen. 2014 [Internet]. <http://community.cochrane.org/tools> [cited 2021-08-20]
- 14) McLachlan HL, Forster DA, Amir LH, et al. Supporting breastfeeding In Local Communities (SILC) in Victoria, Australia: a cluster randomised controlled trial. BMJ Open. 2016 ; 6(2) : e008292.
- 15) Hopkinson J , Konefal Gallagher M. Assignment to a hospital-based breastfeeding clinic and exclusive breastfeeding among immigrant Hispanic mothers: a randomized, controlled trial. J Hum Lact. 2009 ; 25(3) : 287-96.
- 16) Yotebieng M, Labbok M, Soeters HM, et al. Ten Steps to Successful Breastfeeding programme to promote early initiation and exclusive breastfeeding in DR Congo: a cluster-randomised controlled trial. Lancet Glob Health. 2015 ; 3(9) : e546-55.
- 17) McFadden A, Gavine A, Renfrew MJ, et al. Support for healthy breastfeeding mothers with healthy term babies. Cochrane Database Syst Rev. 2017 ; 2(2) : CD001141.
- 18) Hoddinott P, Britten J, Prescott GJ, et al. Effectiveness of policy to provide breastfeeding groups (BIG) for pregnant and breastfeeding mothers in primary care: cluster randomised controlled trial. BMJ. 2009 ; 338:a3026.
- 19) Kramer MS, Chalmers B, Hodnett ED, et al. Promotion of Breastfeeding Intervention Trial (PROBIT) : a randomized trial in the Republic of Belarus. JAMA. 2001 ; 285(4) : 413-20.
- 20) Hoddinott P. Step 10: the breastfeeding support paradox. Lancet Glob Health. 2016 ; 4(1) : e19.
- 21) Coutinho SB, de Lira PI, de Carvalho Lima M, et al. Comparison of the effect of two systems for the promotion of exclusive breastfeeding. Lancet. 2005 ; 366(9491) : 1094-100.
- 22) Lutter CK, Perez-Escamilla R, Segall A, et al. The effectiveness of a hospital-based program to promote exclusive breast-feeding among low-income women in Brazil. Am J Public Health. 1997 ; 87(4) : 659-63.