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Breastfeeding Peer Counseling: From Efficacy through Scale-up

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Abstract

There are a growing number of publications evaluating various breastfeeding peer counseling (PC) models. We have systematically reviewed a) the randomized trials assessing the effectiveness of breastfeeding PC in improving rates of breastfeeding initiation, duration, exclusivity and maternal and child health outcomes; and b) scientific literature describing the scale-up of breastfeeding PC programs. Twenty-six peer-reviewed publications were included in this review. The overwhelming majority of evidence from randomized, controlled trials evaluating breastfeeding PC indicates that peer counselors effectively improve rates of breastfeeding initiation, duration and exclusivity. PC interventions were also shown to significantly decrease the incidence of infant diarrhea and significantly increase the duration of lactational amenorrhea. We conclude that breastfeeding PC initiatives are effective and can be scaled up in both developed and developing countries, as part of well-coordinated national breastfeeding promotion or maternal-child health programs.

Given the well documented health risks associated with poor breastfeeding outcomes, public health policies that improve breastfeeding rates are urgently needed. Breastfeeding peer counselors are local community women who have successfully breastfed, received training in breastfeeding education, and work with their peers to improve breastfeeding outcomes. Peer counselors reinforce breastfeeding recommendations in a socially and culturally relevant context, since they understand the cultural and environmental barriers to breastfeeding and often speak the native language of their clients. Their unique combination

of successful breastfeeding experience, formal training and a real understanding of the factors impacting breastfeeding in their community allows peer counselors to enhance the capacity of clinical health teams.

Breastfeeding peer counseling (PC) has been used in developed and developing countries, with examples ranging from La Leche League International to community health worker models. Likely due to funding priorities, scientific research has primarily focused on the effectiveness of PC in improving the breastfeeding outcomes of low-income women.

Lay support for breastfeeding has been addressed in previous reviews^{1, 2}; however, it was not the primary focus of those reports. Bhandari et al.³ recently published a systematic review regarding the scaling up of exclusive breastfeeding (EBF) (ie. increasing the number of EBF promotion recipients, while maintaining quality and promoting sustainability³). That useful review; however, concentrated on EBF promotion within the context of HIV/AIDS in sub-Saharan Africa. Currently, there are a growing number of randomized trials evaluating various breastfeeding PC models. Our objectives are to systematically review the scientific literature evaluating: a) the effectiveness of breastfeeding PC in improving rates of breastfeeding initiation, duration, exclusivity and maternal and child health outcomes; and b) the scale-up of breastfeeding PC programs.

Methods

Manuscripts evaluated for this systematic literature review were obtained from Internet database searches (PubMed, Web of Science), Cochrane Library systematic reviews^{1, 2, 4}, back-searching reference lists of relevant articles, and the authors' personal files. In September 2008 the following terms were searched in various combinations on internet databases: PC, community health workers, lay support, volunteer, paraprofessionals, breastfeeding, EBF, diarrhea, otitis media, amenorrhea, scale up, national programs, translation, breastfeeding programs, national programs, WIC (Special Supplemental Nutrition Program for Women, Infants and Children) and government. Abstracts published in English, Spanish, French, or Portuguese were reviewed.

This review is organized in 5 sections (Initiation, Duration, Exclusivity, Maternal/Child Health Outcomes, Scale-up). Identified abstracts were evaluated by an expert panel of 4 lactation researchers to determine if they met the following inclusion criteria. For the first four sections, abstracts describing randomized controlled trials, in which breastfeeding was a main focus of the PC intervention, were included. Because the terms used to describe breastfeeding peer counselors in the literature varied, studies included in this review met commonly accepted definitions of lay health workers⁴ or community health workers⁵ who are providing breastfeeding education and support. Studies were excluded if the intervention exclusively utilized professional health workers such as nurses^{6, 7} or if the intervention was not primarily focused on breastfeeding⁸. For the section on the scale-up of breastfeeding PC, abstracts were included if they described large-scale randomized trials evaluating a breastfeeding PC intervention or the development/evaluation of regional or national breastfeeding PC programs or programs including a PC component.

After identifying abstracts meeting the inclusion criteria, the expert panel selected the relevant manuscript section(s) for each abstract. Full text articles were obtained for all abstracts rated by at least 2 panel members as applicable to a specific section. Section authors evaluated each manuscript identified as relevant for their section to determine if the inclusion criteria were met. When necessary, authors of the included studies were contacted via email for clarifications.

Although authors of the PC randomized trials developed their own questionnaires to assess breastfeeding outcomes, their definitions of these outcomes were consistent with the following definitions, unless otherwise noted. “Initiation” reflects ever breastfed. Postpartum breastfeeding rates indicate the infant received any breastmilk at the specified time frame. EBF complied with the WHO definition of EBF⁹ which only allows the provision of breastmilk, medications, and vitamin/mineral drops. Studies were classified as low-intensity if they contained either only prenatal education, or if postpartum contact was primarily via telephone support. Studies that included at least 3 contacts, provided both prenatal and postpartum support, and delivered most contacts in person were considered high-intensity interventions.

Results

Initiation

Details of the 7 studies included in this section are shown in Table 1^{10–16}. Three of the four high-intensity interventions improved breastfeeding initiation rates. In a study evaluating a PC intervention among low-income, primarily minority women delivering in Hartford, Connecticut, Chapman et al¹² found women in the PC group were significantly more likely to initiate breastfeeding as compared to controls (90% vs. 77%, respectively). When testing a more intensive PC intervention (3 prenatal, daily perinatal, 9 postpartum home visits) in this community, Anderson et al¹⁰ found similar results, with significantly higher breastfeeding initiation rates among those in the intervention group versus controls (90% vs. 76%, respectively).

A study by Caulfield and colleagues¹¹ evaluated 3 separate interventions, 2 of which included a peer counselor, among African American WIC recipients in the Baltimore, Maryland region. The first intervention was a breastfeeding motivational video with accompanying posters and WIC staff breastfeeding counseling. The second intervention was a PC intervention initiated prenatally in the WIC clinic. The third intervention was a combination of the first 2, and all were compared to the control group. After controlling for hospital practices, feeding intention and delivery mode, only the second intervention (ie. having a peer counselor) significantly increased breastfeeding initiation rates as compared to controls (OR: 3.84, 95% CI: 1.44 – 10.21). Results of this study should be interpreted with caution since 70% of the intervention group did not have peer counselor contact during the critical period of the first week postpartum.

