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Antenatal breastfeeding education for increasing breastfeeding duration

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Abstract

Background—Breastfeeding (BF) is well recognised as the best food for infants. The impact of antenatal BF education on the duration of BF has not been evaluated.

Objectives—To evaluate the effectiveness of antenatal BF education for increasing BF initiation and duration.

Search methods—We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (21 April 2010), CENTRAL (*The Cochrane Library* 2010, Issue 2), MEDLINE (1966 to April 2010) and SCOPUS (January 1985 to April 2010). We contacted experts and searched reference lists of retrieved articles. We updated the search of the Pregnancy and Childbirth Group's Trials Register on 28 September 2011 and added the results to the awaiting classification section of the review.

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CONTRIBUTIONS OF AUTHORS

P Lumbiganon (PL), R Martis (RM) and J Ho (JH) initiated the topic. PL, RM and M Laopaiboon (ML) drafted the protocol. All review authors approved the final version of the protocol. PL, RM, ML, JH, M Festin (MF) M Hakimi (MH) selected studies and extracted data. ML and PL conducted analysis and interpretation. PL and ML drafted the review.

DECLARATIONS OF INTEREST

None known.

An updated search of the Pregnancy and Childbirth Group's Trials Register on 28 September 2011 identified a further 3 trial reports (Kupratkul 2010; Olenick 2011; Patel 2011). These reports have been added to the awaiting classification section of the review and will be considered for inclusion at the next update, which we plan to complete by early 2012.

Selection criteria—All identified published, unpublished and ongoing randomised controlled trials (RCTs) assessing the effect of formal antenatal BF education or comparing two different methods of formal antenatal BF education, on duration of BF. We excluded RCTs that also included intrapartum or postpartum BF education.

Data collection and analysis—We assessed all potential studies identified as a result of the search strategy. Two review authors extracted data from each included study using the agreed form and assessed risk of bias. We resolved discrepancies through discussion.

Main results—We included 17 studies with 7131 women in the review and 14 studies involving 6932 women contributed data to the analyses. We did not do any meta-analysis because there was only one study for each comparison.

Five studies compared a single method of BF education with routine care. Peer counselling significantly increased BF initiation.

Three studies compared one form of BF education versus another. No intervention was significantly more effective than another intervention in increasing initiation or duration of BF.

Seven studies compared multiple methods versus a single method of BF education. Combined BF educational interventions were not significantly better than a single intervention in initiating or increasing BF duration. However, in one trial a combined BF education significantly reduced nipple pain and trauma.

One study compared different combinations of interventions. There was a marginally significant increase in exclusive BF at six months in women receiving a booklet plus video plus lactation consultation (LC) compared with the booklet plus video only.

Two studies compared multiple methods of BF education versus routine care. The combination of BF booklet plus video plus LC was significantly better than routine care for exclusive BF at three months.

Authors' conclusions—Because there were significant methodological limitations and the observed effect sizes were small, it is not appropriate to recommend any antenatal BF education. There is an urgent need to conduct RCTs study with adequate power to evaluate the effectiveness of antenatal BF education.

Medical Subject Headings (MeSH)

*Breast Feeding; Counseling [methods]; Patient Education as Topic [*methods]; Peer Group; Prenatal Care [*methods]; Time Factors

MeSH check words

Female; Humans; Pregnancy

BACKGROUND

Importance of breastfeeding for infants

Breastfeeding (BF) is well recognised as the best food source for infants (Simard 2005). Complementary foods offered before six months of age tend to displace breast milk and do

not confer any health advantage over exclusive BF (Kramer 2002). BF has been advocated to improve child health, maternal health and mother-infant bonding (Ball 2001; Hanson 2002). BF has been associated with lower rates of gastrointestinal and respiratory diseases, otitis media and allergies, better visual acuity, and speech and cognitive development (Anderson 1999; Blaymore Bier 2002; Duffy 1997b; Innis 2001; Wold 2000). It is also cost effective (Riordan 1997). Infants who are breast fed have a lower risk of developing insulin-dependent diabetes in childhood (Fava 1994; Verge 1994), sudden infant death syndrome (Mitchell 1991) and childhood cancer (Davis 1988). Recent research indicates that type of infant feeding may contribute to children becoming overweight and obese in early and late childhood. BF has been shown to protect against child obesity and cardiovascular risk outcomes and is dose related - the longer the infant is breast fed, the lower the risk (Arenz 2004; Harder 2005; Owen 2005). A Cochrane review by Kramer 2002 indicated that exclusive breastfeeding for six months has several advantages over exclusive breastfeeding for three to four months followed by mixed breastfeeding.

Importance of breastfeeding for mothers and families

Delay in return of fertility has been associated with frequent and long periods of exclusive BF, as well as a lower risk of developing premenopausal breast cancer (Newcomb 1994). Women who had not breast fed their babies were four times more likely to have osteoporosis than women who had breast fed (Blaauw 1994). Better emotional health has also been attributed to women who breast fed. Virden 1988 found that, at one month postpartum, women who breast fed their infants had scores indicating less anxiety than women who had bottle fed their infants. The retrospective review of medical records of 800 pregnancies by Acheson 1995 revealed an association between lack of breastfeeding and physical and sexual abuse of the women and/or her children. This was a small review, the results of which warrant further study. A recent published study found that women who breast fed for at least one year were less likely to develop Type 2 diabetes than women who did not breast feed (Stuebe 2005). Some literatures have shown a benefit of BF in enhancing the couple and family relationships (Cohen 2002; Falceto 2004; Jordan 1993; Li 2004; Sullivan 2004) .

Breastfeeding terminology

In 1988, the WHO and UNICEF proposed the following standard terminology for the collection and description of data on BF behaviour, which were updated in 1991 (WHO 1991), and are now widely used (Dettwyler 1992).

Exclusive breastfeeding—Defined as an infant being fed only breast milk, with the possible exception of vitamin D in certain populations and iron in infants of relatively low birthweight (Dewey 2001).

Predominant breastfeeding—When the infant receives breast milk as the predominant source of nourishment. It allows the infant to receive liquids (water and water-based drinks, fruit juice, oral dehydration solutions) and drops or syrups (vitamins, minerals, medicines) but does not allow the infant to receive anything else (in particular, non-human milk and food-based fluids).

Complementary breastfeeding—When the infant receives breast milk and solid or semi-solid foods and allows the infant to receive any food or liquid including non-human milk.

Breastfeeding—When the infant receives breast milk but allows the infant to receive any food or liquid including non-human milk.

Breastfeeding statistics and trends

Despite the many advantages and extensive promotion of BF, Susin 1999 reports that the trend towards BF in many countries is increasing slowly. However, according to the recent UNICEF report (UNICEF 2005), six million lives a year are being saved by exclusive BF and global BF initiation rates have risen by at least 15% since 1990. At the same time, women breast feed for a shorter time than they intended or wished to (Adams 2001; Wagner 2002). The World Health Organization (WHO) recommends that infants should be exclusively breast fed from birth to six months and then breast fed alongside age-appropriate, complementary feeding for two years and beyond (WHO 2001).

Rationale for using educational interventions

Another Cochrane systematic review provides evidence that various forms of BF education are effective at increasing rates of BF initiation among women on low incomes in the USA and initiation will, therefore, not be the main focus in this review (Dyson 2005). The impact of antenatal BF education on the duration of BF, however, has not been widely reported. In Australia, more than 90% of mothers initiate BF; however, only 48% of mothers are BF at one month postpartum and only 23% maintain any form of BF at six months (Lund-Adams 1996). Similar BF duration rates have been reported in the USA (Raj 1998) and Britain (Griffiths 2005; Hoddinott 2000), as well as in developing countries (UNICEF 1998). A variety of BF promotion methods including educational programmes have been studied to support the trend to increase BF duration. It is generally believed that, by improving the mothers' knowledge of BF antenatally, the rates and duration of BF would increase (McLeod 2002). Lack of antenatal information and education about BF has been one factor attributed by New Zealand mothers interviewed about discontinuing BF (McLeod 2002).

Educational interventions

Antenatal BF education is defined as BF information being imparted during the pregnancy in a variety of forms. This could be on an individual or group basis, could include home visiting programmes, peer education programmes or clinic appointments specifically aimed at imparting BF knowledge and could involve prospective fathers or not. BF education is usually a formalised, defined, descriptive and goal-orientated programme with a specific purpose and target audience.

BF education differs from BF support. BF support is usually aimed at the individual person as the need arises and is defined as a person, a group or an organisation providing support in many ways. This could be psychological support (affirming and encouraging the mother), physical support (providing meals, caring for her other children, house cleaning and

gardening), financial support or BF information services available to be tapped into when a BF question arises. BF support usually starts in the postnatal period, not antenatally.

Although we recognise the potential importance of interventions in the postnatal period on breastfeeding outcomes, the focus of this review is on antenatal BF education only, and we have not included trials examining interventions that also involve intrapartum or postpartum BF education. Other Cochrane reviews examine BF education and support interventions in the intrapartum and postnatal periods (Britton 2007; Dyson 2005; Sikorski 2002).

OBJECTIVES

1. To assess the effectiveness of antenatal breastfeeding (BF) education for increasing BF initiation and duration.
2. To compare the effectiveness of various forms of education; for example, peer support, educational programme, didactic teaching session, workshop, booklets, etc, or a combination of these interventions for increasing BF initiation and duration.
3. To assess the effects of antenatal breastfeeding (BF) education on other maternal and infant outcomes e.g. BF complications, maternal satisfaction and neonatal sepsis.

METHODS

Criteria for considering studies for this review

Types of studies—All identified published, unpublished and ongoing randomised controlled trials (RCTs) comparing two different methods of antenatal breastfeeding (BF) education programmes, with or without formal BF education, on duration of BF. Randomised units can be clustered; for example, hospitals, communities or groups of pregnant women or individual women. We excluded quasi-RCTs. We did not include studies published only as abstracts.

Types of participants—Pregnant women.

Types of interventions—Any type of education with BF components. Antenatal BF education is defined as BF information being imparted during pregnancy in a variety of forms. This could be on an individual or group basis, include home visiting programmes; peer education programmes or clinic appointments specifically aimed at imparting BF knowledge; brochures or booklets; electronic education programmes; or a combination of these, and could involve prospective fathers or not. Formal BF education is defined as BF education that was given formally in addition to any BF education that was given as part of routine antenatal care. We excluded RCTs examining interventions that included intrapartum or postpartum BF education in addition to antenatal BF education.

Types of outcome measures

Primary outcomes

1. Duration of any BF
2. Duration of exclusive BF
3. Proportion of mothers BF at three and six months
4. Proportion of mothers exclusively BF at three and six months
5. Initiation rate of BF

Secondary outcomes

1. Maternal satisfaction
2. BF complications such as mastitis and breast abscess
3. Infant growth by weight and head circumference
4. Neonatal sepsis
5. Taking child to doctor
6. Hospital admission for child

Search methods for identification of studies

Electronic searches—We searched the Cochrane Pregnancy and Childbirth Group's Trials Register by contacting the Trials Search Co-ordinator (21 April 2010). We updated this search on 28 September 2011 and added the results to Studies awaiting classification.

The Cochrane Pregnancy and Childbirth Group's Trials Register is maintained by the Trials Search Co-ordinator and contains trials identified from:

1. quarterly searches of the Cochrane Central Register of Controlled Trials (CENTRAL);
2. weekly searches of MEDLINE;
3. weekly searches of EMBASE;
4. handsearches of 30 journals and the proceedings of major conferences;
5. weekly current awareness alerts for a further 44 journals plus monthly BioMed Central email alerts.

Details of the search strategies for CENTRAL and MEDLINE, the list of handsearched journals and conference proceedings, and the list of journals reviewed via the current awareness service can be found in the 'Specialized Register' section within the editorial information about the [Cochrane Pregnancy and Childbirth Group](#).

Trials identified through the searching activities described above are each assigned to a review topic (or topics). The Trials Search Co-ordinator searches the register for each review using the topic list rather than keywords.

In addition, we searched CENTRAL (*The Cochrane Library*, 2010, Issue 2) and MEDLINE (1966 to April 2010) and Scopus (January 1985 to April 2010) using the search strategies detailed in Appendix 1.

Searching other resources—We contacted investigators (identified from the retrieved articles) and other content experts known to us for unpublished studies. Furthermore, we looked for relevant studies in the references of the retrieved articles.

We did not apply any language restrictions.

