National Institute for Health and Care Excellence

Final

Maternal and child nutrition

[J] Evidence reviews for approaches and interventions for maintaining breastfeeding beyond 8 weeks after birth

NICE guideline NG247

Evidence reviews underpinning recommendations 1.3.9 and 1.3.10 in the NICE guideline.

January 2025

Final

These evidence reviews were developed by NICE

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Approaches and interventions for maintaining breastfeeding beyond 8 weeks after birth

Review question

What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Introduction

The World Health Organization (WHO), UNICEF and the UK Scientific Advisory Committee on Nutrition recommend exclusive breastfeeding for the first 6 months of age with continued breastfeeding alongside solid foods for the first 1-2 years of life. In 2020-21, NHS England data showed that prevalence of exclusive breastfeeding at 6-8 weeks was 36.5%, and any breastfeeding (meaning exclusive or partial breastfeeding) was 54.2% (Office for Health Improvement & Disparities 2023). There is also a decline in both exclusive and partial breastfeeding with each month after birth. Breastfeeding has both short and long term health benefits for both babies and the breastfeeding person, and those benefits tend to be greater the longer breastfeeding lasts. Hence it is important to encourage continued breastfeeding. Recommendations on starting and maintaining breastfeeding up to 8 weeks after birth is covered in the NICE guideline on postnatal care. The aim of this review is to identify what interventions are effective in maintaining breastfeeding beyond 8 weeks after birth.

Summary of the protocol

See Table 1 for a summary of the Population, Intervention, Comparison and Outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

Population	**Inclusion:** • pregnant women and women who have given birth to a healthy baby at term (or to healthy twins and triplets) and their partners • breastfeeding women **Exclusion:** Women and children receiving specialist care in relation to breastfeeding will be excluded, for example: • women with HIV/AIDS • women abusing substances • women on toxic medications • women otherwise contraindicated to breastfeeding Studies of interventions for women with specific conditions will be excluded.
Intervention	**Intervention 1** • education, advice or support from peer* or professional provided postnatally and initiated either antenatally or postnatally (including both within 8 weeks and eight weeks after birth); for example:

	○ one to one ○ group classes ○ professional or peer* breastfeeding support ○ provision of self-help or educational material *denotes that the person has undergone specific training related to the provision of information and support for breastfeeding. **Intervention 2** • financial incentives Studies will be included if a main aim of the intervention is to start and/or maintain breastfeeding. If this is not one of the main aims, studies will be excluded. Note that the original question excluded early mother-infant contact and "rooming-in" mother and infant because the NICE guideline on intrapartum care (CG190) already covers early initiation of breastfeeding. Early skin to skin contact was also excluded because it is covered by the NICE guideline on caesarean section (CG132).
Comparison	**Comparison 1** • standard care • different kinds of intervention 1 compared against each other **Comparison 2** • standard care • different kinds of intervention 2 compared against each other
Outcome	**Critical** • proportion of women breastfeeding at 6-12 weeks (any and exclusive) • proportion of women breastfeeding at 16-26 weeks (any and exclusive breastfeeding) **Important** • women's satisfaction with breastfeeding interventions

AIDS: acquired immunodeficiency syndrome; HIV: human immunodeficiency virus.

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question, including meta-regression, are described in the review protocol in appendix A and in appendix M, and the methods document (supplementary document 1).

Declarations of interest were recorded according to NICE's conflicts of interest policy.

Effectiveness evidence

Included studies

This review is a partial update of evidence review P from the NICE guideline on postnatal care. This review includes two interventions from that review: the intervention 'education, advice or support from peer or professional provided postnatally and initiated either

antenatally or postnatally' and 'financial incentives', which were considered relevant for this guideline to make recommendations on interventions for maintenance of breastfeeding beyond 8 weeks after birth. This review included 3 outcomes from evidence review P from the NICE guideline on postnatal care, considered relevant for this review: 'proportion of women breastfeeding at 6-12 weeks', 'proportion of women breastfeeding at 16-26 weeks', and 'women's satisfaction with breastfeeding interventions'. For breastfeeding rates at 16-26 weeks, this review separately analysed 'any and exclusive breastfeeding' rates, whereas evidence review P from the NICE guideline on postnatal care analysed 'any breastfeeding' rates.

Overall, 70 randomised controlled trials (RCTs) were included in this review.

Fifty-six RCTs were included from evidence review P from the NICE guideline on postnatal care (Abbass-Dick 2015, Ahmed 2016, Anderson 2005, Bonuck 2005 + 2006, Bonuck 2014, Brent 1995, Bunik 2010, Carlsen 2013, Chan 2016, Chapman 2004, Chapman 2013, Curro 1997, Dennis 2002, Edwards 2013, Efrat 2015, Elliott-Rudder 2014, Fu 2014a + 2014b, Graffy 2004, Gross 2016, Henderson 2001, Hoddinott 2012, Jolly 2012, Kools 2005, Labarere 2003, Labarere 2005, Laliberte 2016, Lutenbacher 2018, Maycock 2013, McDonald 2010, McLachlan 2016a, McQueen 2011, Muirhead 2006, Nilsson 2017, Paul 2012, Petrova 2009, Pisacane 2005, Pollard 2010, Pugh 1998, Pugh 2002, Pugh 2010, Quinlivan 2003, Rasmussen 2011, Redman 1995, Reeder 2014, Relton 2018, Sciacca 1995, Simonetti 2012, Srinivas 2015, Steel O'Connor 2003, Su 2007, Vidas 2011, Wallace 2006, Washio 2017, Wen 2011, Wilhelm 2006, Wilhelm 2015). See Evidence Report P, Appendix D from the postnatal care guideline for full details on these studies.

Fourteen RCTs were identified through new literature searches (articles published after April 2019) on approaches and interventions to maintain breastfeeding specifically beyond 8 weeks after birth (Abbass-Dick 2020, Bender 2022, Clarke 2020, Forster 2019, Gonzalez-Darias 2020, Lewkowitz 2020, Linares 2019, Milinco 2020, Padua 2022, Puharic 2020, Santamaria-Martin 2022, Scott 2021, Uscher-Pines 2019, Wen 2020).

The included studies are summarised in Table 2.

Sixty-seven studies reported on interventions for women (Abbass-Dick 2015, Abbass-Dick 2020, Ahmed 2016, Anderson 2005, Bender 2022, Bonuck 2005 + 2006, Bonuck 2014, Brent 1995, Bunik 2010, Carlsen 2013, Chan 2016, Chapman 2004, Chapman 2013, Clarke 2020, Curro 1997, Dennis 2002, Edwards 2013, Efrat 2015, Elliott-Rudder 2014, Forster 2019, Fu 2014a + 2014b, Gonzalez-Darias 2020, Graffy 2004, Gross 2016, Henderson 2001, Hoddinott 2012, Jolly 2012, Kools 2005, Labarere 2003, Labarere 2005, Laliberte 2016, Lewkowitz 2020, Linares 2019, Lutenbacher 2018, McDonald 2010, McLachlan 2016a, McQueen 2011, Milinco 2020, Muirhead 2006, Nilsson 2017, Padua 2022, Paul 2012, Petrova 2009, Pollard 2010, Pugh 1998, Pugh 2002, Pugh 2010, Puharic 2020, Quinlivan 2003, Rasmussen 2011, Redman 1995, Reeder 2014, Relton 2018, Santamaria-Martin 2022, Sciacca 1995, Simonetti 2012, Srinivas 2015, Steel O'Connor 2003, Su 2007, Uscher-Pines 2019, Vidas 2011, Wallace 2006, Washio 2017, Wen 2011, Wen 2020, Wilhelm 2006, Wilhelm 2015) and 3 studies reported interventions for fathers (Maycock 2013, Pisacane 2005, Scott 2021).

Forty-two studies reported on single births (Abbass-Dick 2015, Abbass-Dick 2020, Ahmed 2016, Anderson 2005, Bender 2022, Bonuck 2014, Bunik 2010, Carlsen 2013, Chapman 2004, Chapman 2013, Clarke 2020, Dennis 2002, Edwards 2013, Efrat 2015, Forster 2019, Gonzalez-Darias 2020, Gross 2016, Henderson 2001, Hoddinott 2012, Labarere 2003, Labarere 2005, Laliberte 2016, Lewkowitz 2020, Linares 2019, McDonald 2010, McQueen 2011, Milinco 2020, Nilsson 2017, Padua 2022, Petrova 2009, Pugh 2002, Pugh 2010, Puharic 2020, Rasmussen 2011, Santamaria-Martin 2022, Scott 2021, Simonetti 2012, Steel O'Connor 2003, Su 2007, Uscher-Pines 2019, Wen 2020, Wilhelm 2015). 2 studies reported on single and multiple births (Paul 2012, Quinlivan 2003). 26 studies did not report whether they recruited women expecting single or multiple babies (Bonuck 2005 + 2006, Brent 1995,

Chan 2016, Curro 1997, Elliott-Rudder 2014, Fu 2014a + 2014b, Graffy 2004, Jolly 2012, Kools 2005, Lutenbacher 2018, Maycock 2013, McLachlan 2016, Muirhead 2006, Pisacane 2005, Pollard 2010, Pugh 1998, Redman 1995, Reeder 2014, Relton 2018, Sciacca 1995, Srinivas 2015, Vidas 2011, Wallace 2006, Washio 2017, Wen 2011, Wilhelm 2006).

One study reported on women defined as 'low income' (Lewkowitz 2020). There were no studies that reported on young women (19 and under), and women with a BMI ≥30 kg/m^2, which were identified in the protocol as subgroups of interest.

Sixty-two studies compared education, advice or support interventions to standard care. How the interventions were delivered varied between the studies and included for example, through websites, on the phone, through text messages, through mobile applications, face-to-face individually, or face-to-face in a group. 5 studies compared one education, advice or support intervention to another education, advice or support intervention.

No new studies were identified for the comparison of financial incentives. There was evidence from 3 studies in NG194 (Relton 2018; Sciacca 1995; Washio 2017).

Due to the large volume of included studies for this comparison and the variability of the interventions across the studies, meta-regression was conducted in addition to the pair-wise meta-analysis to assess the effect of interventions and their individual components. Meta-regression allows for the analysis of the effectiveness of the different variables that made up each study's intervention and would determine what component of an intervention was effective irrespective of all other components that made up the intervention.

For the purpose of the meta-regression analysis, each study under this intervention category was categorised using the following variables:

- number of contact visits – 0, 1, 2-3, 4-8 and 9+
- how delivered – face-to-face on an individual basis, face-to-face in a group, remote, self-help
- duration of contact – contact with the intervention lasted less than 8 weeks, contact with the intervention lasted more than 8 weeks
- where the intervention was delivered – at the woman's home, in a healthcare setting or a combination of both home and healthcare setting.

More details on the methods can be found in Supplement 1: Methods. The WinBUGS code used and the results of the analysis can be found in appendix M.

In the pair-wise analysis, evidence was stratified according to population: mothers only; mothers and co-parents; and fathers only. In the pairwise analysis, serious and very serious heterogeneity was explored through intervention subgroups: how the intervention was delivered, where the intervention was delivered, number of contacts, and duration of contacts. The population subgroup 'women defined as low income' was also used to explore heterogeneity in the evidence.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review are listed, and reasons for their exclusion are provided in appendix K.

Summary of included studies

Summaries of the studies that were included in this review are presented in Table 2.

Table 2: Summary of included studies

Study	Population (n randomised)	Intervention and comparator	Outcomes
Intervention 1- Education, advice or support from peer or professional provided postnatally and initiated either antenatally or postnatally (including both within 8 weeks and eight weeks after birth)			
Abbass-Dick 2015 RCT Canada Study from NICE postnatal care guideline (NG194) evidence review P	N=214 couples (intervention aimed at mothers and fathers) • Intervention: n=107 couples • Control: n=107 couples Characteristics: Single pregnancies Nulliparous women Women who planned to breastfeed for at least 12 weeks Women living with partner	<u>Intervention:</u> Standard care plus in-hospital face-to-face discussion (~15 mins), co-parenting booklet, breastfeeding booklet, video on co-parenting and breastfeeding, access to a secure website with information, follow-up emails to parents at 1 and 3 weeks postpartum, telephone call at 2 weeks postpartum. <u>Control:</u> Standard care, which included standard in-hospital breastfeeding support and any breastfeeding assistance that was proactively sought in the community.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Abbass-Dick 2020 RCT Canada Study from new evidence	N=217 n=113 women with single births n=104 co-parents	<u>Intervention: eHealth website + standard care</u> Access to public eHealth breastfeeding co-parenting website (perinatal period), with 8 different components, plus additional breastfeeding information available in the community. <u>Control: Standard care</u> Breastfeeding information available in the community.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Ahmed 2016 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=141 women • Intervention: n=84 women • Control: n=57 women Characteristics: Single pregnancies Nulliparous and multiparous women. Predominately White (>65%) Women with an intention to continue breastfeeding after discharge	<u>Intervention:</u> Standard care and an interactive breastfeeding monitoring system. Breastfeeding data was inputted along with wet and dirty diapers data, and any problems for at least 30 days. The system automatically sent feedback via notifications with tailored interventions if the mother entered data that indicated breastfeeding problems. The system also provided positive notifications when the mother breastfed 8 to 10 times per day. Professional educational resources were also available through the system <u>Control:</u> Standard care including breastfeeding support and education prior to discharge, one phone call within the first week after discharge	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		and advice of community breastfeeding resources. A thank-you letter with a $30 gift card was sent to each mother after completing the survey for month 1, and a $10 gift card was sent after each of the second and third month surveys were completed.	
Anderson 2005 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=182 women • Intervention: n=90 women • Control: n=92 women Characteristics: Single pregnancies Nulliparous and multiparous women. Mean age 25 years (range 18-39) Predominantly Latina women, majority of these Puerto Rican Low-income – income level below 185% federal poverty level Women who were considering breastfeeding	<u>Intervention:</u> Standard care plus 3 prenatal home visits, daily in-hospital visits after birth and 9 postpartum home visits from a trained peer counsellor until 6 weeks after birth. <u>Control:</u> Standard care, certified Baby-Friendly Hospital, hands-on breastfeeding support on maternity ward, 24hr support telephone line Analyses to examine the role of ethnicity on outcomes was also conducted and reported in Anderson 2007.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Bender 2022 RCT USA Study from new evidence	N=216 women with single births	<u>Text message + health professional support</u> Received 7 text messages containing informational and motivational breastfeeding content and an additional 6 text messages asking how the participants were feeding their infant. Participants also had the option of asking questions or presenting concerns as needed, which were addressed by an obstetrician. <u>Control: Standard care</u> Received 6 text messages asking how the participants were feeding their infant.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Bonuck 2005; Bonuck 2006	N=382 women • Intervention: n=188 women	<u>Intervention:</u> 2 individual meetings with a lactation consultant prenatally and 1 postpartum hospital and/or 1 home visit and was available for telephone consultation up to 12	• Any breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
RCT US Study from NICE postnatal care guideline (NG194) evidence review P	• Control: n=194 women Characteristics: Twin or single pregnancies Nulliparous and multiparous Mean age 25 years Primarily Hispanic (55%) and/or black women (37%) Low income (56% in receipt of Medicaid)	months. Meetings were for 60-90 minutes each. Free nursing bra and pump. <u>Control:</u> Health centre standard care. No established protocol for breastfeeding education or support so variation in levels of breastfeeding education or support. Contact with lactation consultant was prohibited. Participants were compensated (no further details provided).	• Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Bonuck 2014 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	BINGO RCT N randomised=666 women, N analysed=628 women • Intervention (1): n=236 women • Intervention (2): n=77 women • Intervention (3): n=238 women • Control: n=77 women PAIRINGS RCT N randomised=275 women, N analysed=262 women • Intervention (3): n=129 women • Control: n=133 women Characteristics: Single pregnancies Nulliparous and multiparous Majority Hispanic women (>55%) and non-Hispanic Black women (approximately 28%) Approximately 37% women obese (BMI ≥30 kg/m^2) Low risk BINGO RCT:	<u>Intervention (1) (BINGO):</u> Electronic prompts in the medical records during 5 prenatal visits. Included 2-3 brief open-ended questions for providers to ask that portrayed breastfeeding as the norm. (This data is presented as part of Intervention 1 – antenatal advice) <u>Intervention (2) (BINGO):</u> Lactation consultant that held 2 prenatal sessions with the woman, a hospital visit, telephone calls for up to 3 months postpartum. Nursing bras, breast pumps and home visits provided as needed. <u>Intervention (3) (BINGO and PAIRINGS):</u> Lactation consultant and electronic prompts <u>Control:</u> Standard care – no explicit breastfeeding promotion or support	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	Primarily low-income women (approximately 60% participating in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC) PAIRINGS RCT: Economically diverse		
Brent 1995 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=115 women • Intervention: n=58 women • Control: n=57 women Characteristics: Nulliparous Predominately White origin (approximately 71%) 90% with low income (eligible for Special Supplemental Nutrition Program for Women, Infants, and Children, WIC) Choice of breastfeeding at first prenatal visit <40%	Intervention: 2-4 prenatal sessions with a lactation consultant (10 min-15 min each); daily inpatient rounds after birth; telephone call 48 h after discharge; visit to lactation clinic at 1 week postpartum and contact with lactation consultant at each health supervision visit until weaning or 1 year Control: Women were offered optional prenatal breastfeeding classes as well as postpartum breastfeeding instruction and outpatient follow-up by nurses and physicians in the paediatric ambulatory department	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Bunik 2010 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=341 women • Intervention: n=161 women • Control: n=180 women Characteristics: Single pregnancies Nulliparous Low income (>60% participating in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC) Majority White Hispanic	Intervention: Standard care plus daily telephone calls by a nurse starting on the day of discharge and continuing daily for the first 2 weeks postpartum. Telephone calls were scripted and developed to be culturally appropriate to target population. Control: Standard care – including healthcare visit at 3 to 5 days and 2 weeks at the clinic, as well as formula company discharge bags. Both groups received hand-outs on breastfeeding, a hand breast pump and lanolin cream, and a water bottle.	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	Willing to consider breastfeeding		
Carlsen 2013 RCT Denmark Study from NICE postnatal care guideline (NG194) evidence review P	N=226 women • Intervention: n=108 women • Control: n=118 women Characteristics: Single pregnancies Women who had participated in the 'Treatment of Obese Pregnant Study' (pre-pregnancy BMI ≥30 kg/m^2) Women intended to breastfeed Nulliparous and multiparous	Intervention: Standard care plus telephone -based advisory support service from a lactation consultant for first 6 months postpartum. Starting within the first week (~20min call) followed by a minimum of 8 follow-up calls (~5-10mins). Control: Standard care (no details provided) All women had contact with a health visitor (paediatric nurse) who makes home visits during the first 18 months of the child's life.	• Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Chan 2016 RCT Hong Kong Study from NICE postnatal care guideline (NG194) evidence review P	N=71 women • Intervention: n=35 women • Control: n=36 women Characteristics: Nulliparous Primarily Chinese women >65% intended to breastfeed for more than 12 weeks	Intervention: Standard care plus a 2.5 hour small group breastfeeding workshop at 28–38 weeks of gestation involving a presentation, watching a DVD, discussions, using dolls and a breast model, and 30–60 minutes of telephone counselling at 2 weeks postpartum. Control: Standard care (included breastfeeding support provided by midwives in the hospital, access to a lactation consultant, and post-partum follow-up by midwives or doctors).	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Chapman 2004 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=219 women • Intervention: n=113 women • Control: n=106 women Characteristics: Single pregnancies Nulliparous and multiparous Primarily (80%) Latina women with majority of these Puerto Rican Low income (recipient of food stamps, Special	Intervention: Standard care plus breastfeeding peer counselling services including at least 1 prenatal home visit, daily in-hospital perinatal visits, at least 3 postpartum home visits, and participants could contact the peer counsellor by pager. Free mini-electric breast pumps provided during postpartum home visits to those who need them. Control: Routine breastfeeding education offered by the hospital including hands-on assistance, individualised education from maternity ward nurses, written breastfeeding materials, access to lactation consultant for serious	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	Supplemental Nutrition Program For Women, Infants, And Children, WIC participant, household income less than 180% of federal poverty level) Women who were considering breastfeeding	problems and access to a nurse on the phone for breastfeeding questions.	
Chapman 2013 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=206 women • Intervention: n=103 women • Control: n=103 women Characteristics: Single pregnancies Primarily (>80%) Hispanic women Low income (income less than 185% of federal poverty level) Overweight or obese (BMI ≥27 kg/m^2) Women considering breastfeeding	<u>Intervention:</u> Standard care plus specialised breastfeeding peer counselling intervention promoting exclusive breastfeeding. Intervention included access to 3 prenatal visits, daily in-hospital visits after birth, and up to 11 postpartum home visits during the first 6 months postpartum. Manual breast pump issued before discharge. This intervention replaced the optional breastfeeding support from Breastfeeding: Heritage and Pride Peer Counsellors (BHP PC) available to control group <u>Control:</u> Routine breastfeeding support from hospital personnel, including lactation consultants able to call hospital's 'warm line', Also optional breastfeeding support from BHP PC. This consisted of prenatal breastfeeding education during routine clinic appointments, written education materials and an electric breast pump loaned on request.	• Exclusive breastfeeding (6-12 weeks)
Clarke 2020 RCT UK Study from new evidence	N=103 women	<u>Intervention: Peer support (paid and volunteer)</u> Face to face meetings to provide 'women-centred support'. Participants were also given information about community services. <u>Control:</u> Standard care No proactive peer support. Women were given information on usual care in a leaflet.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Curro 1997 RCT Italy	N=200 women • Intervention: n=103 women • Control: n=97 women	<u>Intervention (1):</u> 10 minutes verbal counselling session on breastfeeding. Additional booklet with instructions for practical breastfeeding management and with information on advantages of	• Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
Study from NICE postnatal care guideline (NG194) evidence review P	Characteristics: Primiparous Women who were exclusively breastfeeding at recruitment (10-20 days after birth)	exclusive breastfeeding, particularly if prolonged for the first 6 months of life. Control: 10 minutes verbal counselling session only	
Dennis 2002 RCT Canada Study from NICE postnatal care guideline (NG194) evidence review P	N=258 women • Intervention: n=132 women • Control: n=126 women Characteristics: Single births Nulliparous women Women breastfeeding	Intervention: Standard care, plus women were paired to a peer volunteer. Peer volunteers contacted the mother 48hrs after hospital discharge and as frequently thereafter as the mother deemed necessary Control: Standard care – access to conventional in-hospital and community postpartum support services such as those provided by hospital-based nursing and medical staff, a hospital-based breastfeeding clinic managed by lactation consultants, a telephone breastfeeding support line managed by hospital nursing staff, and support services provided by public health nurses at the local regional community health department and by community-based physicians and paediatricians.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Edwards 2013 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=248 women • Intervention: n=124 women • Control: n=124 women Characteristics: Low-income Women aged 21 and under, mean age 18.3 (SD 1.7) African-American women Predominately nulliparous (~88%) Approximately 62% considering breastfeeding	Intervention: Standard care plus support from a doula. Doulas visited women at home weekly in the antenatal period, were present during birth and encouraged first latching after birth, visited during the first 3 months postpartum (average 10-12 home visits) and were available by phone 24 hours. Breast pumps were provided for women who were returning to work or school. Control: Standard care (no details provided)	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Efrat 2015 RCT US Study from NICE	N=289 women • Intervention: n=146 women • Control: n=143 women	Intervention: Standard care plus 4 prenatal and 17 postpartum phone calls with a lactation educator until 6 months after birth. Lactation educators' phone number available to the mothers.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
postnatal care guideline (NG194) evidence review P	Characteristics: Single births Low-income Hispanic women Nulliparous and multiparous	Control*: Standard care – including routine breastfeeding education and support offered by the local health corporation. *1 baby in the control group reported to have birth defects.	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Elliott-Rudder 2014 Cluster RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=15 clusters, corresponding to N=330 women • Intervention: 8 clusters, corresponding to n=154 women • Control: 7 clusters, corresponding to n=176 women Characteristics: Women breastfeeding 12% low family income Nulliparous and multiparous Continued breastfeeding to at least 8 weeks	Intervention: A structured conversation to support continuation of breastfeeding following a Conversation Tool flowchart that used a motivational interviewing approach. Control: Standard care from nurses who had not received WHO breastfeeding support training but would commonly ask whether the woman had any problems	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Forster 2019 RCT Australia Study from new evidence	N=1152 women with single births	Intervention: Peer support + standard care Telephone support from peer supporters. Control: Standard care Hospital postpartum stay and access to hospital specialist breastfeeding services. Women received postnatal visits in their home and also had access to a telephone helpline	• Any breastfeeding (16-26 weeks)
Fu 2014a; Fu 2014b Cluster RCT Hong Kong Study from NICE postnatal care guideline (NG194) evidence review P	N=724 women • Intervention (1): n=191 women • Intervention (2): 269 women • Control: n=264 women Characteristics: Intending to breastfeed Nulliparous	Intervention (1): Standard care plus three in-hospital professional breastfeeding support sessions (30-45 mins) from a midwife or lactation consultant within the first 48 hours Intervention (2): Standard care plus weekly post-discharge breastfeeding telephone support (20-30 mins) for 4 weeks from a midwife or lactation consultant Control: Standard care – consisting of care according to mode of birth, group postnatal lactation education from a midwife or lactation	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		consultant, one-on-one assistance with breastfeeding if problems arose and time permitted, post discharge follow-up, information on available peer-support groups.	
Gonzalez-Darias 2020 RCT Spain Study from new evidence	N=154 women with single births	Intervention: Website access and peer support + standard care Website access to up-to-date information about breastfeeding, which also allowed 1:1 contact with a peer supporter. Control: Standard care No proactive support. Routine postnatal care, which included options to attend support groups, access midwife care, or family planning services.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Graffy 2004 RCT UK Study from NICE postnatal care guideline (NG194) evidence review P	N=720 women • Intervention: n=363 women • Control: n=357 women Characteristics: Women considering breastfeeding who had not breastfed a previous child for 6 weeks Mixed breastfeeding intentions Nulliparous and multiparous	Intervention: 1 antenatal visit from a trained breastfeeding counsellor, who offered postnatal support by telephone or further home visits if requested after the birth Control: Standard care (no details provided)	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Gross 2016 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=533 women • Intervention: n=266 women • Control: n=267 women Characteristics: Single pregnancies Low-income Hispanic families Nulliparous and multiparous 29% pre-pregnancy obesity	Intervention: Standard care plus a family-centred primary care-based early child obesity prevention intervention beginning in the third trimester of pregnancy and continuing after birth until the child is 3 years old. Consisting of individual 45-60 minutes counselling sessions in the prenatal and newborn periods; nutrition and parenting support groups over the 3 years, handouts and DVDs Control: Standard care to include prenatal visits with obstetrician or nurse midwife, initial individual consultation with a nutritionist. Offered antenatal group childbirth and breastfeeding classes; a lactation counsellor was available on the postpartum unit and in the	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		paediatric clinic for women with breastfeeding difficulties. Individual paediatric visits at 5 days of age, and at 1, 2 and 4 months.	
Henderson 2001 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=160 women • Intervention: n=80 women • Control: n=80 women Characteristics: Single pregnancies Nulliparous women Women who planned to breastfeed	Intervention: Standard care plus postpartum positioning and attachment education (~30mins) provided on a one-to-one basis within the first 24 hours; on each subsequent day in the hospital, the woman's positioning and attachment technique was assessed and immediate feedback given Control: Standard postpartum breastfeeding care from hospital midwives (variation in support provided by midwives, often midwives attached the infant for the woman, formal education and assessment of positioning and attachment were not a usual focus)	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Hoddinott 2012 RCT UK Study from NICE postnatal care guideline (NG194) evidence review P	N=69 women • Intervention (1), proactive calls: n=35 women • Intervention (2), reactive calls: n=34 women Characteristics: Single births Women living in disadvantaged areas Women initiating breastfeeding Nulliparous and multiparous	Intervention (1): Proactive telephone calls daily for 1 week following hospital discharge. Calls were terminated at the woman's request or if breastfeeding ceased. At 1 week following discharge, women could choose to continue receiving daily calls for a further week, change the frequency of calls, or have no further calls. Women could telephone the feeding team at any point over the 2 weeks following discharge. Text and answer phone messaging was available. All proactive calls stopped 14 days after hospital discharge. Intervention (2): Reactive telephone calls; women could telephone the feeding team at any point over the 2 weeks following discharge. Text and answer-phone messaging was available	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Jolly 2012 Cluster RCT UK Study from NICE postnatal care guideline (NG194) evidence review P	N=2724 women • Intervention: n=1267 women • Control: n=1457 women Characteristics: Nulliparous and multiparous Multi-ethnic, socio-economically	Intervention: Standard care plus antenatal peer support, and postnatal peer support for women who initiated breastfeeding. Antenatal support was aimed to be 2 support sessions. The support workers were informed when the women were discharged from hospital so that they could contact and visit them within 24-48 hours. Further contact would be needs-based, but with a minimum of 1 more contact in the first week. Additional	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	disadvantaged population	needs-based contacts could be by telephone or home visits. Control: Standard care (antenatal and postnatal midwife care (some home-based), which included breastfeeding advice. Health visitors also saw women postnatally from 10-14 days, sometimes at home, and gave breastfeeding advice as appropriate. Breastfeeding advice was also available from midwives and peer supporters in the hospital.	
Kools 2005 Cluster RCT Netherlands Study from NICE postnatal care guideline (NG194) evidence review P	N=781 women • Intervention: n=408 women • Control: n=373 women Characteristics: 69% women intended to breastfeed Nulliparous and multiparous	Intervention: Structured health counselling; booklet to transfer information between caregivers and between mother and caregivers and used at each consultation; phone number to contact the caregiver if breastfeeding problems arose; lactation consultancy available via caregiver faxing consultant with details of problem. Control: Not specified	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Labarere 2003 RCT France Study from NICE postnatal care guideline (NG194) evidence review P	N=210 women • Intervention: n=106 women • Control: n=104 women Characteristics: Single pregnancies Nulliparous and multiparous In-hospital breastfeeding mothers	Intervention: Standard care and a single (~30mins) one-to-one educational session delivered during the postpartum stay, and a leaflet containing key information in text and pictures. Control: Standard care which included verbal encouragement to maintain breastfeeding by maternity staff and a telephone number of a peer support group to call for help.	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Labarere 2005 RCT France Study from NICE postnatal care guideline (NG194) evidence review P	N=231 women • Intervention: n=116 women • Control: n=115 women Characteristics: Single pregnancies Breastfeeding on the day of discharge Nulliparous and multiparous	Intervention: Standard care and an individual routine outpatient visit in a primary care physician's office within 2 weeks after birth (paediatrician or family physician). Control: Standard care including verbal encouragement to maintain breastfeeding by maternity ward staff, infant health and breastfeeding assessment by a paediatrician on the day of discharge, telephone number of a peer support group to call for help. Outpatient visits in a	• Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		primary care physician's office monthly to 6 months of age.	
Laliberte 2016 RCT Canada Study from NICE postnatal care guideline (NG194) evidence review P	N=472 women • Intervention: n=315 women • Control: n=157 women Characteristics: Single pregnancies Women breastfeeding their baby and continued to do so upon discharge Nulliparous and multiparous	Intervention: In addition to standard care, required to attend a postpartum pre-booked appointment scheduled 48 hours after discharge. Option to attend the clinic for further appointments at woman discretion up to 6 weeks following the birth of their baby. Control: Standard care – discharged according to hospital standards. Entitled to receive follow-up care and seek currently available breastfeeding support in the community.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Lewkowitz 2020 RCT USA Study from new evidence	N=170 women with single births	Intervention: Mobile app support 'Breastfeeding friend' app, including interactive advice, educational content, diet & exercise recommendations, strategies to optimise breastfeeding/pumping, videos, and links to online breastfeeding resources. Control: Standard care Standard care delivered through a control app. Digital version of breastfeeding leaflets provided at routine third-trimester prenatal care visits.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Linares 2019 RCT USA Study from new evidence	N=39 women with single births	Intervention: Peer support Peer support with informational material, individual home visits, and a personalised plan for breastfeeding. Control: Standard care Regular breastfeeding education during prenatal care visits in the clinic.	• Exclusive breastfeeding (6-12 weeks) • Exclusive breastfeeding (16-26 weeks)
Lutenbacher 2018 RCT US Study from NICE postnatal care guideline (NG194)	N=188 women • Intervention (1): n=94 women • Intervention (2), control: n=94 women Characteristics: Self-identified Hispanic women Mean age 30 years	Intervention (1): Implementation of model of care that stresses recognising family strengths and utilising those to address their own family needs. Visits run from pregnancy through to 6 months, consisting of monthly home visits (~1hr) and periodic group gatherings. Intervention (2): Minimal education intervention – distribution of printed	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
evidence review P	Low income – eligible to participate in Maternal Infant Health Outreach Worker programme Approximately 97% reported annual income ≤$15,000	educational materials about maternal and infant health. $25 merchandise card given to all participants at the end of each interview.	
Maycock 2013 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=593 fathers • Intervention: n=295 fathers • Control: n=298 fathers Characteristics: Nulliparous and multiparous Over 18 years	<u>Intervention:</u> Aimed at fathers - standard care plus a 2 hour antenatal education small-group session led by a male facilitator and a postnatal social support 6 week-package. The package included printed and promotional materials delivered at weekly intervals. Antenatal education provided information on benefits of breastfeeding, common difficulties breastfeeding mothers may encounter, and the support fathers can offer. <u>Control:</u> Standard care consisting of antenatal education classes and routine hospital and postnatal care	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
McDonald 2010 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=849 women • Intervention: n=425 women • Control: n=424 women Characteristics: Single pregnancies Women who intended to breastfeed ~36% low socio-economic status Nulliparous and multiparous	<u>Intervention:</u> Individual educational session in hospital room and follow-up support at home by a midwife. Phone calls twice weekly and weekly home visits up to 6 weeks old. <u>Control:</u> Standard care, including one or more home visits by a midwife up to 7 days old, and access to outpatient lactation clinics. Breastfeeding promotional literature and access to an in-house video system to view videos on establishing breastfeeding.	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
McLachlan 2016 Cluster RCT Australia Study from NICE postnatal care guideline (NG194)	N=9675 women • Intervention (1): n=3335 women • Intervention (2): n=2891 women • Control: n=3449 women Characteristics: Nulliparous and multiparous	<u>Intervention (1):</u> Standard care plus home visit – Maternal and child health nurse (MCHN) early visit to bridge the gap (~7days) between a visit by a hospital-midwife and the typical first visit from a MCHN. <u>Intervention (2):</u> Standard care plus home visit and drop in – in addition to the extra MCHN visit, a drop-in centre was made accessible to women. The centre was staffed by a	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
evidence review P		MCHN and there was the opportunity to meet and learn from other mothers. Control: Standard care – hospital midwife visit/s 1-2 days after discharge. MCHN home visit 10 days to 2 weeks after birth. Access to other community supports including 24 hour helpline, support from GPs or other health professionals.	
McQueen 2011 RCT Canada Study from NICE postnatal care guideline (NG194) evidence review P	N=150 women • Intervention: n=69 women • Control: n=81 women Characteristics: Single pregnancies ~14% women aged 19 years or less Women planning to breastfeed Nulliparous	Intervention: Standard care plus self-efficacy intervention; first session within 24 hours of birth, second session within 24 hour of the first session, third session via telephone within 1 week of discharge Control: Standard care that included follow-up by a public health nurse post-hospital discharge	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Milinco 2020 RCT Italy Study from new evidence	N=208 women with single births	Intervention: Video and health professional support Participants given 'Biological Nurturing: laid back breastfeeding' video. After birth in the maternity ward, participants were supported by staff to breastfeed, lying a relaxed, laidback position, with their babies lying prone on their chests. Control: Standard care Participants given 'breast is best' video (details breastfeeding according to the WHO/UNICEF approach). After birth in the maternity ward, participants were shown by staff how to breastfeed, in a sitting upright position, and helped to attach their babies to the breast correctly	• Exclusive breastfeeding (16-26 weeks)
Muirhead 2006 RCT UK Study from NICE postnatal care guideline	N=225 women • Intervention: n=112 women • Control: n=113 women Characteristics: Mix of feeding intentions	Intervention: Standard care and assigned two peer supporters. Peer supporters visited the mother at least once during the antenatal period and contacted women at least every 2 days following discharge either by phone or personal visit up until 28 days. If requested, peer supporters could continue contact up to 16 weeks.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
(NG194) evidence review P	(breastfeeding, formula and undecided) Nulliparous and multiparous	Control: Standard care that included a community midwife for the first 10 days, health visitor after 10 days and breastfeeding support groups and workshops.	• Exclusive breastfeeding (16-26 weeks)
Nilsson 2017 Cluster RCT Denmark Study from NICE postnatal care guideline (NG194) evidence review P	N=3541 women • Intervention: n=2065 women • Control: n=1476 women Characteristics: Single pregnancies Intention to breastfeed Nulliparous and multiparous	Intervention: Mothers were verbally taught breastfeeding techniques along with highlights on a postcard. Mothers were supported postnatally according to the manual and a written pamphlet used during each breastfeeding counselling. Encouraged adherence during the first 3 days or until the first home visit by the health visitor 3–5 days postnatally. The parents received a follow-up telephone call 24 hour after discharge. Control: Standard care (no details provided)	• Exclusive breastfeeding (16-26 weeks)
Padua 2022 RCT Portugal Study from new evidence	N=32 women with single births	Intervention: Nursing care intervention 'Face-to-face' interactive health education sessions with proactive support during regular home visits. Control: Standard care 'Face-to-face' interactive sessions during Children's Health Appointment.	• Exclusive breastfeeding (16-26 weeks)
Paul 2012 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=1154 women and 1169 newborns • Intervention: n=576 women, 583 newborns • Control: n=578 women, 586 newborns Characteristics: Single and twin pregnancies Nulliparous and multiparous Mean age 25 years Majority non-Hispanic Whites (>80%) 5.6% of babies were late preterm (34 to <37 weeks)	Intervention: 1 home nurse visit scheduled to occur within 48 hours of discharge (typically 3-5 days postpartum). Additional office visit scheduled for 1 week after first home visit (typically 5-14 days postpartum). Control: Typical office based care – timing of visit determined by newborn physician.	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	Women attempting to breastfeed during the maternity stay and with intent to continue breastfeeding after discharge		
Petrova 2009 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=104 women • Intervention: n=52 women • Control: n=52 women Characteristics: Single pregnancies Nulliparous and multiparous Low-income – Special Supplemental Nutrition Program For Women, Infants, And Children, WIC participants Primarily Hispanic (88%)	Intervention: Standard care plus additional breastfeeding education during the pregnancy and post-delivery support. A lactation consultant provided two one-to-one (in person 15-20 min) sessions prenatally. Post-birth, education and support was provided in hospital or by phone after discharge, again at the end of the first or second week and of the first and second month. Women were also asked to contact the lactation consultant if problems arose. Educational material translated into Spanish was also provided. Control: Standard breastfeeding education and support during pregnancy and postpartum, including access to lactation consultant services if any breastfeeding problems arose during the hospital stay.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Pisacane 2005 RCT Italy Study from NICE postnatal care guideline (NG194) evidence review P	N=280 mother-father dyads • Intervention: n=140 mother-father dyads • Control: n=140 mother-father dyads Characteristics: Mothers and fathers of healthy, full-term infants, considering breastfeeding Nulliparous and multiparous	Intervention: Fathers were offered a face-to-face, 40-minute session about infant feeding by a midwife. The session focused on potential difficulties and complications and on the father's role in supporting breastfeeding. A leaflet with the main points of the session was provided to fathers. Control: Fathers were offered a face-to-face, 40-minute session about child care, such as accident prevention and vaccination. The session focused on the health benefits of breastmilk but not on the management of breastfeeding. A leaflet with the main points of the session was provided to fathers.	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Pollard 2011 RCT US	N=86 women • Intervention (1): n=43 women • Control: n=43 women	Intervention (1): Women were directed to complete a daily breastfeeding log for 6 weeks. The log had 9 columns that addressed areas such as length of feeding, urine and stool output, use	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
Study from NICE postnatal care guideline (NG194) evidence review P	Characteristics: Postpartum women who planned to breastfeed and initiated breastfeeding within 24 hours of birth Primiparous mothers over 6 months postpartum Age range 18-40 years Primarily White origin (>95%)	of supplement or pumping, and women's feelings. Women received instructions on use of the log and weekly phone calls at 1, 2, 3 weeks to remind them to return the logs to the researcher. Control: Standard care (no details provided) All participants had a videotaped educational session before randomisation, which included information on effective breastfeeding practice, infant feeding patterns, use of breast pumps and common barriers to breastfeeding.	
Pugh 1998 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=60 women • Intervention: n=30 women • Control: n=30 women Characteristics: Primiparous, postpartum women Diverse socioeconomic status Mean age 24 years Majority White origin (93%)	Intervention: Two home visits by community health nurse (once 3-4 days postpartum and again 12 days postpartum). The first visit followed a structured protocol, the second visit was structured to the specific needs of the mother (about 2 hours). Telephone conversation with lactation consultant between these two nurse visits. Control: Standard care including a home visit at 3 to 4 days	• Any breastfeeding (16-26 weeks)
Pugh 2002 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=41 • Intervention: n=21 • Control: n=20 Characteristics: Low income (receiving financial medical assistance support) Predominately (>90%) African American women	Intervention: Standard care plus supplementary visits from community health nurse or peer counsellor team daily in hospital and home visits during weeks 1, 2 and 4 at the team's discretion. Peer counsellors provided telephone support twice weekly through to week 8 and weekly thought to month 6. Control: Standard care that included support from hospital nurses, telephone "warm line," and one hospital visit by a lactation consultant if the participant delivered on a weekday	• Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Pugh 2010 RCT US Study from NICE postnatal	N=328 women • Intervention: n=168 women • Control: n=160 women Characteristics:	Intervention: Breastfeeding support and education for 24 weeks postpartum. Including daily hospital visits, twice at home in week 1 and again in week 4 (home visits lasted 45-60 mins) by community nurse and peer counsellor. Scheduled telephone calls by peer counsellor at	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
care guideline (NG194) evidence review P	Single pregnancies Nulliparous and multiparous Mean age 23 years Predominantly African American (approximately 87%) Low-income (participating in Special Supplemental Nutrition Program For Women, Infants, And Children, WIC) Currently breastfeeding with intention to continue	least every 2 weeks through to week 24 (calls lasted 20 mins on average). Contact number for nurse 24hrs. Additional home visits or telephone support provided if decided by community nurse Control: Standard care including inpatient visit by lactation consultant. Post-discharge, lactation consultant was also available via an answering machine checked at least every 24 hours and office visit with lactation consultant could be requested.	
Puharic 2020 RCT Croatia Study from new evidence	N=400 women with single births	Intervention: Information and telephone intervention Participants given breastfeeding booklet, a general pregnancy booklet, and four proactive telephone calls. Active control: Participants given a general pregnancy booklet and four proactive telephone calls. Control: Standard care No proactive support.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Quinlivan 2003 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=136 women • Intervention: n=71 women • Control: n=65 women Characteristics: Nulliparous Adolescent women (younger than 18 years)	Intervention: Standard care plus home visits by a nurse-midwife at week 1, 2 weeks, 1 month, 2 months, 4 months, and 6 months after birth. Each visit followed a structured protocol and lasted 1–4 hours. Midwives were able to contact the clinic obstetrician if urgent advice was needed, and make referrals. Control: Routine postnatal support, counselling, and information services provided by the hospital, including access to routine hospital domiciliary home-visiting services	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Rasmussen 2011 RCT US	N=50 women • Intervention: n=25 women • Control: n=25 women	Intervention: Phone call from lactation consultant before birth and at 24 to 72 hours after discharge. The lactation consultant asked questions, reviewed practical points about breastfeeding, addressed any issues and was able to book a face-	• Any breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
Study from NICE postnatal care guideline (NG194) evidence review P	Characteristics: Single pregnancies Obese women (pre-pregnancy BMI >29 kg/m^2) Aged at least 19 years Intention to breastfeed	to-face visit if needed. Scripts were followed. After birth, nurses encouraged women to get up and move and asked visitors to leave to allow the mother privacy to breastfeed and bond with the infant. Control: Standard care and a phone call from the lactation consultant before birth to thank women for their participation and asking if they had any questions	
Redman 1995 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=235 women • Intervention: n=120 women • Control: n=115 women Characteristics: Nulliparous Aged between 18-35 years Women intending to breastfeeding	Intervention: Both group and individual sessions delivered by a nurse with midwife and lactation qualifications to include 3 hours teaching session at 24-28 weeks gestation, postnatal hospital visit, phone call at 2-3 weeks, home visit if requested, discussion group at 6-8 weeks postpartum, phone call at 3 months, access to consultant at any point. Control: Standard advice about breastfeeding from their doctor, the hospital staff and from the Antenatal/Preparation for Parenthood classes.	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Reeder 2014 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=1948 women • Intervention (1): n=646 women • Intervention (2): n=645 women • Control: n=657 women Characteristics: Nulliparous or multiparous Low-income (participating in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC) Intended to breastfeed or were considering breastfeeding	Intervention (1): Low frequency telephone peer counselling– 4 planned, peer-initiated calls. One after the initial prenatal assignment, another 2 weeks before due date. Final two are at 1 and 2 weeks postpartum Intervention (2): High frequency telephone peer counselling – 8 planned, peer-initiated calls, two prenatally and one at 1 and one at 2 weeks postpartum. Remaining four scheduled for months 1, 2, 3 and 4. Control: Standard breastfeeding promotion and support. No contact with a peer counsellor.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Relton 2018 Cluster RCT	N=92 areas, corresponding to n=9207 women included	Intervention: Standard care plus financial incentives - shopping vouchers worth £40	• Any breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
UK Study from NICE postnatal care guideline (NG194) evidence review P	in the analysis (analysis was based on areas, not women) Intervention: n=46 areas, corresponding to n=4973 women analysed Control: n=46 areas, corresponding to n=4234 women analysed Characteristics: Predominately White (>95%) population The mean area-level deprivation scores were higher (more deprived) than the mean for England	(US$50) 5 times based on infant age: 2 days, 10 days, 6 to 8 weeks, 3 months, and 6 months (that is,, up to £200/US$250 in total). Vouchers were exchangeable at supermarkets and other retail shops with no restriction on allowable purchases. A web-app postal address checker and a booklet detailing the scheme were distributed to children centres and other public places. <u>Control:</u> Standard care (no details provided)	• Exclusive breastfeeding (6-12 weeks)
Santamaria-Martin 2022 Cluster RCT Spain Study from new evidence	N=434 women	<u>Intervention: Group educational intervention</u> An educational group intervention based on a breastfeeding workshop (acquisition, reinforcement, and/or consolidation of knowledge and skills needed to initiate and maintain exclusive breastfeeding). <u>Control: Standard care</u> Advice given regarding the promotion and benefits of breastfeeding.	• Exclusive breastfeeding (6-12 weeks) • Exclusive breastfeeding (16-26 weeks)
Sciacca 1995 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=68 women • Intervention: n=34 women • Control: n=34 women Characteristics: Low income (participating in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC)	<u>Intervention:</u> Standard care and a 2 hour couples breastfeeding class, where gifts were given to the woman and her partner. In addition, the standard five 1 hour sessions on childbirth preparation as the control group, but the intervention group received incentives for attending at least 3 of 5 sessions. Additional incentives were given for making contact with peer supporter and maintaining breastfeeding. Incentives included a coupon for a free haircut, lunch or breakfast for two, a gift certificate for $15 from a clothing store, an infant carrier, video coupons, or stuffed animals, a box of	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
	Predominately White (approximately 65%) Nulliparous women Participating in study with partner	baby wipes, a bag of diapers. Raffled incentives were higher for exclusive breastfeeding and included: a $40 dinner for two, an electric drill, $100 of groceries, a 52-piece tool set, a trip for two on the Grand Canyon Railway. Raffled incentives for breastfeeding at least half of the time but not exclusively included: a free haircut, lunch for two, a compact disc, a car wash, $5 of gasoline. Control: Standard breastfeeding education given at clinics. This include five 1 hour sessions on childbirth preparation, promotion of breast pump rental service, optional 15 minute breastfeeding group class, 1 prenatal and 3 postnatal contacts (at 2 days, 2 weeks and 2 months postpartum) from peer supporters	
Scott 2021 RCT Australia Study from new evidence	N=1426 fathers	Intervention: Mobile app support Participants given access to an app that uses gamification, social connectivity in the form of a conversation forum, and twice-weekly push notifications linking to polls and conversation starters to engage fathers with breastfeeding information contained within an information library. Control: Standard care Participants attended the breastfeeding component of the hospital based couples antenatal class.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Simonetti 2012 RCT Italy Study from NICE postnatal care guideline (NG194) evidence review P	N=114 women • Intervention: n=55 women • Control: n=59 women Characteristics: Nulliparous women Intending to breastfeed	Intervention: Prenatal Ten Steps to Successful Breastfeeding teaching as per control plus structured telephonic counselling from midwife at least once a week over the first 6 weeks after birth. Able to call the midwife as necessary Control: Standard care included the prenatal Ten Steps to Successful Breastfeeding teaching programme antenatally and conventional counselling - consisting of programmed periodical visits with the physician at 1, 3 and 5 months after delivery. Able to call the midwife as necessary	• Exclusive breastfeeding (6-12 weeks) • Exclusive breastfeeding (16-26 weeks)
Srinivas 2015 RCT	N randomised=120 women	Intervention: Standard care plus contact from a peer counsellor, initially between 28 weeks gestation	• Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
US Study from NICE postnatal care guideline (NG194) evidence review P	N randomised to each group not reported N analysed=103 women • Intervention: n=50 women • Control: n=53 women Characteristics: Nulliparous and multiparous Majority non-White origin Low income – participating in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC and majority on public insurance 82% planning to breastfeed	and 1 week prior to birth. Then contact from peer counsellor in person during clinic visits or via telephone within 3 to 5 days after birth, weekly to 1 month, every 2 weeks up to 3 months, and once at 4 months. Control: Standard care including access to lactation consultants in hospital and outpatient lactation support from clinic paediatricians and nutritionist.	• Exclusive breastfeeding (16-26 weeks)
Steel O'Connor 2003 RCT Canada Study from NICE postnatal care guideline (NG194) evidence review P	N=733 women • Intervention (1), home visits: n=353 women • Intervention (2), telephone screen: n=380 women Characteristics: Single pregnancies Nulliparous Discharged within 2 days of birth	Intervention (1): Two structured home visits by public health nurse, scheduled on the first working day following discharge. One home visit was scheduled as soon as possible, the other one within 10 days of discharge. Referrals to other support services were made if need identified by mother or nurse. Intervention (2): Screening telephone call by public health nurse on the first working day following discharge. A home visit or referrals followed if a need was identified. Otherwise women were provided with a phone number to call if they wished further support	• Any breastfeeding (16-26 weeks)
Su 2007 RCT Singapore Study from NICE postnatal care guideline (NG194)	N=450 women • Intervention (1): n=150 women • Intervention (2): n=149 women • Control: n=151 women Characteristics:	Intervention (1): One session of antenatal breastfeeding education – including a 16 minute educational video, printed handouts and opportunities to talk to lactation counsellor for ~15 minutes. Subsequently received routine intrapartum and postnatal obstetric care.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
evidence review P	Single pregnancies. Nulliparous and multiparous Women who stated an intention to breastfeed Ethnicity: 38% Chinese, 48% Malay, 11% Indian, 3% other	Intervention (2): Two sessions ~30 minutes of postnatal lactation support, once before discharge, once during their first routine postnatal visit one to two weeks after birth. Visit by lactation consultant within the first 3 postnatal days before discharge when they were also given printed handouts on breastfeeding. Control: Standard care that included optional antenatal classes that did address infant feeding and postnatal visits by a lactation consultant should problems arise	• Exclusive breastfeeding (16-26 weeks)
Uscher-Pines 2019 RCT USA Study from new evidence	N=203 women with single births	Intervention: Mobile app support + standard care Participants given 'Pacify Health telelactation' app by hospital nurses. They were also given unlimited video calls, which they could request through app. Control: Standard care Postpartum support offered by various healthcare professionals.	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks)
Vidas 2011 RCT Croatia Study from NICE postnatal care guideline (NG194) evidence review P	N=100 women • Intervention: n=50 women • Control: n=50 women Characteristics: Currently breastfeeding Child had up to 2 months breastfeeding	Intervention: Autogenic training. Every two weeks mothers practiced a new exercise. The 6 basic exercises of autogenic training were taught for 12 weeks in small groups. Mothers were encouraged to practice three times a day at home, until child was 6 months old. Control: Standard care (no details provided)	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Wallace 2006 RCT UK Study from NICE postnatal care guideline (NG194) evidence review P	N=370 women • Intervention: n=188 women • Control: n=182 women Characteristics: Intended to breastfeed Nulliparous	Intervention: Verbal advice about initiation of feeding, positioning and attachment, delivered at the first postnatal ward feed, by a trained midwife. A leaflet explained this information and also reminded mothers that their baby needed only breast milk until at least 4 months post-partum. Control: Standard care followed each maternity unit's policy, which did not stipulate advice about positioning, attachment nor verbal-only care. Additional breastfeeding advice	• Any breastfeeding (6-12 weeks) • Exclusive breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		leaflets were available to mothers and staff in line with the local policy.	
Washio 2017 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=36 women • Intervention: n=18 women • Control: n=18 women Characteristics: Primiparous and multiparous women Self-identified Puerto Rican women Low-income – enrolled in Special Supplemental Nutrition Program for Women, Infants, and Children, WIC programme Currently breastfeeding	Intervention: In addition to standard care a financial incentive of $20 at the end of the first month and increased by $10 every month until the end of 6 months. Maximal potential earning was $270 for breastfeeding for 6 months Control: Standard breastfeeding services from women and infant centre programme. Services included on-site lactation consultation, bilingual peer counselling, weekly peer support meetings, free breast pump, enhanced food package for breastfeeding mothers. All participants in both study groups were compensated $25 per assessment, regardless of breastfeeding status. This equalled a total potential earning of $100 for completing followup.	• Any breastfeeding (6-12 weeks) • Any breastfeeding (16-26 weeks)
Wen 2011 RCT Australia Study from NICE postnatal care guideline (NG194) evidence review P	N=667 women • Intervention: n=337 women • Control: n=330 women Characteristics: Nulliparous Mean age 26 years (range 16-47)	Intervention: Staged intervention lasting one year. 6 home visits from community nurse – once at 30-36 weeks gestation and then after birth at 1, 3, 5, 9, 12 months. Each visit lasted 1-2 hours and addressed infant feeding practices and infant nutrition. Control: Standard care to include one nurse home visit within 1 month of birth if needed.	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)
Wen 2020 RCT Australia Study from new evidence	N=1155 women	Intervention: Telephone support Participants received intervention booklet and family health nurse support via telephone. Text message support Participants given intervention booklet and received text messages via a 2-way automated system at a predetermined time. Control: Standard care	• Any breastfeeding (16-26 weeks) • Exclusive breastfeeding (16-26 weeks)

Study	Population (n randomised)	Intervention and comparator	Outcomes
		Participants received usual care from child and family health nurses in the local health districts.	
Wilhelm 2006 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=73 women • Intervention: n=37 women • Control: n=36 women Characteristics: Primiparous Currently breastfeeding at recruitment Mean age 25 years (range 19-38) Primarily White origin (approximately 89%)	Intervention: Standard care plus motivational interviewing. Initial intervention delivered at days 2-4. 2 booster sessions were delivered during 2 and 6 week outpatient visits Control: Standard care, consisting of breastfeeding assessment plus a lactation consultant troubleshooting problems. Provided during hospital stay and subsequent visits	• Any breastfeeding (16-26 weeks)
Wilhelm 2015 RCT US Study from NICE postnatal care guideline (NG194) evidence review P	N=53 women • Intervention: n=26 women • Control: n=27 women Characteristics: Single pregnancies Self-identified Mexican-American women Mean age 24 years (range 15-50) Majority low income – 91% had annual income <$20,000, 58% <$10,000 Currently breastfeeding at recruitment stage	Intervention: Motivational interviewing delivered during home visit at 3 days and booster sessions delivered during visits at 2 weeks and 6 weeks postpartum. Control: Attention control - Mothers given educational information about different aspects of infant safety during the 3 visits. Includes information on fall prevention, poisoning, drowning and car seat safety. Spanish language research materials and an interpreter were available as needed for all sessions. All mothers received a manual breast pump at the beginning of the study and a box of diapers at the end of the study as incentives.	• Any breastfeeding (16-26 weeks)

RCT: randomised controlled trial; UNICEF: United Nations Children's Fund; WHO: World Health Organisation.