In one high-intensity intervention, there was no statistically significant difference in breastfeeding initiation rates between study groups. Morrow et al¹⁵ investigated the effect of six versus three prenatal and postpartum peer counselor home visits in a low-income neighborhood in Mexico City to determine their effect on breastfeeding initiation. Breastfeeding initiation was nearly universal (6 visit group: 100%, 3 visit group: 98%, controls: 94%), thus no effect of the intervention was observed for this outcome.

The 3 low-intensity interventions were not successful. Graffy et al¹³ evaluated an intervention in which volunteers provided prenatal and postpartum telephone and in-person support to British women considering breastfeeding. The majority of contacts were via telephone. No significant differences in breastfeeding initiation were observed between the intervention and control groups. Muirhead and colleagues¹⁶ in Ayrshire, Scotland found no significant difference in breastfeeding initiation rates between their PC and control groups. This intervention provided one prenatal visit of unspecified length and did not include peer counselor contact in the hospital, which is often a critical time for breastfeeding initiation. In the third study, MacArthur et al¹⁴ delivered a peer support intervention in Birmingham, UK involving 2 antenatal support sessions. There was no difference in initiation rates between

the peer counselor and control groups (69% and 68%, respectively). It should be noted that this study had limited PC coverage (41% of intervention group received both visits), brief counseling sessions (mean duration of first session = 13 minutes). Initiation data were obtained from medical record reviews.

These studies suggest that it is important to include both antenatal and perinatal PC within interventions designed to increase breastfeeding initiation rates, with the majority of contact being in person.

Duration

There were a total of 13 papers included in this section (Table 2), 7 of which were previously described in the “Initiation” section. Four of the 6 new studies included in this section delivered a high intensity intervention. Agrasada and colleagues¹⁷ evaluated a PC intervention targeting mothers of low birth weight infants born in the Philippines. At 6 months postpartum, those receiving the PC intervention were significantly more likely to be breastfeeding compared to the reference and control groups. (63% vs 31% and 29%, respectively).

Leite et al¹⁸ evaluated the impact of PC in a population of otherwise healthy low birthweight (<3.0 kg) infants born in Brazil and discharged within 5 days postpartum. Compared to the intervention group, they observed significantly higher rates of breastfeeding cessation at 4 months postpartum in the control group (20% vs 33%, respectively).

In a study of otherwise healthy NICU infants born in Boston, Massachusetts, Merewood and colleagues¹⁹ observed significantly higher odds of any breastfeeding at 12 weeks postpartum in their intervention group, which received weekly peer counselor visits for 6 weeks, as compared to controls (OR: 2.81, 95% CI: 1.11 – 7.14).

Pugh and colleagues²⁰ evaluated a unique combination of a peer counselor partnered with a nurse. In this small study (N=41) conducted in the US mid-Atlantic region, the PC group tended to have higher breastfeeding rates at 6 months than controls (45 vs. 35%, respectively). However the difference between the groups was not significant, possibly due to the small sample size.

In a low-intensity primarily telephone-based intervention conducted in Montreal, Mongeon et al²¹ evaluated a volunteer PC model which provided one prenatal home visit, weekly telephone contact for the first 6 weeks postpartum, followed by biweekly telephone calls through 5 months postpartum. They observed no significant differences in breastfeeding rates through 5 months postpartum between study groups. Conversely, when evaluating a low-intensity telephone-based intervention Dennis et al²² observed significantly higher rates of any breastfeeding in the intervention group at 4, 8 and 12 weeks postpartum. At 12 weeks postpartum, 81% of intervention vs 67% of controls were breastfeeding (p=0.01). The success of this low intensity intervention may be partially attributed to the study population, which was comprised of predominantly white, educated women in Toronto, Canada.

Among the studies previously described in the initiation section, 2 of the 5 high intensity PC interventions^{10–12, 15, 23} resulted in significantly higher rates of any breastfeeding, versus controls. The 3 other high intensity studies^{10–12} reported higher breastfeeding rates in their intervention (vs control) groups; however the difference was not statistically significant. The 2 previously described low-intensity PC interventions^{13, 16} showed no significant difference in breastfeeding rates during the postpartum period. In total, 5 out of 9 high-intensity PC interventions significantly improved breastfeeding rates, while only 1 of 5 low-intensity

interventions achieved this. This highlights the importance of ongoing, in-person PC support to improve breastfeeding duration.

Exclusive Breastfeeding

Our search identified 12 relevant studies (Table 3) examining the efficacy of PC on EBF rates. Seven randomized controlled trials were specifically designed to evaluate the effectiveness of breastfeeding peer counselors promoting EBF^{10, 15, 17, 24–27}, and each found the intervention to be effective. The first of these was conducted by Davies-Adetugbo et al.²⁴ in Osun State, Nigeria among mothers of young infants suffering from acute diarrhea. The intervention group received 3 breastfeeding peer counselor contacts plus advice for diarrhea management while controls only received the latter. The proportion of mothers exclusively breastfeeding was significantly ($p<0.0001$) higher in the intervention group than in controls at day 7 (49% vs. 6%) and day 21 (46% vs. 8%) after seeking care for acute diarrhea. A key limitation of this study was that follow-up data collection was conducted by individuals who delivered the intervention, thus introducing a potential bias.

Haider et al.²⁵ conducted a community-based randomized trial in Dhaka, Bangladesh to assess the effect of PC on EBF rates. Women receiving this intensive intervention (15 home visits) were significantly more likely to exclusively breastfeed throughout 5 months postpartum, compared to controls.

In a study conducted in Mexico, Morrow et al.¹⁵ compared 2 intensity levels of PC vs controls. Rates of EBF from birth to 3 months were highest in the group receiving six home visits, followed by those receiving three home-visits, and lowest in the control group. The EBF rate of the intervention groups (combined) was significantly greater than that of controls.

Bhandari and colleagues evaluated the effectiveness of a community-based intervention promoting EBF in Haryana State, India. This intervention utilized multiple channels, including traditional birth attendants, community health workers, community representatives, nurse midwives and other health-care workers, to deliver EBF messages. Significantly more intervention infants were exclusively breastfeeding at 3, 4, 5 and 6 months postpartum, compared to controls.