Data collection and analysis

Selection of studies—Six review authors (Pisake Lumbiganon (PL) Ruth Martis (RM) Malinee Laopaiboon (ML) Mario R Festin (MF) Jacqueline J Ho (JH) and Mohammad Hakimi (MH)) independently assessed for inclusion all the potential studies we identified as a result of the search strategy. We resolved any disagreement through discussion.

Data extraction and management—We designed a form to extract data. For eligible studies, PL, RM, ML and MF extracted the data using the agreed form. At least two review authors independently carried out data extraction for each included study. We resolved discrepancies through discussion. PL and ML entered data into Review Manager software (RevMan 2011) and checked for accuracy.

When information regarding any of the above was unclear, we contacted authors of the original reports (Schlickau 2005a; Schlickau 2005b; Westdahl 2008) to obtain further details.

Assessment of risk of bias in included studies—Two review authors (PL, ML) independently assessed risk of bias for each study using the criteria outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). We resolved any disagreement by discussion.

(1) Sequence generation (checking for possible selection bias): We described for each included study the method used to generate the allocation sequence in sufficient detail to allow an assessment of whether it should produce comparable groups.

We assessed the method as:

- low risk of bias (any truly random process, e.g. random number table; computer random number generator);
- high risk of bias (any non-random process, e.g. odd or even date of birth; hospital or clinic record number); or
- unclear (insufficient information to allow judgment).

(2) Allocation concealment (checking for possible selection bias): We described for each included study the method used to conceal the allocation sequence and determined whether

the intervention allocation could have been foreseen in advance of, or during recruitment, or changed after assignment.

We assessed the methods as:

- low risk of bias (e.g. telephone or central randomisation; consecutively numbered sealed opaque envelopes);
- high risk of bias (open random allocation; unsealed or non-opaque envelopes, alternation; date of birth);
- unclear (insufficient information to allow judgment).

(3) Blinding (checking for possible performance bias): We described for each included study the methods used, if any, to blind study participants and personnel from knowledge of which intervention a participant received. We considered that studies were at low risk of bias if they were blinded, or if we judged that the lack of blinding could not have affected the results. We assessed blinding separately for different outcomes or classes of outcomes.

We assessed the methods as:

- low risk, high risk or unclear for participants;
- low risk, high risk or unclear for personnel;
- low risk, high risk or unclear for outcome assessors.

(4) Incomplete outcome data (checking for possible attrition bias through withdrawals, dropouts, protocol deviations): We described for each included study, and for each outcome or class of outcomes, the completeness of data including attrition and exclusions from the analysis. We stated whether attrition and exclusions were reported, the numbers included in the analysis at each stage (compared with the total randomised participants), reasons for attrition or exclusion where reported, and whether missing data were balanced across groups or were related to outcomes.

We assessed methods as:

- low risk of bias (20% or less missing data);
- high risk of bias (more than 20% missing data);
- unclear.

(5) Selective reporting bias: We described for each included study how we investigated the possibility of selective outcome reporting bias and what we found. We assessed the methods as:

- low risk of bias (where it was clear that all of the study's pre-specified outcomes and all expected outcomes of interest to the review had been reported);
- high risk of bias (where not all the study's pre-specified outcomes had been reported; one or more reported primary outcomes were not pre-specified; outcomes

of interest were reported incompletely and so could not be used; study fails to include results of a key outcome that would have been expected to have been reported);

- unclear.

(6) Other sources of bias: We described for each included study any important concerns we had about other possible sources of bias.

We assessed whether each study was free of other problems that could put it at risk of bias:

- low risk of bias;
- high risk of bias;
- unclear.

(7) Overall risk of bias: We made explicit judgements about whether studies were at high risk of bias, according to the criteria given in the *Handbook* (Higgins 2011). With reference to (1) to (6) above, we assessed the likely magnitude and direction of the bias and whether we considered it was likely to impact on the findings. We did not explore the impact of study quality using sensitivity analysis because we included a limited number of studies and did not combine studies in meta-analysis.

Measures of treatment effect—We carried out statistical analyses using the Review Manager software (RevMan 2011). We reported BF duration and other continuous outcomes using mean difference with 95% confidence intervals (CIs) because they were measured in the same way between studies. We reported initiation rate of breastfeeding and other binary outcomes using risk ratios and 95% CIs.

We evaluated the following comparisons:

1. an additional formal education programme versus routine care;
2. one form of education programme versus another form of education programme;
3. programmes involving multiple methods of providing education compared with those using a single method;
4. different combinations of multiple methods of providing education;
5. programmes involving multiple methods of providing education versus no formal education.

Unit of analysis issues—We included studies where individual women were randomised and cluster-randomised studies (CRT) where, for example, clinics were the unit of randomisation. Three included studies were cluster randomised trials and in two of these, in the published study reports some results had already been adjusted for clustering effects. For these two trials, where adjusted data were reported (as odds ratios), we have analysed data using the generic inverse variance method in RevMan 2011 and for these results we have presented results as odds ratios. Where there was no adjustment for cluster design effect and

there was insufficient information available to allow us to adjust the data ourselves (i.e. no ICC was provided or could be imputed) we have presented the raw data published in the study report.

In future updates, if we identify any more cluster-randomised trials we will include them in the analyses along with individually randomised trials. If adjustment for the cluster design effect has not already been made by trial authors, we will adjust their sample sizes using the methods described in the *Handbook* using an estimate of the intracluster correlation coefficient (ICC) derived from the trial (if possible), from a similar trial or from a study of a similar population. If we use ICCs from other sources, we will report this and conduct sensitivity analyses to investigate the effect of variation in the ICC. If we identify both cluster-randomised trials and individually-randomised trials, we plan to synthesise the relevant information. We will consider it reasonable to combine the results from both if there is little heterogeneity between the study designs and the interaction between the effect of intervention and the choice of randomisation unit is considered to be unlikely.

Dealing with missing data—For included studies, we have noted levels of attrition in the risk of bias tables.

In future updates, as more data become available, we will explore the impact of including studies with high levels of missing data in the overall assessment of treatment effect by using sensitivity analysis. For all outcomes, we will carry out analyses, as far as possible, on an intention-to-treat basis, i.e. we will attempt to include all participants randomised to each group in the analyses, and analyse all participants in the group to which they were allocated, regardless of whether or not they received the allocated intervention. The denominator for each outcome in each trial will be the number randomised minus any participants whose outcomes are known to be missing.

Assessment of heterogeneity—In this version of the review we did not assess heterogeneity because data from only one study was available for each outcome.

In the future, if we carry out meta-analysis, for the updated version we will assess statistical heterogeneity in each meta-analysis using the T^2 , I^2 and Chi^2 statistics. We will regard heterogeneity as substantial if I^2 is greater than 30% and either T^2 is greater than zero, or there is a low P-value (< 0.10) in the Chi^2 test for heterogeneity.

Assessment of reporting biases—We did not formally assess reporting bias; without access to study protocols it is difficult to know whether or not there has been outcome reporting bias. We were unable to assess publication bias using funnel plots, as only one study contributed data to each analyses.

Data synthesis—We did not do data synthesis in this version of the review. This was because no more than one study examining a particular type of intervention addressed any of the pre-specified outcomes. Also because postnatal care could have a possible influence on breast-feeding duration, the primary outcome of the review, and postnatal care may have varied widely across the included studies.

In future updates, if we include more studies, we will use fixed-effect meta-analysis for combining data where it is reasonable to assume that studies are estimating the same underlying treatment effect: i.e. where trials are examining the same intervention, and the trials' populations and methods are judged sufficiently similar.

If there is clinical heterogeneity sufficient to expect that the underlying treatment effects differ between trials, or if we detect substantial statistical heterogeneity, we will use random-effects meta-analysis to produce an overall summary if an average treatment effect across trials is considered clinically meaningful. We will treat the random-effects summary as the average range of possible treatment effects and we will discuss the clinical implications of treatment effects differing between trials. If the average treatment effect is not clinically meaningful we will not combine trials.

If we use random-effects analyses, we will present the results as the average treatment effect with its 95% CI, and the estimates of T^2 and I^2 .

Subgroup analysis and investigation of heterogeneity—In future updates, if we identify substantial heterogeneity, we will investigate it using subgroup analyses.

We plan to carry out subgroup analyses according to types of interventions. We will restrict subgroup analyses to the primary outcomes. We will conduct the analyses where sufficient data are available according to the following specified factors: type of intervention, study setting, maternal education and maternal occupation. For fixed-effect inverse variance meta-analyses we will assess differences between subgroups by interaction tests (Deeks 2001). For random-effects and fixed-effect meta-analyses using methods other than inverse variance, we will assess differences between subgroups by inspection of the subgroups' confidence intervals; nonoverlapping confidence intervals suggesting a statistically significant difference in treatment effect between the subgroups.

Sensitivity analysis—We did not carry out any sensitivity analyses. However, in future updates of this review, we plan to carry out sensitivity analysis to explore the effect of study quality. This will involve analyses based on the trial quality ratings for sequence generation, allocation concealment and incomplete outcome data. We will exclude studies of poor quality in the analysis (those categorised as 'high risk of bias' or 'unclear') in order to assess for any substantive difference to the overall results.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

Results of the search—The search of the Pregnancy and Childbirth Group's Trials Register yielded 57 potential studies. Our additional search yielded one potential study. We explored the contents, and grouped together trial reports for the same study; from this we identified 17 studies (involving 7131 women) that met the inclusion criteria. We excluded 40 studies.

We subsequently updated the search of the Pregnancy and Childbirth Group's Trials Register on 28 September 2011 and added the results to the awaiting classification section of the review - these will be incorporated into this review at the next update (expected early 2012) - see 'Characteristics of studies awaiting classification'.

Included studies—We included 17 studies. We have provided full details of included studies in the Characteristics of included studies tables. Of these, 14 studies involving 6932 women contribute data to the analyses for primary and secondary outcomes; three included studies (Kaplowitz 1983; Noel-Weiss 2006; Ryser 2004) met our inclusion criteria but did not report data on any of our prespecified outcomes. Kaplowitz 1983 described women's attitudes towards breastfeeding before and after the intervention and we have not included results from this study in the review. Ryser 2004 and Noel-Weiss 2006 report on breastfeeding at time points which we had not prespecified, and we have included a brief description of results from these studies following results for our primary and secondary outcomes.

Interventions—Interventions included routine breastfeeding (BF) education, formal BF education, printed information, video, peer counselling and lactation consultation (LC).

There were 18 comparisons from the 17 included studies which are described below (some studies with more than two experimental arms are included in more than one comparison).

There were six studies comparing a single method of BF education with routine care (Forster 2004; Kaplowitz 1983; Kluka 2004; Noel-Weiss 2006; Schlickau 2005b; Wolfberg 2004). Two of these studies (Kaplowitz 1983; Noel-Weiss 2006) compared formal BF education versus routine care but did not provide any information about breastfeeding practices. Two studies (Kluka 2004; Schlickau 2005b) compared a BF education workshop versus routine care. One study (Forster 2004) compared BF practical skills education versus BF attitude education versus. Another study (Wolfberg 2004) compared peer counselling for expectant fathers versus routine care.

There were four studies comparing one form of BF education versus other forms of BF education (Forster 2004; Kistin 1990; MacArthur 2009; Schlickau 2005a). One study (Kistin 1990) compared group education versus individual education, and Schlickau 2005a compared BF education discussion versus BF handouts. One study (Forster 2004) compared BF practical skills versus BF attitude education. Another study (MacArthur 2009) compared a peer support worker service with standard antenatal care, which included usual information and advice from midwives on breast feeding.

There were seven studies (Duffy 1997a; Finch 2002; Kools 2005; Lavender 2005; Rossiter 1994; Schlickau 2005a; Serwint 1996) examining programmes involving multiple methods of providing education compared to those using a single method. One study (Duffy 1997a) compared formal BF education and lactation consultation versus routine BF education. Finch 2002 compared LC plus incentive plus handout with formal BF education. One study (Kools 2005) compared LC and provision of a breast feeding booklet with the provision of a breast feeding booklet alone. Lavender 2005 compared routine BF education plus additional

formal BF education with routine BF education alone. Rossiter 1994 examined the effect of a video and formal BF education versus a BF pamphlet. One study (Schlickau 2005a) compared formal BF education and baby quarantine versus routine BF education, and formal BF education and baby quarantine versus formal BF education. Finally, Serwint 1996 compared LC and routine BF education versus routine BF education alone.

