Support for breastfeeding mothers: a systematic review

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Summary

Although the benefits of breastfeeding are widely accepted, the effectiveness of different strategies to promote the continuation of breastfeeding once initiated are less clear. The objective of this systematic review was to describe studies comparing standard care with the provision of extra breastfeeding support and to measure its effectiveness. Outcome measures used were rates of cessation of any breastfeeding or exclusive breastfeeding at chosen points in time. Measures of child morbidity and maternal satisfaction were also used when these were reported.

Twenty eligible randomised or quasi-randomised controlled trials were identified, involving 23 712 mother–infant pairs. Extra support had a beneficial effect on the duration of any breastfeeding (RR [95% confidence intervals] for stopping any breastfeeding before the last study assessment up to 6 months 0.88 [0.81, 0.95]; 15 trials, 21 910 women). The effect was greater for exclusive breastfeeding (RR for stopping exclusive breastfeeding before the last study assessment 0.78 [0.69, 0.89]; 11 trials, 20 788 women).

Although the point estimates of relative risk were very similar, benefit derived from professional support achieved statistical significance for any breastfeeding (RR 0.89 [0.81, 0.97]; 10 trials, 19 696 women) but not for exclusive breastfeeding (RR 0.90 [0.81, 1.01]; six trials, 18 258 women). Lay support was effective in reducing the cessation of exclusive breastfeeding (RR 0.66 [0.49, 0.89]; five trials, 2530 women) while the strength of its effect on any breastfeeding was less clear (RR 0.84 [0.69, 1.02]; five trials, 2224 women). Professional support in the largest trial to assess health outcomes produced a significant reduction in the risk of gastrointestinal infections and atopic eczema. In two trials with children suffering from diarrhoeal illness, extra support was highly effective in increasing short-term exclusive breastfeeding rates and reducing recurrence of diarrhoea.

This review supports the conclusion that supplementary breastfeeding support should be provided as part of routine health service provision. There is clear evidence for the effectiveness of professional support on the duration of any breastfeeding although the strength of its effect on the rate of exclusive breastfeeding is uncertain. Lay support is effective in promoting exclusive breastfeeding although the strength of its effect on the duration of any breastfeeding is uncertain. Evidence supports the promotion of exclusive breastfeeding as central to the management of diarrhoeal illness in partially breast-fed infants.

Introduction

There is a large body of observational evidence for both the short-term and long-term health benefits of breastfeeding. Early benefits include reduced mortality in preterm infants, reduced infant morbidity from gastrointestinal, respiratory, urinary tract and middle...
Breastfeeding is also associated with significantly higher scores for cognitive development than formula feeding in a meta-analysis of 11 trials. This effect is strongest in preterm infants.

There is also increasing evidence for a long-term cardio-protective effect of breastfeeding. Wilson et al. in the Dundee infant feeding study found systolic blood pressure at the age of 7 years to be significantly raised in those children who had been exclusively formula fed for the first 15 weeks of life compared with those who had received any breast milk. Taittonen et al. also found that breastfeeding over 3 months was associated with a mean change in blood pressure of up to ~6.5 mmHg. Similar differences in blood pressure were found in two cohorts of children born prematurely and followed for between 13 and 16 years. The optimal duration of exclusive breastfeeding has recently been reviewed and exclusive breastfeeding until 6 months of age, with introduction of complementary foods and continued breastfeeding thereafter, has been recommended as a target for populations. There are also associated health benefits for the breastfeeding woman.

Despite these established benefits and relatively high rates of initiation of breastfeeding, exclusive breastfeeding rates even at 3–4 months remain remarkably low in many health care settings. Evidence from economically advantaged countries indicates that young mothers and those in low-income groups or those who ceased full-time education at an early age are least likely to either start breastfeeding or continue for a period of time sufficient to confer health gain. Paradoxically, in poorer countries, more affluent groups may have lower breastfeeding rates.

The purpose of this review was to examine interventions which provide extra support for mothers who wish to breastfeed and to assess their impact on breastfeeding duration and exclusivity and, where recorded, on health outcomes and maternal satisfaction. Specific objectives of the review were to describe the forms of support which have been evaluated in controlled studies, and the settings in which they have been used. It was also of interest to examine the effectiveness of different modes of offering similar supportive interventions (e.g. face-to-face or over the telephone) and whether interventions containing both antenatal and post-natal elements were more effective than those taking place in the postnatal period alone. The effectiveness of different care providers and training programmes and the effect of baseline breastfeeding prevalence (where known) on the effectiveness of supportive interventions were also examined.