Research conducted in the Philippines by Agrasada et al.¹⁷ demonstrated that rates of EBF at 6 months postpartum were significantly higher among mothers in the PC group (44%), compared to the reference (7%) and control groups (0%).

In a study of predominantly low income, inner-city Latinas in Hartford, CT, Anderson¹⁰ and colleagues showed that women in the PC group were significantly more likely to exclusively breastfeed throughout the study compared to controls. At 3 months postpartum, mothers in the PC group were almost 15 times more likely to be exclusively breastfeeding compared to controls.

Most recently, Hopkinson et al.²⁶ conducted a unique trial in Houston, TX among mothers of full-term, Latino infants at low risk for hyperbilirubinemia, who were receiving both breastmilk and formula. The trial sought to determine if assigning mixed feeders to a breastfeeding clinic appointment, where they met with a peer counselor within 1 week postpartum, would increase EBF rates. Significantly more intervention mothers were exclusively breastfeeding at 4 weeks postpartum versus controls (17% vs. 10%, respectively; $p=0.03$).

Five randomized trials evaluated breastfeeding PC interventions that promoted breastfeeding, but were not designed to impact EBF rates^{12, 13, 16, 18, 22}. Two of these trials demonstrated significant improvements in EBF rates. In a home-based PC trial promoting breastfeeding among mothers of low birth weight infants in Brazil, Leite et al.¹⁸ observed significantly higher rates of EBF at 4 months postpartum in the intervention (vs. control) group. Similarly, in the telephone-based PC intervention evaluated by Dennis et al EBF rates were significantly higher throughout the study in the intervention (vs control) group. These studies suggest that, in some settings, PC programs, which are designed to promote initiation or duration, may actually improve breastfeeding exclusivity as well.

Two^{13, 16} of the 5 studies which were not specifically designed to promote EBF reported improved EBF rates in their intervention group, but this difference was not statistically significant. Muirhead¹⁶ also observed that mothers in the PC group tended to be more likely to avoid using formula at 16 weeks postpartum (14%), compared to controls (8%). There was no difference in EBF rates at 1 month postpartum in the study by Chapman et al¹².

In conclusion, the overwhelming majority of studies evaluated in this section found a positive impact of peer counselors on EBF practices. Those that did not report a significant impact of peer counselors on EBF were not designed to improve this outcome.

Health Outcomes

The maternal and child health benefits of breastfeeding have long been recognized. We identified 5 trials (Table 4) examining the effect of breastfeeding PC on rates of infant diarrhea. Bhandari et al²⁷ evaluated the effectiveness of a community-based EBF intervention in Haryana, India, utilizing prevalence of infant diarrhea as the primary outcome. Results showed significantly less incidence of diarrhea in the past week at both 3 and 6 months after the intervention in the intervention vs control infants (22% vs. 30% and 25 vs. 28%, respectively). The incidence of diarrheal episodes requiring treatment was significantly lower in the intervention group (vs controls) at both timepoints.

Four trials evaluated infant diarrhea as a secondary outcome. Morrow and colleagues¹⁵ reported that control group infants were significantly more likely to experience diarrhea through 3 months postpartum, compared to infants whose mother received the intervention (26% vs. 12%). Similarly, in a study conducted in Hartford, CT, Anderson and colleagues¹⁰ found control group infants were significantly more likely to experience 1 or more diarrhea episodes as compared to those in the PC group (38 vs 18%, respectively; RR=2.15, 95% CI 1.16 – 3.97). These findings were confirmed by Agrasada et al¹⁷ who reported that infants in their childcare reference group and control group experienced rates of diarrhea that were nearly twice that of the PC group (28%, 31% and 15%, respectively). Furthermore, infants in this trial who were exclusively breastfed experienced no diarrhea. Davies-Adetugbo observed a non-significant reduction in the number of new cases of diarrhea within 21 days of their intervention (12% intervention, 22% controls). Thus, all 5 studies which assessed infant diarrhea demonstrated reduced rates of diarrhea among infants whose mothers received the PC intervention, with the difference being significant in 4 of 5 studies.

Anderson et al¹⁰ also investigated differences in rates of maternal amenorrhea as a secondary outcome in their PC trial. Extended duration of lactation-induced maternal amenorrhea is associated with decreased fertility rates, which is important for women who are not using modern methods of contraception. Anderson reported significantly more women in the PC group remained amenorrheic through 3 months postpartum, compared to controls (53% vs 33%, respectively).

Peer counselor training

The training provided to breastfeeding peer counselors in these randomized trials varied widely and is summarized in Table 5. In several studies, few details were provided regarding the training process.

Scale Up

We define scaling up as ‘delivery of improved [breastfeeding program(s)] to a large number of beneficiaries, with expanding geographical coverage, national level policy/advocacy, and intent to address sustainability in the program design’²⁸. There were 8 studies (Table 6) which met this section’s inclusion criteria.

Examples of Scale-up

A project conducted in Bolivia, Ghana, and Madagascar^{28, 29} identified the impact of community based programs at improving the rates of Timely Initiation of Breastfeeding ((TIBF), i.e. breastfeeding within one hour after birth) and EBF during the first month. Evaluators used a longitudinal study design lasting 3–4 years. In all 3 countries, the scaling up process involved formative research, policy analysis and advocacy, materials development, training of health care providers including community health workers, social marketing, and multisectorial partnerships. In Madagascar, 12,000 community volunteers were trained in breastfeeding promotion. Results from repeated representative community surveys showed statistically significant improvements in both TIBF and EBF during the first 6 months associated with the scaling up interventions. Improvements were detected as early as 9 months after the beginning of the implementation. The impact on these outcomes was sustained during the 3–4 years that the study was conducted.

A recent feasibility project in the Philippines demonstrated it was possible to develop a network of well trained breastfeeding peer counselors at the barangay level (smaller administrative unit), based on a community-driven initiative with strong support from national and local authorities³⁰. A pre/post study design showed that 3 PC home visits to women with children less than 2 months who were not exclusively breastfeeding lead to impressive improvements in the rates of any and EBF. As a result, the PC program has been replicated in nine additional barangays. This program is being tied to the ongoing effort by the country’s department of health to improve healthcare services to 1 million people living in low-income urban areas.

