

REVIEW

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Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on compared to 1.3 folds increase in developed country studies. Counseling had a significant impact on breastfeeding outcomes. Counseling were important for EBF at 6 months.

**Conclusion:** Breastfeeding promotion interventions increased EBF rates at 4-6 weeks and at 6 months. A relatively greater impact of these interventions was seen in developing countries with a 6 folds increase in EBF rates at 4-6 weeks and at 6 months.

**Ba**

Breast-milk provides numerous immunologic, psychological, social, economic and environmental benefits; and is a natural first food and an ideal nutrition for the newborn [1]. Breastfeeding is therefore recommended as the optimal strategy for feeding newborns and young infants [2-5]. Breast-milk has a significant positive impact on child growth and development and decreases the risk for many acute and chronic diseases [6-11], including

infections such as diarrhea and respiratory tract infections during infancy [12]. It also confers benefits on the mother such as reduced postpartum bleeding and early uterine involution, coupled with decreased risk of breast and ovarian cancers and hip fractures later in life [13]. The WHO recommends exclusively breastfeeding the infant for the first six months of life to achieve optimal growth, development and health [14]. Thereafter, appropriate complementary foods should be introduced, while breastfeeding continued up to two years of age or beyond. Nevertheless, EBF remains uncommon in most countries (both developed and developing), even in countries with high rates of breastfeeding initiation [15,16].

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EBF rates in infants less than six months of age varied from as low as 20% in central and eastern European

sessions. Individual support included both face to face and via Telephone.

- The studies were included irrespective of the mode of delivery, whether vaginal or cesarean.
- All studies were included irrespective of language.

data sets from each study, assuming a significant interaction between the two treatment groups. For cluster randomized trials, the cluster-adjusted values were used if reported in the studies themselves. We planned to do subgroup analyses for studies; conducted in developed countries vs. developing countries; group vs. individual counseling; timing of intervention (pre-natal, postnatal vs. prenatal and postnatal) and community based facilitation vs. facility based counseling. The objective of these stratifications was to assess the effectiveness of elements like availability of facilities. For example a lot of deliveries in developing countries occur at home and facility based strategies would not be effective in these scenarios. The World Bank list of economies (July 2009) was used to classify countries into developing and developed [36]. Low- and middle-income countries were taken as developing, while high income countries were taken as developed.

## **R**

### **Trial flow and study characteristics**

Figure 1 shows the search flow diagram. The search strategy used generated 968 titles/abstracts, which were screened and 268 abstracts were preliminarily selected with potential of inclusion in our review. We thoroughly reviewed the abstracts and full texts, where available, of

these and finally, 53 studies met our inclusion criteria. The remaining 213 studies were excluded. Additional File 1 outlines the characteristics of included studies.

## **Quantitative data synthesis**

### ***EBF rates at 4-6 weeks***

There were thirty two randomized and quasi-randomized controlled trials that gave results of breastfeeding promotion interventions on EBF rate at 4-6 weeks post-

### ***EBF at 6 months***

Fifteen studies were found that looked at this outcome [31,38,50,52,54,60,64,66,68-74], of which six were from developing countries [38,64,66,68-70]. There was an overall 137% increase in EBF rate with promotion interventions, with a significant 6 times increased incidence in developing countries, compared to 1.3 times in developed countries (Additional File 2B). The sub-group analysis with respect to timing of interventions is shown in Additional File 3B, with the highest impact of prenatal and postnatal counseling combined. Lay support had a significant impact, while education alone failed to achieve any statistical significance (Additional File 4B). The results were statistically significant for both individual counseling but not for group counseling (Additional File 5B) and also no difference according to the level of care (Additional File 6B) as all sub-group results were statistically insignificant.

### ***Any breastfeeding at 4-6 weeks***

There were 22 studies that included this outcome [44-46,48,49,51,54,55,58,59,61,63,75-84], of which one was from developing country [84]. There was a 10% statistically significant increase in any breastfeeding at 4-6 weeks, with a 14% increase in developing countries (based on one study) (Additional File 2C). The combination of prenatal and postnatal counseling did not have any impact on breastfeeding rate, according to the sub-group analyses, while prenatal and postnatal each alone had significant impacts (Additional File 3C). No other sub-group analyses were performed for this outcome.

### ***Any breastfeeding at 6 months***

Twenty studies included this outcome of any breastfeeding at 6 months [21,25,26,31,44,45,54,56,60,71-73,77-82,84-86], of which two were from developing countries [25,84]. There was a 12% statistically significant increase in any breastfeeding rates at 6 months (RR = 1.12; 95% CI: 1.01 – 1.24), while the results for developing and developed countries separately showed no significant impact (Additional File 2D). The impact was only significant if the promotion was given in prenatal and postnatal periods combined (Additional File 3D). No other sub-group analyses were performed for this outcome.