Methods

Inclusion criteria

Studies were considered for this review if they were randomised or quasi-randomised controlled trials with a minimum of 75% follow-up. Participants were women who intended to breastfeed, who had initiated breastfeeding or who accepted the provision of support before or after the birth of their child. Trials were chosen that studied the contact with an individual or individuals (either professional or lay) offering support that was supplementary to standard care (in the form of, for example, appropriate guidance, encouragement and accurate information) with the purpose of facilitating continued and, when appropriate, exclusive breastfeeding. Studies were included if the intervention occurred in the postnatal period alone or also included an antenatal component. Interventions taking place in the antenatal period alone were excluded from this review as were interventions described as solely educational in nature. The main outcome measure was the effect of the interventions on duration of breastfeeding to specified points in time. Outcomes were recorded for stopping breastfeeding before 4–6 weeks and 2, 3, 4, 6, 9 and 12 months. Other outcomes of interest were exclusive breastfeeding, measures of neonatal and infant morbidity (where available) and measures of maternal satisfaction with care or feeding method.

Search strategy

This review drew on the search strategy developed for the Cochrane Pregnancy and Childbirth Group and on a previous review by the authors. A fuller version of the review is available in the Cochrane Library.
Support for breastfeeding mothers

Cochrane Controlled Trials Register (CCTR)/CENTRAL register was last searched in March 2001. A further independent search of Medline from 1993 and Embase from 1980 was also performed in March 2001. Details of the search strategies can be obtained from the contact author. Secondary references were scanned and relevant studies obtained. Contact was made with experts in the field to identify other published or unpublished studies. However, no further data were obtained by contacting breastfeeding researchers. Two reviewers (J.S. and M.J.R.) screened titles and abstracts of the electronic searches. Articles obtained by all methods were read independently by both reviewers except for two studies in Portuguese, from which data were extracted jointly by the contact reviewer and a translator.20,21

The following study characteristics were extracted and entered on a standardised form by J.S. and details checked by M.J.R.: country, setting, demographic data on study group and controls, study design, randomisation procedure, intervention package, length and completeness of follow-up, description of withdrawals and drop-outs, blinding of assessors and outcome measures. Each study was given a quality score based on the following criteria: clear description of inclusion and exclusion criteria, adequacy of randomisation, description of withdrawals and drop-outs, description of statistical analysis, allocation concealment, blinding of outcome assessment and intention to treat analysis. The maximum score was 8. Outcome data were doubly entered by J.S. and all entries were checked by M.J.R.

Data analysis

Data were analysed on an intention-to-treat basis whenever possible even if intention-to-treat analysis had not been used in the study report. Where cluster randomised studies reported proportions of women breastfeeding rather than cluster means, the ratio estimator procedure was used to adjust proportions to an effective sample size and to calculate an effective outcome rate.22,23 For these calculations, we used intraclass correlation coefficients either reported by study authors or calculated from raw study data. Relative risks were calculated as events (giving up breastfeeding) were common and in this context odds ratios (OR) are likely to exaggerate the benefits of support.24 Random effects models were preferred to perform all meta-analyses as studies were clinically heterogeneous. Subgroup analyses were performed for the overall effect on any breastfeeding, to compare high and low quality studies and to compare individually randomised and cluster randomised studies.

Results

Description of studies

Fourteen references not identified by previous editions of the review were identified by a search of the CCTR. Searches of Medline and Embase identified 189 references. Twenty trials from 10 countries were finally included in the review. The studies included 23 712 mother–infant pairs – a substantial increase since the previous edition of this review. Studies evaluated support provided by a variety of medical, nursing and allied professionals (e.g. nutritionists) as well as lay people. Lay support was either voluntary or remunerated. Details of those involved in providing support and the interventions used are given in the table of included studies (Table 1). Six studies used either the 18-hour or 40-hour WHO/UNICEF breastfeeding counselling/lactation management courses as the basis for the training of breastfeeding supporters.7,21,25–28 The studies were also subdivided into broad categories to examine aspects of the interventions as discussed in the ‘Methods’ section.