A study in predominantly rural areas in Pakistan suggests that community health workers (known as “lady health workers”) responsible for the delivery of diverse home and primary healthcare-based education and services can significantly improve rates of colostrum feeding³¹. This model is of interest for scaling up as it suggests that it is possible to improve some breastfeeding outcomes through existing national or regional community health worker programs, without forming a new cadre of breastfeeding peer counselors.

Brazil has launched the Baby Friendly Primary Health Care Unit Initiative (BFPHCI), in an attempt to adhere to the 10th step of the Baby Friendly Hospital Initiative. This new initiative includes 10 steps^{32, 33} which should be met at the local primary health care unit (ie. Not at the hospital level) in order to promote and support breastfeeding at the community level. Some of these steps include breastfeeding training for all primary health care unit (PHCU) staff, including community health agents (equivalent to peer counselors)³⁴ and the formation of breastfeeding support groups. In the state of Rio de Janeiro, where BFPHCI has been scaled up^{32, 33} EBF rates among children < 6 months

were significantly higher among primary health care units with better BFPHCI implementation.

In the USA, breastfeeding PC has been scaled up by the government through the WIC program that serves low-income pregnant and postpartum women and their children^{35–37}. The WIC breastfeeding PC program was gradually implemented in Mississippi starting in 1990. By 1993 the program was in place in 51 out of 140 WIC clinics, providing an opportunity to assess its impact through a quasi-experimental design. Breastfeeding incidence increased significantly more among mothers attending WIC clinics offering breastfeeding PC³⁸. A study in the state of Georgia, USA³⁹ also found that including PC in WIC clinics was associated with an increase in breastfeeding initiation rates; however, there were no differences in prevalence rates at 8 weeks postpartum. WIC findings need to be understood within the context that peer counselor contact was predominantly via telephone or mail and that this breastfeeding promotion effort is happening within a program that is the largest distributor of free infant formula in the world.

Cost-effectiveness

The cost-effectiveness of scaled up EBF promotion programs was recently estimated in South Africa⁴⁰. Data were derived from a prenatal and postnatal intervention that included breastfeeding peer counselors, seeking to promote EBF among HIV-positive and HIV-negative women. The cost analyses modeled the cost of scaling up the intervention from study site to the provincial level under three scenarios: a) Full: up to 4 prenatal home visits, 14 visits between birth and 6 months postpartum, b) simplified: less home visits and more clinic-based support and c) basic: entirely clinic-based. Results showed that the simplified scenario was the most cost effective in terms of cost per increased month of EBF.

In summary, it is possible to scale up cost-effective breastfeeding PC as part of national breastfeeding promotion efforts. Countries which have scaled up breastfeeding PC have not offered it as a “stand alone” service. In each country, there has been an existing health program or initiative which is used as the vehicle for delivery of breastfeeding PC services. Some countries have used the Baby Friendly Hospital Initiative (step 10) as this vehicle, while others have used government-funded programs addressing family planning or nutrition.

Discussion

This comprehensive review of breastfeeding peer counseling randomized trials and scale-up efforts indicates that peer counseling has been successfully used in demonstration projects and at the regional and national levels to improve breastfeeding outcomes. Although success has been demonstrated internationally, the scale up of breastfeeding peer counseling is still limited. As research in the effectiveness and cost-effectiveness of breastfeeding peer counseling continues, future PC studies should address some key issues.

Few publications adequately described peer counselor training, supervision and compensation. A thorough review (Table 5) of peer counselor training protocols revealed a wide variety in the content, duration, and curriculum used. This highlights the importance of developing a standardized training program for breastfeeding peer counselors which provides up-to-date scientific information and skills (clinical and communication) development, and includes a process for ongoing education. Additionally, few studies provided details of peer counselor activities when interacting with mothers and infants. Since it is possible that outcomes vary based on the specific peer counselor protocols, future publications should include these details.

With the exception of some US studies ^{10, 12, 38}, the involvement of International Board Certified Lactation Consultants (IBCLC) in PC models remains largely unknown. It is important to fill this gap in knowledge. Peer counselors should be trained to recognize the scope of their role and should have access to the expertise of a supervising IBCLC.

As breastfeeding PC efforts are scaled up, salary guidelines will be necessary. Although community volunteers were used in some studies ^{13, 17, 21, 22}, better results were usually achieved in studies that reported providing compensation to peer counselors. Given the valuable service they provide, breastfeeding peer counselors should receive compensation, with rates comparable to those of other community health worker positions in their setting.

Additionally, future publications evaluating PC interventions should clearly define their breastfeeding outcomes, and comply with the standard definition of EBF ⁹. In order to better understand the full benefits of PC, we strongly recommend that future trials collect data on maternal and child health outcomes.

Finally, research on breastfeeding PC has focused primarily on models serving low-income women. This focus is likely due to funding priorities, and should not be interpreted to imply that only low-income women benefit from PC. In settings with limited healthcare resources, PC may represent the only feasible means to provide breastfeeding education and support. The response to PC may vary, based on local breastfeeding customs and income level. There were too few studies evaluating PC in privileged populations to evaluate the effectiveness of PC by income level. In the single study evaluating a PC model serving upper-income women, the intervention was effective and well-received ²².

Conclusions

The overwhelming majority of the evidence from randomized, controlled trials evaluating breastfeeding PC indicates that peer counselors effectively improve rates of breastfeeding initiation, duration and exclusivity. Despite major environmental differences in infant feeding practices, health care access/delivery, and the availability of breastmilk substitutes, PC has been shown to be effective in improving breastfeeding outcomes and decreasing rates of infant diarrhea in both developed and developing countries. In one study, breastfeeding PC also positively impacted maternal health, by significantly increasing the duration of lactational amenorrhea ¹⁰. These improved health outcomes are achieved, not by trained medical professionals, but by mothers who have a passion for breastfeeding and have received adequate training to provide lactation management, as well as emotional/social support, to the women in their community.

