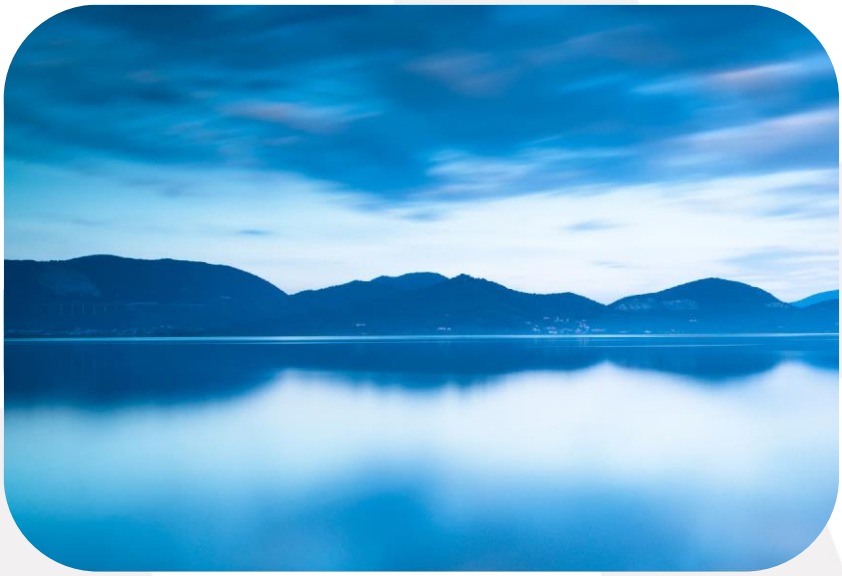
Interventions that promote increased breastfeeding rates and breastfeeding duration among women

An umbrella review



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The views expressed in the review are those of the authors and not necessarily those of the Minister for Health, Department of Health or Health Research Board.

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Glossary of terms

Breastfeeding in Ireland: A five-year strategic action plan (2005) endorsed the World Health Organization's (WHO's) definitions of exclusive (2003) and partial (2001) breastfeeding as those to be applied in assigning targets related to breastfeeding duration in Ireland. The WHO definitions are cited in *Breastfeeding in Ireland: A five-year strategic action plan* (2005) and the *National Infant Feeding Survey* (2008).
https://www.breastfeeding.ie/uploads/files/ACTIONplan.pdf: http://hdl.handle.net/10147/118910

The agreed definitions of the WHO (2003) relevant to breastfeeding are:

Breastfeeding: The child receives breast milk (direct from the breast or expressed).

Exclusive breastfeeding: The child receives no other food or drink, not even water, except breast milk (including milk expressed or from a wet nurse), but allows the infant to receive ORS (oral rehydration salts), drops and syrups (vitamins, minerals and medicines).
http://www.who.int/nutrition/topics/infantfeeding_recommendation/en/

Predominant breastfeeding: The infant's predominant source of nourishment has been breast milk (including milk expressed or from a wet nurse as the predominant source of nourishment). However, the infant may also have received liquids (water and water-based drinks, fruit juice) ritual fluids and ORS, drops or syrups (vitamins, minerals and medicines). http://www.who.int/nutrition/topics/infantfeeding_recommendation/en/

Artificial feeding: Feeding an infant on breast-milk substitute.

Bottle-feeding: Feeding an infant from a bottle, whatever is in the bottle, including expressed breast milk, water, infant formula milk or cow's milk.

Complementary feeding: The child is receiving both breast milk and solid (or semi-solid) food.

One further definition has been added (WHO, 2001):
Partial breastfeeding: The infant receives some breastfeeds, and some artificial feeds, either milk or cereal or other foods (WHO/EURO 2001).

Doula: a woman who gives support, help, and advice to another woman during pregnancy and during and after the birth.

List of abbreviations

CI	confidence interval
QAT	Health Evidence Quality Appraisal Tool
UNICEF/WHO BFHI	UNICEF/WHO Baby-Friendly Hospital Initiative
BFHI	Baby Friendly Health Initiative
DoH	Department of Health
GP	general practitioner
HSE	Health Service Executive
LHW	lay health worker
RCTs	randomised control trials
RR	relative risk
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organization

Executive summary

Purpose

Ireland has the lowest rate of breastfeeding in Europe, with the rate of ever breastfed at 55%, compared with Sweden and Norway which have rates of 98% and 95%, respectively; in addition, despite improvements in recent years, breastfeeding rates continue to lag behind other countries. *Breastfeeding in Ireland: A five-year strategic action plan* is the current government policy on promoting, supporting and protecting breastfeeding in Ireland. The Health Service Executive (HSE) is currently drafting a new HSE Breastfeeding Action Plan. To facilitate the implementation of this action plan, the Department of Health (DoH) has requested that the HRB carry out a review of breastfeeding interventions which aim to increase initiation, exclusivity and duration of breastfeeding.

Review question

The DoH asked the following question:

- What single intervention (single action) or complex intervention (two or more actions) promote increased breastfeeding rates?
    - Increased breastfeeding rates are defined as increased initiation of any (breastfeeding to any degree) or exclusive breastfeeding, and increased duration of any or exclusive breastfeeding.
    - The review is limited to healthy mothers of healthy full-term babies (greater than 36 weeks' gestation).

Methods

The search approach for this review of reviews, or umbrella review, was comprehensive and aimed to identify all potentially relevant systematic reviews published between 2005 and 2015.

The combined searches yielded 2,213 references. Once the titles and abstracts were screened and the most pertinent texts read, 44 reviews were included in this overview of reviews (or umbrella review). A data extraction tool, adapted from a data extraction form used by the Joanna Briggs Institute, was used to record the characteristics of each review and its findings. The quality of each review was assessed using the Health Evidence Quality Appraisal Tool (QAT) developed by McMaster University. The quality of the evidence was rated as:

- Strong (high); total score 8–10
- Moderate; total score 5–7
- Weak (low); total score 4 or less.

Two reviews covering only one primary study (already contained in other included reviews) were excluded from the synthesis; and six studies whose methods were assessed as 'weak' were also excluded, leaving 36 studies in the narrative synthesis or findings.

Findings

The findings presented are those derived from the 36 studies that we assessed as being of strong or moderate quality. Ten interventions were identified in the reviews, with education, counselling and/or support being the most tested intervention. We divided the interventions into two main categories: education/counselling/ support, and other breastfeeding interventions. A number of subcategories emerged from the education/counselling/support category: the timing of the intervention with respect to the pregnancy, the target group for the intervention and the use of web-based communication. Each of these subcategories was synthesised separately. The category 'other breastfeeding interventions' contained nine subcategories:

multifaceted programmes, skin-to-skin contact, rooming-in, supplementary feeding, pacifiers, baby-led scheduling, incentives, antenatal breast examination and comparison of midwife-led and other/doctor-led maternity care.

Education, counselling and support

Having examined the effective and promising interventions which emerged from the included reviews, there is evidence that **education, counselling and support** have a major role to play in the promotion of breastfeeding. Education, counselling and support have been shown to be effective in the antenatal, extended postnatal period, and both periods combined, and some reviews demonstrate that ongoing one-to-one education/counselling/support, especially in the postnatal period, over a long duration is an effective method of promoting breastfeeding. In addition, one-to-one needs-based counselling and support may be effective for low-income and adolescent mothers. Internet support may be a useful adjunct to face-to-face care. A few reviews found that peer support was most effective in low- or middle-income countries and two reviews found that peer support was not effective in high-income countries, particularly where there was well-organised community midwife care after the birth.

However, the reviews examining education, counselling and support were not consistent in their categorisation of interventions and, in some cases, populations. Interventions that were grouped together often varied greatly in terms of the content of the intervention, the length of the intervention, the mode of delivery and the target population. The settings where the interventions were conducted varied, as did the training, if any, which was provided to those performing the interventions.

For peer support, there are considerable differences, which have the potential to modify the effect of peer counselling; such differences include the study populations, the definition of peers, the definition of counsellors, peer counsellor training protocols, peer visit schedules, and outcome ascertainment methods between trials.

In the majority of studies, the interventions were compared to 'routine care', the definition of which seems to vary considerably between countries.

Therefore, given the enormous diversity within and between the reviews it is not possible to say precisely which period of time would be the most beneficial to provide the education, counselling or support; who should provide it; or what component of these interventions might be the most beneficial in order to increase breastfeeding rates.

Some points of note arose from the reviews. A Cochrane review by Renfrew *et al.* containing 52 randomised control trials (RCTs) and which the HRB authors classified as strong, concluded that 'all women should be offered support to breastfeed their babies to increase the duration and exclusivity of breastfeeding. Healthcare settings should provide such trained support as standard. Support is likely to be more effective in settings with high initiation rates, and therefore measures to increase the uptake of breastfeeding should be in place. Support may be offered either by professional or lay/peer supporters, or a combination of these. Strategies that rely mainly on face-to-face support are more likely to succeed. Support that is only offered when women seek help is unlikely to be effective; women should be offered ongoing visits on a scheduled basis so they can predict that support will be available. Support should be tailored to the setting and the needs of the population group.'

Dyson, McCormick and Renfrew (2005), in another Cochrane review containing 11 RCTs with the target of the intervention being **low-income women**, noted: 'Support may be offered either by professional or lay/peer supporters, or a combination of these. Strategies that rely mainly on face-to-face support are more likely to succeed.' In the same review, subgroup analysis of two studies (162 women) evaluating the effect of repeat,

informal breastfeeding education personalised to each woman's needs, showed a statistically significant increase in the number of women starting to breastfeed as a result of the intervention.

The reviews that addressed interventions among **adolescent mothers** showed mixed results, but it is clear that peer support and education interventions improve breastfeeding rates, especially when these are targeted at individuals.

Additionally, a review by Chung *et al*. including 38 RCTS concluded that when the components of multifaceted breastfeeding interventions (formal or structured education, system-level professional support, individual-level professional support and/or lay support [peer]) were examined, the inclusion of lay support in a multicomponent intervention increased the positive effect of the initiation on the rate of exclusive breastfeeding and the proportion continuing to breastfeeding between one and three months.

Two reviews examined the effect of **educating the educators**. One of these found that their evidence was insufficient to draw conclusions, whereas the other review found that most of the large sample size studies did show improvements in breastfeeding outcomes where the educational intervention was greater than 18 hours.

With regard to using **e-technology/telephone support** Lau *et al*. conclude that the review provides support for the development of web-based, text messaging, CD-ROM, electronic prompts and interactive computer agent interventions for promoting and supporting breastfeeding. The HRB authors agree with the authors' conclusion in general, but larger-scale studies are necessary in order to draw definitive conclusions. E-technologies would in no way replace usual care, but could be used in addition to usual care.

Other interventions

Education, counselling and support are contained in three of the ten steps of the Baby Friendly Health Initiative (BFHI). When the effective and promising interventions in the included reviews on 'other' interventions to promote breastfeeding are examined, it emerged that four of the nine interventions described are also included in the Ten Steps to Successful Breastfeeding advocated by the BFHI. These interventions are: structured programmes to promote breastfeeding, promoting early skin-to-skin contact (SSC), having the practice of rooming-in for mother-infant dyads and avoiding supplementary infant feeding.

Beake *et al.*, in a review of 21 studies (mostly observational) and five systematic reviews, reported that most of the studies found an improvement in breastfeeding initiation following the introduction of a **structured programme**, and while there was some improvement in duration of any or exclusive breastfeeding these were not always statistically significant.

Another review examined the topic of early **skin-to-skin contact** and found that this intervention had a short-term positive effect on any or exclusive breastfeeding rates in the early postpartum period, and also had a positive effect on any or exclusive breastfeeding in the longer term (1–4 months, 3–6 months respectively).

Jaafar, Lee and Ho included only one trial in their review of **rooming-in** for mother-infant dyads, in which the only outcome examined, exclusive breastfeeding on discharge from hospital, was found to be significantly higher in the rooming-in group.

One review by Becker and Remmington examined data from two recent RCTs and reported that the larger of the two trials found a positive impact on breastfeeding duration and exclusivity resulting from **avoidance of supplementary feeds**. The authors found that the contradictory evidence in the smaller trial was insufficient to negate the evidence from the larger trial.

Jaafar et al[7] and O'Connor et al [8] indicate that evidence from RCTs do not support the view that **pacifier use** has a negative effect of breastfeeding duration or prevalence at 4 months.

The restriction of pacifier use is advocated in the UNICEF/WHO BFHI initiative. Two reviews (Jaafar *et al*. and O'Connor *et al*.) examined the association between pacifier use and breastfeeding and found that pacifier use did not make a significant difference to breastfeeding outcomes. The authors of one of the reviews (Jaafar *et al*.) observed that there is a widespread belief that pacifiers may interfere with breast milk production and lead to discontinuation of breastfeeding, but the evidence does not support this belief.

Also of interest is the fact that one of the reviews attempted to examine the effect of **baby-led breastfeeding** compared to scheduled breastfeeding and found no RCTs to provide evidence on this practice. Baby-led or cue-based breastfeeding is one of the steps in the UNICEF/WHO BFHI initiative and therefore it is unexpected that there are no trials to prove or refute this point.

An interesting review by Johantgen *et al*. examined the impact of **nurse-midwife care** compared to physician care during labour and delivery on breastfeeding initiation, and found the breastfeeding initiation rates higher in the mothers cared for by nurse-midwives. However, this finding must be interpreted with caution as only three observational studies of moderate quality were included in the review. The evidence from observational studies is less robust than that from RCTs.

Conclusions

While there are apparent gaps in research in relation to some interventions, there is nevertheless a substantial body of consistent evidence that provides a sound basis to proceed with education, counselling and support programmes that are high intensity and are run over the antenatal, intrapartum and extended postnatal period in order to improve rates of breastfeeding among women in Ireland.

The existence of structured programmes (such as UNICEF/WHO BFHI) in hospitals, including the above-mentioned education and support, early mother-infant contact, rooming-in and avoidance of supplemental feeds has been shown to be effective.

All 18 maternity hospitals/units in Ireland participate in the UNICEF/WHO BFHI programme, but only half are accredited at national designation level. Reaching the national designation level means the maternity unit has developed a breastfeeding policy, provides training for staff, promotes informed parental choice through the provision of appropriate and accurate discussions, as well as implementing practices supportive of good mother and baby care. It is not clear from the BFHI website what is required in order for a maternity hospital or unit to be at participation level.

The prevalence of breastfeeding in Ireland on discharge from hospital indicates that indicates there is a need to support UNICEF/WHO BFHI, in order to ensure that all promising and effective interventions are implemented in every public hospital.

1 Introduction

This report presents the findings of a review of the evidence carried out by a team at the Evidence Centre of the Health Research Board (HRB) consisting of Marie Sutton, Emma O'Donoghue, Martin Keane, Louise Farragher, and Jean Long.; Emma O'Donoghue is employed by the Department of Health. The review outlines selective or targeted breastfeeding interventions that promote increased breastfeeding rates among women during pregnancy, delivery, and up to six months after delivery.

1.1 Purpose of the review

Ireland has the lowest rate of breastfeeding in Europe, with rates of ever breastfed at 55%, compared with Sweden and Norway, which have rates of 98% and 95%, respectively. In addition, despite improvements in recent years, rates continue to lag behind other countries. *Breastfeeding in Ireland: A five-year strategic action plan*[1] is the current government policy on promoting, supporting and protecting breastfeeding in Ireland. A review of the strategic action plan was undertaken by Institute of Public Health (IPHI), Ireland in 2014. The Health Service Executive (HSE) is currently drafting a new HSE Breastfeeding Action Plan. To facilitate the implementation of this action plan, the Department of Health (DoH) has requested that the HRB carry out a review of breastfeeding interventions which aim to increase initiation, exclusivity and duration of breastfeeding.

The importance of breastfeeding in preventing childhood illnesses and chronic diseases, and in protecting maternal health, is well established. Breastfeeding is also a significant protective factor against obesity in children. Children who are not breastfed have an increased risk of being overweight and obese, with subsequent health risks and health and social costs.

The World Health Organization (WHO) recommends that all children are exclusively breastfed for the first six months of life, and from six months to two years of age, mothers are recommended to continue breastfeeding, in combination with suitable complementary foods – semi-solid and solid.

The *EU Action Plan on Childhood Obesity 2014–2020* includes a number of actions in relation to breastfeeding and the timely introduction of complementary foods, including:

- promoting early childhood services and maternity care practices that empower new mothers to breastfeed;
- promoting breastfeeding through national health strategies;
- training of healthcare professionals; and
- monitoring of the implementation of the WHO International Code of Marketing of Breast-milk Substitutes in member states.

In parallel with these developments, the DoH recently developed Ireland's first National Maternity Strategy and is working on a revised Obesity Policy and Action Plan. The Department of Children and Youth Affairs, which is developing an Early Years Strategy under the framework of *Better Outcomes, Brighter Futures, the National Policy Framework for Children*, makes specific reference to enhancing Ireland's breastfeeding rates.

The purpose of this review is to study interventions that promote increased initiation, exclusivity and duration of breastfeeding. This work will facilitate the implementation of the evidence-based breastfeeding actions in the above key government policies.

1.2 Research question

What interventions (single action) or complex interventions (two or more actions) promote (initiate and support) increased breastfeeding rates (initiation, exclusive up to six months) and breastfeeding duration among women during pregnancy, delivery, and post-delivery up to six months after birth?

The HRB review team refined the initial DoH question in order to align its terms more closely with those used in the reporting of breastfeeding outcomes in the literature, but the revised question does not change the parameters of the original question or the information to be collected.

Revised question:
What single interventions (single action) or complex interventions (two or more actions) promote increased breastfeeding rates? Increased breastfeeding rates are defined as increased initiation of any (breastfeeding to any degree) or exclusive breastfeeding, and increased duration of any or exclusive breastfeeding.

The review is limited to healthy mothers (BMI <30kg/m^2) of healthy full-term babies (greater than 36 weeks' gestation).

1.3 Background

The benefits of breastfeeding are well recognised and the promotion of breastfeeding forms a key strategy for midwives and other healthcare professionals worldwide. The WHO recommends that, wherever possible, infants should be fed exclusively on breast milk until six months of age and that breastfeeding should continue as part of the infant's diet for up to two years. Because breast milk provides optimal nutrition for infants, and due to the fact that Ireland continues to rank among countries with the lowest breastfeeding rates, promotion of breastfeeding in Ireland remains a long-term population health priority for the DoH. There have been many public health initiatives introduced to achieve this aim and while there was a small increase (1.1%) in the rates of breastfeeding in Ireland between 2009 and 2013, there is scope for improvement. In 2013, 55.7% of infants were breastfed on discharge from hospital. This includes 46.3% who were exclusively breastfed and a further 9.4% who were fed using a combination of bottle and breastfeeding. The percentage of infants who were breastfed (either exclusive or combined) is higher among older mothers and there is a marked social class difference, with much higher rates among mothers in 'higher' and 'lower professional' groups (73.8% and 69.4%, respectively) compared with mothers who were reported to be 'unemployed' (35.8%).[2] The HSE[3] reported that the percentage of babies breastfed (exclusively and not exclusively) at first public health nurse visit was 54%, and at the three-month visit was 35%.

This review sets out to identify interventions that increase breastfeeding rates and in this regard the outcome indicators of interest are:

- initiation of breastfeeding;
- exclusive breastfeeding; and
- duration of breastfeeding.

The interventions may be single-component interventions or multicomponent interventions. Interventions focused on increasing breastfeeding initiation rates aim to increase the proportion of infants who are ever breastfed; those that focus on increasing the duration of breastfeeding aim to increase the length of time that breastfeeding continues once initiated, and interventions to improve the rates of exclusive breastfeeding aim to increase the proportion of infants (up to six months) who are fed only and entirely by breast milk, with no infant formula or non-human milk forming any part of their nutrition.

The benefits of breastfeeding have been widely documented, and include benefits for infants, mothers and for society in general. Significantly, breastfeeding contributes to the development of the infant immune system. Most studies show that the positive effects of breastfeeding are dose-related, with improved outcomes associated with longer breastfeeding duration and lasting for many years after breastfeeding has stopped.[4]

The UK NHS promotes breastfeeding and actively encourages breastfeeding for all infants, while highlighting that breastfeeding reduces babies' risk of:[5]

- infections, with fewer visits to hospital as a result;
- diarrhoea and vomiting, with fewer visits to hospital as a result;
- sudden infant death syndrome (SIDS);
- childhood leukaemia;
- type 2 diabetes;
- obesity; and
- cardiovascular disease in adulthood.

Breastfeeding also has health benefits for the mother, as it lowers the mother's risk of:[5]

- breast cancer;
- ovarian cancer;
- osteoporosis (weak bones);
- cardiovascular disease; and
- obesity.

Health outcomes differ substantially for mothers and infants who formula feed compared with those who breastfeed, even in developed countries such as the United States. A recent meta-analysis for the Agency for Healthcare Research and Quality[6] reviewed this evidence in detail and outlined the following:

- For infants, not being breastfed is associated with an increased incidence of infectious morbidity, including otitis media, gastroenteritis and pneumonia, as well as elevated risks of childhood obesity, type 1 and type 2 diabetes, leukaemia, and sudden infant death syndrome (SIDS).
- Among premature infants, not receiving breast milk is associated with an increased risk of necrotising enterocolitis.
- For mothers, failure to breastfeed is associated with an increased incidence of premenopausal breast cancer, ovarian cancer, retained gestational weight gain, type 2 diabetes, and the metabolic syndrome.[7]

The WHO also emphasises the importance of breastfeeding and a worldwide programme, the Baby Friendly Hospital Initiative (BFHI), to implement practices that protect, promote and support breastfeeding, was launched by the WHO and United Nations Children's Emergency Fund (UNICEF) in 1991, following the adoption of the Innocenti Declaration On the Protection, Promotion and Support of Breastfeeding in 1990.

The Baby Friendly Health Initiative (BFHI) initiative was introduced in Ireland in 1998 and the 'H' in its title was changed from hospital to health in 2013, so as to include the primary care and community health service settings which may, in line with international trends, become part of the 'initiative' in the future.[8] When the BFHI first under way, it was a part of the Health Promoting Hospitals Network programme. Currently, it is an independent organisation with a governance structure and in receipt of grant aid from HSE, Health and Wellbeing Division.[8] The BFHI in Ireland has two levels of involvement (S Hourigan, personal communication, June 2016):

1. Participation (previously membership)
2. National designation as a baby-friendly hospital (accreditation).

The 18 maternity hospitals/units in Ireland are at various stages in the process of attaining the baby-friendly national designation award; all of the maternity hospitals/units participate in BFHI, but only nine were designated baby-friendly hospitals at the end of 2015. The nine hospitals are:[9]

1. Cavan General Hospital
2. Galway University Hospital
3. Midland Regional Hospital Mullingar
4. Midland Regional Hospital Portlaoise
5. Our Lady of Lourdes Hospital, Drogheda
6. Portiuncula Hospital, Ballinasloe
7. Rotunda Hospital, Dublin
8. South Tipperary General Hospital, Clonmel
9. University Maternity Hospital Limerick

The national designation is valid for five years from the date of award; annual auditing is required[8] and is one of the HSE's new key performance indicators.[3] Reaching the national designation standard means that the maternity unit has developed a breastfeeding policy, provides training for staff, promotes informed parental choice through the provision of appropriate and accurate discussions, as well as implementing practices supportive of good mother and baby care. The national designation as a baby-friendly hospital is awarded following validation by an external panel (who assessed that all BFHI criteria were met at that time).[8]

The nine maternity hospitals at participation level are:[9]

1. Coombe Women & Infants University Hospital, Dublin
2. Letterkenny General Hospital, Donegal
3. Mayo General Hospital, Castlebar
4. National Maternity Hospital, Dublin
5. Sligo Regional Hospital
6. St. Luke's General Hospital, Kilkenny
7. University Hospital Kerry, Tralee, Co Kerry
8. University College Maternity Hospital, Cork
9. University Hospital Waterford

It is not clear from the BFHI website what is required for a maternity hospital or unit to be at participation level. In 2014, 42% of the 67,462 births in Ireland occurred in a national-designation baby-friendly hospital.[9]

Given the wide consensus on the advantages and health benefits of breastfeeding, this overview of reviews set out to determine what interventions are used to promote breastfeeding internationally. An initial scoping search yielded a large amount of published peer-reviewed literature on the subject of interventions to promote breastfeeding, with many systematic reviews of the primary studies in this area. Due to time constraints, the current authors decided to conduct a review (or overview) of existing systematic reviews on breastfeeding interventions with the purpose of describing their quality, summarising and comparing their findings and conclusions, and discussing the strength of these conclusions. Because of the growing volume of systematic reviews available to inform many topics in healthcare, systematic reviews of existing reviews are increasingly being undertaken to provide an overall examination of the evidence on a particular topic and, for the purpose of this review, will be termed an overview (or umbrella review) of systematic reviews.

1 Methods

A search was undertaken to identify high-quality evidence on interventions aimed at improving breastfeeding initiation, duration and exclusivity. An initial scoping search of existing literature was carried out in PubMed to gain an insight into the range and depth of research that exists in the area of breastfeeding. This resulted in 59,057 articles on breastfeeding; once the systematic review filter was applied, 982 references were returned. It should be noted that this filter is quite broad and covers clinical guidelines and protocols in addition to systematic reviews. Due to the large number of peer review papers on the topic, coupled with the six-month timeframe, it was decided to limit the search strategy to include systematic reviews only, and therefore to undertake an overview (umbrella review) of systematic reviews.

2.1 Search strategy

The search approach for this review of reviews or umbrella was comprehensive and aimed to identify all potentially relevant systematic reviews published between 2005 and 2015. The 10-year search period was based on the best practice recommended in the Health Evidence Quality Appraisal Tool (Appendix 5). Searches of the PubMed, CINAHL, Embase, MEDLINE, DARE, Trip and Health Evidence databases were undertaken. EndNote and EPPI-Reviewer software packages were used for reference and data management. EPPI-Reviewer was also used for preliminary screening and coding of texts. The combined searches yielded 2,213 references. Appendix 1 presents the search terms. These references were downloaded into EndNote and EPPI-Reviewer, deduplicated (357 duplicates) and screened on title and abstract using predefined inclusion and exclusion criteria (Appendix 2). From these, 104 articles were retrieved for full-text screening. At both title and abstract, and full-text screening stages, references were screened by two authors (MK and MS), with any disagreements on inclusion and exclusion resolved through discussion. Following full-text screening, a total of 44 systematic reviews were included to answer the question posed by the DoH. Additional articles from the search were used to inform the background and context of the review, and these are included in the Bibliography. The flowchart for the screening and selection process is presented in Appendix 3.

A data extraction tool, adapted from a Joanna Briggs Institute data extraction form,[10] was used to record the characteristics of each review and its findings. Three review authors carried out the extraction (MK, MS and EOD). The data extraction tool comprised two worksheets:

- **Sheet 1** extracted data describing the interventions, the sources searched, target population, the number and types of studies included, the country of origin of the included studies, the outcomes assessed and the methods used to combine the findings.
- **Sheet 2** extracted the findings and the overall conclusions of the review.

The extraction parameters included in the tool can be found in Appendix 4.

2.2 Quality assessment

There is no consensus on the best quality assessment tool to use for carrying out a review of reviews.[11, 12] A number of tools were considered and the Health Evidence Quality Appraisal Tool (QAT) developed by McMaster University was selected (Appendix 5). This tool was chosen because it covers a range of appropriate assessment criteria, has been used to assess reviews, and is accompanied by detailed guidance which helps to standardise its use by different team members. The tool can be used to assess internal validity, i.e. to measure the extent to which the findings answered the research question. The assessment criteria were: clearly focused question; appropriate inclusion criteria; research strategy; search timeframe; level of evidence for primary studies; methodological quality; quality review transparency; suitability of combining studies; appropriate methods for combining or comparing studies; and does data support author's interpretation.

All studies (n = 44) that met our inclusion criteria were critically appraised using 10 QAT questions and the ratings for each review are presented in Appendix 6. The quality of the methods for each review was rated as Quality Assessment Rating:

- Strong (high); total score 8–10
- Moderate; total score 5–7
- Weak (Low); total score 4 or less.

Two reviews[13, 14] containing only one primary study already contained in other included reviews, as well as six studies assessed as 'weak', were excluded from the synthesis, leaving 36 studies in the narrative synthesis. The characteristics of the included studies are included in Appendix 7. The details of the six studies that were assessed as methodologically weak, i.e. scoring 4 or less, are included in Appendix 8; the main methodological weaknesses in the six systematic reviews were: the quality of primary studies was not assessed, the analysis did not use accepted methods, and the conclusions did not match the findings. The quality assessment was judged by two of the authors (JL and MS or JL and MK) and in the event of a disagreement, a consensus was reached by discussion.