See the full evidence tables in appendix D for the new studies and the NICE guideline on postnatal care Evidence Report P, Appendix D for full evidence tables for studies originally from NG194. See the forest plots in appendix E.

Evidence review P from the NICE guideline on postnatal care did not include the outcome 'proportion of women breastfeeding at 16-26 weeks (exclusive breastfeeding)' so this data has been extracted separately from relevant studies and are reported in Appendix M.

Summary findings of the pairwise analysis

This section presents the summary of the findings from the pairwise analysis for clinical effectiveness evidence. Findings from the meta-regression analysis are presented here.

Comparison 1.1: Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Overall, education, advice and support interventions given by peers or professionals provided postnatally and initiated either antenatally or within the first eight weeks after birth showed an important benefit over standard care for any (47 studies) and exclusive (37 studies) breastfeeding at 6-12 and for any (47 studies) and exclusive (35 studies) breastfeeding at 16-26 weeks, for mothers only and mothers and co-parents. The quality of this evidence ranged from moderate to very low.

Comparison 1.2: Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: fathers only) (single births)

There was some mixed evidence for education, advice, and support interventions targeted towards fathers. 3 studies were included under this comparison. There was an important benefit over standard care for any breastfeeding at 6-12 weeks, and also for exclusive breastfeeding at 6-12 and 16-26 weeks. However, some evidence also showed no important differences on these same outcomes, and also for any breastfeeding at 16-26 weeks. The quality of this evidence ranged from moderate to very low.

Sub-group analysis for components of interventions

Sub-group analysis was conducted if there was heterogeneity in the evidence according to the following: how the intervention was delivered, where the intervention was delivered, number of contacts, duration of contacts, and women defined as ‘low income’.

1.1.1 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: how the intervention was delivered (population: mothers and co-parents, single births)

Sub-group analysis based on this component did not resolve heterogeneity.

The evidence showed an important benefit for the intervention components face-to-face individual interventions and telephone interventions for exclusive breastfeeding at 6-12 weeks, and for the component face-to-face groups classes for exclusive breastfeeding at 16-26 weeks. This evidence was moderate and very low quality.

There was no important difference between the intervention components face-to-face group classes and self-help compared to standard care for exclusive breastfeeding at 6-12 weeks. There was also no important difference for face-to-face individual, telephone and self-help interventions for exclusive breastfeeding at 16-26 weeks. This evidence was moderate and very low quality.

1.1.2 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: where the intervention was delivered (population: mothers and co-parents, single births)

Sub-group analysis based on this component did not resolve heterogeneity.

The evidence showed an important benefit for the delivery of the intervention in a healthcare setting, home setting and both health care and home setting for exclusive breastfeeding at 6-12 weeks, and also for exclusive breastfeeding at 16-26 weeks in a home setting. This evidence was low and very low in quality.

The evidence showed no important difference for the intervention being delivered in a healthcare setting and both home and a healthcare setting for exclusive breastfeeding 16-26 weeks. This evidence was moderate and low in quality.

1.1.3 Education, advice or support and standard care for maintaining breastfeeding after beyond 8 weeks after birth: number of contacts (population: mothers and co-parents, single births)

Sub-group analysis based on this component did not resolve heterogeneity.

The evidence showed an important benefit for 4-8 contacts and 9+ contacts for exclusive breastfeeding at 6-12 weeks and at 16-26 weeks. This evidence was low and very low in quality.

The evidence showed no important difference for 1 contact and 2-3 contacts for exclusive breastfeeding at 6-12 and 16-26 weeks. This evidence was moderate and very low in quality.

1.1.4 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: duration of contact (population: mothers and co-parents, single births)

Sub-group analysis based on this component did not resolve heterogeneity.

The evidence showed an important benefit for whether the intervention duration was lower than 8 weeks and higher than 8 weeks for exclusive breastfeeding at 6-12 weeks and at 16-26 weeks. This evidence was moderate to very low in quality.

1.1.5 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: women defined as low-income (population: mothers and co-parents, single births)

Sub-group analysis based on income level did not resolve heterogeneity.

The evidence showed an important benefit when sub-grouped by mixed household income or low household income for exclusive breastfeeding at 6-12 weeks. There was also an important benefit for mixed household income for exclusive breastfeeding at 16-26 weeks. The quality of this evidence ranged from moderate to very low.

However, there was no important difference for evidence sub-grouped by low household income for exclusive breastfeeding at 16-26 weeks. This evidence was low in quality.

Comparison 1.3: Education, advice or support versus education, advice or support for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

No new studies were identified that made head-to-head comparisons between active education, advice or support interventions. 3 studies were included under this comparison. The evidence from studies in NG194 showed no important difference when comparing one type of education, advice or support intervention to another.

Comparison 2: Financial incentives

No new studies were identified for the comparison of financial incentives. 3 studies were included under this comparison from NG194. The evidence from studies in NG194 showed that there was an important benefit for financial incentives when compared to standard care.

See appendix F for full GRADE tables.

Meta-regression evidence statements

Critical outcomes

Any breastfeeding between 6 and 12 weeks

- Low quality evidence from 46 RCTs (N=14,801 women) showed that
  - Regarding the mode of delivery ("How"), face-to-face individual, face-to-face group, and remote interventions showed benefit on any breastfeeding between 6 and 12 weeks after birth. Self-help did not show benefit on any breastfeeding between 6 and 12 weeks after birth.
  - Regarding the "Number of contacts", interventions with 4-8 contacts and interventions with ≥9 contacts showed benefit on any breastfeeding between 6 and 12 weeks after birth. Interventions with 0, 1, or 2-3 contacts did not show benefit on any breastfeeding between 6 and 12 weeks after birth.
  - Regarding the "Duration of contact", interventions lasting <8 weeks as well as those lasting >8 weeks showed benefit on any breastfeeding between 6 and 12 weeks after birth.
  - Regarding "Where delivered", interventions delivered in a healthcare setting, those delivered in a home setting, and those delivered in a mixed healthcare and home setting all showed benefit on any breastfeeding between 6 and 12 weeks after birth.

Exclusive breastfeeding between 6 and 12 weeks

- Very low quality evidence from 37 RCTs (N=10,000 women) showed that
  - Regarding the mode of delivery ("How"), face-to-face individual, face-to-face group, and remote interventions showed benefit on exclusive breastfeeding between 6 and 12 weeks after birth. Self-help did not show benefit on exclusive breastfeeding between 6 and 12 weeks after birth.
  - Regarding the "Number of contacts", interventions with 4-8 contacts and interventions with ≥9 contacts showed benefit on exclusive breastfeeding between 6 and 12 weeks after birth. Interventions with 0, 1, or 2-3 contacts did not show benefit on exclusive breastfeeding between 6 and 12 weeks after birth.
  - Regarding the "Duration of contact", interventions lasting <8 weeks as well as those lasting >8 weeks showed benefit on exclusive breastfeeding between 6 and 12 weeks after birth.
  - Regarding "Where delivered", interventions delivered in a healthcare setting, those delivered in a home setting, and those delivered in a mixed healthcare and home setting showed benefit on exclusive breastfeeding between 6 and 12 weeks after birth.

Any breastfeeding between 16 and 26 weeks

- Moderate quality evidence from 48 RCTs (N=17,483 women) showed that
  - Regarding the mode of delivery ("How"), face-to-face individual, face-to-face group, and remote interventions showed benefit on any breastfeeding between 16 and 26 weeks after birth. Self-help did not show benefit on any breastfeeding between 16 and 26 weeks after birth.
  - Regarding the "Number of contacts", interventions with 4-8 contacts showed benefit on any breastfeeding between 16 and 26 weeks after birth. Interventions with 0, 1, 2-3, or ≥9 contacts did not show benefit on any breastfeeding between 16 and 26 weeks after birth.
  - Regarding the "Duration of contact", interventions lasting >8 weeks showed benefit on any breastfeeding between 16 and 26 weeks after birth. Interventions lasting <8 weeks did not show benefit on any breastfeeding between 16 and 26 weeks after birth.
  - Regarding "Where delivered", interventions delivered in a healthcare setting, those delivered in a home setting, and those delivered in a mixed healthcare and home setting showed benefit on any breastfeeding between 16 and 26 weeks after birth.

Exclusive breastfeeding between 16 and 26 weeks

- Very low quality evidence from 36 RCTs (N=12,630 women) showed that

- Regarding the mode of delivery ("How"), face-to-face group, and remote interventions showed benefit on exclusive breastfeeding between 16 and 26 weeks after birth. Face-to-face individual interventions and self-help did not show benefit on exclusive breastfeeding between 16 and 26 weeks after birth.
- Regarding the "Number of contacts", interventions with 4-8 contacts showed benefit on exclusive breastfeeding between 16 and 26 weeks after birth. Interventions with 0-1, or 2-3, or ≥9 contacts did not show benefit on exclusive breastfeeding between 16 and 26 weeks after birth.
- Regarding the "Duration of contact", interventions lasting >8 weeks showed benefit on exclusive breastfeeding between 16 and 26 weeks after birth. Interventions lasting <8 weeks did not show benefit on exclusive breastfeeding between 16 and 26 weeks after birth.
- Regarding "Where delivered", interventions delivered in a home showed benefit on exclusive breastfeeding between 16 and 26 weeks after birth. Interventions delivered and a healthcare setting and those delivered in a mixed healthcare and home setting did not show benefit on exclusive breastfeeding between 16 and 26 weeks after birth.

Economic evidence

Included studies

Two economic studies were identified which were relevant to this question, one included from the NICE guideline on postnatal care NG194 (Frick 2012) and one identified from the update search, which, however, described the economic analysis undertaken to inform the NICE guideline on postnatal care NG194 (Mavranezouli 2022).

See the literature search strategy in appendix B and economic study selection flow chart in appendix G.

Excluded studies

Economic studies not included in this review are listed, and reasons for their exclusion are provided in appendix J.

Summary of included economic evidence

See Table 3 for the economic evidence profiles of the included studies.

Table 3: Economic evidence profiles of approaches and interventions that are effective in maintaining breastfeeding beyond 8 weeks after birth

Study and country	Limitations	Applicability	Other comments	Incremental costs[1]	Incremental effects	ICER[1]	Uncertainty
Frick 2012 US	Potentially serious[2]	Partially applicable[3]	Population: low-income mothers of full-term infants Interventions: Intervention aiming at maintaining breastfeeding, which included postpartum hospital visits by a breastfeeding support team, home visits, telephone support and 24 hour pager access TAU Outcome: proportion of women breastfeeding at 12 and 24 weeks postpartum Time horizon: from birth to 24 weeks postpartum Cost year: uplifted to 2018	£238	0.09 at 12 weeks postpartum 0.01 at 24 weeks postpartum	£2,705/extra woman breastfeeding at 12 weeks postpartum £21,637/extra woman breastfeeding at 24 weeks postpartum	Difference in outcome between groups not statistically significant at 12 or 24 weeks
Mavranezouli 2022 (NG194 Postnatal care economic analysis) UK	Potentially serious limitations[4]	Directly applicable[5]	Population: women who are pregnant or gave birth to healthy babies at term, and their babies Interventions: Education, advice or support from a peer or professional, that was provided in a mixed individual and group mode postnatally and was initiated	£65	0.00125	£51,946	Intervention becomes cost-effective (ICER £20,000/QALY) if base-case RR rises from 1.19 to 1.35-1.40 and if intervention cost falls from £84 to £40-45.

Study and country	Limitations	Applicability	Other comments	Incremental costs[1]	Incremental effects	ICER[1]	Uncertainty
			either antenatally or within the first eight weeks after birth, aiming at promoting initiation and maintenance of breastfeeding TAU Outcome: QALY Clinical conditions assessed: In babies: • gastrointestinal infections • respiratory tract infections • acute otitis media • mortality due to infectious diseases • mortality due to SIDS In mothers • Breast cancer Time horizon: from 1 year to lifetime, depending on clinical condition Cost year: 2018				
Economic analysis undertaken to inform this guideline	Potentially serious limitations[4]	Directly applicable[5]	Population: women and people who are pregnant or gave birth to healthy babies at term, and their babies Interventions: Education, advice or support from a peer or professional, that was provided in (a) a mixed individual and group mode or (b) as a group intervention	(a) £67 (b) -£61	(a) 0.00127 (b) 0.00407	(a) £52,934 (b) dominant	Mixed intervention becomes cost-effective (ICER £20,000/QALY) if base-case RR rises from 1.20 to 1.35-1.40 and if intervention cost falls from £95 to £50-55.

Study and country	Limitations	Applicability	Other comments	Incremental costs[1]	Incremental effects	ICER[1]	Uncertainty
			postnatally and was initiated either antenatally or postnatally, aiming at promoting maintenance of breastfeeding beyond 8 weeks after birth TAU Outcome: QALY Clinical conditions assessed: In babies: • gastrointestinal infections • respiratory tract infections • acute otitis media • mortality due to infectious diseases • mortality due to SIDS In mothers • Breast cancer Time horizon: from 1 year to lifetime, depending on clinical condition Cost year: 2022				

ICER: Incremental cost-effectiveness ratio; NHS: National Health Service; PSA: probabilistic sensitivity analysis; QALY: quality-adjusted life year; RR: risk ratio; SIDS: sudden infant death syndrome; TAU: treatment as usual;
1. Costs converted to GBP using Purchasing Power Parity exchange rates
2. Study based on RCT (N=328; completers at 24 weeks postpartum=243); national unit costs used; time horizon: 24 weeks; sensitivity analysis around variation in time conducted; consideration of intervention costs (staff time and mileage) only; study not powered to detect healthcare cost differences
3. US study, no QALYs used, healthcare perspective, discounting not needed
4. Study based on decision-analytic economic modelling; effectiveness of intervention based on systematic review and meta-regression; outcomes of breastfeeding based on published systematic reviews and meta-analyses, but primary studies were prone to bias, as some studies adjusted for known confounders but others did not, meaning that the magnitude of the clinical benefits of breastfeeding may have been overestimated; epidemiological, utility and cost data obtained from national sources and other published literature; a selection of clinical conditions examined, due to complexity of modelling or unavailability of suitable data for some clinical conditions; time horizon ranging from 1 year to lifetime, varying by clinical condition examined; national unit costs used; PSA conducted
5. English study; NHS/personal social services perspective; QALY was the primary outcome (based mostly on EQ-5D ratings), discounting 3.5% annually for costs and outcomes

Economic model

A decision-analytic model was developed to assess the cost-effectiveness of an intervention for women and people who gave birth, aiming at maintaining breastfeeding beyond 8 weeks after birth. The intervention was provided in addition to standard care and was compared with standard care alone. Details of the economic modelling are provided in appendix I. This section provides a summary of the methods employed and the results of the economic analysis.

Overview of economic modelling methods

The economic analysis is based on the analysis undertaken to inform NICE guideline on postnatal care NG194. The characteristics of the intervention assessed in the economic analysis, in terms of effectiveness and resource use (number of sessions, format, people delivering the intervention, and so on), were determined by the findings of the guideline systematic review and meta-regression undertaken to inform the review question (described in appendix M), supplemented by information on patterns of routine practice regarding postnatal care in the UK obtained from NG194. The intervention comprised education, advice or support from a peer or professional provided postnatally and was initiated either antenatally or postnatally. Standard care in the RCTs that informed the economic analysis ranged from no intervention, through written materials and peer breastfeeding support, to availability of breastfeeding educational programmes of variable intensity in-hospital or in the community. In the UK NHS, standard care may include provision of written material, antenatal breastfeeding educational programmes, and postnatal breastfeeding support groups run by peers and/or health professionals; in some settings breastfeeding information and support is provided by midwives and/or health visitors as part of routine postnatal care visits.

Two separate analyses were conducted: one for an intervention delivered in a mixed individual and group format, and another one for an intervention delivered exclusively in a group format. For the mixed intervention, its relative effect in the form of risk ratio (RR) when added onto standard care versus standard care alone on any breastfeeding at 16-26 weeks after birth was 1.20 (95% CI 1.09 to 1.31), based on the results of the meta-regression for the variable ‘number of contact visits’, category 4-8 contacts. The intervention consisted of 6 face-to-face contacts, comprising 4 individual and 2 group sessions delivered to groups of 6 people. The first two individual sessions were assumed to be provided by a health professional in NHS England Agenda for Change Band 5, while the remaining sessions were assumed to be provided by a volunteer trained peer supporter. The specification of the intervention in terms of resource use was based on NG194 economic analysis. The total cost of the mixed individual and group intervention was £95.

For the group intervention, its relative effect (RR) was 1.64 (95% CI 1.34 to 1.93), based on the results of the meta-regression for the variable ‘how’, category face-to-face group. The intervention consisted of 6 face-to-face group contacts delivered to groups of 6 people. Like the mixed intervention, the first two sessions were assumed to be provided by a health professional in NHS England Agenda for Change Band 5, while the remaining sessions were assumed to be provided by a volunteer trained peer supporter. The total cost of the group intervention was £28.

A hybrid decision-analytic model consisting of a decision-tree followed by 3 further decision trees and 2 Markov models, each representing a clinical condition that has been associated with breastfeeding, was used to evaluate the relative cost-effectiveness of the breastfeeding intervention in the long term. The model was based on the model developed to inform NG194, with input parameters updated where more recent data were available. The time horizon of the analysis ranged from 1 year to lifetime, depending on the clinical condition modelled. The structure of the NG194 economic model was based, for the majority of the

assessed outcomes, on a UK modelling study that estimated long-term benefits and cost-savings associated with breastfeeding that was commissioned by UNICEF UK. Effectiveness data on the protective effect of breastfeeding in women and people who gave birth and their babies were derived from published systematic reviews and meta-analyses, identified from a systematic review undertaken for the NG194 guideline, most of which reported results adjusted for known confounders. Epidemiological data utilised in the updated model, including baseline breastfeeding rates (that is, breastfeeding rates under standard care), were derived from national statistics and large administrative databases. Utility data were estimated based on national UK norms and a published systematic review and meta-analysis. Cost data were taken from national sources and other published literature.

The clinical conditions considered in the model were determined by the availability of relevant clinical data on the protective effect of breastfeeding in women and babies, as identified from the systematic review that was undertaken for this purpose in NG194. The following clinical conditions were modelled:

- clinical conditions in babies:
  - gastrointestinal infection
  - respiratory tract infection
  - acute otitis media
  - mortality due to infectious diseases
  - mortality due to SIDS (sudden infant death syndrome)
- clinical conditions in women:
  - breast cancer.

According to the model structure, hypothetical cohorts of women and people who are pregnant or have given birth to healthy babies at term were either initiated on a breastfeeding intervention in addition to standard care, or received standard care only. Following care received, women and people who gave birth either breastfed or they did not breastfeed at 16-26 weeks after birth. These people and their babies were subsequently followed for a period of time that ranged from 1 year after birth to lifetime, depending on the clinical condition assessed, to estimate their outcomes and costs associated with each of the clinical conditions considered, resulting from the women's and peoples who gave birth and their babies' breastfeeding status at 16-26 weeks after birth.

The economic analysis adopted the perspective of the NHS and personal social services (PSS). Costs consisted of the intervention cost (healthcare professional time) and costs associated with breastfeeding outcomes that are incurred in community, primary or secondary healthcare or personal social service settings. The cost year was 2022. The primary measure of outcome was the QALY. Other secondary measures of outcome were determined by the clinical conditions considered in the economic analysis.

Both deterministic and probabilistic analyses were conducted. Moreover, a two-way sensitivity analysis was carried out, by changing concurrently the mean effect (RR) and cost of the intervention, to explore the impact of changes on the cost-effectiveness results. The ranges tested were from 1.05 to 2.00 for the intervention effect; and from £20 to £100 for the intervention cost.

The result of the analysis was expressed as an ICER, estimated as the difference in costs divided by the difference in QALYs between the intervention added on standard care and standard care alone.

Overview of economic modelling results and conclusions

The ICER of the mixed intervention added on standard care compared with standard care alone was £52,934/QALY, which is well above the NICE upper cost-effectiveness threshold of £30,000/QALY, suggesting that the mixed intervention is not cost-effective.

However, a group intervention added on standard care was more effective and overall less costly compared with standard care, meaning that the group intervention was the dominant option and thus was cost-effective.

The guideline economic analysis considered a number of clinical outcomes to people breastfeeding (prevention of breast cancer) and their babies (prevention of gastrointestinal infection, respiratory tract infection, acute otitis media, mortality due to infectious diseases and SIDS) in the long-term and was overall characterised by robust methodology regarding the model structure and data sources. However, the data on the protective effect of breastfeeding were derived from study designs that were prone to bias and potential confounding, and therefore the magnitude of the clinical benefits of breastfeeding may have somewhat been overestimated in this literature and, consequently, in the economic analysis undertaken to inform this guideline. On the other hand, several other outcomes that are associated with breastfeeding, such as prevention of ovarian cancer and diabetes in breastfeeding people and prevention of obesity in breastfeeding people and their babies were not considered in the analysis. Further research is needed to more accurately quantify the association of breastfeeding to clinical conditions in breastfeeding people and their babies, and to explore the impact of the additional benefits of breastfeeding that were omitted from the current economic modelling, on the cost-effectiveness of breastfeeding interventions.

Details of the methods employed in the economic analysis and full results are provided in appendix I.

Economic evidence statements

- Evidence from a US study conducted alongside an RCT (N=328; completers at 6 weeks postpartum n=280; at 24 weeks postpartum n=243) suggests that an intervention aimed at promoting breastfeeding, which includes provision of a prescribed program of support and education in hospital and for the first 24 weeks postpartum for low-income breastfeeding women of full-term babies improves breastfeeding rates at 6 weeks, but not at 24 weeks postpartum and has an increased cost compared with standard routine practice. The study is partially applicable to the NICE decision-making context as it was conducted in the US; moreover, the lack of use of QALY as the measure of outcome makes interpretation of findings and judgement of the cost-effectiveness of the intervention difficult. The study is characterised by potentially serious limitations.
- Evidence from the economic analysis undertaken to inform the NICE postnatal care guideline (NG194) suggests that providing an intervention delivered in a mixed individual and group format aimed at promoting breastfeeding, which comprises education, advice or support from a peer or professional, in addition to standard care, is unlikely to be cost-effective compared with standard care alone. The study is directly applicable to the NICE decision-making context but is characterised by potentially serious limitations.
- Evidence from the current economic analysis undertaken to inform this guideline suggests that providing an intervention delivered in a mixed individual and group format aimed at promoting maintenance of breastfeeding, which comprises education, advice or support from a peer or professional, in addition to standard care, is unlikely to be cost-effective compared with standard care alone. However, a group intervention delivered in addition to standard care is highly likely to be cost-effective compared with standard care alone. Two-way sensitivity analysis suggested that the mixed intervention became cost-effective (with an ICER of £20,000/QALY) if the base-case RR rose from 1.20 to 1.35-1.40 and if the intervention cost fell from £95 to £50-55. The study is directly applicable to the NICE decision-making context but is characterised by potentially serious limitations.

The committee's discussion and interpretation of the evidence

The outcomes that matter most

The committee were aware that rates of exclusive breastfeeding at 6 months in the UK continue to be low despite recommendations. The proportion of women breastfeeding at 6 to 12 weeks and 16 to 26 weeks were prioritised as critical outcomes by the committee so that they could identify interventions that improved breastfeeding rates during these distinct timepoints. These outcomes followed the outcomes chosen in evidence review P in the NICE postnatal care guideline which this review partially updates. Assessing breastfeeding at 6 to 12 weeks was thought to capture established breastfeeding after initiation whilst breastfeeding at 16 to 26 weeks was thought to capture continued breastfeeding prior to introduction of solid foods.

The committee were interested in both exclusive breastfeeding and any breastfeeding (including exclusive and partial breastfeeding).

Women's satisfaction was considered an important outcome because the committee wanted to know whether women found receiving an intervention beneficial and acceptable.

Evidence was available for all protocol outcomes expect for women's satisfaction with breastfeeding interventions.

The quality of the evidence

The quality of the evidence for outcomes was assessed with GRADE and was rated as very low to moderate, with the majority of the evidence being very low quality.

Overall, there were some concerns with the risk of bias in the evidence. There were issues with the randomisation process, deviation from the intended intervention, and missing outcome data. There were serious or very serious concerns with imprecision around the effect estimate (due to low event rate). Moreover, some of the evidence was downgraded for concerns about heterogeneity that could not be resolved by subgroup analysis. When there was heterogeneity, subgroup analysis was performed by intervention subgroups: how the intervention was delivered, where the intervention was delivered, number of contacts, and duration of contacts and population subgroup: women defined as low income.

Benefits and harms

The committee used evidence from the pairwise analysis, results from the meta-regression analysis and economic analysis to make the recommendations, supported by the qualitative evidence from evidence review K.

There was some evidence from the pairwise analysis and the meta-regression analysis that suggested 4-8 contacts had a benefit on any and exclusive breastfeeding at 6-12 and 16-26 weeks. The committee discussed that the number of contacts a person requires varies depending on their needs. Therefore, in order to tailor care to the person, the committee agreed that rather than specifying the number of contacts, prolonged and continual support during the postnatal period should be available, as and when required.

The pairwise evidence showed that the intervention 'education, advice or support from peers or professionals' had an important benefit over standard care for any and exclusive breastfeeding at 6-12 and 16-26 weeks. However, to make more specific recommendations about intervention components, the committee drew on the evidence from the meta-regression analysis.

In terms of how the intervention is delivered, the meta-regression results suggested that face-to-face individual interventions had an important effect on any breastfeeding at 6-12

weeks after birth, and any breastfeeding at 16-26 weeks after birth. Face-to-face group interventions had an important effect on any and exclusive breastfeeding both at 6-12 weeks and 16-26 weeks after birth. The economic analysis also showed face-to-face group interventions to be cost-effective. The committee agreed with the evidence and were aware from their own knowledge that face-to-face interventions are effective and valued by women. There was also some qualitative evidence in evidence review K which suggested that women prefer group support, as it provided a sense of community. Based on these, the committee recommended the provision of face-to-face breastfeeding support group sessions by appropriately trained healthcare professionals or peer supporters.

The committee discussed different settings to deliver group support, such as breastfeeding 'cafes', which can often include individualised support in a group setting. In current practice, breastfeeding support groups are often offered by charities or other local services and therefore these services may vary from area to area. The support may be provided by healthcare professionals as well as trained peer supporters.

There was some evidence from the meta-regression analysis that suggested remote interventions have a benefit on any and exclusive breastfeeding at 6-12 and 16-26 weeks. Additionally, there was some qualitative evidence (evidence review K) that suggested women appreciated group support, but it could be inaccessible due to location, scheduling and timing of classes available (for example, the group session would be the following week, but the issue required resolution immediately). The committee agreed with this finding and discussed that out-of-hours support was a common request as people often required a quick solution, which could be solved through the provision of online interventions. The committee were aware from their knowledge and experience that the use of online interventions significantly increased during the COVID-19 pandemic and has continued success in practice today.

The committee were aware from their knowledge and experience that some group work and peer supporters had moved online instead of being conducted in children centres, and how this was quite effective particularly in the early stages of motherhood when it can be quite difficult to leave home. Although online support has the potential to increase accessibility, the committee agreed that it is optimum to meet face-to-face for breastfeeding support provision, although remote or online support is an important addition.

There was no new evidence identified on financial incentives. The evidence from NG194 showed some effect on breastfeeding rates but was generally of poor quality and considering the cost of the intervention, the committee did not think the evidence was strong enough to make any recommendations for this intervention. The committee did not make a research recommendation in this area as they did not consider it to be a priority for research.

The evidence for the intervention 'education, advice or support from peers or professionals' was stratified by mothers, fathers only, and women defined as low income, where possible. The committee agreed there was insufficient evidence identified to make separate recommendations for these groups.

Overall, the evidence for the other intervention components, duration of contact and where the intervention was delivered, showed equal benefit and therefore the committee could not recommend one over the other (for example, interventions lasting <8 week and >8 weeks largely showed a benefit for exclusive breastfeeding at both time points).

The committee acknowledged the wide variation in standard care across the evidence and they considered this could be a plausible reason for differences in magnitude of benefits of the interventions, or a lack of difference between the intervention and control arms in the evidence. On the other hand, several studies included in the review (and the meta-regression) compared an active intervention plus standard care versus standard care alone, so it was the additional effect of the active intervention that was assessed in these studies. In other studies, where an active intervention was stated to have been compared to standard care, the characteristics of standard care (where details were provided) were considered to

explore whether standard care reflected routine care or had characteristics of an active intervention. If the latter, then in the meta-regression the comparator was coded as an active intervention rather than as standard care. This approach limited the impact of the variation in standard care across the studies included in the meta-regression on the magnitude of the benefits estimated for the active intervention.

Most of the evidence (except for 2 studies which included both single and multiple births) was in single births, therefore the committee did not make any specific recommendations for multiple births.

Cost effectiveness and resource use

Existing economic evidence conducted to inform the NICE postnatal care guideline (NG194) indicated that providing an intervention delivered in a mixed individual and group format aimed at promoting breastfeeding, which comprises education, advice or support from a peer or professional, in addition to standard care, is unlikely to be cost-effective compared with standard care alone at the NICE cost-effectiveness threshold of £20,000/QALY. There was also inconclusive economic evidence from one study conducted in the US.

The economic analysis undertaken to inform this guideline confirmed the previous finding that providing an intervention delivered in a mixed individual and group format aimed at promoting breastfeeding in addition to standard care, is unlikely to be cost-effective compared with standard care alone. However, new evidence identified during the development of this guideline suggested that group interventions aimed at promoting breastfeeding in addition to standard care are very effective. Using this information, the economic analysis showed that group interventions delivered by a mixture of health professional and peer supporters, when added to standard care, are highly likely to be cost-effective compared with standard care alone.

The guideline economic analysis considered a number of clinical outcomes to people breastfeeding (prevention of breast cancer) and their babies (prevention of gastrointestinal infection, respiratory tract infection, acute otitis media, mortality due to infectious diseases and SIDS) in the long-term and was characterised by robust methodology regarding the model structure and data sources. However, it needs to be noted that the data on the protective effect of breastfeeding were derived from study designs that were prone to bias. Several studies demonstrating clinical benefits associated with breastfeeding which were included in the evidence reported by Victora et al. (2016), which informed the economic analysis, had adjusted for some known confounders; however, it is possible that there are other unknown confounders impacting on the relation between breastfeeding and clinical benefits, which the studies did not adjust for. Moreover, other studies had made no adjustments for confounding. This means that the magnitude of the clinical benefits of breastfeeding may have been overestimated in this literature. Therefore, it is likely that, by using the available data, the economic analysis has somewhat overestimated the benefits and associated cost-savings related to breastfeeding for the modelled conditions. On the other hand, the committee noted that several other outcomes that are associated with breastfeeding, such as prevention of ovarian cancer and diabetes in breastfeeding people and prevention of obesity in breastfeeding people and their babies were not considered in the analysis. On balance, considering the overestimation of some of the benefits and cost-savings in the clinical conditions modelled, but also the omission of other important benefits and cost-savings associated with other clinical conditions affected by breastfeeding which were not possible to model, it can be concluded that provision of a group intervention for women and people who gave birth aimed at maintaining breastfeeding, in addition to standard care, is likely to be cost-effective in the UK. In contrast, provision of a mixed individual and group intervention does not appear to be cost-effective, although further research is needed to more accurately quantify the association of breastfeeding to clinical conditions in breastfeeding people and their babies, and to explore the impact of the

additional benefits of breastfeeding that were omitted from the current economic modelling, on the cost-effectiveness of breastfeeding interventions.

Based on the results of the guideline economic analysis, the committee recommended face-to-face breastfeeding support group sessions (such as breastfeeding 'cafes' or drop-in groups) where appropriately trained healthcare professionals or peer supporters provide individualised, practical, emotional and social support to maintain breastfeeding. These group sessions were recommended in addition to current practice that includes advice and support around breastfeeding, in order to maintain breastfeeding.

Using the results of the clinical evidence, the committee recommended additional support such as virtual support groups, phone calls, emails or text messages, depending on the person's preference, including out-of-hours support and peer support to supplement (but not replace) face-to-face discussions about continuing breastfeeding. This recommendation is anticipated to have modest resource implications, however it is expected to reinforce the effect of group interventions in increasing breastfeeding maintenance rates. This means that the additional costs incurred by provision of group interventions are expected to be offset, at least partially, by benefits to the breastfeeding person and their baby, and cost-savings to the healthcare system, relating to outcomes positively associated with increased maintenance rates of breastfeeding. For example, breastfeeding has been shown to lower the incidence of infections in babies and mortality due to sudden infant death syndrome, and the incidence of certain cancers (such as breast and ovarian cancer) as well as obesity and diabetes in those who breastfeed. In addition, the committee were aware of a large systematic review (Horta 2023) that suggested that exclusive breastfeeding reduced the odds of childhood overweight and obesity. They discussed the importance of these results, particularly in the UK context where 1 in 5 children are in the overweight or obesity weight categories by the time they start school, according to the committee's knowledge. The committee also discussed that continued breastfeeding can have an impact on weight loss after pregnancy.

Other factors the committee took into account

For this review question, the population in the evidence was women and no evidence was identified or reviewed for trans men or non-binary people. The protocol and literature searches were not designed to specifically look for evidence on trans men or non-binary people but they were also not excluded. However, there is a small chance evidence on them may not have been captured, if such evidence exists. In discussing the evidence, the committee considered whether the recommendations could apply to a broader population, and used gender inclusive language to promote equity, respect and effective communication with everyone. Healthcare professionals should use their clinical judgement when implementing the recommendations, taking into account each person's circumstances, needs and preferences, and ensuring all people are treated with dignity and respect throughout their care.

Recommendations supported by this evidence review

This evidence review supports recommendations 1.3.9 and 1.3.10. Other evidence supporting these recommendations can be found in evidence review K on facilitators and barriers for maintaining breastfeeding beyond 8 weeks after birth.

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Appendices

Appendix A Review protocols

Review protocol for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Table 4: Review protocol

ID	Field	Content
0.	PROSPERO registration number	Not applicable
1.	Review title	What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?
2.	Review question	What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?
3.	Objective	To determine which approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth.
4.	Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Emcare • CINAHL • Epistemonikos • International Health Technology Assessment database (INAHTA) Searches will be restricted to:

ID	Field	Content
		• Articles published after 19th April 2019 (date when the search for evidence review P in the postnatal care guideline was run) • Note that evidence review P in the postnatal care guideline limited the search to studies published after 1995 as this is when the Baby Friendly Initiative standards were introduced in the UK • English language only • Human studies only The full search strategies for MEDLINE database will be published in the final review. For each search, the principal database search strategy is quality assured by a second information scientist using an adaptation of the PRESS 2015 Guideline Evidence-Based Checklist.
5.	Condition or domain being studied	Interventions in maintaining breastfeeding beyond 8 weeks after birth
6.	Population	Inclusion: • Pregnant women and women who have given birth to a healthy baby at term (or to healthy twins and triplets) and their partners • Breastfeeding women Exclusion: • Women and children receiving specialist care in relation to breastfeeding will be excluded, for example: • Women with HIV/AIDS • Women abusing substances • Women on toxic medications • Women otherwise contraindicated to breastfeeding Studies of interventions for women with specific conditions will be excluded.
7.	Intervention/ Exposure/Test	**Intervention 1**

ID	Field	Content

		• Education, advice or support from peer* or professional provided postnatally and initiated either antenatally or postnatally (including both within 8 weeks and eight weeks after birth); for example:
		  ○ One to one
		  ○ Group classes
		  ○ Professional or peer* breastfeeding support
		  ○ Provision of self-help or educational material
		
		*denotes that the person has undergone specific training related to the provision of information and support for breastfeeding.
		
		Intervention 2
		• Financial incentives
		Studies will be included if a main aim of the intervention is to start and/or maintain breastfeeding. If this is not one of the main aims, studies will be excluded.
		
		Note that the original question excluded early mother-infant contact and "rooming-in" mother and infant because the NICE guideline on intrapartum care (CG190) already covers early initiation of breastfeeding.
		
		Early skin to skin contact was also excluded because it is covered by the NICE guideline on caesarean section (CG132).

8.	Comparator/ Reference standard/ Confounding factors	**Comparison 1** • Standard care • Different kinds of intervention 1 compared against each other **Comparison 2** • Standard care • Different kinds of intervention 2 compared against each other

ID	Field	Content
		Studies will be included if the intervention being evaluated is a combination of any of the above for example 1 and 3 versus nothing. Where data allow, active interventions from different groups will also be compared with each other, including those provided antenatally versus those provided postnatally
9.	Types of study to be included	Include published full-text papers: • Systematic reviews of RCTs • Parallel RCTs • Quasi-randomised and cross-over trials will be excluded • Conference abstracts will not be considered
10.	Other exclusion criteria	Data from low and middle income countries (according to the World Bank) will be excluded as the configuration of antenatal and postnatal services in these countries might not be representative of that in the UK. In particular, 'standard care' in relation to breastfeeding support is likely to significantly differ from the UK and higher income countries. Finally, breastfeeding rates and attitudes toward breastfeeding are different in those countries.
11.	Context	The population of this guideline may overlap with the population of women included in other NICE guidelines (such as postnatal care, antenatal care, intrapartum care, pregnancy and complex social factors or obesity prevention).
12.	Primary outcomes (critical outcomes)	• Proportion of women breastfeeding at 6-12 weeks (any and exclusive) (if a study provides data on more than one relevant time point belonging to this follow-up grouping, use the latest time point; if a study provides data at 3 months, consider this time point as 12 weeks) • Proportion of women breastfeeding at 16 – 26 weeks (any and exclusive breastfeeding) (if a study provides data on more than one relevant time point belonging to this follow-up grouping, use the latest time point)
13.	Secondary outcomes (important outcomes)	• Women's satisfaction with breastfeeding interventions

ID	Field	Content
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI and de-duplicated. Titles and abstracts of the retrieved citations will be screened to identify studies that potentially meet the inclusion criteria outlined in the review protocol. Dual sifting will be performed on at least 10% of records; 90% agreement is required. Disagreements will be resolved via discussion between the two reviewers, and consultation with senior staff if necessary. Full versions of the selected studies will be obtained for assessment. Studies that fail to meet the inclusion criteria once the full version has been checked will be excluded at this stage. Each study excluded after checking the full version will be listed, along with the reason for its exclusion. A standardised form will be used to extract data from studies. The following data will be extracted: study details (reference, country where study was carried out, type and dates), participant characteristics, inclusion and exclusion criteria, details of the interventions if relevant, setting and follow-up, relevant outcome data and source of funding. One reviewer will extract relevant data into a standardised form, and this will be quality assessed by a senior reviewer.
15.	Risk of bias (quality) assessment	Quality assessment of individual studies will be performed using the following checklists: • ROBIS tool for systematic reviews • Cochrane RoB tool v.2 for RCTs The quality assessment will be performed by one reviewer and this will be quality assessed by a senior reviewer.
16.	Strategy for data synthesis	Quantitative findings will be formally summarised in the review. Where multiple studies report on the same outcome for the same comparison, meta-analyses will be conducted using Cochrane Review Manager software. A fixed effect meta-analysis will be conducted and data will be presented as risk ratios if possible or odds ratios when required (for example, if only available in this form in included

ID	Field	Content

		studies) for dichotomous outcomes, and mean differences or standardised mean differences for continuous outcomes. Heterogeneity in the effect estimates of the individual studies will be assessed using the I^2 statistic. Alongside visual inspection of the point estimates and confidence intervals, I^2 values of greater than 50% and 80% will be considered as significant and very significant heterogeneity, respectively. Heterogeneity will be explored as appropriate using sensitivity analyses and pre-specified subgroup analyses. If heterogeneity cannot be explained through subgroup analysis then a random effects model will be used for meta-analysis, or the data will not be pooled.
		
		Meta-regression analysis will be used in addition to the pairwise meta-analysis when intervention characteristics are highly heterogeneous (for example, significant differences in how the intervention was delivered or how long it lasted for). In NG194 Evidence review P, postnatal care guideline, a meta-regression analysis was conducted for intervention group 2 'education, advice or support from peer or professional provided postnatally and initiated either antenatally or within the first eight weeks after birth', therefore this analysis will be updated. Each study under this intervention category was categorised using the following variables:
		• Number of contact visits:
		  ○ 0 contacts
		  ○ 1 contact
		  ○ 2 to 3 contacts
		  ○ 4 to 8 contacts
		  ○ 9 or more contacts
		• How delivered
		  ○ Face-to-face on an individual basis
		  ○ Face-to-face in a group
		  ○ Remote
		  ○ Self-help
		• Duration of contact
		  ○ Contact with the intervention lasted more than 8 weeks
		  ○ Contact with the intervention lasted less than 8 weeks

ID	Field	Content

		• Where the intervention was delivered
		  ○ Home
		  ○ Healthcare setting
		  ○ Combination of both home and healthcare setting
		The confidence in the findings across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group: http://www.gradeworkinggroup.org/
		
		Minimally important differences:
		Default MIDs will be used for risk ratios and continuous outcomes only, unless the committee pre-specifies published or other MIDs for specific outcomes
		• For proportion of women breastfeeding at 6-12 weeks, or at 16 to 26 weeks: any statistically significant difference
		• Women satisfaction with breastfeeding: 0.8 and 1.25.

17.	Analysis of subgroups	Evidence will be stratified by: • Fathers (interventions aimed at fathers) In the presence of heterogeneity, the following intervention subgroups will be considered for sensitivity analysis: • How delivered (face-to-face individual, face-to-face group, telephone, self-help) • Where delivered (healthcare setting, home or a combination of both home and healthcare setting) • Number of contacts (1, 2-3, 4-8, 9+) • Duration of contact (more than 8 weeks) only for the outcome any breastfeeding at 16 to 26 weeks In the presence of heterogeneity, the following population subgroups will be considered for sensitivity analysis: • Young women (19 years and under)

<table>
<tr><th>ID</th><th>Field</th><th>Content</th></tr>
<tr><td></td><td></td><td>• Single birth versus multiple birth
• Women defined as ‘low income’
• Obese women
Where evidence is stratified or subgrouped the committee will consider on a case by case basis if separate recommendations should be made for distinct groups. Separate recommendations may be made where there is evidence of a differential effect of interventions in distinct groups. If there is a lack of evidence in one group, the committee will consider, based on their experience, whether it is reasonable to extrapolate and assume the interventions will have similar effects in that group compared with others.</td></tr>
<tr><td>18.</td><td>Type and method of review</td><td>☒ Intervention
☐ Diagnostic
☐ Prognostic
☐ Qualitative
☐ Epidemiologic
☐ Service Delivery
☐ Other (please specify)</td></tr>
<tr><td>19.</td><td>Language</td><td>English</td></tr>
<tr><td>20.</td><td>Country</td><td>England</td></tr>
<tr><td>21.</td><td>Anticipated or actual start date</td><td>January 2023</td></tr>
<tr><td>22.</td><td>Anticipated completion date</td><td>July 2024</td></tr>
<tr><td>23.</td><td>Stage of review at time of this submission</td><td><table><tr><th>Review stage</th><th>Started</th><th>Completed</th></tr><tr><td>Preliminary searches</td><td>☐</td><td>☒</td></tr><tr><td>Piloting of the study selection process</td><td>☐</td><td>☒</td></tr></table></td></tr>
</table>

<table>
<tr><th>ID</th><th>Field</th><th>Content</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Formal screening of search results against eligibility criteria</td><td>☐</td><td>☒</td></tr>
<tr><td>Data extraction</td><td>☐</td><td>☒</td></tr>
<tr><td>Risk of bias (quality) assessment</td><td>☐</td><td>☒</td></tr>
<tr><td>Data analysis</td><td>☐</td><td>☒</td></tr>
</table>
</td></tr>
<tr><td>24.</td><td>Named contact</td><td>5a. Named contact
National Institute for Health and Care Excellence (NICE)
5b. Named contact e-mail
mandcnutrition@nice.org.uk
5c. Organisational affiliation of the review
National Institute for Health and Care Excellence (NICE)</td></tr>
<tr><td>25.</td><td>Review team members</td><td>From the National Institute for Health and Care Excellence (NICE):
Senior Systematic Reviewer
Systematic Reviewer</td></tr>
<tr><td>26.</td><td>Funding sources/sponsor</td><td>This systematic review is being completed by the National Institute for Health and Care Excellence (NICE)</td></tr>
<tr><td>27.</td><td>Conflicts of interest</td><td>All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a</td></tr>
</table>

ID	Field	Content
		senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10191
29.	Other registration details	None
30.	Reference/URL for published protocol	Not applicable
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
32.	Keywords	Breastfeeding, interventions, approaches
33.	Details of existing review of same topic by same authors	Not applicable
34.	Current review status	☐ Ongoing ☐ Completed but not published ☒ Completed and published ☐ Completed, published and being updated ☐ Discontinued
35.	Additional information	None
36.	Details of final publication	www.nice.org.uk

CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; DARE: Database of Abstracts of Reviews of Effects; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HTA: Health Technology Assessment; MID: minimally important difference; NHS: National health service; NICE: National Institute for Health and Care Excellence; RCT: randomised controlled trial; RoB: risk of bias; SD: standard deviation

Appendix B Literature search strategies

Literature search strategies for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Effectiveness searches

Database: MEDLINE

Date of last search: 28/03/2023

#	Searches
1	exp breast feeding/ or lactation/
2	(breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
3	or/1-2
4	cognitive behavioral therapy/ or exp counseling/ or education, nonprofessional/ or friends/ or group processes/ or exp home care services/ or hotlines/ or mindfulness/ or patient centered care/ or exp patient education as topic/ or peer group/ or psychotherapy*.sh. or exp psychotherapy, group/ or reality therapy/ or relaxation therapy/ or self-help groups/ or social support/
5	computers/ or computer assisted instruction/ or computer communication networks/ or exp internet/ or pamphlet*.sh. or therapy, computer assisted/ or exp telecommunications/
6	(((behaviour* or behavior*) adj2 cognitiv*) or cbt or ccbt or cognitive development or ((behavi* or biobehavi* or cognitive*) adj3 (intervention* or manag* or program* or therap* or treat*)) or cognitiv* behav*).ti,ab.
7	counsel*.ti,ab.
8	(((computer or distance based or digital* or dvd or internet or multimedia or online or phone or skill* or technology or telephone or telehealth or telecommunicat* or video* or web) adj based) or ((computer* or distance based or digital or dvd or internet or multimedia or online or technology or telephone or telehealth or telecommunicat* or video* or web) adj3 (coach* or educat* or intervention* or skill* or support* or training*)) or ((education or teaching) adj (intervention or program* or therap* or psychotherap*)) or elearning or e learning or ((breastfeeding or feeding) adj (diar* or log*)) or booklet* or pamphlet*).ti,ab. or (health education or health promotion).sh.
9	(person centred adj (care or therap*)).ti,ab.
10	(((communit* or social) adj2 support*) or ((home or house) adj2 (call* or visit*)) or skin to skin).ti,ab.
11	(befriend* or be*1 friend* or buddy or buddies or ((community or lay or paid or support) adj (person or worker*))).ti,ab.
12	((peer* or voluntary or volunteer*) adj3 (assist* or advice* or advis* or counsel* or educat* or forum* or help* or mentor* or network* or support* or visit*)).ti,ab.
13	(((peer* or support* or voluntary or volunteer*) adj2 group*) or ((breastfeed* or breast feed* or lactation) adj nurs*)).ti,ab.
14	((breastfeed* or breast feed*) adj2 group*).ti,ab.
15	((peer* or support* or voluntary or volunteer*) adj3 (intervention* or program* or rehab* or th erap* or service* or skill*)).ti,ab.
16	((peer* adj3 (advis* or consultant or educator* or expert* or facilitator* or instructor* or leader* or mentor* or person* or tutor* or worker*)) or expert patient* or mutual aid).ti,ab.
17	(peer* adj3 (assist* or counsel* or educat* or program* or rehab* or service* or supervis*)).ti,ab.
18	((peer*1 or network*) adj2 (discuss* or exchang* or interact* or meeting*)).ti,ab.
19	(((community or family or social) adj (network* or support*)) or group conferencing or ((individualised or individualized) adj support)).ti,ab.
20	((one to one or transition*) adj support*).ti,ab.
21	(lay adj (led or run)).ti,ab.
22	((network* or social or psychosocial) adj (adapt* or reintegrat* or support*)).ti,ab.
23	((well being or wellbeing) adj2 (intervention* or program* or therap* or skill* or strateg* or workshop*)).ti,ab.
24	((support* adj3 (approach* or educat* or forum* or instruct* or interven* or learn* or module* or network* or program* or psychotherap* or strateg* or system* or technique* or therap* or train* or workshop* or work shop*)) or (support* adj (service* or system))).ti,ab.
25	((group adj (prenatal* or antenatal) adj care) or support group*).ti,ab.
26	(helpline or help line or ((phone* or telephone*) adj3 (help* or instruct* or interact* or interven* or mediat* or program* or rehab* or strateg* or support* or teach* or therap* or train* or treat* or workshop*)) or ((phone or telephone*) adj2 (assist* or based or driven or led or mediat*))).ti,ab.