In the majority of studies, the comparison group was reported to have received usual postnatal care, which varies both between and within countries. The care at the time of the trials may also differ from that which is offered at the present time. In Canada, for example, many women receive one routine home visit by a public health nurse during the first month after discharge from hospital, whereas in the UK, at the time of the two studies contained in this review, postnatal care at home consisted of daily home visits from a midwife until 10 days after birth (and possibly until 28 days if the need arose) and a routine home visit from a health visitor (with an infant feeding advisory function) at approximately 10 days postpartum. In Brazil, no routine postnatal home visits are made and there would be no support for breastfeeding mothers routinely available from the health services, except in special programmes run by municipal secretaries of health. Wherever there were individual study details on care received by the comparison groups, these are given in Table 1.

Breastfeeding was usually reported as being either partial or exclusive with no further refinement of

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Table 1. Characteristics of trials included in the review

<table>
<thead>
<tr>
<th>Study</th>
<th>Randomisation</th>
<th>Allocation concealment</th>
<th>Quality score (/8)</th>
<th>Participants</th>
<th>Intervention</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barros et al. 1994</td>
<td>Not stated</td>
<td>Unclear</td>
<td>5</td>
<td>Urban setting, Brazil, n = 900, Follow-up 93%</td>
<td>Home support (social assistant/nutritionist) on days 5, 10, 20</td>
<td>Breastfeeding at monthly intervals to 6 months</td>
</tr>
<tr>
<td>Brent et al. 1995</td>
<td>Random blocks of 8</td>
<td>Unclear</td>
<td>4</td>
<td>Urban USA, n = 115, Follow-up 94%</td>
<td>Support (lactation consultant) by telephone or in clinic until weaning or 1 year</td>
<td>Rates of breastfeeding at 2 months</td>
</tr>
<tr>
<td>Davies-Adetugbo et al. 1997</td>
<td>Random number table</td>
<td>Not stated</td>
<td>4</td>
<td>Osun State, rural Nigeria, n = 169, Follow-up 95%</td>
<td>Support by Community Health workers days 0, 2 and 7 (18-hour WHO/UNICEF training)</td>
<td>Exclusive/partial breastfeeding after 1 and 3 weeks. Recurrence of diarrhoea</td>
</tr>
<tr>
<td>Dennis 1999</td>
<td>Randomly generated numbers</td>
<td>Sequentially numbered, sealed, opaque envelopes</td>
<td>6</td>
<td>Toronto, Canada, n = 258, Follow-up 99%</td>
<td>Telephone support by volunteers</td>
<td>Breastfeeding (any or exclusive) at 1, 2 and 3 months</td>
</tr>
<tr>
<td>Frank et al. 1987</td>
<td>Computer-generated random numbers</td>
<td>Sealed envelopes</td>
<td>7</td>
<td>Urban USA, n = 343, Follow-up 94%</td>
<td>Breastfeeding counsellor support on days 5, 7, 14, 21, 28 and 6, 8 and 12 weeks</td>
<td>Exclusive breastfeeding at 1, 2, 3, 4 months. Any breastfeeding 4 months. Readmission of infants</td>
</tr>
<tr>
<td>Froozani et al. 1999</td>
<td>Assignment by day (odd or even) of baby’s birth</td>
<td>Inadequate</td>
<td>3</td>
<td>Urban Iran, n = 134, Follow-up 90%</td>
<td>Support (nutritionist) after birth, 10–15 days; after 30 days; monthly to 4 months. Home or lactation clinic (40-hour WHO/UNICEF training)</td>
<td>Exclusive breastfeeding at 1, 2, 3 and 4 months. Mean no. of days illness with diarrhoea</td>
</tr>
<tr>
<td>Grossman et al. 1990</td>
<td>Coin toss</td>
<td>Inadequate</td>
<td>3</td>
<td>Urban USA, n = 97, Follow-up 90%</td>
<td>Telephone support (lactation counsellor) days 2, 4, 7, 10, 21; telephone help line</td>
<td>Breastfeeding at 6 weeks, 3 and 6 months</td>
</tr>
<tr>
<td>Haider et al. 1996</td>
<td>Random permuted blocks of variable length</td>
<td>Sealed envelopes</td>
<td>6</td>
<td>Dhaka, Bangladesh, n = 250, Follow-up 83%</td>
<td>Lactation counsellor or research physician, support days, 1, 2 days of discharge; home visit. (WHO/UNICEF training)</td>
<td>Exclusive breastfeeding on discharge and 2 weeks. Recurrence of diarrhoea</td>
</tr>
<tr>
<td>Haider et al. 2000</td>
<td>Cluster randomisation by random number table</td>
<td>Not stated</td>
<td>5</td>
<td>Dakka, Bangladesh, n = 726, Follow-up 79%</td>
<td>Peer counselling; 15 home visits: two in last trimester; four in month 1; 2-weekly in months 2–5. (WHO/UNICEF training)</td>
<td>Exclusive breastfeeding at birth, 4 days, 4 weeks, 2, 3, 4 and 5 months</td>
</tr>
<tr>
<td>Study Reference</td>
<td>Randomisation Method</td>
<td>Allocation Concealment</td>
<td>Outcome Quality Score</td>
<td>Participants</td>
<td>Intervention Details</td>
<td>Outcomes</td>
</tr>
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<tr>
<td>Jenner 1988&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Sequential allocation</td>
<td>Inadequate</td>