Although some national breastfeeding promotion programs explicitly recognize the role of peer counselors and/or breastfeeding support groups, their specific roles and contributions have not been well documented at a national level. Because of the central role that peer counselors can play at extending support beyond the hospital walls in a cost-effective manner, it is essential that future 'scaling up' analyses pay special attention to this vital component of national breastfeeding promotion programs. The challenge for further improving the scaling up process of breastfeeding PC is to better define, through well designed studies the optimal: (a) breastfeeding peer counselor training programs and role delineation in various settings; (b) salary ranges and supervisory structures; (c) prenatal, perinatal, and postnatal service delivery modes (phone, hospital/clinic based, home visits); (d) support/educational approaches (individual counseling, support groups), and (e) dosage needed (number of contact/visits, time per contact/visit) for achieving specific breastfeeding outcomes (breastfeeding initiation, any breastfeeding and EBF duration) ^{35-37, 41-44}. Future studies should carefully document the components of the peer counselor training programs

and clearly define their breastfeeding outcomes. We conclude that breastfeeding PC initiatives are effective and can be scaled up in both developed and developing countries, as part of well coordinated national breastfeeding promotion or maternal-child health programs.

Summary Statement: The overwhelming majority of evidence from this systematic review of the breastfeeding peer counseling scientific literature indicates that peer counselors effectively improve rates of breastfeeding initiation, duration and exclusivity. In addition to improving breastfeeding outcomes, peer counseling programs significantly decreased rates of infant diarrhea and lengthened the duration of maternal amenorrhea. We conclude that breastfeeding peer counseling initiatives are effective and can be scaled up as part of well-coordinated national breastfeeding promotion or maternal-child health programs.

Biography

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Table 1

Randomized Trials evaluating impact of breastfeeding peer counseling on breastfeeding initiation

Reference	Location/Sample	Study Groups	Intervention	Initiation Results
Anderson (10)	-Hartford, CT USA -N=182 healthy, low-income women considering BF & delivering healthy, term singleton	1:BF PC (n=90) 2:Control (n=92)	-3 prenatal and 9 pp home visits + daily in-hospital visits -Topics covered: Benefits of EBF, BF logistics, avoidance of artificial teats, feeding cues, BF video viewed	BF PC: 91%* Controls: 76%
Caulfield (11)	-Baltimore, MD USA -N=242 low-income African American women, delivering singleton	1:BF video (n=64) 2:PC (n=55) 3:Video+PC (n=66) 4:Control (n=57)	<u>Video</u> : Presented BF benefits and shown in WIC waiting area; WIC staff discussed video & provided written materials <u>PC</u> : 3 prenatal and wkly pp contacts through 16 wks pp <u>Topics covered</u> : Infant feeding attitudes, misconceptions, support sessions.	PC: 62%* Video: 50% Video+PC: 52% Control: 26%
Chapman (12)	-Hartford, CT -N=219 low-income women considering BF, who delivered healthy, term singleton	1:PC (n = 113) 2:Control (n = 106)	-1 prenatal and ≥3 pp home visits; daily in-hospital visits; unlimited phone access to PC; free breastpump <u>Topics covered</u> : BF benefits, myths and logistics; PP hands-on help	PC: 91%* Controls: 77%
Graffy (13)	-London and South Essex, England. -N=720 women considering BF who had < 6 wks prior BF experience; delivered term infant, SES level varied	1:Intervention (n=363) 2:Control (n=357)	-1 prenatal visit -PP phone calls, home visits if requested	Intervention: 95% Control: 96%
MacArthur (14)	-Birmingham, UK -N=2398 low-income women delivering at selected antenatal clinics.	1:Peer support (n=1083) 2:Control (n=1315)	*2 antenatal contacts (1 in clinic, 1 at home). <u>Topics covered</u> : BF benefits, support to address cultural barriers to BF	PC: 69% Controls: 68%
Morrow (15) ¹	-San Pedro Martir, Mexico -N=130 low-income pregnant women delivering healthy infant;	1: 6 visit group (n=44) 2: 3 visit group (n=52) 3: Control (n=34)	<u>6 visit group</u> : mid and late pregnancy, and wks 1, 2, 4, and 8 pp. <u>3 visit group</u> : late pregnancy, and wks 1 and 2 pp. <u>Topics covered</u> : -Benefits of EBF, positioning, myths, lactation anatomy & physiology; PP visits to establish BF	6-visit: 100% 3-visit: 98% Control: 94%
Muirhead (16)	-Ayrshire, Scotland -N=225 pregnant women, SES not specified	1:Peer support (n=112) 2:Control (n=113)	≥1 prenatal visit, no in-hospital contact, pp contact every other day by phone or in person to day 28; extra support from day 28 to 16 wks if requested	PC: 54% Controls: 53%

¹ Duration percentages reflect the two intervention group BF rates combined.

BF, breastfeeding; PC, peer counseling; EBF, exclusive breastfeeding; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children; pp, postpartum

SES: Socio-economic status

* p<0.05

Table 2

Randomized trials evaluating the impact of breastfeeding peer counseling on breastfeeding rates