#	Searches
27	(helpseek* or ((search* or seek*) adj3 (care or assistance or counsel* or healthcare or help* or support* or therap* or treat*))).ti,ab.
28	(information adj (needs or provision or support)).ti,ab.
29	(selfhelp or self help or selfmanag* or self manag* or self support or selfsupport).ti,ab.
30	((intervention* or program*) adj3 (continue or continuation or duration or incidence* or initiat*) adj3 (breastfeed* or breastfed* or lactat*)).ti,ab.
31	((intervention* or program*) adj3 increas* adj3 (breastfeed* or breastfed* or lactat*) adj3 (continue or continuation or duration or incidence* or initiat*)).ti,ab.
32	or/4-31
33	intervention 1.ti.
34	education/ or health education/ or health knowledge, attitudes, practice/ or health promotion/ or mothers/ed or nurse midwives/ed or exp patient education as topic/ or patient education handout/ or prenatal education/ or teaching/
35	((antenatal or father* or mother*) adj2 (eduat* or teach* or train*)).ti,ab.
36	((audiovisual* or education* or print*) adj2 (brochure* or material* or pamphlet*)).ti,ab.
37	(((breastfeed* or breast feed* or breastfed* or lactat*) adj3 (class* or coach* or educat* or intervention* or program* or promotion or session* or support* or taught or teach* or train* or workshop*)) or resourcefulness train* or (skill* adj2 (build* or coach* or educat* or learn* or train))).ti,ab.
38	((antenatal or prenatal or pregnancy) adj2 (class* or coach* or course* or educat* or promotion* or workshop*)).ti,ab.
39	((education* or learning or teaching or training) adj2 (class* or coach* or course* or program* or session* or workshop*)).ti,ab.
40	((education* or learning or teaching or training) adj2 (intervention* or program*)).ti,ab.
41	((computer* or distance based or dvd or internet or multimedia or online or technology or telephone or telephealth or telecommunicat* or video* or web) adj3 educat*).ti,ab.
42	education group*.ti,ab.
43	(best start program* or nursing intervention protocol).ti,ab.
44	((antenatal or prenatal or pregnancy) adj2 visit*).ti,ab.
45	or/33-44
46	or/32,45
47	foreign bodies/ or exp infant equipment/
48	(binky or dodie* or dummy or dummies or foreign object* or pacifier* or soother* or teat* or teether* or ((plastic* or rubber* or silicon*) adj2 nipple*)).ti,ab.
49	or/47-48
50	breast feeding/ec or reimbursement, incentive/ or (compensation* or health promotion or motivation or reward).sh.
51	ec.fs. or (cost* or economics or financ* or funding).sh.
52	(((cash or financ* or monetary or money) adj3 (incentive* or motivat* or promot* or reward* or token* or transfer*)) or demand side financing or social transfer* or voucher*).ti,ab.
53	(((incentive* or motivat* or reward*) adj3 (breastfeed* or breast fed* or lactation)) or ((incentive* or motivat* or reward*) adj3 (intervention* or strateg*)) or nourishing start for health).ti,ab.
54	or/50-53
55	(adipos* or obes* or (overweight* or over weight*) or (weight adj3 (reduc* or los* or control* or gain*)) or (body mass ind* or bmi or waist hip ratio or skinfold thickness)).ti,ab.
56	exp obesity/ or overweight/ or weight loss/
57	(father* or (male adj2 (partner* or parent*)) or paternal).ti,ab. or father/
58	or/46,49,54-57
59	clinical trials as topic.sh. or (controlled clinical trial or pragmatic clinical trial or randomized controlled trial).pt. or (placebo or randomi#ed or randomly).ab. or trial.ti.
60	(controlled clinical trial or pragmatic clinical trial or randomized controlled trial).pt. or drug therapy.fs. or (groups or placebo or randomi#ed or randomly or trial).ab.
61	or/59-60
62	meta-analysis/
63	meta-analysis as topic/ or systematic reviews as topic/
64	(meta analy* or metanaly* or metaanaly*).ti,ab.
65	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
66	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
67	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
68	(search* adj4 literature).ab.

#	Searches
69	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
70	cochrane.jw.
71	or/62-70
72	or/61,71
73	3 and 58 and 72
74	letter/
75	editorial/
76	news/
77	exp historical article/
78	Anecdotes as Topic/
79	comment/
80	case report/
81	(letter or comment*).ti.
82	or/74-81
83	randomized controlled trial/ or random*.ti,ab.
84	82 not 83
85	animals/ not humans/
86	exp Animals, Laboratory/
87	exp Animal Experimentation/
88	exp Models, Animal/
89	exp Rodentia/
90	(rat or rats or mouse or mice or rodent*).ti.
91	or/84-90
92	73 not 91
93	limit 92 to English language
83	limit 82 to ed=20190101-20220430
84	limit 82 to dt=20190101-20220430
85	83 or 84

Database: Embase

Date of last search: 28/03/2023

#	Searches
1	breast feeding/ or breast feeding education/ or lactation/
2	(breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
3	or/1-2
4	exp *cognitive therapy/ or (counseling.sh. and exp *counseling/) or *friend/ or *group processes/ or *group therapy/ or home care/ or *hotline/ or *mindfulness/ or *patient education/ or *peer group/ or *psychotherapy/ or *reality therapy/ or *relaxation training/ or *self help/ or *social adaption/ or *social network/ or *social support/ or *support group/
5	*computer/ or exp *computer assisted therapy/ or *computer network/ or *internet/ or *online system/ or *publication/ or exp *telecommunication/
6	(((behaviour* or behavior*) adj2 cognitiv*) or cbt or ccbt or cognitive development or ((behavi* or biobehavi* or cognitive*) adj3 (intervention* or manag* or program* or therap* or treat*)) or cognitiv* behav*).ti,ab.
7	counsel*.ti,ab.
8	(((computer or distance based or digital* or dvd or internet or multimedia or online or phone or skill* or technology or telephone or telehealth or telecommunicat* or video* or web) adj based) or ((computer* or distance based or digital or dvd or internet or multimedia or online or technology or telephone or telehealth or telecommunicat* or video* or web) adj3 (coach* or educat* or intervention* or skill* or support* or training*)) or ((education or teaching) adj (intervention or program* or therap* or psychotherap*)) or elearning or e learning or ((breastfeeding or feeding) adj (diar* or log*)) or booklet* or pamphlet*).ti,ab. or (health education or health promotion).sh.
9	(person centred adj (care or therap*)).ti,ab.
10	(((communit* or social) adj2 support*) or ((home or house) adj2 (call* or visit*)) or skin to skin).ti,ab.
11	(befriend* or be*1 friend* or buddy or buddies or ((community or lay or paid or support) adj (person or worker*))).ti,ab.

#	Searches
12	((peer* or voluntary or volunteer*) adj3 (assist* or advice* or advis* or counsel* or educat* or forum* or help* or mentor* or network* or support* or visit*)).ti,ab.
13	(((peer* or support* or voluntary or volunteer*) adj2 group*) or ((breastfeed* or breast feed* or lactation) adj nurs*)).ti,ab.
14	((breastfeed* or breast feed*) adj2 group*).ti,ab.
15	((peer* or support* or voluntary or volunteer*) adj3 (intervention* or program* or rehab* or therap* or service* or skill*)).ti,ab.
16	((peer* adj3 (advis* or consultant or educator* or expert* or facilitator* or instructor* or leader* or mentor* or person* or tutor* or worker*)) or expert patient* or mutual aid).ti,ab.
17	(peer* adj3 (assist* or counsel* or educat* or program* or rehab* or service* or supervis*)).ti,ab.
18	((peer*1 or network*) adj2 (discuss* or exchang* or interact* or meeting*)).ti,ab.
19	(((community or family or social) adj (network* or support*)) or group conferencing or ((individualised or individualized) adj support)).ti,ab.
20	((one to one or transition*) adj support*).ti,ab.
21	(lay adj (led or run)).ti,ab.
22	((network* or social or psychosocial) adj (adapt* or reintegrat* or support*)).ti,ab.
23	((well being or wellbeing) adj2 (intervention* or program* or therap* or skill* or strateg* or workshop*)).ti,ab.
24	((support* adj3 (approach* or educat* or forum* or instruct* or interven* or learn* or module* or network* or program* or psychotherap* or strateg* or system* or technique* or therap* or train* or workshop* or work shop*)) or (support* adj (service* or system))).ti,ab.
25	((group adj (prenatal* or antenatal) adj care) or support group*).ti,ab.
26	(helpline or help line or ((phone* or telephone*) adj3 (help* or instruct* or interact* or interven* or mediat* or program* or rehab* or strateg* or support* or teach* or therap* or train* or treat* or workshop*)) or ((phone or telephone*) adj2 (assist* or based or driven or led or mediat*))).ti,ab.
27	(helpseek* or ((search* or seek*) adj3 (care or assistance or counsel* or healthcare or help* or support* or therap* or treat*))).ti,ab.
28	(information adj (needs or provision or support)).ti,ab.
29	(selfhelp or self help or selfmanag* or self manag* or self support or selfsupport).ti,ab.
30	((intervention* or program*) adj3 (continue or continuation or duration or incidence* or initiat*) adj3 (breastfeed* or breastfed* or lactat*)).ti,ab.
31	((intervention* or program*) adj3 increas* adj3 (breastfeed* or breastfed* or lactat*) adj3 (continue or continuation or duration or incidence* or initiat*)).ti,ab.
32	or/4-31
33	intervention 1.ti.
34	breast feeding education/ or childbirth education/ or education/ or health education/ or health promotion/ or learning/ or patient education/ or patient education/ or teaching/ or training/
35	((antenatal or father* or mother*) adj2 (eduat* or teach* or train*)).ti,ab.
36	((audiovisual* or education* or print*) adj2 (brochure* or material* or pamphlet*)).ti,ab.
37	(((breastfeed* or breast feed* or breastfed* or lactat*) adj3 (class* or coach* or educat* or intervention* or program* or promotion or session* or support* or taught or teach* or train* or workshop*)) or resourcefulness train* or (skill* adj2 (build* or coach* or educat* or learn* or train))).ti,ab.
38	((antenatal or prenatal or pregnancy) adj2 (class* or coach* or course* or educat* or promotion* or workshop*)).ti,ab.
39	((education* or learning or teaching or training) adj2 (class* or coach* or course* or program* or session* or workshop*)).ti,ab.
40	((education* or learning or teaching or training) adj2 (intervention* or program*)).ti,ab.
41	((computer* or distance based or dvd or internet or multimedia or online or technology or telephone or telephealth or telecommunicat* or video* or web) adj3 educat*).ti,ab.
42	education group*.ti,ab.
43	(best start program* or nursing intervention protocol).ti,ab.
44	((antenatal or prenatal or pregnancy) adj2 visit*).ti,ab.
45	or/33-44
46	or/32,45
47	"crib (infant equipment)"/ or feeding bottle/ or foreign body/ or pacifier/
48	(binky or dodie* or dummy or dummies or foreign object* or pacifier* or soother* or teat* or teether* or ((plastic* or rubber* or silicon*) adj2 nipple*)).ti,ab.
49	or/47-48
50	financial incentive/ or reimbursement/ or (compensation or health promotion or motivation or reward).sh.
51	(cost* or economics or financ* or funding).sh.

#	Searches
52	(((cash or financ* or monetary or money) adj3 (incentive* or motivat* or promot* or reward* or token* or transfer*)) or demand side financing or social transfer* or voucher*).ti,ab.
53	(((incentive* or motivat* or reward*) adj3 (breastfeed* or breast fed* or lactation)) or ((incentive* or motivat* or reward*) adj3 (intervention* or strateg*)) or nourishing start for health).ti,ab.
54	or/50-53
55	(adipos* or obes* or (overweight* or over weight*) or (weight adj3 (reduc* or los* or control* or gain*)) or (body mass ind* or bmi or waist hip ratio or skinfold thickness)).ti,ab.
56	exp obesity/ or overnutrition/ or weight reduction/
57	(father* or (male adj2 (partner* or parent*)) or paternal).ti,ab. or father/
58	or/46,49,54-57
59	crossover procedure/ or double blind procedure/ or randomized controlled trial/ or single blind procedure/ or (assign* or allocat* or crossover* or cross over* or ((doubl* or singl*) adj blind*) or factorial* or placebo* or random* or volunteer*).ti,ab.
60	"systematic review"/
61	meta-analysis/
62	(meta analy* or metanaly* or metaanaly*).ti,ab.
63	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
64	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
65	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
66	(search* adj4 literature).ab.
67	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
68	cochrane.jw.
69	((pool* or combined) adj2 (data or trials or studies or results)).ab.
70	or/60-69
71	or/59,70
72	3 and 58 and 71
73	letter.pt. or letter/
74	note.pt.
75	editorial.pt.
76	case report/ or case study/
77	(letter or comment*).ti.
78	or/73-77
79	randomized controlled trial/ or random*.ti,ab.
80	78 not 79
81	animal/ not human/
82	nonhuman/
83	exp Animal Experiment/
84	exp Experimental Animal/
85	animal model/
86	exp Rodent/
87	(rat or rats or mouse or mice or rodent*).ti.
88	or/80-87
89	72 not 88
90	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
91	89 not 90
92	limit 91 to English language
81	limit 80 to dc=20190101-20220430

Database: Cochrane Database of Systematic Reviews Issue 7 of 12, July 2023 and Cochrane Central Register of Controlled Trials, Issue 7 of 12, July 2023

Date of last search: 04/04/2023

#	Searches
#1	MeSH descriptor: [Breast Feeding] explode all trees
#2	MeSH descriptor: [Lactation] explode all trees
#3	((breastfeed* or breast NEXT feed* or breastfed* or "breast fed" or breastmilk or "breast milk" or expressed NEXT milk* or lactat* or (nursing near/1 (baby or infant* or mother* or neonate* or newborn*))):ti,ab,kw
#4	#1 or #2 or #3
#5	MeSH descriptor: [Counseling] explode all trees
#6	MeSH descriptor: [Home Care Services] explode all trees
#7	MeSH descriptor: [Mindfulness] this term only
#8	MeSH descriptor: [Patient-Centered Care] this term only
#9	(psychotherapy*):kw
#10	MeSH descriptor: [Psychotherapy, Group] explode all trees
#11	MeSH descriptor: [Reality Therapy] this term only
#12	MeSH descriptor: [Relaxation Therapy] this term only
#13	MeSH descriptor: [Social Support] explode all trees
#14	MeSH descriptor: [Education, Nonprofessional] this term only
#15	MeSH descriptor: [Friends] this term only
#16	MeSH descriptor: [Group Processes] this term only
#17	MeSH descriptor: [Hotlines] this term only
#18	MeSH descriptor: [Peer Group] this term only
#19	MeSH descriptor: [Self-Help Groups] this term only
#20	(pamphlet*):kw
#21	MeSH descriptor: [Computer-Assisted Instruction] this term only
#22	MeSH descriptor: [Computer Communication Networks] this term only
#23	MeSH descriptor: [Internet] explode all trees
#24	MeSH descriptor: [Therapy, Computer-Assisted] this term only
#25	MeSH descriptor: [Telecommunications] this term only
#26	((((behaviour* or behavior*) near/2 cognitiv*) or cbt or ccbt or “cognitive development” or ((behavi* or biobehavi* or cognitive*) near/3 (intervention* or manag* or program* or therap* or treat*)) or cognitiv* NEXT behav*)):ti,ab,kw
#27	(counsel*):ti,ab,kw
#28	((((computer or “distance based” or digital* or dvd or internet or multimedia or online or phone or skill* or technology or telephone or telehealth or telecommunicat* or video* or web) near/1 based) or ((computer* or “distance based” or digital or dvd or internet or multimedia or online or technology or telephone or telehealth or telecommunicat* or video* or web) near/3 (coach* or educat* or intervention* or skill* or support* or training*)) or ((education or teaching) near/1 (intervention or program* or therap* or psychotherap*)) or elearning or “e learning” or ((breastfeeding or feeding) near/1 (diar* or log*)) or booklet* or pamphlet*)):ti,ab,kw
#29	MeSH descriptor: [Health Education] this term only
#30	MeSH descriptor: [Health Promotion] this term only
#31	MeSH descriptor: [Patient Education as Topic] explode all trees
#32	MeSH descriptor: [Consumer Health Information] explode all trees
#33	((“person centred” near/1 (care or therap*))):ti,ab,kw
#34	((befriend* or be NEXT friend* or buddy or buddies or ((community or lay or paid or support) near/1 (person or worker*)))):ti,ab,kw
#35	(((peer* or voluntary or volunteer*) near/3 (assist* or advice* or advis* or counsel* or educat* or forum* or help* or mentor* or network* or support* or visit*))):ti,ab,kw
#36	((((peer* or support* or voluntary or volunteer*) near/2 group*) or ((breastfeed* or breast NEXT feed* or lactation) near/1 nurs*))):ti,ab,kw
#37	(((breastfeed* or breast NEXT feed*) near/2 group*)):ti,ab,kw
#38	(((peer* or support* or voluntary or volunteer*) near/3 (intervention* or program* or rehab* or therap* or service* or skill*))):ti,ab,kw
#39	((peer* near/3 (assist* or counsel* or educat* or program* or rehab* or service* or supervis*))):ti,ab,kw
#40	(((peer* near/3 (advis* or consultant or educator* or expert* or facilitator* or instructor* or leader* or mentor* or person* or tutor* or worker*)) or expert NEXT patient* or “mutual aid”)):ti,ab,kw
#41	(((peer* or network*) near/2 (discuss* or exchang* or interact* or meeting*))):ti,ab,kw
#42	(((“one to one” or transition*) near/1 support*)):ti,ab,kw
#43	((lay near/1 (led or run))):ti,ab,kw

#	Searches
#44	(((network* or social or psychosocial) near/1 (adapt* or reintegrat* or support*))):ti,ab,kw
#45	(((((community or family or social) near/1 (network* or support*)) or "group conferencing" or “individualised support” or “individualized support”)):ti,ab,kw
#46	(((“well being” or wellbeing) near/2 (intervention* or program* or therap* or skill* or strateg* or workshop*))):ti,ab,kw
#47	(((support* near/3 (approach* or educat* or forum* or instruct* or interven* or learn* or module* or network* or program* or psychotherap* or strateg* or system* or technique* or therap* or train* or workshop* or work NEXT shop*)) or (support* near/1 (service* or system)))):ti,ab,kw
#48	(((group near/1 (prenatal* or antenatal) near/1 care) or support NEXT group*)):ti,ab,kw
#49	((helpline or “help line” or ((phone* or telephone*) near/3 (help* or instruct* or interact* or interven* or mediat* or program* or rehab* or strateg* or support* or teach* or therap* or train* or treat* or workshop*)) or ((phone or telephone*) near/2 (assist* or based or driven or led or mediat*)))):ti,ab,kw
#50	((helpseek* or ((search* or seek*) near/3 (care or assistance or counsel* or healthcare or help* or support* or therap* or treat*)))):ti,ab,kw
#51	((information near/1 (needs or provision or support))):ti,ab,kw
#52	((selfhelp or “self help” or selfmanag* or self NEXT manag* or “self support” or selfsupport)):ti,ab,kw
#53	(((intervention* or program*) near/3 (continue or continuation or duration or incidence* or initiat*) near/3 (breastfeed* or breastfed* or lactat*))):ti,ab,kw
#54	(((intervention* or program*) near/3 increas* near/3 (breastfeed* or breastfed* or lactat*) near/3 (continue or continuation or duration or incidence* or initiat*))):ti,ab,kw
#55	(intervention*):ti
#56	MeSH descriptor: [Education] this term only
#57	MeSH descriptor: [Health Education] this term only
#58	MeSH descriptor: [Health Knowledge, Attitudes, Practice] this term only
#59	MeSH descriptor: [Patient Education Handout] this term only
#60	MeSH descriptor: [Teaching] this term only
#61	MeSH descriptor: [Mothers] 3 tree(s) exploded and with qualifier(s): [education - ED]
#62	MeSH descriptor: [Nurse Midwives] explode all trees and with qualifier(s): [education - ED]
#63	(((antenatal or father* or mother*) near/2 (eduat* or teach* or train*))):ti,ab,kw
#64	(((audiovisual* or education* or print*) near/2 (brochure* or material* or pamphlet*))):ti,ab,kw
#65	((((breastfeed* or breast NEXT feed* or breastfed* or lactat*) near/3 (class* or coach* or educat* or intervention* or program* or promotion or session* or support* or taught or teach* or train* or workshop*)) or resourcefulness NEXT train* or (skill* near/2 (build* or coach* or educat* or learn* or train)))):ti,ab,kw
#66	(((antenatal or prenatal or pregnancy) near/2 (class* or coach* or course* or educat* or promotion* or workshop*))):ti,ab,kw
#67	(((education* or learning or teaching or training) near/2 (class* or coach* or course* or program* or session* or workshop*))):ti,ab,kw
#68	(((education* or learning or teaching or training) near/2 (intervention* or program*))):ti,ab,kw
#69	(((computer* or “distance based” or dvd or internet or multimedia or online or technology or telephone or telephealth or telecommunicat* or video* or web) near/3 educat*)):ti,ab,kw
#70	(education NEXT group*):ti,ab,kw
#71	((best NEXT start NEXT program* or “nursing intervention protocol”)):ti,ab,kw
#72	(((antenatal or prenatal or pregnancy) near/2 visit*)):ti,ab,kw
#73	#5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72
#74	MeSH descriptor: [Foreign Bodies] this term only
#75	MeSH descriptor: [Infant Equipment] explode all trees
#76	((binky or dodie* or dummy or dummies or foreign NEXT object* or pacifier* or soother* or teat* or teether* or ((plastic* or rubber* or silicon*) near/2 nipple*))):ti,ab,kw
#77	#74 or #75 or #76
#78	MeSH descriptor: [Breast Feeding] explode all trees and with qualifier(s): [economics - EC]
#79	MeSH descriptor: [Reimbursement, Incentive] this term only
#80	((compensation* or "health promotion" or motivation or reward)):kw
#81	((cost* or economics or financ* or funding)):kw
#82	(((((cash or financ* or monetary or money) near/3 (incentive* or motivat* or promot* or reward* or token* or transfer*)) or “demand side financing” or social NEXT transfer* or voucher*)):ti,ab,kw

#	Searches
#83	((((incentive* or motivat* or reward*) near/3 (breastfeed* or breast NEXT fed* or lactation)) or ((incentive* or motivat* or reward*) near/3 (intervention* or strateg*)) or “nourishing start for health”)):ti,ab,kw
#84	#78 or #79 or #80 or #81 or #82 or #83
#85	MeSH descriptor: [Obesity] explode all trees
#86	MeSH descriptor: [Overweight] this term only
#87	MeSH descriptor: [Weight Loss] this term only
#88	((adipos* or obes* or (overweight* or over NEXT weight*) or (weight near/3 (reduc* or los* or control* or gain*)) or (body NEXT mass NEXT ind* or bmi or “waist hip ratio” or “skinfold thickness”))):ti,ab,kw
#89	#85 or #86 or #87 or #88
#90	MeSH descriptor: [Fathers] this term only
#91	((father* or (male near/2 (partner* or parent*)) or paternal)):ti,ab,kw
#92	#90 or #91
#93	#73 or #77 or #84 or #89 or #92
#94	#4 and #93
#95	conference:pt or (clinicaltrials or trialsearch):so
#96	#94 NOT #95 with Cochrane Library publication date Between Jan 2019 and July 2023

Database: Epistemonikos

Date of last search: 28/03/2023

#	Searches
1	(title:((breastfeed* OR "breast feed*" OR breastfed* OR "breast fed" OR breastmilk OR "breast milk" OR "expressed milk*" OR lactat*)) OR abstract:((breastfeed* OR "breast feed*" OR breastfed* OR "breast fed" OR breastmilk OR "breast milk" OR "expressed milk*" OR lactat*)))
2	(title:(((bottle OR formula OR synthetic) AND (artificial OR fed OR feed* OR infant* OR milk*))) OR abstract:(((bottle OR formula OR synthetic) AND (artificial OR fed OR feed* OR infant* OR milk*)))) OR (title:((bottlefed OR bottlefeed OR "cup feeding" OR "formula supplement*" OR "supplement feed" OR "milk feed" OR formulafeed OR formulated OR "hydrolyzed formula*" OR "infant feeding" OR "bottle nipple*" OR "milk pump*")) OR abstract:((bottlefed OR bottlefeed OR "cup feeding" OR "formula supplement*" OR "supplement feed" OR "milk feed" OR formulafeed OR formulated OR "hydrolyzed formula*" OR "infant feeding" OR "bottle nipple*" OR "milk pump*"))) OR (title:((milk AND (substitut* OR supplement*))) OR abstract:((milk AND (substitut* OR supplement*)))) OR (title:(((baby OR babies OR infant* OR neonate* OR newborn*) AND (formula* OR milk))) OR abstract:(((baby OR babies OR infant* OR neonate* OR newborn*) AND (formula* OR milk))))
3	(title:((educat* OR learn* OR teach* OR train* OR class* OR coach* OR course* OR program* OR session* OR workshop* OR support* OR intervention* OR promot* OR counsel* OR help OR telehealth OR community OR mentor OR volunteer* OR assist OR network OR psychotherap* OR cognitiv* behav*)) OR abstract:((educat* OR learn* OR teach* OR train* OR class* OR coach* OR course* OR program* OR session* OR workshop* OR support* OR intervention* OR promot* OR counsel* OR help OR telehealth OR community OR mentor OR volunteer* OR assist OR network OR psychotherap* OR cognitiv* behav*)))
4	1 or 2
5	4 AND 5 [Filters: protocol=no, min_year=2019, max_year=2023]

Economic searches

Database: MEDLINE

Date of last search: 28/03/2023

#	Searches
1	postpartum period/ or peripartum period/ or postnatal care/
2	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
3	or/1-2
4	exp breast feeding/ or lactation/
5	(breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
6	or/4-5
7	bottle feeding/ or infant formula/
8	(((bottle or formula or synthetic) adj2 (artificial or fed or feed* or infant* or milk*)) or (artificial adj (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk adj2 (substitut* or supplement*)) or ((infant or milk or water or glucose or

#	Searches
	dextrose or formula) adj supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) adj (formula* or milk)) or formulafeed or formulated or (milk adj2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) adj bottle*) or infant feeding or bottle nipple* or milk pump*)).ti,ab.
9	or/7-8
10	or/3,6,9
11	exp budgets/ or exp "costs and cost analysis"/ or economics/ or exp economics, hospital/ or exp economics, medical/ or economics, nursing/ or economics, pharmaceutical/ or exp "fees and charges"/ or value of life/
12	budget*.ti,ab. or cost*.ti. or (economic* or pharmaco?economic*).ti. or (price* or pricing*).ti,ab. or (cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab. or (financ* or fee or fees).ti,ab. or (value adj2 (money or monetary)).ti,ab.
13	or/11-12
14	models, economic/ or quality-adjusted life years/
15	cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.
16	(quality of life or qol).tw. and cost-benefit analysis.sh.
17	or/14-16
18	(eq-5d* or eq5d* or eq-5* or eq5* or euroqual* or euro qual* or euroqual 5d* or euro qual 5d* or euro qol* or euroqol*or euro quol* or euroquol* or euro quol5d* or euroquol5d* or eur qol* or eurqol* or eur qol5d* or eurqol5d* or eur?qul* or eur?qul5d* or euro* quality of life or european qol).tw.
19	(euro* adj3 (5 d* or 5d* or 5 dimension* or 5dimension* or 5 domain* or 5domain*)).tw.
20	(hui or hui2 or hui3).tw.
21	(illness state* or health state*).tw.
22	(multiattribute* or multi attribute*).tw.
23	(qaly* or qal or qald* or qale* or qtime* or qwb* or daly).tw.
24	(quality adjusted or quality adjusted life year*).tw.
25	(sf36 or sf 36 or sf thirty six or sf thirtysix).tw.
26	sickness impact profile.sh.
27	(time trade off*1 or time tradeoff*1 or tto or timetradeoff*1).tw.
28	(utilit* adj3 (score*1 or valu* or health* or cost* or measur* or disease* or mean or gain or gains or index*)).tw.
29	utilities.tw.
30	((qol or hrqol or quality of life).tw. or *quality of life/) and ((qol or hrqol* or quality of life) adj2 (change*1 or declin* or decreas* or deteriorat* or effect or effects or high* or impact*1 or impacted or improve* or increas* or low* or reduc* or score or scores or worse)).ab.
31	quality of life.sh. and ((health-related quality of life or (health adj3 status) or ((quality of life or qol) adj3 (chang* or improv*)) or ((quality of life or qol) adj (measure*1 or score*1))).tw. or (quality of life or qol).ti. or ec.fs.)
32	or/17-31
33	or/13,32
34	10 and 33
35	limit 34 to English language
36	(animals/ not humans/) or exp animals, laboratory/ or exp animal experimentation/ or exp models, animal/ or exp rodentia/
37	(rat or rats or rodent* or mouse or mice).ti.
38	or/36-37
39	35 not 38
40	limit 39 to ed=20190101-20230331
41	limit 39 to dt=20190101-20230331
42	40 or 41

Database: Embase

Date of last search: 28/03/2023

#	Searches
1	puerperium/ or perinatal period/ or postnatal care/
2	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
3	or/1-2
4	breast feeding/ or breast feeding education/ or lactation/

#	Searches
5	(breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
6	or/4-5
7	artificial food/ or bottle feeding/ or infant feeding/
8	(((bottle or formula or synthetic) adj2 (artificial or fed or feed* or infant* or milk*)) or (artificial adj (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk adj2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) adj supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) adj (formula* or milk)) or formulafeed or formulated or (milk adj2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) adj bottle*) or infant feeding or bottle nipple* or milk pump*)).ti,ab.
9	or/7-8
10	or/3,6,9
11	budget/ or exp economic evaluation/ or exp fee/ or funding/ or exp health care cost/ or health economics/
12	budget*.ti,ab. or cost*.ti. or (economic* or pharmaco?economic*).ti. or (price* or pricing*).ti,ab. or (cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab. or (financ* or fee or fees).ti,ab. or (value adj2 (money or monetary)).ti,ab.
13	or/11-12
14	economic model/ or quality adjusted life year/ or "quality of life index"/
15	cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.
16	(quality of life or qol).tw. and cost benefit analysis.sh.
17	(eq-5d* or eq5d* or eq-5* or eq5* or euroqual* or euro qual* or euroqual 5d* or euro qual 5d* or euro qol* or euroqol*or euro quol* or euroquol* or euro quol5d* or euroquol5d* or eur qol* or eurqol* or eur qol5d* or eurqol5d* or eur?qul* or eur?qul5d* or euro* quality of life or european qol).tw.
18	(euro* adj3 (5 d* or 5d* or 5 dimension* or 5dimension* or 5 domain* or 5domain*)).tw.
19	(hui or hui2 or hui3).tw.
20	(illness state* or health state*).tw.
21	(multiattribute* or multi attribute*).tw.
22	(qaly* or qal or qald* or qale* or qtime* or qwb* or daly).tw.
23	(quality adjusted or quality adjusted life year*).tw.
24	(sf36 or sf 36 or sf thirty six or sf thirtysix).tw.
25	sickness impact profile.sh.
26	(time trade off*1 or time tradeoff*1 or tto or timetradeoff*1).tw.
27	(utilit* adj3 (score*1 or valu* or health* or cost* or measur* or disease* or mean or gain or gains or index*)).tw.
28	utilities.tw.
29	((qol or hrqol or quality of life).tw. or *quality of life/) and ((qol or hrqol* or quality of life) adj2 (change*1 or declin* or decreas* or deteriorat* or effect or effects or high* or impact*1 or impacted or improve* or increas* or low* or reduc* or score or scores or worse)).ab.
30	quality of life.sh. and ((health-related quality of life or (health adj3 status) or ((quality of life or qol) adj3 (chang* or improv*)) or ((quality of life or qol) adj (measure*1 or score*1))).tw. or (quality of life or qol).ti. or ec.fs.)
31	or/14-30
32	or/13,31
33	10 and 32
34	limit 33 to English language
35	(animal/ not human/) or nonhuman/ or exp animal experiment/ or exp experimental animal/ or animal model/ or exp rodent/
36	(rat or rats or rodent* or mouse or mice).ti.
37	or/35-36
38	34 not 37
39	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
40	38 not 39
41	limit 40 to dc=20190101-20230331

Database: INAHTA International HTA Database

Date of last search: 28/03/2023

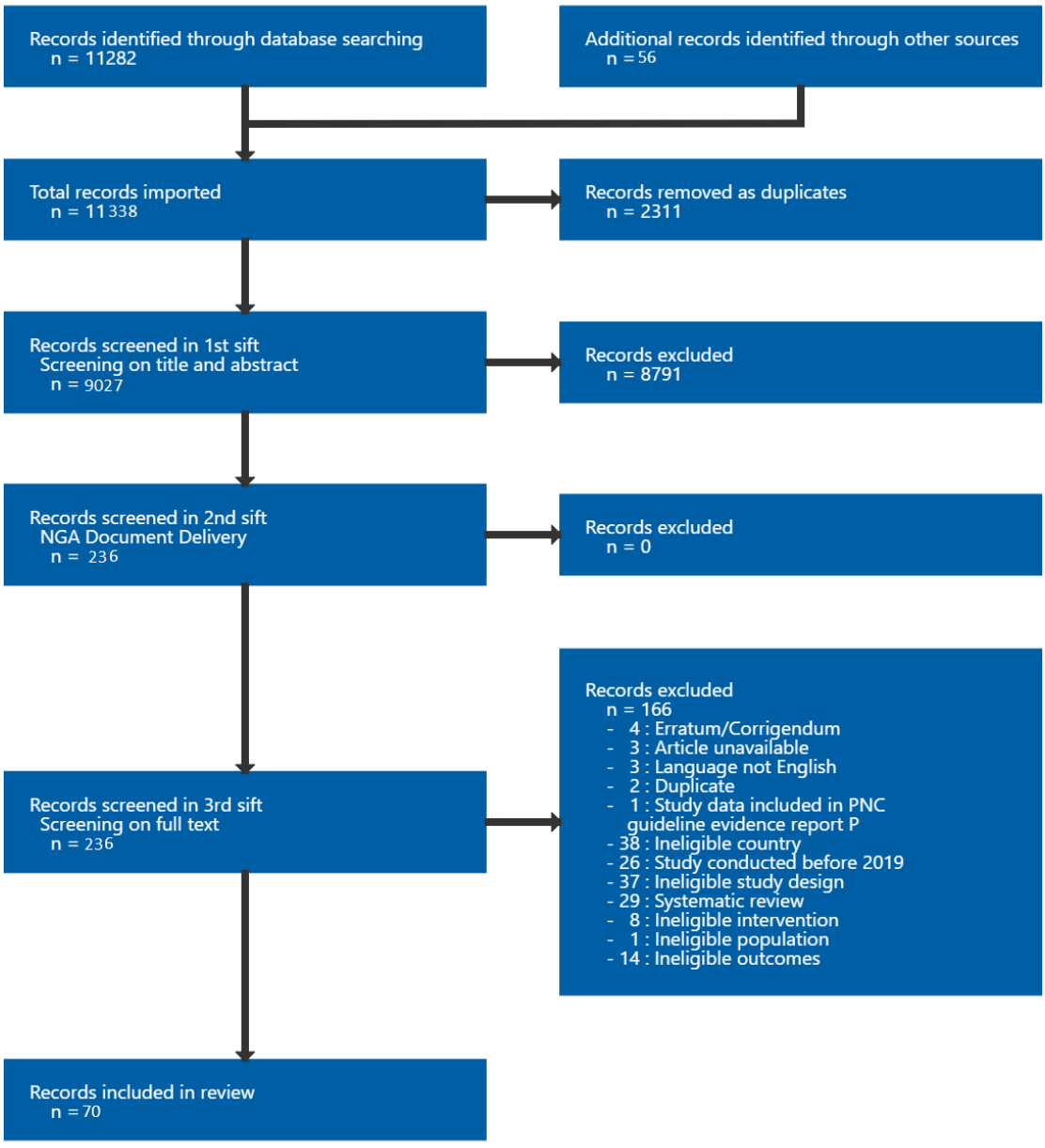
#	Searches
24	LIMIT #23 TO Publication year 2019-2023

#	Searches
23	#22 OR #11 OR #6
22	#21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12
21	(((feeding or baby or infant) AND bottle*))[Title] OR (((feeding or baby or infant) AND bottle*))[abs]
20	((milk AND powder*))[Title] OR ((milk AND powder*))[abs]
19	(((baby or babies or infant* or neonate* or newborn*) AND (formula* or milk)))[Title] OR (((baby or babies or infant* or neonate* or newborn*) AND (formula* or milk)))[abs]
18	(((infant or milk or water or glucose or dextrose or formula) AND supplement))[Title] OR (((infant or milk or water or glucose or dextrose or formula) AND supplement))[abs]
17	((milk AND (substitut* or supplement*)))[Title] OR ((milk AND (substitut* or supplement*)))[abs]
16	((bottlefed or bottlefeed or cup feeding or formula supplement* or supplement feed or milk feed or formulafeed or formulated or hydrolyzed formula* or infant feeding or bottle nipple* or milk pump*))[Title] OR ((bottlefed or bottlefeed or cup feeding or formula supplement* or supplement feed or milk feed or formulafeed or formulated or hydrolyzed formula* or infant feeding or bottle nipple* or milk pump*))[abs]
15	((artificial AND (formula or milk)))[Title] OR ((artificial AND (formula or milk)))[abs]
14	(((bottle or formula or synthetic) AND (artificial or fed or feed* or infant* or milk*)))[Title] OR (((bottle or formula or synthetic) AND (artificial or fed or feed* or infant* or milk*)))[abs]
13	"Infant Formula"[mh]
12	"Bottle Feeding"[mh]
11	#10 OR #9 OR #8 OR #7
10	((nursing AND (baby or infant* or mother* or neonate* or newborn*)))[Title] OR ((nursing AND (baby or infant* or mother* or neonate* or newborn*)))[abs]
9	((breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat*))[Title] OR ((breastfeed* or breast feed* or breastfed* or breast fed or breastmilk or breast milk or expressed milk* or lactat*))[abs]
8	"Lactation"[mh]
7	"Breast Feeding"[mhe]
6	#5 OR #4 OR #3 OR #2 OR #1
5	(((after or follow*) AND birth*))[Title] OR (((after or follow*) AND birth*))[abs]
4	((nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium*))[Title] OR ((nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium*))[abs]
3	"Postnatal Care"[mh]
2	"Peripartum Period"[mh]
1	"Postpartum Period"[mh]

Appendix C Effectiveness evidence study selection

Study selection for: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Figure 1: Study selection flow chart



Appendix D Evidence tables

Evidence tables for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

See Evidence Report P, Appendix D from the postnatal care guideline for full details on the studies included from NG194.

Table 5: Evidence tables

Abbass-Dick, 2020

Bibliographic Reference	Abbass-Dick, J.; Sun, W.; Newport, A.; Xie, F.; Godfrey, D.; Goodman, W. M.; The comparison of access to an eHealth resource to current practice on mother and co-parent teamwork and breastfeeding rates: A randomized controlled trial; Midwifery; 2020; vol. 90; 102812

Study details

Country/ies where study was carried out	Canada
Study type	Randomised controlled trial (RCT)
Study dates	March 2018- December 2018
Inclusion criteria	primiparous/no history of breastfeeding; >25 weeks gestation at recruitment; singleton birth; ≥18 years old; able to speak and read English;

	planning to breastfeed; living with a co-parent.
Exclusion criteria	no access to the internet or a telephone; no intention to breastfeed; no co-parent.
Patient characteristics	**Age (31 or older)- number** Intervention: 69/106 Standard care: 66/111 **Race/ethnicity** Not reported **Gestational weeks (>31 weeks gestation at enrollment)- number** Intervention: 37/106 Standard care: 31/111 **Breastfeeding intention (plan to exclusively breastfeed)- Number** Intervention: 89/106 Standard care: 91/111 Parity Not reported Singleton pregnancy/multifetal pregnancy Not reported

	BMI Not reported Income level of the population in the study (Annual household income, >$60,000))- Number Intervention: 48/106 Standard care: 49/111 Young women (19 years and under) Not reported Women defined as ‘low income’ Not reported Obese women Not reported
Intervention(s)/control	Intervention: Access to a public eHealth breastfeeding co-parenting website containing breastfeeding information organised in 8 main sections ((1) Why breastfeed, (2) How to breastfeed, (3) The early days, (4) Common concerns, (5) Supporting mom/fathers/partners, (6) Where to get help, (7) Everyday life and (8) Helpful links). These sections covered the five elements of the 'Breastfeeding Co-parenting Framework'. Additionally, participants could access further breastfeeding information, generally available in the community. Standard care: Access to breastfeeding information generally available in the community.
Duration of follow-up	52 weeks postpartum
Sources of funding	Not industry funded
Sample size	**ITT** N=217 (women (n=113) and co-parents (n=104)) Intervention: n=106

	Standard care: n=111 **Completers at 12 weeks** N=200 Intervention: n=95 (56 mother-co-parent dyads) Standard care: n=105 (56 mother-co-parent dyads) **Completers at 26 weeks** N=195 Intervention: n=90 (55 mother-co-parent dyads) Standard care: n=105 (56 mother-co-parent dyads)
Other information	Exclusive breastfeeding defined as: no food or liquid other than breast milk given to the infant in the last 7 days and included feeding expressed breast milk and undiluted drops or syrups consisting of vitamins, mineral supplements or medicines

Study arms

Intervention (N = 106)

Standard care (N = 111)

Outcomes

Outcome	Intervention, N = 106	Standard care, N = 111
Proportion of breastfeeding women at 6-12 weeks (Any) No of events	n = 52; % = 93	n = 53; % = 95
Sample size (completers)	n = 56; % = NR	n = 56; % = NR
Proportion of breastfeeding women at 6-12 weeks (Exclusive) No of events	n = 21; % = 38	n = 23; % = 41
Sample size (completers)	n = 56; % = NR	n = 56; % = NR
Proportion of breastfeeding women at 16-26 weeks (Any) No of events	n = 49; % = 89	n = 50; % = 89
Sample size (completers)	n = 55; % = NA	n = 56; % = NA
Proportion of breastfeeding women at 16-26 weeks (Exclusive) No of events	n = 19; % = 34	n = 22; % = 39
Sample size (completers)	n = 56; % = NR	n = 56; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(No serious concerns for missing outcome data. ≤10% attrition for both arms.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT03492411).)*
Overall bias and Directness	Risk of bias judgement	Low *(No serious concerns in any domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Bender, 2022

Bibliographic Reference	Bender, Whitney; Levine, Lisa; Durnwald, Celeste; Text Message-Based Breastfeeding Support Compared With Usual Care: A Randomized Controlled Trial.; Obstetrics and gynecology; 2022; vol. 140 (no. 5); 853-860

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)
Study dates	January to October 2020
Inclusion criteria	non-anomalous singleton gestations
Exclusion criteria	contraindication to breastfeeding <18 years unable to communicate using English-language text messages unable to access a personal mobile phone with unlimited text messaging delivered a preterm neonate/neonate who required care in the neonatal intensive care unit
Patient characteristics	**Age (years)- mean(SD)** Intervention: 31.4 (5.7) Standard care: 31.8 (5.9) **Race/ethnicity- number (%)** Asian Intervention: 9 (8.5) Standard care: 8 (7.3) Black Intervention: 53 (50) Standard care: 61 (55.5)

	Latina (not otherwise specified) Intervention: 38 (35.9) Standard care: 28 (25.5) White Intervention: 38 (35.9) Standard care: 28 (25.5) Unknown Intervention: 3 (2.8) Standard care: 3 (2.7) Latina ethnicity Intervention: 4 (3.8) Standard care: 11 (10) **Gestational age at enrolment (weeks)- mean (SD)** Intervention: 35.5 (0.83) Standard care: 35.6 (0.80) **Breastfeeding intention (plan to exclusively breastfeed)- number (%)** Intervention: 103 (97.2) Standard care: 100 (90.9) **Parity (nulliparous)- number (%)** Intervention: 55 (51.9) Standard care: 45 (40.9)

	Singleton pregnancy/multifetal pregnancy Not reported **BMI (kg/m^2)- median [IQR]** Intervention: 31.6 [26.3-36.8] Standard care: 32.8 [27.7-38.0] **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: text-message based intervention (1 congratulatory text after delivery, followed by one text per week including informational and motivational breastfeeding content + one text per week asking how the participants were feeding their infant, both until 6 weeks post-hospital discharge (birth)). Participants also had the option of asking questions or presenting concerns as needed, which were addressed by a OBGYN. Standard care: text-message based intervention (1 congratulatory text after delivery + one text per week asking how the participants were feeding their infant until 6 weeks post-hospital discharge (birth)).
Duration of follow-up	6 weeks post-hospital discharge
Sources of funding	Not industry funded
Sample size	**ITT**

	N=216 Intervention: n=106 Standard care: n=110 **Completers at 6 weeks** N=185 Intervention: n=93 Standard care: n=92

Study arms

Intervention (N = 106)

Standard care (N = 110)

Outcomes

Outcome	**Intervention, N = 106**	**Standard care, N = 110**
Proportion of breastfeeding women at 6-12 weeks (Any) No of events	n = 73; % = 78.5	n = 65; % = 70.7
Sample size (completers)	n = 93; % = NR	n = 92; % = NR
Proportion of breastfeeding women at 6-12 weeks (Exclusive) No of events	n = 45; % = 48.4	n = 38; % = 41.3

Outcome	Intervention, N = 106	Standard care, N = 110
Sample size (completers)	n = 93; % = NR	n = 92; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Some concerns with the randomisation process. The allocation sequence was random however neither participants nor researchers were blinded to their group allocation.)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(Some concerns with effect of assignment to intervention. Participants and researchers likely aware of their assigned intervention. Intention-to-treat analysis was used to account for missing data.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(12% loss to follow up in intervention arm and 16% loss to follow up in the control arm. Missingness in the outcome did not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT04108533).)*
Overall bias and Directness	Risk of bias judgement	High *(Some concerns in 3 domains.)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Clarke, 2020

Bibliographic Reference	Clarke, J. L.; Ingram, J.; Johnson, D.; Thomson, G.; Trickey, H.; Dombrowski, S. U.; Sitch, A.; Dykes, F.; Feltham, M.; MacArthur, C.; Roberts, T.; Hoddinott, P.; Jolly, K.; The ABA intervention for improving breastfeeding initiation and continuation: Feasibility study results; Maternal & Child Nutrition; 2020; vol. 16 (no. 1); e12907

Study details

Country/ies where study was carried out	UK
Study type	Randomised controlled trial (RCT)
Study dates	February to August 2017
Inclusion criteria	≥16 years pregnant with their first child
Exclusion criteria	Not reported
Patient characteristics	**Age (years)- mean(SD)** Intervention: 28.6 (5.2)

	Standard care: 28.5 (5.8)
	Race/ethnicity- number (%)
	White British
	Intervention: 43 (86)
	Standard care: 45 (86.5)
	White other
	Intervention: 3 (6)
	Standard care: 4 (7.7)
	Asian
	Intervention: 0 (0)
	Standard care: 1 (1.9)
	Black African
	Intervention: 0 (0)
	Standard care: 1 (1.9)
	Black Caribbean
	Intervention: 1 (2)
	Standard care: 1 (1.9)
	Mixed
	Intervention: 2 (4)
	Standard care: 1 (1.9)
	Other

	Intervention: 1 (2) Standard care: 0 (0) **Gestational age at birth (weeks)- mean (SD)** Intervention: 39.4 (2.0) Standard care: 39.7 (1.6) **Breastfeeding intention- number (%)** Breastmilk only Intervention: 17 (34) Standard care: 18 (35.3) Mainly breastmilk Intervention: 17 (34) Standard care: 13 (25.5) Half and half Intervention: 10 (20) Standard care: 12 (23.5) Mainly formula Intervention: 3 (6) Standard care: 2 (3.9) Formula milk only Intervention: 3 (6) Standard care: 6 (11.8)

	Missing Intervention: 0 (0) Standard care: 2 (3.8) **Parity (nulliparous)** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI** Not reported **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income' (index of multiple deprivation quintile)- number (%)** 1 (most deprived) Intervention: 14 (28) Standard care: 11 (21.2) 2 Intervention: 5 (10) Standard care: 8 (15.4) 3

	Intervention: 9 (18) Standard care: 10 (19.2) 4 Intervention: 13 (26) Standard care: 14 (26.9) 5 (least deprived) Intervention: 9 (18) Standard care: 9 (17.3) **Obese women** Not reported
Intervention(s)/control	Intervention: peer supporter (paid at Site A, volunteers at Site B) that provided woman-centred support using an assets-based approach and incorporating behaviour change techniques. Commenced between 30 and 32 weeks gestation, when peer supporters offered a face-to-face meeting (either at home or external location), information about community services, and an informational leaflet. Peer supporters contacted the woman with monthly telephone calls/texts antenatally, which increased to daily after birth for the first 2 weeks (decreasing in frequency from 2 to 8 weeks, and monthly text messages were sent at 3, 4 and 5 months). Standard care: usual care provided for infant feeding within their locality (no proactive support from peer supporters either antenatally or postnatally). Women were given a leaflet detailing usual care services to support infant feeding.
Duration of follow-up	6 months post birth
Sources of funding	Not industry funded

Sample size	**ITT** N=103 Intervention: n=50 Standard care: n=53 **Completers at 8 weeks** N=88 Intervention: n=41 Standard care: n=47 **Completers at 6 months** N=83 Intervention: n=39 Standard care: n=44

Study arms

Intervention (N = 50)

Standard care (N = 53)

Outcomes

Outcome	Intervention, N = 50	Standard care, N = 53
Proportion of women breastfeeding at 6-12 weeks (Any)	n = 23; % = 56.1	n = 22; % = 47

Outcome	Intervention, N = 50	Standard care, N = 53
No of events		
Sample size (completers)	n = 41; % = NR	n = 47; % = NR
Proportion of women breastfeeding at 6-12 weeks (Exclusive)	n = 11; % = 26.8	n = 12; % = 25.5
No of events		
Sample size (completers)	n = 41; % = NR	n = 47; % = NR
Proportion of women breastfeeding at 16-26 weeks (Any)	n = 18; % = 46.2	n = 16; % = 36.4
No of events		
Sample size (completers)	n = 39; % = NR	n = 44; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive)	n = 3; % = 7.7	n = 2; % = 4.5
No of events		
Sample size (completers)	n = 39; % = NR	n = 44; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(22% lost to follow up in the intervention arm and 17% lost to follow up in the control arm. Missingness in the outcome did not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (ISRCTN14760978).)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(High risk of bias in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Forster, 2019

Bibliographic Reference	Forster, D. A.; McLardie-Hore, F. E.; McLachlan, H. L.; Davey, M. A.; Grimes, H. A.; Dennis, C. L.; Mortensen, K.; Moorhead, A. M.; Tawia, S.; Gold, L.; Shafiei, T.; Small, R.; East, C. E.; Amir, L. H.; Proactive Peer (Mother-to-Mother) Breastfeeding Support by Telephone (Ringing up About Breastfeeding Early [RUBY]): A Multicentre, Unblinded, Randomised Controlled Trial; EClinicalMedicine; 2019; vol. 8; 20-28

Study details

Country/ies where study was carried out	Australia
Study type	Randomised controlled trial (RCT)
Study dates	February 2013 to December 2015
Inclusion criteria	first time mothers admitted as public patients to the postnatal units of the participating hospitals proficient in English intending to breastfeed
Exclusion criteria	serious physical or medical illness multiple birth a member of the Australian Breastfeeding Association prior to the baby's birth (indicative of high motivation to breastfeed and high self-efficacy) the infant remained in hospital after the mother's discharge
Patient characteristics	**Age (years)- mean(SD)** Intervention: 31.0 (5.0) Standard care: 31.2 (4.7) **Race/ethnicity** Not reported **Gestational age**

	Not reported **Breastfeeding intention (plan to breastfeed 6 months or more)- number (%)** Intervention: 435 (76) Standard care: 468 (81) **Parity** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI (kg/m^2)- number (%)** Underweight (<18.5) Intervention: 29 (5) Standard care: 30 (5) Normal range (18.5-24.99) Intervention: 362 (67) Standard care: 365 (65) Overweight (25-29.99) Intervention: 91 (17) Standard care: 113 (20) Obese (≥30) Intervention: 57 (11) Standard care: 51 (9)

	Income level of the population in the study (Household weekly income pre-tax, $AUD)
	Less than $1000
	Intervention: 108 (19)
	Standard care: 104 (18)
	$1000 to $1999
	Intervention: 200 (35)
	Standard care: 187 (32)
	$2000 or more
	Intervention: 199 (35)
	Standard care: 226 (39)
	Declined to answer
	Intervention: 67 (12)
	Standard care: 61 (11)
	Young women (19 years and under)
	Not reported
	Women defined as 'low income'
	Not reported
	Obese women
	As reported above

Intervention(s)/control	Intervention: Standard care + pro-active telephone-based support from peer volunteers (first phone call 24-48 hour after hospital discharge + follow-up call 3-4 days after the initial call + weekly phone calls for 12 weeks after birth + 3-4 weekly calls between 12 weeks and 6 months. Focus of calls was mother's wellbeing and breastfeeding experience. Standard care: Postpartum stay (48h after vaginal birth, 72h after caesarean birth) + access to hospital specialist breastfeeding services by lactation consultants + 1-2 postnatal visits in the home from a hospital midwife (within first week of discharge) + community Maternal and Child Health Nurse service. All women could also access the Australian Breastfeeding Association (ABA) telephone helpline service, which is free and available 24 hours a day, 7 days a week.
Duration of follow-up	6 months postpartum
Sources of funding	Not industry funded
Sample size	**ITT** N=1152 Intervention: n=577 Standard care: n=580 **Completers at 6 months** N=1016 Intervention: n=501 Standard care: n=515

Study arms

Intervention (N = 577)

Standard care (N = 580)

Outcomes

Outcome	Intervention, N = 577	Standard care, N = 580
Proportion of women breastfeeding at 16-26 weeks (Any) No of events	n = 376; % = 75	n = 354; % = 69
Sample size (completers)	n = 501; % = NR	n = 515; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(13% lost to follow up in intervention arm and 11% lost to follow up in control arm. Missingness in the outcome did not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (ACTRN12612001024831).)*

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(Some concerns in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Gonzalez-Darias, 2020

Bibliographic Reference	Gonzalez-Darias, A.; Diaz-Gomez, N. M.; Rodriguez-Martin, S.; Hernandez-Perez, C.; Aguirre-Jaime, A.; 'Supporting a first-time mother': Assessment of success of a breastfeeding promotion programme; Midwifery; 2020; vol. 85; 102687

Study details

Country/ies where study was carried out	Spain
Study type	Randomised controlled trial (RCT)
Study dates	April to October 2016
Inclusion criteria	primiparous women singleton pregnancy delivering a healthy baby by spontaneous vertex delivery (SVD) or assisted delivery (forceps or ventouse) hospital admission of no more than 48 hours

	wishing to breastfeed and voluntarily join the study
Exclusion criteria	Not reported
Patient characteristics	**Age (years)- number (%)** 18-25 Intervention: 7 (9) Standard care: 12 (16) 26-35 Intervention: 46 (61) Standard care: 45 (61) >36 Intervention: 22 (3) Standard care: 17 (23) No answer Intervention: 0 (0) Standard care: 1 (0) **Race/ethnicity** Not reported **Gestational weeks** Not reported **Breastfeeding intention (number of months)- mean(SD)**

	Intervention: 9 (3) Standard care: 9 (3) **Parity** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI** Not reported **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: Standard care + being part of the 'Supporting a First-time Mother' programme. This included a website, which had the most up to date information about breastfeeding and allowed one to one contact with peer supporters (contact up to 6 months). Standard care: routine postnatal care (attending or not support groups, midwife care or family planning)
Duration of follow-up	6 months postpartum

Sources of funding	Not industry funded
Sample size	**ITT** N=154 Intervention: n=76 Standard care: n=78 **Completers at 3 and 6 months** N=150 Intervention: n=75 Standard care: n=75
Other information	Exclusive breastfeeding (EB): The infant receives only breast milk, including expressed milk or donor milk. The infant could receive oral rehydration salts, drops and syrups (vitamins, mineral, medicines). Predominantly breastfeeding (PB): The infant receives breast milk, including expressed milk or donor milk, as the predominant source of nourishment, but also the infant could receive certain liquids (such as water and water-based drinks, fruit juice, infusions) and oral rehydration salts, drops and syrups (vitamins, mineral, medicines). Partial breastfeeding (PaB): The infant receive breast milk, including expressed milk or donor milk, but allows the infant to receive formula. Artificial feeding (AF): where the baby is exclusively fed using formula milk.