<td>4</td>
<td>Urban UK. n = 38. Follow-up 100%</td>
<td>Lay support (face-to-face/telephone) at home and in hospital Support by lactation nurse in hospital and at home. (Duration not specified)</td>
<td>Breastfeeding at 3 months</td>
</tr>
<tr>
<td>Jones and West 1985&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Randomisation by date of birth (2 week blocks)</td>
<td>Inadequate</td>
<td>5</td>
<td>District hospital. UK. n = 678. Follow-up 96%</td>
<td>Support from all health care staff (hospital/ community). Infants seen monthly. (WHO/UNICEF Baby Friendly Initiative)</td>
<td>Breastfeeding at 4 weeks, 3, 6, 12 months. Satisfaction with care</td>
</tr>
<tr>
<td>Kramer et al. 2001&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Random allocation within cluster pairs</td>
<td>Coin toss following randomisation</td>
<td>6</td>
<td>Urban/rural Belarus. n = 17 046. Follow-up 96.7%</td>
<td>Peer counsellor home visits days 5, 15, 30, 60, 90 and 120. (20-hour adapted WHO/UNICEF course)</td>
<td>Rates of exclusive, predominant, partial and artificial feeding at 4 months</td>
</tr>
<tr>
<td>Leite et al. 1998&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Random blocks of 20</td>
<td>Sealed envelopes</td>
<td>6</td>
<td>Urban Brazil. n = 1003. Follow-up 86%</td>
<td>Volunteer support; antenatal home visit, telephone contacts weekly for 6 weeks and 2-weekly to 5 months</td>
<td>Duration of breastfeeding</td>
</tr>
<tr>
<td>Lynch et al. 1986&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Not described</td>
<td>Unclear</td>
<td>3</td>
<td>Urban Canada. n = 270. Follow-up 100%</td>
<td>Support from health visitor or medical officer; daily hospital visits, home visit 4-6 weeks. 24-hour telephone advice line</td>
<td>Breastfeeding rates at 1, 2, 3, 4 and 6 months</td>
</tr>
<tr>
<td>Mongeon and Allard 1995&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Drawing numbered tickets</td>
<td>Unclear</td>
<td>4</td>
<td>Urban Canada. n = 200. Follow-up 97%</td>
<td>Home-based support (Community post-natal support worker) up to 10 visits in first 28 days</td>
<td>Breastfeeding rates at 1, 2, 3, 4 and 6 months</td>
</tr>
<tr>
<td>Moore et al. 1985&lt;sup&gt;g&lt;/sup&gt;</td>
<td>Not stated</td>
<td>Unclear</td>
<td>4</td>
<td>Urban UK. n = 525. Follow-up 90%</td>
<td>Exclusive breastfeeding at 3 months</td>
<td>Exclusive breastfeeding at 3 months</td>
</tr>
<tr>
<td>Morrell et al. 2000&lt;sup&gt;h&lt;/sup&gt;</td>
<td>Random number table</td>
<td>Sequentially numbered, sealed, opaque envelopes</td>
<td>7</td>
<td>Urban UK. n = 632. Follow-up 78%</td>
<td>Home-based support by peer counsellors. 3- and 6-visit intervention groups</td>
<td>Breastfeeding at 3 and 6 months. Incidence of diarrhoea in infants 0-3 months</td>
</tr>
<tr>
<td>Morrow et al. 1999&lt;sup&gt;i&lt;/sup&gt;</td>
<td>Cluster randomisation, stratified by subdivision</td>
<td>By computer</td>
<td>6</td>
<td>Urban Mexico. n = 130. Follow-up 96% to 3 months, 80% to 6 months</td>
<td>Support from paediatrician; days 1 and 4; 2 and 6 weeks; 3 months. Weekly telephone</td>
<td>Partial and exclusive breastfeeding at 2, 4, 8, 12, 16, 20 and 24 weeks</td>
</tr>
<tr>
<td>Porteous et al. 2000&lt;sup&gt;j&lt;/sup&gt;</td>
<td>Computerised block randomisation</td>
<td>Unclear</td>
<td>4</td>
<td>Urban Canada. n = 52. Follow-up 98%</td>
<td>Support by community midwife: daily hospital visits; telephone call; minimum of one home visit</td>
<td>Exclusive and partial breastfeeding at 4 weeks</td>
</tr>
<tr>
<td>Sjolin et al. 1979&lt;sup&gt;k&lt;/sup&gt;</td>
<td>Sequential pairs</td>
<td>Inadequate</td>
<td>2</td>
<td>Urban Sweden. n = 146. Follow-up 100%</td>
<td>Support by paediatrician; days 1 and 4; 2 and 6 weeks; 3 months. Weekly telephone</td>
<td>Partial and exclusive breastfeeding at 2, 4, 8, 12, 16, 20 and 24 weeks</td>
</tr>
</tbody>
</table>
definition. Few studies reported both partial and exclusive rates at all time points. Reporting of health outcomes was scanty and inconsistent allowing little joint analysis. The timing of outcome assessments varied considerably between studies, ranging from 2 weeks to 1 year postnatally. Several studies took repeated measurements of breastfeeding rates and some reported mean duration. Support was usually offered to women intending to breastfeed but in two studies intention to formula feed was not an exclusion criterion.\textsuperscript{29,30} In the small study by Porteous \textit{et al.},\textsuperscript{31} support was only offered to those breastfeeding women who identified themselves as unsupported on a self-report questionnaire. In one study, only women with a personal, family or partner history of atopy were selected while two further trials studied the effect of support for mothers of sick infants with moderate diarrhoeal disease.\textsuperscript{25,27,32}