The primary objectives of some of the reviews included were not pertinent to this current overview review, but these reviews did contain relevant secondary outcomes, and thus were included. Where this was the case, data were only extracted from sections of these reviews where breastfeeding-related outcomes were reported.

2 Findings

As outlined in the Methods section, the scoping search identified an extensive body of literature on breastfeeding interventions, including reviews of such interventions. At that point, a decision was made to conduct an overview or umbrella review, and not to consider primary studies. There was considerable variation both within and between reviews as to how interventions were defined and categorised. Some reviews covered more than one intervention.

The findings presented are those derived from studies that we assessed as being of strong or moderate quality. Appendix 6 contains a quality assessment table of all included studies. Appendix 7 provides details of those studies assessed as being of weak quality, and these were not included in the synthesis.

Table 1 lists the reviews which provide material for the synthesis for each type of intervention and each of the individual reviews' overall quality assessment rating. The findings for each of the individual reviews are then presented within category headings. There were 10 interventions, with education, counselling and/or peer support the most tested intervention.

Twenty-five reviews examined the topic 'education, counselling and support'. Of these, 18 reviews considered education, counselling and support as one group of interventions and, in their analysis, they compared this group of interventions to routine care. Two reviews considered education and support as one group of interventions. One review considered counselling and support as one group of interventions. Jolly *et al.* examined peer support only in their analysis. Three reviews covered interventions provided through telephone and e-technology. This means that it was not possible for the HRB authors to isolate the individual effect of the three approaches – education, counselling and support – on breastfeeding outcomes.

Therefore, we divided the interventions into two main categories: education, counselling, and support; and other breastfeeding interventions. A number of subcategories emerged from the education/counselling/support category, and these were the timing of the intervention with respect to the pregnancy, the target group for the intervention and the use of web-based communication. Each of these subcategories was synthesised separately. The category 'other breastfeeding interventions' contained nine subcategories: multifaceted programmes, skin to skin contact (SSC), rooming-in, supplementary feeding, pacifiers, baby-led scheduling, incentives, antenatal breast examination and comparison of midwife-led and other/doctor-led maternity care.

Table 1: Interventions, their associated reviews and quality scores included in this umbrella review

	Category of intervention	Review author (date)	Quality score
1	**Education/counselling/support**		
1.1	**Education/counselling/support by timing of intervention**		
	Antenatal period only	Catling *et al.* (2015)[15]	Strong
		Wong, Tarrant and Lok (2015)[16]	Moderate
		Lumbiganon *et al.* (2012)[17]	Strong
	Antenatal versus postnatal	Chung *et al.* (2008)[18]	Strong
		Skouteris *et al.* (2014)[19]	Strong
		Imdad, Yakoob and Bhutta (2011)[20]	Strong
	Antenatal or perinatal combined with postnatal	Mitchell-Box and Braun (2013)[21]	Moderate
		Yonemoto *et al.* (2013)[22]	Strong
		Renfrew *et al.* (2012)[23]	Strong
		Jolly *et al.* (2012)[24]	Strong
	Timing of intervention not specified	Haroon *et al.* (2013)[25]	Moderate
		Lewin *et al.* (2010)[26]	Strong
		Sinha *et al.* (2015)[27]	Moderate
		Webel *et al.* (2010)[28]	Moderate
1.2	**Education/counselling/support by target of intervention**		
	Low-income mothers	Dyson, McCormick and Renfrew (2005)[29]	Strong
		Ibanez *et al.* (2012)[30]	Strong
		Ingram *et al.* (2010)[31]	Strong
		MacVicar and Kirkpatrick (2014)[32]	Moderate
	Adolescent mothers	Sipsma, Jones and Cole-Lewis (2015)[33]	Moderate
		Hall Moran *et al.* (2007)[34]	Strong
	Educating the educators	Spiby *et al.* (2009)[35]	Strong
		Ward and Byrne (2011)[36]	Moderate
1.3	**Education/counselling/support via e-technology or telephone**		
	e-technologies/telephone	Dennis and Kingston (2008)[37]	Moderate
		Lavender *et al.* (2013)[38]	Strong
		Lau *et al.* (2015)[39]	Strong

2	**Other breastfeeding interventions**		
2.1	**Multifaceted programmes (10-point BFHI or other structured multicomponent programme)**	Beake *et al.* (2012)[40]	Moderate
2.2	**Skin-to-skin contact**	Moore *et al.* (2012)[41]	Strong
		Dyson, McCormick and Renfrew (2005) – already included, but includes some evidence on skin-to-skin[29]	Strong
2.3	**Rooming-in**	Jaafar, Lee and Ho (2012)[42]	Moderate
2.4	**Supplementary feeding**	Becker and Remmington (2014)[43]	Strong
2.5	**Pacifiers**	Jaafar *et al.* (2012)[44]	Strong
		O'Connor *et al.* (2009)[45]	Strong
2.6	**Baby-led scheduling**	Fallon *et al.* (2014)[46]	No primary studies found
2.7	**Incentives**	Hall Moran *et al.* (2015)[47]	Strong
2.8	**Antenatal breast examination**	Lee and Thomas (2008)[48]	No primary studies found
2.9	**Comparison of midwife-led and other/doctor-led maternity care**	Johantgen *et al.* (2012)[49]	Strong
		Sandall *et al.* (2015)[50]	Strong

3.1 Education, counselling and support interventions

The goal of educating mothers is not only to increase their breastfeeding knowledge and skills, but also to influence their attitudes towards breastfeeding. Breastfeeding education or instruction occurs most often during the prenatal and intrapartum (during labour or delivery) periods and is typically provided by a healthcare worker (such as a midwife or lactation consultant) who has expertise or training in lactation management, often within an informal group setting but also on a one-to-one basis. Such instruction primarily includes information and resources. Although the target audience is usually pregnant or breastfeeding women, it may include fathers and others who support the breastfeeding mother.

The goal of peer support and counselling is to encourage and support pregnant women and those who currently breastfeed. There is no agreed definition from the literature on what constitutes peer support or who provides it

and surprisingly there is also no consistently used definition of breastfeeding in these reviews. Peer support occurs when people provide knowledge, experience, and emotional, social or practical help to each other. It commonly refers to an initiative involving trained supporters (although it can be provided by peers without training), and can take a number of forms such as peer mentoring, listening or counselling. Peer support is also used to refer to initiatives where colleagues, members of self-help organisations and others meet, in person or online, as equals to give each other support on a reciprocal basis. Peer support includes psycho-emotional support, encouragement and education about breastfeeding, and helps with solving problems.

Infant feeding counselling is the process by which a health worker or peer can support mothers and babies to implement good feeding practices and help them overcome difficulties.
http://apps.who.int/iris/bitstream/10665/44117/1/9789241597494_eng.pdf

The reviews retrieved which contribute to this section on interventions are a heterogeneous group with regard to the actual intervention examined, the period when the intervention takes place, the focus of the intervention, the definitions associated with the intervention (e.g. definition of peers), the place of intervention, the means by which the intervention is delivered, the intensity of the intervention, the person providing the intervention, and the training, if any, given to the person(s) providing the intervention.

Seventeen reviews fell within this broad grouping of education, counselling and support. Nine reviews were rated as strong, five as moderate (Appendix 7) and three as weak and are thus excluded from the synthesis (their characteristics and findings are available in Appendix 8). The findings begin with individual descriptions of the moderate and strong reviews and they are grouped by timing of the intervention (antenatal, perinatal or postnatal or in combination), target group for the intervention (women, men, adolescents, lower socioeconomic mothers) and then interventions carried out by e-technology or telephone.

Education, counselling and support by timing of the intervention

Antenatal interventions only

The WHO recommends early (i.e. within one hour of giving birth) initiation of breastfeeding. Protection, promotion, and support of breastfeeding are critical public health needs. The DoH document *Creating a Better Future Together; National Maternity Strategy 2016*[51] sets goals for increasing both breastfeeding initiation and duration, and decreasing disparities in these rates across all the population of Ireland. It is clear that in order to increase breastfeeding rates (duration and exclusivity of breastfeeding), initiation of breastfeeding is an essential starting point. The majority of pregnant women seek professional help and advice during pregnancy. This is an opportune time to introduce the concept of breastfeeding to pregnant women and to increase women's self-efficacy in relation to breastfeeding. Psychologist Albert Bandura introduced the idea of self-efficacy in the 1970s and this theory states that psychological procedures, whatever their form, alter the level and strength of self-efficacy. It is hypothesised that expectations of personal efficacy determine whether coping behaviour will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and aversive experiences. According to many researchers, breastfeeding self-efficacy and the related concepts of confidence and perception of success are correlated with breastfeeding initiation and duration.[52]

Reviews of antenatal interventions:

Catling CJ, Medley N, Foureur M *et al.* (2015) Group versus conventional antenatal care for women. Cochrane Database of Systematic Reviews, 2: CD007622.[15]

The review by Catling *et al*. examined multiple objectives, one of which was relevant to the current HRB review, namely, to compare the effects of group antenatal care versus conventional antenatal care on initiation of any

breastfeeding and duration of exclusive breastfeeding. In most Western countries, healthcare during pregnancy traditionally involves a schedule of one-to-one visits with a midwife, an obstetrician or a general practitioner (GP) in a hospital or clinic setting. A different way of providing pregnancy care involves use of a group model rather than a one-to-one approach. Group antenatal or pregnancy care has been developed in the USA in a model known as Centering Pregnancy. Care is provided by a midwife or an obstetrician to groups of eight to twelve women of similar gestational age. Groups meet eight to ten times during pregnancy at the usual scheduled visits, with sessions running for 90 to 120 minutes. All pregnancy care is provided in this group setting by integrating the usual pregnancy health assessment with information, education and peer support. Three randomised controlled trials (RCTs) (involving 1,733 women) were included by Catling *et al.* in this review: two were undertaken in the USA and one in Iran, with one of the USA studies specifically recruiting young women (aged 14 to 25 years). No difference in initiation of breastfeeding was observed between groups (average relative risk (RR) 1.10, 95% confidence interval (CI) 0.83-1.46). There was significant heterogeneity and it is possible that methodological differences and differences in background rates of breastfeeding may have been contributing factors. The small number of trials also meant that heterogeneity was both possible and difficult to explore. Data were insufficient to permit assessment of the duration of exclusive breastfeeding.

Catling *et al*. concluded that no differences in initiation of breastfeeding were observed between groups and that the review was limited because of the small numbers of studies and women, and the fact that most of the analyses are based on a single study.

The HRB authors rated this systematic review as strong and agree with the conclusions and limitations presented by Catling *et al*.

Wong KL, Tarrant M and Lok KY (2015) Group versus individual professional antenatal breastfeeding education for extending breastfeeding duration and exclusivity: a systematic review. *J Hum Lact*, 31(3): 354–366.[16]

This review included 19 studies with 6,931 participants who were healthy pregnant women expecting healthy infants, and who were free from physical conditions that contraindicated breastfeeding. Professional antenatal breastfeeding education (e.g. given by nurses, midwives, doctors or physicians) was provided to groups, or individually, in order to compare the intervention's effectiveness on breastfeeding exclusivity and duration, and these interventions were compared with standard care or peer-led breastfeeding classes. Antenatal breastfeeding education was provided as a stand-alone intervention or was combined with educational materials or marketing incentives. Of the 19 studies, 13 evaluated group antenatal education, five evaluated individual antenatal education, and one evaluated both a group and an individual antenatal education intervention.

When compared with standard care, four out of 14 studies found that antenatal group education significantly improved full or any breastfeeding rates at different time points. Four out of six studies with antenatal individual education found significantly increased exclusive breastfeeding or any breastfeeding rates. Two studies compared antenatal group education with peer-led education and neither study showed a significant difference in breastfeeding outcomes.

Wong, Tarrant and Lok infer that strong conclusions about the effectiveness of group versus individual antenatal breastfeeding education cannot be drawn due to substantial methodological heterogeneity and a limited number of high-quality studies. The authors mention that there is some evidence to suggest that one-to-one antenatal breastfeeding education may be effective in some vulnerable populations such as low-education women, minority groups and new immigrants, and that there is a need for high-quality trials with an adequate

sample size to ascertain the effects of these two modes of professional antenatal education on breastfeeding duration and exclusivity.

The quality assessment completed by the HRB authors classified this review as moderate. This study was well executed up to the point of analysis. However, the analysis was difficult to interpret and their interpretation of better breastfeeding outcomes in low-income mothers in the discussion is not demonstrated in Table 2 of the paper's findings.

Lumbiganon P, Martis R, Laopaiboon M *et al.* (2012) Antenatal breastfeeding education for increasing breastfeeding duration. Cochrane Database of Systematic Reviews, 9: CD006425.[17]

The focus of this review is solely on antenatal breastfeeding education, defined as a formalised, descriptive and goal-oriented intervention delivered during the pregnancy in a variety of forms. This education could be provided on an individual or group basis, and could include home visiting programmes, peer education programmes or clinic appointments, brochures, booklets, electronic education programmes or a combination of these.

The relevant objectives were to assess the effectiveness of antenatal breastfeeding education for increasing breastfeeding initiation and duration, and to compare the effectiveness of various forms of education. Primary outcomes measured were: duration of any breastfeeding; duration of exclusive breastfeeding; proportion of mothers breastfeeding at three and at six months; proportion of mothers exclusively breastfeeding at three and at six months; initiation rate of breastfeeding.

Nineteen RCTs were included; only 16 studies involving 8,262 women contributed data to the analysis. Interventions evaluated included routine breastfeeding education, formal breastfeeding education, printed information, video, peer counselling and lactation consultation. The interventions for increasing breastfeeding duration differed among the studies, and the authors did not carry out any meta-analysis because, for each different type of intervention, only a single study included outcome data. The authors note that in studies where breastfeeding education was compared with routine care there was considerable variation in what was offered as part of usual care in terms of breastfeeding education; in many studies, routine care was not described at all, or the description was vague.

Five studies compared a single method of breastfeeding education with routine care and only one small study found that peer counselling significantly increased breastfeeding initiation in the intervention group (RR 1.82; 95% CI 1.13-2.93). Three studies compared one form of breastfeeding education with another. No intervention was significantly more effective in increasing initiation or duration of breastfeeding. Seven studies compared multiple methods versus a single method of breastfeeding education, with no significant effect on breastfeeding initiation or duration. One study compared different combinations of interventions and found that there was a marginally significant increase in exclusive breastfeeding at six months in women receiving a booklet plus video plus lactation consultation, compared with those receiving a booklet plus video only (RR 2.23; 95% CI 1.01-4.92). The same study compared multiple methods of breastfeeding education versus no formal care (Mattar, 2007, 159 women) and reported that the combination of breastfeeding booklet plus video plus lactation consultant was significantly better than no formal breastfeeding education for exclusive breastfeeding at three months (RR 2.02; 95% CI 1.16-3.49).

Lumbiganon *et al.*, the review authors, conclude that peer counselling alone was found to be effective in increasing initiation of breastfeeding. A combination of a breastfeeding booklet, video and lactation consultation was found to be effective in increasing breastfeeding at three months, when compared with routine care. A

combination of breastfeeding booklet, video and lactation consultation was found to be more effective in increasing exclusive breastfeeding at six months, when compared with breastfeeding booklet and video. However, because there were significant methodological limitations among included studies, and because the observed effect sizes were small, the authors state that it was not appropriate to recommend any specific antenatal breastfeeding educational intervention, and that in order to evaluate the effectiveness of breastfeeding education, e.g. peer counselling, lactation consultation, etc., in low- and middle-income countries where breastfeeding should have a more significant impact, there is an urgent need to conduct a high-quality RCT that has an adequate sample size and is free from commercial influence.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors agree with the authors' conclusions.

Antenatal versus postnatal interventions

Three reviews discussed, *inter alia,* the timing of breastfeeding interventions and commented on the benefits of antenatal versus postnatal interventions, and of combining both types. Choosing the most appropriate intervention for a given setting and population, and the timing of that intervention, can be challenging given the breadth of possibilities. Evidence around the successful timing of the intervention to increase breastfeeding rates would be a useful aid when allocating resources.

Reviews of antenatal versus postnatal interventions:

Chung M, Raman G, Trikalinos T *et al.* (2008) Interventions in primary care to promote breastfeeding: an evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med*, 149(8): 565–582.[18]

This review examined the effectiveness on breastfeeding initiation, duration and exclusivity rates of counselling or behavioural interventions initiated from a primary care setting (this could include interventions initiated in hospital, the clinic, the home or elsewhere as long as it was a healthcare setting; maternity services were considered to be primary care for this review). The interventions could be delivered by lactation consultants, nurses, peer counsellors, midwives or physicians.

Interventions included system-level breastfeeding support (such as BFHI and training of health professionals), breastfeeding education and professional or lay support, such as from lactation consultants, midwives, other healthcare professionals or peer support counsellors. The interventions could be formal (one-to-one or group education sessions) or informal (home visits or telephone support from peers). In addition, the effects of delayed pacifier use and SSC were examined. Several components were often combined into a single multifaceted intervention.

Overall, it was found that breastfeeding promotion interventions did not change the rate of any breastfeeding initiation (RR 1.04; CI 95% 1.00-1.08), but did significantly increase the proportion of mothers who continued to give any breastfeeding between one and three months (RR 1.10; 95% CI 1.02-1.19) compared with usual care. When the two studies from developing countries were removed from the analysis, breastfeeding promotion interventions had no effect on any breastfeeding initiation or duration.

Breastfeeding promotion interventions did not change the rate of exclusive breastfeeding initiation or duration compared with usual care.

When the components of combinations of breastfeeding interventions (formal or structured education, system-level professional support, individual-level professional support and/or lay support) were examined, Chung *et al*.

concluded that the inclusion of lay support in a multicomponent intervention increased the positive effect on the initiation of exclusive breastfeeding and the proportions of women continuing any or exclusive breastfeeding in the short term (between one and three months).

The quality assessment completed by the HRB authors classified this review as strong. The tables and figures in the review reveal a very clear analysis. However, the text describing the tabular analysis overestimates the significance of the findings. Therefore, the HRB authors have based the summary text presented in this review on the actual results presented in the tables.

Skouteris H, Nagle C, Fowler M *et al.* (2014) Interventions designed to promote exclusive breastfeeding in high-income countries: a systematic review. *Breastfeed Med*, 9(3): 113–127.[19]
The objective of this study was to present a conceptual and methodological synthesis of interventions designed to promote exclusive breastfeeding to six months in high-income countries. Seventeen studies were included in this review, and the majority of interventions focused primarily on providing maternal support (six) or education (six), provided either pre- or postnatally. In the interventions implemented during pregnancy, the focus was on maternal education, provided through antenatal classes, lactation consultants/peer counselling and written and oral information on breastfeeding practices and milk storage. Overall, most education interventions focused on training the mothers by providing advice and teaching skills about exclusive breastfeeding practices, in both a one-to-one and group setting.

Six of the interventions that commenced in the postnatal period provided home/telephone support. Several postnatal interventions provided only in-hospital support to mothers through midwife education strategies, mother-infant proximity or single educational sessions and educational material.

Of the 17 studies, nine demonstrated a statistically significant improvement in rates of initiation and duration of exclusive breastfeeding, of which only seven significantly increased exclusive breastfeeding rates to six months postpartum. Successful interventions tended to be support-based programmes providing additional home-based and telephone support by lactation experts. These support interventions commenced in the postnatal period and extended over a relatively long period (from approximately five weeks to six months after the birth). Studies that did not demonstrate a significant increase in the duration of exclusive breastfeeding were generally education only and provided one intervention session to mothers.

Skouteris *et al*. conclude that the most successful interventions for increasing exclusive breastfeeding initiation and duration were conducted in the postnatal period and continued over a long period of time. However, they note that due to inconsistent results produced by the reviewed studies and the limitations of study design (lack of power, lack of intervention fidelity, use of some unstandardised measures, and varied definitions of both exclusive breastfeeding and 'usual care') that further research is needed in order to provide a robust evidence base to inform future interventions.

The quality assessment completed by the HRB authors classified this review as strong and the HRB authors agree with the conclusions of Skouteris *et al*.

Imdad A, Yakoob MY and Bhutta ZA (2011) Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health*, 11 Suppl 3: S24.[20]
The objective of this review was to examine studies that evaluated the impact of breastfeeding promotional strategies on any breastfeeding and exclusive breastfeeding rates at two time points. Breastfeeding interventions included in the review involved: i) formal or structured breastfeeding education defined as one-to-one or group education sessions or classes (e.g., curriculum or standard agenda) directed at mothers or other

family members; ii) professional support divided into system-level support involving mass-level interventions, such as the implementation of BFHI policies or the training of health professionals, and individual-level interventions where support was provided individually to mothers during hospital stay or outpatient clinics or was in the form of social support (e.g., home visits or telephone support) from health professionals; and iii) lay support in which there was social support (e.g., home visits or telephone support) from peers. These categories of interventions were not mutually exclusive and could overlap. The outcomes considered in the review included exclusive and any breastfeeding rates between four and six weeks after birth and at six months postpartum. Exclusive breastfeeding was defined as the child receiving only breast milk and no other type of milk or solids, but allowing for vitamins, drops of other medicines and oral rehydration therapy. Any breastfeeding comprised breast milk given either alone, or with formula milk and/or solids. In total, 53 randomised and quasi-randomised controlled trials were included in the review.

Exclusive breastfeeding rates between four and six weeks: Thirty two randomised and quasi-randomised controlled trials reported results of breastfeeding interventions on the exclusive breastfeeding rate between four and six weeks postpartum; ten of these trials were performed in developing countries. There was a statistically significant 43% increase in exclusive breastfeeding rates between four and six weeks (RR = 1.43; 95% CI 1.28-1.60), with an 89% and 20% significant increase in developing and developed countries, respectively. Subgroup analysis according to the time of intervention showed that prenatal, postnatal and combined interventions all had statistically significantly impacts, with the highest impact being that of prenatal counselling.

Exclusive breastfeeding rates at six months: Fifteen studies examined this outcome of which six from developing countries. There was an overall 137% increase in exclusive breastfeeding rate with promotion interventions, with a significant six times increased incidence in developing countries, compared with 1.3 times in developed countries. Both prenatal (RR 1.41; 95% CI 1.04-1.90) and postnatal (RR 2.35; 95% CI 1.01-5.46) counselling was of significant benefit for exclusive breastfeeding at six months, with combined prenatal and postnatal counselling having a much greater benefit (RR 6.53; CI 1.70-25.15).

Any breastfeeding between four and six weeks: Twenty-two studies evaluated this outcome; one study was from a developing country. There was a 10% statistically significant increase in any breastfeeding between four and six weeks, with a 14% increase in the developing country. Prenatal and postnatal interventions each on their own had significant impacts (RR 2.95; 95% CI 1.86-4.66; RR 1.07; 1.01-1.13 respectively); when combined, no impact was observed (RR 1.13; 95% CI 0.94-1.36).

Any breastfeeding at six months: Twenty studies examined this outcome; of which two were from developing countries. There was a 12% statistically significant increase in any breastfeeding rates at six months (RR = 1.12; 95% CI 1.01-1.24), the results for developing and developed countries separately showing no significant impact.

The evidence grading for exclusive breastfeeding at the four to six weeks period and at the six months timepoint was found to be ‘high’ based on directness, precision and consistency of the overall studies. The results at both time intervals were statistically significant, with p-values of less than 0.1. Substantial clinical and methodological heterogeneity is reported; there was variability in interventions, definitions of outcomes, study designs and risk of bias. Relatively fewer studies were from developing countries, as opposed to developed countries.

Imdad, Yakoob and Bhutta concluded that breastfeeding promotion interventions increased exclusive and any breastfeeding rates between four and six weeks and at six months. A relatively greater impact of these interventions was seen in developing countries, with 1.89 and sixfold increases in exclusive breastfeeding rates between four and six weeks and at six months, respectively.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors agree with the conclusions of this review.

Antenatal or perinatal combined with postnatal

Four reviews examined interventions implemented in the perinatal/postnatal period. The WHO defines the perinatal period as the period commencing at 22 completed weeks (154 days) of gestation and ending seven days after birth. However, definitions can vary. The postnatal period is defined by the WHO as the first six weeks after birth, but can also be broadly defined as the first six months after birth and containing three phases. The initial or acute period involves the first six to twelve hours postpartum, followed by the second phase, which is the subacute postpartum period, lasting two to six weeks. The third phase is the delayed postpartum period, which can last up to six months (Romano 2010). The postnatal period marks a significant point of transition in the life of the mother. The period of postnatal care extends from the hospital stay to the community and home, and is provided by multiple caregivers. The nature of how this care is delivered has changed significantly over the last 40 years. Women do not 'lie in' for long periods and the average length of stay in hospital is now one day for a healthy mother and baby. Moreover, many women are less likely to be able to transition from hospital to an extended family network such as would traditionally have provided support and education regarding parenting. During this time period, additional or alternative forms of support for breastfeeding are now likely to be required.

Reviews of antenatal or perinatal combined with postnatal interventions:

Mitchell-Box KM and Braun KL (2013) Impact of male-partner-focused interventions on breastfeeding initiation, exclusivity, and continuation. *J Hum Lact*, 29: 473–479.[21]
Six articles with four unique interventions were identified and tested through randomised controlled trials or quasi-experimental design. These four interventions provided breastfeeding education to fathers, with breastfeeding outcomes reported by the mother. Intervention components comprised: *education* to fathers (three interventions were provided in three cases by professionals and in one case by a peer educator); *open discussion* with the educators; *educational materials* – three interventions used videos or leaflets); *incentives* – two interventions; *follow-up support* – follow-up visits or calls for data collection. Three studies compared initiation rates between intervention and control conditions, and two showed significantly higher rates of breastfeeding initiation in the intervention group. With regard to continuation of exclusive breastfeeding, three of four studies had a significant impact on exclusive breastfeeding, but different time points were examined in the three studies.

For breastfeeding continuation, Mitchell-Box and Braun did not find evidence to suggest that the education of male partners contributed to an increase in any breastfeeding continuation. However, the studies are measuring different outcomes at different time points.

The authors conclude that because all four interventions found at least one breastfeeding outcome to be superior in the treatment group, breastfeeding education should be offered to male partners.

The HRB authors consider this to be a moderate study and concur with the findings and conclusions of Mitchell-Box and Braun.

Yonemoto N, Dowswell T, Nagai S *et al.* (2013) Schedules for home visits in the early post-partum period. Cochrane Database of Systematic Reviews, 7: CD009326.[22]
The objective of this review was to assess outcomes for women and babies of different home visiting schedules during the early postpartum period. The review focused on the frequency of home visits, the duration (when visits ended) and intensity and on different types of home visiting interventions. One of the neonatal outcomes that this review aimed to examine was the effect of the intervention on infant feeding.

The interventions and control conditions varied considerably across studies. Trials focused on three broad comparisons: scheduled visits involving more versus fewer postnatal home visits (five studies), scheduled visits involving different models of care (three studies), and home visits versus hospital clinic postnatal check-ups (four studies). Postnatal care at home was delivered by healthcare professionals in 10 of the 12 trials.

In three studies (960 women), mothers receiving additional support at home were more likely to be *exclusively breastfeeding* their babies at six weeks postpartum (average RR 1.17; 95% CI 1.01-1.36). Moreover, three studies (1,309 women) examined exclusive breastfeeding to six months postpartum and found that mothers receiving additional support at home were more likely to continue exclusive breastfeeding to six months (average RR 1.38; 95% CI 1.10-1.73).

For *any breastfeeding* there were no differences between women receiving additional postnatal visits and controls at six weeks (average RR 0.89; 95% CI 0.57-1.38, two studies, 813 women) and no differences up to six months postpartum (average RR 1.01; 95% CI 0.99-1.03; two studies, 1,315 women).

The authors state that for most of their outcomes only one or two studies provided data, and overall results were inconsistent. They concluded that further well-designed RCTs evaluating this complex intervention will be required in order to formulate the optimal package. However, the authors suggest that there was some evidence that more home visits rather than fewer home visits may encourage more women to exclusively breastfeed their babies.

The quality assessment completed by the HRB authors classified this review as strong and agree with the conclusions.