There was only one study (Mattar 2007) comparing different combinations of multiple interventions; this study compared a BF booklet plus a video and LC versus a BF booklet and video only. There were two studies (Mattar 2007; Ryser 2004) comparing programmes involving multiple methods of providing education versus no formal education. One study (Mattar 2007) compared a BF booklet, video and lactation consultation versus no formal BF education. Another study (Ryser 2004) compared a counselling session plus viewing video plus the provision of written materials addressing common BF barriers perceived by low-income women versus no formal BF education. This study did not provide any information on our proposed outcomes and has not been included in the analyses.

In studies where BF 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 (e.g. provision of a leaflet or midwife advice). We have set out information about care for control groups in the Characteristics of included studies and it is important that this is taken into account in the interpretation of results. Intrapartum and postpartum care could also have an impact on BF duration and these aspects of care also varied across included studies.

Excluded studies—We excluded 39 studies. Reasons for exclusion included: the intervention was not confined to the antenatal period only or was not an educational intervention, or the paper did not report on a randomised controlled study. For further details, see the Characteristics of excluded studies table.

We have not considered educational and support interventions to promote breastfeeding in the intrapartum and postnatal periods in this review; related Cochrane reviews (Britton 2007; Dyson 2005) examine these topics.

Risk of bias in included studies

We have provided details of the methodological quality of each study in the Characteristics of included studies tables and the methodological quality summary (Figure 1) and methodological quality graph (Figure 2).

Allocation—Six out of 17 included studies (Forster 2004; Kistin 1990; Kools 2005; MacArthur 2009; Mattar 2007; Serwint 1996) had adequate sequence generation for randomisation.

Six out of 17 included studies (Forster 2004; Kluka 2004; Lavender 2005; Mattar 2007; Noel-Weiss 2006; Schlickau 2005b) had adequate allocation concealment.

Blinding—Only six included studies (Duffy 1997a; Kluka 2004; Lavender 2005; MacArthur 2009; Mattar 2007; Noel-Weiss 2006) had implemented blinding; however, this blinding was only for the outcome assessors. This is perhaps mainly due to the nature of the interventions in that it was not possible to blind both mothers and educators.

Incomplete outcome data—Ten out of 17 included studies (Forster 2004; Kluka 2004; Kools 2005; Lavender 2005; MacArthur 2009; Mattar 2007; Noel-Weiss 2006; Ryser 2004; Schlickau 2005b; Serwint 1996) had addressed issues concerning incomplete outcome data.

Selective reporting—Since we did not have access to the protocols of all included studies, we assessed their risk of bias for selective reporting as unclear.

Other potential sources of bias—Five out of 17 included studies (Duffy 1997a; Kluka 2004; Kools 2005; Lavender 2005; Schlickau 2005a) had unclear risk of other potential sources of biases.

We consider that one of the included studies (Mattar 2007) had low risk of bias. Two studies had high risk of bias (Finch 2002; Wolfberg 2004).

Effects of interventions

This review includes 17 studies with 7131 women. However, for our primary and secondary outcomes only 14 studies with 6932 women contributed data for analyses. The interventions for increasing BF duration differed among the studies, and due to variation in the types of interventions we were unable to combine results from studies in meta-analysis; for each different type of intervention only a single study contributed outcome data. Some studies had more than two treatment arms and are included in more than one comparison.

We have presented effects of interventions for each comparison as follows.

1. Formal breastfeeding education versus routine care

Initiation of BF: One study (Schlickau 2005b) involving 86 women compared a BF education workshop with routine care. There was no significant difference in initiation of BF (risk ratio (RR) 1.19, 95% confidence interval (CI) 0.97 to 1.45). A study by Wolfberg 2004 involving 59 women compared peer counselling versus routine care and showed a significant increase in the initiation of BF in the intervention group (RR 1.82, 95% CI 1.13 to 2.93). One study (Forster 2004) compared BF practical skills education versus routine care and BF attitudes education versus routine care. There were no significant differences in initiation of BF (RR 1.01, 95% CI 0.98 to 1.04 and RR 0.99, 95% CI 0.95 to 1.02 respectively) (Analysis 1.1)

Breastfeeding and exclusive breastfeeding: Kluka 2004 compared a BF education workshop with routine care. This study involved 195 women and no significant increases were found either in BF at three months (RR 1.07, 95% CI 0.92 to 1.24) or in exclusive BF at three months (RR 1.08, 95% CI 0.84 to 1.38). There were 178 women remaining in the sample at six months and no significant increases were found in BF (RR 1.15, 95% CI 0.87 to 1.51) or in exclusive BF (RR 1.13, 95% CI 0.70 to 1.80). One study (Forster 2004)

compared BF practical skills education versus routine care. There were no significant differences in BF at six months and exclusive BF at six months. The RRs and 95% CIs were 1.01 (0.87 to 1.7) and 1.19 (0.69 to 2.05) respectively. This study (Forster 2004) also compared BF attitudes education versus routine care. There were also no significant differences in BF at six months and exclusive BF at six months. The RRs and 95% CIs were 0.92 (0.79 to 1.07) and 1.16 (0.67 to 2.01) respectively. (Analysis 1.2; Analysis 1.3; Analysis 1.4; Analysis 1.5)

Non-prespecified outcomes: There were two studies that reported BF practices at time points not pre-specified for this review. One study (Noel-Weiss 2006) compared a BF education workshop with routine care. It involved 92 women and no significant increases were reported for BF at eight weeks (RR 0.91, 95% CI 0.75 to 1.11) and exclusive BF at eight weeks (RR 0.82, 95% CI 0.60 to 1.12) (data not shown in data and analyses tables). Another study (Ryser 2004) compared a BF education programme with routine care. It involved 54 women and outcomes were reported at seven days; at this time point significant increases were reported in BF (RR 1.21, 95% CI 1.03 to 1.42) (data not shown in data and analyses tables).

One form of formal breastfeeding education versus another form of breastfeeding education

Initiation of breastfeeding: One cluster-randomised trial (MacArthur 2009) involving 2511 women compared an antenatal peer support worker service planned with routine care. In this study the planned intervention involved a minimum of two contacts with women to provide advice, information and support from approximately 24 weeks' gestation within the antenatal clinic or at home. Women in the control group received standard antenatal care, which included the usual information and advice from midwives on BF, without input from community peer support workers. There was no significant difference between groups in the initiation of BF (adjusted odds ratio (OR) 1.11, 95% CI 0.86 to 1.43). Another study (Forster 2004) compared BF practical skills education versus BF attitudes education. There was no significant difference between groups in the initiation of BF (RR 1.03, 95% CI 0.99 to 1.07) (Analysis 2.1).

Breastfeeding at three months: One study (Kistin 1990) involving 74 women compared group discussion versus individual discussion and reported no significant increase in BF at three months (RR 2.84, 95% CI 0.61 to 13.18) (Analysis 2.2).

Breastfeeding at six months: Forster 2004 compared BF practical skills education versus BF attitudes education. There was no significant difference between groups for this outcome (RR 1.21, 95% CI 0.87 to 1.67) (Analysis 2.3).

Exclusive breastfeeding at six months: There was no evidence of differences between groups receiving practical skills education versus BF attitudes education for exclusive breastfeeding at six months (RR 1.03, 95% CI 0.61 to 1.73) (Forster 2004) (Analysis 2.4).

Duration of any breastfeeding: One study involving 16 women reported the comparison of formal BF education with routine BF education (Schlickau 2005a). The mean difference (MD) in duration of any BF in the two groups was not statistically significant, (MD 6.2 months, 95% CI -10.84 to 23.24 months) (Analysis 2.5).

Programs involving multiple methods of providing breastfeeding education versus a single method

Initiation of breastfeeding: One study involving 144 women (Serwint 1996) compared LC plus routine BF education versus routine BF education alone. There was no significant difference in the initiation of BF (RR 1.33, 95% CI 0.86 to 2.07) (Analysis 3.1).

Breastfeeding at three months: A cluster randomised trial (Kools 2005) involving 698 women comparing LC plus a BF booklet versus a BF booklet alone reported no significant difference in BF at three months (adjusted OR 0.82, 95% CI 0.59 to 1.14) (Analysis 3.2).

Breastfeeding at six months: Two studies (Lavender 2005; Rossiter 1994) involving 1425 women reported this outcome. The study by Rossiter 1994 involved 175 women and compared video plus formal BF education with the provision of pamphlets. There was no significant difference in BF at six months (RR 1.59, 95% CI 0.86 to 2.94). In a cluster-randomised trial (Lavender 2005) involving 1250 women comparing routine BF education plus formal BF education with routine BF education alone, there was no significant difference in BF at six months (RR 0.97, 95% CI 0.79 to 1.19). The RR was analysed without adjusting for clustering effect because the information to carry out any adjustment for this outcome was not available in the paper (Analysis 3.3).

Exclusive breastfeeding at three months: One CRT (Kools 2005) involving 698 women compared lactation consultation plus a BF booklet with provision of a BF booklet alone and reported no significant differences between the two groups in exclusive BF rates at three months (RR 0.85, 95% CI 0.68 to 1.08). (We analysed the RR for this outcome without being adjusted for cluster design effect as we did not have sufficient information to carry out the adjustments. Information on the ICC was not provided in the paper and we were unable to impute an ICC from another source as we were unable to identify any published papers reporting an ICC for a similar population (Analysis 3.4).

Duration of any breastfeeding: One study (Schlickau 2005a) involving 25 women compared formal BF education plus baby quarantine versus routine BF education. There was no significant difference in mean duration of BF (MD 14.20 days, 95% CI -2.97 to 31.37 days). This study also compared formal BF education plus baby quarantine versus formal antenatal BF education, and again reported no significant difference in the duration of any BF (MD 8.00 days, 95% CI -6.84 to 22.84 days) (Analysis 3.5).

One study (Finch 2002) involving 48 women compared LC plus incentive versus routine BF education; there were no significant differences in duration of BF between intervention and control group (median 12 versus six weeks, data not shown in the analysis).

Mastitis and other breastfeeding complications: Duffy 1997a compared formal BF education plus lactation consultation versus routine BF education. There was no significant difference in mastitis (RR 0.20, 95% CI 0.01 to 4.02); however, a significant reduction in nipple pain as measured by visual analogue scale (VAS) scores was recorded (MD -19.80, 95% CI -23.23 to -16.37). The VAS ranged from 0 to 10 with a '0' representing 'no pain' and an increase to a maximum of 10 representing 'pain as bad as it could possibly be'. Significantly less nipple trauma measured by NTI scores was reported for the group receiving formal BF education plus lactation consultation (MD 38.65, 95% CI 32.95 to 44.35). The possible range of NTI was 0 to 34 with a higher NTI score indicating less trauma (Analysis 3.6; Analysis 3.7; Analysis 3.8).

Different combinations of multiple methods of providing breastfeeding education—One study (Mattar 2007) compared a BF booklet plus video plus lactation consultation versus a BF booklet plus video.

Exclusive breastfeeding at three and six months: Mattar 2007 reported no significant difference in exclusive BF at three months (RR 1.29, 95% CI 0.80 to 2.06) (Analysis 4.1).

Exclusive breastfeeding at six months: At six months Mattar 2007 reported a significant increase in exclusive BF in the group receiving a booklet plus video plus lactation consultation compared with the group who received a booklet plus video only (RR 2.23, 95% CI 1.01 to 4.92) (Analysis 4.2).

Programme involving multiple methods versus no formal education— Mattar 2007 also compared BF booklet plus video plus LC versus no formal BF education.

Exclusive breastfeeding at three months: The study involved 159 women and reported a significant increase in exclusive BF at three months in the group who received a BF booklet plus video plus LC compared with the group who received no formal education (RR 2.02, 95% CI 1.16 to 3.49). (Analysis 5.1).

Exclusive breastfeeding at six months: The study involved 175 women and reported no significant difference in exclusive BF at six months (RR 2.11, 95% CI 0.99 to 4.52) (Analysis 5.2).

DISCUSSION

Summary of main results

When compared with routine care, peer counselling significantly increased initiation of BF.

We found no intervention to be significantly more effective than any other intervention in increasing BF initiation or BF duration. A combined BF educational intervention was not found to be significantly better than a single intervention in initiating BF or increasing BF duration. However, in one trial a combined BF educational intervention significantly reduced nipple pain and trauma. There was a marginally significant increase in exclusive BF at six months in a group receiving a booklet plus video plus lactation consultation (LC)

compared with the booklet plus video group. A BF booklet plus video plus LC was significantly better than no formal BF education for exclusive BF at three months.

We would like to emphasise that all four significant results are based on findings from single studies.