### Methodological quality

Quality scores varied from 2 to 7 (maximum score 8) with six trials scoring 6 or above.

### Overall effect on any breastfeeding

The main summary outcome measure was breastfeeding at the time of the last study assessment up to 6 months. There was a beneficial effect on the duration of any breastfeeding in the meta-analysis of all forms of extra support (RR [95% confidence intervals] for stopping breastfeeding before the time of the last study assessment up to 6 months 0.88 [0.81, 0.95]; 15 trials, 21,910 women) (Fig. 1). Excluding trials with data collection for periods <6 months did not alter this conclusion although the effect size was smaller (RR 0.94 [0.89, 0.99]; nine trials, 20,015 women). Significant statistical

![Figure 1. Effect of all forms of extra support on cessation of any breastfeeding.](image-url)
heterogeneity was present ($P = 0.003$). This main finding persisted when higher-quality trials (scoring 6 or more on the 8-point scale) were analysed separately (RR 0.82 [0.69, 0.97]; six trials, 19 413 women) (Fig. 1). The heterogeneity present in this latter analysis became non-significant on exclusion of the study by Morrell et al. This finding may reflect the fact that this trial offered support from a community postnatal support worker to any woman, irrespective of feeding method. Although the supporters in this study received some training concerning the advantages of breastfeeding and correct positioning, they reported only 3% of their time in women’s homes being used in discussing breastfeeding.

In order to explore any differential effect of support conditional on the baseline prevalence of breastfeeding in the area in which the trial was conducted, we divided the trials into three categories denoted by high (>80%), intermediate (60–80%) or low (< 40%) initiation rates. This analysis showed that clear evidence of benefit was only statistically significant in settings where there were high rates of breastfeeding initiation (RR for stopping breastfeeding in areas of high initiation 0.84 [0.74, 0.96]; five trials, 19 223 women; in areas of intermediate initiation RR 0.91 [0.80, 1.03]; six trials, 1986 women; in areas of low initiation RR 0.88 [0.69, 1.12]; three trials, 555 women) (Fig. 2).