Renfrew MJ, McCormick FM, Wade A *et al.* (2012) Support for healthy breastfeeding mothers with healthy term babies. Cochrane Database of Systematic Reviews, 5: CD001141.[23]
The intervention was described by the authors as contact with an individual or individuals (either professional or volunteer) offering support which is supplementary to the standard care offered in that setting. 'Support' interventions eligible for this review could include elements such as reassurance, praise, information, and the opportunity to discuss and to respond to the mother's questions, and it could also include staff training to improve the supportive care given to women. It could be offered by health professionals or lay people, trained or untrained, in hospital and community settings. It could be offered to groups of women or one-to-one, including mother-to-mother support, and it could be offered proactively by contacting women directly, or reactively, by waiting for women to get in touch. It could be provided face to face or over the telephone and it could involve only one contact or regular, ongoing contact over several months. 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 stopping breastfeeding by specified points in time. Primary outcomes were recorded for stopping any or exclusive breastfeeding before four to six weeks and

at the last study assessment (up to six months after the birth). Other outcomes of interest were stopping any or exclusive breastfeeding at other time points (two, three, four, nine and twelve months).

Fifty-two studies contributed outcome data to the review. The total number of mother-infant pairs in these studies is 56,451. The data in this review come from participants living in 21 countries. Using the World Bank classification of countries by income, two studies were conducted in low-income countries; two studies were conducted in low-middle-income countries; 12 studies were conducted in upper-middle-income countries; and 37 studies were conducted in high-income countries.

The included studies comprise 30 studies of professional support, nine of lay and professional support and 13 of lay support. In 30 of the 52 studies a variety of medical, nursing and allied professionals (for example, nutritionists, lactation consultants and researchers) provided the breastfeeding support. In nine studies professionals provided the support in conjunction with others (para-professionals, peer supporters, lay people). The mode of support was face-to-face and/or by telephone.

Renfrew et al noted that some studies reported exclusive breastfeeding rates and provided a clear definition of what this meant, whereas others were ambiguous and it was difficult to ascertain whether the infant was fed breast milk alone. For outcomes relating to any breastfeeding, it was not always clear in study reports whether this meant that babies were predominantly or only occasionally receiving breast milk, and definitions varied in different trials, and at different time points in the same trial, as weaning foods were gradually introduced.

All forms of extra support analysed together showed an increase in duration of 'any breastfeeding' (this included partial and exclusive breastfeeding) with a RR for stopping any breastfeeding before six months of 0.91 (95% CI 0.88-0.96). All forms of extra support together also had a positive effect on duration of exclusive breastfeeding (RR at six months 0.86, 95% CI 0.82-0.91; RR for four to six weeks (RR 0.74; 95% CI 0.61-0.89)). In addition, analysis of results at different periods of follow-up suggests that the benefit of all forms of support was present at all time points up to nine months. The size of the treatment effects varied considerably in different trials, and average treatment effects may not be applicable in different settings. The subgroup analysis suggested that face-to-face support was associated with a greater treatment effect than telephone support for exclusive breastfeeding, and that interventions had an increased effect on exclusive breastfeeding in areas where background breastfeeding initiation was high.

Renfrew *et al.* conclude that all women should be offered support to breastfeed their babies to increase the duration and exclusivity of breastfeeding. Healthcare settings should provide such trained support as standard. Support is likely to be more effective in settings with high initiation rates, and therefore efforts to increase the uptake of breastfeeding should be in place. Support may be offered either by professional or lay/peer supporters, or a combination of both. Strategies that rely mainly on face-to-face support are more likely to succeed. Support that is only offered when women seek help is unlikely to be effective; women should be offered ongoing visits on a scheduled basis, so that they can predict that support will be available. Support should be tailored to the setting and the needs of the population group.

The quality assessment completed by the HRB authors classified this review as strong, and Renfrew *et al*. stated that the quality of the studies which they included in the review was mixed, with 50% rated as having a low risk of bias (high quality). The HRB authors stress that the women included in the studies had initiated breastfeeding in both experimental and control groups and therefore had already made a decision to breastfeed. In all other respects the HRB authors agree with Renfrew *et al*.

Jolly K, Ingram L, Khan KS *et al.* (2012) Systematic review of peer support for breastfeeding continuation: metaregression analysis of the effect of setting, intensity, and timing. *Bmj*, 344: d8287.[24]
The objective of this study was to examine the effect of setting, intensity and timing of peer support on breastfeeding. Peer supporters may be voluntary, or they may receive remuneration. Seventeen studies were included in this review. All trials apart from one offered peer support at home, usually in person, although in two trials support was by telephone. The training of the peer supporters ranged from two-and-a-half hours plus a handbook, up to an eight-week course, and was specified in only two trials.

Thirteen studies reported on the outcome of any breastfeeding. Overall, compared with usual care, those allocated to peer support had a 15% significantly lower risk of *not breastfeeding* at the last follow-up (RR 0.85; 95% CI 0.77-0.94); however, the studies had significant heterogeneity. The RR of not breastfeeding at last study follow-up of women in low- and middle-income countries who were allocated peer support was a significant 30% lower than usual care (RR 0.70; 95% CI 0.60-0.81), but was a non-significant 7% lower in studies from high-income countries (RR 0.93; 95% CI 0.87-1.00) and, specifically, was only 4% lower in studies performed in the UK (RR 0.96; 95% CI 0.89-1.04) and also non-significant.

Twelve studies reported on exclusive breastfeeding. Compared with usual care, those allocated to peer support in both high-income countries and low- and middle-income countries had an 18% significantly lower risk of not breastfeeding exclusively at the last follow-up (RR 0.82; 95% CI 0.76-0.88), although the risk reduction of 37% (RR 0.63; 95% CI 0.52-0.77 in low- and middle-income countries was considerably larger than the 10% observed in high-income countries (RR 0.90; 95% CI 0.85-0.97). Once again, there was a non-significant reduction in the UK (RR 0.98; 95% CI 0.96-1.01). The studies had significant heterogeneity.

Peer support provided at a low *intensity* (fewer than five planned contacts) was not associated with lower rates of not breastfeeding (RR 0.99; 95% CI 0.9-1.09).

In relation to the *timing* of the interventions, postnatal only peer breastfeeding interventions significantly reduced not breastfeeding (RR 0.75; 95% CI 0.63-0.89). Combined antenatal and postnatal, and postnatal-only support interventions compared with usual care, significantly reduced the risk of not exclusively breastfeeding by a similar magnitude.

Jolly *et al.* conclude that although peer support interventions increase breastfeeding continuation in low- and middle-income countries, especially exclusive breastfeeding, this does not seem to apply in high-income countries, particularly in the UK, where breastfeeding support is part of routine postnatal healthcare. Peer support of low intensity does not seem to be effective. Policy relating to provision of peer support should be based on more specific evidence on setting and any new peer services in high-income countries need to undergo concurrent evaluation.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors agree with the conclusions of Jolly *et al*.

Timing of interventions unspecified or occurring in all three periods (antenatal, perinatal and postnatal)
There were four reviews of breastfeeding interventions included in this group and these are outlined below.

Haroon S, Das JK, Salam RA *et al.* (2013) Breastfeeding promotion interventions and breastfeeding practices: a systematic review. *BMC Public Health*, 13 Suppl 3: S20.[25]
The purpose of this review was to summarise the effect of educational interventions (individual and group counselling and both combined, formal educational classes and counselling of fathers) in various settings, in order to promote breastfeeding. Studies from both low- and middle-income countries and high-income countries were included. In total, 110 studies were reviewed and the outcomes examined were exclusive breastfeeding, predominant breastfeeding rates, partial breastfeeding rates, rates of no breastfeeding and breastfeeding beyond six months.

Exclusive breastfeeding rates: Sixty-six studies reported on this outcome; 27 were undertaken in developing countries. Overall, educational interventions significantly increased exclusive breastfeeding at day one by 43% (RR 1.43; 95% CI 1.09-1.87), day 2 to day 28 by 30% (RR 1.30; 95% CI 1.19-1.42) and between one and five months by 90% (RR 1.90; 95% CI 1.54-2.34). At day 1, individual counselling alone led to 60% increase (RR 1.60; 95% CI 1.04-2.48) and the effects of group counselling alone or combined individual and group counselling were non-significant. For the less-than-one-month subgroup analysis of exclusive breastfeeding rates, the effects of individual counselling and combined individual and group counselling were significant, with increases of 31% and 27%, respectively.

Facility-based interventions were found to increase exclusive breastfeeding rates by 26% (RR 1.26; 95% CI 1.11-1.43) and combined facility and community-based interventions showed a significant increase of 31% (RR 1.31; 95% CI 1.14-1.50). The effects were significant for both developing and developed countries, at 35% (RR 1.35; 95% CI 1.15-1.58) and 26% (RR 1.26; 95% CI 1.13-1.41), respectively.

At one to five months, both individual and group counselling alone had significant effects at 90% (RR 1.90; 95% CI 1.54-2.34) and 80% (RR 1.80; 95% CI 1.18-2.74), respectively. Combined individual and group counselling led to an increase of 101% (RR: 2.01; 95% CI 1.43-2.82). In analyses for level of care, both community-based and facility-based care showed significant results at 159% (RR 2.59; 95% CI 1.80-3.73) and 87% (RR 1.87; 95% CI 1.26-2.78), respectively, and the effect of combined facility-based and community-based care was an increase of 47% (RR 1.47; 95% CI 1.08-1.99).

Haroon *et al*. report that the effects of interventions at day 1 and between one and five months were increases of 157% and 188%, respectively, whereas results for developed countries were non-significant.

Predominant breastfeeding rates: For this outcome, 13 studies reported findings and eight of these were undertaken in developing countries. Overall, educational interventions had a non-significant effect on predominant breastfeeding rates up to age one month (RR 0.66; 95% CI 0.43-1.01) and between one and five months (RR 1.08; 95% CI 0.55-2.13).

Partial breastfeeding rates: Twenty-four studies reported on this outcome; of these studies, 10 were undertaken in developing countries. Overall, educational interventions had a non-significant effect on partial breastfeeding rates at day one (RR 1.21; 95% CI 0.79-1.87), up to one month after birth (RR 0.88, 95% CI 0.72-1.08) and between one and five months (RR 0.87; 95% CI 0.75-1.02) intervals. Combined facility and community-based interventions had a reduction of 66% (66% (RR 0.34; 95% CI 0.13-0.93) up to one month.

No breastfeeding rates: Ninety-seven studies reported on this outcome; of these studies, 23 were undertaken in developing countries. Overall, educational interventions significantly reduced rates of no breastfeeding by 32% at day one (RR 0.68; 95% CI 0.54-0.87), 30% (RR 0.70; 95% CI 0.62-0.80) between day 2 and day 28 and 18% (RR 0.82; 95% CI: 0.77-0.89) between one and five months.

Group counselling alone resulted in a 43% reduction (RR 0.57; 95% CI 0.41-0.80) and individual counselling alone led to a 27% reduction (RR 0.73; 95% CI 0.55-0.96). The effect of combining individual and group counselling was non-significant.

Only facility-based interventions led to a significant reduction of 52% (RR 0.48; 95% CI 0.34-0.69). Interventions in both developing and developed countries had significant effects, with reductions of 42% (RR 0.58; 95% CI 0.44-0.78) and 27% (RR 0.73; 95% CI 0.57-0.95), respectively.

Combining individual and group counselling resulted in a 34% reduction (RR 0.66; 95% CI 0.51-0.87); individual counselling alone resulted in a 29% reduction (RR 0.71; 95% CI 0.61-0.84) and group counselling alone led to a 29% reduction (RR 0.71; 95% CI 0.51-0.99). For the one- to five-month time period following birth, there was a significant reduction in 'no breastfeeding rates' when combining individual and group counselling with a reduction of 32% (RR 0.68; 95% CI 0.50-0.92), individual counselling alone reported a reduction of 14% (RR 0.86; 95% CI 0.79-0.94), and group counselling alone reduced 'no breastfeeding rates' by 24% (RR 0.76; 95% CI 0.63-0.91).

Facility-based interventions, and combining facility and community-based interventions, led to significant reductions of 18% (RR 0.82; 95% CI 0.75-0.89) and 17% (RR 0.83; 95% CI 0.75-0.93), respectively.

The effects of educational interventions in both developing and developed countries were significant, at 44% (RR 0.56; 95% CI 0.45-0.69) and 12% (RR 0.88; 95% CI 0.82-0.95), respectively.

Beyond six months: Eleven studies reported on this outcome, for exclusive, partial and no breastfeeding rates. Between 6 and 12 months, a 19% increase in partial breastfeeding rates was reported, which was significant (RR 1.19; 95% CI 1.12-1.26).

The authors point out that there was methodological heterogeneity; most RCTs demonstrated unclear blinding and/or allocation concealment. There was also clinical heterogeneity - variation in types of intervention and the duration of the intervention, target population differences in income and education, outcome definitions (fully breastfeeding interpreted as exclusive breastfeeding, but possibly including predominant breastfeeding) and different time intervals for follow-up. In addition, there were differences in the exposure to the intervention.

Haroon *et al.* conclude that breastfeeding education and/or support increase exclusive breastfeeding rates and decrease no breastfeeding rates at birth, and between one and five months. Combined individual and group counselling appeared to be superior to individual or group counselling alone, and interventions in developing countries had a greater impact than interventions in developed countries.

The quality assessment completed by the HRB authors classified this review as moderate. The HRB authors agree with the conclusions of Haroon *et al.*

Lewin SA, Munabi-Babigumira S, Glenton C *et al*. (2010) Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. Cochrane Database of Systematic Reviews, 3: CD004015.[26]

This review examined the effects of lay health workers' interventions in primary and community healthcare on maternal and child health and the management of infectious diseases. A lay health worker was defined as any health worker carrying out functions related to healthcare delivery, trained in some way in the context of the intervention, and having no formal professional or paraprofessional certificate or tertiary education degree. The review comprised 82 studies, of which 18 (16 in the meta-analysis) addressed breastfeeding promotion interventions. The breastfeeding outcomes measured were initiation; any breastfeeding up to 12 months postpartum; exclusive breastfeeding up to six months postpartum. In 14 of the 18 breastfeeding studies, the aim was to promote health or to offer psychosocial support for breastfeeding through the provision of counselling, education and support to mothers. Most of the interventions involved face-to-face contact with women in their homes; contact at primary care facilities and by telephone was also used. Several studies used a combination of all of these approaches.

Initiation of breastfeeding: Twelve studies provided data which was pooled to give an overall result; breastfeeding promotion had a small impact on the initiation of breastfeeding, with studies showing an aggregate RR of 1.36 (95% CI 1.14-1.61).

Any breastfeeding up to 12 months postpartum: Twelve studies provided data on this outcome and the results were pooled; there was evidence, of moderate quality, that breastfeeding promotion had a small impact on any breastfeeding up to six months postpartum (RR 1.24, 95% CI 1.10-1.39: p = 0.0004)

Exclusive breastfeeding up to six months postpartum: Ten studies provided data that could be pooled to answer this question; there was evidence, again of moderate quality, that breastfeeding promotion by lay health workers (LHWs) had a substantial impact on exclusive breastfeeding up to six months postpartum (RR 2.78; 95% CI 1.74-4.44: p = 0.0001).

From the included studies, Lewin *et al*. conclude that there is moderate quality evidence of the effectiveness of LHWs in promoting and increasing breastfeeding, when compared with usual care; the usual care practices are not described. Health planners could consider including LHW interventions as components of health service strategies in the area of breastfeeding. The meta-analysis findings need to be interpreted with caution. The results were heterogeneous for several analyses, and the authors suggest that the available evidence allows no overall conclusions to be drawn regarding the effectiveness of LHWs in substituting for professional providers.

The quality assessment completed by the HRB authors classified this review as strong. However, the studies were conducted in a number of countries with mixed socioeconomic conditions, and the more positive results on all breastfeeding outcomes were predominantly from low- and middle-income countries where the background rates of breastfeeding are high. The HRB authors agree with the conclusions of Lewin *et al.*, but it is important to note the influence of studies in low- and middle-income countries on the findings.

Sinha B, Chowdhury R, Sankar MJ *et al.* (2015) Interventions to improve breastfeeding outcomes: a systematic review and meta-analysis. *Acta Paediatr*, 104(S467): 114–134.[27]

This review included 195 studies in the meta-analysis. Varied interventions were described. The health systems interventions (73) were: BFHI support, rooming-in practices or any organisational support on breastfeeding outcomes. Home and family support (57): peer support, one-to-one counselling or education by home visits or telephone, home support by father or grandparent. Community environment (6): group counselling, group meetings, social mobilisation, mass media or social media. Work environment (4): maternity leave, workplace

support and employment status of the mothers. Policy (2): International Code of Marketing of Breast-milk Substitutes and national maternal and child health programmes on breastfeeding. Fifty-three studies examined a combination of interventions. The interventions to improve breastfeeding were delivered to families, community, health staff and other stakeholders. The main focus of the paper was full-term infants, but articles which examined the intervention effects on breastfeeding outcomes in preterm infants or babies in the neonatal intensive care unit were also included. The outcomes measured were early initiation of breastfeeding, exclusive breastfeeding, continued breastfeeding and any breastfeeding.

Initiation of breastfeeding within one hour of birth (49 studies): Initiation of breastfeeding within one hour increased significantly by 25% as an overall effect of all interventions (RR 1.25; 95% CI 1.19-1.32). Interventions delivered in the health system setting improved rates of early initiation of breastfeeding by 11%, whereas interventions in the community environment increased the rate of breastfeeding initiation significantly (RR 1.86; 95% CI 1.33-2.59). Interventions delivered in the home and family setting were not statistically significant. The effect of intervention was higher in low- and middle-income countries (RR 1.66; 1.44-1.91) when compared with high-income countries (RR 1.13 1.07-1.19) $p< 0.05$.

Exclusive breastfeeding: The overall effect of all the interventions (130 studies) was to increase exclusive breastfeeding rates by 44% (RR 1.44; 95% CI 1.38-1.51). The effects on exclusive breastfeeding rates were higher in low- and middle-income countries (RR 1.69; 1.54-1.86) when compared with high-income countries (RR 1.35; 1.26-1.43) $p<0.05$. Pooled results from RCTs showed a 61% improvement (RR 1.61; 95% CI 1.46-1.78) in exclusive breastfeeding rates whereas the improvement was 34% (1.24-1.46) and 46% (1.31-1.63) $p=0.009$ in observational and quasi-experimental studies; studies that had controlled for confounding showed a lower improvement (RR 1.36; 95% CI 1.28-1.46) compared those with no control for confounding (RR 1.61; 95% CI 1.48-1.75) $p< 0.001$.

Continued breastfeeding up to 23 months (19 studies): Continued breastfeeding rates showed a significant improvement of 61% as a result of all interventions.

Any breastfeeding (118 studies): The overall effect of all interventions improved breastfeeding rates by 30% (RR 1.3; 95% CI 1.23-1.37).

Sinha *et al*. conclude that in order to promote breastfeeding, interventions should be delivered in a combination of settings by involving health systems, home and family and the community environment concurrently. The authors also draw attention to the fact that studies varied in terms of their quality and reliability, and that studies which controlled for potential confounders showed a more modest effect of interventions on all breastfeeding outcomes.

The quality assessment completed by the HRB authors classified this review as moderate. The overall results were clear, but the many comparisons were often presented as being different when they were not, and it was clear that CIs overlapped. The comparisons that were not significant were removed by the HRB authors from the narrative of the results of Sinha *et al*., as these comparisons are misleading.

Webel AR, Okonsky J, Trompeta J *et al.* (2010) A systematic review of the effectiveness of peer-based interventions on health-related behaviors in adults. *Am J Public Health,* 100(2): 247–253.[28]
This review included 25 RCTs that assessed the effect of peer-based interventions on health-related behaviours in adults. The studies were grouped by the seven measured outcomes, one of which was to increase breastfeeding among new mothers. Webel *et al.* reviewed six breastfeeding studies, conducted in the USA, Scotland, Brazil, Canada and Bangladesh. The outcome measure was to increase breastfeeding which, when

examining the included papers, turned out to mean either an increase in initiation (one paper), an increase in exclusive breastfeeding (two papers), or in duration of breastfeeding (one paper). It was not clear from the titles of the other three included studies what outcome was measured.

For this review Webel *et al.* defined peer-based interventions as a method of teaching or facilitating health promotion that asks people to share specific health messages with members of their own community. The breastfeeding interventions studies (6) used the dyad model of peer-based intervention in healthcare. This model used peers as buddies for individuals, who were matched for the healthcare concern of interest and demographics; the peers provided one-on-one advice and support to increase breastfeeding.

Five studies reported positive results, of which three were statistically significant. When a meta-analysis was performed, the overall effect size was OR = 2.857 (0.79-10.61), which is not statistically significant. There was significant heterogeneity among the studies; however, the authors did use random effects methods in their analysis. The authors conclude that interventions delivered by peers to increase breastfeeding were not significant in increasing such rates.

The quality assessment completed by the HRB authors classified this review as moderate. However, the HRB authors emphasise that the results of the individual studies were mixed with the significant effects occurring in low- and middle-income countries. A number of different breastfeeding outcomes were measured in the same model, which contributes to the heterogeneity of the model.

Education, counselling and support by target of the intervention

Low-income mothers

Low-income mothers were the target of the intervention in four studies; the classification of mothers' socioeconomic status as low income was determined by the authors of the primary studies. Socioeconomic status clearly is an important factor contributing to mothers not meeting their own goals for breastfeeding duration. Women in low-income groups are less likely to start or continue breastfeeding.[53-56] Regardless of socioeconomic status, breastfeeding mothers generally need practical knowledge and experienced support in order to attain breastfeeding success, but disadvantaged mothers may require extra input and support in order to overcome breastfeeding problems. Barriers to breastfeeding among low-income women include perceptions of social disapproval of breastfeeding in public, the influence of family and friends, lack of support from some health providers, and difficulties associated with working.[57] Maternal employment has a negative impact on breastfeeding duration[58] and low-income women face particular challenges in this regard, since many of them must work to support themselves and their families.

Lack of education, knowledge and lack of prior exposure to breastfeeding contribute to the decision of many low-income mothers to formula feed or to introduce solid foods early. Some low-income women choose not to breastfeed because they fear their infant will not be satisfied by breast milk alone.[59] New mothers need support from professionals and others to reassure them that exclusively breastfeeding will be sufficient nutrition for their infants, and education about the benefits of breastfeeding may also need to extend to their partners. Developing healthcare professionals' capabilities to educate disadvantaged groups, their social networks and the public about breastfeeding is crucial.[60]

Reviews of interventions targeted at low-income mothers:

Dyson L, McCormick F and Renfrew MJ (2005) Interventions for promoting the initiation of breastfeeding. Cochrane Database of Systematic Reviews, *Rev,* 2: CD001688.[29]

The objective of this review was to evaluate the effectiveness of interventions which aim to encourage women to breastfeed, in terms of changes in the number of women who initiate breastfeeding. Outcomes measured were initiation and duration of any breastfeeding. Participants were all those exposed to interventions intended to promote breastfeeding, including pregnant women, mothers of newborn infants and women who may decide to breastfeed in the future. The review included 11 RCTs; meta-analysis was conducted on eight of them (1,553 women). Of the 11 included studies, nine targeted participants on low income.

The following types of breastfeeding promotion interventions were evaluated: health education for pregnant women (five trials); peer support (one trial); breastfeeding promotion packs (one trial); early mother-infant contact (one trial).

Five studies (582 women) evaluated the effect of health education interventions for increasing initiation rates of breastfeeding among low-income women in the USA. When these studies were combined for meta-analysis, a statistically significant increase in the number of women starting to breastfeed was demonstrated (RR 1.57; 95% CI 1.15-2.15). The authors report substantial statistical heterogeneity between these studies. Subgroup analysis of two studies (162 women) evaluating the effect of repeat, informal breastfeeding education personalised to each woman's needs showed a statistically significant increase in the number of women starting to breastfeed as a result of the intervention (RR 2.40; 95% CI 1.57-3.66). Statistical heterogeneity between these studies was small. Subgroup analysis of three studies (420 women) evaluating the effect of generic, formal, single breastfeeding education sessions on the initiation of breastfeeding found a positive but non-statistically significant increase in the number of women initiating breastfeeding (RR 1.26; 95% CI 1.00-1.60). Statistical heterogeneity was not found between these studies. Two studies were not included in the meta-analysis.

A single study (165 women) on needs-based, informal peer support services in the antenatal and perinatal periods was shown to be effective in increasing initiation rates among predominantly low-income Latina women who were considering breastfeeding in the USA (RR 4.02; 95% CI 2.63-6.14).

A single study on breastfeeding promotion packs showed no effect on increasing initiation rates among women of middle- or higher-income groups in a US setting (RR 0.93; 95% CI 0.80-1.08) and a single study on an early mother-infant contact intervention showed no effect on increasing initiation rates among low-income Nicaraguan women (RR 1.05; 95% CI 0.94-1.17).

Dyson et al observe that both one-to-one, needs-based, informal repeat sessions and generic, formal, antenatal sessions show results among women of low income, but that larger increases are likely to occur from needs-based, informal repeat education sessions. They conclude that the type of education or support intervention which may be most likely to increase initiation rates among low-income women appears to be needs-based, one-to-one informal sessions delivered in the antenatal or perinatal period by a trained breastfeeding professional or peer counsellor, and this conclusion appears reasonable. However, they warn about the generalisability of these findings to other countries, especially where breastfeeding rates are typically high.

The quality assessment completed by the HRB authors classified this review as strong and agree with the conclusions of Dyson, McCormick and Renfrew.

Ibanez G, de Reynal de Saint Michel C, Denantes M *et al.* (2012) Systematic review and meta-analysis of randomized controlled trials evaluating primary care-based interventions to promote breastfeeding in low-income women. *Fam Pract*, 29: 245–254.[30]
The objective of this review was to identify effective programmes that can be implemented by GPs to promote breastfeeding in low-income women. The programme had to be implemented by a healthcare professional to be included in the review, but the exact type of professional was purposefully not limited to GPs. Other requirements were that the programme had to be feasible in general practice in terms of frequency and duration, and any technical equipment had to be suitable for use in a GP's office.

Breastfeeding outcomes were categorised as initiation, short-term duration (six weeks to two months) and long-term duration (three to six months). The definition of breastfeeding included any form of breastfeeding, partial or exclusive. The authors conducted separate meta-analyses of RCTs on the rates of three of the outcomes measures: initiation of breastfeeding, short-term duration and long-term duration of breastfeeding, using random effect methods if heterogeneity was present.

Ten articles were included in the final analysis. These 10 articles included a total of 1,445 mother-and-child pairs. Nine studies were conducted in the USA and one in England. The number of individuals included in each study ranged from 48 to 583. Four studies were conducted prepartum (antenatally), two postpartum (postnatally) and four both prepartum and postpartum. Five studies were interested in the initiation and the duration of any form of breastfeeding, two in the initiation and the duration of exclusive breastfeeding, two in the initiation of any form of breastfeeding and two in the initiation of exclusive breastfeeding. Seven studies designed a programme involving multiple visits or appointments for the treatment group. Five studies gave a brochure to the treatment group. Four studies provided telephone support for the treatment group and one provided it for both the treatment and control groups. One study showed a video to the treatment group.

The seven studies that assessed ways of encouraging the initiation of any form of breastfeeding showed that educational programmes are effective (RR 1.46; 95% CI: 1.03-2.08). Seven studies involving ways to encourage mothers to continue any form of breastfeeding showed no significant success rates up to months post-delivery (RR 1.15; 95% CI: 0.97-1.37), but there were significant success rates in five of the studies after three months (RR 1.15; 95% CI: 1.01-1.30). Four studies that assessed ways of encouraging the initiation of exclusive breastfeeding showed that programmes implemented at the primary care level were effective (RR 1.82; 95% CI: 1.22-2.88). The pooled RR of exclusive breastfeeding could not be calculated due to the small number of studies on the topic.

The evidence suggests that educational programmes in the context of ongoing personal contact with a health professional are effective in promoting the initiation and duration of breastfeeding in low-income women.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors find this to be a well-conducted study and the review provides evidence that educational programmes delivered by a health professional in the context of a GP clinic are effective in promoting breastfeeding.

Ingram L, MacArthur C, Khan K *et al.* (2010) Effect of antenatal peer support on breastfeeding initiation: a systematic review. *CMAJ*, 182(16): 1739–1746.[31]
This review includes RCTs, quasi-randomised trials and cohort studies with concurrent controls, and contains 11 studies with 5,445 women in total. Of these studies, seven evaluated universal peer support and four evaluated targeted peer support, and then compared these to routine care. The targeted peer support was provided only to women who were considering breastfeeding. The population in all studies predominantly comprised low-income women. All studies had an antenatal and postnatal component to the peer support. The outcome

examined was breastfeeding initiation. The studies were conducted in the UK (four), USA (six) and Mexico (one). All interventions had different intensity. The two US-based RCTs with targeted peer support had an in-hospital component also.