Overall completeness and applicability of evidence

All studies except one were from developed countries, mainly the USA, Canada, Australia and the UK. Applying the results to low and middle-income countries should be done cautiously. Although we have 17 included studies, there were diverse interventions among these studies. There were no outcomes where we could combine data from two or more studies. The overall completeness of evidence in this review is therefore too limited to make any strong conclusions or generalisations.

Quality of the evidence

We included 17 studies but only 14 studies with 6932 women could provide data for the analysed results. However, all except one included studies (Mattar 2007) had either unclear or high risk of bias. Moreover, there were wide variations in the nature of BF educational interventions as well as in reported outcomes between studies. Therefore the internal validity of the results of this review is limited.

Potential biases in the review process

We strictly followed the review process recommended by Cochrane Pregnancy and Childbirth Review Group. We obtained all relevant studies identified from search results. We independently reviewed all potentially relevant studies and resolved disagreement by discussion. Potential bias in the review process should be minimal.

Agreements and disagreements with other studies or reviews

A systematic review of professional support interventions for breastfeeding concluded that interventions expanding from pregnancy to the intrapartum period and throughout the postnatal period were more effective than interventions concentrating on a shorter period. In addition, intervention packages using various methods of education and support from well-trained professionals are more effective than interventions concentrating on a single method (Hannula 2008). However, this review included not only educational but also support interventions and did not restrict the included studies to RCTs.

Another Cochrane review found that health education and peer support interventions can result in some improvements in the number of women beginning to breast feed (Dyson 2005). We also found that peer counselling was significantly better than formal BF education in initiation of BF.

AUTHORS' CONCLUSIONS

Implications for practice

Peer counselling alone was found to be effective in increasing initiation of BF. A combination of a BF booklet, video and LC was found to be effective in increasing BF at three months when compared with routine care. A combination of BF booklet, video and LC was found to be more effective in increasing exclusive BF at six months when compared with BF booklet and video. However, because there were significant methodological limitations among included studies and the observed effect sizes were small, it is not appropriate to recommend any antenatal BF educational intervention.

Implications for research

There is an urgent need to conduct a high-quality, randomised controlled study with an adequate sample size and that is free from commercial influence to evaluate the effectiveness of BF education, e.g. peer counselling, LC, etc. in low- and middle-income countries where BF should have a more significant impact.

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The World Health Organization retains copyright and all other rights in the manuscript of this Review as submitted for publication, including any revisions or updates to the manuscript which WHO may make from time to time.

As part of the pre-publication editorial process, this review has been commented on by three peers (an editor and two referees who are external to the editorial team), a member of the Pregnancy and Childbirth Group's international panel of consumers and the Group's Statistical Adviser.

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Appendix 1. Search strategies

Authors wrote and ran these searches.

CENTRAL (*The Cochrane Library 2010, Issue 2*)

- #1 antenatal (MeSH)
- #2 prenatal (MeSH)
- #3 education*
- #4 BF
- #5 (breast next feeding)
- #6 breastfeeding
- #7 lactation*
- #8 nursing
- #9 (#1 or #2)
- #10 (#4 or #5 or #6 or #7 or #8)
- #11 (#9 and #3 and #10)

MEDLINE (January 1966 to April 2010) and SCOPUS (January 1985 to April 2010)

- #1 antenatal[tiab]
- #2 prenatal care[mh]
- #3 (#1 or #2)
- #4 breastfeeding
- #5 breast feeding
- #6 lactation
- #7 nursing
- #8(#4 or #5 or #6 or #7)
- #9 randomised controlled trial[pt]
- #10 controlled clinical trial[pt]
- #11 randomised[tiab]
- #12 placebo[tiab]
- #13 groups[tiab]
- #14 cluster[tiab]

#15(#9 or #10 or #11 or #12 or #13 or #14)

#16 education

#17 (#3 and #8 and #15 and #16)

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Duffy 1997a

Methods	Randomised controlled trial. Using a sealed envelope containing group allocation in blocks of 12, with 6 in the control and 6 in the experimental group. Random assignment was carried out by the lactation consultant giving the educational session.	
Participants	Number of women randomised: 75 Inclusion criteria Attended antenatal classes in the study hospital, and intended to BF. Verbal and written explanation was given. Explained the completely voluntary and confidential nature of the study Exclusion criteria Delivered less than 37 weeks. With medical complications.	
Interventions	Experimental group (n = 37) An additional 1-hour teaching session for nulliparas more than 36 weeks' pregnant. The teaching intervention was through a lactation consultant, not involved in the data collection. The content of the teaching session was correct positioning and attachment of the baby on the breast for feeding Control group (n = 38) Standard educational program of the study hospital.	
Outcomes	Outcome measures (dichotomous) Primary <ul style="list-style-type: none">Incidence of BF at 6 weeks postpartum. Secondary <ul style="list-style-type: none">Mastitis. Outcome measures (continuous) Primary <ul style="list-style-type: none">LATCH score. Secondary <ul style="list-style-type: none">Nipple pain (VAS).Nipple trauma (NTI score).	
Notes	Loss of participants to follow up: < 10%. Blinding: outcome assessors. This study was conducted in Western Australia.	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Sealed envelope (not described whether it was opaque or not)
Blinding (performance)	Low risk	Only outcome assessors.

bias and detection bias) All outcomes		
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No details available.
Selective reporting (reporting bias)	Unclear risk	No information.
Other bias	Unclear risk	No other obvious biases.

Finch 2002

Methods	Randomised controlled trial.	
Participants	Number of women randomised: 60 Inclusion criteria English speaking pregnant, HIV negative women. Exclusion criteria Not specified.	
Interventions	Experimental group (n = 30) BF education by trained LC, incentive, instruction and discussion with handout Control group (n = 30) Prenatal educational regarding benefit and barriers to BF.	
Outcomes	<ul style="list-style-type: none">• Duration of BF.• Feeding intentions.	
Notes	This study was conducted in New York, USA.	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information available.
Allocation concealment (selection bias)	Unclear risk	No information available.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information available.
Incomplete outcome data (attrition bias) All outcomes	High risk	Loss to follow-up in intervention group 36.7% (11/30) , in control group 3.3% (1/30)
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Low risk	No other obvious biases.

Forster 2004

Methods	Randomised controlled trial.	
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Random allocation to a control group or one or two intervention groups, randomised by an external computerised system accessed by telephone by a research midwife	
Participants	<p>Number of women randomised: 984</p> <p>Inclusion criteria Women booked as public patients. Women who were primiparas. Women pregnant between 16 and 24 weeks. Women able to read and write in English.</p> <p>Exclusion criteria Women with physical problems that prevented BF. Women who chose private obstetric care. Women choosing to give birth at birth centre</p>
Interventions	<p>Experimental group: Group 1: 1.5hr session on practical BF using teaching aids. Latch-on technique demonstrated with dolls and knitted breasts, also BF complications and management. Plus access standard care available Group 2: Two 1hr sessions that focused on changing attitudes to BF. Women were encouraged to bring their partners or a significant other. Session one included information about BF advantages, views and attitudes of participants, their friends and families and society. For session two participants were encouraged to interview their own mother or her partner's mother about attitudes of breastfeeding, which then was reflected and discussed in this session. Access standard care available</p> <p>Control group: Able to access standard care, which included formal BF education sessions etc</p>
Outcomes	<p>Duration of any breastfeeding at 2-4 days, excluded babies yet not feeding. Duration of exclusive breastfeeding at 2-4 days, excluded babies yet not feeding. Number of mothers any breastfeeding at 6 months. Number of mothers exclusive breastfeeding at 6 months.</p>
Notes	<p>Loss of participants to follow-up and reasons: < 10%. Blinding: unclear. Intention-to-treat analysis: used. Each intervention group was compared only with the group of women allocated to standard care; they were not compared with each other</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A computerized system of biased urn randomization was accessed by telephone by the research midwife to ascertain women's group allocation"
Allocation concealment (selection bias)	Low risk	"A computerized system of biased urn randomization was accessed by telephone by the research midwife to ascertain women's group allocation"
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	The follow-up rate in practical skill, attitudes, standard care were 91%, 90% and 91%, respectively
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Unclear risk	No other obvious biases.

Kaplowitz 1983

Methods	Randomised controlled trial.
Participants	44 consecutive women from 2 upstate New York Women, Infants and Children (WIC) programmes, at least 18 years old, in fourth to sixth month of pregnancy, primigravida or women

who had bottle-fed previous children or who had had an unsuccessful BF experience were randomly assigned to experimental (21 women) or control (23 women) groups		
Interventions	Intervention group (21 women) 5 pamphlets providing information on the benefits of BF, basic physiology of lactation, proper nursing technique were mailed to the women's homes one at a time over 5 consecutive weeks Control group (23 women) Did not receive pamphlets.	
Outcomes	<ul style="list-style-type: none">• Women’s knowledge about nursing after the intervention.• Attitude toward BF before and after the intervention. <p>These outcomes were not relevant to the review objective.</p>	
Notes	This study was conducted in New York. No information about BF practice available.	
Risk of bias		
Bias	Authors’ judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not described.
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Unclear risk	Inadequate information.

Kistin 1990

Methods	Randomised controlled trial. Women in Monday clinic were randomised with a random number table into 2 intervention groups Friday clinic became control group (not randomised, therefore data can not be used, both intervention groups data can be compared, as they were randomised)
Participants	Number of women randomised: 74 Inclusion criteria Women 24 weeks' gestation or less. Black women born in the USA. Exclusion criteria None mentioned.
Interventions	Describe: 2 types of prenatal education. Individual BF and antenatal BF class Experimental groups Intervention group 1 (38 women): antenatal group BF class, 50-80 minutes, at least 1 session discussing myths, problems and benefits of BF Intervention group 2 (36 women): individual pre-counselling with a nurse practitioner or paediatrician, 1-to-1 15-30 minutes between 30-40 weeks' gestation, similar topics discussed in IG1 Control group Normal antenatal care. No additional information but not randomised, therefore data excluded, and not included in our analysis
Outcomes	<ul style="list-style-type: none"> • Duration of any BF 2 weeks. • Duration of any BF 6 weeks.

- Any BF at 3 months.

Notes	Loss of participants to follow-up: 18.2%. Blinding: participants; no, counsellors; not feasible, outcome assessors; not clear. Intention-to-treat analysis: not clear. This study was conducted in Chicago, USA.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Table of random number was used.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information.
Selective reporting (reporting bias)	Unclear risk	Information not available.
Other bias	Low risk	No other obvious biases.

Kluka 2004

Methods	Randomised controlled trial.	
Participants	Number of women randomised: 209 Inclusion criteria Primiparous women who were planning to BF their infants. Exclusion criteria None mentioned.	
Interventions	Describe: Experimental group: 111 women Usual care plus a self-assessment pre-workshop guide and an interactive, educational, antenatal workshop Control group: 98 women Usual care.	
Outcomes	• BF at 3 and 6 months.	
Notes	This study was conducted in Canada.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Low risk	Opaque sealed envelopes.
Blinding (performance bias and detection bias) All outcomes	Low risk	Outcome assessors.

Incomplete outcome data (attrition bias) All outcomes	Low risk	Comparable loss to follow up (< 20% at 6 months in both arms)
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Low risk	No other obvious biases.

Kools 2005

Methods	Cluster randomisation of 10 home healthcare centres. Coin flip determined which centres would receive intervention Clusters had comparable overall pre-randomisation rates and sizes
Participants	Number of women randomised: 781 Inclusion criteria Women considering BF. All pregnant women using the identified 3 home healthcare organisations and from their 10 centres. Women pregnant in their 7 th month of pregnancy. Exclusion criteria Women with babies weighing < 2000 g.
Interventions	Experimental group 408 women received standard care and BF booklet, which was used and referred to by caregiver at each consultation (which included practical instructions on BF, discussion around how to cope with BF, motivational discussion to initiate and maintain BF and additional information if asked for). Opportunity to access 24-hour free lactation consultant Control group 373 received standard antenatal care and BF booklet and phone number for BF questions or BF problems
Outcomes	<ul style="list-style-type: none"> Number of mothers any BF at birth. Number of mothers BF exclusively at birth. Number of mothers any BF at 3 months. Number of mothers exclusive BF at 3 months.
Notes	Loss of participants to follow up: < 10%. Blinding: participants; no, others unclear. Intention-to-treat analysis: used. This study was conducted in Maastricht, Netherlands.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Coin flip.
Allocation concealment (selection bias)	Unclear risk	Coin flip was used.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Minimal loss to follow-up in experimental group and no loss to follow-up in control group

Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Unclear risk	No other obvious biases.