### Overall effect on exclusive breastfeeding

The effect of support on exclusive breastfeeding (RR for stopping breastfeeding before last study assessment 0.78 [0.69, 0.89]; 11 trials, 20 788 women) is greater than that observed on any breastfeeding although there is marked heterogeneity (Fig. 3). Excluding trials with data collection for periods <6 months did not alter this conclusion although the effect size was smaller (RR 0.96 [0.92, 0.99]; three trials, 17 825 women). It does not appear that the heterogeneity can be explained by a greater effect of supportive interventions on exclusive breastfeeding in countries with higher rates of breastfeeding initiation.

### Figure 2. Effect of all forms of extra support on cessation of any breastfeeding in countries with different rates of breastfeeding initiation.

<table>
<thead>
<tr>
<th>Study</th>
<th>Extra support</th>
<th>Usual care</th>
<th>RR [95% CI Random]</th>
<th>Weight %</th>
<th>RR [95% CI Random]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trials in settings with low breastfeeding initiation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brent 1995</td>
<td>39 / 58</td>
<td>52 / 57</td>
<td></td>
<td>34.2</td>
<td>0.74 [0.61, 0.90]</td>
</tr>
<tr>
<td>Frank 1987</td>
<td>68 / 171</td>
<td>82 / 172</td>
<td></td>
<td>30.7</td>
<td>0.83 [0.65, 1.06]</td>
</tr>
<tr>
<td>Grossman 1990</td>
<td>42 / 49</td>
<td>38 / 48</td>
<td></td>
<td>35.1</td>
<td>1.08 [0.90, 1.30]</td>
</tr>
<tr>
<td><strong>Total [95% CI]</strong></td>
<td>149 / 278</td>
<td>172 / 277</td>
<td></td>
<td>100.0</td>
<td>0.88 [0.69, 1.12]</td>
</tr>
<tr>
<td><strong>Trials in settings with intermediate breastfeeding initiation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dennis 1999</td>
<td>25 / 132</td>
<td>43 / 126</td>
<td></td>
<td>7.1</td>
<td>0.55 [0.36, 0.85]</td>
</tr>
<tr>
<td>Jones 1985</td>
<td>142 / 228</td>
<td>257 / 355</td>
<td></td>
<td>24.3</td>
<td>0.86 [0.76, 0.97]</td>
</tr>
<tr>
<td>Lynch 1986</td>
<td>81 / 135</td>
<td>79 / 135</td>
<td></td>
<td>18.0</td>
<td>1.03 [0.84, 1.25]</td>
</tr>
<tr>
<td>Mongeon 1995</td>
<td>76 / 100</td>
<td>80 / 100</td>
<td></td>
<td>22.0</td>
<td>0.95 [0.82, 1.10]</td>
</tr>
<tr>
<td>Morrell 2000</td>
<td>259 / 311</td>
<td>264 / 312</td>
<td></td>
<td>28.2</td>
<td>0.98 [0.92, 1.05]</td>
</tr>
<tr>
<td>Porteous 2000</td>
<td>1 / 27</td>
<td>8 / 25</td>
<td></td>
<td>0.4</td>
<td>0.12 [0.02, 0.86]</td>
</tr>
<tr>
<td><strong>Total [95% CI]</strong></td>
<td>584 / 933</td>
<td>731 / 1053</td>
<td></td>
<td>100.0</td>
<td>0.91 [0.80, 1.03]</td>
</tr>
<tr>
<td><strong>Trials in settings with high breastfeeding initiation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barros 1994</td>
<td>280 / 450</td>
<td>293 / 450</td>
<td></td>
<td>35.2</td>
<td>0.96 [0.87, 1.05]</td>
</tr>
<tr>
<td>Froozani 1999</td>
<td>11 / 67</td>
<td>17 / 67</td>
<td></td>
<td>3.4</td>
<td>0.65 [0.33, 1.28]</td>
</tr>
<tr>
<td>Kramer 2001</td>
<td>153 / 291</td>
<td>171 / 269</td>
<td></td>
<td>29.0</td>
<td>0.83 [0.72, 0.95]</td>
</tr>
<tr>
<td>Leite 1998</td>
<td>177 / 503</td>
<td>235 / 500</td>
<td></td>
<td>27.7</td>
<td>0.75 [0.64, 0.87]</td>
</tr>
<tr>
<td>Morrow 1999</td>
<td>26 / 80</td>
<td>11 / 30</td>
<td></td>
<td>4.7</td>
<td>0.89 [0.50, 1.56]</td>
</tr>
<tr>
<td><strong>Total [95% CI]</strong></td>
<td>647 / 1391</td>
<td>727 / 1316</td>
<td></td>
<td>100.0</td>
<td>0.84 [0.74, 0.96]</td>
</tr>
</tbody>
</table>
Overall effect of support at different points in time