Study arms

Intervention (N = 76)

Standard care (N = 78)

Outcomes

Outcome	Intervention, N = 76	Standard care, N = 78
Proportion of women breastfeeding at 6-12 weeks (Any) No of events	n = 10; % = 13	n = 13; % = 17
Sample size (completers)	n = 75; % = NR	n = 75; % = NR
Proportion of women breastfeeding at 6-12 weeks (Exclusive) No of events	n = 57; % = 76	n = 42; % = 56
Sample size (completers)	n = 75; % = NR	n = 75; % = NR
Proportion of women breastfeeding at 16-26 weeks (Any) No of events	n = 14; % = 19	n = 10; % = 13
Sample size (completers)	n = 75; % = NR	n = 75; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive) No of events	n = 45; % = 60	n = 33; % = 44
Sample size (completers)	n = 75; % = NR	n = 75; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(No information provided on the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(No information provided on effect of assignment to intervention)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(No serious concerns for missing outcome data. ≤10% attrition for both arms.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Some concerns *(No information reported. Some concerns in bias in measurement of the outcome)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Some concerns *(Some concerns with bias in selection of the reported result. No trial registration/pre-specified protocol reported.)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(Some concerns in four domains)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Lewkowitz, 2020

Bibliographic Reference	Lewkowitz, A. K.; Lopez, J. D.; Carter, E. B.; Duckham, H.; Strickland, T.; Macones, G. A.; Cahill, A. G.; Impact of a novel smartphone application on low-income, first-time mothers' breastfeeding rates: a randomized controlled trial; American Journal of Obstetrics & Gynecology MFM; 2020; vol. 2 (no. 3); 100143

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)
Study dates	July 2017 to December 2018
Inclusion criteria	first-time mothers approximately 36 gestational weeks singleton pregnancy a desire to initiate breastfeeding
Exclusion criteria	multiple gestations major fetal anomalies lack of desire to initiate breastfeeding contraindications to breastfeeding
Patient characteristics	**Age (years, at due date)- mean (SD)** Intervention: 22.7 (4.9) Standard care: 21.6 (4.0) **Race/ethnicity- number (%)**

	White Intervention: 9 (10.7) Standard care: 10 (11.8) Black Intervention: 71 (84.5) Standard care: 67 (78.8) Hispanic Intervention: 1 (1.2) Standard care: 2 (2.4) Asian Intervention: 0 (0.0) Standard care: 2 (2.4) Other Intervention: 3 (3.6) Standard care: 4 (4.7) **Gestational weeks** Not reported **Breastfeeding intention (best way to feed infant is)- number (%)** Breastfeeding Intervention: 56 (66.7) Standard care: 59 (69.4)

	Breastfeeding and formula feeding Intervention: 15 (17.9) Standard care: 12 (14.1) Formula feeding only Intervention: 2 (2.4) Standard care: 0 (0.0) Breastfeeding and formula are equally good Intervention: 11 (13.1) Standard care: 14 (16.5) **Parity** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI (reported pre-pregnancy, kg/m^2)- mean (SD)** <25 Intervention: 35 (41.7) Standard care: 39 (45.9) 25.0-29.99 Intervention: 19 (22.6) Standard care: 13 (15.3) 30.0-34.99

	Intervention: 8 (9.5) Standard care: 11 (12.9) 35.0-39.99 Intervention: 5 (6.0) Standard care: 6 (7.1) ≥40 Intervention: 12 (14.3) Standard care: 9 (10.6) Declined to answer Intervention: 5 (6.0) Standard care: 7 (8.2) **Income level of the population in the study (Annual household income))- number (%)** <$25,000 Intervention: 47 (56.0) Standard care: 49 (57.7) $25,001-$50,000 Intervention: 16 (19.1) Standard care: 15 (17.7) >$50,001 Intervention: 2 (2.4) Standard care: 5 (5.9)

	Declined to answer Intervention: 19 (22.6) Standard care: 16 (18.8) **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** As reported above
Intervention(s)/control	Intervention: Breastfeeding Friend (BBF) app. Features include: interactive advice, educational content, diet & exercise recommendations, strategies to optimise breastfeeding/pumping, videos, and links to online breastfeeding resources. Standard care: a control app (containing only digital versions of conventional breastfeeding support handouts provided at routine third-trimester prenatal care visits. These handouts included written education on breastfeeding benefits and availability of in-person breastfeeding resources during their delivery hospitalization and in the postpartum period
Duration of follow-up	6 months postpartum
Sources of funding	Not industry funded
Sample size	**ITT** N=170 Intervention: n=85 Standard care: n=85 **Completers at 3 months**

	N=152 Intervention: n=76 Standard care: n=76 **Completers at 6 months** N=127 Intervention: n=60 Standard care: n=67

Study arms

Intervention (N = 85)

Standard care (N = 85)

Outcomes

Outcome	**Intervention, N = 85**	**Standard care, N = 85**
Proportion of women breastfeeding at 6-12 weeks (Any) No of events	n = 23; % = 30.3	n = 28; % = 36.8
Sample size (completers)	n = 76; % = NR	n = 76; % = NR
Proportion of women breastfeeding at 6-12 weeks (Exclusive)	n = 10; % = 13.2	n = 10; % = 13.2

Outcome	Intervention, N = 85	Standard care, N = 85
No of events		
Sample size (completers)	n = 76; % = NR	n = 76; % = NR
Proportion of women breastfeeding at 16-26 weeks (Any)	n = 10; % = 16.7	n = 16; % = 23.9
No of events		
Sample size (completers)	n = 60; % = NR	n = 67; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive)	n = 5; % = 8.3	n = 7; % = 10.4
No of events		
Sample size (completers)	n = 60; % = NR	n = 67; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(29% loss to follow up in the intervention arm and 21% loss*

Section	Question	Answer
		to follow up in the control arm. Missingness in the outcome does not depend on its true value.)
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT03167073).)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(High risk of bias in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Linares, 2019

Bibliographic Reference	Linares, A. M.; Cartagena, D.; Rayens, M. K.; Las Dos Cosas Versus Exclusive Breastfeeding: A Culturally and Linguistically Exploratory Intervention Study in Hispanic Mothers Living in Kentucky; Journal of pediatric health care : official publication of National Association of Pediatric Nurse Associates & Practitioners; 2019; vol. 33 (no. 6); e46-e56

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)

Study dates	Not reported
Inclusion criteria	self-identify as Immigrant Hispanic women pregnant at or beyond 30 weeks of gestation intention to at least try to breastfeed planning to deliver at a local birthing hospital planning to remain in the area for at least 6 months after the birth of their child
Exclusion criteria	prior or current participation in any study to enhance BF pregnant with twins history of breast surgery contraindication to breastfeeding
Patient characteristics	**Age (years)- mean (SD)** Intervention: 24.3 (5.2) Standard care: 26.6 (6.6) **Race/ethnicity** Not reported **Gestational weeks** Not reported **Breastfeeding intention- number (%)** Intervention: 13.3 (1.9) Standard care: 10.3 (5.2)

	Parity Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI** Not reported **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: peer counsellor (PC) intervention based on the concepts of the Behaviour-Specific Cognitions and Affect variables within the Health Promotion Model (HPM). Additionally, participants received informational material, individual home visits, and a personalised plan for breastfeeding. Participants received 1-2 prenatal visits, one in-hospital visit, two home postpartum visits, and pre/post-natal follow up phone calls as needed from peer counsellors (until 6 months after birth). Standard care: regular breastfeeding education during prenatal care visits in the clinic. *women from both groups gave birth in a "Baby Friendly Hospital" that allowed them to receive support from a clinical International Board Certified Lactation Consultant (IBCLC) from the birthing hospital. Women in the control group did not have any contact with the IBCLC/PC study team.

Duration of follow-up	6 months after birth
Sources of funding	Not industry funded
Sample size	**ITT** N=39 Intervention: n=20 Standard care: n=19 **Completers at 3 months** N=34 Intervention: n=17 Standard care: n=17 **Completers at 6 months** Intervention: n=14 Standard care: n=15

Study arms

Intervention (N = 20)

Standard care (N = 19)

Outcomes

Outcome	Intervention, N = 20	Standard care, N = 19
Proportion of women breastfeeding at 6-12 weeks (Exclusive) No of events	n = 6; % = NA	n = 2; % = NA
Sample size (completers)	n = 17; % = NR	n = 17; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive) No of events	n = 2; % = NA	n = 1; % = NA
Sample size (completers)	n = 14; % = NR	n = 15; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Some concerns with randomisation process. No information reported on how allocation sequence was randomised. Participants and researchers were blinded.)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(No serious concerns about effect of assignment to intervention. No details reported for analyses used to estimate the effect of assignment to intervention.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(30% loss to follow up from intervention arm and 21% loss to follow up from control arm. Missingness in the outcome does not depend on its true value.)*

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Some concerns *(Some concerns with the reported results. Trial protocol registered retrospectively and no trial number reported.)*
Overall bias and Directness	Risk of bias judgement	High *(High risk of bias in one domain and some concerns in three domains.)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Milinco, 2020

Bibliographic Reference	Milinco, M.; Travan, L.; Cattaneo, A.; Knowles, A.; Sola, M. V.; Causin, E.; Cortivo, C.; Degrassi, M.; Di Tommaso, F.; Verardi, G.; Dipietro, L.; Piazza, M.; Scolz, S.; Rossetto, M.; Ronfani, L.; Trieste, B. N. Investigators; Effectiveness of biological nurturing on early breastfeeding problems: a randomized controlled trial; International Breastfeeding Journal; 2020; vol. 15 (no. 1); 21

Study details

Country/ies where study was carried out	Italy
Study type	Randomised controlled trial (RCT)

Study dates	March to December 2018
Inclusion criteria	planned to give birth at the study venue expressed the intention to breastfeed identified during the visit for their 3rd antenatal ultrasound scan (30/32 weeks of gestation)
Exclusion criteria	presence of maternal problems with potential negative impact on breastfeeding antenatal diagnosis of fetal complex diseases twin pregnancy
Patient characteristics	**Age** Not reported **Race/ethnicity** Not reported **Gestational weeks (at birth)- median (IQR)** Intervention: 40.0 (39.0-40.3) Standard care: 39.0 (39.0-40.0) **Breastfeeding intention** Not reported **Parity** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported

	BMI Not reported **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: the biological nurturing (BN) approach. Women were given a video titled the 'Biological Nurturing: laid back breastfeeding for mothers' to watch before birth. After birth in the maternity ward, women were supported by staff to breastfeed, lying a relaxed, laidback position, with their babies lying prone on their chests. Standard care: women were given the 'breast is best' video, which included details on breastfeeding according to the WHO/UNICEF approach. They were recommended to watch it before birth. After birth in the maternity ward, women were shown by staff how to breastfeed, in a sitting upright position, and helped to attach their babies to the breast correctly following the WHO/UNICEF 20 hour course.
Duration of follow-up	4 months after birth
Sources of funding	Not industry funded
Sample size	**ITT** N=208 Intervention: n=104

	Standard care: n=104 **Completers at 4 months** N=169 Intervention: n=79 Standard care: n=90
Other information	EBF was defined according to the WHO definition- infants receiving only breast milk, from their mother or from a wet nurse, through breastfeeding or breast milk expression, and no other liquids or solids, except for drops of syrups with nutritional supplements or medicines

Study arms

Intervention (N = 104)

Standard care (N = 104)

Outcomes

Outcome	Intervention, N = 104	Standard care, N = 104
Proportion of women breastfeeding at 16-26 weeks (Exclusive) No of events	n = 60; % = 75.9	n = 58; % = 64.4
Sample size (completers)	n = 79; % = NR	n = 90; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(Although researchers were aware of treatments provided, no serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(24% lost to follow up in intervention arm and 13% lost to follow up in control arm. Missingness in the outcome)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT03503500).)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(High risk of bias in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Padua, 2022

Bibliographic Reference	Padua, A. R.; Melo, E. M.; Alvarelhao, J. J.; An Intervention Program Based on Regular Home Visits for Improving Maternal Breastfeeding Self-efficacy: A Pilot Study in Portugal; Maternal & Child Health Journal; 2022; vol. 26 (no. 3); 575-586

Study details

Country/ies where study was carried out	Portugal
Study type	Randomised controlled trial (RCT)
Study dates	January to September 2018
Inclusion criteria	≥ 18 years singleton infant delivery at a gestational age of > 36 weeks no medical problems still breastfeeding at children's health appointment (CHA) 1 or HV1
Exclusion criteria	Not reported
Patient characteristics	**Age (years)- mean (SD)** Intervention: 33.1 (6.0) Standard care: 31.7 (4.1) **Race/ethnicity** Not reported **Gestational weeks (at birth)- mean (SD)** Intervention: 39.1 (1.2) Standard care: 39.2 (1.7) **Breastfeeding intention** Not reported

	Parity- number (%) Primiparous Intervention: 12 (75.0) Standard care: 8 (50.0) Multiparous Intervention: 4 (25.0) Standard care: 8 (50.0) **Singleton pregnancy/multifetal pregnancy** Not reported **BMI** Not reported **Income level of the population in the study (Annual household income, >$60,000))- Number** Intervention: 48/106 Standard care: 49/111 **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported

Intervention(s)/control	Intervention: nursing care intervention, aiming to assess breastfeeding knowledge + promote support, training and empower in breastfeeding success + educate about risk factors for stopping breastfeeding (4 postpartum home visits, each lasting 40-60 minutes). Women were also given evidence-based thematic pamphlets with specific breastfeeding advice. Standard care: assess breastfeeding knowledge + promote, support, and empower maintenance of breastfeeding + 3 children's health appointments (first week after birth, 1st month after birth, 4th month after birth). Health appointments lasted for 20-30 minutes.
Duration of follow-up	4 months after birth
Sources of funding	Not industry funded
Sample size	**ITT** N=32 Intervention: n=16 Standard care: n=16 **Completers at 4 months** N=20 Intervention: n=11 Standard care: n=9
Other information	Exclusive breastfeeding definition (WHO and UNICEF (2008))- infant receives only breast milk, no other liquids or solids are given—not even water, except oral rehydration solution, or drops/syrups of vitamins, minerals, or medicines.

Study arms

Intervention (N = 16)

Standard care (N = 16)

Outcomes

Outcome	Intervention, N = 16	Standard care, N = 16
Proportion of women breastfeeding at 16-26 weeks (Exclusive) No of events	n = 10; % = 91	n = 6; % = 67
Sample size (completers)	n = 11; % = NR	n = 9; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(No information provided on the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(No information provided on effect of assignment to intervention)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(31% lost to follow up in intervention arm and 44% lost to follow up in control arm. Missingness in the outcome did not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Some concerns *(No information reported on measurement of the outcome. Outcomes were objective.)*

Section	Question	Answer
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Some concerns *(Some concerns with bias in selection of the reported result. No trial registration/pre-specified protocol reported.)*
Overall bias and Directness	Risk of bias judgement	High *(High risk of bias in one domain and some concerns in 4 domains.)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Puharic, 2020

Bibliographic Reference	Puharic, D.; Malicki, M.; Borovac, J. A.; Sparac, V.; Poljak, B.; Aracic, N.; Marinovic, N.; Luetic, N.; Zakarija-Grkovic, I.; The effect of a combined intervention on exclusive breastfeeding in primiparas: A randomised controlled trial; Maternal & Child Nutrition; 2020; vol. 16 (no. 3); e12948

Study details

Country/ies where study was carried out	Croatia
Study type	Randomised controlled trial (RCT)
Study dates	November 2013 to December 2016
Inclusion criteria	primigravidae

	singleton pregnancy attended primary care obstetrician between 20 to 32 gestational weeks speak Croatian reside within the territory of the Republic of Croatia for at least a year
Exclusion criteria	unable to communicate in Croatian by phone planning to leave the country within a year had a severe medical or psychiatric problem that could be aggravated by participating in the study
Patient characteristics	**Age (years)- number (%)** <18 years Intervention: 1 (1) Active control: 2 (2) Standard care: 4 (3) 18-24 Intervention: 30 (23) Active control: 21 (20) Standard care: 29 (24) 25-35 Intervention: 91 (71) Active control: 72 (70) Standard care: 73 (59)

	>35 Intervention: 6 (5) Active control: 8 (8) Standard care: 17 (14) **Race/ethnicity** Not reported **Gestational weeks** Not reported **Breastfeeding intention** No breastfeeding Intervention: 1 (1) Active control: 1 (1) Standard care: 0 (0) Exclusive breastfeeding Intervention: 85 (66) Active control: 57 (55) Standard care: 73 (60) Mixed feeding Intervention: 43 (33) Active control: 45 (44) Standard care: 48 (40)

	Parity Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI- median (IQR)** Intervention: 24.5 (22.2-26.1) Active control: 24.1 (21.9-26.8) Standard care: 24.8 (23.1-26.9) **Income level of the population in the study (Monthly income, EURO)- number (%)** <472 Intervention: 34 (26) Active control: 33 (32) Standard care: 37 (30) 472-950 Intervention: 95 (74) Active control: 70 (68) Standard care: 84 (68) >950 Intervention: 0 (0) Active control: 0 (0) Standard care: 2 (2)

	Young women (19 years and under) As reported above **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: breastfeeding booklet and a general pregnancy booklet + four proactive telephone calls (1 antenatally, 3 at 2, 6 and10 weeks postpartum) Active control group: a general pregnancy booklet + four proactive telephone calls (1 antenatally, 3 at 2, 6 and10 weeks postpartum) Standard care: usual care that did not receive any written materials or phone calls before or after birth
Duration of follow-up	6 months after birth
Sources of funding	Not reported
Sample size	**ITT** N=400 Intervention: n=136 Active control: n=128 Standard care: n=136 **Completers at 3 and 6 months** N=355 Intervention: n=129

	Active control: n=103 Standard care: n=123
Other information	Note: data analysed and critically appraised for intervention and standard care arms only.

Study arms

Intervention (N = 136)

Active control (N = 128)

Standard care (N = 136)

Outcomes

Outcome	Intervention, N = 136	Active control, N = 128	Standard care, N = 136
Proportion of women breastfeeding at 6-12 weeks (Any) No of events	n = 10; % = 8	n = 13; % = 13	n = 25; % = 20
Sample size (completers)	n = 129; % = NR	n = 103; % = NR	n = 123; % = NR
Proportion of women breastfeeding at 6-12 weeks (Exclusive) No of events	n = 105; % = 81	n = 70; % = 68	n = 58; % = 47
Sample size (completers)	n = 129; % = NR	n = 103; % = NR	n = 123; % = NR
Proportion of women breastfeeding at 16-26 weeks (Any)	n = 25; % = 19	n = 47; % = 46	n = 46; % = 37

Outcome	Intervention, N = 136	Active control, N = 128	Standard care, N = 136
No of events			
Sample size (completers)	n = 129; % = NR	n = 103; % = NR	n = 123; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive)	n = 82; % = 64	n = 16; % = 16	n = 4; % = 3
No of events			
Sample size (completers)	n = 129; % = NR	n = 103; % = NR	n = 123; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(No serious concerns for missing outcome data. ≤10% attrition for both arms.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*

Section	Question	Answer
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT01998087))*
Overall bias and Directness	Risk of bias judgement	Low *(No serious concerns in any domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Santamaria-Martin, 2022

Bibliographic Reference	Santamaria-Martin, M. J.; Martin-Iglesias, S.; Schwarz, C.; Rico-Blazquez, M.; Portocarrero-Nunez, J. A.; Diez-Izquierdo, L.; Llamosas-Falcon, L.; Rodriguez-Barrientos, R.; Del-Cura-Gonzalez, I.; Effectiveness of a group educational intervention - prolact - in primary care to promote exclusive breastfeeding: a cluster randomized clinical trial; BMC pregnancy and childbirth; 2022; vol. 22 (no. 1); 132

Study details

Country/ies where study was carried out	Spain
Study type	Cluster randomised controlled trial
Study dates	January 2015 to June 2016
Inclusion criteria	≥18 years

	their children born at term (≥ 37 weeks of gestation) birth weight ≥ 2.5 kg attended the health centres for any reason during the first 4 weeks of the children's life breastfed exclusively between study dates communicate in Spanish
Exclusion criteria	participating in other clinical trials unable to attend follow-up visits clinical contraindications to breastfeeding and/or children who had clinical conditions that hinder, prevent or contraindicate breastfeeding
Patient characteristics	**Age (years)- mean(SD)** Intervention: 33.2 (4.8) Standard care: 32.5 (5.2) **Race/ethnicity** Not reported **Gestational age (weeks)- mean (SD)** Intervention: 39 (1.2) Standard care: 39 (1.1) **Breastfeeding intention (plan to exclusively breastfeed)- number (%)** Not reported **Parity (has other children)- number (%)**

	Intervention: 78 (35.6) Standard care: 106 (49.3) **Singleton pregnancy/multifetal pregnancy** Not reported **BMI (kg/m^2)- mean (SD)** Intervention: 24.4 (3.7) Standard care: 25.3 (4.4) **Income level of the population in the study (income/household member)- median (IQR)** Intervention: 833.3 (750-1250) Standard care: 750 (500-1167) **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported
Intervention(s)/control	Intervention: PROLACT intervention. An educational group intervention based on a breastfeeding workshop (acquistion, reinforcement, and/or consolidation of knowledge and skills needed to initiate and maintain exclusive breastfeeding). Intervention included 6 weekly group sessions of 120 minutes each. Standard care: advice given regarding the promotion and benefits of breastfeeding.
Duration of follow-up	6 months after birth

Sources of funding	Not industry funded
Sample size	N=10 centres/cluster Intervention: n=5 centres/clusters Standard care: n=5 centres/clusters **ITT** N=434 Intervention: n=219 Standard care: n=215 **Completers at 3 months** N=411 Intervention: n=210 Standard care: n=201 **Completers at 6 months** N=391 Intervention: n=206 Standard care: n=185
Other information	Exclusive breastfeeding: feeding expressed breast milk or milk from a wet nurse to which oral rehydration solution, drops, syrups, vitamins, minerals or medicines are added Predominant breastfeeding: breastfeeding plus water or water-based drinks and/or fruit juices Complementary feeding: any solid or liquid food, including milk of non-human origin and child formula, in addition to breast milk

	*ICC of 0.01

Study arms

Intervention (N = 219)

Standard care (N = 215)

Outcomes

Outcome	Intervention, N = 219	Standard care, N = 215
Proportion of women breastfeeding at 6-12 weeks (Exclusive)		
No of events	n = 155; % = NR	n = 113; % = NR
Sample size	n = 210; % = NR	n = 201; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive)		
No of events	n = 46; % = NR	n = 16; % = NR
Sample size	n = 206; % = NR	n = 185; % = NR

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Cluster randomised trials NGA

Section	Question	Answer
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low *(No serious concerns with the timing of identification and recruitment of individual participants in relation to timing of randomisation)*
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low *(No serious concerns for deviations from intended interventions)*
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Some concerns *(5.9% loss to follow up in the intervention arm and 14% loss to follow up in the control arm.)*
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low *(No serious concerns in the bias in measurement of the outcome)*
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT01869920).)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(Some concerns in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable

Scott, 2021

Bibliographic Reference	Scott, Jane Anne; Burns, Sharyn K; Hauck, Yvonne L; Giglia, Roslyn C; Jorgensen, Anita M; White, Becky Kate; Martin, Annegret; Robinson, Suzanne; Dhaliwal, Satvinder S; Binns, Colin W; Maycock, Bruce R; Impact of a Face-To-Face Versus Smartphone App Versus Combined Breastfeeding Intervention Targeting Fathers: Randomized Controlled Trial.; JMIR pediatrics and parenting; 2021; vol. 4 (no. 2); e24579

Study details

Country/ies where study was carried out	Australia
Study type	Randomised controlled trial (RCT)
Study dates	August 2015 to December 2016
Inclusion criteria	owning a smartphone (iOS or Android) internet access residence within Perth both partners intending to participate in the rearing of their child sufficient English language skills to engage with the intervention
Exclusion criteria	mother with an existing medical condition likely to inhibit the initiation of breastfeeding or exclusive breastfeeding expecting a multiple birth same sex couple
Patient characteristics	**Age (years)- mean(SD)** Intervention: 34 (5.3) Standard care: 33 (4.8)

	Race/ethnicity Not reported **Gestational age at enrollment (weeks)** Not reported **Breastfeeding intention (plan to exclusively breastfeed)** Not reported **Parity (nulliparous)** Not reported **Singleton pregnancy/multifetal pregnancy** Not reported **BMI (kg/m^2)** Not reported **Income level of the population in the study** Not reported **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women** Not reported

Intervention(s)/control	Intervention: Milk Man smartphone app group. App uses gamification, social connectivity in the form of a conversation forum, and twice-weekly push notifications linking to polls and conversation starters to engage fathers with breastfeeding information contained within an information library. Fathers had access to the app from recruitment (approx. 32 gestational weeks) to 6 months postpartum. Control: usual care (attended the breastfeeding component of the hospital-based couples' antenatal class).
Duration of follow-up	26 weeks
Sources of funding	Not industry funded
Sample size	**ITT** N=1426 Intervention: n=397 Control: n=358 **Completers at 6 weeks** N=836 Intervention: n=224 Control: n=215 **Completers at 26 weeks** N=702 Intervention: n=184 Control: n=184 Note: data extracted for Milk Man app only as this is the only relevant intervention for this review question.

Study arms

Intervention (N = 397)

Control (N = 358)

Outcomes

Outcome	Intervention vs Control, N2 = 397, N1 = 358
Sample size (completers)	n1 = 215; %1 = 60.1, n2 = 224; %2 = 56.4
Proportion of breastfeeding women at 6-12 weeks (Any) Odds ratio/95% CI	0.96 (0.49 to 1.88)
Sample size (completers)	n1 = 215; %1 = 60.1, n2 = 224; %2 = 56.4
Proportion of breastfeeding women at 6-12 weeks (Exclusive) Odds ratio/95% CI	0.92 (0.53 to 1.33)
Sample size (completers)	n1 = 184; %1 = 51.4, n2 = 184; %2 = 46.3
Proportion of breastfeeding women at 16-26 weeks (Any) Odds ratio/95% CI	0.9 (0.59 to 1.39)
Sample size (completers)	n1 = 184; %1 = 51.4, n2 = 184; %2 = 46.3
Proportion of breastfeeding women at 16-26 weeks (Exclusive) Odds ratio/95% CI	0.72 (0.32 to 1.66)

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(46% loss to follow up in the intervention arm and 49% loss to follow up in the control arm. Missingness in the outcome does not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered ACTRN12614000605695.)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(High risk of bias in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Uscher-Pines, 2020

Bibliographic Reference	Uscher-Pines, L.; Ghosh-Dastidar, B.; Bogen, D. L.; Ray, K. N.; Demirci, J. R.; Mehrotra, A.; Kapinos, K. A.; Feasibility and Effectiveness of Telelactation Among Rural Breastfeeding Women; Academic pediatrics; 2020; vol. 20 (no. 5); 652-659

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)
Study dates	October 2016 to May 2018
Inclusion criteria	at least 18 years old spoke English had a valid email address had a singleton baby at a gestational age of at least 35 weeks, had initiated breastfeeding and planned to continue after hospital discharge
Exclusion criteria	planned separation from the infant (eg, incarceration) neonatal intensive care unit stay have a condition where breastfeeding was medically contraindicated
Patient characteristics	**Age (years)- mean(SD)** 26.5 (5.11) **Race/ethnicity- number (%)** Not reported

	Gestational age at birth (weeks)
	38.8 (1.17)
	Breastfeeding intention (plan to breastfeed)- number (%)
	At least 3 months
	Intervention: 71 (76)
	Standard care: 74 (80)
	At least 6 months
	Intervention: 66 (70)
	Standard care: 69 (74)
	Parity (primiparous)- number (%)
	Intervention: 39 (41)
	Standard care: 35 (38)
	Singleton pregnancy/multifetal pregnancy
	Not reported
	BMI (kg/m^2)
	Not reported
	Income level of the population in the study (household income)- number (%)
	$0-$14,999
	Intervention: 17 (18)
	Standard care: 13 (14)
	$15,000-$24,999

	Intervention: 12 (13) Standard care: 9 (10) $25,000-$39,999 Intervention: 9 (10) Standard care: 15 (16) $40,000-$54,999 Intervention: 15 (16) Standard care: 13 (14) $55,000-$79,999 Intervention: 21 (22) Standard care: 14 (15) $80,000 or more Intervention: 10 (11) Standard care: 18 (19) **Young women (19 years and under)** Not reported **Women defined as 'low income'** Not reported **Obese women (BMI≥30)** Intervention: 9 (10) Standard care: 8 (9)

Intervention(s)/control	Intervention: Telelaction intervention + standard care. Participants were introduced to and asked to download 'Pacify Health' telelactation application by hospital nurses. Participants were given a coupon code so they could download this app for free. They were also given unlimited video calls, which they could request through app whenever required. Standard care: support offered by various healthcare professionals who cared for participants during their postpartum hospital stay. After discharge, they received support from paediatricians and their staff as a component of routine, outpatient paediatric health maintenance visits, and women enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) could access WIC breastfeeding services.
Duration of follow-up	12 weeks after birth
Sources of funding	Not industry funded
Sample size	**ITT** N=203 Intervention: n=102 Standard care: n=101 **Completers at 3 months** N=187 Intervention: n=94 Standard care: n=93

Study arms

Intervention (N = 102)

Standard care (N = 101)

Outcomes

Outcome	Intervention, N = 102	Standard care, N = 101
Proportion of women breastfeeding at 6-12 weeks (Any) No of events	n = 69; % = 73	n = 63; % = 68
Sample size (completers)	n = 94; % = NR	n = 93; % = NR
Proportion of women breastfeeding at 6-12 weeks (Exclusive) No of events	n = 53; % = 56	n = 42; % = 45
Sample size (completers)	n = 94; % = NR	n = 93; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(Participants and researchers aware of treatment allocation. No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(No serious concerns for missing outcome data. ≤10% attrition for both arms.)*

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (NCT02870413).)*
Overall bias and Directness	Risk of bias judgement	Low *(No serious concerns in any domains)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

Wen, 2020

Bibliographic Reference	Wen, L. M.; Rissel, C.; Xu, H.; Taki, S.; Buchanan, L.; Bedford, K.; Phongsavan, P.; Baur, L. A.; Effects of Telephone and Short Message Service Support on Infant Feeding Practices, "Tummy Time," and Screen Time at 6 and 12 Months of Child Age: A 3-Group Randomized Clinical Trial; JAMA Pediatrics; 2020; vol. 174 (no. 7); 657-664

Study details

Country/ies where study was carried out	Australia
Study type	Randomised controlled trial (RCT)
Study dates	February 2017 to November 2018

Inclusion criteria	aged ≥16 years between 24 and 34 gestational weeks 24 able to communicate in English had a mobile telephone lived in the recruitment areas
Exclusion criteria	Not reported
Patient characteristics	**Age (years)- number (%)** 16-24 Telephone support: 33 (9) SMS support: 33 (9) Standard care: 31 (8) 25-29 Telephone support: 92 (24) SMS support: 81 (21) Standard care: 99 (26) 30-34 Telephone support: 135 (35) SMS support: 162 (42) Standard care: 145 (38) 35-39

	Telephone support: 102 (26) SMS support: 87 (23) Standard care: 81 (21) 40-49 Telephone support: 24 (6) SMS support: 21 (5) Standard care: 29 (8) **Race/ethnicity** Not reported **Gestational age at enrolment** Not reported **Breastfeeding intention (plan to exclusively breastfeed)- number (%)** Not reported **Parity (first time mother)- number (%)** Yes Telephone support: 209 (54) SMS support: 214 (56) Standard care: 201 (52) No Telephone support: 177 (46) SMS support: 170 (44)

	Standard care: 184 (48) **Singleton pregnancy/multifetal pregnancy** Not reported **BMI** Not reported **Income level of the population in the study (annual household income, A$)** <40,000 Telephone support: 47 (12) SMS support: 44 (12) Standard care: 45 (12) 40,000-79,999 Telephone support: 82 (21) SMS support: 80 (21) Standard care: 90 (23) ≥80,000 Telephone support: 213 (55) SMS support: 224 (58) Standard care: 202 (53) **Young women (19 years and under)** Not reported **Women defined as 'low income'**

	Not reported **Obese women** Not reported
Intervention(s)/control	Intervention (Telephone Support): intervention booklet + family health nurse support via telephone. Each call was approximately 30 to 60 minutes long, and the nurse and mother talked about the intervention information provided in the booklets and discussed issues raised by the mother. Guided by the HBT checklists, telephone support scripts were developed to assist the nurses providing telephone support. Intervention (SMS Support): intervention booklet + SMS messages sent to participants 2x/week for 4 weeks via a 2-way automated SMS system at a predetermined time (10 AM to 1 PM). Messages were used to reinforce the intervention information and key messages in the booklets. Standard care: usual care from child and family health nurses in the local health districts. Home safety promotion materials and a newsletter on “Kids’ Safety” sent to the control group at the third trimester and at 3, 6, and 9 months of child age as one of the retention strategies.
Duration of follow-up	12 months after birth
Sources of funding	Not industry funded
Sample size	**ITT** N=1155 Telephone support: n=386 SMS support: n=384 Standard care: n=385 **Completers at 6 months** N=947 Telephone support: n=293

	SMS support: n=338 Standard care: n=316
Other information	Note: the two intervention arms have been combined in the revman analysis.

Study arms

Telephone support (N = 386)

SMS support (N = 384)

Standard care (N = 385)

Outcomes

Outcome	**Telephone support, N = 386**	**SMS support, N = 384**	**Standard care, N = 385**
Proportion of women breastfeeding at 16-26 weeks (Any) No of events	n = 213; % = 73	n = 241; % = 73	n = 216; % = 71
Sample size (completers)	n = 293; % = NR	n = 338; % = NR	n = 316; % = NR
Proportion of women breastfeeding at 16-26 weeks (Exclusive) No of events	n = 17; % = 6	n = 19; % = 4	n = 10; % = 3
Sample size (completers)	n = 293; % = NR	n = 338; % = NR	n = 316; % = NR

Critical appraisal

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(No serious concerns about the randomisation process)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(No serious concerns about effect of assignment to intervention. Intention-to-treat analysis was used to account for missing data)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(24% loss to follow up in the telephone support intervention arm, 12% loss to follow up in the SMS support intervention, and 18% loss to follow up in the standard care arm. Missingness in the outcome did not depend on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(No serious concerns about outcome measurement)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No serious concerns with the reported results. Trial registered (ACTRN12616001470482).)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(High risk of bias in one domain)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

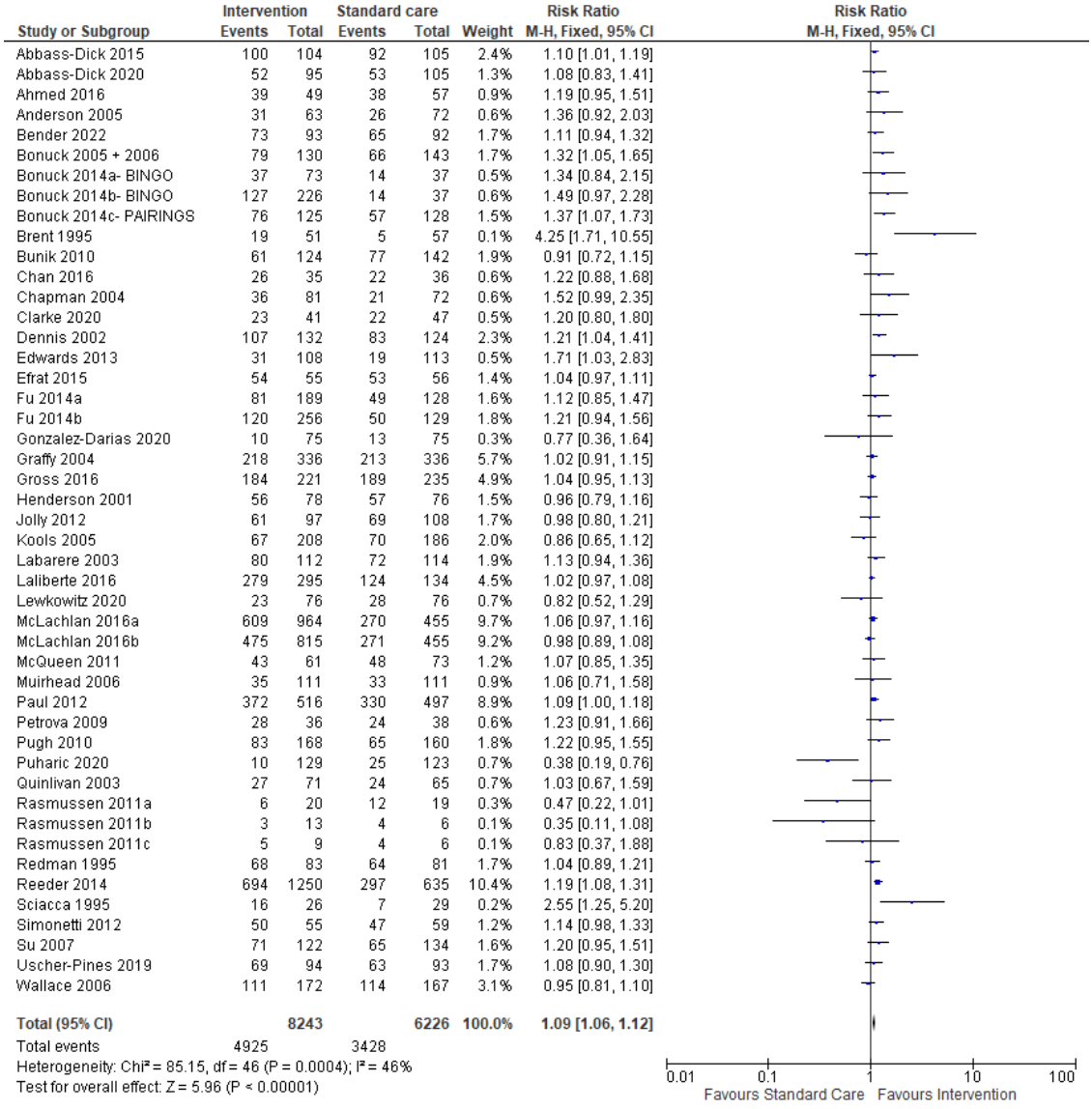
Appendix E Forest plots

Forest plots for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

This section includes forest plots only for outcomes that are meta-analysed. Outcomes from single studies are not presented here; the quality assessment for such outcomes is provided in the GRADE profiles in appendix F.

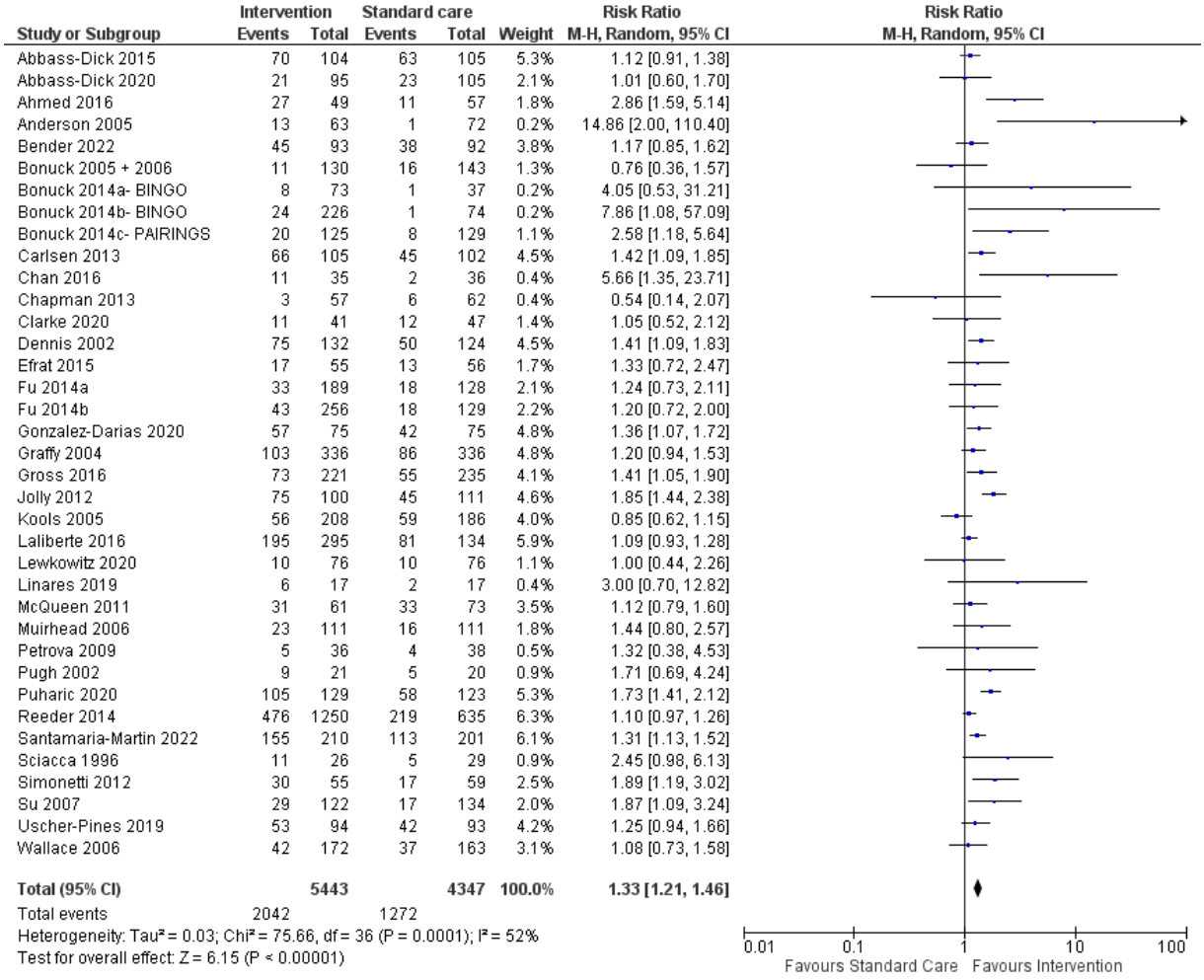
Comparison 1.1 Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Figure 2: Proportion of women breastfeeding at 6-12 weeks (Any)



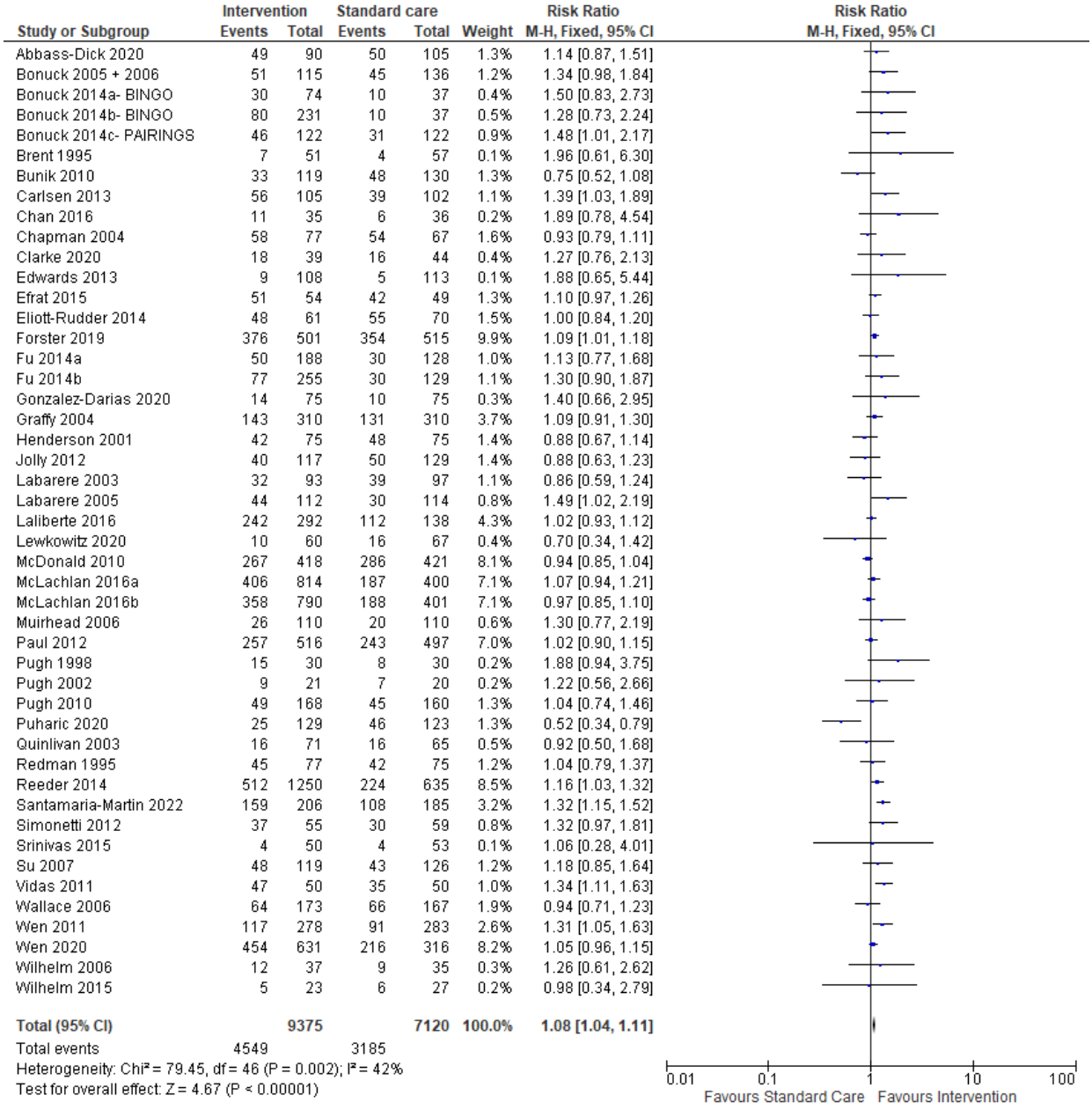
CI: confidence interval

Figure 3: Proportion of women breastfeeding at 6-12 weeks (Exclusive)



CI: confidence interval

Figure 4: Proportion of women breastfeeding at 16-26 weeks (Any)

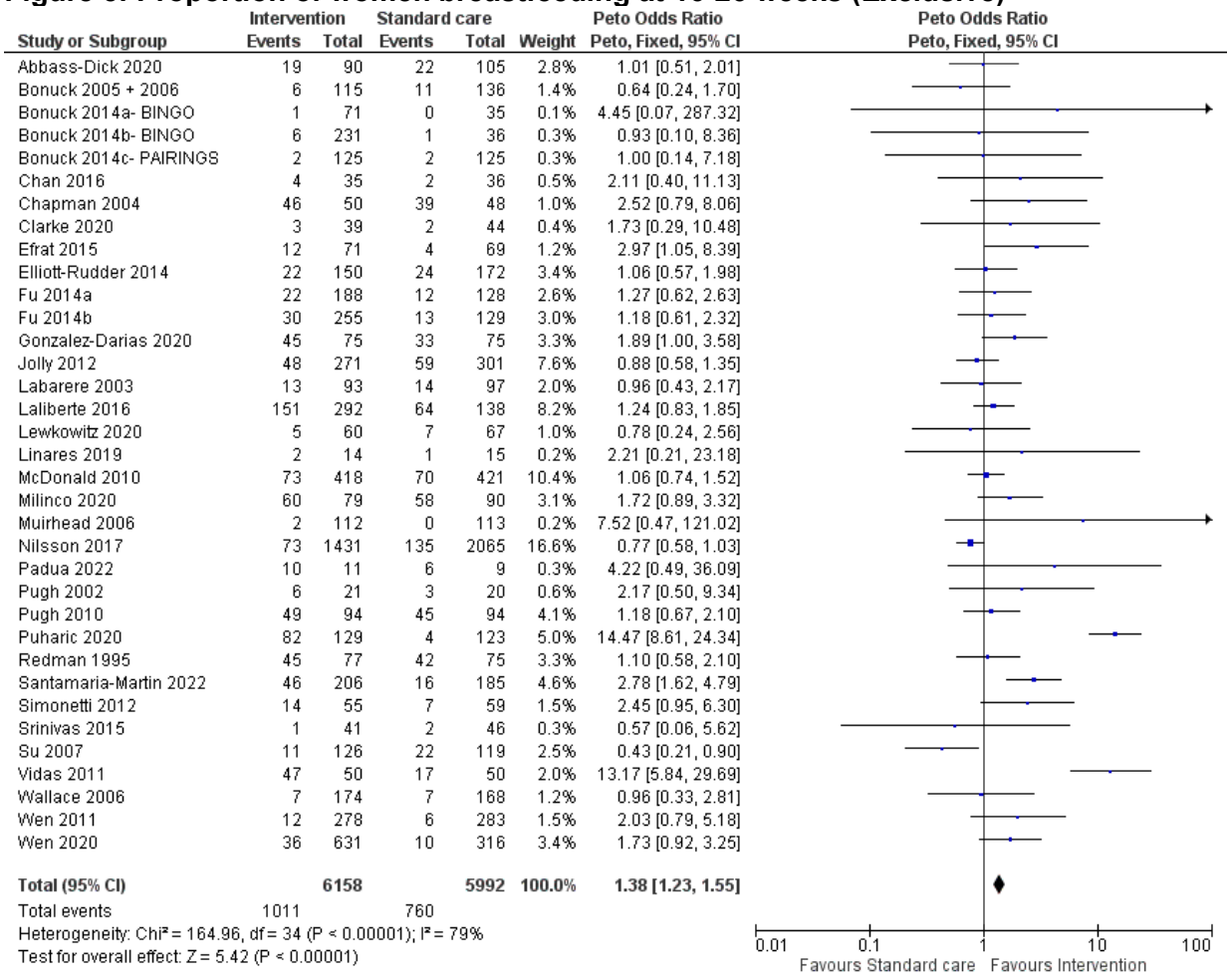


Study or Subgroup	Intervention Events	Intervention Total	Standard care Events	Standard care Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Abbass-Dick 2020	49	90	50	105	1.3%	1.14 [0.87, 1.51]
Bonuck 2005 + 2006	51	115	45	136	1.2%	1.34 [0.98, 1.84]
Bonuck 2014a- BINGO	30	74	10	37	0.4%	1.50 [0.83, 2.73]
Bonuck 2014b- BINGO	80	231	10	37	0.5%	1.28 [0.73, 2.24]
Bonuck 2014c- PAIRINGS	46	122	31	122	0.9%	1.48 [1.01, 2.17]
Brent 1995	7	51	4	57	0.1%	1.96 [0.61, 6.30]
Bunik 2010	33	119	48	130	1.3%	0.75 [0.52, 1.08]
Carlsen 2013	56	105	39	102	1.1%	1.39 [1.03, 1.89]
Chan 2016	11	35	6	36	0.2%	1.89 [0.78, 4.54]
Chapman 2004	58	77	54	67	1.6%	0.93 [0.79, 1.11]
Clarke 2020	18	39	16	44	0.4%	1.27 [0.76, 2.13]
Edwards 2013	9	108	5	113	0.1%	1.88 [0.65, 5.44]
Efrat 2015	51	54	42	49	1.3%	1.10 [0.97, 1.26]
Eliott-Rudder 2014	48	61	55	70	1.5%	1.00 [0.84, 1.20]
Forster 2019	376	501	354	515	9.9%	1.09 [1.01, 1.18]
Fu 2014a	50	188	30	128	1.0%	1.13 [0.77, 1.68]
Fu 2014b	77	255	30	129	1.1%	1.30 [0.90, 1.87]
Gonzalez-Darias 2020	14	75	10	75	0.3%	1.40 [0.66, 2.95]
Graffy 2004	143	310	131	310	3.7%	1.09 [0.91, 1.30]
Henderson 2001	42	75	48	75	1.4%	0.88 [0.67, 1.14]
Jolly 2012	40	117	50	129	1.4%	0.88 [0.63, 1.23]
Labarere 2003	32	93	39	97	1.1%	0.86 [0.59, 1.24]
Labarere 2005	44	112	30	114	0.8%	1.49 [1.02, 2.19]
Laliberte 2016	242	292	112	138	4.3%	1.02 [0.93, 1.12]
Lewkowitz 2020	10	60	16	67	0.4%	0.70 [0.34, 1.42]
McDonald 2010	267	418	286	421	8.1%	0.94 [0.85, 1.04]
McLachlan 2016a	406	814	187	400	7.1%	1.07 [0.94, 1.21]
McLachlan 2016b	358	790	188	401	7.1%	0.97 [0.85, 1.10]
Muirhead 2006	26	110	20	110	0.6%	1.30 [0.77, 2.19]
Paul 2012	257	516	243	497	7.0%	1.02 [0.90, 1.15]
Pugh 1998	15	30	8	30	0.2%	1.88 [0.94, 3.75]
Pugh 2002	9	21	7	20	0.2%	1.22 [0.56, 2.66]
Pugh 2010	49	168	45	160	1.3%	1.04 [0.74, 1.46]
Puharic 2020	25	129	46	123	1.3%	0.52 [0.34, 0.79]
Quinlivan 2003	16	71	16	65	0.5%	0.92 [0.50, 1.68]
Redman 1995	45	77	42	75	1.2%	1.04 [0.79, 1.37]
Reeder 2014	512	1250	224	635	8.5%	1.16 [1.03, 1.32]
Santamaria-Martin 2022	159	206	108	185	3.2%	1.32 [1.15, 1.52]
Simonetti 2012	37	55	30	59	0.8%	1.32 [0.97, 1.81]
Srinivas 2015	4	50	4	53	0.1%	1.06 [0.28, 4.01]
Su 2007	48	119	43	126	1.2%	1.18 [0.85, 1.64]
Vidas 2011	47	50	35	50	1.0%	1.34 [1.11, 1.63]
Wallace 2006	64	173	66	167	1.9%	0.94 [0.71, 1.23]
Wen 2011	117	278	91	283	2.6%	1.31 [1.05, 1.63]
Wen 2020	454	631	216	316	8.2%	1.05 [0.96, 1.15]
Wilhelm 2006	12	37	9	35	0.3%	1.26 [0.61, 2.62]
Wilhelm 2015	5	23	6	27	0.2%	0.98 [0.34, 2.79]
Total (95% CI)		**9375**		**7120**	**100.0%**	**1.08 [1.04, 1.11]**
Total events	4549		3185			

Heterogeneity: Chi² = 79.45, df = 46 (P = 0.002); I² = 42%
Test for overall effect: Z = 4.67 (P < 0.00001)

CI: confidence interval

Figure 5: Proportion of women breastfeeding at 16-26 weeks (Exclusive)

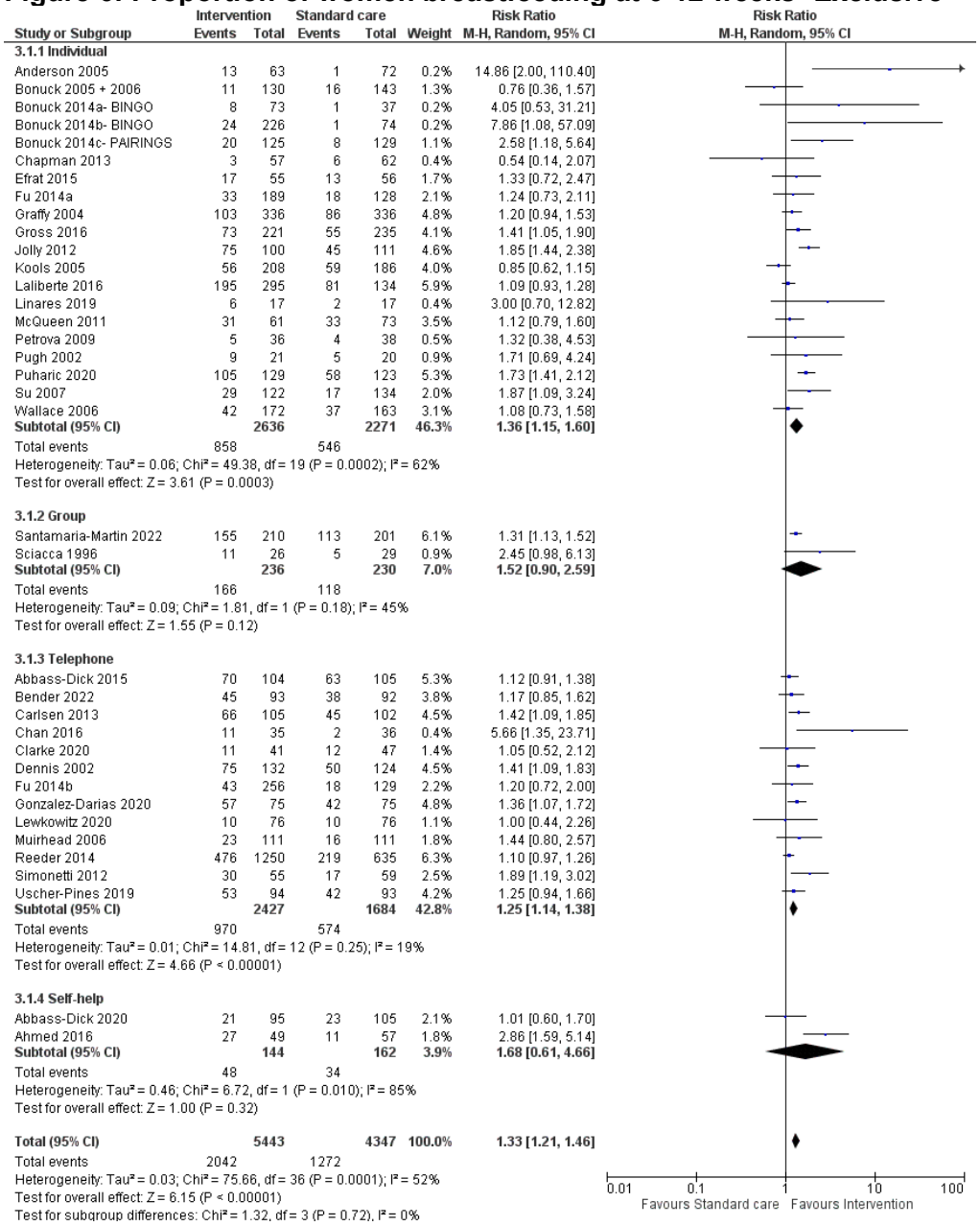


CI: confidence interval

The following forest plots (Figure 6 to Figure 15) are sub-group analyses for components of interventions (how the intervention was delivered, where the intervention was delivered, number of contacts, duration of contacts, and women defined as 'low income'). Subgroup analyses was only conducted when there was heterogeneity in the evidence.