Lavender 2005

Methods	Cluster-randomised controlled study. Unit of randomisation: 8 electoral wards in one county, pairs were matched by according to Jarman Underprivileged area score (UPA) Within pair randomised = 4 clusters each. Opaque sealed envelopes.	
Participants	Number of women randomised: 1312 Inclusion criteria Women registered with a practice site/GP in one of the 8 wards. Women who expressed a desire to BF. Women with no detected fetal abnormality at 20 week ultrasound Exclusion criteria Women with detected fetal abnormality. Women who gave birth before 36 weeks' gestation. Women who lived in potentially unsafe homes. Women who planned to bottle feed. Women who had previously BF for at least six weeks.	
Interventions	Describe: 1 antenatal BF education session with the woman's attending community midwife. Midwives were trained for this intervention. Experimental group (n = 633) Normal antenatal care plus during third trimester attendance of a single antenatal BF education session. Each session involved up to 8 women and was facilitated by a qualified infant feeding co-ordinator Control group (n = 679) Received standard antenatal care that included BF advice from attending clinic midwives	
Outcomes	<ul style="list-style-type: none">• Number of mothers any BF at hospital discharge.• Number of mothers any BF at 2 weeks.• Number of mothers any BF at 4 weeks.• Number of mothers any BF at 6 weeks.• Number of mothers any BF at 4 months.• Number of mothers exclusive BF at 4 months.• Number of mothers any BF at 6 months.• Number of mothers any BF at 12 months.	
Notes	Loss of participants to follow-up: < 10%. Blinding: participants: not feasible, counsellors: no, outcome assessors: yes. Intention-to-treat analysis: used. This study was conducted in Northwest UK.	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Low risk	Opaque sealed envelopes were used.
Blinding (performance)	Low risk	Outcome assessors were blinded.

bias and detection bias) All outcomes		
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow up < 10% in both arms.
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Unclear risk	No other obvious biases.

MacArthur 2009

Methods	Cluster-randomised controlled trial.
Participants	66 antenatal clinics with 2511 pregnant women: 33 clinics including 1140 women were randomised to receive the peer support worker service 33 clinics including 1371 women were randomised to receive standard care
Interventions	Intervention group (1140 women) An antenatal peer support worker service planning a minimum of 2 contacts with women to provide advice, information, and support from approximately 24 weeks' gestation within the antenatal clinic or at home. The trained peer support workers were of similar ethnic and socio-demographic backgrounds to their clinic population Control group (1371 women) Women in the control clusters received standard antenatal care, which included usual information and advice from midwives on BF without input from community peer support workers
Outcomes	Initiation of BF obtained from computerised maternity records of the hospitals where women from the primary care trust delivered
Notes	This study was conducted in Birmingham, UK.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Low risk	Data on outcome were supplied to the research team in an anonymous format
Incomplete outcome data (attrition bias) All outcomes	Low risk	113 out of 2511 women (4.5%) who participated in the trial were not available for primary outcome assessment
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Low risk	No other obvious biases.

Mattar 2007

Methods	Randomised controlled trial. A computer-generated list was used to randomise the women into the 3 groups. Each woman was allocated to the intervention group next on the list after written informed consent had been obtained.
Participants	<p>Number of women randomised: 401</p> <p>Inclusion criteria Singleton pregnancy, gestation of at least 36 weeks at recruitment, no uterine scar, and the absence of any obstetric complication that would contraindicate vaginal delivery, with informed consent</p> <p>Exclusion criteria Not described.</p>
Interventions	<p>Describe Intervention: multiple versus single.</p> <p>Experimental group Group A: received an information booklet describing the techniques and benefits of BF, which was written and published by the hospital's BF support group. It contained practical advice on feeding techniques, expressing breast milk, and management of common BF problems. Patients also watched a 16-minute educational video entitled "14 Steps to Better BF" (InJoy Videos, Boulder, CO), in which the benefits of BF were introduced, correct positioning, latch-on, and breast care were demonstrated, and common concerns (such as nipple pain) discussed. In addition, each woman had one 15-minute session with a lactation counsellor who examined the woman's nipples to assess adequacy for BF and answered questions on BF Group B received: the same booklet and watched the same video but did not have an individual session with the lactation counsellor</p> <p>Control group Received the BF booklet, did not watch the video, and did not have counselling</p>
Outcomes	<ul style="list-style-type: none"> • Number of mothers BF at 3 months. • Number of mothers BF at 6 months.
Notes	<p>Loss of participants to follow-up: 10%.</p> <p>Blinding: only outcome assessor.</p> <p>Intention-to-treat analysis addressed: yes.</p> <p>This study was conducted in Singapore.</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated list.
Allocation concealment (selection bias)	Low risk	Each woman was allocated to the intervention group next on the list after written informed consent had been obtained
Blinding (performance bias and detection bias) All outcomes	Low risk	Outcome assessors were blinded.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow-up 10%.
Selective reporting (reporting bias)	Unclear risk	Information not available.
Other bias	Low risk	No other obvious biases.

Noel-Weiss 2006

Methods	Randomised controlled trial.	
Participants	Number of women randomised: 101 inclusion criteria Nulliparous women expecting a single child, an uncomplicated birth, and planning to BF. The women had to read and write in English and have a telephone to complete the postpartum questionnaires. To remain in the study, a mother and her infant had to be discharged at the same time and be able to BF without restriction Exclusion criteria Not described.	
Interventions	Describe: workshop. Experimental group (n = 47) Standard care plus a 2.5-hour prenatal BF workshop designed using Bandura’s theory of self-efficacy and adult learning principles. The intervention involved the use of lifelike dolls, videos, and discussion in a comfortable atmosphere Control group (n = 45) Standard care.	
Outcomes	<ul style="list-style-type: none">• Maternal BF self-efficacy.• BF duration measured at 4 weeks and 8 weeks postpartum.	
Notes	This study was conducted in Ontario, Canada.	
Risk of bias		
Bias	Authors’ judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not available.
Allocation concealment (selection bias)	Low risk	Used sealed, sequentially numbered, opaque envelope containing a slip of paper stating either Control or Workshop
Blinding (performance bias and detection bias) All outcomes	Low risk	Only outcome evaluators.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Analysed the data with both the intention-to-treat assumption and using the actual workshop attendance. 101 randomised and 92 were available for analysis
Selective reporting (reporting bias)	Unclear risk	Protocol not available.
Other bias	Low risk	No other obvious biases.

Rossiter 1994

Methods	Randomised controlled trial, did not describe how randomisation was done	
Participants	<p>Number of women randomised: convenience sample of 194 pregnant women.</p> <p>Inclusion criteria</p> <ol style="list-style-type: none"> 1 Ethnic Vietnamese or other women who were born and reared in Vietnam. 2 Vietnamese speaking. 3 At least 12 weeks pregnant. 4 Gave consent to participate. <p>Exclusion criteria</p>	

Unforeseen circumstances (miscarriage, stillbirth, change of address)		
Interventions	Describe intervention: culture and language specific educational programme. Experimental group A 25-minute videotape programme followed by a series of 3 × 2 hours of small-group discussion sessions conducted in Vietnamese Control group BF and childbirth pamphlets.	
Outcomes	<ul style="list-style-type: none">• Number of mothers BFat birth.• Number of mothers BF at 4 weeks.• Number of mothers BF at 6 months.	
Notes	Loss of participants to follow-up: < 10%. Blinding: Participant: not feasible. Clinician: unclear. Outcome assessor: unclear. Intention-to-treat analysis: unclear. This study was conducted in Sydney, Australia.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Loss to follow-up < 10% in both arms.
Selective reporting (reporting bias)	Unclear risk	Information not available.
Other bias	Low risk	No other obvious biases.

Ryser 2004

Methods	Randomised controlled trial.
Participants	Total number of women randomised: 54 Pregnant women, at least 18 years old, English speaking, able to read and write, received prenatal care and could attend 4 visits before delivery, low income, having access to telephone, undecided about BF method during initial contact with researchers
Interventions	Intervention group (26 women) Educational program (Best Start) included: <ol style="list-style-type: none"> counselling session. viewing video. written materials addressing common BF barriers perceived by low-income women. Control group (28 women) No exposure to the program.

Outcomes	<ul style="list-style-type: none"> • Attitude toward BF. • Social and professional support. • BF sense of control. • Intention to BF. • BF at 7 days delivery.
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Notes	This study was conducted in Houston, Texas, USA.
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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Women selected a sealed envelope. No information about envelopes
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	No loss to follow-up.
Selective reporting (reporting bias)	Unclear risk	No protocol was available.
Other bias	Low risk	No other obvious biases.

Schlickau 2005a

Methods	Randomised controlled trial. Method of randomisation was not described
Participants	<p>Number of women randomised: 30</p> <p>Inclusion criteria Low-risk primigravida, Hispanic, in their third trimester, received care at Sedgwick, not planning to work outside the home for 6 months.</p> <p>Exclusion criteria Not described.</p>
Interventions	<p>Describe intervention: prenatal BF education (PBE).</p> <p>Experimental group Level 1: the researcher approached the expectant mother. All participants confirmed that they planned to BF. Contents included benefits of BF. Charts and pictures were used to present supply-and-demand concept and prenatal breast preparation. Early and consistent BF practices were emphasised. A doll was used as a model for instruction about holding and positioning the baby and BF discreetly Level 2: completed first level. Participants were introduced the concept of "baby quarantine" (nothing enters the baby's mouth except the mother's breast for at least 40 days after birth. The benefits of avoiding bottles, pacifier and supplementation to promote establishment of milk for successful BF were reinforced. BF commitment was encouraged through the use of checklist.</p> <p>Control group Standard of care offered advice to BF and handouts were distributed during the initial prenatal visit</p>
Outcomes	<ul style="list-style-type: none"> • Number of mothers BF at 45 days. • Duration of any BF.
Notes	<p>Loss of participants to follow-up: 17%.</p> <p>Blinding: Participant: not feasible.</p>

Clinician: unclear.
 Outcome assessor: unclear.
 Intention-to-treat analysis: unclear.
 This study was conducted in Kansas, USA.

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Loss of participants to follow-up: 17%.
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Unclear risk	Not enough information.

Schlickau 2005b

Methods	Randomised controlled trial.	
Participants	Number of women randomised: 86 Inclusion criteria Primigravida, immigrant Hispanic women aged 15-45 , 32-36 weeks' gestation, stable family situation, had a work situation compatible with BF for 6 weeks, had normal nipple assessment Exclusion criteria Homeless, not in a temporary agencies or shelter, high-risk pregnancies, serious illness of the newborn or mother that precluded BF, stillbirth, unforeseen family situation	
Interventions	Describe intervention: prenatal BF education (PBE) Experimental group (44) BF education workshop. Control group (42) No formal BF education.	
Outcomes	<ul style="list-style-type: none">• Initiation of BF.• Duration of any BF.	
Notes	This study was conducted in Kansas, USA.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Low risk	Manila packet sealed envelopes.

Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow-up in intervention group (9.1%, 2/44), in control group (9.5 %, 4/42)
Selective reporting (reporting bias)	Unclear risk	Protocol not available.
Other bias	Low risk	No other obvious biases.

Serwint 1996

Methods	Randomised controlled trial. Random number table was used. Method of randomisation was not described
Participants	Number of women randomised: 156 Nulliparous women, 18 years or older, with a fetus of gestational age of 28 weeks or less, who had not yet selected a paediatrician or wanted their infants to receive paediatric care at the hospital-based paediatric clinic
Interventions	Lactation consultation plus routine BF education (81 women) versus routine BF education (75 women)
Outcomes	<ul style="list-style-type: none"> Number of mothers who initiated BF at birth. Number of mothers BF at 30 days. Number of mothers BF at 60 days.

Notes This study was conducted in Baltimore, USA.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number table was used.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow-up 7.7%.
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Low risk	No other obvious biases.

Wolfberg 2004

Methods	Randomised controlled trial. Method of randomisation was not described
Participants	Number randomised: Not clear (59 couples completed study)

567 expectant mothers were approached during 1st and 2nd trimester, refused to participate 24%; lost during prenatal period 36%; lack of involvement with father 8%; fathers refusal to participate 11 %; fathers' failure after enrolling 9%, completed the study with 59 couples

Inclusion criteria

Women who sought prenatal care in the resident and faculty practices at Johns Hopkins Hospital

Exclusion criteria

Not described.