Reference	Location/Sample	Study Groups	Intervention	BF Rates
Agrasada (17)	-Manilla, Philippines -N=204 low-income primiparae, vaginal delivery, LBW singleton	1:BF PC(n=68) 2:Childcare (n=67) 3:Control (n=69)	*8 visits at 3–5, 7–10 and 21 d, 1.5, 2.5, 3.5, 4.5 and 5.5 months pp. <u>Topics covered:</u> Benefits of EBF, preventing BF problems.	<u>6 months</u> *** PC: 63% Childcare: 31% Controls: 29%
Anderson (10)	See Table 1	See Table 1	See Table 1	<u>3 months</u> PC group: 49%, Controls: 36%
Caulfield (11)	See Table 1	See Table 1	See Table 1	BF at 7–10 days pp: OR (95% CI) Video: 0.79 (0.25, 2.52) PC: 1.11 (0.34, 3.61) Video + PC: 1.52 (0.50, 4.59) Control: 1.00
Chapman (12)	See Table 1	See Table 1	See Table 1	<u>1 month</u> PC: 64%, Controls: 51% <u>3 months</u> PC: 44%, Controls: 29%
Dennis (22)	-Toronto, Canada -N=258 primiparae with local telephone access, delivering term infant; mostly middle/high SES	1:Peer support (n=132) 2:Control (n=126)	Telephone contact within 48 hrs pp and as needed <u>Topics covered:</u> BF support and help.	<u>4 weeks</u> PC: 92%, Controls: 84% * <u>8 weeks</u> PC: 85%, Controls: 75% <u>12 weeks</u> PC: 81%, Controls: 67% *
Graffy (13)	See Table 1	See Table 1	See Table 1	<u>6 weeks</u> Intervention:65%, Control: 63% <u>4 months</u> Intervention: 46%, Control: 42%
Gross (23) ^I	-Baltimore, MD, USA -N=116 African American, low-income women who initiated BF .	See Caulfield et al	See Caulfield et al	<u>7–10 days</u> Video:67%, PC:72%, Video +PC: 80%, Control: 53% <u>8 weeks</u> * Video:75%, PC:75%, Video +PC: 70%, Control: 23% <u>12 weeks</u> * Video:48%, PC:52%, Video +PC: 40%, Control: 0%
Leite (18)	-Fortaleza, Brazil -N=1003 low-income women delivering healthy, LBW (≤3000g) singletons, discharged ≤5 days pp.	1:Lay counselors (n=503) 2:Control (n=500)	*6 visits at 5, 12, 30, 60, 90 and 120 days pp <u>Topics covered:</u> Correct positioning, correcting BF problems, discouraged use of artificial teats/non-BM liquids.	<u>4 months</u> *** PC: 80%, Control: 67%
Merewood (19)	-Boston, MA, USA -N=108 low-income women who delivered preterm (26–37 weeks gestation) & intended to BF	1:PC (n=53) 2:Control (n=55)	-First visit ≤ 72 hrs pp & wkly contact for 6 wks. In person contact while infant in NICU -Free electric breast pump. -Written guidelines provided for each contact	<u>12 weeks OR (95% CI)</u> Intervention: 2.81 (1.11–7.14)* Control: 1.0
Mongeon (21)	-Montreal, Quebec, Canada -N=200 primiparous women planning to BF; SES not specified, 58% college-educated	1. PC: (n=100) 2. Control (n=100)	-1 prenatal visit + weekly telephone contact for first 6 wks pp, then biweekly calls until 5 months pp	<u>1 month</u> Intervention: 72%, Control: 81% <u>3 months</u> Intervention: 53%, Control: 57% <u>6 months</u> Intervention: 25%, Control: 20%

Reference	Location/Sample	Study Groups	Intervention	BF Rates
Morrow ² (15)	See Table 1	See Table 1	See Table 1	<u>≥3 months</u> * Intervention: 95%, Control: 85% <u>≥6 months</u> Intervention: 87%, Control: 76%
Muirhead (16)	See Table 1	See Table 1	See Table 1	<u>10 days</u> PC: 41%, Control: 41% <u>6 weeks</u> PC: 31%, Control: 29% <u>16 weeks</u> PC: 23%, Control: 18%
Pugh (20)	-Mid-Atlantic region, USA -N=41 low-income women	<u>2 groups:</u> 1: Intervention (n=21) 2: Control (n=20)	Nurse/PC team provided daily hospital visits, home visits at 1, 2 and 4 wks pp, telephone support twice weekly through wk 8, and calls weekly through month 6.	<u>6 months</u> Intervention: 45%, Control: 35%

¹ This study analyzes the same dataset as Caulfield et al, but only includes data from women who initiated BF.

² Statistical analyses conducted using 1-sided tests, comparing combined intervention groups vs. controls.

*
p<0.05;

**
p<0.01;

p<0.001

LBW, low birth weight; BF, breastfeeding; PC, peer counseling; pp, postpartum; SES, socio-economic status; OR, Odds Ratio; CI, confidence interval; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children; NICU, neonatal intensive care unit;

Table 3

Randomized trials evaluating the impact of breastfeeding peer counseling on exclusive breastfeeding rates

Reference	Location/Sample	Study Groups	Intervention	EBF Rates
Agrasada ^a (17)	See Table 2	See Table 2	See Table 2	<u>6 months</u> *** PC: 44% Childcare counseling: 7% Control: 0%
Anderson ^b (10)	See Table 1	See Table 1	See Table 1	<u>3 months</u> * PC: 27%, Controls: 3%
Bhandari (27)	-Haryana State, India -N=1115 low-income women delivering in study villages	1: Intervention (n = 552) 2: Control (n = 473)	Community health workers shared EBF information from monthly meetings at monthly neighborhood meetings targeting those caring for children ≤2 y. <u>Topics covered:</u> Immediate BF after birth, benefits of EBF for 6 months, BF frequency	<u>3 months</u> **** Intervention: 79%, Control: 48% <u>4 months</u> **** Intervention: 69%, Control: 12% <u>5 months</u> **** Intervention: 49%, Control: 6% <u>6 months</u> **** Intervention: 42%, Control: 4%
Chapman (12)	See Table 1	See Table 1	See Table 1	<u>1 month RR (95% CI)</u> PC: 1.07 (0.90 – 1.27) Controls: 1.0
Davies-Adetugbo (24)	-Osun State, Nigeria -N=161 low-income mothers of infants ≤3 months; seeking care for infant's uncomplicated diarrhea	1: PC (n=82) 2: Control (n=79)	1st visit at health care facility & 2 home visits (day 2 and 7 after initial visit) <u>Topics covered:</u> EBF benefits, correct latch & positioning, milk expression	<u>7 Days after first visit</u> **** PC: 49%, Controls: 6% <u>21 Days after first visit</u> **** PC: 46%, Controls: 8%
Dennis ^b (22)	See Table 2	See Table 2	See Table 2	<u>4 weeks</u> * PC: 74%, Controls: 63% <u>8 weeks</u> PC: 63%, Controls: 55% <u>12 weeks</u> * PC: 57%, Controls: 40%
Graffy (13)	See Table 1	See Table 1	See Table 1	<u>6 weeks</u> PC: 31%, Controls: 26%
Haider (25)	-Dhaka City, Bangladesh -N=726 lower-middle and low SES, pregnant women with ≤3 living children, delivering healthy singleton	1: PC (n=363) 2: Controls (n=363)	2 prenatal & 13 pp home visits through 5 months pp <u>Topics covered:</u> Benefits of EBF, early dyad contact, discouraged pre and post lacteal foods, management of BF problems.	<u>5 months</u> **** PC: 70%, Controls: 6%
Hopkinson ^b (26)	-Houston, TX, USA -N=522 low-income mothers feeding their low-risk infant both breastmilk & formula	1: Intervention (n=255) 2: Control (n=267)	1 BF clinic visit (3–7 d pp), more visits/calls as needed. <u>Topics covered:</u> Breast exam, evaluation of latch & milk transfer, weight check, benefits of EBF, concerns addressed	<u>4 weeks</u> * PC: 16%*, Control: 10%
Leite (18)	See Table 2	See Table 2	See Table 2	<u>4 months</u> * PC: 25%, Controls: 19%
Morrow ^{a,c} (15)	See Table 1	See Table 1	See Table 1	<u>3 months</u> ***