### ***Recommendations for the LiST model***

For the LiST model, we recommend estimates using the studies from developing countries. We recommend a 89% increase in rate of EBF at 4-6 weeks from promotion interventions (RR = 1.89; 95% CI: 1.50 – 2.37) and a 6 fold increase in rate of EBF at 6 months (RR = 12.14; 95% CI: 9.76 – 15.11). For EBF at 4-6 weeks, group counseling (RR = 1.67; 95% CI: 1.23 – 2.26) had a greater impact compared to individual counseling (RR = 1.38; 95% CI: 1.22 – 1.56), while for EBF at 6 months the effects of each were significant for individual counseling [RR 2.60,

95 % CI 1.13-5.96) but were insignificant for group counseling (RR = 2.03; 95% CI: 0.85 – 4.85).

### **D**

This systematic review summarizes the effect of breastfeeding promotion interventions, including support and education, on exclusive and any breastfeeding rates at 4-6 weeks and at 6 months with recommendations for

would be receptive to breastfeeding promotion because of other factors like early employment, more ready availability of formula milk, and a different social milieu. The sub-group analyses on timing of breastfeeding show that prenatal counseling had greater impacts on breastfeeding rates at 4-6 weeks, while combined prenatal and postnatal promotion were important for breastfeeding rates at 6 months. For EBF at 4-6 weeks, most components of promotion interventions were important that included education alone, professional support alone, lay support alone and education plus professional support, while for EBF at 6 months, lay support and education plus professional support achieved statistical significance. For EBF at 4-6 weeks, group counseling had a better impact than individual counseling, while the results were insignificant for both individual and group counseling alone for EBF at six months. Community and facility promotion combined was found to be better than community or facility promotion alone.

While a 6 fold increase in EBF at 6 months is large, it is still well below recommendations; the intervention groups still failed to achieve high rates of EBF with the exception of Haider et al. [38]. This supports the observation that EBF is difficult and implies that it requires substantially more than education and support targeted solely at the mother to improve EBF rates in developing and developed countries.

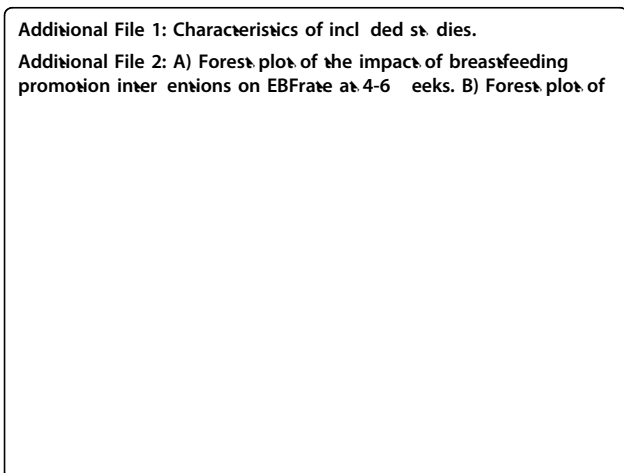
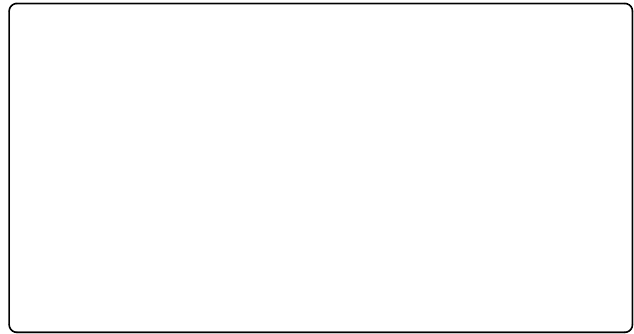
### C

Breastfeeding promotion interventions significantly increased EBF rates at 4-6 weeks and at 6 months postpartum, with a greater effect in developing countries. Prenatal counseling was found to be of greater importance for breastfeeding at 4-6 weeks, while combined prenatal and postnatal counseling was of significant benefit for EBF at 6 months of age.

### A a a a

Additional File 1: Characteristics of included studies.

Additional File 2: A) Forest plot of the impact of breastfeeding promotion interventions on EBF rate at 4-6 weeks. B) Forest plot of



- sex, socio-economic factors and seasons. *Acta Paediatr Scand Suppl* 1989, 350:44-54.
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