Peer support was defined as support offered by women who had themselves breastfed, who were usually from the same socioeconomic background and locality as the women they were supporting, and who had received appropriate training (the type and duration of appropriate training received was not described). Peer supporters could be either voluntary or in receipt of basic remuneration or money for expenses. For the purpose of the review, breastfeeding initiation was defined as any attempt to breastfeed, even if only once. Peer counselling took place at home (visits or telephone), in the clinic or in hospital.

Pooled estimates from the three high-quality RCTs for universal peer support showed no significant effect of universal peer support on non-initiation of breastfeeding (RR 0.96; CI 0.76-1.22). Three non-randomised controlled studies all individually showed increased initiation of breastfeeding in the intervention groups.

Three RCTS examined targeted peer support, and pooled analysis showed significant reduction in breastfeeding non-initiation (RR 0.64; 95% CI 0.41-0.99), but there was significant heterogeneity among the studies. One small cohort study showed an increase in the rate of initiation of breastfeeding with targeted peer support (RR 0.22; 95% CI 0.08-0.64).

Ingram *et al*. concluded that universal antenatal peer support does not appear to improve rates of breastfeeding initiation among low-income women, but targeted antenatal peer support may be beneficial.

The quality assessment completed by the HRB authors classified this review as strong. The findings support the conclusion of Ingram *et al*., and HRB authors agree with their conclusions. Of note, the population in all the studies predominantly comprised low-income women, thereby possibly diluting the effect of the intervention on low-income women.

MacVicar S and Kirkpatrick P (2014) The effectiveness and maternal satisfaction of breast-feeding support for women from disadvantaged groups: a comprehensive systematic review. *JBI Database of Systematic Reviews & Implementation Reports,* 12(6): 420–476.[32]
This study had two main objectives: the establishment of breastfeeding in the postnatal period (two quantitative studies) and the satisfaction with breastfeeding supports in disadvantaged women (eight quantitative studies). The first objective is the only one relevant to the current review. The authors found two quantitative studies, both described as prospective cohort studies (one in Bristol and the other in Brazil), which examined the effect of breastfeeding support interventions led by hospital-based professionals for disadvantaged women for the establishment of breastfeeding during the seven days after delivery. The participants were women who had already decided to breastfeed. A narrative summary of these two studies is provided below.

The first study is described by the authors as a non-randomised prospective cohort phased intervention study (conducted by Ingram *et al.* in 2002). The study included 1,400 South Bristol mothers, representative of those who live in lower socioeconomic city areas of the UK, who were breastfeeding on discharge from hospital. There were four phases of data collection in the study: Phase 1 – baseline observation of data on breastfeeding duration prior to a 'hands-off' breastfeeding technique taught to midwives in hospital who subsequently taught mothers in their care; Phase 2 – the research midwife watched mothers breastfeed to assess how well they were mastering the 'hands-off' breastfeeding technique; Phase 3 – the women were given a leaflet to back up technique principles; Phase 4 – the research midwife withdrew from the postnatal ward to assess whether midwives could incorporate the technique and apply its principals as part of their routine workload.

The findings over the four phases demonstrated a significant increase in both exclusive breastfeeding and any breastfeeding by mothers on discharge from hospital. Factors associated with continued breastfeeding at two weeks were mothers' perception of a plentiful milk supply; reports of receiving enough support from hospital staff; and experience of breastfeeding problems.

The second study (conducted by Lutter *et al.* in 1997) was a prospective comparable cohort study. It included low-income women who delivered in a hospital with an active breastfeeding promotion programme and a control hospital nearby without such a programme. All women delivering healthy singleton infants with a birthweight of two kilogrammes or more were enrolled. The intervention was a comprehensive breastfeeding promotion programme of rooming-in, early initiation of breastfeeding and breastfeeding assistance, and talks during hospitalisation. These talks included information on the importance of exclusive breastfeeding for six months, how to solve common breastfeeding problems and where to find postnatal breastfeeding help. The comparator was a control hospital with no breastfeeding programme, although it did practise rooming-in and prohibited free gifts of infant formula.

The findings showed that delivery in the programme hospital was associated with increased maternal awareness of breastfeeding continuation support practices. There was an increased number of women breastfeeding on discharge from the intervention hospital compared with the control hospital. The study reported an overall improvement of exclusive breastfeeding for intervention participants for a median duration of 75 days, compared with women in the control hospital who fed for a median duration of 22 days.

From their interpretation of the two studies, MacVicar and Kirkpatrick suggest that, in spite of study limitations, enhanced technical expertise, practical assistance and information appear to positively contribute to the level of knowledge, increased rates and duration of breastfeeding in cohorts of low-income women.

The quality assessment completed by the HRB authors classified this review as moderate quality. Two quantitative studies examined the duration of breastfeeding after intervention. Judging by the results, the Bristol study is not a cohort study, it is a before-and-after study, and therefore has no comparison group. The numeric findings of the Bristol study are not presented, so it is difficult to assess its contribution to the review. This weakens the overall quantitative aspect of the Bristol review. The Brazil study demonstrates an increase in the duration of breastfeeding among the intervention group compared with the control group (75 days versus 22 days). However, the failure to report the numeric data from the Bristol study and the weaknesses in the Bristol study design means that the HRB authors cannot determine what the Bristol study adds to our knowledge of interventions in the postnatal period.

Adolescent mothers

Teenage mothers face many challenges to successful breastfeeding and are less likely to breastfeed than any other population group. Studies on adults cannot be extrapolated to adolescents because many studies suggest age-related differences in breastfeeding intentions and outcomes.[61-63] Interventions that target adolescents and minority women must consider the complex set of factors that influence the mother's choice of infant-feeding method. Yet, few data are available on the predictors of breastfeeding in these special populations. In the current literature search, the HRB authors found two reviews that examine the topic of breastfeeding in adolescent mothers.[33, 34]

Reviews of interventions targeted at adolescent mothers:

Sipsma HL, Jones KL and Cole-Lewis H (2015) Breastfeeding among adolescent mothers: a systematic review of interventions from high-income countries. *J Hum Lact*, 31(2): 221–229.[33]

Six studies met the inclusion criteria and were included in this review to determine the effectiveness of interventions designed to improve rates of breastfeeding. The countries covered by the studies are not listed. Interventions included school-based programmes, home visits and telephone support that were implemented by a combination of peer counsellors, nurse physicians, doulas, and lactation consultants.

Four studies evaluated breastfeeding initiation. Two studies reported statistically significant differences between the intervention and control group (65% versus 15%) p<0.01 and 63% versus 49.6% p=0. 02, respectively. The other two studies found no significant difference between intervention and controls.

Five studies reported on duration of breastfeeding. Only one of these studies reported significantly longer breastfeeding duration among the intervention group when compared with controls, with a median of 177 days in the intervention group, as opposed to 42 days in the attention control group (partial intervention) and 61 days in the usual care group p<.01.

Four studies examined exclusive breastfeeding duration and three reported significant differences in favour of the intervention group. These studies were generally of short duration. One study found a greater duration of exclusive breastfeeding among the intervention group compared with the control group (35 days versus 10 days, respectively). Greater proportions of exclusive breastfeeding were found among mothers in the intervention group compared with mothers in the control group in one study at three months (45% versus 25%, respectively) and at six months (30% versus 15% respectively), and in another study at six weeks (94% versus 82.1%, respectively) and at four months (21.3% versus 12.5%, respectively).

Sipsma, Jones and Cole-Lewis conclude that only one intervention, a combination of education and counselling provided by a lactation consultant-peer counsellor team, significantly improved both breastfeeding initiation and duration. Other results were mixed, and studies were subject to several methodological limitations. They recommended that more interventions should be developed and evaluated.

The quality assessment completed by the HRB authors classified this review as moderate. The conclusions were supported by the findings and the HRB authors agree with the conclusions of Sipsma *et al.*

Hall Moran V, Edwards J, Dykes F *et al.* (2007) A systematic review of the nature of support for breast-feeding adolescent mothers. *Midwifery*, 23(2): 157–171.[34]

This review includes seven studies, two of which are qualitative. The focus of the review is on adolescent mothers, and the outcomes assessed were breastfeeding initiation or continuation. The interventions were education and support programmes (two), education by lactation consultant and support from breastfeeding peer counsellor (one), identification of factors influencing adolescent mothers' feeding patterns (one), midwife support for breastfeeding (one). The countries covered by the included studies are the UK, USA and Australia.

The findings were tabulated and described narratively and thematically. The papers included in this review varied in design, quality and focus. Five types of support were identified: emotional (felt cared for), esteem (feelings of self-worth), instrumental (tangible assistance and practical help), informational (advice, suggestions, directions or feedback) and network (mothers, partners and peers). The participants in the included studies seemed to find the emotional, esteem and network components of support most helpful. Support from the participants' mothers seemed to be particularly powerful. The provision of continuity of support from an expert individual who is skilled in both lactation support and working with adolescents was also highly valued by

breastfeeding adolescents. There was also evidence to suggest that targeted breastfeeding education programmes, specifically designed for the adolescent learner, may be successful in improving breastfeeding initiation (three studies measured initiation before and after the intervention, and two of the three were significant) and continuation rates (two studies measured continuation but with different end points, i.e. two months and three months, respectively; both were significant) in this population.

However, a question still arises about which elements of the complex package on offer were most effective. The authors concluded that although the support provided by known and trusted individuals emerges as important to the adolescents, further research is required on the specific nature of that support and the person best placed to provide it.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors concur with the conclusion of the review of Hall Moran *et al.*

Educating the educators

There is always room for improving the education and training of childcare providers and staff with regard to the benefits of breastfeeding and human milk. Studies have shown that widespread education of childcare providers and staff are absolutely necessary in order to ensure adherence to breastfeeding support guidelines. It also aids in the proper dissemination of information about breastfeeding to families. The HRB authors identified two reviews identified that examined this area of breastfeeding education**.**

Reviews of interventions focusing on education of the educators:

Spiby H, McCormick F, Wallace L *et al.* (2009) A systematic review of education and evidence-based practice interventions with health professionals and breast feeding counsellors on duration of breast feeding. *Midwifery*, 25(1): 50–61.[35]

The authors included nine studies that reported interventions targeted at health professionals, most of which aimed to increase knowledge and change professional practice in support of breastfeeding as measured by breastfeeding outcomes. All studies used before-and-after designs that included education of healthcare professionals (doctors, nurses, midwives); no studies were identified that related to breastfeeding counsellors. The authors provided a narrative summary of each intervention rather than a meta-analysis because of heterogeneity among the studies. In six of the studies, the participants were working with mothers and babies in hospitals (three in the UK, two in Italy and one in France); in three studies, the participants were working in community settings (Canada, Spain and the USA). Two UK studies and two non-UK studies (Spain and USA) included mothers living in disadvantaged areas. Breastfeeding outcomes were consistent but were measured at very different time points in the different studies.

Six of the nine studies examined exclusive breastfeeding as an outcome. At early time points, four studies showed a significant increase in the rate of exclusive breastfeeding and two showed no significant increase.

All of the studies examined any breastfeeding as an outcome, and four showed an increase in any breastfeeding at one time point.

Spiby *et al*. conclude that evidence from these studies was insufficient to draw conclusions about overall benefit or harm associated with the interventions, and that many of the studies reviewed have methodological limitations. Study settings and contexts vary and lack comparability. From the studies identified, there seems to be no single approach that consistently achieves changes in breastfeeding duration. From one of the more

methodologically robust studies, it seems that UNICEF/WHO BFHI training might have the potential to influence breastfeeding duration.

The quality assessment completed by the HRB authors classified this review as strong. The HRB authors consider that the results are mixed. Study settings and contexts vary and lack comparability. All of the interventions were different, and although some success was evident, it is difficult to build a comprehensive picture.

Ward KN and Byrne JP (2011) A critical review of the impact of continuing breastfeeding education provided to nurses and midwives. *J Hum Lact*, 27(4): 381–393.[36]
This review set out to examine the effects of educational interventions aimed at already practising health professionals, particularly nurses and midwives. Fifteen studies were included in the review (five RCTs, six quasi-experimental studies, four non-experimental quantitative studies (before-and-after design)). The countries covered by the studies were Italy, Sweden, the UK, the USA, France, Canada, Australia and India.

The outcomes were not specifically stated, but the findings included information on increased knowledge in professionals after the intervention, change of attitude in professionals, increased BFHI compliance, improved clinical practices and skills, rates of initiation and duration of any or exclusive breastfeeding, the length of interventions, resistance to change, and sustainability of change. Only a small section of the review examined breastfeeding outcomes relevant to the current review.

Interventions were not specifically itemised for some the studies, and it was difficult to know exactly what the educational interventions were, but those described varied from a formal 18-hour UNICEF course to shorter, less formal interventions.

No test of heterogeneity for the studies was described, and a narrative analysis was provided.

Breastfeeding outcomes: it was difficult to make direct comparisons in the area of breastfeeding outcomes. Eight studies measured the use of supplemental feeds in the postnatal hospital environment. One study measured nurses' and midwives' intent to change this practice, and the others measured the percentage of infants receiving supplemental feeds through chart audits, maternal surveys or observation. After the intervention, nurses and midwives became more aware of the issues surrounding supplemental feeds, with all continuing education having varying degrees of success in reducing supplementation. More positive changes were seen in India, where the use of supplements was initially very high, than was seen in Sweden, where the use of supplements is very low.

Six studies discussed exclusive, full or total breastfeeding, but only five of these actually attempted to measure any changes. Full breastfeeding includes both women who exclusively breastfeed and those who predominantly breastfeed but use an occasional non-human milk supplement. From the results, most of the studies that found significant increases in breastfeeding outcomes had educational interventions of greater than 18 hours and large sample sizes. While nurses and midwives were the largest group of health professionals trained, all but one study also included the education of other health professionals.

The quality assessment completed by the HRB authors classified this review as moderate. The HRB authors support the authors' conclusion on breastfeeding outcomes.

Education, counselling and support via e-technology or telephone

Women have unique health and education needs in relation to pregnancy and infant feeding. According to the CDC women's social networks are highly influential in their decision-making processes (https://www.cdc.gov/breastfeeding/pdf/breastfeeding_interventions.pdf), including pregnancy and childbirth information, there would seem to be considerable potential for using social media, social network programmes and communications technologies in general as a means to provide support and increase awareness of, and receptivity to, initiating and continuing breastfeeding in mothers.

Reviews of interventions focused on e-technology/telephone:

Lavender T, Richens Y, Milan SJ *et al.* (2013) Telephone support for women during pregnancy and the first six weeks postpartum. Cochrane Database of Systematic Reviews, 7: CD009338.[38]

Breastfeeding continuation was a secondary outcome in this review, which set out to examine the effect of telephone support for women in the first six weeks postpartum. Eight trials were designed to examine the effect of telephone support on the rates of any breastfeeding or exclusive breastfeeding. Telephone support included support available on request (passive) and support initiated (proactively offered) without request. Telephone calls and text messaging were included. The support was carried out by healthcare professionals or trained volunteers, or a mix of both. All of the trials relating to breastfeeding outcomes were carried out in a high-resource setting.

The authors found a non-significant effect on any breastfeeding up to six weeks postpartum (five trials) (RR 0.98; 95% CI 0.86-1.12). At six months postpartum, it appeared that the results significantly favoured the intervention group, with women receiving telephone support being more likely to be still breastfeeding (five trials) (RR 1.21; 95% CI 1.06-1.38). At four to eight weeks postpartum, four trials examined exclusive breastfeeding and found non-significant results (RR 1.27; 95% CI 0.88-1.83).

Three trials, which examined exclusive breastfeeding at three to six months postpartum, found a statistically significant difference between groups, with women who received the intervention more likely to be exclusively breastfeeding (RR 1.51; 95% CI 1.19, 1.93). One study which examined mean breastfeeding duration (any breastfeeding) showed a mean difference in days of breastfeeding duration of 7.60 (95% CI 0.06-15.14), which is just barely significant.

The authors concluded that results from trials encouraging breastfeeding through telephone support were inconsistent; there was some evidence that telephone support may increase the duration of breastfeeding.

The quality assessment completed by the HRB authors classified this review as strong, but breastfeeding practices were a secondary outcome. The HRB authors agree with Lavendar et al that the results are inconsistent, but they do not agree that the evidence for telephone support, which is based on one study, is sufficient to draw conclusions about increasing the duration of breastfeeding.

Lau Y, Htun TP, Tam WS *et al.* (2015) Efficacy of e-technologies in improving breastfeeding outcomes among perinatal women: a meta-analysis. *Matern Child Nutr*, Epub ahead of print.[39]

The objective of this review was to synthesise the best available evidence through a meta-analysis to evaluate the efficacy of e-technologies in improving breastfeeding outcomes among perinatal women. Data from 16 experimental studies totalling 5,505 women in six countries were included. All 16 studies examined e-technological intervention versus usual care. The e-technological interventions in this review included: web-

based (Internet, websites providing educational materials and practice information, online information and support); CD-ROM (can include multimedia training material to provide information and support); e-education and e-Learning (using multimedia software package); virtual interactive approach (includes an interactive computer [virtual] agent which is a computer-animated character that uses motivational interviewing techniques to provide information and support; also includes videoconferencing); SMS (short message services: texting); and e-prompt (provides support and information in a reminder system that appears in the electronic medical records of patients during their medical visits).

The providers of interventions were: midwives/nurses (10 studies); dietitians (two studies); paediatricians (two studies); university staff (three studies) and peer counsellors (one study).

Seven studies examined exclusive breastfeeding; meta-analyses of these studies showed substantial heterogeneity. Two studies on web-based interventions to promote exclusive breastfeeding initiation found a significant increase in breastfeeding rates (RR 1.76; 95% CI 1.54-2.01). Four studies using e-prompt, CD ROM and web-based interventions on exclusive breastfeeding initiation had a significant result (RR 1.11; 95% CI 1.03-1.19). The effect of visual consultation over the Internet (one study) on exclusive breastfeeding initiation was not significant. The overall effect of e-technologies on exclusive breastfeeding initiation was significant (RR 1.17; 95% CI 1.12-1.22).

e-Prompt and web-based interventions had a significant positive effect on the rate of exclusive breastfeeding at four weeks (RR 1.72; 95% CI 1.04-2.84). Web-based and visual consultation did not improve the rate of exclusive breastfeeding at six weeks (RR 1.01; 95% CI 0.88-1.17). e-Prompt, web-based interventions and SMS significantly improved the rate of exclusive breastfeeding at six months (RR 2.23; 95% CI 1.36-3.65).

Lau *et al.* conclude that the review provides support for the development of web-based, text messaging, CD-ROM, electronic prompts and interactive computer agent interventions for promoting and supporting breastfeeding.

The quality assessment completed by the HRB authors classified this review as strong. We agree with Lau *et al.*'s conclusion in general, but larger-scale studies are necessary in order to draw definitive conclusions. e-technologies would in no way replace usual care, but could be used in addition to usual care.

Dennis CL and Kingston D (2008) A systematic review of telephone support for women during pregnancy and the early postpartum period. *J Obstet Gynecol Neonatal Nurs*, 37(3): 301–314.[37]

All forms of telephone support were included in this review – proactive and reactive, and both scheduled and unscheduled forms of telephone support. Telephone support was provided by a lay person or health professional in the antenatal period or during the first two months postpartum, or both. The study included pregnant women and new mothers within the first two weeks postpartum. The majority of interventions were proactive, where study participants were telephoned; no study included or specifically presented data related to a reactive telephone support that was initiated by the participants. The interventions were provided by a variety of health professionals and in four trials the intervention was provided by lay individuals. No trials provided data regarding the time and length of the actual telephone calls. The majority of trials were conducted in the USA; three were conducted in Canada, one in Australia and one in the UK.

Three studies evaluated the influence of telephone support on any or exclusive breastfeeding at various time points (0–4 weeks, 5–8 weeks, 9–12 weeks, 13–16 weeks and 17–24 weeks). Proactive telephone support was

found to significantly increase the rate of any breastfeeding, when compared with the usual care for the time periods 0–4 weeks and 9–12 weeks; proactive telephone support was not found to be significant for any other time periods. Proactive telephone support was found to significantly increase the rate of exclusive breastfeeding when compared with the usual care for the time period 9–12 weeks, and was not found to be significant for any other time periods.

The quality assessment completed by the HRB authors classified this review as moderate. The HRB authors consider that Dennis and Kingston's interpretation of their finding at individual time points is more positive than the actual results presented in the text. They combine numerous different time points to estimate the overall effect of telephone support on exclusive breastfeeding or any breastfeeding, and these findings have little meaning in practice.

Level of effectiveness for education/counselling/support interventions

We have summarised the main results of the included reviews by categorising their findings in a framework used by the Cochrane collaboration when undertaking an umbrella review such as this:

- **Effective interventions:** indicating that the review found evidence of effectiveness for an intervention.
- **Promising interventions (more evidence needed):** indicating that the review found some evidence of effectiveness for an intervention, but that more evidence is needed.
- **Ineffective interventions:** indicating that the review found evidence of lack of effectiveness for an intervention.
- **Possibly ineffective interventions (more evidence needed):** indicating that the review found evidence suggesting lack of effectiveness for an intervention, but that more evidence is needed.
- **No conclusions possible due to lack of evidence:** indicating that the review found insufficient evidence to comment on the effectiveness or safety of an intervention.

Effective interventions

- Antenatal peer counselling improved the rate of breastfeeding **initiation** in one review by **Lumbiganon *et al***.[17] This review only examined the effect of antenatal interventions, including formal and informal breastfeeding education, printed information, video, peer counselling and lactation consultation. Of these interventions, peer counselling alone was found to be effective in increasing the initiation of breastfeeding.

- **Lumbiganon *et al.*[17]** also found that antenatal multiple methods of breastfeeding education (breastfeeding booklet plus video plus lactation consultant) were significantly better in improving the rates of **exclusive breastfeeding at three months**, when compared with no formal education.

- **Mitchell-Box and Braun[21]** found that antenatal or postnatal male partner-focused interventions (open discussion, educational materials, incentives, follow-up support) improved the rates of at least one breastfeeding outcome, i.e. initiation, exclusivity or continuation.

- In a review by **Imdad *et al.***,[20] breastfeeding promotion interventions (formal or structured breastfeeding education, professional support and lay support) increased **exclusive** and **any** breastfeeding rates between **four and six weeks** and at **six months.** These interventions had a relatively greater impact in developing countries.

- In relation to timing of the interventions, **Imdad *et al*.**[20] found that prenatal and postnatal and combined interventions were effective in increasing **exclusive breastfeeding** between **four and six weeks** and at **six months**, with prenatal interventions having the greatest impact for exclusive breastfeeding between four and six weeks, whereas combined antenatal and postnatal interventions had the greatest impact on exclusive breastfeeding to six months.

- **Renfrew *et al*.**[23] examined breastfeeding support interventions in the postnatal period only. This support included reassurance, praise, information, or the opportunity to discuss the mothers' questions, and could be offered by health professionals or lay people, trained or untrained, in hospital and community settings, proactively or reactively, on a group basis or one-to-one. It could also include staff training to improve the supportive care given to women. All forms of extra support analysed together showed an increase in duration of **any** or **exclusive breastfeeding** up to **six months**. In addition, analyses of results at different periods of follow-up suggest that the benefit of all forms of support was present at **all time points** up to **nine months**.

- **Ibanez *et al*.**[30] reviewed interventions provided in a primary care setting to low-income women who intended to breastfeed or who were already breastfeeding. They concluded that the evidence suggests that long-term educational programmes delivered by a health professional in the context of a GP clinic are effective in promoting the initiation and duration of breastfeeding in low-income women.

- **Haroon *et al.***[25] conclude that breastfeeding education and/or support (counselling during home visits, peer counselling, peer support groups, telephone counselling, Internet or software-based educational programmes, formal educational classes, in-hospital counselling and counselling of the fathers) increased **exclusive breastfeeding** rates at three time points (day one, less than one month, and between one and five months) and decreased **no breastfeeding rates** for the same time periods. Interventions were less effective in developed countries and only exclusive breastfeeding at less than one month and no breastfeeding rates at the three time points remained significant. Combined individual and group counselling appeared to be superior to either individual or group counselling alone, and interventions in developing countries had a greater impact than those in developed countries.

- **Dyson, McCormick and Renfrew**[29] conclude that needs-based, one-to-one informal sessions delivered in the antenatal or perinatal period by a trained breastfeeding professional or peer counsellor increase **initiation** rates among low-income women.

- The review of **Sipsma, Jones and Cole-Lewis**[33] examined interventions to improve breastfeeding rates among adolescent mothers. The interventions included school-based programmes, home visits and telephone support that were implemented by a combination of peer counsellors, nurse physicians, doulas, and lactation consultants. Only one intervention, a combination of education and counselling provided by a lactation consultant/peer counsellor team, significantly improved both breastfeeding **initiation and duration** among adolescent mothers.

Promising interventions:

- **Wong, Tarrant and Lok,**[16] in a review of group versus individual professional antenatal breastfeeding education for extending breastfeeding duration and exclusivity, found evidence to suggest that one-to-one antenatal breastfeeding education may be effective in some vulnerable populations such as low-education women, minority groups and new immigrants.

- **Chung *et al***.[18] found that primary care breastfeeding promotion interventions increased the rate of short-term and long-term **exclusive breastfeeding**. When the components of combinations of breastfeeding interventions (formal or structured education, system-level professional support, individual-level professional support and/or lay support) were examined, Chung *et al*. concluded the inclusion of lay support in a multicomponent intervention increased the positive effect on the **initiation of exclusive breastfeeding** and on the proportions of women **continuing any** or **exclusive breastfeeding** in the short term (between **one and three months**). However, the inclusion of studies (two) conducted in low- and middle-income countries enhanced the positive findings of primary care breastfeeding promotion interventions on the **initiation and short-term duration of any breastfeeding**.

- When the timings of the breastfeeding interventions are examined, **Chung *et al.***[18] found evidence to suggest that combining prenatal and postnatal interventions had a larger effect on increasing **duration of any breastfeeding** in the medium and long-term than either prenatal or postnatal interventions alone.

- **Skouteris *et al.***,[19] in a review of antenatal and postnatal interventions focusing on maternal support or education, conclude that the most successful interventions for increasing the duration of **exclusive breastfeeding** were conducted in the postnatal period and over a long period of time; however, the findings were inconsistent. Successful interventions tended to be support-based programmes providing additional home-based and telephone support by lactation experts.

- **Yonemoto *et al.***[22] found some evidence that more home visits in the postnatal period rather than fewer home visits may encourage more women to exclusively breastfeed their babies.

- **Sinha *et al.***[27] conclude that in order to promote breastfeeding, interventions should be delivered in a combination of settings by involving health systems, home and family and the community environment concurrently. This review included a wide variety of interventions in a multiplicity of settings delivered by a variety of agents at diverse time points. The authors did draw attention to the fact that studies varied in quality and reliability, and that studies which controlled for potential confounders showed a more modest effect of interventions on all breastfeeding outcomes.

- **Ward and Byrne**[36] examined educational interventions aimed at already-practising health professionals, particularly nurses and midwives, and found that most of the studies with significant increases in breastfeeding outcomes had educational interventions of greater than 18 hours and large sample sizes.

- **MacVicar and Kirkpatrick**,[32] reviewing two studies, suggest that the provision of technical and physiological instruction in issues relating to breastfeeding, together with practical assistance and information, appears to positively contribute to the mother's level of knowledge and to increase rates and duration of breastfeeding in low-income women. Study limitations have been noted.

- **Spiby *et al.***[35] reviewed education and evidence-based practice interventions with health professionals and breastfeeding counsellors. They found that evidence from the studies was insufficient to draw overall conclusions about benefits or harm associated with the interventions, but conclude from one of the methodologically more robust studies that BFHI training might have the potential to influence breastfeeding duration.

- **Lau *et al.***[39] conclude that the review provides support for the development of web-based, text messaging, CD-ROM, electronic prompts and interactive computer agent interventions for promoting and supporting breastfeeding.

- **Ingram *et al.***[31] reviewed studies containing antenatal and postnatal peer support for low-income mothers, and concluded that universal antenatal peer support (home visits, or telephone support, or counselling in a clinic or in hospital) does not appear to improve rates of breastfeeding initiation, but that targeted antenatal peer support may be beneficial.

Ineffective interventions

- **Webel *et al.***[28] reviewed the effect of peer-based interventions on health-related behaviours; an increase in breastfeeding among new mothers was one of the outcomes measured. The authors concluded that although five studies reported positive results, of which three were significant, the overall effect of peer-based interventions for increasing breastfeeding rates was not significant, with significant heterogeneity between the studies.