Interventions	<p>Describe intervention: classroom discussion on infant care and BF for expectant fathers</p> <p>Experimental group (27 fathers) Groups of 4-12 expectant fathers attending the classroom with open discussion about BF and support each other to be advocates for BF among fathers in the groups, facilitated by a man who was himself a father. 2- hour classes used a variety of teaching media were held approximately every 2 weeks</p> <p>Control group (32 fathers) The class covered topics related to infant care and safety only using the same facilitator, and methods of interactive and informal education as of those the intervention group. These subjects did not receive the intervention class that contained the BF content</p>
Outcomes	<ul style="list-style-type: none"> • Number of mothers for initiated BF. • Number of mothers BF at 4 weeks. • Number of mothers BF at 6 weeks. • Number of mothers BF at 8 weeks.
Notes	<p>Loss of participants to follow-up: 36%.</p> <p>Blinding: Participant: not feasible. Clinician: unclear. Outcome assessor: unclear. Intention-to-treat analysis: not used. This study was conducted in Baltimore, USA.</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not described.
Allocation concealment (selection bias)	Unclear risk	Not described.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	Loss to follow-up 36%.
Selective reporting (reporting bias)	Unclear risk	No information available.
Other bias	Low risk	No other obvious biases.

BF: breastfeeding

LC: lactation consultation

VAS: visual analogue scale

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Aidam 2005	Not only antenatal BF education. 9 home visits were provided in the 6-month postpartum period
Anderson 2005	Not only antenatal BF education. Peer counsellors also gave postpartum visits
Barlow 2006	Not only antenatal BF education. Home visits extended to 6 month postpartum
Bonuck 2005	Not only antenatal BF education. Lactation consultants also made postpartum hospital or home visits
Brent 1995	Not only antenatal BF education. Lactation consultants provided support in the postpartum period and until infants up to one year of age
Caulfield 1998	Not only antenatal BF education. Peer counsellors followed up women in the postpartum period as long as they continued to breast feed
Chapman 2004	Not only antenatal BF education. Peer counselling extended to postpartum period
Ekstrom 2006	Not only antenatal BF education. Support was also provided at 3-day, 3-month and 9-month postpartum
Eneroth 2007	Not RCT, objective not relevant.
Gijsbers 2006	Not only antenatal BF education; a home visit was also provided postnatally
Graffy 2004	Not only antenatal BF education. Lactation counsellors provided postnatal support by telephone or home visits
Grossman 1988	Not RCT (Letter to editor commenting on non-RCT papers).
Hall 2007	Not RCT.
Isselmann 2006	Intervention was not antepartum BF education.
Jenner 1988	Not RCT.
Johnston 2001	Not RCT
Kafatos 1991	Not only antenatal BF education. Home visits continued after delivery until the infant was 12 months
Loh 1997	Not RCT.
Mattar 2003	Not RCT (Letter to editor with comments on non-RCT papers).
Memmott 2006	Not RCT.
Moore 2007	Not RCT, did not evaluate antenatal BF education.
Morrow 1999	Not only prenatal BF education intervention. Peer counsellors also visited mothers at 1st, 2nd, 4th and 8th week postpartum
Muirhead 2006	Not only prenatal BF education intervention. Peer supporters provided support up to 16 week postpartum
Petrova 2009	Not only prenatal BF education intervention. Lactation consultant also provided support postnatally
Rea 1999	Participants were not pregnant women.
Redman 1995	Not only antenatal BF educational intervention. Lactation counsellors also visited women after delivery
Reeve 2004	Not RCT.
Reifsnider 1997	Not RCT (systematic assignment).
Ross 1983	Not RCT.
Sandy 2009	Not only antenatal BF education. Following the birth of a prenatally enrolled target child, the Family Support Workers typically made a visit to the newborn's mother in the hospital. During this visit, the FSW assisted program group mothers with any problems initiating breastfeeding. After hospital discharge, FSWs continued to offer program group mothers information and support in the home on a weekly basis
Sciacca 1995	Not only antenatal BF education. BF incentives were given pre- and post-natally
Su 2007	Not only antenatal BF education. Lactation support was also provided in the postpartum period

Study	Reason for exclusion
Taddei 2000	Participants were not pregnant women. They were health professionals
Walkup 2009	Not only antenatal BF education. Paraprofessional delivered home visit education during the postpartum period
Waller 1946	Not RCT.
Wambach 2009	Not only antenatal BF education. Lactation consultant and peer counselling extended through 4 weeks postpartum
Westdahl 2008	Intervention was not antenatal BF education.
Westphal 1995	Participants were not pregnant women.
Wiles 1984	Not RCT.

BF: breastfeeding

RCT: randomised controlled trial

DATA AND ANALYSES

Comparison 1 Formal BF education versus routine care

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Initiation rate of breastfeeding	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 BF education workshop versus routine care	1	80	Risk Ratio (M-H, Fixed, 95% CI)	1.19 [0.97, 1.45]
1.2 Peer counselling versus routine care	1	59	Risk Ratio (M-H, Fixed, 95% CI)	1.82 [1.13, 2.93]
1.3 BF practical skills versus routine care	1	616	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.98, 1.04]
1.4 BF attitude education versus routine care	1	618	Risk Ratio (M-H, Fixed, 95% CI)	0.99 [0.95, 1.02]
2 Breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 BF education workshop versus routine care	1	185	Risk Ratio (M-H, Fixed, 95% CI)	1.07 [0.92, 1.24]
3 Breastfeeding at six months			Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 BF education workshop versus routine care	1	178	Risk Ratio (M-H, Fixed, 95% CI)	1.15 [0.87, 1.51]
3.2 BF practical skills versus routine care	1	596	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.87, 1.17]
3.3 BF attitude education versus routine care	1	592	Risk Ratio (M-H, Fixed, 95% CI)	0.92 [0.79, 1.07]
4 Exclusive breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 BF education workshop versus routine care	1	185	Risk Ratio (M-H, Fixed, 95% CI)	1.08 [0.84, 1.38]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
5 Exclusive breastfeeding at six months			Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
5.1 BF education workshop versus routine care	1	178	Risk Ratio (M-H, Fixed, 95% CI)	1.13 [0.70, 1.80]
5.2 BF practical skills versus routine care	1	596	Risk Ratio (M-H, Fixed, 95% CI)	1.19 [0.69, 2.05]
5.3 Formal BF attitude versus routine care	1	592	Risk Ratio (M-H, Fixed, 95% CI)	1.16 [0.67, 2.01]

Comparison 2 One BF education versus another BF education

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Initiation of BF	2		Odds Ratio (Fixed, 95% CI)	Subtotals only
1.1 Peer counselling versus BF information and advice	1	2398	Odds Ratio (Fixed, 95% CI)	1.11 [0.86, 1.43]
1.2 BF practical skills versus BF attitude education	1	614	Odds Ratio (Fixed, 95% CI)	1.03 [0.99, 1.07]
2 Breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 Group education versus individual education	1	74	Risk Ratio (M-H, Fixed, 95% CI)	2.84 [0.61, 13.18]
3 Breastfeeding at six months	1		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 BF practical skills versus BF attitude education	1	590	Odds Ratio (M-H, Fixed, 95% CI)	1.21 [0.87, 1.67]
4 Exclusive breastfeeding at six months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 BF practical skills versus BF attitude education	1	590	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.61, 1.73]
5 Duration of any breastfeeding	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.1 BF education discussion versus Handouts	1	16	Mean Difference (IV, Fixed, 95% CI)	6.20 [-10.84, 23.24]

Comparison 3
Multiple BF educational interventions versus a single
BF educational interventions

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Initiation rate of breastfeeding	1		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 LC + routine BF education versus routine BF education	1	144	Risk Ratio (M-H, Random, 95% CI)	1.33 [0.86, 2.07]
2 Breastfeeding at three months	1		Odds Ratio (Fixed, 95% CI)	Subtotals only
2.1 LC + BF booklet versus BF booklet	1	698	Odds Ratio (Fixed, 95% CI)	0.82 [0.59, 1.14]
3 Breastfeeding at six months	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 Video + education session versus pamphlets	1	175	Risk Ratio (M-H, Fixed, 95% CI)	1.59 [0.86, 2.94]
3.2 Routine BF education + formal BF education versus routine BF education	1	1249	Risk Ratio (M-H, Fixed, 95% CI)	0.97 [0.79, 1.19]
4 Exclusive breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 LC + BF booklet versus BF booklet	1	698	Risk Ratio (M-H, Fixed, 95% CI)	0.85 [0.68, 1.08]
5 Duration of any breastfeeding	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.1 BF education discussion + baby quarantine versus BF handout	1	16	Mean Difference (IV, Fixed, 95% CI)	14.20 [-2.97, 31.37]
5.2 BF education discussion + baby quarantine versus BF education discussion	1	18	Mean Difference (IV, Fixed, 95% CI)	8.0 [-6.84, 22.84]
6 Mastitis	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
6.1 Formal BF education + LC versus routine BF education	1	70	Risk Ratio (M-H, Fixed, 95% CI)	0.2 [0.01, 4.02]
7 Breastfeeding complication (nipple pain)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.1 Formal BF education + LC versus routine BF education	1	70	Mean Difference (IV, Fixed, 95% CI)	-19.8 [-23.23, -16.37]
8 Breastfeeding complication (nipple trauma)	1	70	Mean Difference (IV, Fixed, 95% CI)	38.65 [32.95, 44.35]
8.1 Formal BF education + LC versus routine BF education	1	70	Mean Difference (IV, Fixed, 95% CI)	38.65 [32.95, 44.35]

Comparison 4
Different combinations of multiple methods of
providing education

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Exclusive breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 BF booklet + video + LC versus BF booklet + video	1	150	Risk Ratio (M-H, Fixed, 95% CI)	1.29 [0.80, 2.06]
2 Exclusive breastfeeding at six months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 BF booklet + video + LC versus BF booklet + video	1	169	Risk Ratio (M-H, Fixed, 95% CI)	2.23 [1.01, 4.92]

Comparison 5
Multiple interventions versus no formal BF education

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Exclusive breastfeeding at three months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 BF booklet + video + LC versus no formal BF education	1	159	Risk Ratio (M-H, Fixed, 95% CI)	2.02 [1.16, 3.49]
2 Exclusive breastfeeding at six months	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 BF booklet + video + LC versus no formal BF education	1	175	Risk Ratio (M-H, Fixed, 95% CI)	2.11 [0.99, 4.52]

Analysis 1.1

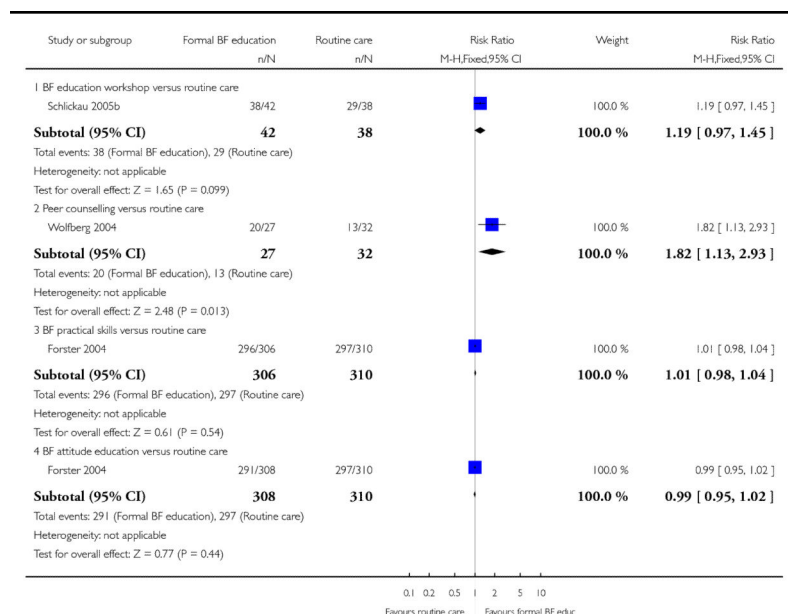
Comparison 1 Formal BF education versus routine care,

Outcome 1 Initiation rate of breastfeeding

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 1 Formal BF education versus routine care

Outcome: 1 Initiation rate of breastfeeding



Analysis 1.2

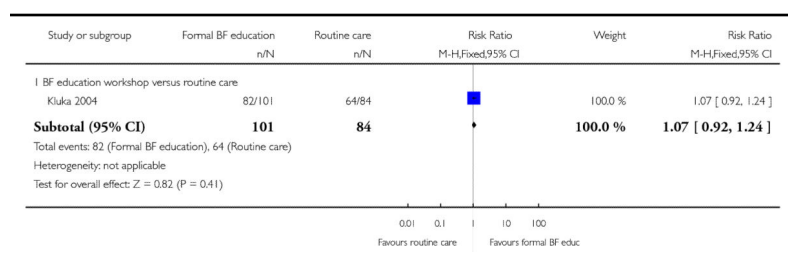
Comparison 1 Formal BF education versus routine care,