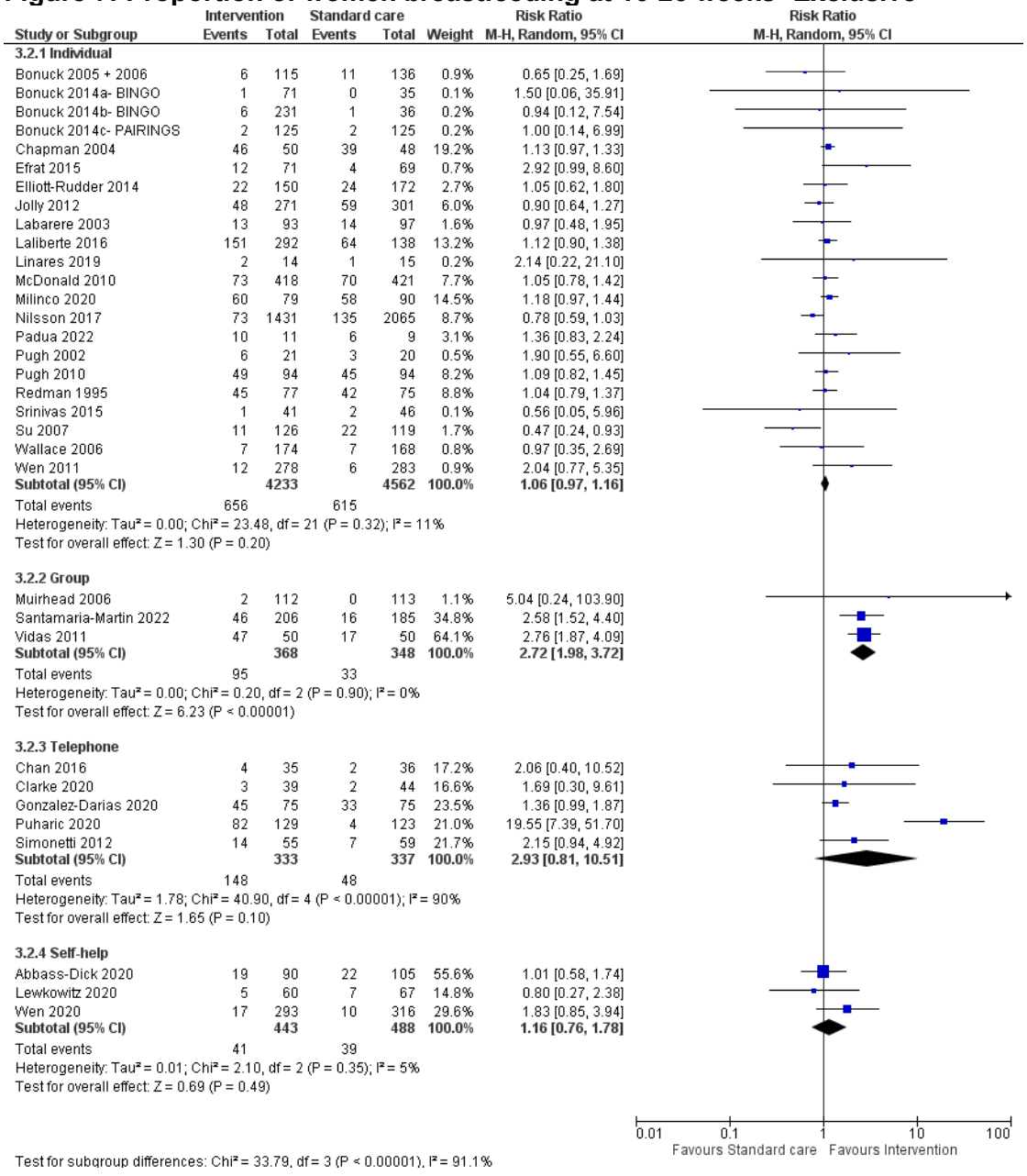
1.1.1 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth-: how the intervention was delivered (population: mothers and co-parents) (single births)

Figure 6: Proportion of women breastfeeding at 6-12 weeks- Exclusive



CI: confidence interval

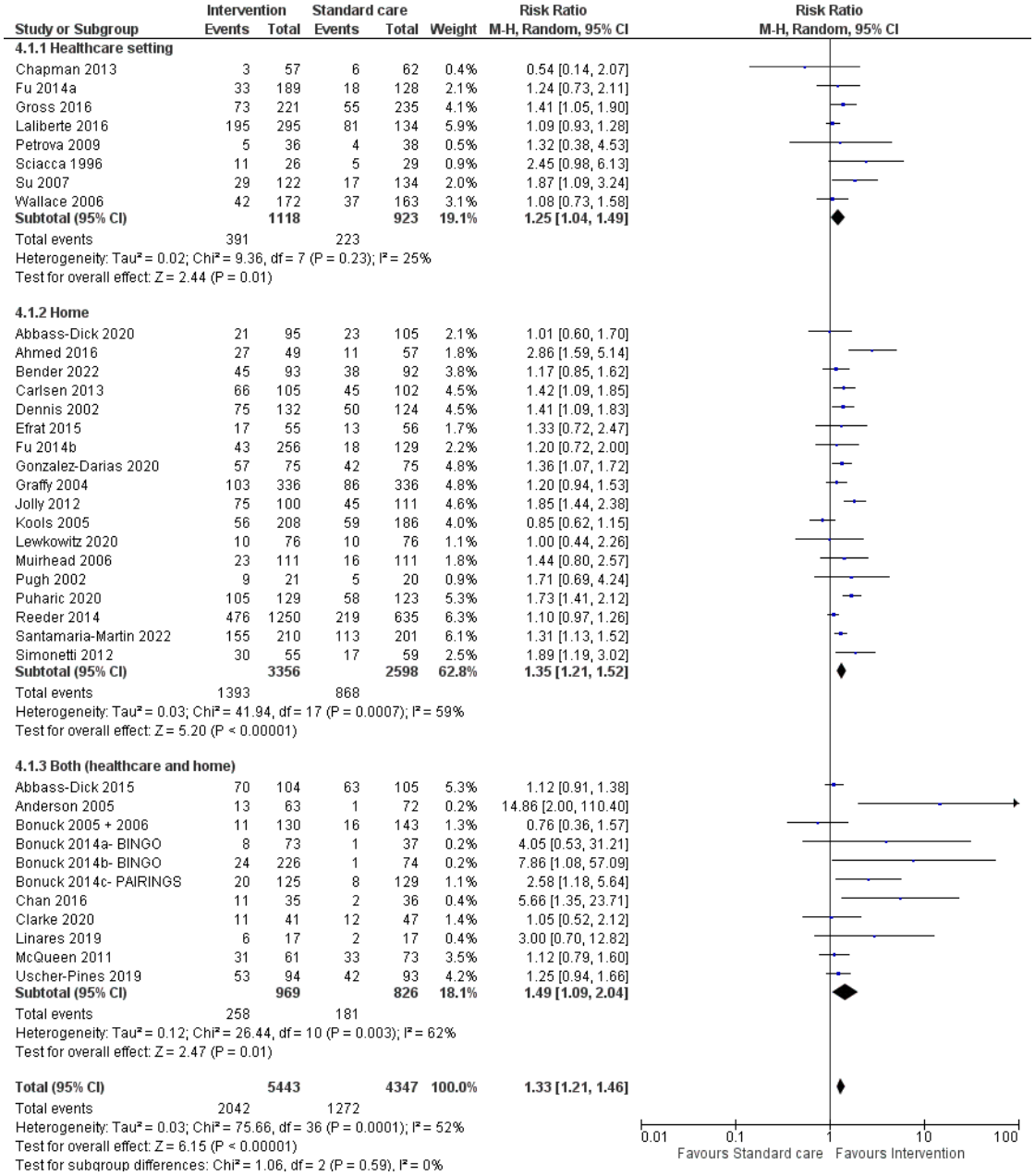
Figure 7: Proportion of women breastfeeding at 16-26 weeks- Exclusive



CI: confidence interval

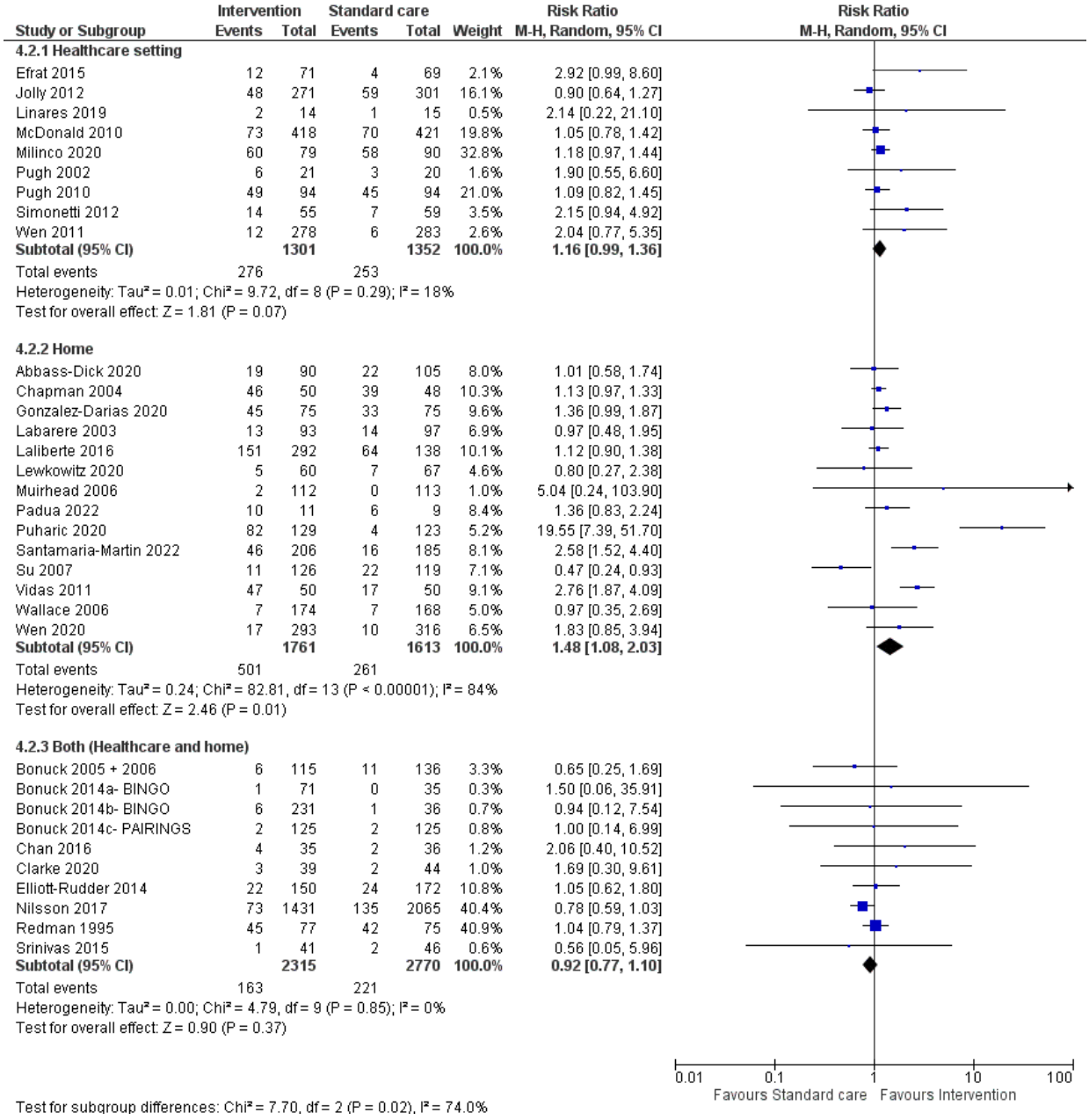
1.1.2 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: where the intervention was delivered (population: mothers and co-parents) (single births).

Figure 8: Proportion of women breastfeeding at 6-12 weeks- Exclusive



CI: confidence interval

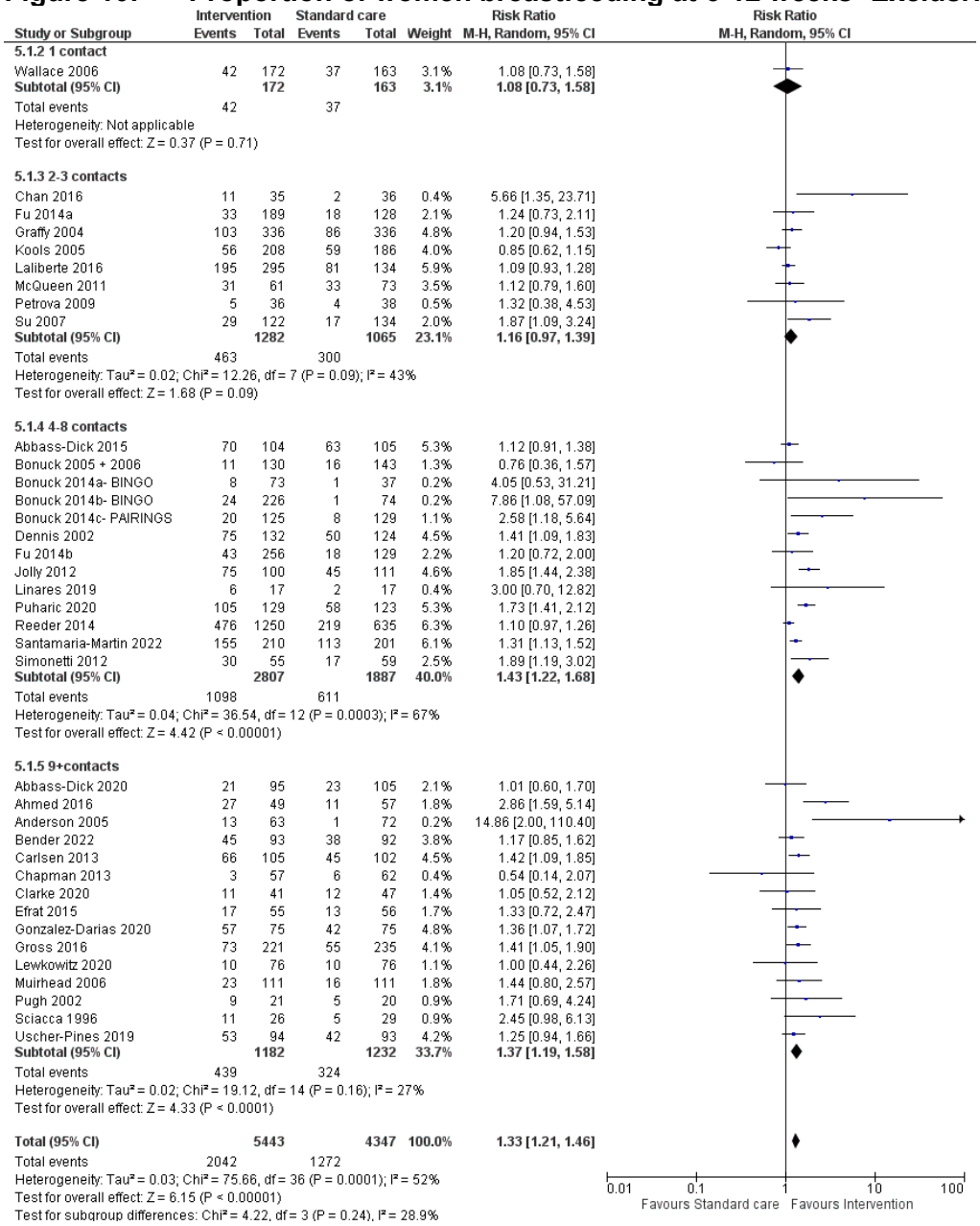
Figure 9: Proportion of women breastfeeding at 16-26 weeks- Exclusive



CI: confidence interval

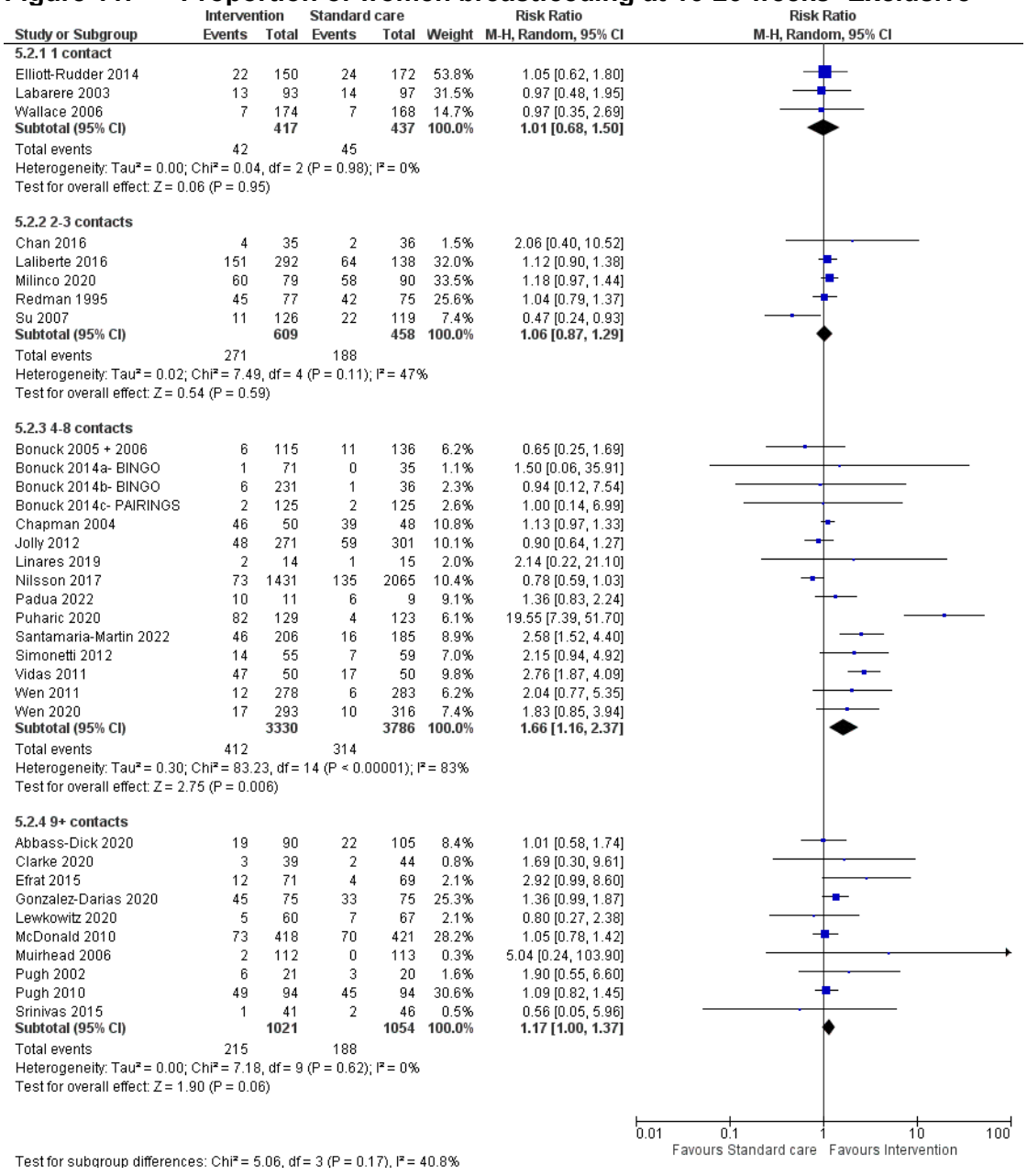
1.1.3 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth- number of contacts (population: mothers and co-parents) (single births).

Figure 10: Proportion of women breastfeeding at 6-12 weeks- Exclusive



CI: confidence interval

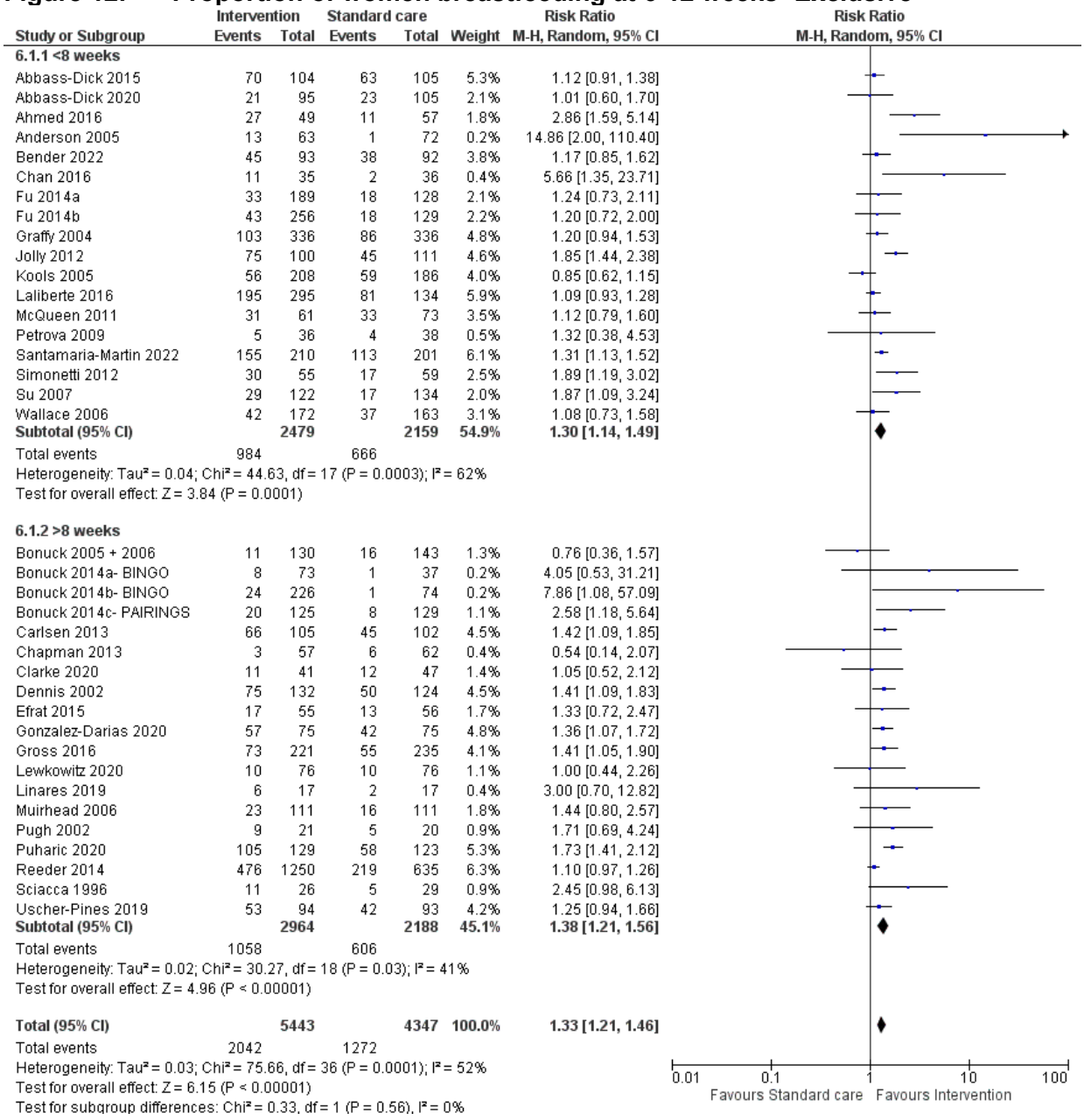
Figure 11: Proportion of women breastfeeding at 16-26 weeks- Exclusive



CI: confidence interval

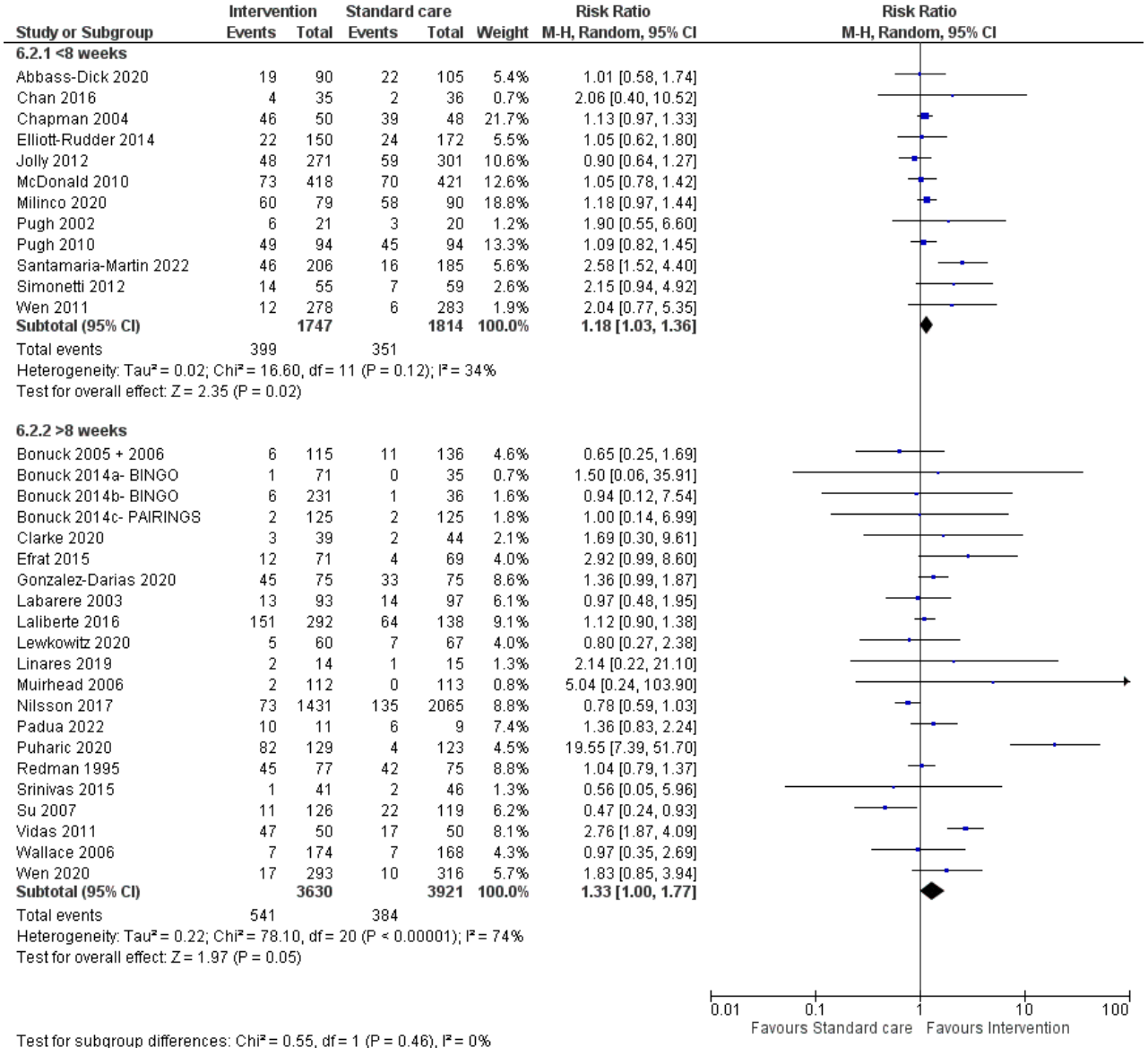
1.1.4 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth-: duration of contact (population: mothers and co-parents) (single births).

Figure 12: Proportion of women breastfeeding at 6-12 weeks- Exclusive



CI: confidence interval

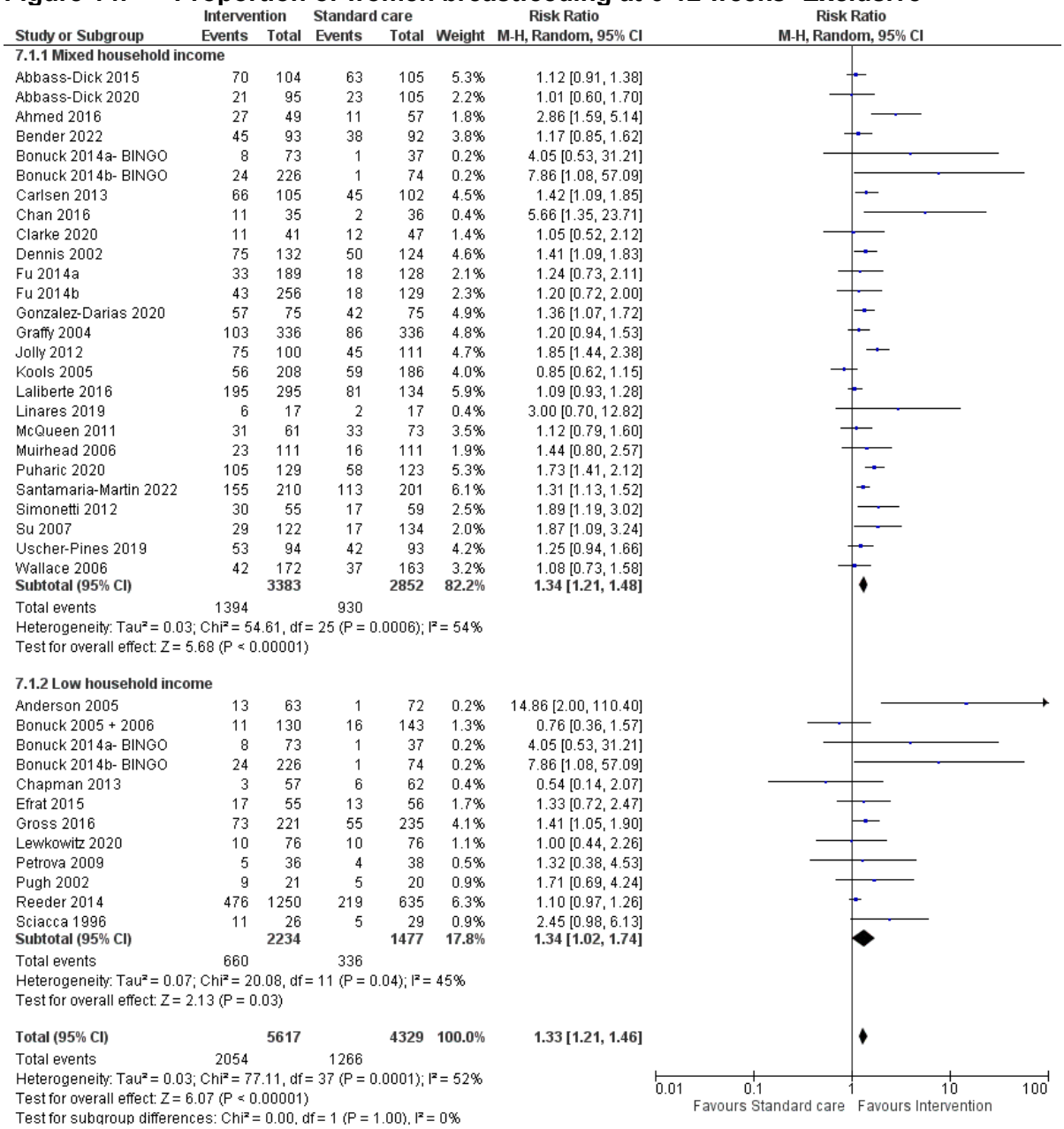
Figure 13: Proportion of women breastfeeding at 16-26 weeks- Exclusive



CI: confidence interval

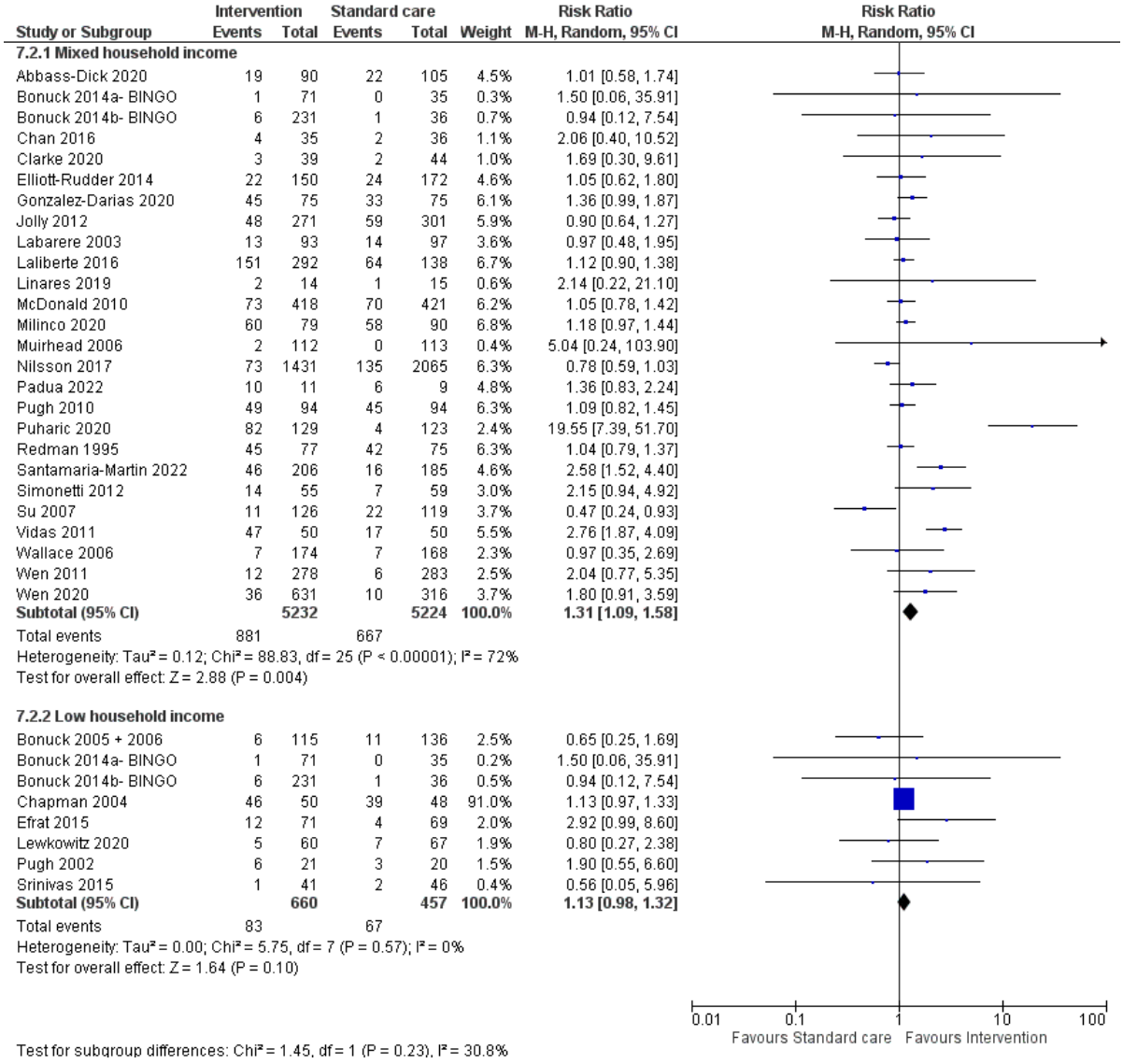
1.1.5 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: women defined as low-income (population: mothers and co-parents) (single births)

Figure 14: Proportion of women breastfeeding at 6-12 weeks- Exclusive



CI: confidence interval

Figure 15: Proportion of women breastfeeding at 16-26 weeks- Exclusive



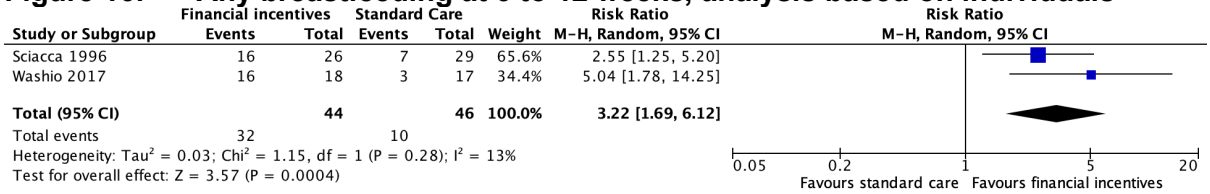
CI: confidence interval

Comparison 1.2 Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: fathers only) (single births)

No forest plots as only one study contributed to the analysis.

Comparison 2: Financial incentives

Figure 16: Any breastfeeding at 6 to 12 weeks, analysis based on individuals



CI: confidence interval

Appendix F GRADE tables

GRADE tables for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Comparison 1.1 Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Table 6: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care	Relative (95% CI)	Absolute		
Proportion of women breast feeding at 6-12 weeks- ANY												
47[1]	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	4925/8243 (59.7%)	3428/6226 (55.1%)	RR 1.09 (1.06 to 1.12)	50 more per 1000 (from 33 more to 66 more)	LOW	CRITICAL
Proportion of women breastfeeding 6-12 weeks- EXCLUSIVE												
37[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	2042/5443 (37.5%)	1272/4347 (29.3%)	RR 1.33 (1.21 to 1.46)	97 more per 1000 (from 61 more to 135 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- ANY												
47[1]	randomised trials	serious[4]	no serious inconsistency	no serious indirectness	no serious imprecision	none	4549/9375 (48.5%)	3185/7120 (44.7%)	RR 1.08 (1.04 to 1.11)	36 more per 1000 (from 18 more to 49 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE												
35[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	1011/6158 (16.4%)	760/5992 (12.7%)	pOR 1.38 (1.23 to 1.55)[5]	48 more per 1000 (from 29 more to 70 more)	VERY LOW	CRITICAL

CI: confidence interval; NR: not reported; pOR: peto odds ratio; RR: risk ratio
[1] See corresponding forest plot in appendix E for studies contributing to this outcome
[2] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[3] Serious heterogeneity. Subgroup analysis did not resolve heterogeneity (see tables 9 to 11)
[4] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[5] Peto odds ratio used as meta-analysis included low and zero events

Comparison 1.2 Education, advice or support versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: fathers only) (single births)

Table 7: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth (population: fathers) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks -ANY												
1 (Scott 2021)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	208/224 (92.9%)	202/215 (94%)	OR 0.96 (0.49 to 1.88)	2 fewer per 1000 (from 56 fewer to 27 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 6-12 weeks -ANY												
1 (Maycock 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	288/295 (97.6%)	224/298 (75.2%)	RR 1.30 (1.21 to 1.39)	226 more per 1000 (from 158 more to 293 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 6-12 weeks -EXCLUSIVE												
1 (Scott 2021)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	157/224 (70.1%)	153/215 (71.2%)	OR 0.92 (0.53 to 1.6)	17 fewer per 1000 (from 145 fewer to 86 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 6-12 weeks -EXCLUSIVE												
1 (Maycock 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	164/295 (55.6%)	133/298 (44.6%)	RR 1.25 (1.06 to 1.47)	112 more per 1000 (from 27 more to 210 more)	LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- ANY												
1 (Scott 2021)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	144/184 (78.3%)	147/184 (79.9%)	OR 0.90 (0.59 to 1.37)	17 fewer per 1000 (from 98 fewer to 46 more)	LOW	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 16-26 weeks- ANY												
1 (Pisacane 2005)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	31/59 (52.5%)	26/59 (44.1%)	RR 1.19 (0.82 to 1.74)	84 more per 1000 (from 79 fewer to 326 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE												
1 (Scott 2021)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	7/184 (3.8%)	9/184 (4.9%)	OR 0.72 (0.32 to 1.62)	13 fewer per 1000 (from 33 fewer to 28 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE												
1 (Pisacane 2005)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	35/140 (25%)	21/140 (15%)	RR 1.67 (1.02 to 2.71)	100 more per 1000 (from 3 more to 257 more)	VERY LOW	CRITICAL

CI: confidence interval; OR: odds ratio; RR: risk ratio
[1] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[2] Serious imprecision. Event rates 150-300 events
[3] Very serious imprecision. Event rates <150 events

The following GRADE tables are sub-group analyses (Table 9 to Table 13) for components of interventions (how the intervention was delivered, where the intervention was delivered, number of contacts, duration of contacts, and women defined as 'low income'). Subgroup analyses was only conducted when there was heterogeneity in the evidence.

1.1.1 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth : how the intervention was delivered (population: mothers and co-parents) (single births)

Table 8: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: how intervention delivered (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- how intervention delivered)	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Individual												
20[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	858/2636 (32.5%)	546/2271 (24%)	RR 1.36 (1.15 to 1.6)	87 more per 1000 (from 36 more to 144 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Group												
2[1]	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	serious[4]	none	166/236 (70.3%)	118/230 (51.3%)	RR 1.52 (0.90 to 2.59)	267 more per 1000 (from 51 fewer to 816 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Telephone												
13[1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	970/2427 (40%)	574/1684 (34.1%)	RR 1.25 (1.14 to 1.38)	85 more per 1000 (from 48 more to 130 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Self-help												
2[1]	randomised trials	serious[5]	very serious[6]	no serious indirectness	very serious[7]	none	48/144 (33.3%)	34/162 (21%)	RR 1.68 (0.61 to 4.66)	143 more per 1000 (from 82 fewer to 768 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Individual												
22[1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	656/4233 (15.5%)	615/4562 (13.5%)	RR 1.06 (0.97 to 1.16)	8 more per 1000 (from 4 fewer to 22 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Group												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- how intervention delivered)	Relative (95% CI)	Absolute		
3[1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[7]	none	95/368 (25.8%)	33/348 (9.5%)	RR 2.72 (1.98 to 3.72)	163 more per 1000 (from 93 more to 258 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Telephone												
5[1]	randomised trials	serious[5]	very serious[6]	no serious indirectness	serious[4]	none	148/333 (44.4%)	48/337 (14.2%)	RR 2.93 (0.81 to 10.51)	275 more per 1000 (from 27 fewer to 1000 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Self-help												
3[1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[7]	none	41/443 (9.3%)	39/488 (8%)	RR 1.16 (0.76 to 1.78)	13 more per 1000 (from 19 fewer to 62 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
[1] See corresponding forest plot in appendix E for studies contributing to this outcome
[2] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[3] Serious heterogeneity unexplained by subgroup analysis
[4] Serious imprecision. Event rates 150-300 events
[5] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[6] Very serious heterogeneity unexplained by subgroup analysis
[7] Very serious imprecision. Event rates <150 events

1.1.2 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: where the intervention was delivered (population: mothers and co-parents) (single births)

Table 9: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: where intervention delivered

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- where intervention delivered)	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Healthcare setting												
8[1]	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	391/1118 (35%)	223/923 (24.2%)	RR 1.25 (1.04 to 1.49)	60 more per 1000 (from 10 more to 118 more)	LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Home												
18[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	1393/3356 (41.5%)	868/2598 (33.4%)	RR 1.35 (1.21 to 1.52)	117 more per 1000 (from 70 more to 174 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Both (healthcare and home)												
11[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	258/969 (26.6%)	181/826 (21.9%)	RR 1.49 (1.09 to 2.04)	107 more per 1000 (from 20 more to 228 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Healthcare setting												
9[1]	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	276/1301 (21.2%)	253/1352 (18.7%)	RR 1.16 (0.99 to 1.36)	30 more per 1000 (from 2 fewer to 67 more)	LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE – Home												
14[1]	randomised trials	serious[4]	very serious[5]	no serious indirectness	no serious imprecision	none	501/1761 (28.4%)	261/1613 (16.2%)	RR 1.48 (1.08 to 2.03)	78 more per 1000 (from 13 more to 167 more)	VERY LOW	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Education, advice or support**	**Standard care (subgroup analyses for heterogeneity- where intervention delivered)**	**Relative (95% CI)**	**Absolute**		
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE – Both (Healthcare and home)												
10[1]	randomised trials	serious[4]	no serious inconsistency	no serious indirectness	no serious imprecision	none	163/2315 (7%)	221/2770 (8%)	RR 0.92 (0.77 to 1.1)	6 fewer per 1000 (from 18 fewer to 8 more)	MODERATE	CRITICAL

CI: confidence interval; RR: risk ratio
[1] See corresponding forest plot in appendix E for studies contributing to this outcome
[2] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[3] Serious heterogeneity unexplained by subgroup analysis
[4] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[5] Very serious heterogeneity unexplained by subgroup analysis

1.1.3 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: number of contacts (population: mothers and co-parents) (single births).

Table 10: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: number of contacts

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- number of contacts)	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - 1 contact												
1 (Wallace 2006)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	42/172 (24.4%)	37/163 (22.7%)	RR 1.08 (0.73 to 1.58)	18 more per 1000 (from 61 fewer to 132 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - 2-3 contacts												
8[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	463/1282 (36.1%)	300/1065 (28.2%)	RR 1.16 (0.97 to 1.39)	45 more per 1000 (from 8 fewer to 110 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - 4-8 contacts												
13[3]	randomised trials	serious[1]	serious[4]	no serious indirectness	no serious imprecision	none	1098/2807 (39.1%)	611/1887 (32.4%)	RR 1.43 (1.22 to 1.68)	139 more per 1000 (from 71 more to 220 more)	LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - 9+contacts												
15[3]	randomised trials	very serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	439/1182 (37.1%)	324/1232 (26.3%)	RR 1.37 (1.19 to 1.58)	97 more per 1000 (from 50 more to 153 more)	LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - 1 contact												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- number of contacts)	Relative (95% CI)	Absolute		
3[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	42/417 (10.1%)	45/437 (10.3%)	RR 1.01 (0.68 to 1.5)	1 more per 1000 (from 33 fewer to 51 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - 2-3 contacts												
5[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	271/609 (44.5%)	188/458 (41%)	RR 1.06 (0.87 to 1.29)	25 more per 1000 (from 53 fewer to 119 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE – 4-8 contacts												
15[3]	randomised trials	very serious[5]	very serious[6]	no serious indirectness	no serious imprecision	none	412/3330 (12.4%)	314/3786 (8.3%)	RR 1.66 (1.16 to 2.37)	55 more per 1000 (from 13 more to 114 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE – 9+ contacts												
10[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	215/1021 (21.1%)	188/1054 (17.8%)	RR 1.17 (1 to 1.37)	30 more per 1000 (from 0 more to 66 more)	MODERATE	CRITICAL

CI: confidence interval; RR: risk ratio
[1] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[2] Very serious imprecision. Event rates <150 events
[3] See corresponding forest plot in appendix E for studies contributing to this outcome
[4] Serious heterogeneity unexplained by subgroup analysis
[5] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[6] Very serious heterogeneity unexplained by subgroup analysis

1.1.4 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: duration of contact (population: mothers and co-parents) (single births).