Possibly ineffective interventions

- **Jolly *et al.***[24] conclude that although peer support interventions increase breastfeeding continuation – especially exclusive breastfeeding – in low- or middle-income countries, this does not seem to apply in high-income countries. They also found that peer support of low intensity does not seem to be effective. When they compared antenatal and postnatal combined peer support with postnatal-only peer support, they found that the former was not effective, whereas postnatal peer support significantly reduced the risk of not breastfeeding at last study follow-up, which varies between studies.

- **Dennis and Kingston,**[37] in three studies, evaluated the influence of telephone support on any breastfeeding or exclusive breastfeeding at five different time points, and reported that proactive telephone support was found to significantly increase the rate of any breastfeeding, when such support was compared with the results for usual care at two time points (0–4 weeks, 9–12 weeks) and exclusive breastfeeding at one time point (9–12 weeks), but was not significant for any other time periods. However, the HRB authors noted that Dennis and Kingston combined numerous different time points in order to estimate the overall effect of telephone support on exclusive breastfeeding or any breastfeeding, and that these estimations have little meaning in practice.

No conclusions possible:

- Reviews by both **Catling *et al.***[15] **and Wong, Tarrant and Lok**[16] examining the effectiveness of group versus individual antenatal care interventions found that it was not possible to draw conclusions due to substantial methodological heterogeneity and/or a limited number of high-quality studies.

- **Lewin *et al.***[26] conclude that the available evidence allows no overall conclusions to be drawn regarding the effectiveness of lay health workers in substituting for professional providers.

- **Hall Moran *et al.***[34] conclude that the effectiveness of providing incentives for breastfeeding compared with no incentives in adolescent mothers is unclear, due to study heterogeneity and variation in study quality and the multiplicity of interventions.

- **Lavender *et al.*[38]** concluded that results from trials encouraging breastfeeding through telephone support were inconsistent; there was some evidence that telephone support may increase the duration of breastfeeding.

HRB authors' synthesis: education, counselling and support

Education, counselling and support

Having examined the effective and promising interventions which emerged from the included reviews, there is evidence that **education, counselling and support** have a major role to play in the promotion of breastfeeding. Education, counselling and support have been shown to be effective in the antenatal,[17, 20, 21] extended postnatal period,[3, 23, 25] and both periods combined,[20] and some reviews demonstrate that ongoing one-to-one education/counselling/support, especially in the postnatal period, over a long duration is an effective method of promoting breastfeeding. In addition, one-to-one needs-based counselling and support may be effective for low-income[29, 30] and adolescent mothers.[33] Internet support may be a useful adjunct to face-to-face care.[38, 39] A few reviews[24, 28] found that peer support was most effective in low- or middle-income countries and two reviews[24, 25] found that peer support was not effective in high-income countries, particularly where there was well-organised community midwife care after the birth.

However, the reviews examining education, counselling and support were not consistent in their categorisation of interventions and, in some cases, populations. Interventions that were grouped together often varied greatly in terms of the content of the intervention, the length of the intervention, the mode of delivery and the target population. The settings where the interventions were conducted varied, as did the training, if any, which was provided to those performing the interventions.

For peer support, there are considerable differences, which have the potential to modify the effect of peer counselling; such differences include the study populations, the definition of peers, the definition of counsellors, peer counsellor training protocols, peer visit schedules, and outcome ascertainment methods between trials.

In the majority of studies, the interventions were compared to 'routine care', the definition of which seems to vary considerably between countries.

Therefore, given the enormous diversity within and between the reviews it is not possible to say precisely which period of time would be the most beneficial to provide the education, counselling or support; who should provide it; or what component of these interventions might be the most beneficial in order to increase breastfeeding rates.

Some points of note arose from the reviews. A Cochrane review by Renfrew *et al.*[23] containing 52 randomised control trials (RCTs) and which the HRB authors classified as strong, concluded that 'all women should be offered support to breastfeed their babies to increase the duration and exclusivity of breastfeeding. Healthcare settings should provide such trained support as standard. Support is likely to be more effective in settings with high initiation rates, and therefore measures to increase the uptake of breastfeeding should be in place. Support may be offered either by professional or lay/peer supporters, or a combination of these. Strategies that rely mainly on face-to-face support are more likely to succeed. Support that is only offered when women seek help is unlikely to be effective; women should be offered ongoing visits on a scheduled basis so they can predict that support will be available. Support should be tailored to the setting and the needs of the population group.'

Dyson, McCormick and Renfrew (2005),[29] in another Cochrane review containing 11 RCTs with the target of the intervention being **low-income women**, noted: 'Support may be offered either by professional or lay/peer supporters, or a combination of these. Strategies that rely mainly on face-to-face support are more likely to succeed.' In the same review, subgroup analysis of two studies (162 women) evaluating the effect of repeat, informal breastfeeding education personalised to each woman's needs, showed a statistically significant increase in the number of women starting to breastfeed as a result of the intervention.

The reviews[33, 34] that addressed interventions among **adolescent mothers** showed mixed results, but it is clear that peer support and education interventions improve breastfeeding rates, especially when these are targeted at individuals.

Additionally, a review by Chung *et al*.[18] including 38 RCTS concluded that when the components of multifaceted breastfeeding interventions (formal or structured education, system-level professional support, individual-level professional support and/or lay support [peer]) were examined, the inclusion of lay support in a multicomponent intervention increased the positive effect of the initiation on the rate of exclusive breastfeeding and the proportion continuing to breastfeeding between one and three months.

Two reviews[35, 36] examined the effect of **educating the educators**. One of these found that their evidence was insufficient to draw conclusions, whereas the other review found that most of the large sample size studies did show improvements in breastfeeding outcomes where the educational intervention was greater than 18 hours.

With regard to using **e-technology/telephone support**[37-39] Lau *et al*. conclude that the review provides support for the development of web-based, text messaging, CD-ROM, electronic prompts and interactive computer agent interventions for promoting and supporting breastfeeding. The HRB authors agree with the authors' conclusion in general, but larger-scale studies are necessary in order to draw definitive conclusions. E-technologies would in no way replace usual care, but could be used in addition to usual care.

3.2 Other interventions to promote breastfeeding

The category 'other breastfeeding interventions' contained nine subcategories: multifaceted programmes (one review), skin-to-skin contact (two reviews), rooming-in (one review), supplementary feeding (one review), pacifiers (two reviews), baby-led scheduling (one review), incentives (one review), antenatal breast examination (one review) and comparison of midwife-led and other/doctor-led maternity care (two reviews). The effectiveness of each of these interventions is discussed individually.

Multifaceted programme

A multifaceted programme is a structured approach to support breastfeeding that targets change at organisational, service-delivery and individual-behaviour levels – for example, implementation of the BFHI.

Beake S, Pellowe C, Dykes F *et al.* (2012) A systematic review of structured compared with non-structured breastfeeding programmes to support the initiation and duration of exclusive and any breastfeeding in acute and primary health care settings. *Matern Child Nutr,* 8(2): 141–161.[40]

The objective of this review was to consider the evidence of outcomes of structured compared with non-structured breastfeeding programmes in acute maternity care settings to support initiation and duration of exclusive breastfeeding.

The review included 21 studies (most are small observational before-and-after studies) and five systematic reviews. There was poor homogeneity between included studies, with wide variation in the outcomes measured and the timing of assessments, and little consistency in the type of support intervention described. The quality of the overall study was poor and much of the evidence in the primary studies is low in the evidence hierarchy. No meta-analysis was possible and Beake *et al.* provide a narrative summary only.

The breastfeeding outcomes measured in this review are: rates of initiation of breastfeeding; and duration of exclusive breastfeeding and/or any breastfeeding. Nine studies evaluated initiation of breastfeeding. Seven found a statistically significant improvement in the initiation of breastfeeding post-intervention, while two showed no significant difference.

Six studies evaluated breastfeeding rates up to one week post-birth, both during the hospital stay and/or at discharge from hospital. Five of the studies showed an increase in breastfeeding. One study found no statistically significant difference in the overall breastfeeding rate, but did find an increase in the rate of exclusive breastfeeding. Four of the studies examined exclusive breastfeeding rates in hospital, and all four reported increased rates of exclusive breastfeeding.

Nine studies evaluated breastfeeding outcomes from hospital discharge to two months postpartum. Of these, four studies assessed breastfeeding outcomes at two weeks postpartum. Six studies included data on breastfeeding outcomes at one month and two studies examined breastfeeding outcomes at two months. Studies included a range of outcomes, including exclusive, mixed and any breastfeeding. Four of the six studies showed higher rates of breastfeeding at one month. One of two studies showed higher rates of breastfeeding at two months and three studies of the four showed higher rates of breastfeeding at two weeks.

Three studies evaluated breastfeeding outcomes at three months and four studies at four months. All studies showed an increase in breastfeeding rates at three and four months, except one where the difference at four months was not statistically significant.

Five studies evaluated breastfeeding at six months. Four of these showed increases in breastfeeding rates (any and/or exclusive breastfeeding), and one study found no difference in exclusive breastfeeding rates.

Four studies evaluated the duration of exclusive breastfeeding, and all four showed an increase in duration of exclusive breastfeeding.

The authors report that most studies found an improvement in initiation of breastfeeding following introduction of a structured breastfeeding programme compared with no programme. Structured programmes also had an impact on duration of both exclusive breastfeeding and any breastfeeding, although not all studies reported a statistically significant difference in these outcomes, i.e. the impact on duration was less clear. The authors comment that structured programmes may have a greater benefit in healthcare settings with low breastfeeding uptake and duration rates.

The authors recommend that acute maternity care settings implement structured programmes to support breastfeeding initiation and the duration of exclusive or any breastfeeding, and suggest that the content of such programmes could replace an existing programme – such as BFHI – in full or in part, or be specifically developed to reflect local needs.

The quality assessment completed by the HRB authors classified this review as moderate. The HRB authors found that the review authors' interpretation of the results is supported by the data, with the exception of the narrative summary on breastfeeding duration. Furthermore, the complete study results are not presented in the supporting tables.

This review indicates that multifaceted interventions are effective in increasing the initiation and duration of exclusive breastfeeding.

Skin-to-skin contact (SSC)

Early skin-to-skin contact (SSC) involves placing the naked baby prone on the mother's bare chest at birth or soon afterwards (within the first 24 hours after birth). The general belief is that SSC should continue until the end of the first successful breastfeeding to show an effect and to enhance infant self-regulation.

Moore ER, Anderson GC, Bergman N *et al.* (2012) Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database of Systematic Reviews, 5: CD003519.[41]

The objective of this review was to assess the effects of early SSC on breastfeeding, physiological adaptation and behaviour in healthy mother-newborn dyads. The characteristics of the intervention varied greatly between studies. Duration of SSC also varied.

Two studies with 57 women reported the number **exclusively breastfeeding** at **hospital discharge**; there was no evidence of a difference in groups receiving SSC compared with routine care (RR 0.99; 95%CI 0.66-1.47). Three studies with 245 women examined any breastfeeding status **at one month** postpartum. There was no clear evidence of differences between groups for this outcome and results varied considerably between studies therefore the overall average treatment effect should be treated with caution (MD or effect size 0.86 (95% CI- 0.73 – 2.44)).

More infants were **exclusively** breastfed between **three and six months** post birth in three studies (RR 1.97; 95% CI 1.37-2.83). Two studies reported breastfeeding at one year post birth, with no statistical difference between groups (RR 6.19; 95% CI 0.82-46.78).

The authors report a statistically significant positive effect of early SSC on **any breastfeeding** between one and four months after birth (13 trials; 702 participants (RR 1.27; 95% CI 1.06-1.53)). SSC was not seen to increase

breastfeeding duration in seven trials with 324 participants (mean difference 42.55 days, 95% CI 1.69-86.79, p = 0.06).

Moore *et al.* conclude that mothers were more likely to be breastfeeding (**any breastfeeding**) between **one to four months**, and **exclusively breastfeeding** between three and six **months,** if they had early SSC with their babies.

They also point out as noteworthy that an intervention practised for such a short time after birth should have measurable breastfeeding effects one to four months after birth.

The HRB authors classified the quality of this review as strong and agree with the conclusions of Moore *et al.*

Overall conclusion on SSC

This review[41] indicates that SSC is effective in increasing the uptake of any breastfeeding and the findings of the Dyson review[29] support this finding.

Rooming-in

Rooming-in is described as keeping mother and infant together during their hospital stay by placing the infant either in the mother's bed or by the bedside in a crib/cot. Separate care is described as the practice of placing the infant in the hospital nursery after birth.

Jaafar SH, Lee KS and Ho JJ (2012) Separate care for new mother and infant versus rooming-in for increasing the duration of breastfeeding. Cochrane Database of Systematic Reviews, 9: CD006641.[42]

This review set out to assess the effect of mother-infant separation versus rooming-in on the duration of breastfeeding (exclusive and total duration of breastfeeding).

Only one trial (n = 176 women) met the inclusion criteria. Exclusive breastfeeding before discharge from hospital (at day four postpartum) was significantly lower in the separate care group compared with the rooming-in group, 45% compared to 86% respectively (RR 0.58; 95% CI 0.42-0.81).

However, the trial did not report the mean duration of exclusive breastfeeding, the proportion of infants exclusively breastfed up to six months of age, or any of the maternal or neonatal outcomes pre-specified in their protocol.

The HRB authors classified the quality of this review as strong and agree with the conclusions of Jaafar, Lee and Ho.

This review indicates that rooming-in is promising in increasing the likelihood of exclusive breastfeeding on discharge.

Supplementary feeding

Supplementation is the addition of early food and fluid supplements for healthy breastfed full-term infants of less than six months old.

Becker GE and Remmington T (2014) Early additional food and fluids for healthy breastfed full-term infants. Cochrane Database of Systematic Reviews, 11: CD006462.[43]

The objective of this review was to assess the benefits and harms of supplementation for full-term healthy breastfed infants, and to examine the timing and type of supplementation. Exclusive breastfeeding was defined as an infant's consumption of human milk with no supplementation of any kind, including water, juice, non-human milk or foods. In the review the authors report that they focused on exclusive breastfeeding as the norm and supplementation as an intervention.

They included eight trials (984 randomised infants/mothers). Six trials provided data on outcomes on breastfeeding relevant to the current review. The variation in outcome measures and time points made it difficult to pool results from trials. The trials that provided outcome data compared exclusively breastfed infants with breastfed infants who were allowed additional nutrients in the form of artificial milk, glucose, water or solid foods.

In relation to the majority of the older trials, the description of study methods was inadequate to assess the risk of bias. The two more-recent trials were found to be at low risk for selection and detection bias. The overall quality of the evidence for the main comparison was low.

Of the two more recent trials, one which involved 170 infants (Martin-Calma 1997) compared exclusively breastfeeding infants with breastfed infants who were allowed additional glucose water. A significant difference was found, showing that those babies who were exclusively breastfed were still breastfeeding up to and including week 20, (RR 1.45; 95% CI 1.05-1.99), with more infants in the exclusively breastfed group still exclusively breastfeeding when compared with those who were allowed supplementation. Conversely, in the second trial – which was small with 39 infants (Flaherman 2013) and compared exclusively breastfed infants with non-exclusively breastfed infants who were provided with artificial milk – fewer infants in the exclusively breastfed group were exclusively breastfeeding at one week (RR 0.58; 95% CI 0.37-0.92) and at three months (RR 0.44; 95% CI 0.26-0.76), and there was no significant difference in the proportion of infants continuing any breastfeeding at three months between groups (RR 0.76; 95% CI 0.56-1.03). Becker and Remmington report that the evidence in the smaller trial is insufficient to negate the evidence from the larger trial.

Becker and Remmington conclude that negative effects on the duration of breastfeeding may be associated with the brief use of additional water or glucose water.

The HRB authors classified the quality of this review as strong and agree with the authors' conclusions.

This review indicates that supplementary feeding has a negative effect on the duration of breastfeeding.

Pacifiers

A pacifier is a nipple-shaped device for soothing babies. The babies normally suck or bite on the teat.

Jaafar SH, Jahanfar S, Angolkar M *et al.* (2012) Effect of restricted pacifier use in breastfeeding term infants for increasing duration of breastfeeding. Cochrane Database of Systematic Reviews, 7: CD007202.[44]
The objective of this review was to assess the effect of unrestricted versus restricted pacifier use in healthy full-term newborn babies whose mothers have initiated breastfeeding and intend to exclusively breastfeed, on the duration of breastfeeding, other breastfeeding outcomes and on infant health.

The authors found three trials (involving 1,915 babies) for inclusion in the review, but have included only two trials (involving 1,302 healthy full-term breastfeeding infants) in the analysis. Meta-analysis of the two combined studies showed that pacifier use in healthy breastfeeding infants had no significant effect on the proportion of infants exclusively breastfed at three months (RR 0.99; 95% CI 0.93-1.05), and at four months of age (RR 0.99; 95% CI 0.92-1.06) and also had no effect on the proportion of infants partially breastfed at three months (RR 1.00; 95% CI 0.98 to 1.13), and at four months of age (RR 1.01; 95% CI 0.98 to 1.03).

Jaafar *et al.* concluded that pacifier use in healthy-term breastfeeding infants, under way from birth or after lactation is established, did not significantly affect the prevalence or duration of exclusive and partial breastfeeding up to four months of age. However, evidence to assess the short-term breastfeeding difficulties faced by mothers and the long-term effect of pacifiers on infants' health is lacking. The authors added that their review concluded that for mothers who are motivated to breastfeed their infants, pacifier use before or after breastfeeding was established did not significantly affect the prevalence or duration of exclusive and partial breastfeeding up to four months of age. However, there is a widespread belief that pacifiers may interfere with breast milk production and lead to discontinuation of breastfeeding.

The HRB authors classified the quality of this review as strong and agree with the authors' main conclusion. However, it is important to point out that although there is a widespread belief that pacifiers may interfere with breast milk production and lead to discontinuation of breastfeeding, the evidence from this review does not support this view.

O'Connor NR, Tanabe KO, Siadaty MS *et al.* (2009) Pacifiers and breastfeeding: a systematic review. *Arch Pediatr Adolesc Med*, 163(4): 378–382.[45]
The objective of this review was to summarise current evidence on the association between infant pacifier use and breastfeeding. This review is an earlier review than that of Jaafar *et al.* above, and also a wider review which included four RCTs, 20 cohort studies and five cross-sectional studies. Significant heterogeneity was found among the studies (e.g. outcomes defined differently, outcomes measured using different scales for different subsets of the population). Results are grouped by study design, as this heterogeneity is controlled for in a meta-analysis.

None of the RCTs that evaluated a pacifier-related intervention reported a significant difference in breastfeeding outcomes; pacifier-related interventions included pacifier use during tube feeds, at any time after delivery, education on avoidance of pacifiers and a UNICEF/WHO hospital environment.

Seventeen of the observational studies reported an OR, RR or HR of shortened duration or exclusivity of breastfeeding with pacifier use for all the respective outcomes studied; the remaining eight studies did not report a statistically significant association with either all or some of the breastfeeding outcomes studied. Most

of the studies included multivariate analysis with some control for a large number of possible confounders, whereas others only controlled for educational level and maternal age.

The authors conclude that the highest level of evidence does not support an adverse relationship between pacifier use and breastfeeding duration or exclusivity. The association between shortened duration of breastfeeding and pacifier use in observational studies possibly reflects a number of other complex or confounding factors, such as breastfeeding difficulties or intent to wean. More research is needed in order to confirm these findings.

The HRB authors classified the quality of this review as strong and agree with the authors' conclusions.

Overall conclusion on pacifiers

The findings of the two reviews[44, 45] indicate that synthesis from RCTs do not support the view that pacifier use has a negative effect of breastfeeding duration or prevalence at four months.

Baby-led scheduling

Baby-led or demand breastfeeding is defined as occurring when mothers of healthy babies are encouraged to have no restrictions placed on the frequency or length of their baby's breastfeeds.

Fallon A, Van der Putten D, Dring C *et al.* (2014) Baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding. **Cochrane Database of Systematic Reviews, 7: CD009067.[46]**

The objective of this review was to evaluate the effects of baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding, for healthy newborns. Baby-led or demand breastfeeding is defined as occurring when mothers of healthy babies are encouraged to have no restrictions placed on the frequency or length of their baby's breastfeeds. (The baby knows best!) Scheduled breastfeeding is defined as when mothers breastfeed their babies according to an *a priori* schedule that is not determined by the baby. Mixed patterns occur when mothers of healthy babies alternate and/or combine practices from both.

No trials were identified that were eligible for inclusion in this review. Therefore, there is no evidence from randomised controlled trials evaluating the effect of baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding, for healthy newborns.

The HRB authors note that there is no available evidence to demonstrate which is better – baby-led feeding or scheduled breastfeeding.

Incentives

An incentive is an item or service given to encourage a behaviour: for example, household help to encourage a mother to breastfeed.

Hall Moran V, Morgan H, Rothnie K *et al.* (2015) Incentives to promote breastfeeding: a systematic review. *Pediatrics*, 135(3): e687–e702.[47]

The goal of this study was to assess the evidence regarding the effectiveness of incentive interventions, delivered within or outside healthcare settings, to individuals and/or their families seeking to increase and sustain breastfeeding in the first six months after birth.

Incentives included providing access to breast pumps, gifts, vouchers, money, food packages, and help with household chores.

The lack of quality RCTs and the multicomponent nature of the interventions ruled out a meta-analysis. The results of the review are reported in narrative form.

Of six studies that evaluated breast pumps (the most common incentive used), four were RCTs ranging in sample size from 34 to 1,625 women, and two were observational studies. Three of the RCTs found non-significant results and one RCT had significant findings, but this included only 55 women in the trial.

In total, 16 papers were included in the review. The majority evaluated multicomponent interventions of varying frequency, intensity and duration, but little consensus in findings was revealed. The majority of studies incorporated an education and/or support element in which the incentive was either provided to encourage continuation in the programme or as a reward for continuing breastfeeding.

Hall Moran *et al.* conclude that the overall effect of providing incentives for breastfeeding compared with no incentive is unclear due to study heterogeneity and variations in study quality, and to the multiplicity of interventions.

The quality assessment completed by the HRB authors classified this review as strong and the HRB authors agree with the conclusions of Hall Moran *et al.*

Antenatal breast examination

Lee SJ and Thomas J. (2008) Antenatal breast examination for promoting breastfeeding. Cochrane Database of Systematic Reviews *Rev,* 3: CD006064.[48]
Lee and Thomas set out to determine the effect of antenatal breast examination(s) on the initiation of breastfeeding.

The authors identified no RCTs and therefore could not provide any evidence to support or refute this practice to increase breastfeeding rates.

Comparison of midwife-led and other/doctor-led maternity care
Two reviews set out to compare different approaches to the delivery of maternity care: midwife-led versus doctor-led care and midwife-led care versus conventional maternity care.

Johantgen M, Fountain L, Zangaro G *et al.* (2012) Comparison of labor and delivery care provided by certified nurse-midwives and physicians: a systematic review, 1990 to 2008. *Women's Health Issues*, 22(1): e73–e81.[49]
The study compared the labour and delivery care outcomes of certified nurse-midwives (CNMs) and physicians. Breastfeeding was one of many outcomes examined. In total, 18 unique studies (21 papers) were included. Two of the studies were RCTs; the majority of the observational studies were retrospective cohort designs that used existing administrative databases or medical records reviews.

Johantgen *et al.* concluded that differences in practice between certified nurse-midwives and medical doctors seem to be well documented, particularly in the use of technology. The findings provide evidence that care by

certified nurse-midwives is safe and effective. Certified nurse-midwives should be better utilised to address the projected healthcare workforce shortages.

Only three moderate-quality observational studies examined the outcome of breastfeeding initiation and found that initiation rates were higher for women cared for by certified nurse-midwives compared with physicians. This is the only information on breastfeeding outcomes reported in this paper.

The HRB authors classified the quality of this review as strong and agree with the conclusions of Johantgen *et al.* However, the HRB authors would like to have seen the results quantified to determine the size of the effect and the level of significance.

Overall, there is promising evidence from cohort studies that breastfeeding initiation rates are higher for women cared for by certified nurse-midwives compared with physicians, but more rigorous evidence is required.

Sandall J, Soltani H, Gates S *et al.* (2015) Midwife-led continuity models versus other models of care for childbearing women. Cochrane Database of Systematic Rev 9: CD004667.[50]
The objectives of this review were to compare the effects of midwife-led continuity models of care with other models of care for childbearing women and their infants. Breastfeeding initiation was one of many secondary outcomes.

The midwife-led continuity model of care has been defined as care where 'the midwife is the lead professional in planning, organising and delivery of care given to a woman from initial booking to the postnatal period'. This model is based on the premise that pregnancy and birth are normal life events. The midwife-led continuity model of care includes: continuity of care; monitoring the physical, psychological, spiritual and social well-being of the woman and family throughout the childbearing cycle; providing the woman with individualised education, counselling and antenatal care; and attendance during labour, birth and the immediate postpartum period.

There were no statistically significant differences in breastfeeding initiation rates between midwife-led and other models of care for childbearing women (RR 1.12; 95% CI 0.81-1.53) in two studies with 2,050 participants and high heterogeneity (81%). In summary, Sandall *et al.* found no difference in rates of breastfeeding initiation between the models of care.

The HRB authors classified the quality of this review as strong and agree with the conclusions of Sandall *et al.* However, the breastfeeding outcome was only a secondary outcome.

Overall conclusions on midwives versus other professionals or models of care
There is promising evidence from cohort studies that breastfeeding initiation rates were higher for women cared for by certified nurse midwives than for women cared for by physicians,[49] but there was no evidence to show that midwife-led care compared with normal maternity care had higher levels of breastfeeding initiation.[50]

Level of effectiveness for other interventions

We have summarised the main results of the included reviews by categorising their findings in a framework used by the Cochrane Collaboration when undertaking an umbrella review such as this one.

- **Effective interventions:** indicating that the review found evidence of effectiveness for an intervention.
- **Promising interventions (more evidence needed):** indicating that the review found some evidence of effectiveness for an intervention, but that more evidence is needed.

- **Ineffective interventions:** indicating that the review found evidence of lack of effectiveness for an intervention.
- **Possibly ineffective interventions (more evidence needed):** indicating that the review found evidence suggesting lack of effectiveness for an intervention, but that more evidence is needed.
- **No conclusions possible due to lack of evidence:** indicating that the review found insufficient evidence to comment on the effectiveness or safety of an intervention.

Effective interventions

- **Beake *et al.*[40]** recommend that acute maternity care settings implement structured programmes to support breastfeeding initiation and the duration of exclusive or any breastfeeding, and suggest that the content of such programmes could replace an existing programme, such as BFHI, in full or in part, or be specifically developed to reflect local needs.

- **Moore *et al.*[41]** conclude that early SSC has a positive effect on **any breastfeeding** between one and four **months** and **exclusive breastfeeding** between three and six **months**. The authors highlight the positive impact of this relatively short-duration intervention.

- **Becker and Remmington[43]** on the topic of supplemental feeds conclude that negative effects on the duration of breastfeeding may be associated with the brief use of additional water or glucose water. Therefore, avoidance of supplemental feeds is recommended.

Promising interventions

- **Johantgen *et al.*,[49]** reviewing three moderate-quality observational studies, examined the outcome of breastfeeding initiation and found that initiation rates were higher for women cared for by certified nurse-midwives than for women cared for by physicians.

- **Jaafar, Lee and Ho**,[42] in a review which examined rooming-in as an intervention and which included only one trial, found that exclusive breastfeeding before discharge from hospital (at day four postpartum) was significantly lower in the separate care group compared with the rooming-in group.

Ineffective interventions

- **Sandall *et al.*[50]** examined breastfeeding as a secondary outcome in a review which compared midwife-led continuity models with other models of care for childbearing women, and found no statistically significant differences in breastfeeding initiation rates between the two models of care.

- **O'Connor *et al***.[45] reviewed the association between pacifier use and breastfeeding. They found that none of the RCTs evaluating this intervention reported a significant difference in breastfeeding outcomes. Some included observational studies which did report an adverse relationship, but the authors concluded that the highest level of evidence does not support this finding.

- **Jaafar *et al.*[44]** concluded that for mothers who are motivated to breastfeed their infants, pacifier use before or after breastfeeding was established did not significantly affect the prevalence or duration of exclusive and partial breastfeeding up to four months of age.

No conclusions possible

- **Lee and Thomas**[48] set out to determine the effect of antenatal breast examination(s) on the initiation of breastfeeding. They identified no RCTs and therefore could not provide any evidence to support or refute this practice to increase breastfeeding rates.