Outcome 2 Breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 1 Formal BF education versus routine care

Outcome: 2 Breastfeeding at three months



Analysis 1.3

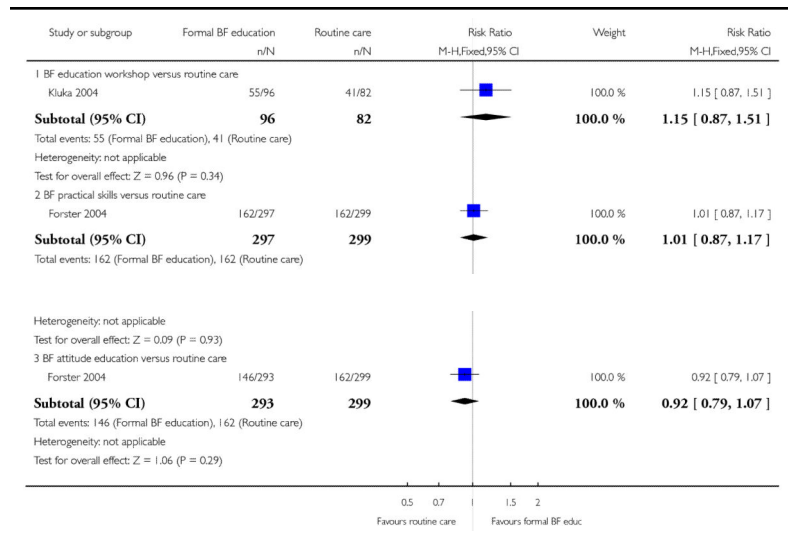
Comparison 1 Formal BF education versus routine care,

Outcome 3 Breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 1 Formal BF education versus routine care

Outcome: 3 Breastfeeding at six months



Analysis 1.4

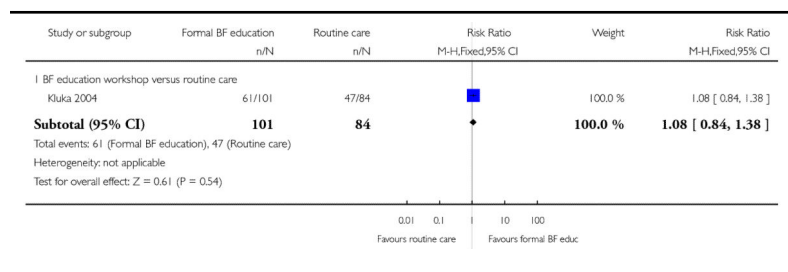
Comparison 1 Formal BF education versus routine care,

Outcome 4 Exclusive breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 1 Formal BF education versus routine care

Outcome: 4 Exclusive breastfeeding at three months



Analysis 1.5

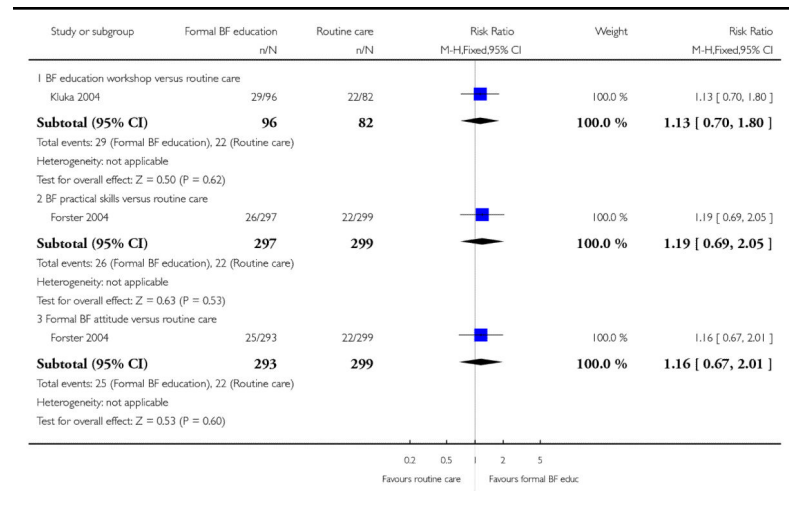
Comparison 1 Formal BF education versus routine care,

Outcome 5 Exclusive breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 1 Formal BF education versus routine care

Outcome: 5 Exclusive breastfeeding at six months



Analysis 2.1

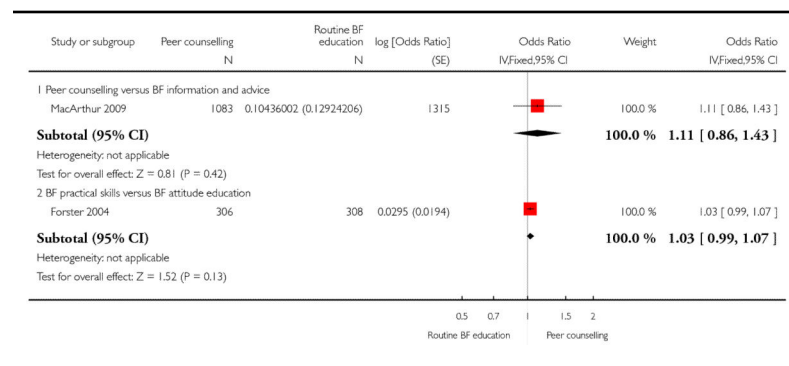
Comparison 2 One BF education versus another BF

education, Outcome 1 Initiation of BF

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 2 One BF education versus another BF education

Outcome: 1 Initiation of BF



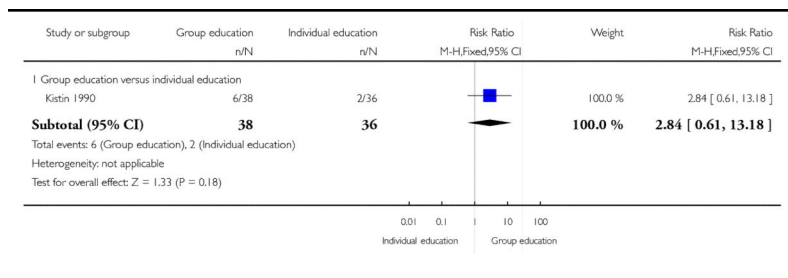
Analysis 2.2

Comparison 2 One BF education versus another BF education, Outcome 2 Breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 2 One BF education versus another BF education

Outcome: 2 Breastfeeding at three months



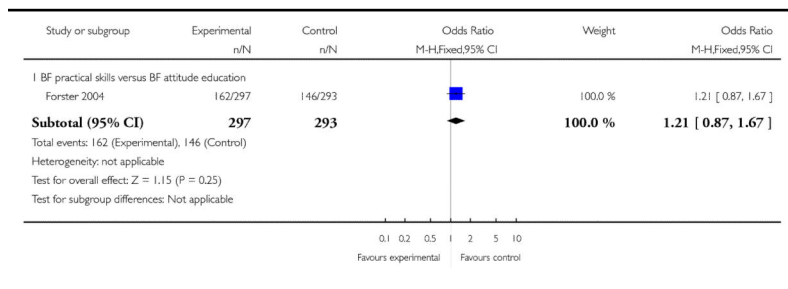
Analysis 2.3

Comparison 2 One BF education versus another BF education, Outcome 3 Breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 2 One BF education versus another BF education

Outcome: 3 Breastfeeding at six months



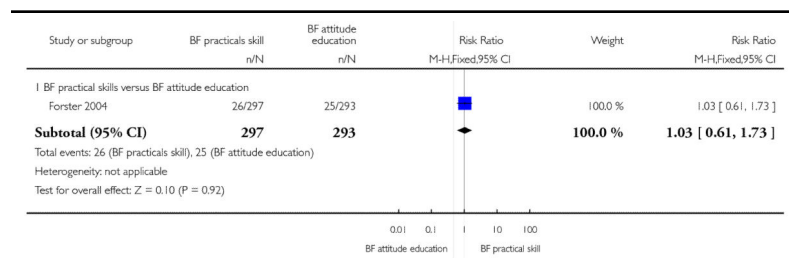
Analysis 2.4

Comparison 2 One BF education versus another BF education, Outcome 4 Exclusive breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 2 One BF education versus another BF education

Outcome: 4 Exclusive breastfeeding at six months



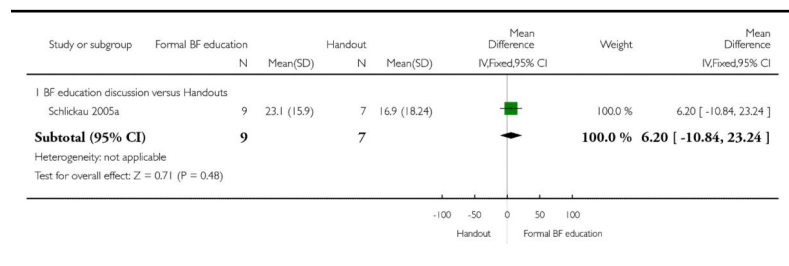
Analysis 2.5

Comparison 2 One BF education versus another BF education, Outcome 5 Duration of any breastfeeding

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 2 One BF education versus another BF education

Outcome: 5 Duration of any breastfeeding



Analysis 3.1

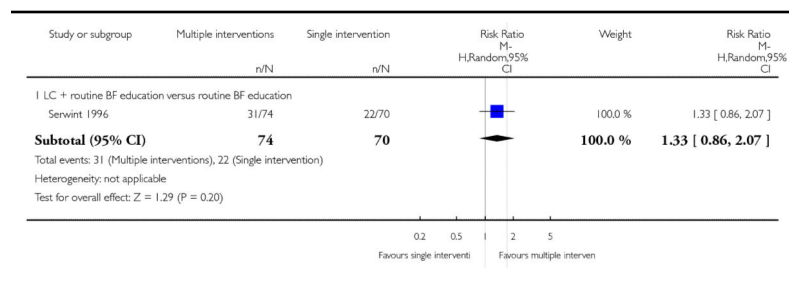
Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 1

Initiation rate of breastfeeding

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 1 Initiation rate of breastfeeding



Analysis 3.2

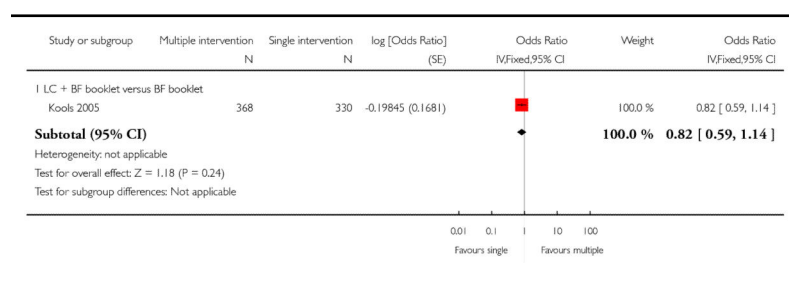
Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 2

Breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 2 Breastfeeding at three months



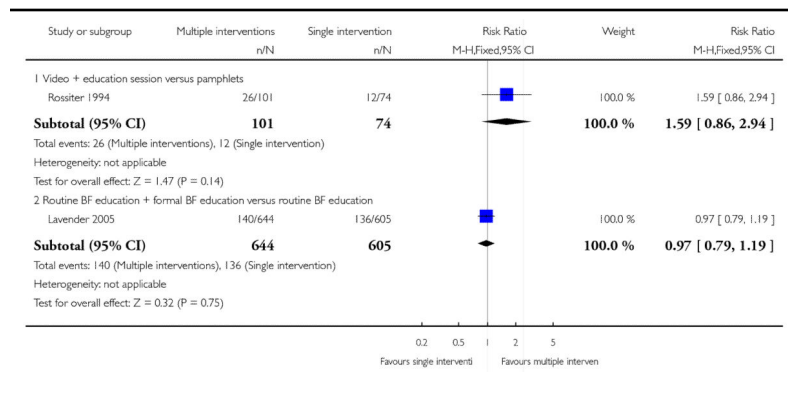
Analysis 3.3

Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 3 Breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 3 Breastfeeding at six months