Table 11: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: duration of contact

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity- duration of contact)	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - <8 weeks												
18[1]	randomised trials	serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	984/2479 (39.7%)	666/2159 (30.8%)	RR 1.30 (1.14 to 1.49)	93 more per 1000 (from 43 more to 151 more)	LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - >8 weeks												
19[1]	randomised trials	very serious[4]	no serious inconsistency	no serious indirectness	no serious imprecision	none	1058/2964 (35.7%)	606/2188 (27.7%)	RR 1.38 (1.21 to 1.56)	105 more per 1000 (from 58 more to 155 more)	LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - <8 weeks												
12[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	399/1747 (22.8%)	351/1814 (19.3%)	RR 1.18 (1.03 to 1.36)	35 more per 1000 (from 6 more to 70 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - >8 weeks												
21[1]	randomised trials	very serious[4]	serious[3]	no serious indirectness	no serious imprecision	none	541/3630 (14.9%)	384/3921 (9.8%)	RR 1.33 (1 to 1.77)	32 more per 1000 (from 0 more to 75 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio

[1] See corresponding forest plot in appendix E for studies contributing to this outcome

[2] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2

[3] Serious heterogeneity unexplained by subgroup analysis

[4] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2

1.1.5 Education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: women defined as low-income (population: mothers and co-parents) (single births),

Table 12: Evidence profile for comparison between education, advice or support and standard care for maintaining breastfeeding beyond 8 weeks after birth: low income population

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Education, advice or support	Standard care (subgroup analyses for heterogeneity-low income population)	Relative (95% CI)	Absolute		
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Mixed household income												
26[1]	randomised trials	very serious[2]	serious[3]	no serious indirectness	no serious imprecision	none	1394/3383 (41.2%)	930/2852 (32.6%)	RR 1.34 (1.21 to 1.48)	111 more per 1000 (from 68 more to 157 more)	VERY LOW	CRITICAL
Proportion of women breastfeeding at 6-12 weeks- EXCLUSIVE - Low household income												
12[1]	randomised trials	serious[4]	no serious inconsistency	no serious indirectness	no serious imprecision	none	660/2234 (29.5%)	336/1477 (22.7%)	RR 1.34 (1.02 to 1.74)	77 more per 1000 (from 5 more to 168 more)	MODERATE	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Mixed household income												
26[1]	randomised trials	serious[4]	serious[3]	no serious indirectness	no serious imprecision	none	881/5232 (16.8%)	667/5224 (12.8%)	RR 1.31 (1.09 to 1.58)	40 more per 1000 (from 11 more to 74 more)	LOW	CRITICAL
Proportion of women breastfeeding at 16-26 weeks- EXCLUSIVE - Low household income												
8[1]	randomised trials	serious[4]	no serious inconsistency	no serious indirectness	serious[5]	none	83/660 (12.6%)	67/457 (14.7%)	RR 1.13 (0.98 to 1.32)	19 more per 1000 (from 3 fewer to 47 more)	LOW	CRITICAL

CI: confidence interval; RR: risk ratio

[1] See corresponding forest plot in appendix E for studies contributing to this outcome

[2] Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2

[3] Serious heterogeneity unexplained by subgroup analysis
[4] Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
[5] Serious imprecision. Event rates 150-300 events

Comparison 1. 3 Education, advice or support versus education, advice or support for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Table 13: Evidence profile for comparison between counselling session and booklet versus counselling session only for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Counselling session + booklet**	**Counselling session only**	**Relative (95% CI)**	**Absolute**		
Any breastfeeding 16 to 26 weeks												
1 (Curro 2007)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	61/103 (59.2%)	50/97 (51.5%)	RR 1.15 (0.89 to 1.48)	77 more per 1000 (from 57 fewer to 247 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
Note: study from NICE postnatal care guideline evidence review P
1 Serious risk of bias due to concerns with blinding, randomisation, selective reporting
2 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 events for dichotomous outcome
3 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses the line of no effect

Table 14: Evidence profile for comparison between video and keeping a log book versus video only for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Video + feeding log	Video	Relative (95% CI)	Absolute		
Any breastfeeding at 6 to 12 weeks												
1 (Pollard 2010)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	23/41 (56.1%)	18/43 (41.9%)	RR 1.34 (0.86 to 2.09)	142 more per 1000 (from 59 fewer to 456 more)	VERY LOW	CRITICAL
Any breastfeeding 16 to 26 weeks												
1 (Pollard 2010)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	15/41 (36.6%)	14/43 (32.6%)	RR 1.12 (0.62 to 2.03)	39 more per 1000 (from 124 fewer to 335 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
Note: study from NICE postnatal care guideline evidence review P
1 Serious risk of bias due to concerns with blinding, randomisation, selective reporting
2 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses the line of no effect
3 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 events for dichotomous outcome

Table 15: Evidence profile for comparison between home visit versus telephone call for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Home visit	Telephone call	Relative (95% CI)	Absolute		
Any breastfeeding 16 to 26 weeks												
1 (Steel O'Connor 2003)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	146/248 (58.9%)	149/262 (56.9%)	RR 1.04 (0.89 to 1.2)	23 more per 1000 (from 63 fewer to 114 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio

Note: study from NICE postnatal care guideline evidence review P
1 Serious risk of bias due to concerns with blinding and selective reporting
2 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 events for dichotomous outcome
3 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses the line of no effect

Table 16: Evidence profile for comparison between regular home visits versus printed educational materials for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Regular home visits	Printed educational materials	Relative (95% CI)	Absolute		
Any breastfeeding 6 to 12 weeks												
1 (Lutenbacher 2018)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	61/90 (67.8%)	60/85 (70.6%)	RR 0.96 (0.79 to 1.17)	28 fewer per 1000 (from 148 fewer to 120 more)	VERY LOW	CRITICAL
Exclusive breastfeeding 6 to 12 weeks												
1 (Lutenbacher 2018)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	2/90 (2.2%)	1/86 (1.2%)	RR 1.91 (0.18 to 20.69)	11 more per 1000 (from 10 fewer to 229 more)	VERY LOW	CRITICAL
Any breastfeeding 16 to 26 weeks												
1 (Lutenbacher 2018)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	45/90 (50%)	42/85 (49.4%)	RR 1.01 (0.75 to 1.36)	5 more per 1000 (from 124 fewer to 178 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
Note: study from NICE postnatal care guideline evidence review P
1 Serious risk of bias due to concerns with blinding, randomisation and selective reporting
2 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses the line of no effect
3 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 events for dichotomous outcome

Table 17: Evidence profile for comparison between proactive phone calls versus reactive phone calls for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Proactive phone calls	Reactive phone calls	Relative (95% CI)	Absolute		
Any breastfeeding at 6 to 12 weeks												
1 (Hoddinott 2012)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	22/32 (68.8%)	17/32 (53.1%)	RR 1.29 (0.87 to 1.93)	154 more per 1000 (from 69 fewer to 494 more)	VERY LOW	CRITICAL
Exclusive breastfeeding 6 to 12 weeks												
1 (Hoddinott 2012)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2,3]	none	17/32 (53.1%)	8/26 (30.8%)	RR 1.73 (0.89 to 3.35)	225 more per 1000 (from 34 fewer to 723 more)	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
Note: study from NICE postnatal care guideline evidence review P
1 Serious risk of bias due to concerns with blinding, missing data and selective reporting
2 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses one calculated MID (calculated from SD of control arm)
3 Evidence downgraded by 2 levels due to risk of very serious imprecision as confidence interval crosses two calculated MID (calculated from SD of control arm)

Comparison 2: Financial incentives versus standard care for maintaining breastfeeding beyond 8 weeks after birth (population: mothers and co-parents) (single births)

Table 18: Clinical evidence profile for financial incentives versus standard care

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Financial incentives for breastfeeding behaviour	Standard care	Relative (95% CI)	Absolute		
Any breastfeeding 6-12 weeks												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Financial incentives for breastfeeding behaviour**	**Standard care**	**Relative (95% CI)**	**Absolute**		
2[1]	randomised trials	very serious[2]	no serious inconsistency	serious[3]	serious[4]	none	32/44 (72.7%)	10/46 (21.7%)	RR 3.22 (1.69 to 6.12)	483 more per 1000 (from 150 more to 1000 more)	VERY LOW	CRITICAL
Any breastfeeding 6-12 weeks, areas (better indicated by higher values)												
1 (Relton 2018)	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	46 areas (4973 people)	46 areas (4234 people)	-	MD 4.5 higher (1.5 to 7.5 higher)[9]	MODERATE	CRITICAL
Exclusive breastfeeding 6-12 weeks												
1 (Sciacca 1995)	randomised trials	very serious[6]	no serious inconsistency	serious[3]	very serious[7]	none	11/26 (42.3%)	5/29 (17.2%)	RR 2.45 (0.98 to 6.13)	250 more per 1000 (from 3 fewer to 884 more)	VERY LOW	CRITICAL
Exclusive breastfeeding 6-12 weeks, areas (better indicated by higher values)												
1 (Relton 2018)	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[8]	none	46 areas (4973 people)	46 areas (4234 people)	-	MD 2.3 higher (0.2 lower to 4.8 higher)[11]	LOW	CRITICAL
Any breastfeeding 16-26 weeks												
1 (Washio 2017)	randomised trials	very serious[6]	no serious inconsistency	no serious indirectness	serious[4]	none	13/18 (72.2%)	0/17 (0%)	RR 25.58 (1.64 to 399.35)	-	VERY LOW	CRITICAL

CI: confidence interval; RR: risk ratio
Note: study from NICE postnatal care guideline evidence review P
1 See forest plot for study details
2 Very serious risk of bias due to concerns with randomisation, blinding, missing data, outcome measurements and selective reporting
3 Evidence downgraded by 1 level due to serious risk of indirectness as concerns with Sciacca 1995, as the intervention group received an additional 2-hr antenatal breastfeeding class for expectant couples as well as financial incentives

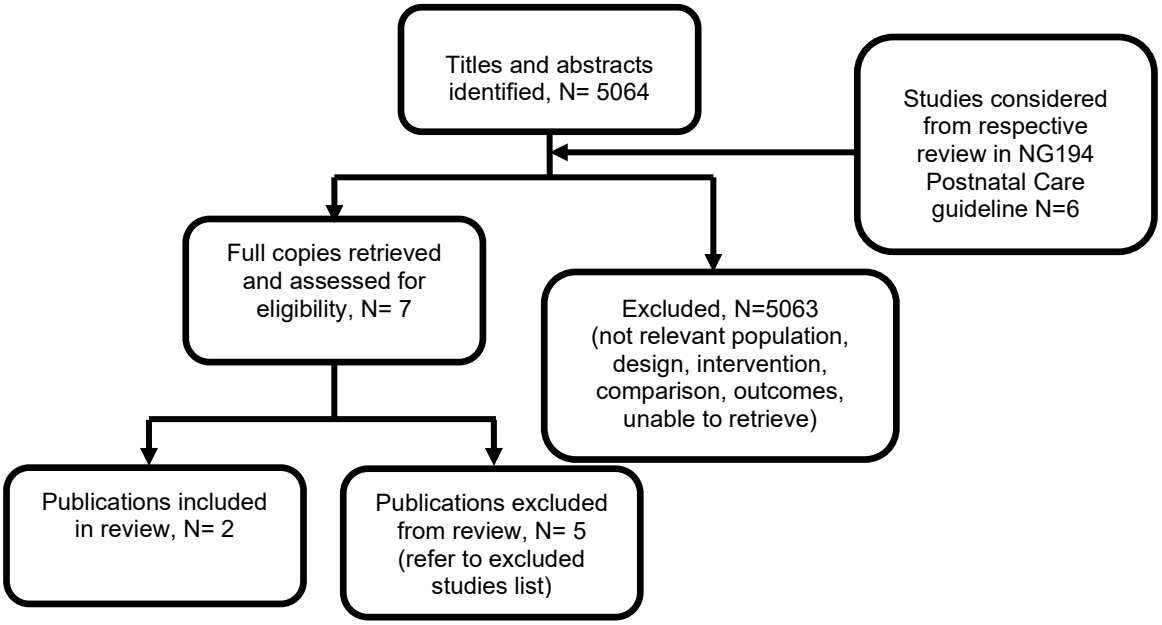
4 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 events for dichotomous outcome
5 Evidence downgraded by 1 level due to risk of serious imprecision as confidence interval crosses the line of no effect
6 Very serious risk of bias due to concerns with blinding, missing data, outcome measurements and selective reporting
7 Evidence downgraded by 1 level due to risk of serious imprecision as total events is below 300 for dichotomous outcome and downgraded by 1 level due to risk of serious imprecision as the confidence interval crosses the line of no effect
8 Calculated by study authors after weighting and adjusting for local government areas and baseline 6- to 8 week breastfeeding prevalence (as a proxy for the unknown baseline breastfeeding initiation prevalence)

Appendix G Economic evidence study selection

Study selection for: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Figure 17 shows the flow diagram of the selection process for economic evaluations of approaches and interventions that are effective in maintaining breastfeeding beyond 8 weeks after birth.

Figure 17: Study selection flow chart



Appendix H Economic evidence tables

Economic evidence tables for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Table 19: Economic evidence tables for interventions that are effective in maintaining breastfeeding beyond 8 weeks after birth

Study Country Study type	Intervention details	Study population Study design Data sources	Costs and outcomes: description and values	Results: Cost-effectiveness	Comments
Frick 2012 US Cost-effectiveness analysis	Interventions: Intervention aiming at maintaining breastfeeding, which included postpartum hospital visits by a breastfeeding support team, home visits, telephone support and 24 hour pager access Treatment as usual (TAU), comprising access to an inpatient visit by a lactation consultant (LC) for breastfeeding mothers, a hospital-based LC available via a telephone "warm-line" (an answering machine checked at least every 24 hours) post-discharge, and access to a post-discharge office visit with the LC upon request.	Low-income mothers of full-term infants (eligible for the Special Supplemental Nutrition Program for Women, Infants, and Children) RCT (Pugh 2010) (N=328; completers at 24 weeks postpartum=243) Source of efficacy and resource use data: RCT Source of unit costs: national sources	Costs: intervention (staff time and travel/mileage) Mean intervention cost: $296.45 (range $274.12 to $320.97) Primary outcome measure: proportion of breastfeeding at 12 and 24 weeks postpartum. Proportion of breastfeeding: 12 weeks postpartum Intervention 0.49; TAU 0.41 p=0.07 24 weeks postpartum Intervention 0.29; TAU 0.28; p=0.46	ICER per additional woman breastfeeding: $3,369 at 12 weeks postpartum $26,950 at 24 weeks postpartum	Perspective: healthcare (intervention cost only, relating to staff time and travel) Currency: US$ Cost year: 2009 Time horizon: 24 weeks Discounting: NA Applicability: partially applicable Quality: potentially serious limitations

Study Country Study type	Intervention details	Study population Study design Data sources	Costs and outcomes: description and values	Results: Cost-effectiveness	Comments
Mavranezouli 2022 (NG194 Postnatal Care economic analysis) UK Cost-utility analysis	Interventions: Education, advice or support from a peer or professional, that was provided postnatally and was initiated either antenatally or within the first eight weeks after birth, aiming at promoting initiation and maintenance of breastfeeding Treatment as usual (TAU)	Women who are pregnant or gave birth to healthy babies at term, and their babies Decision-analytic economic modelling Source of efficacy data: systematic review and meta-regression Source of outcomes of breastfeeding: published systematic reviews and meta-analyses, but primary studies were prone to bias, as some studies adjusted for known confounders but others did not, meaning that the magnitude of the clinical benefits of breastfeeding may have been overestimated Sources of epidemiological, utility and cost data: national sources and other published literature Source of unit costs: national sources	Costs: intervention (staff time, travel), costs associated with gastrointestinal or respiratory tract infections, acute otitis media, mortality due to infectious diseases or SIDS (babies), breast cancer (mothers) Incremental cost: £65 Primary outcome measure: QALY Clinical conditions assessed: In babies: • gastrointestinal infections • respiratory tract infections • acute otitis media • mortality due to infectious diseases • mortality due to SIDS In mothers • Breast cancer Incremental QALYs: 0.00125	ICER £51,946/QALY Intervention becomes cost-effective (ICER £20,000/QALY) if base-case RR rises from 1.19 to 1.35-1.40 and if intervention cost falls from £84 to £40-45.	Perspective: NHS & PSS Currency: GBP Cost year: 2018 Time horizon: from 1 year to lifetime, depending on clinical condition Discounting: 3.5% annually Applicability: directly applicable Quality: potentially serious limitations

ICER: incremental cost-effectiveness ratio; LC: lactation consultant; PSS: personal social services; QALY: quality-adjusted life year; RR: risk ratio; SIDS: sudden infant death syndrome; TAU: treatment as usual; WTP: willingness to pay

Appendix I Economic model

Economic model for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Introduction – objective of economic modelling

The assessment of the cost-effectiveness of interventions aiming at maintaining breastfeeding beyond 8 weeks after birth was identified by the committee as an area with potentially major resource implications. Existing economic evidence in this area is very limited and has not considered the long-term benefits to women and their babies and related cost-savings associated with breastfeeding. An economic analysis was therefore carried out to assess the long-term cost-effectiveness of an intervention for women, initiated antenatally or postnatally, that is effective in maintaining breastfeeding beyond 8 weeks after birth in the UK. To inform the economic analysis, we used the structure of the economic model that was developed to assess the cost-effectiveness of interventions aiming at initiating and/or maintaining breastfeeding, which informed the NICE NG194 guideline on Postnatal Care (NICE 2021), updating the clinical, epidemiological and cost data with more recent evidence, where available and appropriate.

Economic modelling methods

Population

The study population of the economic model comprised women and people who gave birth to healthy babies at term, and their babies. The age of women and people who gave birth at the start of the model was 31 years, as this is the mean age of the population who gives birth in England and Wales (Office for National Statistics 2023a). The starting age of the cohort was needed in order to model benefits associated with breastfeeding over lifetime. Each birth could result in one or more babies. In accordance with national epidemiological data, the mean number of babies per live birth was 1.014 (Office for National Statistics 2023b).

Intervention

The characteristics of the intervention assessed in the guideline economic analysis, in terms of effectiveness and resource use (number of sessions, format, people delivering the intervention, and so on), were determined by the findings of the guideline systematic review and meta-regression undertaken to inform the review question, supplemented by the committee's expert opinion.

The focus of the economic analysis was on an intervention that comprised education, advice or support from a peer or professional, that was provided postnatally and was initiated antenatally or postnatally. In accordance with available evidence, the intervention was assumed to be provided in addition to standard care; the comparator of the analysis was standard care alone. The definition of standard care varied widely across the RCTs included in the guideline systematic review and meta-regression that informed the economic analysis. Standard care in the RCTs ranged from no intervention, through written materials and peer breastfeeding support, to availability of breastfeeding educational programmes of variable intensity in-hospital or in the community. In the UK NHS, standard care may include provision of written material, antenatal breastfeeding educational programmes, and postnatal breastfeeding support groups run by peers and/or health professionals; in some settings breastfeeding information and support is provided by midwives and/or health visitors as part of routine postnatal care visits.

In order to identify effective components of an intervention promoting breastfeeding and specify the intervention for consideration in the economic analysis, effectiveness data on 'any breastfeeding between 16 and 26 weeks after birth', obtained from the guideline systematic review and meta-regression (described in appendix M), were inspected (Table 20). This outcome was amongst critical outcomes for this review, as determined by the committee. Data on 'any breastfeeding' were selected because most of the outcome data on the clinical conditions associated with breastfeeding that informed the economic model were relevant to 'any' rather than 'exclusive' breastfeeding, as it will be discussed later for individual clinical conditions modelled; moreover, the period between 16 and 26 weeks after birth was chosen to ensure that breastfeeding was established and therefore could have an impact on longer-term mother and baby outcomes, and over this period no data on exclusive breastfeeding were available. The components of the intervention considered for the economic analysis were specified by looking at the intervention characteristics that demonstrated a statistically significant effect (risk ratio, RR) versus standard care.

Table 20: Effectiveness of interventions aiming at maintaining breastfeeding beyond 8 weeks after birth – results of guideline meta-analysis and meta-regression for 'any breastfeeding 16 to 26 weeks after birth'

Comparisons	Risk Ratio: mean (95CI)
How	
Face-to-face individual intervention vs standard care	**1.08 (1.01 to 1.15)**
Face-to-face group intervention vs standard care	**1.64 (1.34 to 1.93)**
Remote vs standard care	**1.14 (1.04 to 1.25)**
Self-help vs standard care	1.03 (0.82 to 1.24)
Number of Contacts	
0 vs standard care	1.05 (0.65 to 1.49)
1 vs standard care	1.05 (0.90 to 1.19)
2-3 vs standard care	1.09 (0.95 to 1.23)
4-8 vs standard care	**1.20 (1.09 to 1.31)**
9 vs standard care	1.09 (0.97 to 1.23)
Duration of Intervention	
Fewer than 8 weeks vs standard care	1.07 (0.98 to 1.16)
More than 8 weeks vs standard care	**1.17 (1.08 to 1.27)**
Where delivered	
Home vs standard care	**1.15 (1.02 to 1.29)**
Healthcare setting vs standard care	**1.09 (1.01 to 1.18)**
Mixed home and healthcare setting vs standard care	**1.21 (1.04 to 1.38)**

Comparisons with statistically significant effects have been highlighted in bold.

From the above table, it can be seen that face-to-face interventions, delivered either individually or in group format, and also interventions delivered remotely appear to be effective compared with standard care. Face-to-face group interventions appear to have the highest effect. Regarding the number of contacts, only interventions comprising 4-8 contacts appear to have a significant effect. Interventions seem to be effective if they are delivered either at home or in a healthcare setting, or in a mixed setting; among them, the latter show the highest effect.

Effectiveness of the intervention

The economic analysis utilised the effect on any breastfeeding at 16-26 weeks after birth for "4-8 contacts vs standard care" [mean RR 1.20, 95% CI 1.09 to 1.31]. The same effect was utilised in the economic analysis that informed the NG194 Postnatal care. Regarding the mode of delivery of the intervention (as captured in the meta-regression), the value of this effect is between the value of the effect of individual face-to-face and that of the group face-to-face intervention versus standard care, and closer towards the value of the individual face-to-face intervention effect (see Table 20). It is also close to, although somewhat higher than, the value of the effect of the remote intervention versus standard care. It is also very similar to the value of the effect estimated for interventions delivered at mixed home and healthcare settings. These characteristics were considered when estimating the resource use associated with provision of the intervention (see next section) and in line with patterns of routine practice regarding postnatal care in the UK, i.e. an intervention that is offered in a mixed individual and group format, with a higher number of contacts being individual rather than group, delivered in a mixed home and healthcare setting.

In addition, a further analysis utilised the effect on any breastfeeding at 16-26 weeks after birth for "face-to-face group intervention vs standard care" [mean RR 1.64, 95% CI 1.34 to 1.93], which showed the highest effect in meta-regression. It is noted that in the respective meta-regression undertaken to inform the NG194 Postnatal care, face-to-face group intervention also showed the highest effect, however, this effect was based on very limited evidence identified for that guideline (NG194), and therefore group interventions were not considered in that guideline's economic analysis.

Sensitivity analysis explored the impact of changes in the mean effect (range of RR from 1.05 to 2.00 tested) on the cost-effectiveness of the intervention.

Intervention cost

The intervention cost of the mixed (individual and group) intervention was estimated assuming that the intervention consisted of 6 contacts, which is the average of 4-8 contacts corresponding to the effectiveness estimate used in the economic analysis. Based on information from the NG194 regarding patterns of routine practice regarding postnatal care in the UK, four contacts comprised individual face-to-face sessions lasting 30 minutes each, and two contacts comprised group face-to-face sessions delivered to groups of 6 people, lasting 45 minutes each.

The first two individual sessions were assumed to be provided by a health professional in NHS England Agenda for Change (AfC) Band 5. The mean annual unit cost per patient-related hour for nursing, midwifery and health visiting staff at AfC Band 5, NHS England was estimated at £68, including salary, salary on-costs and overheads, having taken into account actual working time and the ratio of direct time (that is, time on direct care) to indirect time (that is, time on care planning, assessment and co-ordination, travelling, administrative tasks and other duties) (Jones et al., 2023). Health professionals' travel expenses relating to home visits are small compared with their unit cost per hour and were not included in the total intervention cost estimate as relevant data are not available. Indirect time for travel was considered when estimating the unit cost per patient-related hour.

The remaining two individual and two group sessions were assumed to be provided by a volunteer trained peer supporter. The unit cost per patient-related hour was assumed to be £22, based on expert advice from the NG194 committee, including the costs of training, supervision, co-ordination and travel. This cost can be higher if it includes additional costs, for example childcare.

The total estimated intervention cost using the above assumptions was £95. Details on the estimation of the intervention cost are provided in Table 21.

Table 21. Cost of a mixed (combined individual and group) intervention for maintaining breastfeeding beyond 8 weeks after birth

Cost element	Unit cost	Cost per person
2 individual face-to-face sessions lasting 30 minutes each (total 60 minutes), provided by a health professional in NHS England Agenda for Change (AfC) Band 5 (nursing, midwifery and health visiting staff).	£68 per patient-related hour[1]	**£68**
2 individual face-to-face sessions lasting 30 minutes each (total 60 minutes), delivered by a volunteer trained peer supporter	£22 per patient-related hour[2]	**£22**
2 group face-to-face sessions delivered to groups of 6 people, lasting 45 minutes each (total 90 minutes / 6 people = 15 minutes per person), delivered by a volunteer trained peer supporter	£22 per patient-related hour[2]	**£5**
TOTAL COST PER PERSON		**£95**

1 Jones et al., 2023. Unit cost includes salary, salary on-costs and overheads; actual working time and the ratio of direct time (direct care) to indirect time (care planning, assessment and co-ordination, travelling, administrative tasks and other duties) taken into account. Travel expenses not included.
2 Expert advice (NG194 committee). Unit cost includes training, supervision, co-ordination and travel.

The intervention cost of the group intervention was estimated assuming that the intervention consisted of 6 group sessions, each lasting 45 minutes and delivered to groups of 6 people. The first two sessions were assumed to be provided by a health professional in NHS England Agenda for Change (AfC) Band 5, while the remaining 4 group sessions were assumed to be provided by a volunteer trained peer supporter. The total estimated intervention cost using the above assumptions was £28. Details on the estimation of the intervention cost are provided in Table 22.

Table 22. Cost of a group intervention for maintaining breastfeeding beyond 8 weeks after birth

Cost element	Unit cost	Cost per person
2 group face-to-face sessions lasting 45 minutes each (total 90 minutes), provided by a health professional in NHS England Agenda for Change (AfC) Band 5 (nursing, midwifery and health visiting staff).	£68 per patient-related hour[1]	**£17**
4 group face-to-face sessions delivered to groups of 6 people, lasting 45 minutes each (total 180 minutes / 6 people = 30 minutes per person), delivered by a volunteer trained peer supporter	£22 per patient-related hour[2]	**£11**
TOTAL COST PER PERSON		**£28**

1 Jones et al., 2023. Unit cost includes salary, salary on-costs and overheads; actual working time and the ratio of direct time (direct care) to indirect time (care planning, assessment and co-ordination, travelling, administrative tasks and other duties) taken into account. Travel expenses not included.
2 Expert advice (NG194 committee). Unit cost includes training, supervision, co-ordination and travel.

The intervention was assumed to be offered in addition to standard care, and therefore the description and cost of standard care was omitted from both arms of the model. If the intervention is expected to be provided as an alternative (and not in addition) to standard care, then its net cost is lower than the estimate used in the model.

Sensitivity analysis explored the impact of changes in the intervention cost (range in cost from £20 to £100 tested) on the cost-effectiveness of the intervention.

Overview of costs and outcomes considered in the analysis

The economic analysis adopted the perspective of the NHS and personal social services (PSS), as recommended by NICE (NICE 2014). Costs consisted of the intervention cost (healthcare professional time) and costs associated with breastfeeding outcomes that are incurred in community, primary or secondary health care or personal social service settings. Costs to parents relating to formula feeding (milk powder, bottles, sterilising equipment) were not considered. The cost year was 2022.

The primary measure of outcome was the QALY. Other secondary measures of outcome were determined by the clinical conditions considered in the economic analysis and are described later, for each clinical condition.

Selection of clinical conditions for mothers and people who gave birth and their babies associated with breastfeeding for consideration in the economic model

An important objective of the economic analysis was to estimate the clinical benefits to mothers and people who gave birth and their babies resulting from increased rates of breastfeeding following provision of the intervention. The guideline systematic review of the clinical effectiveness of interventions for maintaining breastfeeding beyond 8 weeks after birth captured only the increase in breastfeeding rates, following provision of the intervention, as a measure of outcome; the RCTs included in the review did not report longer-term clinical outcomes to mothers and people who gave birth and their babies associated with such an increase. The evaluation and quantification of the clinical benefits of breastfeeding was beyond the scope of this guideline. This part of the economic analysis (selection of clinical conditions and quantification of effects associated with breastfeeding) was adopted from the respective economic model developed to inform NG194 (see Evidence review P, Appendix J for the approach used to identify and select clinical conditions for incorporation in the economic model). That model was heavily influenced by a previous economic model developed for Unicef UK (Renfrew et al., 2012) and a large review of reviews on the association of breastfeeding with a range of clinical outcomes (Victora et al., 2016). The clinical conditions associated with breastfeeding that were considered in the guideline economic analysis are summarised in Table 23.

Table 23. Clinical conditions considered in the guideline economic analysis of cost-effectiveness of interventions for maintaining breastfeeding beyond 8 weeks after birth.

Clinical conditions in babies	Clinical conditions in mothers and people who gave birth
• Gastrointestinal infection • Respiratory tract infection • Acute otitis media • Mortality due to infectious diseases • Mortality due to sudden infant death syndrome (SIDS)	Breast cancer

Model structure

The economic analysis adopted the structure of the decision-analytic model developed to inform NG194, constructed using Microsoft Office Excel 2013. The model estimated the total costs and benefits to mothers and people who gave birth and their babies associated with the provision of a breastfeeding intervention.

According to the model structure, hypothetical cohorts of women and people who gave birth to healthy babies at term were either initiated on a breastfeeding intervention in addition to standard care, or received standard care only. Following care received, women and people who gave birth either breastfed or they did not breastfeed their babies at 16-26 weeks after birth. Women and people who gave birth and their babies were subsequently followed for a period of time that ranged from one year after birth to lifetime, depending on the clinical condition assessed, to estimate their outcomes and associated costs resulting from the breastfeeding status at 16-26 weeks after birth. The clinical conditions assessed are those listed in Table 23.

The first part of the guideline economic model, which assessed the impact of the breastfeeding intervention on breastfeeding rates at 16-26 weeks after birth, took the form of a decision-tree. This part of the model, which was informed by the results of the guideline systematic review and meta-regression, was followed by separate models on each of the clinical conditions considered for mothers and people who gave birth and their babies, which took the form of either a decision-tree or a Markov model, as appropriate for the condition examined.

The models on gastrointestinal infection, respiratory tract infection and acute otitis media in babies took the form of a simple decision tree, where babies either developed one of the infections or not. Those who developed an infection were treated by GPs, with a sub-group of those developing gastrointestinal infection and respiratory tract infection being hospitalised for further treatment. The time horizon of those models was one year.

One model was developed for mortality due to SIDS or infectious diseases in babies. Babies who did not die because of SIDS or infectious diseases over their first year of life entered a very simple, two-state Markov model, with a one-year cycle, that considered the states of ‘alive’ and ‘dead’ over the babies’ lifetimes.

One three-state Markov model was developed to assess costs and outcomes for women and people who gave birth at risk for breast cancer over their lifetime. The cohort entered the model at 31 years of age, which is the mean age of women who give birth in England and Wales. The model considered the states of ‘no breast cancer’, ‘breast cancer’ and death; the model cycle was one year and a half-cycle correction was applied. Breast cancer in those who survived was assumed to result in breast cancer-related disutility and healthcare costs over 10 years, after which people who survived re-entered the ‘no breast cancer’ state and were at risk of developing a new breast cancer. The state of ‘breast cancer’ consisted of 10 tunnel states, one for each year of breast cancer, so that the time people spent with breast cancer could be estimated and a breast cancer’s duration-dependent mortality, as well as time-dependent costs and utilities associated with breast cancer, could be applied.

The overall structure of the economic model assessing the cost-effectiveness of an intervention for starting and maintaining breastfeeding is shown in Figure 18. Figure 19 shows the economic model component on breast cancer in mothers and people who gave birth.

Figure 18. Schematic structure of the economic model assessing the cost-effectiveness of an intervention aiming at maintaining breastfeeding beyond 8 weeks after birth

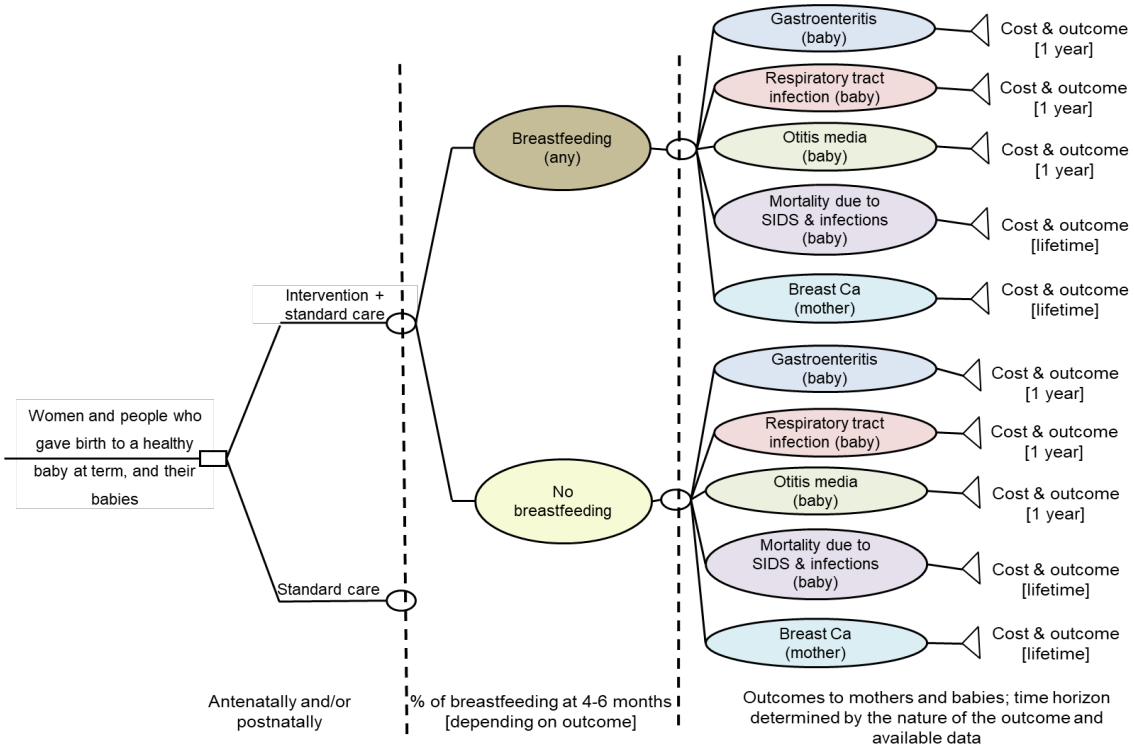
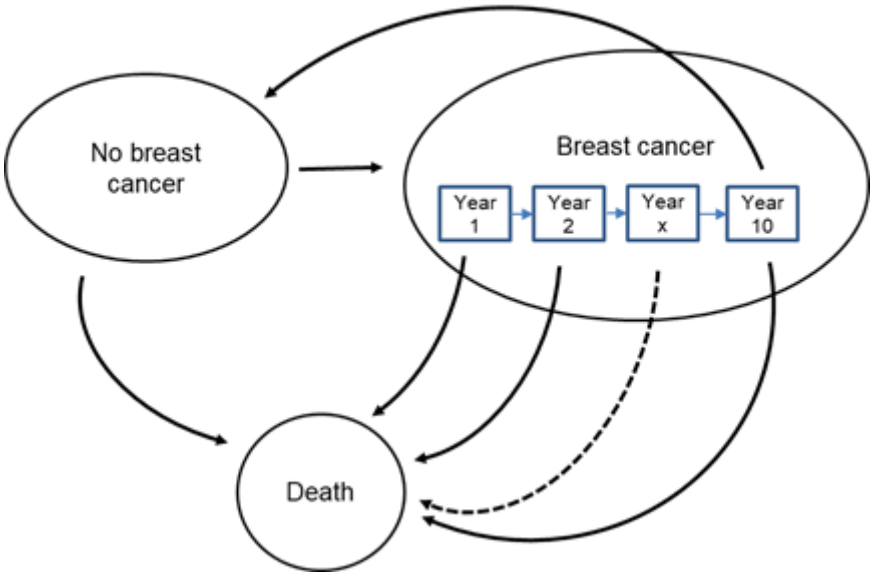


Figure 19. Schematic structure of the economic model component on breast cancer in mothers and people who gave birth



Clinical and cost data associated with each of the clinical conditions that were considered in the economic analysis and related outcomes measured

Values of all input data described below and details on their method of estimation are provided in Table 29.

Gastrointestinal infection in babies

Details of model structure, assumptions and clinical data utilised in the model

The model structure was the same with that developed by Renfrew et al. (2012). The analysis considered the protective effect of breastfeeding on the risk of gastrointestinal infection in babies up to their first year of age, with each infection assumed to correspond to one GP contact, as well as on the rate of hospitalisations in babies aged up to one year due to gastrointestinal infection.

According to the model, provision of a breastfeeding intervention is expected to increase breastfeeding rates; the protective effect of increased breastfeeding rates was subsequently applied onto the current (baseline) incidence of gastrointestinal infection and related numbers of hospitalisations in babies aged up to one year, to estimate the reduction in the incidence of gastrointestinal infection and in the related number of hospitalisations in babies aged 0-1 years following provision of the intervention. The model took into account the fact that the current (baseline) incidence of gastrointestinal infection and related hospitalisations reflect the current mix of babies who are breastfed and those who are not (that is, all healthy babies born at term under standard care).

Data on the protective effect of breastfeeding on i) the incidence of gastrointestinal infection (0.46, 95% CI 0.28 to 0.78) and ii) the risk of hospitalisation due to gastrointestinal infection in babies (0.28, 95% CI 0.16 to 0.50) in the form of a risk ratio (RR) were obtained from Victora et al. (2016) and were the same as those used in the NG194 model.

The baseline incidence of gastrointestinal infection in babies up to one year of age in England was assumed to equal the number of GP consultations on babies up to one year of age for clinical diagnoses of gastrointestinal infections and diarrhoea (0.031), estimated using data obtained from the Clinical Practice Research Datalink (2023). The baseline rate of hospital admissions due to gastrointestinal infection over the first year of life (0.012) was estimated using data on admissions for babies aged 0-1 years of age for infectious intestinal diseases (ICD10 A00-A09) in England (NHS Digital, 2023), divided by the population aged 0-1 years in England (Office for National Statistics, 2022b).

In order to estimate the incidence of gastrointestinal infection and hospitalisation due to gastrointestinal infection under current standard practice in babies aged up to 1 years that were breastfed (BF) and those that were not breastfed (nonBF) the following formulae were used (Bartick and Reinhold, 2010):

$$Incidence\ in\ nonBF = \frac{Overall\ incidence}{Current\ BF\ rate\ x\ RR + 1 - current\ BF\ rate}$$

and

$$Incidence\ in\ BF = Incidence\ in\ nonBF\ x\ RR$$

where ‘overall incidence’ is the incidence of the clinical condition (in this case gastrointestinal infection; and also hospitalisation due to gastrointestinal infection) in the overall population of babies aged up to 1 years old, and RR the risk ratio expressing the protective effect of breastfeeding on the clinical condition examined.

Resource use and cost data

The unit cost of a GP visit (£41) and the cost of a paediatric hospitalisation for gastrointestinal infection (£1,044) were obtained from national data (Jones et al., 2023; NHS Improvement, 2023).

Outcome measures

The outcomes measured in this model were the number of cases of gastrointestinal infection and the number of hospitalisations due to gastrointestinal infection in babies aged up to one year. These were secondary outcomes in the guideline economic analysis.

Respiratory tract infection in babies

Details of model structure, assumptions and clinical data utilised in the model

The model structure was the same with that developed by Renfrew et al. (2012). The analysis considered the protective effect of breastfeeding on the risk of lower RTI in babies up to their first year of age, with each infection assumed to correspond to one GP contact, as well as on the rate of hospitalisations in babies aged up to one year due to any (lower and upper, according to available evidence) RTI.

According to the model, provision of a breastfeeding intervention is expected to increase breastfeeding rates; the protective effect of increased breastfeeding rates was subsequently applied onto the current (baseline) incidence of lower RTI and the numbers of hospitalisations due to (any) RTI in babies aged up to one year to estimate the reduction in the incidence of lower RTI and in the number of hospitalisations due to RTI in babies aged 0-1 years following provision of the intervention. The model took into account the fact that the current (baseline) incidence of lower RTI and hospitalisations due to RTI reflect the current mix of babies who are breastfed and those who are not (that is, all healthy babies born at term under standard care).

Data on the protective effect of breastfeeding on i) the incidence of lower RTI (0.68, 95% CI 0.60 to 0.77) and ii) the risk of hospitalisation due to RTI in babies (0.43, 95% CI 0.33 to 0.55) in the form of a RR were obtained from Victora et al. (2016) and were the same as those used in NG194 model.

The baseline incidence of lower RTI in babies up to one year of age in England was assumed to equal the number of GP consultations on babies up to one year of age for the clinical diagnosis of pneumonia and other lower RTI (0.077), estimated using data obtained from the Clinical Practice Research Datalink (2023). The baseline rate of hospital admissions due to RTI over the first year of life (0.137) was estimated using data on admissions for babies aged 0-1 years of age for RTI (ICD10 J00-J22) in England (NHS Digital, 2023), divided by the population aged 0-1 years in England (Office for National Statistics, 2022b).

In order to estimate the incidence of lower RTI and hospitalisation due to RTI under current standard practice in babies aged up to 1 years that were breastfed and those that were not breastfed, the same formulae described earlier were used (Bartick and Reinhold 2010).

Resource use and cost data

The unit cost of a GP visit (£41) and the cost of a paediatric hospitalisation for RTI (£1,540) were obtained from national data (Jones et al., 2023; NHS Improvement, 2023).

Outcome measures

The outcomes measured in this model were the number of cases of lower RTI and the number of hospitalisations due to RTI in babies aged up to one year. These were secondary outcomes in the guideline economic analysis.

Acute otitis media in babies

Details of model structure, assumptions and clinical data utilised in the model

The model structure was the same with that developed by Renfrew et al. (2012). The analysis considered the protective effect of breastfeeding on the risk of acute otitis media in babies up to their first year of age, with each infection assumed to correspond to one GP contact.

According to the model, provision of a breastfeeding intervention is expected to increase breastfeeding rates; the protective effect of increased breastfeeding rates was subsequently applied onto the current (baseline) incidence of acute otitis media in babies aged up to one year to estimate the reduction in the incidence of acute otitis media in babies aged 0-1 years following provision of the intervention. The model took into account the fact that the current (baseline) incidence of acute otitis media reflects the current mix of babies who are breastfed and those who are not (that is, all healthy babies born at term under standard care).

Data on the protective effect of breastfeeding on the incidence of acute otitis media in babies (0.67, 95% CI 0.62 to 0.72) in the form of an odds ratio (OR) were obtained from Victora et al. (2016) and were the same as those used in NG194 model.

The baseline incidence of acute otitis media in babies up to one year of age in England was assumed to equal the number of GP consultations on babies up to one year of age for the clinical diagnosis of acute otitis media (0.008), estimated using data obtained from the Clinical Practice Research Datalink (2023).

In order to estimate the incidence of acute otitis media under current standard practice in babies aged up to 1 years that were breastfed and those that were not breastfed, the same formulae described earlier were used (Bartick and Reinhold, 2010). It is noted that these formulae utilise RR rather than OR. However, when the incidence of an event at baseline is rare (<10%), then OR approximates RR and the formulae can produce accurate results using OR instead of RR (Zhang and Yu, 1998).

Resource use and cost data

The unit cost of a GP visit (£41) was obtained from national data (Jones et al., 2023).

Outcome measure

The outcome measured in this model was the number of cases of acute otitis media in babies aged up to one year. This was a secondary outcome in the guideline economic analysis.

Mortality due to infectious diseases and sudden infant death syndrome (SIDS) in babies

Details of model structure, assumptions and clinical data

The economic analysis considered the protective effect of breastfeeding on mortality due to infectious diseases and SIDS in babies up to their first year of age, and modelled the reduced mortality and associated benefits in babies whose life was saved over their lifetime.

According to the model, provision of a breastfeeding intervention is expected to increase breastfeeding rates; the protective effect of increased breastfeeding rates was subsequently applied onto the current (baseline) incidence of mortality due to infectious diseases and SIDS in babies aged up to one year to estimate the reduction in mortality due to infectious

diseases and SIDS in babies aged 0-1 years following provision of the intervention. The model took into account the fact that the current (baseline) mortality due to infectious diseases and SIDS reflects the current mix of babies who are breastfed and those who are not (that is, all healthy babies under standard care).

Data on the protective effect of breastfeeding on mortality in babies in the form of ORs were obtained from Victora et al. (2016) for infectious diseases (0.48, 95% CI 0.38 to 0.60) and Renfrew et al. (2012) for SIDS (0.38, 95% CI 0.27 to 0.54). It is noted that these data came from studies from low and medium income countries, and therefore are not directly relevant to the UK context.

It needs to be noted that both outcomes (ORs) used in the guideline economic analysis reflected the difference in mortality between babies that have been breastfed and those that have never been breastfed. The difference in mortality between babies that were breastfed for longer versus shorter periods of time is likely to be lower, as a shorter duration of breastfeeding has also a protective effect on mortality due to infectious diseases and SIDS in babies. The effect (RR) of the breastfeeding intervention obtained from the guideline meta-analysis was applied onto the baseline rate of any breastfeeding at 4 months in order to estimate the increase in the number of babies that were breastfed at 4 months following provision of the intervention. However, babies in the economic model that were not breastfed at 4 months may have been breastfed until some earlier point and are not necessarily babies that were never breastfed, so they may have already received some protection on mortality due to infectious diseases and SIDS from a shorter duration of breastfeeding. Therefore, the guideline economic analysis has likely overestimated the benefits and cost-savings of the breastfeeding intervention to babies regarding the reduction in mortality due to infectious diseases and SIDS.

The baseline mortality due to infectious diseases (0.00007) and SIDS (0.00019) in babies aged 0-1 years was estimated by dividing the number of deaths due to infectious diseases and SIDS in babies aged 0-1 years with the number of live births, using infant mortality data in England and Wales (Office for National Statistics, 2023c).

In order to estimate the mortality due to infectious diseases and SIDS under current standard practice in babies aged up to 1 years that were breastfed and those that were not breastfed, the same formulae described earlier were used (Bartick and Reinhold, 2010). These formulae utilise RR rather than OR, however, because mortality due to infectious diseases and SIDS in babies aged 0-1 years is a rare event, OR approximates RR and the formulae can produce accurate results using OR instead of RR (Zhang and Yu, 1998).

Babies whose life was saved as a result of breastfeeding (that is, they did not die from infectious diseases or SIDS as a result of the protective effect of breastfeeding) were followed up over lifetime. Two types of data were needed in order to estimate their mortality in each cycle of the model:

- The proportion of males among babies whose life was saved. This was estimated using the number of males and females aged one year in England (Office for National Statistics, 2022b) due to lack of more relevant data (that is, data on the proportion of males versus females whose life was saved as a result of the protective effect of breastfeeding on mortality due to infectious diseases and SIDS).
- Age- and gender-specific overall mortality over lifetime (Office for National Statistics, 2021)

Resource use and cost data

The cost of death due to an infectious disease or SIDS per baby (£9,559) was estimated by summing up the NHS cost derived from NHS reference costs for code VB99Z 'Emergency medicine, patient dead on arrival' (NHS Improvement, 2023) and the cost of a paediatric coronial case and forensic service (Peres 2017). It is acknowledged that babies dying from an infectious disease are likely to have incurred further healthcare costs due to infection, however, some of these may have already been considered under other clinical conditions in babies associated with breastfeeding and were therefore not considered in this part of the model. In any case, the intention of this model component was to attach a cost specifically to death due to an infectious disease (or SIDS), rather than to consider the costs of the full pathway of infection that led to babies' death. On the other hand, there are considerable intangible emotional costs to parents following the death of a baby, which were not possible to include in the analysis.

Outcome measures and utility data

The outcomes measured in this model were the number of QALYs gained over saved babies' lifetime (primary outcome of the guideline economic analysis) and the number of deaths due to infectious diseases and SIDS in babies aged up to one year (secondary outcome).

To estimate total QALYs over lifetime, age- and gender-specific EQ-5D-derived utility values for the UK population were used (Kind 1999), shown in Table 24.

Table 24. Utility values of the general UK population - EQ-5D ratings (Kind et al., 1999)

Age (years)	Utility mean (SE)	
	Males	Females
Under 25	0.94 (0.01)	0.94 (0.01)
25 to 34	0.93 (0.01)	0.93 (0.01)
35 to 44	0.91 (0.01)	0.91 (0.01)
45 to 54	0.84 (0.02)	0.85 (0.01)
55 to 64	0.78 (0.02)	0.81 (0.02)
65 to 74	0.78 (0.02)	0.78 (0.02)
75+	0.75 (0.03)	0.71 (0.02)

Breast cancer in mothers and people who gave birth

Details of model structure, assumptions and clinical data

The economic analysis considered the protective effect of breastfeeding on the risk of breast cancer in women and people who gave birth over their lifetime. The age of the cohort at the start of the model was 31 years, as this is the mean age of women in England and Wales (Office for National Statistics, 2023a).

According to the model, provision of a breastfeeding intervention is expected to increase breastfeeding rates; the protective effect of increased breastfeeding rates was subsequently applied onto the current (baseline) incidence of breast cancer in parous women over lifetime to estimate the reduction in the incidence of breast cancer in this population following provision of the intervention. The model took into account the fact that the current (baseline) incidence of breast cancer in parous women reflects the current mix of parous women who have breastfed and those who have not (that is, all parous women that have received standard care in the postnatal period).

Data on the protective effect of breastfeeding on the incidence of breast cancer were obtained from a published meta-analysis (Unar-Munguía et al., 2017b) which pooled data from 25 studies on parous women and adjusted for several confounders such as age, parity, age at first pregnancy and family history of breast cancer. The standardised RR for breast cancer in parous women for any versus no breastfeeding for 6 months was used (0.86, 95% CI 0.82 to 0.91).

It is noted that the protective effect of breastfeeding on the incidence of breast cancer reported in Unar-Munguía et al. (2017b) reflects the difference in incidence between women that have breastfed over at least 6 months and those that have never breastfed. The difference in the incidence of breast cancer between women that have breastfed for longer versus shorter periods of time may be lower, as there seems to be a dose-response association between breastfeeding and breast cancer, so that a shorter duration of breastfeeding may also have a protective effect on breast cancer in women. The effect (RR) of the breastfeeding intervention obtained from the guideline meta-analysis was applied onto the baseline rate of any breastfeeding at 6 months in order to estimate the increase in the number of women that breastfed at 6 months following provision of the intervention. However, women in the economic model who did not breastfeed at 6 months may have done so until some earlier point and are not necessarily women who have never breastfed, so they may have already received some protection on breast cancer from a shorter duration of breastfeeding. Therefore, the guideline economic analysis has likely overestimated the benefits and cost-savings of the breastfeeding intervention to women regarding the reduction in the incidence of breast cancer.

The baseline incidence of breast cancer in parous women was estimated using the following data:

- The age-specific incidence of breast cancer in women in the general population, that is, a mixture of parous and nulliparous women (Cancer research UK, 2021a). These data are shown in Table 25.
- The percentage of nulliparous women in the population of women aged 31 years and over. This is, according to available data, 53% at 30 years of age; 27% at 35 years of age; 17% at 40 years of age; and 18% at 45 years of age and above (Office for National Statistics, 2022a).
- The mean number of children per parous woman aged 31 years and over (including previous births), which is approximately 2, starting from 1.86 at 30 years of age and reaching 2.26 at 50 years of age, according to available data (Office for National Statistics, 2022a). This information was needed in order to estimate the incidence of breast cancer in parous women, as parity reduces the incidence of breast cancer and the reduction depends on the number of children per woman.
- The protective effect of parity on breast cancer, expressed as an OR of incidence of breast cancer in parous women with 2 live births versus non-parous women (0.84, 95% CI 0.80 to 0.89) (Lambe et al., 1996). Parous women with 2 live births were selected as the relevant sub-population of parous women, as the mean number of children of parous women aged 31 years and over (which is the study population) is 2, as reported above.

For every year in the model, starting at 31 years of age, the incidence of breast cancer in parous women and in nulliparous women was estimated using the formulae reported in Bartick and Reinhold (2010) as described earlier, using the overall age-specific incidence of breast cancer in women in the general population, the percentage of nulliparous women amongst women in the general population, and the protective effect of parity on breast cancer. Subsequently, the same formulae were used to estimate the incidence of breast cancer under current standard practice in women aged 31 years and over who breastfed and those who did not, amongst parous women. These formulae utilise RR rather than OR,

however, because breast cancer in women is a rare event (<10%), OR approximates RR and the formulae can produce accurate results using OR instead of RR (Zhang and Yu, 1998).

Table 25. Incidence (new cases) and mortality of breast cancer in women in the general population

Age	Incidence – new breast cancer cases per 100,000 women, UK 2016-2018 (Cancer Research UK, 2021a)	Mortality due to breast cancer per 100,000 women, UK 2016-2018 (Cancer Research UK, 2021b)
15 to 19	0.1	0.0
20 to 24	1.6	0.1
25 to 29	11.5	0.8
30 to 34	31.2	3.4
35 to 39	65.8	7.3
40 to 44	124.6	13.3
45 to 49	214.8	22.6
50 to 54	279.8	32.9
55 to 59	285.5	40.0
60 to 64	337.9	47.5
65 to 69	412.3	58.0
70 to 74	372.7	80.9
75 to 79	403.0	106.5
80 to 84	430.4	153.9
85 to 89	447.7	214.0
90+	448.4	339.6

Women in the model were followed up over their lifetime to estimate the costs and benefits (QALYs) associated with the development of breast cancer. Mortality in women without breast cancer was derived from age-specific mortality data for women in the general population for the years 2017-2019, that is, pre-pandemic (Office for National Statistics, 2021). It is acknowledged that women in the general population include women with breast cancer, who have higher mortality than women without breast cancer, and therefore the mortality of women without breast cancer in the model has been overestimated. However, because women with breast cancer are only a very small proportion of women in the general population, the overestimation of mortality in women without breast cancer in the economic model was probably negligible.