- **Fallon *et al.***[46] found no RCTs evaluating the effect of baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding, for healthy newborns. Therefore, there is no evidence for this intervention.

- **Hall Moran *et al.***[47] examined the effectiveness of incentive interventions to promote breastfeeding and conclude that the overall effect of providing incentives for breastfeeding compared with no incentive is unclear, due to study heterogeneity and variation in study quality and the multiplicity of interventions.

HRB authors' synthesis: other interventions

Education, counselling and support are contained in three of the ten steps of the Baby Friendly Health Initiative (BFHI). When the effective and promising interventions in the included reviews on 'other' interventions to promote breastfeeding are examined, it emerged that four of the nine interventions described are also included in the Ten Steps to Successful Breastfeeding advocated by the BFHI. These interventions are: structured programmes to promote breastfeeding, promoting early skin-to-skin contact (SSC), having the practice of rooming-in for mother-infant dyads and avoiding supplementary infant feeding.

Beake *et al.*,[40] in a review of 21 studies (mostly observational) and five systematic reviews, reported that most of the studies found an improvement in breastfeeding initiation following the introduction of a **structured programme**, and while there was some improvement in duration of any or exclusive breastfeeding these were not always statistically significant.

Another review examined the topic of early **skin-to-skin contact** and found that this intervention had a short-term positive effect on any or exclusive breastfeeding rates in the early postpartum period, and also had a positive effect on any or exclusive breastfeeding in the longer term (1–4 months, 3–6 months respectively).[41]

Jaafar, Lee and Ho[42] included only one trial in their review of **rooming-in** for mother-infant dyads, in which the only outcome examined, exclusive breastfeeding on discharge from hospital, was found to be significantly higher in the rooming-in group.

One review by Becker and Remmington[43] examined data from two recent RCTs and reported that the larger of the two trials found a positive impact on breastfeeding duration and exclusivity resulting from **avoidance of supplementary feeds**. The authors found that the contradictory evidence in the smaller trial was insufficient to negate the evidence from the larger trial.

Jaafar et al[44,] and O'Connor et al [45] indicate that evidence from RCTs do not support the view that **pacifier use** has a negative effect of breastfeeding duration or prevalence at 4 months.

The restriction of pacifier use is advocated in the UNICEF/WHO BFHI initiative. Two reviews (Jaafar *et al*. and O'Connor *et al*.)[44, 45] examined the association between pacifier use and breastfeeding and found that pacifier use did not make a significant difference to breastfeeding outcomes. The authors of one of the reviews (Jaafar *et al*.)[44] observed that there is a widespread belief that pacifiers may interfere with breast milk production and lead to discontinuation of breastfeeding, but the evidence does not support this belief.

Also of interest is the fact that one of the reviews attempted to examine the effect of **baby-led breastfeeding** compared to scheduled breastfeeding and found no RCTs to provide evidence on this practice.[46] Baby-led or cue-based breastfeeding is one of the steps in the UNICEF/WHO BFHI initiative and therefore it is unexpected that there are no trials to prove or refute this point.

An interesting review by Johantgen *et al*.[49] examined the impact of **nurse-midwife care** compared to physician care during labour and delivery on breastfeeding initiation, and found the breastfeeding initiation rates higher in the mothers cared for by nurse-midwives. However, this finding must be interpreted with caution as only three observational studies of moderate quality were included in the review. The evidence from observational studies is less robust than that from RCTs.

3 Discussion and conclusion

4.1 Main findings

The objective of the current review is to summarise evidence from relevant published systematic reviews of different interventions to promote breastfeeding. Interventions that are loosely characterised in the literature as education, counselling and support have been shown to improve breastfeeding rates. The findings of this overview of reviews indicate that there are some interventions that are effective in promoting breastfeeding and thereby increasing breastfeeding rates. However, due to the diversity of the interventions included in this category, the lack of consistent definitions for the individual components, the lack of comparability between timings of the interventions and the variety of time-points used to measure outcomes, it is difficult to be precise about which components of this type of intervention work, who should provide it and when is the best time period to deliver it. Nevertheless, certain indications emerged from the review that may be useful to service planners and policy-makers, and these are that breastfeeding support (by professionals, lay workers or peers) provided in the postnatal period over a four- to six-month period is associated with increased breastfeeding duration and exclusivity, and that if this support is provided face-to-face and on an ongoing, scheduled basis, it is more likely to be effective. In addition, the findings of this overview of reviews found that training courses for breastfeeding educators were more effective when the duration of the course was 18 hours or more.

Alongside education, counselling and support, four other interventions, which form part of the UNICEF/WHO BFHI, have also been found to be useful in improving breastfeeding rates: having structured programmes to promote breastfeeding, promoting early skin-to-skin contact, the practice of rooming-in for mother-infant dyads, and avoiding supplementary infant feeding. There were no studies to support or refute the practice that baby-led breastfeeding is better than mother-led or scheduled breastfeeding. The evidence on the effects of pacifiers indicates that they do not negatively affect the establishment or prevalence of breastfeeding.

Women in low-income groups are less likely to start or continue breastfeeding.[53-56] Teenage mothers face many challenges to successful breastfeeding and are less likely to breastfeed than any other population group.[61-63] The reviews that addressed interventions among low-income women and adolescent mothers showed mixed results, but it is clear that peer support and education interventions increase breastfeeding knowledge and rates, especially when these are targeted to individuals.

4.2 Strengths and limitations

This review is an overview of reviews and uses a different methodology than that used when conducting a systematic review: An overview summarises existing systematic reviews rather than summarising or synthesising primary studies. There are limitations associated with the overview approach. Firstly, in relation to quality assessment, the reviewer assesses the quality of the systematic review and not of the individual primary studies, thus a systematic review rated as strong may have included some weak primary studies and vice versa.

A problem also arises in relation to overlap of primary studies among different reviews. It is common to find more than one systematic review addressing the same or a similar question; therefore the likelihood of primary studies being included in more than one review is high. This could introduce 'double counting' of primary studies, which would lead to biased overview results. One method for calculating the degree of overlap developed by Pieper *et al*. in 2014[64] is the citation matrix, which has been employed in this overview. From the citation matrix, we calculated the corrected covered area of the matrix which was less than 2%, and this indicates only slight overlap of primary studies.

A further potential problem with overviews relates to the question of 'up-to-dateness', a term derived by Pieper *et al*.[65] to describe whether an overview has included systematic reviews that are current. More recent, relevant primary studies may have been published but not captured in the included systematic reviews, and this may mean that newly developed and innovative interventions are not included in the overview. This overview includes six reviews published in 2015, with the latest search being conducted until May of that year. It is unlikely that many new studies with evidence that might substantially alter or add to our findings have been published since then.

Discordant results may arise where the findings of several reviews on the same topic do not necessarily come to the same conclusion. Reasons for discordance include different populations, study designs and outcomes, and different interpretation of the same data. There was some suggestion of discordance in the current overview, most likely due to heterogeneity of the primary studies. One area where some discordance was noted was in the different reviews on peer support. This may be explained by differences in routine postnatal care in the various study jurisdictions; for example, Jolly *et al*.[24] conclude that although peer support interventions increase breastfeeding continuation in low- or middle-income countries, especially exclusive breastfeeding, this does not seem to apply in high-income countries, particularly in the United Kingdom, where breastfeeding support is part of routine postnatal healthcare. Jolly *et al*. recommend that policy relating to provision of peer support should be based on more specific evidence on setting, and any new peer services in high-income countries need to undergo concurrent evaluation. The other incidence of heterogeneity within reviews was where RCT study designs came to different conclusions compared with cohort or cross-sectional study designs due to the fact that RCTs can better control for bias and confounding when compared with cohort or cross-sectional study designs.

A particular difficulty in examining breastfeeding outcomes relates to the lack of consistency in definitions and terms used to discuss breastfeeding in the literature. Terms frequently employed, sometimes rather loosely, include any breastfeeding, partial breastfeeding, full breastfeeding, exclusive breastfeeding and almost exclusive breastfeeding. In addition, studies examining the effectiveness of breastfeeding interventions assess the outcome at many different time points, which means that comparability is limited.

4.3 Comparison with experience of breastfeeding in Ireland

The DoH-commissioned public consultation for the 2016 National Maternity Strategy noted a lack of breastfeeding support in the hospital, community and home settings.[51] Some respondents noted a striking contrast between the emphasis placed on the benefits of breastfeeding during their antenatal care with the subsequent lack of practical support received during the postnatal period. Women reported receiving inconsistent, sometimes contradictory and poor-quality information on breastfeeding, and limited support on postnatal wards with little or no access to lactation consultants. The respondents to the public consultation reported a perceived pressure to use infant formula during the period following birth. One area for improvement identified in the public consultation included increased community-based support for breastfeeding following birth; respondents noted that if the necessary information and support is made available, more women are likely to breastfeed. The evidence from this overview indicates that interventions that are loosely characterised in the literature as education, counselling and support have been shown to improve breastfeeding rates.

A report titled *Review and Evaluation of Breastfeeding in Ireland: A Five-year Strategic Action Plan 2005–2010* by McAvoy *et al*. (2014)[66] concluded that international studies confirm the effectiveness of the UNICEF/WHO BFHI as an important, evidence-based approach to supporting the establishment of breastfeeding in the hospital and continuation in the community. The findings of this overview of reviews found that seven of the UNICEF/WHO

BFHI steps were promising or effective in promoting breastfeeding. The McAvoy *et al*.[66] report, which reviewed and evaluated the DoH's 2005 *Breastfeeding in Ireland: A five-year strategic action plan*, recommends, among other things, investment in training and skills development for breastfeeding support across a range of services. The findings of this overview of reviews found that training courses for breastfeeding educators were more effective when the duration of the course was 18 hours or more, and this is a consideration when designing courses for breastfeeding educators.

4.4 Implications for practice and research

Implications for practice

While there are apparent gaps in the research in relation to some interventions, there is nevertheless a substantial body of consistent evidence that provides a sound basis to proceed with education, counselling and support programmes that are high intensity and run over the antenatal, intrapartum and extended postnatal periods to improve rates of breastfeeding among women in Ireland. Adolescent and low-income mothers in other countries require tailored supports, such as one-to-one counselling, and we would expect that the same applies in Ireland.

The existence of structured programmes (such as UNICEF/WHO BFHI) in hospitals and the community, including the above-mentioned education and support, early mother-infant contact, rooming-in and avoidance of supplemental feeds, has been shown to be effective.

All 18 maternity hospitals/units in Ireland participate in the UNICEF/WHO BFHI programme, but only half are accredited at the national designation level. Reaching the national designation level means that the maternity unit has developed a breastfeeding policy, provides training for staff, and promotes informed parental choice through the provision of appropriate and accurate discussions, as well as implementing practices supportive of good mother and baby care. It is not clear from the BFHI website what is required for a maternity hospital or unit to be at participation level.

The prevalence of breastfeeding in Ireland on discharge from hospital indicates that indicates there is a need to support UNICEF/WHO BFHI, in order to ensure that all promising and effective interventions are implemented in every public hospital. The continuation of breastfeeding in the community requires the support of peers, family members, midwives and others breastfeeding leaders.

It would be important to monitor and evaluate any interventions or structured programmes introduced in Ireland to determine their effectiveness with a view to refining and improving these programmes for future strategies.

Implications for research

In summarising evidence from available systematic reviews, this report has identified gaps in the coverage of potential intervention types and outcomes. Specific gaps and problems in the literature relevant to breastfeeding objectives are: evidence on interventions to specifically increase the initiation of breastfeeding; evidence on interventions that foster exclusive breastfeeding up to six months; evidence on the effectiveness of interventions designed to influence public attitudes towards, and support for, breastfeeding; lack of consistency in breastfeeding terminology and definitions; and lack of comparable time points when measuring the outcomes of breastfeeding interventions.

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Appendix 1: Search strategy used to find articles

The search strategies are presented in the table below. To maximise the retrieval rate, the search strategies combined Medical Subject headings (MeSH terms) or other controlled vocabulary terms with text words.

Database name	Search string or search term(s)	Results retrieved
PubMed	("Breast Feeding"[Mesh]) OR "Lactation"[Mesh] Results were limited using the Systematic Review filter	**982**
Embase (Ovid)	1. exp Meta Analysis/ 2. ((meta adj analy$) or metaanalys$).tw. 3. (systematic adj (review$1 or overview$1)).tw. 4. or/1-3 5. cancerlit.ab. 6. cochrane.ab. 7. embase.ab. 8. (psychlit or psyclit).ab. 9. (psychinfo or psycinfo).ab. 10. (cinahl or cinhal).ab. 11. science citation index.ab. 12. bids.ab. 13. or/5-12 14. reference lists.ab. 15. bibliograph$.ab. 16. hand-search$.ab. 17. manual search$.ab. 18. relevant journals.ab. 19. or/14-18 20. data extraction.ab. 21. selection criteria.ab. 22. 20 or 21 23. review.pt. 24. 22 and 23 25. letter.pt. 26. editorial.pt. 27. animal/ 28. human/ 29. 27 not (27 and 28) 30. or/25-26,29 31. 4 or 13 or 19 or 24 32. 31 not 30 33. exp breast feeding/ 34. 32 and 33 35. limit 34 to embase	**640**
CINAHL with Full text (EBSCO)	((MH "Breast Feeding+") OR (MH "Breast Feeding Promotion")) AND PT systematic review Limiters: Exclude MEDLINE records	**68**
DARE Database	Mesh = Breastfeeding	**83**
Medline (Ovid)	1. breastfeeding.ti. 2. limit 1 to yr="2014 -Current" 3. limit 2 to systematic reviews	**74**
Trip Database	(title:breastfeeding) (breast or feeding) from:2005 to:2015	**179**

Health Evidence	breastfeeding AND Limit: Date = Published from 2005 to 2015	**93**
	TOTAL	**2,119**

Appendix 2: Inclusion and exclusion criteria

The overview of reviews included all systematic reviews published after 2004 that measured one or more of the following breastfeeding outcomes:

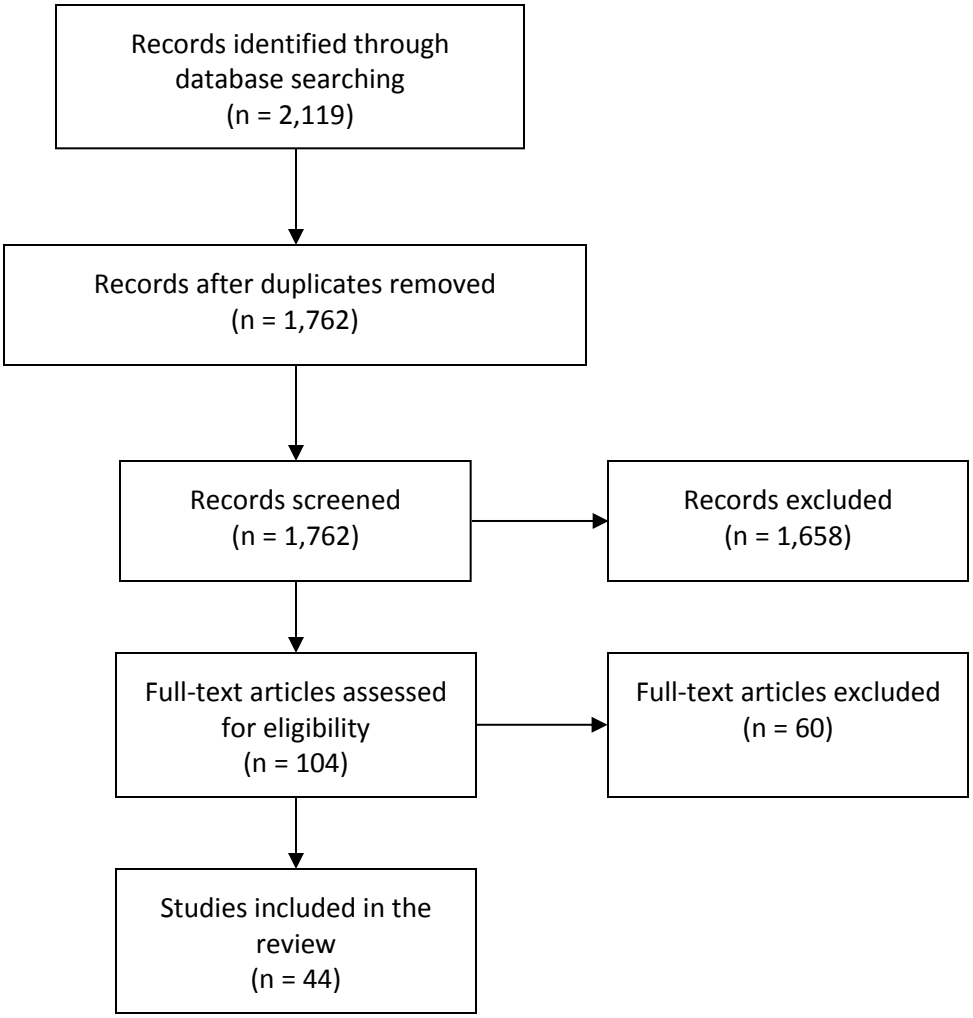
- initiation
- exclusivity
- any
- none
- duration

The exclusion criteria were:

- reviews dated prior to 2005
- reviews not in the English language
- primary studies
- reviews of reviews/commentary on reviews/protocols for reviews
- reviews containing qualitative studies only
- reviews including fewer than two databases in their search strategy
- reviews not providing details of methods
- reviews examining interventions outside the health or community setting; e.g., workplace interventions
- reviews that examined low- and middle-income countries only (those that examined low- and middle-income countries in addition to high-income countries were included)
- studies on preterm infants
- studies which focused on mothers or infants with health indications
- reviews which had been updated or only included a single study which had been included in another review
- reviews which did not include the outcomes for this review.

Appendix 3: Flowchart of screening and selection process

The PRISMA flow diagram presents the screening and selection process:



Appendix 4: Extraction form

Main criteria	Subcriteria
Study title and year	
Number and type of studies included in review	
Study type	
Sample size	
Study population	Exposed or cases Comparison group or controls (reference group)
Intervention/aetiology	
Study outcomes	
All studies quality criteria	Research question
Systematic reviews/ meta-analysis quality criteria	Search strategy Inclusion and exclusion criteria Quality assessment Primary studies described Method of pooling Summary result Heterogeneity Publication bias
Primary studies quality criteria	Description study population Sample size calculation/rationale/CI Minimise bias Control for confounding
Level of evidence	
Comment	

Appendix 5: Quality assessment tool for reviews

Health Evidence [TM] Helping public health use best evidence in practice		**Quality Assessment Tool – Review Articles**

Instructions for completion:

Please refer to the attached dictionary for definition of terms and instruction for completing each section. For each criterion, score by placing a check mark in the appropriate box.

First author:

Year:

Journal:

Reviewer:

CRITERION	YES	NO
Q1 Did the authors have a clearly focused question [population, intervention (strategy, and outcomes(s)]?		
Q2 Were the appropriate inclusion criteria used to select primary studies?		
Q3 Did the authors describe a search strategy that was comprehensive?		
Circle all strategies used: • health databases • psychological databases • social science databases • educational databases • other • hand searching • key informants • reference lists • unpublished		
Q4 Did the search strategy cover an adequate number of years?		

For questions 5, 6, and 8, please choose the column relating to the appropriate methodology. Strike a line through the column that does not apply.

Q5. Quantitative reviews: Did the authors describe the level of evidence in the primary studies included in the review? Level I RCTS only Level II on-randomised, cohort, case-control Level III uncontrolled studies	Q5. Qualitative reviews: Do the authors provide a clear description of the range of methods in each of the primary studies included in the review?		
Q6. Quantitative reviews: Did the review assess the methodological quality of the primary studies, including: *(Minimum requirement: **4/7** of the following)* • Research design • Study sample • Participation rates • Sources of bias (confounders, respondent bias) • Data collection (measures of independent/dependent variables) • Follow-up/attrition rates • Data analysis	Q6. Qualitative reviews: Did the review assess the methodological quality of the primary studies, including: *(Minimum requirement: **4/7** of the following)* • Suitability of methodology/paradigm to the research question • Sampling (selection of participants/settings/documentation) • Clear description of context, data collection and data analysis • Rigour: Audit trail Some coding by two or more coders, if appropriate Deviant case analysis *negative cases) Respondent validation (member checking) • Triangulation • Reflexivity (research and research process) • Relevance (credibility, consistency, applicability, transferability)		
Q7. Are the results of the quality review transparent?			
Q8. Quantitative reviews: Was it appropriate to combine the findings or results across studies?	Q8. Qualitative reviews: Is there a description of how reviewers determined results were similar enough across studies to compare or combine them?		
Q9. Were appropriate methods used for combining or comparing results across studies?			
Q10. Do the data support the author's interpretation?			
		TOTAL SCORE:	

Quality Assessment Rating: (Circle one)	Strong (high) (total score 8 – 10)	Moderate (total score 5 – 7)	Weak (Low) (total score 4 or less)

Appendix 6: Quality scores of reviews

Papers by intervention type with quality rating

Interventions	Quality Assessment	Quality assessment criteria									
		1	2	3	4	5	6	7	8	9	10
Counselling/education/peer support											
1. Catling *et al*. (2015) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Chapman *et al*. (2010)	Weak	x	✓	✓	✓	✓	x	x	x	x	x
3. Chung *et al*. (2008)	Strong	x	✓	✓	✓	✓	✓	✓	✓	✓	x
4. Crepinsek *et al*. (2012) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Dyson, McCormick and Renfrew (2005) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Flannery (2014)	Weak	✓	x	x	x	✓	x	x	x	x	x
7. Hall Moran *et al*. (2007)	Strong	✓	✓	✓	✓	✓	x	x	✓	✓	✓
8. Haroon *et al*. (2013)	Moderate	x	✓	✓	x	✓	✓	x	✓	✓	x
9. Ibanez *et al*. (2012)	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10. Imdad, Yakoob and Bhutta (2011)	Strong	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
11. Ingram *et al*. (2010)	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12. Jolly *et al*. (2012)	Strong	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
13. Kaunonen, Hannula and Tarkka (2012)	Weak	x	x	x	x	✓	x	x	x	x	x
14. Lewin *et al*. (2010) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15. Lumbiganon *et al*. (2012) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16. MacVicar and Kirkpatrick (2014)	Moderate	✓	✓	✓	✓	✓	✓	x	x	x	x
17. Mitchell-Box and Braun (2013)	Moderate	✓	✓	✓	✓	✓	x	x	x	x	x
18. Renfrew *et al*. (2012) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19. Sinha *et al*. (2015)	Moderate	x	✓	✓	✓	✓	✓	x	x	x	x
20. Sipsma, Jones and Cole-Lewis (2015)	Moderate	x	✓	x	✓	✓	✓	✓	x	✓	✓
21. Skouteris *et al*. (2014)	Strong	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
22. Spiby *et al*. (2009)	Strong	✓	✓	✓	✓	✓	x	x	✓	✓	✓
23. Ward and Byrne (2011)	Moderate	x	x	✓	✓	✓	✓	x	✓	x	✓
24. Watkins and Dodgson (2010)	Weak	✓	x	✓	x	✓	x	x	x	x	x
25. Webel *et al*. (2010)	Moderate	✓	✓	✓	✓	✓	x	x	✓	x	x

26. Wong, Tarrant and Lok (2015)	Moderate	✓	✓	✓	✓	✓	✓	✓	x	x	x
27. Yonemoto *et al*. (2013) – Cochrane Review	Strong	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
E-technology/telephone support											
28. Dennis and Kingston (2008)	Moderate	x	✓	✓	✓	✓	✓	✓	x	x	x
29. Giglia and Binns (2014)	Moderate	x	✓	✓	✓	✓	x	x	x	x	✓
30. Lavender *et al*. (2013) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
31. Pate (2009)	Weak	x	x	x	✓	✓	✓	x	x	x	x
32. Lau *et al*. (2015)	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Midwives versus doctors											
33. Johantgen *et al*. (2012)	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
34. Sandall *et al*. (2015) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Antenatal breast examination											
35. Lee and Thomas (2008) – Cochrane Review No studies identified in this review											
Skin-to-skin contact											
36. Moore *et al*. (2012) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Dyson, McCormick and Renfrew (2005) – As above	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rooming-in											
37. Jaafar, Lee and Ho (2012) – Cochrane Review	Moderate	✓	✓	x	✓	✓	✓	✓	x	x	✓
Baby-led scheduling											
38. Fallon *et al*. (2014) – Cochrane Review No studies identified for this review											
Pacifiers											
39. Jaafar *et al*. (2012) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
40. O'Connor *et al*. (2009)	Strong	✓	✓	✓	✓	✓	✓	x	✓	x	✓
Supplementary feeding											
41. Becker and Remmington (2014) – Cochrane Review	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Multifaceted programmes											
42. Beake *et al*. (2012)	Moderate	✓	✓	✓	✓	✓	**x**	**x**	✓	**x**	✓
43. Figueredo, Mattar and Abrão (2012)	Weak	x	x	✓	✓	x	x	x	x	x	x

Incentives											
44. Hall Moran *et al*. (2015)	Strong	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note. ✓ = criteria met; x = criteria not met; 1 = clearly focused question; 2 = appropriate inclusion criteria; 3 = research strategy; 4 = timeframe; 5 = level of evidence; 6 = methodological quality; 7 = review transparency; 8 = suitability of combining studies; 9 = appropriate methods for combining or comparing studies; 10 = does data support author's interpretation

Appendix 7: Characteristics of reviews assessed included in synthesis

Study details	
Author/year	Catling *et al.*/2015
Focus of the review	1. To compare the effects of group antenatal care versus conventional antenatal care on psychosocial, physiological, labour and birth outcomes for women and their babies 2. To compare the effects of group antenatal care versus conventional antenatal care on care provider satisfaction
Participants (Characteristics/total n)	Pregnant women accessing antenatal care/total n = 2,350
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included RCTs (of different types of design) and quasi-RCTs comparing group antenatal care with conventional antenatal care. Excluded crossover randomised designs, studies that address group antenatal education but that do not provide antenatal care and assessment for the group were excluded.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register
Range (years) of included studies	2007–2013
Number and type of studies included study design, mixed methods…	Four studies; RCTs
Country of origin of included studies	Sweden, USA and Iran
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Primary outcomes: Gestational age at birth; low birthweight; small-for-gestational-age; perinatal mortality. Secondary outcomes: breastfeeding initiation, duration of exclusive breastfeeding.

Study details	
Author/year	Wong, Tarrant and Lok/2015
Focus of the review	To compare effectiveness of group and individual antenatal professional education on breastfeeding exclusivity and duration.
Participants (Characteristics/total n)	Healthy pregnant women who were expecting healthy infants and free from physical conditions that contraindicated breastfeeding/total n = 6,931
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: original studies in English with pregnant women as participants; with professional antenatal breastfeeding education as an intervention without any intrapartum, postpartum or peer components; with subgroups available for comparison; and reporting rates of exclusive or any breastfeeding duration as outcome measures. Only RCTs or quasi-experimental studies included. Definition of breastfeeding education provided. Exclusion criteria: interventions without any face-to-face interaction between the educator and participants or ones that included fathers-to-be as the only target audience.
Sources searched	MEDLINE, PubMed, CINAHL, Embase, British Nursing Index, Google Scholar, Cochrane Library
Range (years) of included studies	1987–2014
Number and type of studies included study design, mixed methods…	19 studies; RCTs, quasi-experimental studies
Country of origin of included studies	USA, Australia, Canada, Singapore, Denmark, Chile and UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Due to large heterogeneity no meta-analysis or data synthesis could be done. A narrative summary of key findings was produced.
Outcomes assessed	Primary outcome: duration of exclusive or any breastfeeding.

Study details	
Author/year	Lumbiganon *et al*./2012
Focus of the review	To evaluate the effectiveness of antenatal breastfeeding education on increasing breastfeeding initiation and duration.
Participants (Characteristics/total n)	Pregnant women/total n = 8,506
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included RCTs assessing the effect of formal antenatal breastfeeding education or comparing two different methods of formal antenatal breastfeeding education on duration of breastfeeding. Interventions for any type of antenatal education with breastfeeding components. Excluded RCTs examining interventions that included intrapartum or postpartum breastfeeding education in addition to antenatal breastfeeding education.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register, CENTRAL, MEDLINE, Scopus
Range (years) of included studies	1983–2011
Number and type of studies included study design, mixed methods…	19 studies; RCTs
Country of origin of included studies	USA, Canada, UK, Australia, Netherlands, Denmark and Singapore
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Primary outcomes: 1. Duration of any breastfeeding 2. Duration of exclusive breastfeeding 3. Proportion of mothers breastfeeding at three months and six months 4. Proportion of mothers exclusively breastfeeding at three months and six months 5. Initiation rate of breastfeeding Secondary outcomes: breastfeeding complications such as mastitis and breast abscess.