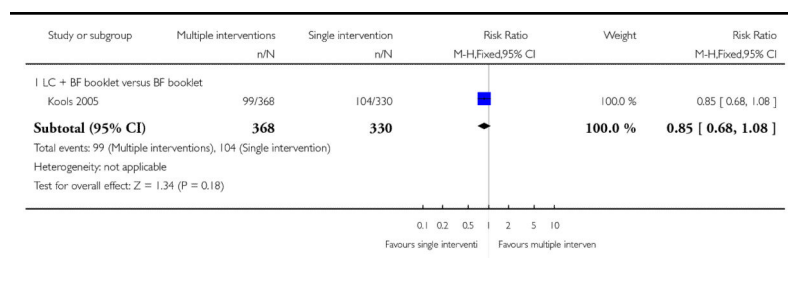
Analysis 3.4

Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 4 Exclusive breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 4 Exclusive breastfeeding at three months



Analysis 3.5

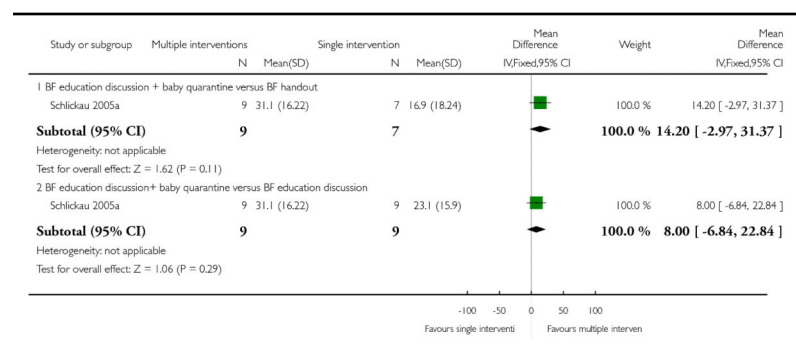
Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 5

Duration of any breastfeeding

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 5 Duration of any breastfeeding



Analysis 3.6

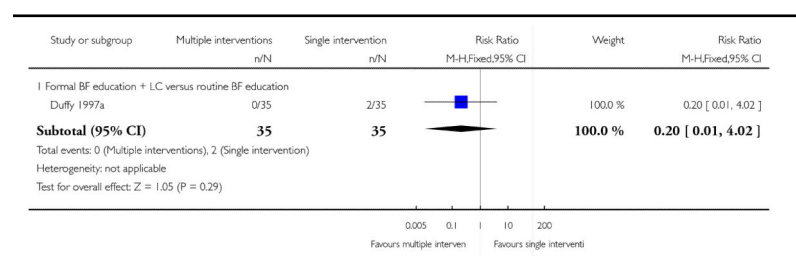
Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 6

Mastitis

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 6 Mastitis



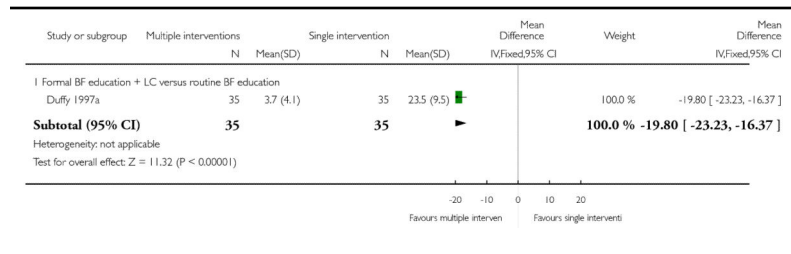
Analysis 3.7

Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 7 Breastfeeding complication (nipple pain)

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 7 Breastfeeding complication (nipple pain)



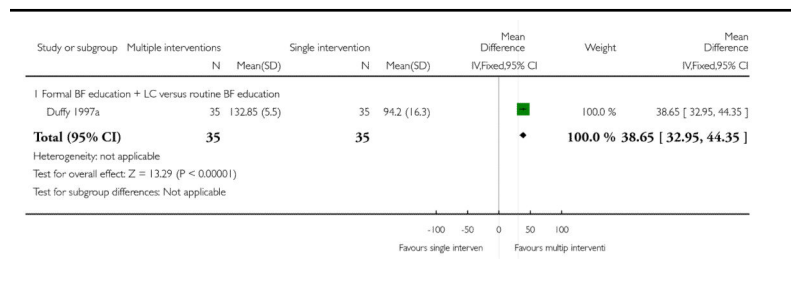
Analysis 3.8

Comparison 3 Multiple BF educational interventions versus a single BF educational interventions, Outcome 8 Breastfeeding complication (nipple trauma).

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 3 Multiple BF educational interventions versus a single BF educational interventions

Outcome: 8 Breastfeeding complication (nipple trauma)



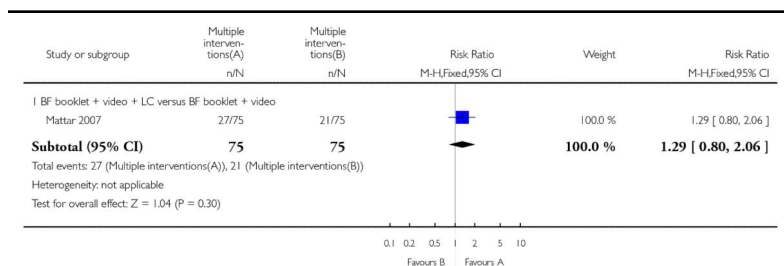
Analysis 4.1

Comparison 4 Different combinations of multiple methods of providing education, Outcome 1 Exclusive breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 4 Different combinations of multiple methods of providing education

Outcome: 1 Exclusive breastfeeding at three months



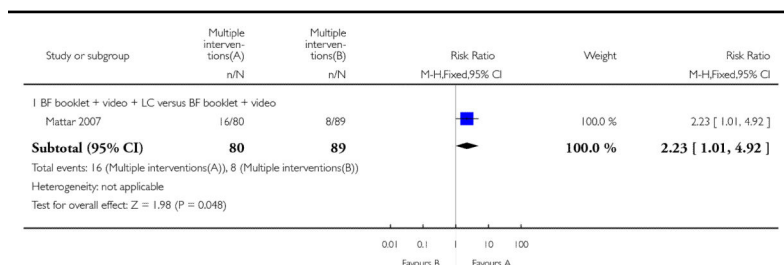
Analysis 4.2

Comparison 4 Different combinations of multiple methods of providing education, Outcome 2 Exclusive breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 4 Different combinations of multiple methods of providing education

Outcome: 2 Exclusive breastfeeding at six months



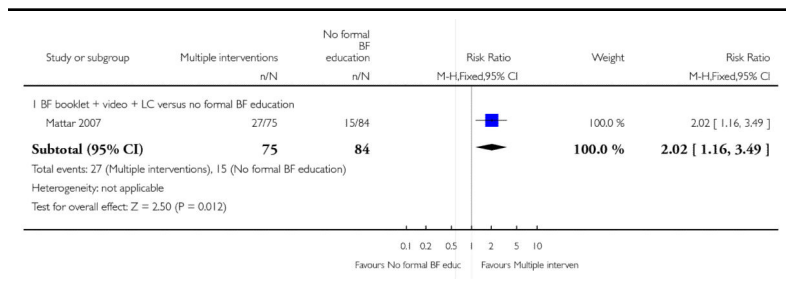
Analysis 5.1

Comparison 5 Multiple interventions versus no formal BF education, Outcome 1 Exclusive breastfeeding at three months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 5 Multiple interventions versus no formal BF education

Outcome: 1 Exclusive breastfeeding at three months



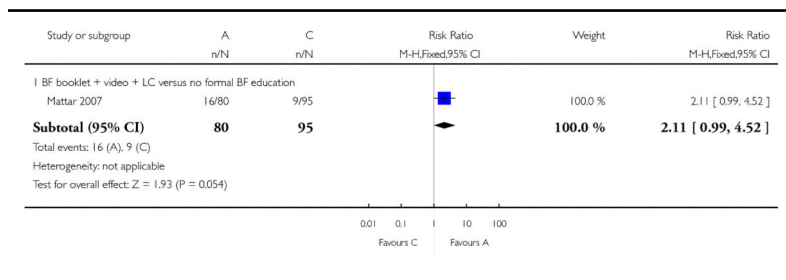
Analysis 5.2

Comparison 5 Multiple interventions versus no formal BF education, Outcome 2 Exclusive breastfeeding at six months

Review: Antenatal breastfeeding education for increasing breastfeeding duration

Comparison: 5 Multiple interventions versus no formal BF education

Outcome: 2 Exclusive breastfeeding at six months



WHAT'S NEW

Last assessed as up-to-date: 20 October 2010.

Date	Event	Description
7 October 2011	Amended	Sources of support edited.

HISTORY

Protocol first published: Issue 2, 2007

Review first published: Issue 11, 2011

Date	Event	Description
17 April 2008	Amended	Converted to new review format.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We added one more comparison of ‘programmes involving multiple methods of providing education versus no formal education’ to our subgroup analysis. We searched SCOPUS instead of EMBASE because our university subscribed to SCOPUS but not EMBASE.

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** Indicates the major publication for the study*

PLAIN LANGUAGE SUMMARY

Antenatal breastfeeding education for increasing breastfeeding duration

Breastfeeding is well recognised as the best food for infants and the World Health Organization recommends that all infants should have exclusive breastfeeding for at least six months after birth. Complementary foods offered before six months of age tend to displace breast milk and do not give any health advantage. Breastfeeding (BF) can improve the child's health, the mother's health and mother-infant bonding. Infants with BF have lower rates of gastrointestinal and respiratory diseases, otitis media and allergies, better visual acuity, and speech and cognitive development. The impact of educational interventions during pregnancy on breastfeeding duration has not yet been evaluated.

This review includes data from 14 randomised controlled studies involving 6932 women, mostly from developed countries including the USA, Canada, UK and Australia. Peer counselling, lactation consultation and formal BF education during pregnancy appear to increase BF duration. Peer counselling also appears to be better than routine care for initiating BF. However, because most included studies were of poor quality and the effects of BF education were quite small, it is not appropriate to recommend any specific BF educational intervention. The findings of this review are based on single studies and there is a need for well-designed clinical trials with adequate sample sizes.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding (performance bias and detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Duffy 1997a	?	?	+	?	?	?
Finch 2002	?	?	?	●	?	+
Forster 2004	+	+	?	+	?	?
Kaplowitz 1983	?	?	?	?	?	?
Kistin 1990	+	?	?	?	?	+
Kluka 2004	?	+	+	+	?	+
Kools 2005	+	?	?	+	?	?
Lavender 2005	?	+	+	+	?	?
MacArthur 2009	+	?	+	+	?	+
Mattar 2007	+	+	+	+	?	+
Noel-Weiss 2006	?	+	+	+	?	+
Rossiter 1994	?	?	?	?	?	+
Ryser 2004	?	?	?	+	?	+
Schlickau 2005a	?	?	?	?	?	?
Schlickau 2005b	?	+	?	+	?	+
Serwint 1996	+	?	?	+	?	+
Wolfberg 2004	?	?	?	●	?	+

Figure 1.

Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

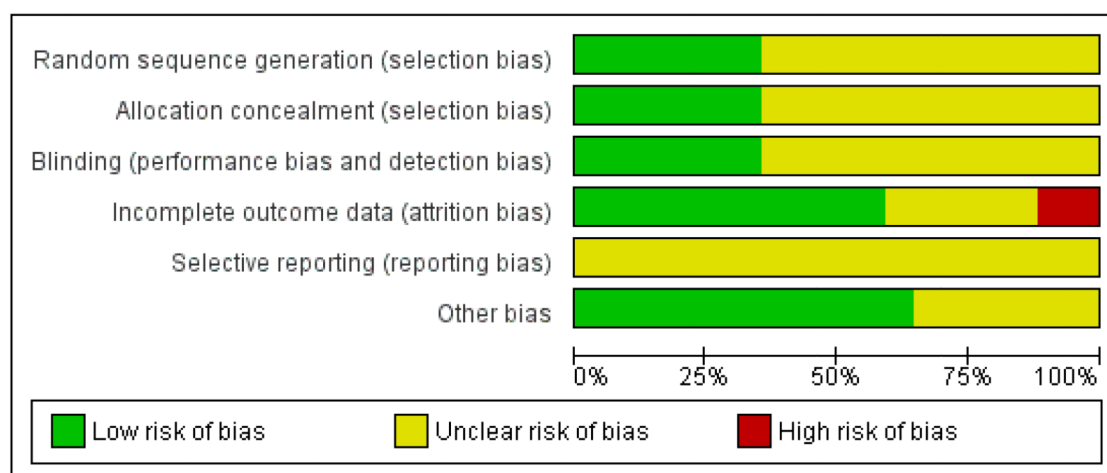


Figure 2. Methodological quality graph: review authors' judgements about each methodological quality item presented as percentages across all included studies.