Reference	Location/Sample	Study Groups	Intervention	EBF Rates
				6-visit: 67%, 3-visit: 50%, Control: 12%
Muirhead (16)	See Table 1	See Table 1	See Table 1	<u>8 weeks</u> PC: 21%, Controls: 14% <u>16 weeks</u> PC: 2%, Controls: 0%

EBF, exclusive breastfeeding; PC, peer counseling; BF, breastfeeding; pp, postpartum; SES, socio-economic status.

*
p<0.05,

**
p<0.01,

p<0.001,

p<0.0001

^a EBF rates in this table reflect infant-feeding practices over the previous 7 days

^b EBF rates in this table reflect infant-feeding practices during the previous 24 hours

^c Analyses conducted using 1-sided tests.

Table 4

Randomized trials evaluating the impact of breastfeeding peer counseling on maternal and child health outcomes

Reference	Health Outcome
Agrasada (17)	<u>Infant diarrhea, incidence at 6 months pp</u> PC: 15%, Childcare group: 28%, Controls: 31%
Anderson (10)	<u>Infant diarrhea, incidence at 3 months pp</u> * PC: 18%, Controls: 38% <u>Maternal amenorrhea at 3 months pp</u> * PC: 52%, Controls: 33%
Bhandari (27)	<u>Infant diarrhea, 7 day prevalence at 3 months pp</u> * PC: 22%, Controls: 30% <u>Infant diarrhea, requiring specialized medical treatment at 3 months pp</u> **** PC: 34%, Controls: 43% <u>Infant diarrhea, 7 day prevalence at 6 months pp</u> * PC: 25%, Controls: 28% <u>Infant diarrhea, requiring specialized medical treatment at 6 months pp</u> * PC: 43%, Controls: 52%
Davies-Adetugbo (24)	<u>Infant diarrhea, new episode of diarrhea within 21 days after counseling</u> PC: 12%, Controls: 22%
Morrow (15)	<u>Infant diarrhea, incidence at 3 months pp</u> * PC: 12%, Controls: 26%

PC, peer counseling; pp, postpartum

*
p<0.05,

**
p<0.01,

p<0.001,

p<0.0001

Table 5

Summary of peer counselor training protocols

Author(s)	Training Materials	Training Duration	Training Staff	Training Content	Hands on experience?
Agrasada (17)	Not specified	40 hours	CLC	Benefits of EBF, preventing BF problems	Not specified
Anderson (10)	WHO/UNICEF and Hispanic Health Council Breastfeeding Heritage and Pride program curricula	-40 hours -2 months observing IBCLC	IBCLC and study coordinator	Counseling skills, benefits of EBF, BF logistics and complications, avoidance of artificial teats, feeding cues, pumping, and a BF video viewed	Yes
Caulfield (11)	Adapted from DC WIC manual	Ten 2.5 hour sessions plus bi-weekly meetings for continuing education	Investigators and WIC staff	Not specified	Not specified
Chapman (12)	La Leche League and Hispanic Health Council Breastfeeding Heritage and Pride program curricula	-30 hours of classroom education -1 hour of continuing education/month -3-6 months of shadowing experienced PC	Program coordinator (an IBCLC)	Breast anatomy and physiology, BF management, benefits, myths and logistics, feeding cues and counseling skills	Yes
Davies-Adetugbo (24)	-Adapted from WHO 18-hour course. Modified for non-hospital-based settings. -Course in BF counseling skills	Not specified	Not specified	Not specified	Not specified
Dennis (22)	-An established volunteer BF organization (Halton BF Connections) provided counselors. -43 page handbook	2.5 hour orientation session	Primary investigator	Handbook outlined volunteer role description, BF benefits, myths and general information, and tips for effective phone support.	No
Graffy (13)	Counselors accredited by the National Childbirth Trust	Not specified	Not specified	Not specified. Counselors used non-directive counseling approach, sought to increase maternal confidence.	Not specified
Gross (23)	See Caulfield et al	See Caulfield et al	See Caulfield et al	See Caulfield et al	Not specified
Haider (25)	WHO/UNICEF BF course -King's book: King FS. "Helping mothers to BF". Nairobi: African Medical and Research Foundation, 1992.	-40 hours of classroom training -2 weeks of prenatal and pp counseling	Breastfeeding supervisors based at the International Centre for Diarrheal Disease Research, Dhaka, Bangladesh	Benefits of EBF, early dyad contact, discouraged pre and post lacteal foods, management of BF problems.	Yes
Hopkinson (26)	Texas Dept of State Health Services lactation management training course	-20 hours of classroom training -21 yr as WIC employee -2 months of supervised hospital training	IBCLC	Not specified	Yes
Leite (18)	Counselors associated with MEAC-UFC milk bank. Course content based on "BF Counseling: a training course"	20 hours	Not specified	Counseling skills, clinical skills including: positioning, management of BF complications, and assessment of BF sessions	Not specified
Merewood (19)	-BF course through Center for BF	5 days	Not specified	Counseling skills, advantages of BF, BF initiation and management of	Not specified

Author(s)	Training Materials	Training Duration	Training Staff	Training Content	Hands on experience?
	-Regular NICU/BF procedures at mandatory training days			complications, and breast anatomy and physiology	
Morrow (15)	Not specified	-1 week of classroom education -2 months in lactation clinics -1 day demonstration by experts -6 months practice in neighborhoods *No personal experience required	La Leche League staff	Not specified	Yes
Mongeon (21)	Not specified	-9 hours of classroom training -monthly meetings with medical staff to discuss cases	Medical staff	Prevention and treatment of BF problems	Not specified
Muirhead (16)	Not specified	-2 full days and 4 evenings of classroom education -Regular follow-up to discuss cases	Study investigators	Factors to promote or inhibit BF, taking a feeding history, initiation, latch and common BF problems	Not specified
Pugh (20)	Not specified	Not specified	Not specified	Not specified	Not specified

CLC: certified lactation counselor; EBF: exclusive breastfeeding; IBCLC: Internationally Board Certified Lactation Consultant; DC: District of Columbia; WIC: Special Supplemental Nutrition Program for Women, Infants, and Children; PC: peer counselor; WHO/UNICEF: World Health Organization/United Nations Children's Fund; MEAC-UFC: Assis Chateaubriand Maternity School Milk Bank at the Federal University of Ceará; NICU: Neonatal Intensive Care Unit; pp: postpartum;

^aKing FS. Helping mothers to breastfeed. Nairobi: African Medical and Research Foundation, 1992.