Study details	
Author/year	Mitchell-Box and Braun/2013
Focus of the review	Examined the impact of male-partner-focused breastfeeding interventions on breastfeeding initiation, exclusivity and continuation.
Participants (Characteristics/total n)	Couples/fathers/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included articles were from English-language, peer-reviewed journals and reported on interventions specifically developed for the male partner to increase breastfeeding initiation and continuation. Only studies of true experimental or quasi-experimental design were included.
Sources searched	PubMed, PsycINFO, CINAHL, Cochrane Database
Range (years) of included studies	1995–2008
Number and type of studies included study design, mixed methods…	Six articles reporting on four unique interventions; two RCTs and two quasi-experimental.
Country of origin of included studies	USA, Brazil and Italy
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Breastfeeding initiation, exclusivity and continuation

Study details	
Author/year	Chung *et al*./2008
Focus of the review	To systematically review evidence for the effectiveness of primary-care-initiated interventions to promote breastfeeding with respect to breastfeeding and child and maternal health outcomes.
Participants (Characteristics/total n)	Healthy mothers, members of the mother-child support system (partners, grandparents, friends) and their healthy term or near-term infants/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included RCTs that included any counselling or behavioural intervention initiated from a clinician's practice (office or hospital) to improve the breastfeeding initiation rate or duration of breastfeeding among healthy mothers or members of the mother-child support system (partners, grandparents, friends) and their healthy term or near-term infants. Review was focused on developed countries; however, it also included RCTs of the BFHI that were conducted in Brazil and Belarus. Interventions were eligible as long as they originated in a healthcare setting. Excluded community or peer-initiated interventions.
Sources searched	MEDLINE, Cochrane Central Register of Controlled Trials, CINAHL, and references of selected articles, restricted to English-language publications
Range (years) of included studies	September 2001–February 2008
Number and type of studies included study design, mixed methods…	38 studies; RCTs.
Country of origin of included studies	Australia, Canada, Denmark, France, Italy, Japan, Netherlands, New Zealand, Scotland, Sweden, Singapore, UK and USA; Brazil and Belarus
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Key questions: 1. What are the effects of breastfeeding interventions on child and maternal health outcomes? 2. What are the effects of breastfeeding interventions on breastfeeding initiation, duration and exclusivity? 3. Are there harms from interventions to support and promote breastfeeding?

Study details	
Author/year	Skouteris *et al*./2014
Focus of the review	The objective was to present a conceptual and methodological synthesis of interventions designed to promote exclusive breastfeeding to six months in high-income countries.
Participants (Characteristics/total n)	Pregnant women, mothers, infant-mother dyads, midwives / total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Exclusion criteria: Articles that were not in English; had a follow-up period of less than four months postpartum; or referred specifically to developing or low-income countries; articles specific to adolescent mothers; those not aimed at increasing exclusive breastfeeding specifically; those specific to breastfeeding in the presence of maternal smoking or HIV-positive status.
Sources searched	Academic Search Complete; CINAHL; Cochrane Library; Embase; Health Policy Reference Center; Health Source: Consumer Edition; Health Source: Nursing/Academic Edition; Maternity and Infant Care; MEDLINE; PsycARTICLES; Psychology & Behavioral Sciences Collection; PsycINFO
Range (years) of included studies	January 2000–June 2013
Number and type of studies included study design, mixed methods…	17 studies; RCTs, cluster-randomised trials
Country of origin of included studies	USA, Australia, UK, Turkey, Netherlands, Denmark, Belarus, Singapore and Malaysia
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative synthesis
Outcomes assessed	Exclusive breastfeeding initiation and duration

Study details	
Author/year	Imdad, Yakoob and Bhutta/2011
Focus of the review	To evaluate the impact of breastfeeding promotional strategies (education and support) on any breastfeeding and exclusive breastfeeding rates at 4–6 weeks and at 6 months
Participants (Characteristics/total n)	Mothers receiving education/support (individual or groups) in prenatal/postnatal period in community or health facility settings/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: The intervention included breastfeeding education and/or additional support given to mothers through counsellors (professional or peer) in individual (including face-to-face or telephone) or group sessions. All studies where intervention was given either in prenatal/postnatal or both. Any language, but non-English articles were not translated. Exclusion criteria: Studies on web/internet-based interventions; interventions with preterm/low-birth-weight babies; educational/support interventions with fathers or other family members; other promotion interventions such as skin-to-skin contact, delayed pacifier use, motivational interviews with the goal of decreasing resistance towards sustained breastfeeding; studies where breastfeeding education was provided in the form of a package with other interventions
Sources searched	PubMed, Cochrane Database of Systematic Reviews, WHO regional databases
Range (years) of included studies	Cut-off date October 2010
Number and type of studies included study design, mixed methods…	53 studies; RCTs and quasi-RCTs
Country of origin of included studies	Developed and developing countries (not specified)
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analyses, subgroup analyses
Outcomes assessed	Exclusive and any breastfeeding rates at 4–6 months

Study details	
Author/year	Yonemoto *et al*./2013
Focus of the review	To assess outcomes for women and babies of different home-visiting schedules during the early postpartum period
Participants (Characteristics/total n)	Women in the early postpartum period (up to 42 days after birth)/total n = >11,000 women
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included: RCTs comparing different types of home-visiting interventions enrolling participants in the early postpartum period. Excluded: studies in which women were enrolled and received an intervention during the antenatal period, even those in which the intervention continued into the postnatal period; studies that only recruited women from specific high-risk groups (alcohol, drug problems).
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register; reference lists of retrieved articles
Range (years) of included studies	1998–2012
Number and type of studies included study design, mixed methods…	12 studies; RCTs
Country of origin of included studies	Turkey, Syria, UK, USA, Canada, Denmark and Zambia
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis; subgroup analysis
Outcomes assessed	Primary outcomes: 1. Maternal mortality at 42 days post-birth 2. Neonatal mortality Secondary outcomes: Neonatal – Established feeding regimen (e.g. exclusive breastfeeding) at 28 days after birth

Study details	
Author/year	Renfrew *et al.*/2012
Focus of the review	To examine whether providing extra support for breastfeeding mothers, from professionals or from trained lay people or both, would help mothers to continue to breastfeed when compared with providing standard maternity care.
Participants (Characteristics/total n)	Women breastfeeding their babies. Studies that recruited pregnant women considering breastfeeding or intending to breastfeed were included if the intervention included breastfeeding support after the birth/total n = >56,000 women
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	RCTs or quasi-RCTs comparing extra support for healthy breastfeeding mothers of healthy term babies with usual maternity care. Included studies if intervention occurred in the postnatal period alone or also included an antenatal component. Excluded interventions taking place in the antenatal period alone, and interventions described as solely educational in nature.
Sources searched	Cochrane Pregnancy and Childbirth Group Trials Register
Range (years) of included studies	1979–2011
Number and type of studies included study design, mixed methods…	52 studies; RCTs
Country of origin of included studies	Bangladesh, Burkina Faso, Uganda, India, Syria, Belarus, Brazil, Iran, Mexico, Turkey, South Africa, Australia, Canada, Denmark, France, Italy, Netherlands, Singapore, Sweden, UK and USA
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis; subgroup analysis
Outcomes assessed	Primary outcomes: 1. Stopping breastfeeding before six months postpartum 2. Stopping exclusive breastfeeding before six months postpartum 3. Stopping any breastfeeding before 4–6 weeks postpartum 4. Stopping exclusive breastfeeding before 4–6 weeks postpartum Secondary outcomes: 1. Stopping breastfeeding before 2, 3, 9, 12 months postpartum 2. Stopping exclusive breastfeeding before 2, 3, 9, 12 months postpartum

Study details	
Author/year	Jolly *et al.*/2012
Focus of the review	To examine the effect of setting, intensity, and timing of peer support on breastfeeding
Participants (Characteristics/total n)	Pregnant or postpartum women/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: Recruited pregnant or postpartum women; peer support interventions in antenatal and postnatal period or postnatal period only; had usual care as the comparator; reported any breastfeeding or exclusive breastfeeding at least four weeks postpartum; used randomisation to create the study groups.
Sources searched	Cochrane Library, MEDLINE, CINAHL, National Research Register, BNI
Range (years) of included studies	Search from inception or from 1980–2011
Number and type of studies included study design, mixed methods…	17 studies; RCTs
Country of origin of included studies	UK, USA, Canada, Brazil, Mexico, Bangladesh, Philippines, Burkina Faso, Uganda and South Africa
Methods used to combine the findings of results across studies? e.g. narrative	Meta-analysis (15); descriptive summary (2)

summary, meta-analysis?	
Outcomes assessed	Any or exclusive breastfeeding at the end of study follow-up

Study details	
Author/year	Haroon *et al.*/2013
Focus of the review	To examine the effects of interventions to promote breastfeeding (educate/support mothers) on breastfeeding rates; exclusive, predominant, partial or no breastfeeding
Participants (Characteristics/total n)	Mothers receiving community- or health-facility-based interventions/total n = not specified
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included studies with community- or facility-based interventions; those interventions that offered education and/or support to mothers through counsellors (lay and health professional), and in either individual or group sessions or a combination. Intervention either in prenatal/postnatal period, or both. Excluded studies with before/after study designs, cohort and cross-sectional studies; studies on preterm babies, babies with low birthweight or born to drug-using mothers or in NICU; interventions for promotion of breastfeeding such as skin-to-skin contact, delayed pacifier use.
Sources searched	PubMed, MEDLINE, Cochrane Library, Embase, WHO regional databases
Range (years) of included studies	No date restrictions on search; study dates not specified
Number and type of studies included study design, mixed methods…	110 studies; RCTS, quasi-experimental studies
Country of origin of included studies	Not specified
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analyses, subgroup analyses
Outcomes assessed	Exclusive, predominant, partial and no breastfeeding rates at day 1, <1 month, 1–5 months

Study details	
Author/year	Lewin *et al.*/2010
Focus of the review	To assess the effects of lay health worker (LHW) interventions in primary and community healthcare on maternal and child health and the management of infectious diseases / LHW interventions to promote breastfeeding compared with usual care.
Participants (Characteristics/total n)	Any LHW (paid or voluntary) including community health workers, village health workers, birth attendants, peer counsellors, nutrition workers, home visitors, mothers and children up to age five years. Total n for breastfeeding not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included any intervention delivered by LHW and intended to improve maternal or child health or the management of infectious diseases. Excluded interventions in which a healthcare function was performed as an extension to a participant's profession (e.g. health promotion by teachers, formally trained nurse aids, medical assistants, physician assistants, paramedical workers in emergency and fire services, and other self-defined health professionals or para-professionals); interventions involving patient support groups only; peer health counselling programs in schools; interventions in which the LHW was a family member; LHW in referral hospitals; RCTs of intervention to train self-management tutors; head-to-head comparisons of different LHW interventions; multi-faceted interventions that included LHW and professionals working together and without a comparison group.
Sources searched	Cochrane Register of Controlled Trials; MEDLINE; Embase; AMED; British Nursing Index; CINAHL; POPLINE; WHOLIS
Range (years) of included studies	Databases searched from inception–2009 Breastfeeding studies range = 1998–2009
Number and type of studies included study design, mixed methods…	82 studies, of which 18 (16 analysed) looked at breastfeeding; RCTs
Country of origin of included studies	Breastfeeding studies: UK, USA, Bangladesh, Brazil, Canada, Philippines, Mexico and India
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Breastfeeding not specified as a measured outcome, but breastfeeding data subsumed

	within 'health behaviours' outcome. Breastfeeding outcomes measured: initiation; any breastfeeding up to 12 months postpartum; exclusive breastfeeding up to 6 months postpartum.
Study details	
Author/year	Sinha *et al.*/2015
Focus of the review	To provide evidence of the effect of interventions on early initiation, exclusive, continued and any breastfeeding rates when delivered in five settings: (i) health systems and services; (ii) home and family environment; (iii) community environment; (iv) work environment; and (v) policy environment, or a combination of any of the above.
Participants (Characteristics/total n)	Families, community, health staff, other stakeholders and antenatal or postnatal women.
Inclusion/exclusion criteria (Includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	By study design; RCTs, cluster RCTs, quasi-experimental studies and observational studies including prospective/retrospective and case control. Interventions delivered to mothers in the antenatal and postnatal period; also families, community, health staff and other stakeholders. Outcomes: early initiation of breastfeeding, exclusive breastfeeding in first 6 months, continued breastfeeding between 12 and 23 months, any breastfeeding. Excluded if none of the key outcomes was mentioned in the abstract.
Sources searched	PubMed, Cochrane and CABI and reference lists of papers identified
Range (years) of included studies	No date restrictions employed
Number and type of studies included study design, mixed methods…	195 studies; study types not specified, but see search criteria above
Country of origin of included studies	Not outlined; just high income/low income
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis and metaregression plus subgroup analysis.
Outcomes assessed	Early initiation of breastfeeding, exclusive breastfeeding, continued breastfeeding and any breastfeeding.

Study details	
Author/year	Webel *et al.*/2010
Focus of the review	To examine the effect of peer-based interventions on health-related behaviour in adults.
Participants (Characteristics/total n)	Mother-infant dyads/total breastfeeding n = 2,207
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: Participants older than 18; randomisation to intervention and control groups; a primary outcome of health behaviour change, defined as any measurable behaviour change related to a disease or change in an individual's health; independence from other studies; a quality rating of greater than 12 out of 18 possible points; sufficient information to allow adequate estimate of odds ratio or standardised mean differences and 95% confidence intervals; and a primary population of lay participants, rather than health care providers Exclusion criteria: Low-quality studies
Sources searched	MEDLINE, CINAHL, Embase, PsycINFO, Cochrane Library
Range (years) of included studies	2000–2006 (breastfeeding)
Number and type of studies included study design, mixed methods…	25 studies (6 breastfeeding studies); RCTs
Country of origin of included studies	Scotland, USA, Brazil, Canada, Bangladesh, China, UK, Bulgaria and India
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis; subgroup analyses
Outcomes assessed	Increase in breastfeeding

Study details	
Author/year	Dyson, McCormick and Renfrew/2005
Focus of the review	To evaluate the effectiveness of interventions that aim to encourage women to breastfeed in terms of changes in the number of women who start to breastfeed.
Participants (Characteristics/total n)	All those exposed to interventions intended to promote breastfeeding, including pregnant women, mothers of newborn infants and women who may decide to breastfeed in the future/total n = 1,553
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included: RCTs of any breastfeeding intervention aiming to promote the initiation of breastfeeding that takes place before the first breastfeed. Excluded: women and infants with a specific health problem; evaluations of interventions taking place after the first breastfeed or whose primary purpose is to affect duration or exclusivity of breastfeeding are excluded from this review.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register, hand-searched *Journal of Human Lactation, Health Promotion International, Health Education Quarterly*, scanned reference lists of articles obtained.
Range (years) of included studies	1987–2004
Number and type of studies included study design, mixed methods…	11 studies; RCTs
Country of origin of included studies	USA, Australia, Nicaragua
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analyses on data from eight studies; subgroup analyses within the health education intervention category
Outcomes assessed	Initiation and duration of any and exclusive breastfeeding.

Study details	
Author/year	Ibanez *et al.*/2012
Focus of the review	To identify effective programmes that can be implemented by GPs to promote breastfeeding in low-income women.
Participants (Characteristics/total n)	Pregnant women intending to breastfeed or women already breastfeeding / total n = 1,445 'mother and child' pairs
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included studies of developed countries and populations, which were free from associated pathologies, studies conducted in the primary care setting, written in English or French. Excluded all uncontrolled trials and cross-sectional studies. Of the RCTs, excluded studies in which the intervention programmes were not likely to be implemented by a GP or in which the intervention programmes were implemented by a non-healthcare professional (peer counselling, father of the child) or were carried out just once following the birth in maternity wards.
Sources searched	MEDLINE, Cochrane, Public Health (Banque de donnees en santé publique) databases
Range (years) of included studies	1985–2009
Number and type of studies included study design, mixed methods…	10 studies; RCTs
Country of origin of included studies	USA, England
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Breastfeeding outcomes were categorised as initiation, short-term duration (six weeks to two months) and long-term duration (3–6 months). The definition of breastfeeding included any form of breastfeeding (partial or exclusive breastfeeding).

Study details	
Author/year	Ingram *et al.*/2010
Focus of the review	To examine the effect of antenatal peer support on rates of breastfeeding initiation
Participants (Characteristics/total n)	Pregnant women/total n = 5,445
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included studies in which participants were pregnant women, peer-support intervention was provided in the antenatal period irrespective of whether it was also provided in the immediate postnatal period, any comparator was used, breastfeeding initiation was reported, and the study design was either an RCT, quasi-randomised or cohort study with concurrent control. Excluded low-quality studies.
Sources searched	Cochrane Library, MEDLINE, CINAHL, National Research Register, BNI
Range (years) of included studies	From inception/1980–2009; study dates not specified
Number and type of studies included study design, mixed methods…	11 studies; 7 RCTs, observational studies
Country of origin of included studies	USA, Mexico and UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Calculated risk ratios and 95% confidence intervals for individual studies and undertook separate meta-analyses for high-quality trials of universal peer support and targeted peer support.
Outcomes assessed	Breastfeeding initiation

Study details	
Author/year	MacVicar and Kirkpatrick / 2014
Focus of the review	To appraise and synthesise the best available evidence on effectiveness and maternal satisfaction of interventions supporting the establishment of breastfeeding in the early postnatal period, up to seven days following delivery, for women from disadvantaged groups.
Participants (Characteristics/total n)	Women from disadvantaged groups, defined as those from socioeconomically deprived areas; low income; under 20 years or substance dependent/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included studies of women from disadvantaged groups who had elected to breastfeed. Disadvantaged groups characterised as populations at increased risk of health inequalities due to specific sociodemographic factors, i.e. residence in areas of socioeconomic deprivation; low income; under 20 years of age; substance-dependent; and/or eligible for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in the USA. Excluded studies researching the general population of breastfeeding women, inclusive of disadvantaged groups but not focusing exclusively on disadvantaged groups. Subgroups with low breastfeeding initiation due to ethnic, cultural or specific religious practices were deemed not representational of other disadvantaged women and were excluded.
Sources searched	ASSIA, Campbell Collaboration, CINAHL, Cochrane Database, EBSCO, EThOS, Journals@Ovid, MEDLINE, and SAGE journals.
Range (years) of included studies	1992–2013
Number and type of studies included study design, mixed methods…	10 studies included; 2 quantitative, 8 qualitative
Country of origin of included studies	Not specified.
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Qualitative research findings were pooled and subjected to meta-synthesis. Findings from quantitative studies were presented in narrative form.
Outcomes assessed	1. Establishment of breastfeeding within the postnatal period, determined as infant being fully fed at breast at seven days following birth 2. Maternal satisfaction as determined by the perceived usefulness and acceptability of the intervention to support breastfeeding establishment in the postnatal period.

Study details	
Author/year	Sipsma, Jones and Cole-Lewis / 2015
Focus of the review	Aims to review interventions designed to improve breastfeeding rates among adolescents and to make recommendations for future research and practice
Participants (Characteristics/total n)	Pregnant / postpartum adolescents from high-income countries/total n = 1,308
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included interventions aiming to improve rates of breastfeeding targeting pregnant or postpartum adolescents conducted in high-income settings. Further inclusion criteria: 1. Studies must have reported results from an intervention with at least 1 control group (including randomised and non-randomised) 2. Interventions must have enrolled young women during pregnancy or in the early postpartum period 3. Interventions must have specifically targeted adolescents 13–21 years (or if study participants had mean age younger than 22 years) 4. Outcomes of interest must have included at least one measure of breastfeeding behaviour, including initiation, duration and exclusivity Excluded pilot studies; limited to studies conducted in high-income countries.
Sources searched	MEDLINE, PsycINFO
Range (years) of included studies	2000–2014
Number and type of studies included study design, mixed methods…	six studies; controlled trials
Country of origin of included studies	USA, Netherlands
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Breastfeeding behaviour, including initiation, duration or exclusivity

Study details	
Author/year	Hall Moran *et al*./2007
Focus of the review	To review the evidence on the nature of support for breastfeeding adolescent mothers.
Participants (Characteristics/total n)	At least some are healthy pregnant or postnatal teen mothers (>20 years at study entry) who are expecting or who have a healthy term baby / total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: Research papers using any methods; at least some participants are healthy pregnant or postnatal teen mothers (<20 years at study entry) who are expecting or have a healthy term baby; studies that are designed to assess a specific support measure for breastfeeding; studies with emergent findings relating to support for breastfeeding. Exclusion criteria: Opinion papers, letters to editor, foreign-language papers. Excluded papers focusing on breastfeeding of premature or sick babies, or papers with insufficient data on support.
Sources searched	Ovid, MEDLINE, CINAHL, Cochrane Library, AMED, British Nursing Index, and MIDIRS
Range (years) of included studies	1980–2006
Number and type of studies included study design, mixed methods…	Seven studies; two qualitative, four quantitative, one quantitative descriptive
Country of origin of included studies	USA, Australia and UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative and thematic summary
Outcomes assessed	Breastfeeding initiation and continuation; experiences and support needs of breastfeeding adolescents; breastfeeding intention and its correlates; difference in knowledge score and incidence of predefined neonatal outcomes.

Study details	
Author/year	Spiby *et al*./2009
Focus of the review	To examine the effects of training, education and practice-change interventions with health professionals and lay breastfeeding educators/counsellors on duration of breastfeeding.
Participants (Characteristics/total n)	Various participants: hospitals; health workers; mothers; babies; mother-baby pairs/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	RCTs, non-RCTs with concurrent controls and before/after studies (cohort or cross-sectional), undertaken in a developed country, published between 1980 and 2003 in any language. Excluded: Studies with no breastfeeding data
Sources searched	MEDLINE, CINAHL and 17 other electronic databases; 3 key journals were hand-searched (Health Promotion International, Health Education Quarterly, Journal of Human Lactation).
Range (years) of included studies	1980–2003
Number and type of studies included study design, mixed methods…	Nine studies; RCTs, non-RCTs with concurrent controls and before/after studies (cohort or cross-sectional)
Country of origin of included studies	UK, USA, Canada, Italy, France and Spain
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary (studies were described, their quality assessed and findings examined).
Outcomes assessed	Primary outcome: duration of breastfeeding. Secondary and process outcomes, such as attitude, knowledge and behaviour change of participants, were included from papers that also reported breastfeeding duration outcomes.

Study details	
Author/year	Ward and Byrne/2011
Focus of the review	To analyse the effects of educational interventions on breastfeeding for health professionals, particularly nurses and midwives.
Participants (Characteristics/total n)	Nurses or midwives or health professionals/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria were: - that nurses or midwives combined to form the largest group of health professionals in each study; - that the education was a stand-alone intervention or the main part of a wider intervention; - that they were level II (RCTs), III-1 (pseudo RCTs) or III-2 (comparative studies with concurrent controls) of the Australian National Health and Medical Research Council levels of evidence; and - studies were published after 1995. Research reports by the same authors using previously collected data were included if they had a different focus of analysis or research question; however, pilot studies that were later replicated with more rigour were not included.
Sources searched	MEDLINE, CINAHL and OVID@fulltext; Journal of Human Lactation; search also conducted via Lactation Resource Centre
Range (years) of included studies	1995–2006
Number and type of studies included study design, mixed methods…	Fifteen studies: five RCTs, six quasi-experimental studies and four non-experimental quantitative studies with a pre-test/post-test design. Some studies also had qualitative components.
Country of origin of included studies	Italy, Sweden, UK, USA, France, Canada, Australia, India and Brazil
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary: results from reviewed studies are categorised and discussed under headings and sub-headings.
Outcomes assessed	Primary outcomes: knowledge and attitudes; BFHI compliance; clinical skills and practices; counselling and supportive behaviour; breastfeeding outcomes. Secondary outcomes:

	length of intervention; resistance to change; sustainability of changes

Study details	
Author/year	Dennis and Kingston/2008
Focus of the review	To assess the effects of telephone-based support on smoking, preterm birth, low birthweight, breastfeeding and postpartum depression
Participants (Characteristics/total n)	Total n = 8,037 women
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: RCT only; primary aim was to reduce risk of adverse health outcomes for women and their infants related to smoking abstinence, relapse, cessation, preterm birth, low birthweight, breastfeeding duration or postpartum depression; telephone support was provided by a layperson or health professional antenatally or during the first two months postpartum or both; the study included pregnant women and new mothers within the first two months postpartum. Exclusion criteria: Quasi-randomised trials; trials examining early discharge interventions; studies that included interventions where telephone support only consisted of reactive hotlines as an adjunct to a main face-to-face interaction.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register (March 2006); Cochrane Central Register of Controlled Trials (March 2006); MEDLINE (1966–2006); Embase (1980–2006), CINAHL (1982–2006).
Range (years) of included studies	1986–2004
Number and type of studies included study design, mixed methods…	14 studies; RCTs
Country of origin of included studies	USA, Canada, Australia and UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analyses; subgroup analyses
Outcomes assessed	Breastfeeding duration and exclusivity (inter alia)

Study details	
Author/year	Lavender *et al.*/2013
Focus of the review	To assess the effects of telephone support during pregnancy and the first six weeks post-birth, compared with routine care, on maternal and infant outcomes.
Participants (Characteristics/total n)	Pregnant women and postnatal women in the first six weeks post birth/total n = >12,000
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included RCTs (and cluster randomised trials) comparing telephone support with routine care or with another supporting intervention. Studies where intervention is introduced in pregnancy or the first six weeks post birth or both. Intervention may or may not have extended from the antenatal to postnatal period; in any setting and delivered by healthcare staff, peer supporters or using automated messaging. Excluded quasi-RCTs and crossover studies.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register and reference lists of all retrieved articles
Range (years) of included studies	1982–2012
Number and type of studies included study design, mixed methods…	27 studies; RCTs
Country of origin of included studies	USA, Canada, Australia, England, Thailand, New Zealand, Italy, Zanzibar and Scotland
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Primary outcomes: 1. Maternal satisfaction with support during pregnancy and the first 6 months postpartum (as defined by trial authors) 2. Maternal anxiety (measures as defined by trial authors) Secondary outcomes:

	Breastfeeding duration (exclusive or combined feeding)
Study details	
Author/year	Lau *et al*. (2015)
Focus of the review	Evaluate whether e-technologies have had any effect in improving breastfeeding outcomes among perinatal women.
Participants (Characteristics/total n)	Perinatal women/total n = 5,006
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: 1. Published, unpublished and ongoing experimental studies, whether RCTs or quasi-RCTs 2. Studies that involved e-technological intervention such as web-based learning, e-learning, e-education, e-prompts, CD-ROM-based, visual interactive computer agents, visual consultations, or SMS/texting that offer breastfeeding information, support and consultation to perinatal women through health professionals 3. Studies involving interventions given in either prenatal, postnatal, or combined prenatal and postnatal period 4. Studies that used usual care as a control group 5. Studies that explored the breastfeeding outcomes, i.e. exclusive breastfeeding (BF) initiation, exclusive BF duration, BF awareness, BF knowledge, BF attitudes, BF intention, BF confidence, BF satisfaction, BF difficulty, BF assessment, BF intensity or coping with BF. Exclusion criteria: studies that 1. were before-after, cohort, cross-sectional or qualitative studies 2. used qualitative data as breastfeeding outcomes 3. used e-technological approach for data collection, screening, assessment or recording 4. had abstracts only 5. were conference papers 6. involved non-human subjects 7. were not published in English
Sources searched	Nine electronic databases; CINAHL, MEDLINE, PsycINFO, ScienceDirect, Scopus, Web of Science, ProQuest Dissertations & Theses Global, PubMed and Google Scholar.
Range (years) of included studies	2007–2014
Number and type of studies included study design, mixed methods…	15 studies; RCTs or quasi-RCTs
Country of origin of included studies	USA, Iran, Finland, Taiwan, China and France
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis, subgroup analysis
Outcomes assessed	Initiation of exclusive breastfeeding, exclusive breastfeeding duration, breastfeeding attitudes, breastfeeding knowledge.