Analysis of results at different periods of follow-up suggested that the benefit of all forms of support was present at all time points up to 9 months. Some caution needs to be exercised in interpreting these trends, however, as not all studies are represented at each of the time points at which data were analysed.

Professional support

Trials comparing professional support with usual care in preventing the cessation of any breastfeeding showed professional support to be effective overall (RR for stopping breastfeeding before last study assessment up to 6 months 0.89 [0.81, 0.97]; 10 trials, 19,692 women). As with the combined analysis of all forms of support, this benefit was present at all time points up to 9, but not, 12 months. The beneficial effect of professional support on exclusive breastfeeding at the time of the last study assessment did not achieve statistical significance (RR before 4–6 weeks 0.50 [0.27, 0.90]; RR before 2 months 0.76 [0.61, 0.94]).

Lay support

Overall, trials of lay support showed a non-significant trend towards reducing breastfeeding cessation at the time of the last trial assessment (RR 0.84 [0.69, 1.02], OR 0.67 [0.54, 0.84]; five trials, 2224 women). Further analysis did not reveal a statistically significant effect at any time point up to 6 months. However, in the studies of lay support which reported exclusive breastfeeding, there was a marked reduction in the cessation of exclusive breastfeeding (RR 0.66 [0.49, 0.89]; five trials, 2530 women).

Differing modes and timing of support

Analysis of studies reporting a predominantly face-to-face intervention showed a statistically significant benefit (RR for giving up breastfeeding 0.86 [0.78, 0.94]; eight trials, 20,544 women), whereas those using mainly telephone contact had a similar RR that was not statistically significant (RR 0.92 [0.78, 1.08]; five trials, 1168 women). The effect size measured in studies of interventions containing an antenatal element to breastfeeding support (RR 0.85 [0.70, 1.04]; three trials, 455 women) and that measured in studies where only postnatal support was offered (RR 0.88 [0.80, 0.96]; 12 trials, 21,465 women) were similar although only the latter reached statistical significance.

Health outcomes

There was a highly significant beneficial effect on exclusive breastfeeding 2–3 weeks after discharge from a health care facility in the two studies of support for mothers with sick infants (RR for stopping exclusive breastfeeding before 2–3 weeks after discharge 0.49 [0.33, 0.72]).25,27 There was also a marked short-
term reduction in the recurrence of diarrhoea in these two trials (RR for recurrence before 2–3 weeks follow-up 0.44 [0.24, 0.80]). In the study by Haider et al., 27 eight babies in the control group and two babies in the intervention group had died 2 weeks after discharge from hospital. The difference in the populations in these trials when compared with the healthy mother–infant dyads included in other studies led to their exclusion from the main meta-analysis.

Few trials reported health outcomes and it was not possible to combine these statistically. The PROBIT study found a significant reduction in the risk of one or more gastrointestinal infections (9.1% vs. 13.2%; adjusted OR 0.60 [0.40, 0.91]) and of atopic eczema (3.3% vs. 6.3%; adjusted OR 0.54 [0.31, 0.95]) in the group receiving care from health professionals who had received the WHO/UNICEF Baby Friendly Initiative training. 7 There was no significant reduction in respiratory tract infection (39.2% vs. 39.4%; adjusted OR 0.87 [0.59, 1.28]). Frank et al. 33 found no difference in breastfeeding rates in those infants rehospitalised during their study while Froozani et al. 26 observed a significant reduction in the mean number of days of gastrointestinal illness in the group receiving support (1.2 [SD 2.7] days vs. 4.0 [SD 7.1] days, P < 0.004) but no significant difference in respiratory illness (3.2 [SD 5.0] days vs. 3.7 [SD 8.8] days).