Table 6

Studies examining impact of breastfeeding peer counseling interventions at scale.

Reference	Country/Region	Design/Measures	Interventions	Results	Comments
Baker et al. (28) Quinn (29)	Catchment populations: Bolivia: 1 million Ghana: 3.5 million Madagascar: 6 million	-Prospective (3–4 y) -Repeated representative community surveys	-Multisectorial LINKAGES initiative -EBF promotion through training of health workers including CHWs, social marketing, advocacy	TIBF (pre vs post) Bolivia: 56% vs 74% Ghana: 32% vs 40% Madagascar: 34% vs 78% EBF (pre vs post) Bolivia: 81% vs 88% ¹ ; 54% vs 65% ² Ghana: 68% vs 79% ¹ ; 46% vs 68% ² Madagascar: 86% vs 91% ¹ ; 46% vs 68% ²	-Cost in Madagascar: US \$2.33/TIBF recipient -‘Scale’ interventions effective and sustainable during the 3–4 year project -Results possibly confounded by improving EBF trends in all countries before scaling up projects started
De Oliveira (32,33)	State of Rio de Janeiro, Brazil	-Developed “10 Steps for Baby Friendly PHCU” -Assessed PHCU compliance with these steps via staff & client interviews -Outcome evaluation: EBF among infants 6 months (n=2458)	None (Observational study)	-Baby Friendly PHCU performance: 13 PHCUs rated as ‘fair’ (score=0.34–0.66); 11 rated as ‘poor’ (score≤0.33). -EBF rates among 4 month olds: ‘Fair’ PHCUs (25%), ‘poor’ PHCUs (8%) (p<0.001) -Need for BF support groups identified	-Study resulted in nationwide dissemination of training materials for baby friendly PHCUs. -By 2005 2/3 of state municipalities received Baby Friendly PHCU training -Dose-response relationship shown between EBF rates and the proportion of PHCU’s receiving training
Worobec (30)	Philippines	-Longitudinal cohort, 161 non-EBF infant < 2 months old -Infant 24-h recall applied at baseline and after 3 weeks	-Intersectorial, community-driven BF PC program --3 PC home visits to women not practicing EBF or experiencing BF difficulties	--FF decreased from 53% to 7% -Among those exclusively FF at baseline, 40% switched to EBF and 48% to MF	-BF PC program was replicated in 9 additional barangays -Lack of sufficient IBCLCs identified as a challenge for program
Omer et al. (31)	Pakistan	-Randomized trial -Survey applied 10 months after intervention began -Stratified random sample (N=969) collected infant feeding data from women who were pregnant or had a child < 3 years	-Home visits by ‘Lady Health Workers’ trained by Pakistan’s National Family Planning and Primary Healthcare Program -One intervention component used an embroidered fabric to promote colostrum feeding	-Intervention associated with higher odds of colostrum feeding (OR: 1.60, 95% CI: 1.17–2.18)	-Data collected in intervention communities may include some infants born prior to intervention -52 LHW strained to deliver intervention in a catchment population of 50,000
Desmond (40)	KwaZulu-Natal, South Africa	-Cost-effectiveness analysis for BF PC among HIV+ and HIV- women -Modeled costs of scaling up intervention from study site to the provincial level under 3 scenarios	Simulated scenarios: -Full: up to 4 prenatal home visits, 14 visits between birth and 6 months pp; -Simplified: less home visits and more clinic-based support; -Basic: entirely clinic-based	-Simplified scenario was most cost effective -If resources unlimited, full scenario increases EBF the most -Basic scenario was the cheapest, but very ineffective	

Reference	Country/Region	Design/Measures	Interventions	Results	Comments
Grummer-Strawn. (38)	Mississippi, USA	-Secondary analysis of PedNSS data -Compared BF incidence in 1989 (N=18,889) and 1993 (17,216) in clinics with vs. without PC program	-WIC BF PC Program introduced in 1990 -51 WIC clinics had implemented program by 1993	BF Incidence (%) (1989/1993) PC: 12.3/19.9 Non-PC: 9.2/10.7 -Predictors of improved WIC BF rates: LC or specialist in clinic; PC staff were former WIC beneficiary; longer duration of PC program operation; PC visits ≥ 45 minutes	-High levels of missing data for BF incidence but no evidence of differential bias as a function of BF PC program status -Unlikely that parallel BF promotion efforts confounded results
Ahluwalia (39)	Georgia, USA	-Secondary data analysis -1992-96 PedNSS; Compared BF outcomes by WIC interventions -1993-96 PRAMS; compared BF rates at 8 wks among WIC participants -Focus Groups (n=13)	-Georgia WIC implemented 5 BF strategies starting in 1991: BF education, breast pumps, maternity ward bedside support, peer counseling, community coalitions	1992-96 changes in BF initiation, % Standard: 30/33 Education:33/41 Pumps: 56/49 PC:40/50 Bedside: 30/52 Coalition:24/30 -No change in WIC BF rate at 8 wks	-PedNSS had high percentage of missing data for BF initiation -Possible confounding by parallel BF promotion efforts not ruled out

¹ EBF among infants 1 month old or less

² EBF among infants 6 months old or less

CHW, community health worker; TIBF, Timely initiation of breastfeeding; EBF, exclusive breastfeeding; PHCU, primary health care unit; PC, Peer counseling; OR, odds ratio; CI, confidence interval; LHW, lay health worker; FF, formula feeding; PedNSS, Pediatric Nutrition Surveillance System; WIC, Special Supplemental Nutrition Program for Women, Infants and Children; PRAMS, Pregnancy risk assessment monitoring system;