Study details	
Author/year	Beake *et al*./2012
Focus of the review	To consider the evidence of outcomes of structured compared with non-structured breastfeeding programmes in acute maternity care settings to support initiation and duration of exclusive breastfeeding.
Participants (Characteristics/total n)	Included pregnant women and mothers of newborn infants in hospital/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria	Quantitative and qualitative studies that focused on programmes to support the initiation and duration of exclusive breastfeeding implemented in the hospital setting were included. Studies were excluded if they only evaluated the 1998 unic UK Baby Friendly Initiative's *The Seven Point Plan for Sustaining Breastfeeding in the Community*, as the aim of the review was to assess structured programmes that included support from the initiation of breastfeeding. Studies that only considered community-based interventions were

based on search if appropriate	excluded.
Sources searched	CINAHL, MEDLINE, Cochrane Library, CRD databases, Embase, PubMed, Social Sciences Citation Index, Web of Science, MIDIRS, PsycINFO.
Range (years) of included studies	1992-2010
Number and type of studies included study design, mixed methods…	26 articles included; one RCT, two controlled trials, one cross-sectional study, two descriptive studies, 15 cohort studies and five systematic reviews.
Country of origin of included studies	UK, Brazil, Germany, USA, Israel, Taiwan, Italy, France, Turkey, Belarus and Switzerland
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary.
Outcomes assessed	Primary outcome measures: rates of initiation of breastfeeding; duration of any breastfeeding and/or exclusive breastfeeding. Secondary outcome measures: maternal and infant health outcomes; women's knowledge, attitudes and skills following introduction of a structured programme; staff knowledge, attitudes and skills following introduction of a structured programme; women's experiences of support (professional and peer) for breastfeeding; breastfeeding problems and impact on health care resources.

Study details	
Author/year	Moore *et al*./2012
Focus of the review	To assess the effects of early skin-to-skin contact on breastfeeding, physiological adaptation and behaviour in healthy mother-newborn dyads.
Participants (Characteristics/total n)	Mothers and their healthy full-term or late-preterm newborn infants having early skin-to-skin contact starting less than 24 hours after birth, and controls undergoing standard patterns of care/total n = 2,177
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included: RCTs comparing early skin-to-skin contact with usual hospital care Excluded: quasi-RCTs
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register; bibliography on kangaroo mother care
Range (years) of included studies	1976–2010
Number and type of studies included study design, mixed methods…	24 studies; RCTs
Country of origin of included studies	USA, South Africa, Russia, UK, Sweden, Spain, Taiwan, Israel, Italy, Guatemala, Germany, Iran, Poland, Japan, Thailand, Nepal and Chile
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Primary outcomes: 1. Number of mothers breastfeeding (any breastfeeding) one month to four months post birth 2. Duration of breastfeeding Secondary outcomes: 1. Effective breastfeeding (infant breastfeeding assessment tool IBFAT) 2. Breastfeeding rates/exclusivity (using either Labbok Index of breastfeeding status or the Thulier 2010 five-point scale) at hospital discharge up to two weeks post birth 3. Breastfeeding rates (using Labbok or Thulier) 3–6 months post birth

Study details	
Author/year	Jaafar, Lee and Ho/2012
Focus of the review	To assess the effect of mother-infant separation versus rooming-in on the duration of breastfeeding (exclusive and total duration of breastfeeding)
Participants (Characteristics/total n)	All mothers who have given birth and are able to care for their normal newborn infants whether or not they have initiated breastfeeding/total n = 176
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	RCTs, quasi-RCTs investigating the effect of separate mother-infant care versus rooming-in after hospital birth or at home on the duration of breastfeeding, proportion of breastfeeding at six months and adverse neonatal and maternal outcomes. Excluded trials recruiting populations with specific health problems such as AIDS.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register
Range (years) of included studies	2008
Number and type of studies included study design, mixed methods…	One study; RCT
Country of origin of included studies	Not specified
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	N/A
Outcomes assessed	Primary outcomes: duration of breastfeeding as measured by one of the following: 1. mean duration of exclusive breastfeeding 2. mean duration of any breastfeeding 3. proportion of infants being exclusively breastfed at six months Secondary outcomes: mean frequency of breastfeeding per day; rate of exclusive breastfeeding on discharge from hospital; maternal outcomes including rate of breast engorgement, maternal duration of sleep, maternal adverse events, maternal satisfaction, level of confidence in parenting; neonatal outcomes including diarrhoea, hypoglycaemia, hypothermia.

Study details	
Author/year	Becker and Remmington/2014
Focus of the review	To assess the benefits and harms of supplementation for full-term healthy breastfed infants and to examine the timing and type of supplementation.
Participants (Characteristics/total n)	Full-term breastfed infants up to the age of six months, or the mothers of these infants/total n = 984 infants/mothers
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Randomised or quasi-randomised controlled trials in infants under six months comparing exclusive breastfeeding versus breastfeeding with any additional food or fluids.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register; reference lists of all relevant retrieved papers
Range (years) of included studies	1982–2013
Number and type of studies included study design, mixed methods…	Eight studies; RCTs
Country of origin of included studies	Honduras, USA, Iceland, Spain, UK and Nigeria
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Primary outcomes: breastfeeding duration; incidence of infant morbidity; infant mortality

	(at discharge, 28 days or one year); physiological jaundice. Secondary outcomes: weight change; duration of hospital stay; maternal self-confidence in breastfeeding; max serum bilirubin levels; phototherapy in hospital or home setting if required.
Study details	
Author/year	Jaafar *et al.*/2012
Focus of the review	To assess the effect of unrestricted versus restricted pacifier use in healthy full-term newborns whose mothers have initiated breastfeeding and intend to exclusively breastfeed on the duration of breastfeeding, other breastfeeding outcomes and infant health.
Participants (Characteristics/total n)	Healthy full-term newborns whose mothers have initiated breastfeeding and intend to exclusively breastfeed regardless of whether they were born at home or in hospital / total n = 1,915
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	RCTs and quasi-RCTs comparing unrestricted versus restricted pacifier use in healthy full-term newborns whose mothers have initiated breastfeeding regardless of whether they were born at home or in the hospital. Excluded studies including newborns exposed to bottle-feeding prior to enrolment.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register
Range (years) of included studies	1997–2001
Number and type of studies included study design, mixed methods…	Three studies; RCTs
Country of origin of included studies	Argentina, Québec and Switzerland
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis of two trials.
Outcomes assessed	Primary outcomes: duration of breastfeeding Secondary outcomes: rate of breastfeeding difficulties; maternal satisfaction and level of confidence in parenting.

Study details	
Author/year	O'Connor *et al.*/2009
Focus of the review	To summarise current evidence on the association between infant pacifier use and breastfeeding.
Participants (Characteristics/total n)	Participants from a range of socioeconomic and demographic backgrounds/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: Any study design; only studies that reported an association between pacifier use and breastfeeding initiation or duration, had a clearly identified comparison group, consisted of healthy term or preterm infant populations, and had at least 70% follow-up or 50% participation were included. Exclusion criteria: Non-English language; studies that included infants with congenital abnormalities.
Sources searched	MEDLINE, CINAHL, Cochrane Library, Embase, POPLINE and bibliographies of identified articles
Range (years) of included studies	January 1950–August 2006
Number and type of studies included study design, mixed methods…	29 studies; RCTs, cohort studies, cross-sectional studies
Country of origin of included studies	Australia, Brazil, Canada, Hungary, Italy, New Zealand, Poland, Russia, Sweden, Switzerland, UK and USA
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Systematic review of the identified articles, grouped by study design (could not carry out meta-analysis due to heterogeneity).
Outcomes assessed	Breastfeeding duration or exclusivity.

Study details	
Author/year	Fallon *et al.*/2014
Focus of the review	To evaluate the effects of baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding, for healthy newborns.
Participants (Characteristics/total n)	N/A
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Randomised and quasi-randomised trials with randomisation at both the individual and cluster level. Studies using a crossover design were not eligible.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register; CINAHL; EThOS, Index to Theses and ProQuest; trials included in the WHO's evidence to support the 'Ten Steps to Successful Breastfeeding'
Range (years) of included studies	N/A
Number and type of studies included study design, mixed methods…	0 studies found
Country of origin of included studies	N/A
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	N/A
Outcomes assessed	1. Proportion of women breastfeeding exclusively up to six months 2. Proportion of women breastfeeding up to 24 months

Study details	
Author/year	Hall Moran *et al.* (2015)
Focus of the review	To assess the evidence regarding the effectiveness of incentive interventions.
Participants (Characteristics/total n)	Number of participants not aggregated. The mean age of participants varied between 16.2 and 31.6 years.
Inclusion/exclusion criteria (Includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	• Population was women who were pregnant or those who had given birth within six months at time of intervention and/or family members or partners. Intervention could benefit either or both; • Incentives were financial or nonfinancial but tangible (rewards), latter to be delivered directly/indirectly at local/regional/national level by healthcare or other community and/or commercial providers; • Solely supportive relationships/provision of educational material excluded; • Interventions that included both incentive reward component and psychosocial component were included; • Multifaceted programs providing incentives to women as part of usual care excluded unless provided incentives over and above those routinely offered as part of program; • Studies using medical devices not routinely provided (e.g. breast pumps) were included; • Studies in English from developed countries as defined by UN included; • Grey literature reported in a separate study
Sources searched	MEDLINE, Embase, CINAHL, Science Citation Index, Applied Social Sciences Index and Abstracts, PsycINFO, Maternity and Infant Care, Trials Register of Promoting Health Interventions, Cochrane Central Register of Controlled Trials, NHS Economic Evaluation Database, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of

	Effects, the Health Technology Assessment Database
Range (years) of included studies	1992–2011
Number and type of studies included study design, mixed methods…	16 studies; RCTs, historically controlled studies and case series
Country of origin of included studies	USA and one study from the UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	A narrative summary of the studies was undertaken due to the heterogeneity among the included studies.
Outcomes assessed	Breastfeeding initiation and exclusive or any breastfeeding rates.

Study details	
Author/year	Lee and Thomas/2008
Focus of the review	To determine the effect of antenatal breast examinations on the initiation of breastfeeding.
Participants (Characteristics/total n)	All pregnant women attending antenatal care at least once / total n = 0
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	All RCTs of the effects of antenatal breast examination, with a concurrent comparison group.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register
Range (years) of included studies	From inception
Number and type of studies included study design, mixed methods…	No studies found
Country of origin of included studies	N/A
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	N/A
Outcomes assessed	Primary outcome measure is the rate of breastfeeding initiation in all pregnant women after birth.

Study details	
Author/year	Johantgen *et al.*/2012
Focus of the review	This study compares the labour and delivery care outcomes of certified nurse-midwives (CNMs) and physicians.
Participants (Characteristics/total n)	CNMs, physicians, pregnant women/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Only those articles where processes or outcomes of care were quantitatively compared between CNMs and physicians were included.
Sources searched	PubMed, CINAHL, ProQuest
Range (years) of included studies	1990–2008
Number and type of studies included study design, mixed methods…	21 articles/dissertations reflecting 18 studies; RCTs and observational studies
Country of origin of included studies	Not specified
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	For each outcome that had at least three studies, detailed tables were created to summarise the study characteristics and to summarise the outcomes.

Outcomes assessed	Specified four categories of outcomes, including infant outcome, for which breastfeeding was one of the measures.

Study details	
Author/year	Sandall *et al*./2015
Focus of the review	To compare midwife-led continuity models of care with other models of care for childbearing women and their infants.
Participants (Characteristics/total n)	Pregnant women/total n = 17,674
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	All published and unpublished (randomised) trials in which pregnant women are randomly allocated to midwife-led continuity models of care or other models of care during pregnancy.
Sources searched	Cochrane Pregnancy and Childbirth Group's Trials Register
Range (years) of included studies	1989–2013
Number and type of studies included study design, mixed methods…	15 studies; RCTs
Country of origin of included studies	Australia, Canada, Ireland and UK
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis; subgroup analysis
Outcomes assessed	Secondary outcomes: breastfeeding initiation; any breastfeeding at three months; breastfeeding on hospital discharge

Appendix 8: Characteristics and findings of reviews assessed as weak and not included in synthesis

Chapman, Morel, Anderson *et al.* (2010):[67] Breastfeeding peer counseling: from efficacy through scale-up

Study details	
Author/year	Chapman *et al.*/2010
Focus of the review	To systematically review the scientific literature evaluating: a) the effectiveness of breastfeeding peer counselling in improving rates of breastfeeding initiation, duration, exclusivity and maternal and child health outcomes; and b) the scale-up of breastfeeding peer counselling programs.
Participants (Characteristics/total n)	Varied classes of pregnant women/mothers/total n = not provided
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Review is organised in five sections: Initiation, Duration, Exclusivity, Maternal/Child Health Outcomes, Scale-up. For the first four sections, studies describing RCTs, in which breastfeeding was a main focus of the peer counselling intervention, were included. Studies were excluded if the intervention exclusively utilised professional health workers such as nurses, or if the intervention was not primarily focused on breastfeeding. For the last section on the scale-up of breastfeeding peer counselling, studies were included if they describe large-scale randomised trials evaluating a breastfeeding peer counselling intervention or the development/evaluation of regional or national breastfeeding peer counselling programmes or programmes including a peer counselling component.
Sources searched	PubMed, Web of Science, Cochrane Library
Range (years) of included studies	Databases searched from inception–2008
Number and type of studies included study design, mixed methods…	26 studies; RCTs
Country of origin of included studies	USA, UK, Mexico, Philippines, Canada, Brazil, India, Nigeria, Bangladesh, Bolivia, Ghana, Madagascar, Pakistan and South Africa
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Breastfeeding initiation, duration, exclusivity, maternal/child health outcomes (infant diarrhoea, maternal amenorrhoea)

Study findings and conclusions

Breastfeeding peer counsellors are local community women who have successfully breastfed, received training in breastfeeding education, and work with their peers to improve breastfeeding outcomes. They reinforce breastfeeding recommendations in a socially and culturally relevant context. The authors point out that few publications adequately described peer counsellor training, supervision and compensation.

There were seven studies that examined the effect of peer counselling on the **initiation** of breastfeeding. Four of these were described as high intensity and three as low intensity. The results showed that the high-intensity peer counselling could be useful in promoting the initiation of breastfeeding whereas low-intensity peer counselling does not. Three of four high-intensity interventions improved breastfeeding initiation rates. The three low-intensity interventions were all delivered in the UK, and evaluations of all three found no significant difference between the peer counsellor group (intervention) and controls on rates of women initiating breastfeeding.

Thirteen studies provided data on the **duration** of breastfeeding. Eight of these had a high-intensity peer counselling intervention and five had low-intensity interventions. Five of the eight high-intensity interventions and one of five low-intensity interventions significantly increased the duration of any breastfeeding.

In a further two of the five high-intensity peer counsellor interventions, significantly higher rates of **any breastfeeding** were observed. The three other high-intensity studies reported higher breastfeeding rates in their intervention; however, the difference was not statistically significant. Two further low-intensity peer counsellor interventions showed no significant difference in breastfeeding rates during the postpartum period. In total, five out of nine high-intensity peer counsellor interventions significantly improved breastfeeding rates, while only one of five low-intensity interventions achieved higher rates.

Twelve studies evaluated **exclusive breastfeeding** rates. The four additional studies that measured exclusive breastfeeding were not categorised by the level of intensity of the intervention, and therefore these results cannot be reported by this factor. Nine of the 12 studies showed that peer counsellors significantly increased exclusive breastfeeding rates. Two did not significantly increase exclusive breastfeeding rates and for one study the findings were not reported.

The authors conclude that the overwhelming majority of the evidence from RCTs evaluating breastfeeding peer-counsellor interventions indicates that peer counsellors effectively improve rates of breastfeeding initiation, duration and exclusivity. An additional observation that may be drawn from this review is that high-intensity interventions may be more effective than less intensive interventions.

The quality assessment completed by the HRB authors classified this review as weak. The results of the review are not presented clearly, and the conclusions of Chapman *et al.* are not supported by the findings. For example, the HRB authors found that the effect of peer-counsellor interventions on duration is mixed, with only five of nine high-intensity intervention studies significantly increasing duration and one of four low-intensity interventions significantly increasing breastfeeding duration, compared with Chapman *et al.*'s conclusion that the findings of the review highlight the importance of ongoing in-person peer counsellor support to improve breastfeeding duration. It is important to note that most of the studies with significant results were conducted in low-income countries and may not be applicable to high-income countries with low background rates of breastfeeding.

Figueredo, Mattar and Abrão (2012):[68] Baby-friendly Hospital Initiative – a policy of promoting, protecting and supporting breastfeeding

Study details	
Author/year	Figueredo, Mattar and Abrão 2012
Focus of the review	To conduct a literature review of the 10 steps of BFHI, showing the impact of this initiative on breastfeeding rates.
Participants (Characteristics/total n)	Not specified
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Articles that addressed the review topic, published in Portuguese, Spanish or English, with abstracts available in the selected databases were included, with no date limit. Exclusion criteria were: articles that did not meet the aims of this review, those not available online or in Brazilian libraries, or that did not have an abstract.
Sources searched	PubMed, MEDLINE, SciELO, LILACS
Range (years) of included studies	1979–2009
Number and type of studies included study design, mixed methods…	35 articles
Country of origin of included studies	Not specified
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Impact of each of the steps of BFHI on breastfeeding practice/rates.

Study findings and conclusions

The review authors use 35 studies in this review and present evidence from these papers for each of the 10 steps of the BFHI and posit that the evidence demonstrates that each step in the BFHI increases breastfeeding rates.

However, the HRB authors classified the quality of this review as weak because it would be very difficult to repeat the study using the reported methods as the inclusion criteria were poorly defined, the screening of papers for inclusion is not explicit and the methods used to combine data were not clearly defined. The review authors did not complete a quality assessment of included primary studies or assign them a level of evidence. In all, the study appears to be an effort to promote the BFHI rather than an evidence review to demonstrate the effectiveness of breastfeeding using transparent methods.

Flannery (2014)[69] Increasing breastfeeding rates: Evidence-based strategies

Study details	
Author/year	Flannery/2014
Focus of the review	To analyse evidence about how postpartum women in low-income, rural areas perceive breastfeeding support.
Participants (Characteristics/total n)	Low-income postpartum women/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: English-language, peer-reviewed, research-based articles that contribute to the existing body of nursing science.
Sources searched	CINAHL, MEDLINE, PubMed, PsycINFO
Range (years) of included studies	2008–2013
Number and type of studies included study design, mixed methods…	Five studies; one RCT, one quasi-experimental study with randomisation, two qualitative studies with one study having a component of case-controlled retrospective design, and one descriptive study
Country of origin of included studies	Not specified
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Narrative summary
Outcomes assessed	Breastfeeding rates – exclusive breastfeeding, breastfeeding initiation, breastfeeding continuation. Women's perceptions and experiences of professional or peer breastfeeding support

Study findings and conclusions

The review includes five studies, one RCT, one quasi-experimental study, two qualitative and one descriptive study. In the first paragraph of the findings the results of two studies about telephone support are reported in narrative summary. Flannery concluded that these confirmed that scheduled telephone support calls increase rates of exclusive breastfeeding at six months. The next paragraph in this review deals with the effectiveness of peer counselling (one study); the paragraph after that deals with the effectiveness of cognitive and behavioural strategies; in the final paragraph, themes that support breastfeeding are identified.

The quality assessment completed by the HRB authors classified this review as a weak study (score 2). The author had a clear question, but did not answer it in a transparent manner. The search could not be repeated and the analysis of the aspect of the study on telephone counselling is incomplete. There are no tables presenting the characteristics or summary findings of the studies, and therefore the results are not transparent. Flannery did not assess the quality of the studies included in the review and some of the findings presented

were not included in the research question. The author strays from the stated objective. Only the two telephone counselling studies are relevant to the question in the current HRB review and there is limited or no evidence to show that it works.

Kaunonen, Hannula and Tarkka (2012):[70] A systematic review of peer support interventions for breastfeeding

Study details	
Author/year	Kaunonen, Hannula and Tarkka/2012
Focus of the review	To describe peer support interventions supporting breastfeeding during pregnancy and the postnatal period.
Participants (Characteristics/total n)	Peer supporters; healthy mothers and infants/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Breastfeeding peer support interventions and education of healthy mothers and infants from the perspective of family members; articles combining peer support and professional support also included. Limited to articles representing original articles or reviews. Excluded: developing countries, if described breastfeeding statistics, health benefits of breastfeeding, using formula supplements, famine prevention, breastfeeding of sick mothers and newborns, breastfeeding of premature or breastfeeding attitudes of various groups or if conducted solely from the professional perspective
Sources searched	CINAHL, MEDLINE, Cochrane Database
Range (years) of included studies	2000–2008
Number and type of studies included study design, mixed methods…	34 (30 primary studies and four reviews); reviews, RCTs, quasi-experimental studies, primary quantitative and qualitative, case studies, expert opinion and consensus reports
Country of origin of included studies	USA, Europe, Australia and NZ
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Used a narrative summary under four headings; peer supporters and their training, peer support during pregnancy, peer support at maternity hospital and peer support in the postnatal period.
Outcomes assessed	Breastfeeding initiation, continuation, exclusiveness, maternal satisfaction and perception of the intervention.

Study findings and conclusions

The objective of this systematic review was to describe peer support interventions supporting breastfeeding during pregnancy and the postnatal period. The outcome is breastfeeding initiation, continuation and exclusivity. Included are 30 articles and four reviews. The articles were both qualitative (six) and quantitative (17), mixed-methods (seven) and reviews (four).

The authors discuss the composition of the peer supporters in the included studies and how these could contain a wide variety of people; e.g., spouses without training, spouses and grandmothers with antenatal education, grandmothers with no training, friends, other breastfeeding mothers or mothers in the social support network. Training received, if any, and breastfeeding experience for women providing support varied enormously. The type and timing of interventions were extremely varied as were the settings where the interventions occurred. In summary this article has many different interventions in all settings at all stages of pregnancy, with all kinds of peers and some professionals who have various experience and training.

Kaunonen *et al.* conclude: ' Only continuous breastfeeding support produces effective results. Diverse types of interventions are needed during different phases of motherhood. The role of peer support is most important during the postnatal period. If professional support is not available for mothers, peer support could provide an alternative worth considering'.

The quality assessment completed by the HRB authors classified this review as weak. It is not clear who the control groups are. The authors' question relates to peer support interventions, but in some cases the intervention group included professionals. Several studies described both professional and peer support, which contaminates the information relating to the effect of peer support intervention. There are no tables presenting the characteristics or summary findings of the studies, and the results are not transparent. In addition, the level of evidence of the included studies was assigned, but there was no quality assessment of these included studies. The summary findings do not concur with the findings presented in the results.

Pate (2009):[71] A systematic review of the effectiveness of breastfeeding intervention delivery methods

Study details	
Author/year	Pate/2009
Focus of the review	To analyse breastfeeding intervention delivery methods to determine the likelihood of successful breastfeeding outcomes of e-based interventions compared to provider-based interventions.
Participants (Characteristics/total n)	Prenatal/postpartum mothers/total n = 8,965
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Inclusion criteria: studies were conducted in a developed country, published from 2004–2008, included a concurrent control group, and reported frequency data on breastfeeding initiation or duration. Exclusion criteria: studies did not report sufficient information for calculation of measures of effect (frequencies and/or proportion of events) regarding exclusive or non-exclusive breastfeeding.
Sources searched	MEDLINE, CINAHL, Academic Search Elite, Health Source: Nursing/Academic Edition, SocINDEX, PsycINFO, Cochrane Library
Range (years) of included studies	2004–2008
Number and type of studies included study design, mixed methods…	21 studies. Randomised or non-randomised controlled trials with concurrent control groups
Country of origin of included studies	North America, Europe, Asia (individual countries not specified)
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Meta-analysis
Outcomes assessed	Exclusive/non-exclusive breastfeeding initiation or duration

Study findings and conclusions

Authors say they compare e-based interventions (three studies) to provider-based interventions (18 studies), all non-probability randomised trials.

Provider-based interventions: peer counsellor visits in context of BFHI, peer counsellor visits, home visits and telephone calls by lactation consultant, practical breastfeeding skills sessions, education, home-based support, booklets, breastfeeding workshops, motivational interviewing, breastfeeding classes for fathers.

E-based interventions: prenatal web-based instruction, group web-based prenatal care, and pre- and postnatal online breastfeeding information and support.

Meta-analysis: Odds ratios were calculated for each individual study, and studies were stratified into two groups by intervention delivery type. The pooled results, according to the authors, indicated that studies using e-based interventions had a moderate effect on breastfeeding (odds ratio 2.2 [1.9-2.7], d = 0.5), whereas provider-based interventions had very little to no effect (odds ratio 1.1 [1.0-1.2], d = 0.03).

The authors conclude that the results indicate that breastfeeding promotion programs delivered via the Internet may be an appealing alternative to time-consuming and expensive provider-based breastfeeding education and support.

The HRB authors identified several shortcomings in this study. The first is that the two interventions are not compared directly with one another, and what they are compared to is not clearly described. Pate does not have enough information on the original studies to control for the effects of different socioeconomic groups. The most important deficiencies in this study are in relation to the outcome measures. The outcome measures for e-based learning and provider interventions differ. Exclusive breastfeeding decreases over time, and this was not taken into account by the author. The outcome measure, exclusive breastfeeding at initiation in the e-based intervention tested by Salonen (2008), could be compared to four studies in the provider intervention group, and the results for three of the four studies in the provider group are similar to those of Salonen. The outcome measures in the other two studies in the e-based intervention group are not comparable to any of the studies in the provider-based group. This indicates that the findings are not appropriate for use by policy-makers.

Watkins and Dodgson (2010):[72] Breastfeeding educational interventions for health professionals: A synthesis of intervention

Study details	
Author/year	Watkins and Dodgson/2010
Focus of the review	The purpose of this synthesis was to review intervention studies that focused on increasing the breastfeeding knowledge, self-confidence, and supportive behaviours of healthcare professionals.
Participants (Characteristics/total n)	Physicians, nurses, midwives and nonprofessional staff/total n = not given
Inclusion/exclusion criteria (includes decisions related to the target population, intervention, outcome(s), as well as the research design (RCT, cohort, participatory, etc.). May include exclusion criteria based on search if appropriate	Included English-language; education for professionals only Excluded studies for developing countries
Sources searched	CINAHL, ERIC, PsycINFO, MEDLINE, Cochrane Library
Range (years) of included studies	2002–2008
Number and type of studies included study design, mixed methods…	14 intervention studies described in 15 articles; RCT, quasi-experimental, observational
Country of origin of included studies	USA, UK, Australia, Sweden, Denmark, Israel, France and China
Methods used to combine the findings of results across studies? e.g. narrative summary, meta-analysis?	Literature synthesis
Outcomes assessed	Duration or continuation of breastfeeding

Study findings and conclusions

The purpose of this synthesis was to review intervention studies that focused on the effectiveness of increasing the breastfeeding knowledge, self-confidence, and supportive **behaviours of healthcare professionals** and to examine changes in breastfeeding duration after professionals completed the intervention.

Fourteen articles were identified through database searches as the basis for this review. Interventions included: education in person or through videos and CD-ROMs.

Twelve studies measured the physician, midwife, nursing student or nurse's knowledge, confidence and/or attitudinal changes in breastfeeding after the educational intervention: breastfeeding knowledge scores

significantly correlated with positive attitudes in nurses and other health professionals. However, a positive attitude did not correlate with higher knowledge scores.

Intervention with paediatric residents did not influence maternal satisfaction with breastfeeding guidance pre- and post-intervention even though there was a demonstrated increase in competency in advising mothers on certain aspects of breastfeeding. Breastfeeding education in nurses and other health professionals was found to significantly improve confidence in practice. Nurses' ages and educational levels positively associated with pro-breastfeeding attitudes in several studies.

Four studies examined duration of any breastfeeding or exclusive breastfeeding. One study measured the rate of exclusive breastfeeding or any breastfeeding at four weeks. The other measured the duration of exclusive breastfeeding at six months. The other two measured the duration of any breastfeeding, but one of these did not report on duration. According to the authors, the duration of breastfeeding increased significantly and the rate of exclusive breastfeeding increased significantly after a breastfeeding educational intervention.

Initiation rates and rates of any breastfeeding are not provided. One study found breastfeeding initiation and duration rated increased significantly after an intensive breastfeeding course was delivered to professionals. Another study found no significant difference with respect to the rate of any breastfeeding at four weeks. However, mothers in their intervention group were most likely to be exclusively breastfeeding and have a longer overall duration of breastfeeding.

Authors' summary: ' Improving nurses' knowledge of breastfeeding is a modifiable factor that is important in supporting a mother in her decision to breastfeed'.

The quality assessment completed by the HRB authors classified this review as weak. For two studies the results match the outcome variables and one of these found an increase in exclusive breastfeeding rates and any breastfeeding at four weeks. Another study reported an increased median duration of any breastfeeding. For the other two studies, the outcome variables do not match the reported results. None of the four studies present any figures. The results in the text do not align with the results in the table.