Measures of satisfaction

Satisfaction measures were, on the whole, not well reported. Jones and West 34 reported satisfaction with the amount of help received both at home and in hospital and found this to be greater in the intervention group. Only Dennis 35 reported maternal satisfaction with infant feeding, finding no significant differences between the peer and control groups’ mean scores on the Maternal Breastfeeding Evaluation Scale 36 (mean scores 53.81 [SD 5.69] vs. 52.98 [SD 5.94], P = 0.73). However, significantly more mothers in the control group reported overall dissatisfaction with their infant-feeding method.

Socially disadvantaged groups

Only one study reported effects of the supportive intervention in different social groups.34 In this study, the greatest difference in the proportion of women still breastfeeding at 4 weeks was in social classes IV and V (86% of social classes IV and V in the intervention group breastfeeding at 4 weeks vs. 58% in social classes IV and V in the control group, P < 0.01). It was not possible to compare this finding with the three trials in communities receiving assistance from the Women, Infants and Children programme in the USA (which had low rates of breastfeeding initiation) as only one of these trials reported breastfeeding rates at 4–6 weeks.

Effect of differing training programmes

Six trials reported using either the 18- or 40-hour WHO/UNICEF breastfeeding training courses, while one trial used the peer counsellor methods developed by La Leche League, the international lay breastfeeding support organisation.7,21,25–28,37 Meta-analysis of four trials using WHO/UNICEF training showed significant benefit in prolonging exclusive breastfeeding (RR 0.70 [0.53, 0.93]) but was highly heterogeneous.

Discussion

This review adds several trials to its predecessor and brings to 23,712 the number of women observed.18 The reporting of these studies was often not comprehensive, lacking, for example, in terms of details of the training and qualifications of the supporters, the definitions used of the extent of breastfeeding and in the description of adherence to the support protocol. There was also a failure to present details of the informational element of the interventions and on the background detail of the care received by the comparison groups.

Nevertheless, the newer studies included in the review (1998 onwards) were of a higher overall quality with five out of seven trials scoring 6 or more out of a maximum quality score of 8. These factors, together with the diversity of supportive interventions and the widely differing timing of study endpoints, should urge some caution in the interpretation of the analysis of pooled data from the majority of studies to assess a measure of overall benefit. Despite this caution, the overall benefit found from all forms of supportive intervention has been explored with subgroup analysis and is moderately robust following exclusion of the methodologically weaker trials. The apparent greater effectiveness observed in trials of support in communities with high levels of breastfeeding initiation may indicate that an early culture of breastfeeding acts synergistically with the provision of extra support.
Although the effect size of support interventions on reducing the cessation of any breastfeeding is modest, there is evidence of a greater effect on the prolongation of exclusive breastfeeding. These effects are also well illustrated in the studies of sick children where the attendant short-term health benefits of exclusive breastfeeding are demonstrated.

Our attempts to determine the most helpful elements of support strategies should also be treated with some caution as they arise from qualitative judgements of the intended intervention rather than quantitative estimates of the intervention as delivered. Nevertheless, on this basis, it would appear that strategies that depend mainly on face-to-face support appear more effective than those that rely primarily on telephone contact. There also appears to be no beneficial effect on the duration of breastfeeding to be derived from including an antenatal component to the support offered.

**Implications for practice**

Consideration should be given to providing supplementary breastfeeding support as part of routine health service provision. There is clear evidence for the effectiveness of additional professional support in prolonging any breastfeeding but the strength of its effect on exclusive feeding is less certain. WHO/UNICEF training courses appear to be an effective model for professional training. Lay support is effective in promoting exclusive breastfeeding although the strength of its effect on the duration of any breastfeeding is uncertain. Face-to-face support appears to be more effective than support by telephone, but there is as yet no evidence to suggest that the duration of breastfeeding is improved by routine antenatal contact. Evidence supports the promotion of exclusive breastfeeding as central to the management of diarrhoeal illness in partially breast-fed infants. However, there are several areas that require further study and these are summarised in Table 2.

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Table 2. Implications for research

- Further trials are required to assess the effectiveness of both lay and professional support in different settings – in particular in those communities with low rates of breastfeeding initiation. Trials should test the effectiveness of different training programmes (which should be well defined and reproducible) and should attempt to address impact on both exclusive and any breastfeeding where possible.
- Prospective economic analyses are required to accompany trials to establish the cost-effectiveness of different interventions.
- Fundamental qualitative research should explore the different elements of breastfeeding support strategies and the mechanisms by which support operates.

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