For women with breast cancer, mortality was estimated using age-specific data on mortality in the general population (Office for National Statistics, 2021), age-specific data on mortality due to breast cancer in women in the general population as shown in Table 25 (Cancer Research UK 2021b) and the following assumptions:

- The general population comprises women with breast cancer and women without breast cancer
- Women with breast cancer may die from breast cancer or from other causes
- Women without breast cancer may die from other causes only (that is, any cause except breast cancer)
- Mortality due to other causes (any cause except breast cancer) is overall the same for women with breast cancer and those without; it is acknowledged that there is uncertainty around this assumption and that women with breast cancer may have higher or lower mortality due to other causes compared with women without breast cancer, but no

relevant data were available to allow different assumptions and, on balance, the assumption appeared to be reasonable according to committee's expert opinion.

Based on the above assumptions it was possible to estimate the overall age-specific mortality in women with breast cancer in every model cycle.

Mortality in women with breast cancer depends on their age but also on the number of years lived with breast cancer (that is, the duration of breast cancer). A RR of mortality in women with breast cancer between 1-10 years after diagnosis versus women with breast cancer in the first year after diagnosis was estimated, using age-adjusted net survival data for women with breast cancer over 1-10 years after diagnosis (Cancer Research UK, 2019). Survival data and the estimated RRs are shown in Table 26. From these data, and using (i) the estimated age-specific mortality in women with breast cancer in every model cycle and (ii) the number of women with breast cancer for 1, 2, 3 and up to 10 years after diagnosis in every cycle, it was possible to estimate the age- and breast cancer's duration-specific mortality in women with breast cancer, depending on the number of years after diagnosis (that is, number of years lived with breast cancer).

Table 26. Age-adjusted survival from breast cancer in women over 1-10 years from development and estimated mortality

Year	Age-adjusted % net survival up to 10 years after diagnosis*	Estimated mortality in those alive at the start of each year	Estimated RR of mortality in year x versus year 1
1	0.960	0.040	1.00
2	0.933	0.028	0.70
3	0.908	0.027	0.67
4	0.886	0.024	0.61
5	0.866	0.023	0.56
6	0.848	0.021	0.52
7	0.830	0.021	0.53
8	0.814	0.019	0.48
9	0.798	0.020	0.49
10	0.784	0.018	0.44

**Cancer Research UK (2019)*
RR: risk ratio

Women with breast cancer surviving after 10 years with breast cancer were assumed to return to the mortality of the women in the general population (rather than retaining an increased mortality associated with breast cancer for the rest of their lives), but were at risk of developing a new breast cancer (in which case their mortality was again increased). This assumption was necessary as no relevant UK survival data for women with breast cancer beyond 10 years after diagnosis were available in the literature and it was considered reasonable because mortality of women with breast cancer after 10 years from diagnosis is not expected to differ considerably from that of women of the same age in the general population, unless women experience a recurrence of breast cancer. Given that women were at risk of developing a new breast cancer after 10 years from initial breast cancer diagnosis, the impact of this assumption on the results is expected to be minimal.

Resource use and cost data

Healthcare costs incurred by women with breast cancer and those without were obtained from a study that estimated total healthcare costs using data from national databases (National Cancer Data Repository, Hospital Episode Statistics, and the National Schedules of

Reference Costs) on 359,771 women with breast cancer in England (Laudicella et al., 2016). The study reported annual healthcare costs for each year of breast cancer between 1-9 years after diagnosis; it also reported annual healthcare costs incurred between 1-3 years before diagnosis of breast cancer. Costs were reported separately for women aged 18-64 years, and those ≥ 65 years. Based on the available data, the following costs were estimated and used in the guideline economic analysis:

- For women with breast cancer one year after diagnosis in the model, the cost figure for one year after diagnosis reported in Laudicella et al. (2016) was combined with the excess cost reported in the same study for one year before breast cancer diagnosis (the healthcare cost one year before diagnosis of breast cancer was notably higher than the cost incurred over 2 and 3 years before diagnosis).
- For women with breast cancer 2-9 years after diagnosis in the model, the respective cost figures for 2-9 years after diagnosis reported in Laudicella et al. (2016) were used.
- For women with breast cancer 10 years after diagnosis in the model, the healthcare cost reported for 9 years after diagnosis reported in Laudicella et al. (2016) was used, due to lack of cost data specific to 10 years after diagnosis.
- After 10 years from breast cancer diagnosis, it was assumed that women incurred the same costs as women without breast cancer, unless they developed a new breast cancer.
- For women without breast cancer, averaged costs for 3 and 2 years before diagnosis of breast cancer reported in Laudicella et al. (2016) were used.

Depending on the women's age in the model, relevant data for women aged 18-64 years or ≥ 65 years were used.

Cost data reported by Laudicella et al. (2016) were updated to 2022 prices using the hospital and community health services (HCHS) index up to 2015 (Curtis & Burns, 2018) and the NHS Cost Inflation Index up from 2016 to 2022 (Jones et al., 2023). Annual healthcare costs for women with breast cancer and those without breast cancer that were utilised in the guideline economic analysis are shown in Table 27.

Table 27. Annual healthcare costs (2022 prices) for women with breast cancer and women without breast cancer utilised in the guideline economic model

Health state	Cost in women aged 18-64 years	ost in women aged ≥ 65 years
No breast cancer	£215	£518
Breast cancer – year 1	£14,125	£10,509
Breast cancer – year 2	£4,547	£3,309
Breast cancer – year 3	£2,692	£2,808
Breast cancer – year 4	£2,204	£2,824
Breast cancer – year 5	£2,113	£2,704
Breast cancer – year 6	£2,036	£2,749
Breast cancer – year 7	£1,805	£2,624
Breast cancer – year 8	£1,771	£2,652
Breast cancer – year 9	£1,628	£2,817
Breast cancer – year 10	£1,628	£2,817
All costs estimated based on data reported in Laudicella et al., 2016		

Outcome measures and utility data

The outcomes measured in this model were the number of QALYs (primary outcome of the guideline economic analysis) and the number of new cases of breast cancer over lifetime (secondary outcome).

To estimate QALYs for women without breast cancer, age-specific EQ-5D-derived utility values for women in the UK population were used (Kind 1999), shown in Table 24.

Utility values for women with breast cancer were estimated based on data reported in a systematic review and meta-analysis of utility values for breast cancer (Kaur et al., 2022), which reported a mean utility value for early breast cancer between 0.58 and 0.81 and a co-efficient for advanced/metastatic breast cancer is -0.11, and the fact that 15% of all breast Ca cases at any time are metastatic (Cancer Research UK, 2021c). Using these data, we estimated a mean utility value for breast cancer (weighted for early and advanced/metastatic) which was used for years 1-5 following diagnosis of breast cancer (0.68). For years 6-10 after breast cancer diagnosis, it was assumed that the mean utility value of women with breast cancer was the average between the utility of breast cancer (0.68) and the age-specific utility of women without breast cancer, obtained from the general population (see Table 24). After 10 years with breast cancer, women were assumed to return to the utility value of women without breast cancer (that is, the age-specific utility of women in the general population), unless they developed a new breast cancer.

Baseline probability of breastfeeding

Current breastfeeding rates under standard care in England for the period of 16 weeks (4 months) to 26 weeks (6 months) after birth were obtained from national statistics. The period between 16 and 26 weeks after birth was chosen to ensure that breastfeeding was established and therefore could have an impact on longer-term mother and baby outcomes. Over this period, only data on the effectiveness of intervention on any breastfeeding were available from the guideline systematic review and meta-regression. Moreover, the protective effect of breastfeeding on most clinical conditions considered in the guideline economic analysis referred to any breastfeeding (more versus less, longer versus shorter duration, any versus none, and so on) rather than exclusive breastfeeding.

For baby outcomes, baseline rates of any breastfeeding at 4 months after birth were used, as breastfeeding is established and benefits from breastfeeding can be enjoyed by this time point, and evidence suggests that the protective effect of breastfeeding is retained even after breastfeeding stops (Collaborative Group on Hormonal Factors in Breast Cancer, 2002; Victora et al., 2016).

For breast cancer in mothers, baseline rates of any breastfeeding at 6 months after birth were used, as evidence suggests that the effect of breastfeeding on the incidence of breast cancer is significant from 6 months of breastfeeding onwards (Unar-Munguía et al., 2017).

The most recent rates of any breastfeeding at 4 and 6 months after birth in England were available for the year 2010 from the Infant Feeding Survey conducted in the UK (NHS Digital, 2012). The most recent (2023) data on any breastfeeding in England were available only for 6-8 weeks after birth (Office for Health Improvement and Disparities, 2023). However, it was possible to estimate the rates of any breastfeeding at 4 and 6 months after birth for 2023, using the 2023 figure for the prevalence of any breastfeeding at 6-8 weeks and the instant rate of reduction in any breastfeeding between 6 weeks and 4 months (16 weeks) and between 4 months and 6 months (26 weeks) as calculated from the available 2010 data, assuming exponential change in breastfeeding rates over time.

Recent Scottish data on any breastfeeding at 4 and 6 months after birth, available from the Scottish Maternal and Infant Nutrition Survey 2017, were used only in a sensitivity analysis, as the committee advised that the breastfeeding services in Scotland differ from those of England, so that Scottish breastfeeding rates are not reflecting of the English setting.

The actual and estimated rates of any breastfeeding in England at different time points following birth for the years 2010 and 2023, as well as Scottish breastfeeding rates at different time points following birth in 2017 are shown in Table 28.

Table 28: Prevalence of any breastfeeding at different points after birth

Time point	Prevalence of any breastfeeding		
	England		Scotland
	2010 (NHS Digital, 2012)	2023 (Office for Health Improvement and Disparities 2023)	2017 (Healthcare Quality and Improvement Directorate 2018)
Birth	0.83		0.75
6-8 weeks after birth	0.57 [6 weeks]	0.54 [6-8 weeks]*	0.55
4 months after birth	0.44	0.43 [estimated][1]	0.49
6 months after birth	0.36	0.35 [estimated][1]	0.43

** known cases only*
1. estimated using the 2023 figure for the prevalence of any breastfeeding at 6-8 weeks and the instant rate of reduction in any breastfeeding between 6 weeks and 4 months, and between 4 months and 6 months, as calculated from 2010 data (assuming exponential change).

Discounting

Where costs and/or outcomes were measured over a period longer than one year (that is, estimation of QALYs gained over lifetime associated with mortality due to infectious diseases and SIDS in babies; and estimation of costs and QALYs associated with breast cancer in mothers over their lifetime), costs and benefits were discounted at an annual rate of 3.5% as recommended by NICE (2014).

Handling uncertainty

Model input parameters were synthesised in a probabilistic analysis. This means that the input parameters were assigned probabilistic distributions (rather than being expressed as point estimates); this approach allowed more comprehensive consideration of the uncertainty characterising the input parameters and captured the non-linearity characterising the economic model structure. Subsequently, 10,000 iterations were performed, each drawing random values out of the distributions fitted onto the model input parameters. Results (mean costs and QALYs for each intervention) were averaged across the 10,000 iterations. This exercise provides more accurate estimates than those derived from a deterministic analysis (which utilises the mean value of each input parameter ignoring any uncertainty around the mean), by capturing the non-linearity characterising the economic model structure (Briggs et al., 2006).

ORs and RRs expressing (i) the effectiveness of the breastfeeding intervention, (ii) the impact of breastfeeding on the incidence of the clinical conditions considered in the economic model, and (iii) the impact of parity on the incidence of breast cancer were assigned a log-normal distribution.

A beta distribution was assigned to the following parameters: the baseline probability of breastfeeding at 4 and 6 months; the proportion of breast cancer cases that are metastatic at any time; the baseline incidence of all clinical conditions examined in the economic analysis,

(with the exception of hospitalisations due to gastrointestinal infection and RTI in babies aged 0-1 years as these were derived from national data that were not subject to uncertainty); and all the utility values utilised in the economic model (i.e. age- and gender-specific utilities in the general population and utilities in women with breast cancer), after applying the method of moments on utility data reported in the relevant literature.

NHS/PSS costs associated with the 'breast cancer' and 'no breast cancer' health states, the unit costs of hospitalisations due to gastrointestinal infection and RTI in babies aged 0-1 years and the unit cost associated with death in babies were assigned a gamma distribution. The cost of the breastfeeding intervention and the unit cost of a GP visit were assigned a normal distribution.

The following parameters were not assigned a probability distribution as they were estimated based on nationally collected data and therefore were not subject to uncertainty: the age-specific mortality in the general population; the age-specific incidence of breast cancer and mortality due to breast cancer in women of the general population; the mortality due to infectious diseases and SIDS in babies aged 0-1 years; the age-adjusted net survival in women with breast cancer; the percentage of nulliparous women among women of different age groups; the proportion of males among babies who did not die due to infectious diseases or SIDS following breastfeeding intervention; and the incidence of hospitalisations due to gastrointestinal infection and RTI in babies aged up to one year.

Table 29 reports the mean values of all input parameters utilised in the guideline economic model and provides details on the types of distributions assigned to each input parameter and the methods employed to define their range.

A two-way sensitivity analysis was undertaken, by changing concurrently the mean effect (RR) and cost of the intervention, to explore the impact of changes on the cost-effectiveness results. The ranges tested were from 1.05 to 2.00 for the intervention effect; and from £20 to £100 for the intervention cost.

Table 29. Input parameters (deterministic values and probability distributions) that informed the guideline economic model of an intervention aiming at maintaining breastfeeding beyond 8 weeks after birth

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
Mean number of babies per live birth	1.014	None	Office of National Statistics 2023b; total number of liveborn babies born to singleton and multiple maternities in England and Wales were divided by number of maternities that resulted in at least one liveborn
Intervention specification			
Effect (risk ratio) – mixed intervention – group intervention	1.20 1.64	Log-normal: 95% CI 1.09 to 1.31 Log-normal: 95% CI 1.34 to 1.93	Guideline meta-regression on 'any breastfeeding between 16 and 26 weeks after birth' Mixed intervention: analysis of number of contacts; effect for 4-8 contacts (+ standard care) vs standard care Group intervention: analysis of modality (how); effect for face-to-face group intervention (+ standard care) vs standard care
Cost – mixed intervention – group intervention	£95 £28	Normal: SE = 0.10 of the mean Normal: SE = 0.10 of the mean	See Table 21; distribution based on assumption See Table 22; dbirth distribution based on assumption
Baseline probability of 'any breastfeeding' – base-case analysis			
Base-case analysis At 4 months At 6 months	 0.43 0.35	 Beta distribution: α=430; β=570 Beta distribution: α=350; β=650	Estimated using the 2023 figure for the prevalence of any breastfeeding at 6-8 weeks (Office for Health Improvement and Disparities 2023) and the instant rate of reduction in any breastfeeding between 6 weeks and 4 months, and between 4 months and 6 months, as calculated from data obtained from the Infant Feeding Survey 2010 (NHS Digital, 2012), assuming exponential change in breastfeeding rates over time. Distribution based on assumption
Sensitivity analysis At 4 months At 6 months	 0.49 0.43	 Beta distribution: α=490; β=510 Beta distribution: α=430; β=570	Scottish Maternal and Infant Nutrition Survey 2017 (Healthcare Quality and Improvement Directorate 2018). Distribution based on assumption
Gastrointestinal infection [GI] in babies			

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
Breastfeeding effect (RR) on the incidence of GI	0.46	Log-normal: 95% CI 0.28 to 0.78	Victora et al., 2016; pooled figures for 'more versus less breastfeeding', from a mixture of studies with different definitions of the 'risk factor' (e.g. exclusive vs non-exclusive; predominant vs partial; partial vs none; any vs none) Effect on incidence of GI from studies in babies and children aged 6 months to 5 years Effect on incidence of hospitalisation due to GI from studies in babies and children aged < 5 years
Breastfeeding effect (RR) on the incidence of hospitalisation due to GI	0.28	Log-normal: 95% CI 0.16 to 0.50	
Proportion of GP consultations for GI in babies aged 0-1 years – current (baseline)	0.031	Beta distribution: α=31; β=969	Clinical Practice Research Datalink 2023; Incidence of GP consultations for babies aged <1 year in CPRD, for clinical diagnoses of gastrointestinal infections and diarrhoea. Distribution based on assumption
Hospital admissions for GI in babies aged 0-1 years – current (baseline)	0.012	None	Admissions for babies aged 0-1 years for infectious intestinal diseases (ICD10 A00-A09) in England (NHS Digital, 2023), divided by the population aged 0-1 years in England (Office for National Statistics, 2022b).
Unit cost of GP visit	£41	Normal: SE = 0.10 of the mean	Jones et al., 2023; cost per consultation lasting 9.22 minutes, including direct care staff and qualification costs. Distribution based on assumption
Cost per hospital admission for GI	£1,044	Gamma: SE = 0.10 of the mean	NHS Improvement, 2023; weighted unit costs for HRG codes PF21A & PF21B, that is, 'Paediatric, Infectious or Non-Infectious Gastroenteritis', with CC Score 1+ and CC Score 0, respectively. Distribution based on assumption
Respiratory tract infection [RTI] in babies			
Breastfeeding effect (RR) on the incidence of lower RTI	0.68	Log-normal: 95% CI 0.60 to 0.77	Victora et al., 2016; pooled figures for 'more versus less breastfeeding', from a mixture of studies with different definitions of the 'risk factor' (e.g. exclusive vs non-exclusive; predominant vs partial; partial vs none; any vs none). Effects derived from studies in babies and children aged < 2 years
Breastfeeding effect (RR) on the incidence of hospitalisation due to RTI	0.43	Log-normal: 95% CI 0.33 to 0.55	

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
Proportion of GP consultations for lower RTI in babies aged 0-1 years – current (baseline)	0.077	Beta distribution: α=77; β=923	Clinical Practice Research Datalink 2023; Incidence of GP consultations for babies aged <1 year in CPRD, for the clinical diagnosis of pneumonia and other lower RTI. Distribution based on assumption
Hospital admissions for RTI in babies aged 0-1 years – current (baseline)	0.137	None	Admissions for babies aged 0-1 years for respiratory infectious diseases (ICD10 J00-J22) in England (NHS Digital, 2023), divided by the population aged 0-1 years in England (Office for National Statistics, 2022b).
Unit cost of GP visit	£41	Normal: SE = 0.10 of the mean	Jones et al., 2023; cost per consultation lasting 9.22 minutes, including direct care staff and qualification costs. Distribution based on assumption
Cost per hospital admission for RTI	£1,540	Gamma: SE = 0.10 of the mean	NHS Improvement, 2023; weighted unit costs for HRG codes PD11, Paediatric, Acute Upper Respiratory Tract Infection or Common Cold, with CC Score 0 to 4+, PD14, Paediatric Lower Respiratory Tract Disorders without Acute Bronchiolitis, with CC Score 0 to 11+, PD15, Paediatric Acute Bronchiolitis with CC Score 0 to 5+, PD65, Paediatric Upper Respiratory Tract Disorders with CC Score 0 to 5+, and PD12, Paediatric, Asthma or Wheezing, with CC Score 0 to 4+. Distribution based on assumption
Acute otitis media in babies			
Breastfeeding effect (OR) on the incidence of acute otitis media	0.67	Log-normal: 95% CI 0.62 to 0.72	Victora et al., 2016; pooled figures for 'more versus less breastfeeding', from a mixture of studies with different definitions of the 'risk factor' (e.g. exclusive vs non-exclusive; predominant vs partial; partial vs none; any vs none). Effect derived from studies in babies and children aged ≤ 2 years.
Proportion of GP consultations for acute otitis media in babies aged 0-1 years – current (baseline)	0.008	Beta distribution: α=8; β=992	Clinical Practice Research Datalink 2023; Incidence of GP consultations for babies aged <1 year in CPRD, for the clinical diagnosis of acute otitis media. Distribution based on assumption.

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
Unit cost of GP visit	£41	Normal: SE = 0.10 of the mean	Jones et al., 2023; cost per consultation lasting 9.22 minutes, including direct care staff and qualification costs. Distribution based on assumption
Mortality due to infectious diseases and SIDS in babies			
Breastfeeding effect (OR) on mortality due to infectious diseases	0.48	Log-normal: 95% CI 0.38 to 0.60	Victora et al., 2016; pooled figure for 'any versus never breastfeeding' Effect derived from studies in babies and children aged 6-23 months.
Breastfeeding effect (RR) on mortality due to SIDS	0.38	Log-normal: 95% CI 0.27 to 0.54	Renfrew et al., 2012; pooled figure for 'any versus never breastfeeding'. Effect derived from studies in babies and children aged ≥2 months.
Mortality due to infectious diseases in babies aged 0-1 years – current (baseline)	0.00007	None	Number of deaths due to infectious diseases and SIDS in babies aged 0-1 years divided by the number of live births, according to infant mortality data for England and Wales (Office for National Statistics, 2023c).
Mortality due to SIDS in babies aged 0-1 years – current (baseline)	0.00019	None	
Unit cost of death - babies	£9,559	Gamma: SE = 0.10 of the mean	NHS Improvement, 2023; unit cost for HRG code VB99Z 'Emergency medicine, patient dead on arrival' (£706) plus cost of a paediatric coronial case and forensic service, uplifted to 2022 prices (£8,853) (Peres 2017). Distribution based on assumption.
Proportion of males among babies whose life was saved.	0.512	None	Estimated using the number of males and females aged one year in England (Office for National Statistics, 2022b).
Age- and gender-specific mortality in the general population	(multiple data – not shown)	None	Data for England, Office for National Statistics, 2021
Age- and gender-specific utility in the general population	See Table 24	Normal – for SE see Table 24	Kind et al., 1999
Breast cancer in women			
Starting age of women (years)	31	None	Mean age of women who give birth in England and Wales, Office for National Statistics, 2023a

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
Proportion of nulliparous women - At 30 years of age - At 35 years of age - At 40 years of age - At 45+ years of age	 0.53 0.27 0.17 0.18	None	Data for 2021, Office for National Statistics, 2022a
Mean total number of children per parous woman (including previous births)	2	None	Data for 2021, Office for National Statistics, 2022a [1.86 at 30 years of age, reaching 2.26 at 50 years of age]
Effect of parity (OR) on breast cancer - parous women with 2 live births (including previous births) vs non-parous women	0.84	Log-normal: 95% CI 0.80 to 0.89	Lambe et al., 1996. The effect has been applied onto age-specific incidence of breast cancer in the general population (comprising parous and nulliparous women), to get the incidence of breast cancer in parous women.
Breastfeeding effect (OR) on the incidence of breast cancer	0.86	Log-normal: 95% CI 0.82 to 0.91	Unar-Munguria et al., 2017b; pooled figure for 'any breastfeeding over 6 months versus never breastfeeding' adjusted for age, parity, age at first pregnancy, and family history of breast cancer
Incidence of breast cancer – women in the general population	See Table 25	None	Cancer Research UK, 2021a
Mortality from breast cancer – women in the general population	See Table 25	None	Cancer Research UK, 2021b
Age-specific mortality – women in the general population	(multiple data – not shown)	None	Data for England, Office for National Statistics, 2021
Age-adjusted survival from breast cancer in women over 1-10 years from development	See Table 26	None	Cancer Research UK, 2019. After 10 years with breast cancer, women were assumed to return to the mortality of the women in the general population, unless they re-developed breast cancer.
Utility in women with breast cancer (years 1-5)	0.68	Beta distribution: $\alpha=67.85$; $\beta=32.15$	Estimated based on data reported by Kaur et al. (2022) according to which the mean utility value for early breast cancer is between 0.58 and 0.81 and the co-efficient for advanced/metastatic breast cancer is -0.11 and the fact that 15% of all breast Ca cases at any time are metastatic

Input parameter	Mean deterministic value	Probability distribution	Source of data – comments
			(Cancer Research UK, 2021c). For years 6-10 in breast cancer, 50% of women were assumed to have the utility of breast cancer (mean 0.68) and 50% of women were assumed to have the age-specific utility of the women in the general population (see Table 24). After 10 years, women were assumed to return to the utility of the women in the general population, unless they re-develop breast cancer. Distribution based on assumption.
Age-specific utility in women of the general population	See Table 24	Normal – for SE see Table 24	Kind et al., 1999
Healthcare cost in women with breast cancer and those without breast cancer	See Table 27	Gamma: SE = 0.10 of the mean	Laudicella et al., 2016; data on 359,771 women with breast cancer. For breast cancer in year 1, the excess cost of one year before breast cancer diagnosis was added. For breast cancer in year 10, same cost as for year 9 was assumed, due to lack of relevant cost data. After 10 years, it is assumed that women incur the same costs as women without breast cancer, unless they re-develop breast cancer. Costs for women without breast cancer assumed to equal averaged data 3 and 2 years before diagnosis of breast cancer. Distribution based on assumption. Costs uplifted using the HCHS index up to 2015 (Curtis & Burns, 2018) and the NHS Cost Inflation Index up from 2016 to 2022 (Jones et al., 2023)
Annual discount rate	0.035	None	Applied to both costs and outcomes. NICE, 2014

CI: confidence intervals; CPRD: Clinical Practice Research Datalink; GI: gastrointestinal infection; GP: general practitioner; HCHS: hospital and community health services; HRG: hospital related group; OR: odds ratio; RR: risk ratio; RTI: respiratory tract infection; SE: standard error; SIDS: sudden infant death syndrome

Presentation of the results

Mean total costs, QALYs and other outcomes are presented for each option (intervention added on standard care and standard care alone. The ICER was calculated using the following formula:

$$ICER = \Delta C / \Delta E$$

where ΔC is the difference in total costs between two treatment options considered and ΔE the difference in their effectiveness (QALYs). The ICER expresses the extra cost per extra unit of benefit (QALY) associated with one treatment option relative to its comparator. If an option has an ICER of up to £20,000-£30,000/QALY relative to its comparator (NICE lower and upper cost-effectiveness threshold, respectively) then the intervention is considered to be cost-effective (NICE, 2014).

Validation of the economic model

The economic model (including the conceptual model and the identification and selection of clinical outcomes and input parameters) was developed by the health economist in collaboration with a health economics sub-group formed by members of the NG194 committee, using as a basis a previous economic model (Renfrew et al., 2012). As part of the model validation, all inputs and model formulae were systematically checked; the model was tested for logical consistency by setting input parameters to null and extreme values and examining whether results changed in the expected direction. The base-case results and results of sensitivity analyses were discussed with the committee to confirm their plausibility. Moreover, where modelling structure components were identical to those of Renfrew et al. (2012), for example the modelling components on babies' infections, input data from that study were used to confirm that its results could be replicated using the guideline model.

Economic modelling results

The results of the base-case economic analysis are provided in Table 30 for the mixed intervention and Table 31 for the group intervention. The tables provide the total intervention cost as well as total costs and outcomes (QALYs and secondary outcomes, as relevant) associated with every clinical condition considered in the economic analysis, for 1000 women and people who gave birth and their babies. Both interventions showed better outcomes and resulted in cost-savings across all conditions examined, when added on standard care compared with standard care alone. However, the mixed intervention, when provided in addition to standard care, was costlier overall than standard care alone as the cost-savings resulting from increased breastfeeding rates and better outcomes following provision of the mixed intervention were not adequate to offset its intervention costs. The ICER of the mixed intervention added on standard care compared with standard care alone was £52,934/QALY, which is well above the NICE upper cost-effectiveness threshold of £30,000/QALY, suggesting that the mixed intervention is not cost-effective. In contrast, the group intervention, when provided in addition to standard care was overall less costly than standard care alone, as the cost-savings resulting from increased breastfeeding rates and better outcomes following provision of the group intervention outweighed its intervention costs. Group intervention was thus cost-effective, as it dominated standard care (it was both less costly and more effective).

Table 30. Base-case results of the economic analysis: mixed intervention for maintaining breastfeeding beyond 8 weeks after birth (results for 1000 women and people who gave birth and their babies)

Parameter		Intervention + SC	SC alone	Difference
Intervention cost		£95,065	£0	£95,065
Gastrointestinal infection in babies	Infections	29.20	31.09	-1.89
	Hospitalisations	11.38	12.51	-1.13
	Costs	£13,085	£14,340	-£1,254
(lower) RTI in babies	Infections	75.96	78.47	-2.51
	Hospitalisations	130.04	139.10	-9.07
	Costs	£203,357	£217,424	-£14,067
Acute otitis media in babies	Infections	8.25	8.53	-0.28
	Costs	£338	£350	-£12
Mortality in babies	Deaths due to infections	0.07	0.07	-0.00
	Deaths due to SIDS	0.18	0.19	-0.01
	Costs of deaths prevented	-£41.12		-£41.12
	QALYs gained	0.11		0.11
Breast cancer in women	New cases	137.45	138.85	-1.39
	QALYs	20,751.90	20,750.73	1.16
	Costs	£7,800,524	£7,812,858	-£12,334
Total difference in QALYs				1.27
Total difference in costs				£67,357
ICER		**£52,934/QALY**		

ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life year; RTI: respiratory tract infection; SC: standard care; SIDS: sudden infant death syndrome

Table 31. Base-case results of the economic analysis: group intervention for maintaining breastfeeding beyond 8 weeks after birth (results for 1000 women and people who gave birth and their babies)

Parameter		Intervention + SC	SC alone	Difference
Intervention cost		£27,865	£0	£27,865
Gastrointestinal infection in babies	Infections	25.05	31.09	-6.04
	Hospitalisations	8.90	12.51	-3.61
	Costs	£10,326	£14,340	-£4,013
(lower) RTI in babies	Infections	70.43	78.47	-8.04
	Hospitalisations	110.09	139.10	-29.02
	Costs	£172,409	£217,424	-£45,015
Acute otitis media in babies	Infections	7.62	8.53	-0.91
	Costs	£313	£350	-£37
Mortality in babies	Deaths due to infections	0.06	0.07	-0.01
	Deaths due to SIDS	0.15	0.19	-0.04

Parameter		Intervention + SC	SC alone	Difference
	Costs of deaths prevented	-£131.60		-£131.60
	QALYs gained	0.35		0.35
Breast cancer in women	New cases	134.39	138.85	-4.46
	QALYs	20,754.46	20,750.73	3.73
	Costs	£7,773,389	£7,812,858	-£39,469
Total difference in QALYs				4.07
Total difference in costs				-£60,801
ICER		**Intervention dominant**		

ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life year; RTI: respiratory tract infection; SC: standard care; SIDS: sudden infant death syndrome

Results of deterministic and probabilistic sensitivity analysis were very similar; the two tables above show the results of the deterministic analysis as these are directly comparable to the results of the two-way sensitivity analysis presented below. The ICER of the probabilistic analysis for the mixed intervention was £52,770/QALY, and its probability of being cost-effective was 0.02. Group intervention was also dominant in probabilistic analysis, with a probability of being cost-effective of 1.00.

In the sensitivity analysis that used Scottish data on baseline breastfeeding rates at 4 and 6 months, the mixed intervention had an ICER of £39,408/QALY, whereas the group intervention remained dominant.

The results of two-way sensitivity analysis are shown in Table 32, for different combinations of intervention effect and intervention cost. Green cells show combinations for which the intervention is cost-effective, with an ICER below the NICE lower cost-effectiveness threshold of £20,000/QALY. Yellow cells show combinations for which the intervention is not cost-effective, with an ICER above the NICE upper cost-effectiveness threshold of £30,000/QALY. Blue cells show combinations where the ICER is between £20,000-£30,000/QALY. The orange cells show the mixed intervention cost and effect values used in base-case analysis and the respective ICER. The purple cells show the group intervention cost and effect values used in base-case analysis and the respective ICER.

As expected, the cost-effectiveness of the intervention improves as its effectiveness increases and its intervention cost decreases. For the mixed intervention and a base-case relative effect (RR) of 1.20 (for any breastfeeding at 16-26 weeks after birth), the intervention was cost-effective (<£20,000/QALY) if its cost per person receiving the intervention fell at approximately £50-£55. At its base-case cost of £95, the mixed intervention was cost-effective if its effectiveness (in terms of breastfeeding rates), when added on standard care, was at least 35%-40% higher than the effectiveness of standard care alone (that is, if the RR reached 1.35-1.40). For the group intervention and a base-case RR of 1.64, the group intervention remained cost-effective at any cost up to the maximum value of £100 per person tested. At its base-case cost of £28, the group intervention was cost-effective as long as its effectiveness, when added on standard care, remained at least 10-15% higher than the effectiveness of standard care alone (that is, if the RR was at least 1.10-1.15).

Table 32. Guideline economic analysis, results of two-way sensitivity analysis

Intervention effect	Intervention cost																
	£20	£25	£28	£35	£40	£45	£50	£55	£60	£65	£70	£75	£80	£85	£90	£95	£100
1.05	£41,094	£56,811	£65,817	£88,246	£103,963	£119,680	£135,397	£151,115	£166,832	£182,549	£198,266	£213,984	£229,701	£245,418	£261,135	£277,058	£292,570
1.10	£9,660	£17,518	£22,021	£33,236	£41,094	£48,953	£56,811	£64,670	£72,529	£80,387	£88,246	£96,104	£103,963	£111,822	£119,680	£127,642	£135,397
1.15	dominant	£4,421	£7,423	£14,899	£20,138	£25,377	£30,616	£35,855	£41,094	£46,333	£51,572	£56,811	£62,050	£67,290	£72,529	£77,836	£83,007
1.20	dominant	dominant	£123	£5,730	£9,660	£13,589	£17,518	£21,448	£25,377	£29,306	£33,236	£37,165	£41,094	£45,023	£48,953	£52,934	£56,811
1.25	dominant	dominant	dominant	£229	£3,373	£6,516	£9,660	£12,803	£15,947	£19,090	£22,234	£25,377	£28,520	£31,664	£34,807	£37,992	£41,094
1.30	dominant	dominant	dominant	dominant	dominant	£1,801	£4,421	£7,040	£9,660	£12,279	£14,899	£17,518	£20,138	£22,757	£25,377	£28,031	£30,616
1.35	dominant	dominant	dominant	dominant	dominant	dominant	£678	£2,924	£5,169	£7,414	£9,660	£11,905	£14,150	£16,396	£18,641	£20,916	£23,132
1.40	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£1,801	£3,766	£5,730	£7,695	£9,660	£11,624	£13,589	£15,579	£17,518
1.45	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£928	£2,674	£4,421	£6,167	£7,913	£9,660	£11,429	£13,152
1.50	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£229	£1,801	£3,373	£4,945	£6,516	£8,109	£9,660
1.55	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£1,087	£2,516	£3,944	£5,392	£6,802
1.60	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£491	£1,801	£3,128	£4,421
1.64	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£328	£1,572	£2,783
1.70	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	£678
1.75	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant
1.80	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant
1.85	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant
1.90	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant
1.95	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant
2.00	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant	dominant

White cells – tested values (x axis – intervention cost; y axis: intervention effect)
Orange cells: mixed intervention cost and effect values & respective ICER; purple cells: group intervention cost and effect values & respective ICER
Yellow cells: results where ICER > £30,000/QALY; blue cells: results where ICER is between £20,000-£30,000/QALY
Green cells: results where ICER < £20,000/QALY; dominant = intervention + standard care is less costly and more effective than standard care alone

Discussion – conclusions, strengths and limitations of economic analysis

The guideline economic analysis assessed the cost-effectiveness of an intervention initiated antenatally or postnatally aiming at maintaining breastfeeding beyond 8 weeks after birth. The results of the analysis suggest that adding an intervention delivered in a mixed individual and group modality on to standard care is not cost-effective, as its ICER when added on to standard care versus standard care alone was £52,934/QALY, which is well above the NICE upper cost-effectiveness threshold of £30,000/QALY. In contrast, adding a group intervention on to standard care was dominant compared with standard care alone, as it was shown to be both more effective than standard care and less costly overall. These results persisted in a sensitivity analysis which used Scottish data on baseline breastfeeding rates (which showed higher breastfeeding rates than in England), although the ICER of the mixed intervention was reduced.

The effectiveness of the intervention in improving breastfeeding rates was determined by the guideline systematic review and meta-regression of RCTs and its cost was estimated based on intervention characteristics that were found to improve effectiveness according to the guideline meta-regression (for example, in terms of format, number of contacts, setting) supplemented with the NG194 committee's expert advice on patterns of routine practice regarding postnatal care in the UK. The baseline breastfeeding rates were estimated using national statistical data.

The definition of standard care varied widely across the RCTs included in the guideline systematic review and meta-regression that informed the economic analysis, and is also variable across the UK NHS. In principle, the wide variation in standard care across the evidence could be a plausible reason for differences in magnitude of benefits of the interventions or a lack of difference between the intervention and control arms in the evidence. On the other hand, several studies included in the review (and the meta-regression) compared an active intervention plus standard care versus standard care alone, so it was the additional effect of the active intervention that was assessed in these studies. In other studies, where an active intervention was stated to have been compared to standard care, the characteristics of standard care (where details were provided) were considered to explore whether standard care reflected routine care or had characteristics of an active intervention. If the latter, then in the meta-regression the comparator was coded as an active intervention rather than as standard care. This approach limited the impact of the variation in standard care across the studies included in the meta-regression on the magnitude of the benefits estimated for the active intervention.

The economic analysis considered a number of long-term benefits and associated cost-savings resulting from improved breastfeeding rates, including a reduction in gastrointestinal infections, respiratory tract infections and acute otitis media in babies aged up to one year, a reduction in babies' mortality due to infectious diseases or SIDS during their first year of life, and a reduction in the incidence of breast cancer in women and people who gave birth over lifetime. The economic analysis utilised best quality information: the structure of the economic model was based, for the majority of the assessed outcomes, on a UK modelling study that estimated long-term benefits and cost-savings associated with breastfeeding that was commissioned by UNICEF UK (Renfrew et al. 2012). Effectiveness data on the protective effect of breastfeeding in mothers and babies were mostly derived from a study reporting the results of 28 systematic reviews and meta-analyses that had adjusted for confounders, 22 of which were commissioned by WHO (Victora et al. 2016).

Epidemiological data utilised in the model were derived from national statistics and a large administrative database (CRPD). Utility data were estimated based on national UK norms (Kind et al. 1999) and a systematic review and meta-analysis of utility data in women with breast cancer (Kaur et al. 2022). Cost data were taken from national sources and a large

study on 359,771 women with breast cancer in England, which utilised information from national databases (Laudicella et al. 2016). The time horizon of the analysis varied across the clinical conditions modelled, but reached lifetime in conditions where mortality of babies (due to infectious diseases and SIDS) as well as mortality and lifetime health-related quality of life of mothers and people who gave birth (due to breast cancer) were affected.

The analysis considered a range of clinical outcomes in mothers and people who gave birth and their babies associated with breastfeeding. However, breastfeeding has been found to be associated with several other outcomes that were not possible to consider in the economic model, either due to lack of suitable and/or good quality epidemiological and cost data that would allow robust modelling to be conducted, or due to the complexity or uncertainty of modelling owing to the multifactorial nature of some diseases. For example, breastfeeding has been associated with a reduced risk of obesity in babies over their lifetime (Horta et al., 2023) and a reduced risk of diabetes both in mothers and people who gave birth and their babies (Victora et al., 2016). It has also been associated with improved cognitive outcomes in babies and reduced incidence of ovarian cancer in mothers and people who gave birth (Victora et al. 2016). Furthermore, there is indication that breastfeeding has a protective effect on the development of triple negative breast cancer (John et al., 2018; Ma et al., 2017), which is considered to be more aggressive and have a poorer prognosis compared with other types of breast cancer. Prevention of infections in babies, which is associated with breastfeeding, results in lower antibiotic use and thus lower rates of antimicrobial resistance in the community. Finally, a successful breastfeeding intervention provided to mothers and people who gave birth who wish to breastfeed but experience societal barriers or lack of skilled support and frustration by not being able to breastfeed is likely to improve their mental health and wellbeing and to promote emotional attachment with their baby, improving also the baby's mental health and psychological development. These clinical benefits associated with breastfeeding were not captured in the guideline economic analysis, which means that clinical benefits and cost-savings resulting from provision of the breastfeeding intervention may have been underestimated in the analysis.

Moreover, the estimated ICER has only captured benefits expressed in the form of QALYs. Other clinical benefits, including the reduction in the incidence of gastrointestinal infections, respiratory tract infections and acute otitis media in babies were not considered in the estimation of the ICER. On the other hand, the impact of these outcomes on the health-related quality of life of the babies is important but is usually very brief and therefore the QALY gains resulting from a reduction in the incidence of these infections are expected to be negligible. The ICER has also not captured the intangible benefits to parents associated with improved outcomes in babies, in particular the psychological burden avoided by a reduction in mortality due to infectious diseases and SIDS.

The intervention was assumed to be offered in addition to standard care, and therefore the description and cost of standard care was omitted from both arms of the model. If the intervention is expected to be provided as an alternative (and not in addition) to standard care, then its net cost is lower than the figure utilised in the model, and its cost-effectiveness is higher. Furthermore, the intervention is expected to lead to additional cost-savings to the parents, as breastfeeding reduces parents' personal expenses associated with formula feeding, including costs of bottles, formula milk powder or sterilising equipment; these costs were beyond the NHS/PSS perspective of the analysis and therefore were not included in the estimation of total costs.

On the other hand, various clinical data utilised in the model may have overestimated the magnitude of the modelled benefits and associated cost-savings of the breastfeeding intervention:

- The clinical data on the protective effect of breastfeeding on mortality due to infectious diseases and SIDS in babies that were utilised in the model expressed the difference in

mortality between babies that were breastfed and those that were never breastfed. However, both the effectiveness of the breastfeeding intervention and the baseline breastfeeding rates that were utilised in the guideline analysis referred to a single time point and reflected the proportions of babies that were or were not breastfed at 4 months; some of the babies who were not breastfed at 4 months may have been breastfed for shorter time periods (that is, they are not necessarily babies that have never been breastfed between birth and 4 months), and therefore they may have received the protective effects of breastfeeding on mortality due to infectious diseases and SIDS. This means that the guideline economic analysis has likely overestimated the benefits to babies and associated cost-savings of breastfeeding (and, consequently, of the breastfeeding intervention) regarding the reduction in babies' mortality due to infectious diseases and SIDS. However, as infant mortality from both infectious diseases and SIDS is rare, benefits and cost-savings due to a reduction in mortality resulting from an increase in breastfeeding are very small and thus their overestimation is expected to have been negligible and highly unlikely to have impacted on the results and conclusions of the analysis. One further point to note is that evidence on the association between breastfeeding and mortality from infectious diseases was derived exclusively from low and medium income countries, so findings may not be directly relevant to the population in the UK.

- Similarly, the clinical data on the protective effect of breastfeeding on the incidence of breast cancer utilised in the model expressed the difference in the incidence of breast cancer between parous women that were breastfeeding at 6 months after birth and those who had never breastfed. However, both the effectiveness of the breastfeeding intervention and the baseline breastfeeding rates that were utilised in the guideline analysis referred to a single time point and reflected the proportions of women that were or were not breastfeeding at 6 months; some of the mothers who were not breastfeeding at 6 months may have breastfed for shorter time periods (that is, they are not necessarily mothers that have never breastfed between birth and 6 months), and therefore they may have received the protective effects of breastfeeding on the incidence of breast cancer. This means that the guideline economic analysis has likely overestimated the benefits and cost-savings of breastfeeding (and, consequently, of the breastfeeding intervention) to mothers and people who gave birth regarding the reduction in the incidence of breast cancer. This overestimation is likely significant, given that the clinical benefits (QALYs) and cost-savings from the reduction in the incidence of breast cancer contributed considerably to the estimation of the ICER (QALYs gained due to a reduction in the incidence of breast cancer accounted for 91% of total QALYs gained following provision of the breastfeeding intervention; cost-savings due to a reduction in the incidence of breast cancer accounted for 45% of the total cost-savings following provision of the breastfeeding intervention).
- Further to the above, according to alternative, older high-quality data (Collaborative Group on Hormonal Factors in Breast Cancer, 2002), the impact of any versus no breastfeeding for up to 6 months on breast cancer is very small and non-significant (OR 0.98, 95% CI 0.95 to 1.01), while the impact of any versus no breastfeeding for a duration of 7-18 months is statistically significant but still small (OR 0.94, 95% CI 0.91 to 0.97), and smaller that the estimate reported by Unar-Munguía et al. (2017b) that informed the guideline economic analysis. These data suggest that the guideline economic model may have further overestimated the clinical benefits and associated cost-savings of the breastfeeding intervention, in relation to the reduction in the incidence of breast cancer.

Overall, the data on the protective effect of breastfeeding were derived from study designs that were prone to bias; several studies demonstrating clinical benefits associated with breastfeeding which were included in the evidence reported by Victora et al. (2016) had adjusted for some known confounders; however, it is possible that there are other unknown confounders impacting on the relation between breastfeeding and clinical benefits, which the

studies did not adjust for. Moreover, other studies had made no adjustments for confounding. This means that the magnitude of the clinical benefits of breastfeeding may have been overestimated in this literature. Therefore, it is likely that, by using the available data, the economic analysis has somewhat overestimated the benefits and associated cost-savings related to breastfeeding for the modelled conditions.

On balance, considering the overestimation of some the benefits and cost-savings in the clinical conditions modelled, but also the omission of other important benefits and cost-savings associated with other clinical conditions affected by breastfeeding which were not possible to model, it can be concluded that provision of a group intervention for women and people who gave birth aiming at maintaining breastfeeding, in addition to standard care, is likely to be cost-effective in the UK. In contrast, provision of a mixed individual and group intervention does not appear to be cost-effective. Further research is needed to more accurately quantify the association of breastfeeding to clinical conditions in breastfeeding people and their babies, and to explore the impact of the additional benefits of breastfeeding that were omitted from the current economic modelling, on the cost-effectiveness of breastfeeding interventions.

It needs to be emphasised that, as other literature suggests, worldwide, breastfeeding itself is cost-effective as it leads to important clinical benefits to mothers and people who gave birth and their babies and cost-savings to the health service, parents and the whole society, at no intervention cost (Bartick et al., 2017; Büchner et al., 2007; Colchero et al., 2015; Ma et al., 2013; Rollins et al., 2016; Unar-Munguía et al., 2017a; Walters et al., 2019). The guideline economic analysis only demonstrated that the mixed breastfeeding intervention, as specified in the economic analysis, was not cost-effective because the clinical benefits and cost-savings resulting from an increase in breastfeeding rates, although important, were not adequate to outweigh the initial intervention costs. However, the group intervention, which was shown to have high benefits in terms of improving breastfeeding rates and had a lower cost than a mixed intervention was shown to be highly cost-effective as it led to higher benefits and lower costs compared with standard care when provided in addition to it.

Overall conclusion from the guideline economic analysis

The guideline economic analysis suggests that providing a group intervention, in addition to standard care, to women and people who gave birth, aiming at maintaining breastfeeding beyond 8 weeks after birth, is likely to be cost-effective in the UK.

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Acknowledgement

The economic analysis described in this Appendix has used data from the Clinical Practice Research Datalink obtained under licence from the UK Medicines and Healthcare products Regulatory Agency (Study ID: 23_003665). The data are provided by patients and collected by the NHS as part of their care and support. The interpretation and conclusions contained in this study are those of the author/s alone.

Appendix J Excluded studies

Excluded studies for review question: What approaches and interventions are effective in maintaining breastfeeding beyond 8 weeks after birth?

Excluded effectiveness studies

Table 33: Excluded studies and reasons for their exclusion

Study	Code [Reason]
Abbass-Dick J., Stern SB., Nelson LE., Watson W., Dennis CL. Coparenting breastfeeding support and exclusive breastfeeding: a randomized controlled trial. Pediatrics, 13, 102 - 10, 2015	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Abbass-Dick, J., Dennis, CL. Maternal and paternal experiences and satisfaction with a co-parenting breastfeeding support intervention in Canada. Midwifery, 56, 135-141, 2018	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Abbass-Dick, J., Brown, H. K., Jackson, K. T. et al. (2019) Perinatal breastfeeding interventions including fathers/partners: A systematic review of the literature. Midwifery 75: 41-51	- Systematic review References checked and no eligible studies identified for inclusion
Abbott, Jonathan; Carty, Jenava; Batig, Alison L (2019) Infant Feeding Practices, Workplace Breastfeeding/Lactation Practices, and Perception of Unit/Service Support Among Primiparous Active Duty Servicewomen. Military medicine 184(78): e315-e320	- Ineligible intervention Study reports effect of the postpartum follow-up interval
Addicks, S. H. and McNeil, D. W. (2019) Randomized Controlled Trial of Motivational Interviewing to Support Breastfeeding Among Appalachian Women. JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing 48(4): 418-432	- Ineligible outcomes No protocol outcomes. Study reported outcome follow-up at 4 weeks (covered in evidence review (P) in PNC guideline (NG 194))
Agudelo, Sergio I, Molina, Carlos F, Gamboa, Oscar A et al. (2021) Comparison of the Effects of Different Skin-to-Skin Contact Onset Times on Breastfeeding Behavior. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 16(12): 971-977	- Ineligible country Study from low/middle income country
Ahmed, A. H., Roumani, A. M., Szucs, K. et al. (2016) The Effect of Interactive Web-Based Monitoring on Breastfeeding Exclusivity, Intensity, and Duration in Healthy, Term Infants After Hospital Discharge. JOGNN: journal of obstetric, gynecologic & neonatal nursing 45(2): 143-154	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Ahmed, A. H. and Roumani, A. M. (2020) Breastfeeding Monitoring Improves Maternal Self-Efficacy and Satisfaction. MCN, American Journal of Maternal Child Nursing 45(6): 357-363	- Ineligible outcomes No protocol outcomes. Study is a secondary analysis of Ahmed 2016 (RCT included in evidence review (P) in PNC guideline NG 194). Study reports breastfeeding self-efficacy, satisfaction with breastfeeding (not satisfaction with breastfeeding intervention), and breastfeeding pattern.

Study	Code [Reason]
Ajike, S. O., Ogunsanmi, O. O., Chinenye-Julius, A. E. et al. (2020) Effect of a breastfeeding educational programme on fathers' intention to support exclusive breastfeeding: A quasi-experimental study. African Journal of Reproductive Health 24(3): 59-68	- Ineligible study design Quasi randomised trial
Akyildiz, Deniz and Bay, Betul (2023) The effect of breastfeeding support provided by video call on postpartum anxiety, breastfeeding self-efficacy, and newborn outcomes: A randomized controlled study. Japan journal of nursing science : JJNS 20(1): e12509	- Ineligible country Study from low/middle income country
Almohanna, A. A.; Win, K. T.; Meedya, S. (2020) Effectiveness of Internet-Based Electronic Technology Interventions on Breastfeeding Outcomes: Systematic Review. Journal of Medical Internet Research 22(5): e17361	- Systematic review References checked and no eligible studies identified for inclusion
Anderson AK., Damio G., Chapman DJ., Perez-Escamilla R. Differential response to an exclusive breastfeeding peer counseling intervention: the role of ethnicity. Journal of Human Lactation, 23, 16–23, 2007	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Anderson AK., Damio G., Young S., Chapman DJ., Perez-Escamilla R. A randomised trial assessing the efficacy of peer counseling on exclusive breastfeeding in a predominantly Latina low-income community. Archives of Pediatric and Adolescent Medicine, 159, 836–41, 2005	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Anokye, N., Coyle, K., Relton, C. et al. (2020) Cost-effectiveness of offering an area-level financial incentive on breast feeding: a within-cluster randomised controlled trial analysis. Archives of Disease in Childhood 105(2): 155-159	- Study data included in PNC guideline evidence report P
Antonanzas-Baztan, Elena, Belintxon, Maider, Marin-Fernandez, Blanca et al. (2021) Six-month breastfeeding maintenance after a self-efficacy promoting programme: an exploratory trial. Scandinavian journal of caring sciences 35(2): 548-558	- Ineligible study design Study design doesn't randomise participants
Aswathy, S., Panicker, K., Rajani, G. et al. (2020) Infant and young child feeding practices-an interventional behaviour change communication approach. Journal of Clinical and Diagnostic Research 14(2): LC17-LC21	- Ineligible country Study from low/middle income country
Azimi, N. and Nasiri, A. (2020) The effect of peer counseling on breastfeeding behavior of primiparous mothers: A randomized controlled field trial. Public Health Nursing 37(3): 446-452	- Ineligible country Study from low/middle income country
Balaguer Martínez, J. V., Valcarce Pérez, I., Esquivel Ojeda, J. N. et al. (2018) Telephone support for breastfeeding by primary care: a	- Language not English

Study	Code [Reason]
randomised multicentre trial. Anales de pediatria (Barcelona, Spain : 2003) 89(6): 344-351	
Bastani, F. and Rahmatnejad, L. (2009) The effects of a prenatal workshop integrated with telephone counselling on exclusive breastfeeding adherence among primiparous women. Journal of nursing and midwifery of urmia university of medical sciences 7(1): 1-7	- Language not English
Benis, M. M. (2002) Critically appraised topic. Are pacifiers associated with early weaning from breastfeeding?. Advances in neonatal care (elsevier science) 2(5): 259-266	- Ineligible intervention Study reports use of foreign objects to baby's mouth
Bergamini, M., Simeone, G., Verga, M.C. et al. (2022) Complementary Feeding Caregivers' Practices and Growth, Risk of Overweight/Obesity, and Other Non-Communicable Diseases: A Systematic Review and Meta-Analysis. Nutrients 14(13): 2646	- Ineligible study design Literature review including ineligible study designs
Bernal, D. (2018) The Effect of a Peer Counseling Support Program on Breastfeeding Initiation, Duration and Exclusivity among Low-Income Hispanic Women. Dissertation/ thesis: 1-1	- Article unavailable
Bertino, E, Giuliani, F, Tonetto, P et al. (2006) Randomized, controlled trial of breastfeeding versus formula feeding in extremely low birth weight infants. Pediatrics 117(3): 985-6authorreply986	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Blackmore, Alicia, Howell, Brittany, Romme, Kristen et al. (2022) The Effectiveness of Virtual Lactation Support: A Systematic Review and Meta-Analysis. Journal of human lactation : official journal of International Lactation Consultant Association 38(3): 452-465	- Systematic review References checked and no eligible studies identified for inclusion
Bonuck, KA, Trombley, M, Freeman, K et al. (2005) Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months. Pediatrics 116(6): 1413-1426	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Brent NB., Redd B., Dworetz A., D'Amico F., Greenberg JJ. Breast-feeding in a low income population: program to increase incidence and duration. Archives of Pediatrics & Adolescent Medicine, 149, 798-803, 1995	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Buckland, C., Hector, D., Kolt, G. S. et al. (2020) Interventions to promote exclusive breastfeeding among young mothers: a systematic review and meta-analysis. International Breastfeeding Journal 15(1): 102	- Systematic review References checked and no eligible studies identified for inclusion
Bunik M., Shobe P., O'Connor ME., Beaty B. Are 2 weeks of daily breastfeeding support insufficient to overcome the influences of formula? Academic Pediatrics, 10, 21-8, 2010	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Bunik, M. E., Jimenez-Zambrano, A., Beaty, B. et al. (2021) Mother's milk messagingTM	- Ineligible study design Study/Conference abstract

Study	Code [Reason]
(MMM): mixed methods evaluation of bilingual app and texting program to support breastfeeding (BF). Pediatrics 147(3): 324-325	
Bærug, A., Langsrud, Ø, Løland, B. F. et al. (2016) Effectiveness of Baby-friendly community health services on exclusive breastfeeding and maternal satisfaction: a pragmatic trial. Maternal & child nutrition 12(3): 428-439	- Ineligible study design Quasi randomised
Cagan, E.S. and Genc, R. (2022) The effects of kangaroo care at birth on exclusively breastfeeding, baby's growth and development according to attachment theory: a randomized controlled trial. Early Child Development and Care	- Ineligible country Study from low/middle income country
Carlsen EM., Kyhnaeb A., Renault KM., Cortes D., Michaelsen KF., Pryds O. Telephone-based support prolongs breastfeeding duration in obese women: a randomized trial. American Journal of Clinical Nutrition, 98, 1226-32, 2013	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Cauble, J. S., Herman, A., Wick, J. et al. (2021) A prenatal group based phone counseling intervention to improve breastfeeding rates and complementary feeding: a randomized, controlled pilot and feasibility trial. BMC Pregnancy & Childbirth 21(1): 521	- Ineligible intervention Intervention starts and finishes antenatally. These interventions are out of scope and are already covered in both NG194 and the antenatal care guideline NG201.
Caulfield LE., Gross SM., Bentley ME., Bronner Y., Kessler L., Jensen J., Weathers B., Paige DM. WIC-based interventions to promote breastfeeding among AfricanAmerican women in Baltimore: effects on breastfeeding initiation and continuation. Journal of Human Lactation , 14, 15-22, 1998	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Chan, M. Y.; Ip, W. Y.; Choi, K. C. (2016) The effect of a self-efficacy-based educational programme on maternal breast feeding self-efficacy, breast feeding duration and exclusive breast feeding rates: a longitudinal study. Midwifery 36: 92-88	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Chang, Y. S., Glaria, A. A., Davie, P. et al. (2020) Breastfeeding experiences and support for women who are overweight or obese: A mixed methods systematic review. Maternal & child nutrition 16(1): e12865	- Systematic review References checked and no eligible studies identified for inclusion
Chapman DJ., Damio G., Young S., Perez-Escamilla R. Effectiveness of breastfeeding peer counseling in a low-income, predominantly Latina population. Archives of Pediatrics & Adolescent Medicine, 158, 897-902, 2004	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Chapman DJ., Morel K., Bermudez-Millan A., Young S., Damio G., Perez-Escamilla R. Breastfeeding education and support trial for overweight and obese women: a randomized trial. Pediatrics, 131, e162-e170, 2013	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Chaves, A. F. L., Ximenes, L. B., Rodrigues, D. P. et al. (2019) Telephone intervention in the	- Ineligible country

Study	Code [Reason]
promotion of self-efficacy, duration and exclusivity of breastfeeding: randomized controlled trial. Revista Latino-Americana de Enfermagem 27: e3140	Study from low/middle income country
Chawanpaiboon, Saifon; Titapant, Vitaya; Pooliam, Julaporn (2021) A Randomized Controlled Trial of the Effect of Music During Cesarean Sections and the Early Postpartum Period on Breastfeeding Rates. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 16(3): 200-214	- Ineligible country Study from low/middle income country
Chehreh, Razhan, Zahrani, Shahnaz Tork, Karamelahi, Zolaykha et al. (2021) Effect of peer support on breastfeeding self-efficacy in ilamian primiparous women: A single-blind randomized clinical trial. Journal of family medicine and primary care 10(9): 3417-3423	- Ineligible country Study from low/middle income country
Cheng, L. Y.; Wang, X.; Mo, P. K. H. (2019) The effect of home-based intervention with professional support on promoting breastfeeding: a systematic review. International journal of public health 64(7): 999-1014	- Systematic review References checked and no eligible studies identified for inclusion
Chipojola, R., Chiu, H. Y., Huda, M. H. et al. (2020) Effectiveness of theory-based educational interventions on breastfeeding self-efficacy and exclusive breastfeeding: A systematic review and meta-analysis. International Journal of Nursing Studies 109: 103675	- Systematic review References checked and no eligible studies identified for inclusion
Clarke, J. L., Ingram, J., Johnson, D. et al. (2020) An assets-based intervention before and after birth to improve breastfeeding initiation and continuation: the ABA feasibility RCT. Public health research 8(7)	- Duplicate
Cordell, A. and Elverson, C. (2021) Interventions to Improve Breastfeeding Outcomes from Six Weeks to Six Months: A Systematic Review. Western Journal of Nursing Research 43(6): 583-596	- Systematic review References checked and no eligible studies identified for inclusion
Cramer, R. L., McLachlan, H. L., Shafiei, T. et al. (2019) Maternal and child health nurses' experiences of implementing two community-based breastfeeding interventions in Victoria, Australia: A mixed methods process evaluation. Australian Journal of Child and Family Health Nursing 16(1): 4-14	- Ineligible study design Exploratory study, qualitative methods used
Cramer, R. L., McLachlan, H. L., Shafiei, T. et al. (2017) Implementation and evaluation of community-based drop-in centres for breastfeeding support in Victoria, Australia. International breastfeeding journal 12: 1-14	- Ineligible study design Exploratory study, mixed methods used
Cui, R. and Wang, E. (2021) The effect of postpartum family visits on the promotion of breastfeeding and improvement of maternal and infant health. American Journal of Translational Research 13(12): 14089-14095	- Ineligible country Study from low/middle income country

Study	Code [Reason]
Cummins, L.; Meedya, S.; Wilson, V. (2022) Factors that positively influence in-hospital exclusive breastfeeding among women with gestational diabetes: An integrative review. Women & Birth: Journal of the Australian College of Midwives 35(1): 3-10	- Ineligible study design Literature review. No RCTs included.
Dagla, M., Vogiatzoglou, M., Sarantaki, A. et al. (2021) The relationship between breastfeeding prevalence and duration with childbirth education and antenatal classes for parenthood. A literature review. Review of Clinical Pharmacology and Pharmacokinetics, International Edition 35(1): 27-29	- Article unavailable
Dall'Oglio, I., Marchetti, F., Mascolo, R. et al. (2020) Breastfeeding Protection, Promotion, and Support in Humanitarian Emergencies: A Systematic Review of Literature. Journal of Human Lactation 36(4): 687-698	- Systematic review References checked and no eligible studies identified for inclusion
Dall'Oglio, Immacolata, Marchetti, Francesca, Mascolo, Rachele et al. (2020) Breastfeeding protection, promotion, and support in humanitarian emergencies: a systematic review of literature. MIDIRS Midwifery Digest 30(2): 256-256	- Duplicate
Danielo Jouhier, M., Boscher, C., Roze, J. C. et al. (2021) Osteopathic manipulative treatment to improve exclusive breast feeding at 1 month. Archives of Disease in Childhood Fetal & Neonatal Edition 106(6): 591-595	- Ineligible intervention Study reports osteopathic manipulative treatment to improve exclusive breast feeding at 1 month
Davie, P., Chilcot, J., Chang, Y. S. et al. (2020) Effectiveness of social-psychological interventions at promoting breastfeeding initiation, duration and exclusivity: a systematic review and meta-analysis. Health Psychology Review 14(4): 449-485	- Systematic review References checked and no eligible studies identified for inclusion
Davis, A. (2015) Effects of an Educational Intervention on Baccalaureate Nursing Students' Knowledge and Attitude in Providing Breastfeeding Support to Mothers. International journal of childbirth education 30(4): 8-12	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Dayan, N., Semenic, S., Fiorda, A. et al. (2021) Breastfeeding and blood Pressure patterns in MOthers with recent hypertensive coMplications of pregnancy: BP-MOM Feasibility Study. Canadian journal of cardiology 37(2): e25	- Ineligible study design Study/Conference abstract
Dennis CL., Hodnett E, Gallop R., Chalmers B. The effect of peer support on breastfeeding duration among primiparous women: a randomized controlled trial. Canadian Medical Association Journal, 166, 21-8, 2002	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Dennis CL., Breastfeeding peer support: maternal and volunteer perceptions from a randomised controlled trial. Birth, 29, 169-76, 2002	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)

Study	Code [Reason]
Demirci, J. R., Suffoletto, B., Doman, J. et al. (2020) The development and evaluation of a text message program to prevent perceived insufficient milk among first-time mothers: Retrospective analysis of a randomized controlled trial. JMIR mHealth and uHealth 8(4)	- Ineligible outcomes No protocol outcomes. Study reports usability, acceptability, and qualitative perceptions of a SMS based intervention
Demirci, Jill R, Glasser, Melissa, Bogen, Debra L et al. (2023) Effect of antenatal milk expression education on lactation outcomes in birthing people with pre-pregnancy body mass index >=25: protocol for a randomized, controlled trial. International breastfeeding journal 18(1): 16	- Ineligible study design Study protocol
Dennis, C. E. (1999) A randomized controlled trial evaluating the effect of peer (mother-to-mother) support on breastfeeding duration among primiparous women. Dissertation/ thesis: 204p	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Dib, Sarah, Kittisakmontri, Kulnipa, Wells, Jonathan C et al. (2022) Interventions to Improve Breastfeeding Outcomes in Late Preterm and Early Term Infants. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 17(10): 781-792	- Systematic review References checked and no eligible studies identified for inclusion
Dodou, Hilana Dayana, Bezerra, Raylla Araujo, Chaves, Anne Fayma Lopes et al. (2021) Telephone intervention to promote maternal breastfeeding self-efficacy: randomized clinical trial. Revista da Escola de Enfermagem da U S P 55: e20200520	- Ineligible country Study from low/middle income country
Edwards C., Thullen J., Korfmacher J., Lantos D., Henson G., Hans L. Breastfeeding and complementary food: randomized trial of community doula home visiting. Pediatrics, 132, S160-6, 2013	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Ekstrom A., Kylberg E., Nissen E. A Process-Oriented Breastfeeding Training Program for Healthcare Professionals to Promote Breastfeeding: An Intervention Study. Breastfeeding Medicine, 7, 85-92, 2012	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Ekstrom A., Widstrom AM., Nissen E. Does continuity of care by well-trained breastfeeding counselors improve a mother's perception of support? Birth, 33, 123- 30, 2006	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Ericson, J.; Lampa, E.; Flacking, R. (2021) Breastfeeding satisfaction post hospital discharge and associated factors - a longitudinal cohort study of mothers of preterm infants. International Breastfeeding Journal 16(1): 28	- Ineligible study design Secondary analysis of a RCT. No eligible outcome data.
Evans, L.; Hilditch, C.; Keir, A. (2019) Are there interventions that improve breastfeeding and the use of breast milk in late preterm infants?. Journal of Paediatrics & Child Health 55(4): 477-480	- Systematic review References checked and no eligible studies identified for inclusion

Study	Code [Reason]
Fair, F. J.; Ford, G. L.; Soltani, H. (2019) Interventions for supporting the initiation and continuation of breastfeeding among women who are overweight or obese. Cochrane Database of Systematic Reviews	- Systematic review References checked and no eligible studies identified for inclusion
Flaherman, V. J., Cabana, M. D., McCulloch, C. E. et al. (2019) Effect of Early Limited Formula on Breastfeeding Duration in the First Year of Life: A Randomized Clinical Trial. JAMA Pediatrics 173(8): 729-735	- Ineligible intervention Study reports use of foreign objects to baby's mouth
Forster, D, McLachlan, H, Lumley, J et al. (2003) ABFAB. Attachment to the breast and family attitudes to breastfeeding. The effect of breastfeeding education in the middle of pregnancy on the initiation and duration of breastfeeding: a randomised controlled trial. BMC pregnancy and childbirth 3	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Franco-Antonio, C., Calderon-Garcia, J. F., Santano-Mogena, E. et al. (2020) Effectiveness of a brief motivational intervention to increase the breastfeeding duration in the first 6 months postpartum: Randomized controlled trial. Journal of Advanced Nursing 76(3): 888-902	- Ineligible outcomes No protocol outcomes. Study reports presence of postpartum depression, duration of breastfeeding (rather than number of women breastfeeding), and self-efficacy
Franco-Antonio, C., Santano-Mogena, E., Chimento-Diaz, S. et al. (2022) A randomised controlled trial evaluating the effect of a brief motivational intervention to promote breastfeeding in postpartum depression. Scientific Reports 12(1): 373	- Ineligible outcomes No protocol outcomes. Study reports postpartum depression and breastfeeding on the development of postpartum depression
Franco-Antonio, C., Santano-Mogena, E., Sanchez-Garcia, P. et al. (2021) Effect of a brief motivational intervention in the immediate postpartum period on breastfeeding self-efficacy: Randomized controlled trial. Research in Nursing & Health 44(2): 295-307	- Ineligible outcomes No protocol outcomes. Study reports breastfeeding efficacy
Fu IC., Fong DY., Heys M., Lee IL., Sham A., Tarrant M. Professional breastfeeding support for first-time mothers: a multicentre cluster randomised controlled trial. BJOG: an International Journal of Obstetrics and Gynaecology, 121, 1673–84, 2014	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Gagnon AJ., Dougherty G., Jimenez V., Leduc N. Randomized trial of postpartum care after hospital discharge. Pediatrics, 109, 1074-80, 2002	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Gavine, A., Marshall, J., Buchanan, P. et al. (2021) Remote provision of breastfeeding support and education: Systematic review and meta-analysis. Maternal & child nutrition: e13296	- Systematic review References checked and no eligible studies identified for inclusion
Gibby, Cheryl L K, Palacios, Cristina, Campos, Maribel et al. (2019) Acceptability of a text message-based intervention for obesity prevention in infants from Hawai'i and Puerto	- Ineligible study design Qualitative results reported only

Study	Code [Reason]
Rico WIC. BMC pregnancy and childbirth 19(1): 291	
Giugliani, E. R. J., Nunes, L. M., Issler, R. M. S. et al. (2019) Involvement of maternal grandmother and teenage mother in intervention to reduce pacifier use: a randomized clinical trial. Jornal de Pediatria 95(2): 166-172	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Gomez, L., Verd, S., de-la-Banda, G. et al. (2021) Perinatal psychological interventions to promote breastfeeding: a narrative review. International Breastfeeding Journal 16(1): 8	- Ineligible study design Literature review (non-systematic / non-RCT)
Graffy J., Taylor J., Williams A., Eldridge S. Randomised controlled trial of support from volunteer counsellors for women considering breast feeding. BMJ, 328, 26-31, 2004	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Graffy J., Taylor J. What information, advice, and support do women want with breastfeeding? Birth, 32, 179-186, 2005	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Grassley, J. S. and Sauls, D. J. (2012) Evaluation of the Supportive Needs of Adolescents during Childbirth Intrapartum Nursing Intervention on Adolescents' Childbirth Satisfaction and Breastfeeding Rates. JOGNN: journal of obstetric, gynecologic & neonatal nursing 41(1): 33-44	- Ineligible study design Quasi randomised
Griffin, Laurie B, Lopez, Julia D, Ranney, Megan L et al. (2021) Effect of Novel Breastfeeding Smartphone Applications on Breastfeeding Rates. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 16(8): 614-623	- Ineligible outcomes Secondary analysis of Lewkowitz 2020. Protocol outcomes reported by intervention usage (highest and lowest quartile of app usage).
Grimes, H. A., Forster, D. A., Shafiei, T. et al. (2020) Breastfeeding peer support by telephone in the RUBY randomised controlled trial: A qualitative exploration of volunteers' experiences. PLoS ONE [Electronic Resource] 15(8): e0237190	- Ineligible study design Qualitative study design
Grimes, Heather A, McLachlan, Helen L, Forster, Della A et al. (2021) Implementing a successful proactive telephone breastfeeding peer support intervention: volunteer recruitment, training, and intervention delivery in the RUBY randomised controlled trial. International breastfeeding journal 16(1): 90	- Ineligible study design Descriptive paper. Study reports on the implementation and delivery of a peer support intervention
Gross SM., Caulfield LE., Bentley ME., Bronner Y., Kessler L., Jensen J., Paige VM. Counseling and motivational videotapes increase duration of breast-feeding in African-American WIC participants who initiate breast-feeding., Journal of the American Dietetic Association, 98, 143–8, 1998	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Gross RS., Mendelsohn AL., Gross MB., Scheinmann R., Messito MJ. Randomized Controlled Trial of a Primary Care-Based Child	- Study conducted before 2019

Study	Code [Reason]
Obesity Prevention Intervention on Infant Feeding Practices. Journal of Pediatrics, 174, 171-177.e2, 2016	Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Guise, JM, Palda, V, Westhoff, C et al. (2003) The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force. Annals of family medicine 1(2): 70-78	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Haase, B.; Brennan, E.; Wagner, C. L. (2019) Effectiveness of the IBCLC: Have we Made an Impact on the Care of Breastfeeding Families Over the Past Decade?. Journal of Human Lactation 35(3): 441-452	- Ineligible study design Literature review (non-systematic / non-RCT)
Harari N., Rosenthal MS., Bozzi V., Goeschel L., Jayewickreme T., Onyebeke C., Griswold M., Perez-Escamilla R. Feasibility and acceptability of a text message intervention used as an adjunct tool by WIC breastfeeding peer counsellors: The LATCH pilot. Maternal and Child Nutrition, 14 (1) (no pagination), 2018	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Harris-Luna, M. L. and Badr, L. K. (2018) Pragmatic Trial to Evaluate the Effect of a Promotora Telephone Intervention on the Duration of Breastfeeding. Journal of obstetric, gynecologic, and neonatal nursing : JOGNN 47(6): 738-748	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Henderson A., Stamp G., Pincombe J. Postpartum positioning and attachment education for increasing breastfeeding: a randomized trial. Birth, 28(4): 236–42, 2001	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Hermanson, A. and Astrand, L. L. (2020) The effects of early pacifier use on breastfeeding: A randomised controlled trial. Women & Birth: Journal of the Australian College of Midwives 33(5): e473-e482	- Ineligible intervention Study reports use of foreign objects to baby's mouth
Hoddinott P., Britten J., Prescott GJ., Tappin D., Ludbrook A., Godden DJ. Effectiveness of policy to provide breastfeeding groups (BIG) for pregnant and breastfeeding mothers in primary care: cluster randomised controlled trial. BMJ, 338, a3026, 2009.	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Hoddinott P., Britten J., Pill R. Why do interventions work in some places and not others: A breastfeeding support group trial. Social Science and Medicine, 70, 769- 778, 2010	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Hodnett, E (1999) Efficacy of home-based peer counseling to promote exclusive breast-feeding: a randomized controlled trial. Journal of pediatrics 135(5): 649-650	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Hoffmann, J., Gunther, J., Stecher, L. et al. (2019) Effects of a lifestyle intervention in routine care on short-and long-term maternal	- Ineligible outcomes No protocol outcomes. Study reports proportion of women breastfeeding at 52 weeks only.

Study	Code [Reason]
weight retention and breastfeeding behavior-12 months follow-up of the cluster-randomized gelis trial. Journal of Clinical Medicine 8(6)	
Hongo, Hiroko, Green, Joseph, Shibanuma, Akira et al. (2020) The Influence of Breastfeeding Peer Support on Breastfeeding Satisfaction Among Japanese Mothers: A Randomized Controlled Trial. Journal of human lactation : official journal of International Lactation Consultant Association 36(2): 337-347	- Ineligible outcomes No protocol outcomes. Study reports data as regression output, which cannot be meta-analysed
Huang, P., Yao, J., Liu, X. et al. (2019) Individualized intervention to improve rates of exclusive breastfeeding: A randomised controlled trial. Medicine 98(47): e17822	- Ineligible country Study from low/middle income country
Huda, M. H., Chipojola, R., Lin, Y. M. et al. (2022) The Influence of Breastfeeding Educational Interventions on Breast Engorgement and Exclusive Breastfeeding: A Systematic Review and Meta-Analysis. Journal of human lactation : official journal of International Lactation Consultant Association 38(1): 156-170	- Systematic review References checked and no eligible studies identified for inclusion
Inoue, Chiaki, Hashimoto, Yuri, Nakatani, Yoko et al. (2022) Smartphone use during breastfeeding and its impact on mother-infant interaction and maternal responsiveness: Within-subject design. Nursing & health sciences 24(1): 224-235	- Ineligible study design Participants were not randomised
Javorski, M., Rodrigues, A. J., Dodt, R. C. M. et al. (2018) Effects of an educational technology on self-efficacy for breastfeeding and practice of exclusive breastfeeding. Revista da Escola de Enfermagem da U S P 52: e03329	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Jiang, H., Li, M., Wen, L. M. et al. (2019) A Community-Based Short Message Service Intervention to Improve Mothers' Feeding Practices for Obesity Prevention: Quasi-Experimental Study. JMIR MHealth and UHealth 7(6): e13828	- Ineligible country Study from low/middle income country
Kapinos, K., Kotzias, V., Bogen, D. et al. (2019) The Use of and Experiences With Telelactation Among Rural Breastfeeding Mothers: Secondary Analysis of a Randomized Controlled Trial. Journal of Medical Internet Research 21(9): e13967	- Ineligible outcomes No protocol outcomes. Study reports use of and experiences with telelactation
Karaahmet, Aysu Yildiz and Bilgic, Fatma Sule (2022) Breastfeeding success in the first 6 months of online breastfeeding counseling after cesarean delivery and its effect on anthropometric measurements of the baby: a randomized controlled study. Revista da Associacao Medica Brasileira (1992) 68(10): 1434-1440	- Ineligible country Study from low/middle income country
Kassianos, A. P., Ward, E., Rojas-Garcia, A. et al. (2019) A systematic review and meta-analysis of interventions incorporating behaviour	- Systematic review

Study	Code [Reason]
change techniques to promote breastfeeding among postpartum women. Health Psychology Review 13(3): 344-372	References checked and no eligible studies identified for inclusion
Kay, Melissa C, Cholera, Rushina, Flower, Kori B et al. (2020) Are Low-Income, Diverse Mothers Able to Meet Breastfeeding Intentions After 2 Months of Breastfeeding?. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 15(7): 435-442	- Ineligible intervention Study reports intervention to reduce early childhood obesity
Kelaher, M., Dunt, D., Feldman, P. et al. (2009) The effect of an area-based intervention on breastfeeding rates in Victoria, Australia. Health policy 90(1): 89-93	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Kellams, A. L., Gurka, K. K., Hornsby, P. P. et al. (2018) A Randomized Trial of Prenatal Video Education to Improve Breastfeeding Among Low-Income Women. Breastfeeding medicine 13(10): 666-673	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Khorasani, E. C.; Peyman, N.; Esmaily, H. (2019) Effect of education based on the theory of self-efficacy and health literacy strategies on exclusive breastfeeding: a randomized clinical trial. Koomesh 21(4): 633-638	- Ineligible country Study from low/middle income country
Kim, J. H.; Shin, J. C.; Donovan, S. M. (2019) Effectiveness of Workplace Lactation Interventions on Breastfeeding Outcomes in the United States: An Updated Systematic Review. Journal of Human Lactation 35(1): 100-113	- Systematic review References checked and no eligible studies identified for inclusion
Kim, S. K., Park, S., Oh, J. et al. (2019) Corrigendum to "Interventions promoting exclusive breastfeeding up to six months after birth: A systematic review and meta-analysis of randomized controlled trials" [Int. J. Nurs. Stud. 80 (April) (2018) 94-105. International journal of nursing studies 89: 132-137	- Erratum/Corrigendum
Kluka, S. M. (2004) A randomized controlled trial to test the effect of an antenatal educational intervention on breastfeeding duration among primiparous women. Dissertation/ thesis: 219p	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Kohan, S., Keshvari, M., Mohammadi, F. et al. (2019) Designing and Evaluating an Empowering Program for Breastfeeding: A Mixed-Methods Study. Archives of Iranian Medicine 22(8): 443-452	- Ineligible country Study from low/middle income country
Kools EJ., Thijs C., Kester AD., Vanden Brandt PA., De Vries H. A breast-feeding promotion and support program a randomized trial in The Netherlands. Preventive Medicine, 40, 60-70, 2005	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Kronborg H., Vaeth M., Olsen J., Harder I. Health visitors and breastfeeding support: influence of knowledge and self-efficacy. European Journal of Public Health, 18, 283-288, 2008	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)

Study	Code [Reason]
Krowchuk, H. V. (2019) Online Participatory Intervention to Promote and Support Exclusive Breastfeeding: Randomized Clinical Trial. MCN The American Journal of Maternal/Child Nursing 44(6): 366	- Ineligible country Study from low/middle income country
Kul Uctu, A. and Ozerdogan, N. (2022) Effect of teach-back method on breastfeeding success: A single blind randomized controlled study. Health Care for Women International: 1-14	- Ineligible country Study from low/middle income country
Labarere J., Gelbert-Baudino N., Ayral AS., Duc C., Berchotteau M., Bouchon N., Schelstraete C., Vittoz JP., Francois P., Pons JC. Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: a prospective, randomized, open trial of 226 mother-infant pairs. Pediatrics, 115, e139–46, 2005	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Laborie, Sophie, Denis, Angelique, Horsch, Antje et al. (2020) Breastfeeding peer counselling for mothers of preterm neonates: protocol of a stepped-wedge cluster randomised controlled trial. BMJ open 10(1): e032910	- Ineligible study design Study protocol
Lee, Y. H.; Chang, G. L.; Chang, H. Y. (2019) Effects of education and support groups organized by IBCLCs in early postpartum on breastfeeding. Midwifery 75: 5-11	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Lewkowitz, A. K., Lopez, J. D., Werner, E. F. et al. (2021) Effect of a Novel Smartphone Application on Breastfeeding Rates among Low-Income, First-Time Mothers Intending to Exclusively Breastfeed: Secondary Analysis of a Randomized Controlled Trial. Breastfeeding Medicine 16(1): 59-67	- Ineligible population Study data for the sub-population in the secondary analysis is already included in Lewkowitz 2020, which is included in this review.
Lok, KY, Ko, RW, Fan, HS et al. (2022) Feasibility and Acceptability of an Online WhatsApp Support Group on Breastfeeding: protocol for a Randomized Controlled Trial. JMIR research protocols 11(3): e32338	- Ineligible study design Study protocol
MacArthur C., Jolly K., Ingram L., Freemantle N., Dennis C.L., Hamburger R., Brown J., Chambers J., Khan K. Antenatal peer support workers and initiation of breast feeding: cluster randomised controlled trial. BMJ (Clinical research ed.), 338, b131, 2009	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Majors, L. and Unangst, M. (2021) Retrospective Analysis of a Nationwide Telelactation Program. Clinical Lactation 12(2): 91-100	- Ineligible study design Retrospective analysis
Malouf, R.; Henderson, J.; Alderdice, F. (2019) Expectations and experiences of hospital postnatal care in the UK: a systematic review of quantitative and qualitative studies. BMJ open 9(7): e022212	- Systematic review References checked and no eligible studies identified for inclusion
Mardhika, A., Sulistyono, A., Sulpat, E. et al. (2020) A systematic review of lactation	- Systematic review

Study	Code [Reason]
counseling for exclusive breastfeeding. International Journal of Psychosocial Rehabilitation 24(7): 7576-7586	References checked and no eligible studies identified for inclusion
Marinelli, A., Del Prete, V., Finale, E. et al. (2019) Breastfeeding with and without the WHO/UNICEF baby-friendly hospital initiative: A cross-sectional survey. Medicine 98(44): e17737	- Ineligible study design Participants were not randomised
Martinez-Brockman, J. L.; Harari, N.; Pérez-Escamilla, R. (2018) Lactation Advice through Texting Can Help: an Analysis of Intensity of Engagement via Two-Way Text Messaging. Journal of health communication 23(1): 40-51	- Ineligible study design Study/Conference abstract
Martinez-Brockman, J. L., Harari, N., Segura-Pérez, S. et al. (2018) Impact of the Lactation Advice Through Texting Can Help (LATCH) Trial on Time to First Contact and Exclusive Breastfeeding among WIC Participants. Journal of nutrition education and behavior 50(1): 33-42.e1	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
McCardel, R. E. and Padilla, H. M. (2020) Assessing Workplace Breastfeeding Support Among Working Mothers in the United States. Workplace Health & Safety 68(4): 182-189	- Ineligible study design Cross sectional survey
McFadden, A., Siebelt, L., Marshall, J. L. et al. (2019) Counselling interventions to enable women to initiate and continue breastfeeding: a systematic review and meta-analysis. International Breastfeeding Journal 14: 42	- Systematic review References checked and no eligible studies identified for inclusion
McLachlan HL., Forster DA., Amir LH., Cullinane M., Shafiei T., Watson LF., Ridgway L., Cramer RL., Small R. Supporting breastfeeding In Local Communities (SILC) in Victoria, Australia: a cluster randomised controlled trial. BMJ Open, 6, e008292, 2016	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
McQueen, K. A. (2009) Improving breastfeeding outcomes: a pilot randomized controlled trial of a self-efficacy intervention with primiparous mothers. Dissertation/ thesis: 268p	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
McQueen, K. A., Dennis, C., Stremler, R. et al. (2011) A Pilot Randomized Controlled Trial of a Breastfeeding Self-Efficacy Intervention With Primiparous Mothers. JOGNN: journal of obstetric, gynecologic & neonatal nursing 40(1): 35-46	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Meah, S. (2001) A breastfeeding intervention increased breast feeding and reduced GI tract infections and atopic eczema. Evidence based nursing: 106-106	- Ineligible study design Study/Conference abstract
Mercan, Y. and Tari Selcuk, K. (2021) Association between postpartum depression level, social support level and breastfeeding attitude and breastfeeding self-efficacy in early postpartum women. PLoS ONE [Electronic Resource] 16(4): e0249538	- Ineligible country Study from low/middle income country

Study	Code [Reason]
Messito, M. J., Katzow, M. W., Mendelsohn, A. L. et al. (2020) Starting Early Program Impacts on Feeding at Infant 10 Months Age: A Randomized Controlled Trial. Childhood obesity (Print) 16(S1): S4-S13	- Ineligible outcomes No protocol outcomes. Study reports proportion of women breastfeeding at 10 months only.
Mi, C. J. and Kyoung, K. H. (2021) Maternal Health Effects of Internet-Based Education Interventions during the Postpartum Period: A Systematic Review. Journal of Korean Academy of Community Health Nursing 32(1): 116-129	- Language not English
Mieso, B.; Neudecker, M.; Furman, L. (2020) Mobile Phone Applications to Support Breastfeeding Among African-American Women: a Scoping Review. Journal of Racial and Ethnic Health Disparities.	- Ineligible study design Literature review (non-systematic / non-RCT)
Mildon, A., Francis, J., Stewart, S. et al. (2021) Correction to: Effect on breastfeeding practices of providing in-home lactation support to vulnerable women through the Canada Prenatal Nutrition Program: protocol for a pre/post intervention study (International Breastfeeding Journal, (2021), 16, 1, (49), 10.1186/s13006-021-00396-y). International Breastfeeding Journal 16 (1)	- Erratum/Corrigendum
Mildon, A., Francis, J., Stewart, S. et al. (2021) Effect on breastfeeding practices of providing in-home lactation support to vulnerable women through the Canada Prenatal Nutrition Program: protocol for a pre/post intervention study. International Breastfeeding Journal 16(1): 49	- Ineligible study design Study protocol
Miremberg, H., Yirmiya, K., Rona, S. et al. (2022) Smartphone-based counseling and support platform and the effect on postpartum lactation: a randomized controlled trial. American Journal of Obstetrics & Gynecology MFM 4(2): 100543	- Ineligible study design Study/Conference abstract
Morse, H. and Brown, A. (2021) Accessing local support online: Mothers' experiences of local Breastfeeding Support Facebook groups. Maternal & Child Nutrition 17(4): e13227	- Ineligible study design Participants were not randomised
Murthy, P. S.; Deshmukh, S.; Murthy, S. (2020) Assisted breastfeeding technique to improve knowledge, attitude, and practices of mothers with cleft lip- and palate-affected infants: A randomized trial. Special Care in Dentistry 40(3): 273-279	- Ineligible country Study from low/middle income country
Natalia, R.; Rustina, Y.; Efendi, D. (2021) Combining breastfeeding education and support to improve breastmilk production, frequency of breastmilk expression, and partial breastfeeding in low-birth-weight infants. Journal of Neonatal Nursing.	- Ineligible country Study from low/middle income country
Necipoglu, D.; Bebis, H.; Sevig, U. (2021) The effect of nursing interventions on immigrant women living in Northern Cyprus on their breastfeeding self-efficacy and success: a	- Ineligible outcomes

Study	Code [Reason]
randomized controlled trial. Health Care for Women International 42(2): 235-247	No protocol outcomes. Study reports breastfeeding self-efficacy and success in breastfeeding
Noel-Weiss, J. (2005) The effect of prenatal education on maternal breastfeeding self-efficacy and breastfeeding duration. Effect of prenatal education on maternal breastfeeding self-efficacy & breastfeeding duration: npagp	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
O'Reilly, Sharleen L, O'Brien, Eileen C, McGuinness, Denise et al. (2021) Latch On: A protocol for a multi-centre, randomised controlled trial of perinatal support to improve breastfeeding outcomes in women with a raised BMI. Contemporary clinical trials communications 22: 100767	- Ineligible study design Study protocol
Ogbo, F. A., Akombi, B. J., Ahmed, K. Y. et al. (2020) Breastfeeding in the Community-How Can Partners/Fathers Help? A Systematic Review. International Journal of Environmental Research & Public Health [Electronic Resource] 17(2): 08	- Systematic review References checked and no eligible studies identified for inclusion
Olenick, P. L. (2006) The effect of structured group prenatal education on breastfeeding confidence, duration and exclusivity to twelve weeks postpartum. Dissertation/ thesis: 325p	- Article unavailable
Olenick, P. L. (2010) The Effect of Structured Group Prenatal Education on Breastfeeding Confidence, Duration, and Exclusivity to 12 Weeks Postpartum. JOGNN: journal of obstetric, gynecologic & neonatal nursing 39: 104	- Ineligible study design Study/Conference abstract
Oras, P., Ljungberg, T., Hellstrom-Westas, L. et al. (2020) A breastfeeding support program changed breastfeeding patterns but did not affect the mothers' self-efficacy in breastfeeding at two months. Early Human Development 151: 105242	- Ineligible outcomes No protocol outcomes. Study reports number of breastfeeding session, breastfeeding patterns, and breastfeeding self-efficacy.
Orchard, Lisa J. and Nicholls, Wendy (2020) A systematic review exploring the impact of social media on breastfeeding practices. Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues	- Systematic review References checked and no eligible studies identified for inclusion
Panahi, Farideh, Rashidi Fakari, Farzaneh, Nazarpour, Soheila et al. (2022) Educating fathers to improve exclusive breastfeeding practices: a randomized controlled trial. BMC health services research 22(1): 554	- Ineligible country Study from low/middle income country
Parry, K. C., Tully, K. P., Moss, S. L. et al. (2017) Innovative Prenatal Breastfeeding Education Curriculum: ready, Set, BABY. Journal of nutrition education and behavior 49(7): S214-S216.e1	- Ineligible study design Participants were not randomised
Petrova A., Ayers C., Stechna S., Gerling JA., Mehta R. Effectiveness of exclusive breastfeeding promotion in low-income mothers:	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)

Study	Code [Reason]
a randomized controlled study. Breastfeeding Medicine, 4, 63-69, 2009	
Piro, S. S. and Ahmed, H. M. (2020) The effectiveness of antenatal nursing intervention on initiation, exclusivity, and continuity of breastfeeding. Systematic Reviews in Pharmacy 11(1): 515-520	- Ineligible country Study from low/middle income country
Prasitwattanaseree, P., Sinsucksai, N., Prasopkittikun, T. et al. (2019) Effectiveness of breastfeeding skills training and support program among first time mothers: A randomized control trial. Pacific Rim International Journal of Nursing Research 23(3): 258-270	- Ineligible country Study from low/middle income country
Pugh LC., Milligan RA. Nursing intervention to increase the duration of breastfeeding. Applied Nursing Research, 11, 190-4, 1998	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Qian, J., Wu, T., Lv, M. et al. (2021) The Value of Mobile Health in Improving Breastfeeding Outcomes Among Perinatal or Postpartum Women: Systematic Review and Meta-analysis of Randomized Controlled Trials. JMIR MHealth and UHealth 9(7): e26098	- Systematic review References checked and no eligible studies identified for inclusion
Quinlivan JA., Box H., Evans SF. Postnatal home visits in teenage mothers: a randomised controlled trial. Lancet, 361, 893-900, 2003	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Raab, R., Michel, S., Günther, J. et al. (2021) Associations between lifestyle interventions during pregnancy and childhood weight and growth: a systematic review and meta-analysis. The international journal of behavioral nutrition and physical activity 18(1): 8	- Systematic review References checked and no eligible studies identified for inclusion
Rasmussen K M., Dieterich CM., Zelek ST., Altabet JD., Kjolhede CL. Interventions to increase the duration of breastfeeding in obese mothers: the Bassett Improving Breastfeeding Study, Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine, 6, 69-75, 2011	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Reeder JA., Joyce T., Sibley K., Arnold D., Altindag O. Telephone peer counseling of breastfeeding among WIC participants: a randomized controlled trial. Pediatrics, 134, e700–e709, 2014	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Relton, C. (2019) Valuing breastfeeding: Can financial incentives for breastfeeding help strengthen the UK breastfeeding culture?. Evidence Based Midwifery 17(1): 4-9	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Ridgway, L., Cramer, R., McLachlan, H. L. et al. (2016) Breastfeeding Support in the Early Postpartum: content of Home Visits in the SILC Trial. Birth: issues in perinatal care 43(4): 303-312	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)

Study	Code [Reason]
Rodriguez-Gallego, I., Leon-Larios, F., Corrales-Gutierrez, I. et al. (2021) Impact and effectiveness of group strategies for supporting breastfeeding after birth: A systematic review. International Journal of Environmental Research and Public Health 18(5): 1-23	- Systematic review References checked and no eligible studies identified for inclusion
Rodriguez-Gallego, I., Leon-Larios, F., Ruiz-Ferron, C. et al. (2020) Erratum: Evaluation of the impact of breastfeeding support groups in primary health centres in Andalusia, Spain: A study protocol for a cluster randomized controlled trial (GALMA project) (BMC Public Health (2020) 20 (1129) DOI: 10.1186/s12889-020-09244-w). BMC Public Health 20 (1)	- Erratum/Corrigendum
Rojjanasrirat, W. (2000) The effects of a nursing intervention on breastfeeding duration among primiparous mothers planning to return to work. Dissertation/ thesis: 226p	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Roman, C. A. K. (1992) The effect of individual and group educational interventions on first time breastfeeding mothers with implications for nursing education. Dissertation/ thesis: 143p	- Ineligible study design Quasi-experimental study design
Sabogal, I. M. U.; Narino, C. C. D.; Monsalve, M. A. M. (2021) Lactation counseling for maintaining exclusive breastfeeding in adolescent mothers: a trial protocol. Pilot and Feasibility Studies 7(1)	- Ineligible country Study from low/middle income country
Saglik, M. and Karacam, Z. (2021) Effectiveness of structured education and follow-up in the management of perceived breastmilk insufficiency: a randomized control trial. Health Care for Women International: 1-19	- Ineligible country Study from low/middle income country
Saljughi, F., Kohan, S., Savabi-Esfahani, M. et al. (2020) Breastfeeding training through role-play and effects on mother-infant attachment behaviours: A randomised controlled trial. Africa Journal of Nursing and Midwifery 22 (1)	- Ineligible country Study from low/middle income country
Sandy JM., Anisfeld E., Ramirez E. Effects of a prenatal intervention on breastfeeding initiation rates in a Latina immigrant sample. Journal of Human Lactation, 25, 404–11, 2009	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Schlickau, J. M. (2005) Prenatal breastfeeding education: an intervention for pregnant immigrant Hispanic women. Dissertation/ thesis: 124p	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Seddighi, Aazam; Khalesi, Zahra Bostani; Majidi, Soheila (2022) The effect of mobile-based training on maternal breastfeeding self-efficacy: a randomized clinical trial. African health sciences 22(3): 648-655	- Ineligible country Study from low/middle income country
Segura-Perez, S., Hromi-Fiedler, A., Adnew, M. et al. (2021) Impact of breastfeeding interventions among United States minority women on breastfeeding outcomes: a	- Systematic review References checked and no eligible studies identified for inclusion

Study	Code [Reason]
systematic review. International Journal for Equity in Health 20(1): 72	
Shafaei, F. S.; Mirghafourvand, M.; Havizari, S. (2020) The effect of prenatal counseling on breastfeeding self-efficacy and frequency of breastfeeding problems in mothers with previous unsuccessful breastfeeding: a randomized controlled clinical trial. BMC Women's Health 20(1): 94	- Ineligible country Study from low/middle income country
Shortis, E. (2019) Have interventions been effective at increasing the rates of breastfeeding in the UK?. British Journal of Midwifery 27(5): 312-319	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Souza, Efdc; Pina-Oliveira, A. A.; Shimo, A. K. K. (2020) Effect of a breastfeeding educational intervention: a randomized controlled trial. Revista Latino-Americana de Enfermagem 28: e3335	- Ineligible country Study from low/middle income country
Stockdale J., Sinclair M., Kernohan G., Keller JM., Dunwoody L., Cunningham JB., Lawther L., Weir P. Feasibility study to test Designer Breastfeeding: a randomised controlled trial. Evidence Based Midwifery, 6, 76–82, 2008	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Tang, K., Gerling, K., Chen, W. et al. (2019) Information and Communication Systems to Tackle Barriers to Breastfeeding: Systematic Search and Review. Journal of Medical Internet Research 21(9): e13947	- Systematic review References checked and no eligible studies identified for inclusion
Tang, L., Lee, A. H., Binns, C. W. et al. (2021) Correction to: WeChat-based intervention to support breastfeeding for Chinese mothers: protocol of a randomised controlled trial (BMC Medical Informatics and Decision Making, (2020), 20, 1, (300), 10.1186/s12911-020-01322-8). BMC Medical Informatics and Decision Making 21 (1)	- Erratum/Corrigendum
Taylor, Y. J.; Scott, V. C.; Danielle Connor, C. (2020) Perceptions, Experiences, and Outcomes of Lactation Support in the Workplace: A Systematic Literature Review. Journal of human lactation : official journal of International Lactation Consultant Association 36(4): 657-672	- Ineligible study design Literature review. No RCTs included.
Thomson, J. L., Tussing-Humphreys, L. M., Goodman, M. H. et al. (2017) Low rate of initiation and short duration of breastfeeding in a maternal and infant home visiting project targeting rural, Southern, African American women. International breastfeeding journal: 1-11	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Tseng, J. F., Chen, S. R., Au, H. K. et al. (2020) Effectiveness of an integrated breastfeeding education program to improve self-efficacy and exclusive breastfeeding rate: A single-blind, randomised controlled study. International Journal of Nursing Studies 111: 103770	- Ineligible intervention Intervention starts and finishes antenatally. These interventions are out of scope and are already covered in both NG194 and the antenatal care guideline NG201.

Study	Code [Reason]
Tussing-Humphreys, L., Thomson, J. L., Goodman, M. et al. (2019) Enhanced vs Standard Parents as Teacher Curriculum on Factors Related to Infant Feeding among African American Women. Southern Medical Journal 112(10): 512-519	- Ineligible outcomes No protocol outcomes. Study reports maternal knowledge and beliefs about infant feeding and compliance with infant feeding recommendations.
van Dellen, S. A., Wisse, B., Mobach, M. P. et al. (2019) The effect of a breastfeeding support programme on breastfeeding duration and exclusivity: a quasi-experiment. BMC Public Health 19(1): 993	- Ineligible study design Quasi randomised
Wambach KA., Aaronson L., Breedlove G., Domian EW., Rojjanasrirat W., Yeh HW. A randomized controlled trial of breastfeeding support and education for adolescent mothers. Western Journal of Nursing Research, 33, 486–505, 2011	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Washio, Y., Atreyapurapu, S., Hayashi, Y. et al. (2021) Systematic review on use of health incentives in U.S. to change maternal health behavior. Preventive Medicine 145: 106442	- Systematic review References checked and no eligible studies identified for inclusion
Wen, Juan, Yu, Guiling, Kong, Yan et al. (2021) Effects of a theory of planned behavior-based intervention on breastfeeding behaviors after cesarean section: A randomized controlled trial. International journal of nursing sciences 8(2): 152-160	- Ineligible country Study from low/middle income country
Wilhelm SL., Stepans MB., Hertzog M., Rodehorst TK., Gardner P. Motivational interviewing to promote sustained breastfeeding. Journal of obstetric, gynecologic, and neonatal nursing: JOGNN / NAACOG, 35, 340-348, 2006	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Wilhelm L., Aguirre M., Koehler E., Rodehorst TK. Evaluating motivational interviewing to promote breastfeeding by rural Mexican-American mothers: the challenge of attrition. Issues in Comprehensive Pediatric Nursing, 38, 7–22, 2015	- Study conducted before 2019 Articles published before 19th April 2019 will not be included (date when the search for evidence review P in the postnatal care guideline was run)
Wong, M. S.; Mou, H.; Chien, W. T. (2021) Effectiveness of educational and supportive intervention for primiparous women on breastfeeding related outcomes and breastfeeding self-efficacy: A systematic review and meta-analysis. International Journal of Nursing Studies 117: 103874	- Systematic review References checked and no eligible studies identified for inclusion
Wrenn, S. E. (1997) Effects of a model-based intervention on breastfeeding attrition. Dissertation/ thesis: 187p	- Ineligible study design Quasi-experimental study design
Yesil, Y.; Eksioglu, A.; Turfan, E. C. (2022) The effect of hospital-based breastfeeding group education given early perinatal period on breastfeeding self-efficacy and breastfeeding status. Journal of Neonatal Nursing.	- Ineligible country Study from low/middle income country
Yilmaz, M. and Aykut, M. (2021) The effect of breastfeeding training on exclusive	- Ineligible country Study from low/middle income country

Study	Code [Reason]
breastfeeding: a randomized controlled trial. Journal of Maternal-Fetal & Neonatal Medicine 34(6): 925-932	
Yin, Caixin, Su, Xi, Liang, Qiuxia et al. (2021) Effect of Baby-Led Self-Attachment Breastfeeding Technique in the Postpartum Period on Breastfeeding Rates: A Randomized Study. Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine 16(9): 734-740	- Ineligible country Study from low/middle income country
You, H., Lei, A., Xiang, J. et al. (2020) Effects of breastfeeding education based on the self-efficacy theory on women with gestational diabetes mellitus: A CONSORT-compliant randomized controlled trial. Medicine 99(16): e19643	- Ineligible country Study from low/middle income country
Yurtsal, B. and Hasdemir, O. (2022) "Effects of the whatsapp midwife breastfeeding support line on early postpartum breastfeeding process of mothers". Health Care for Women International: 1-16	- Ineligible country Study from low/middle income country
Zhang, Y.; Yuan, R.; Ma, H. (2021) Effect of the theory of planned behavior on primipara breastfeeding. Annals of Palliative Medicine 10(4): 4547-4554	- Ineligible country Study from low/middle income country
Zhao, Y., Lin, Q., Wang, J. et al. (2020) Effects of prenatal individualized mixed management on breastfeeding and maternal health at three days postpartum: A randomized controlled trial. Early Human Development 141: 104944	- Ineligible country Study from low/middle income country
Zhu, Y., Zhang, Z., Ling, Y. et al. (2017) Impact of intervention on breastfeeding outcomes and determinants based on theory of planned behavior. Women and birth 30(2): 146-152	- Ineligible country Study from low/middle income country
Zhuang, J. (2021) Developing Messages Tailored to Self-construal, Time-orientation, and Perspective Taking to Promote 6-Month Exclusive Breastfeeding. Journal of Health Communication 26(3): 204-213	- Ineligible study design Participants were not randomised

Excluded economic studies

Study	Reason for exclusion
Anokye N, Coyle K, Relton C, Walters S, Strong M, Fox-Rushby J. Cost-effectiveness of offering an area-level financial incentive on breast feeding: a within-cluster randomised controlled trial analysis. Arch Dis Child 2020; 105(2):155-159	Outcome measured at 6-8 weeks post-partum
Camacho EM, Hussain H. Cost-effectiveness evidence for strategies to promote or support breastfeeding: a systematic search and narrative literature review. BMC Pregnancy Childbirth. 2020;20(1):757.	Systematic review (individual studies checked for eligibility)

Study	Reason for exclusion
Hoddinott P, Britten J, Prescott GJ, Tappin D, Ludbrook A, Godden DJ. Effectiveness of policy to provide breastfeeding groups (BIG) for pregnant and breastfeeding mothers in primary care: cluster randomised controlled trial. BMJ 2009; 338:a3026.	Outcome measured at 6-8 weeks post-partum
Hoddinott P, Craig L, Maclennan G, Boyers D, Vale L; NHS Grampian and the University of Aberdeen FEST Project Team. The FEeding Support Team (FEST) randomised, controlled feasibility trial of proactive and reactive telephone support for breastfeeding women living in disadvantaged areas. BMJ Open 2012; 2(2):e000652.	Outcome measured at 6-8 weeks post-partum
Stevens B, Guerriere D, McKeever P, Croxford R, Miller KL, Watson-MacDonell J, Gibbins S, Dunn M, Ohlsson A, Ray K, Coyte P. Economics of home vs. hospital breastfeeding support for newborns. Journal of Advanced Nursing 2006, 53(2):233-243.	Outcome measured at 5-12 days post-partum

Appendix K Research recommendations – full details

No research recommendations were made for this review question.

Appendix L Supplementary data for studies included from NICE guideline on postnatal care

For outcome data on any and exclusive breastfeeding at 6-12 weeks and any breast feeding at 16-26 weeks please refer to NICE guideline on postnatal care, evidence review P.

Please see below outcome data for exclusive breastfeeding at 16 weeks from studies included in evidence review P in the NICE guideline on postnatal care. For full data extraction for these studies, please refer to NICE guideline on postnatal care, evidence review P.

Table 34: Outcome data for exclusive breastfeeding at 16-26 weeks- studies included from NG194 Postnatal care

Study ID	Exclusive breastfeeding at 16-26 weeks			
	Intervention (n)	Sample size, completers (N)	Control (n)	Sample size, completers (N)
Bonuck 2005	6	103	42	97
Bonuck 2014a	1	71	1	71
Bonuck 2014b	6	231	1	71
Bonuck 2014c	2	125	2	125
Chan 2016	4	271	59	301
Chapman 2004	46	93	14	97
Curro 1997	50	292	64	138
Efrat 2015	12	90	1	86
Elliott-Rudder 2014	22	418	70	421
Jolly 2012	48	112	0	113
Labarere 2003	13	1431	135	2065
Laliberte 2016	151	140	21	140
Lutenbacher 2018	2	14	3	13
McDonald 2010	73	21	3	20
Muirhead 2006	2	94	45	94
Nilsson 2017	73	77	42	75
Piscane 2005	35	55	7	59
Pollard 2010	10	41	2	46

Study ID	Exclusive breastfeeding at 16-26 weeks			
	Intervention (n)	Sample size, completers (N)	Control (n)	Sample size, completers (N)
Pugh 2002	6	126	22	119
Pugh 2010	49	50	17	50
Redman 1995	45	174	7	168
Simonetti 2012	14	278	6	283
Srinivas 2015	1	103	42	97
Su 2007	11	71	4	69
Vidas 2011	47	150	24	172
Wallace 2006	7	271	59	301
Wen 2011	12	93	14	97

Appendix M Meta-regression methods and results

Introduction – overview of meta-regression

Due to the large volume of included studies for intervention 1 ‘education, advice or support from peer or professional provided postnatally and initiated either antenatally or postnatally’ and the variability of the interventions across the studies, meta-regression was conducted in addition to the pairwise meta-analysis. Meta-regression allows for the analysis of the effectiveness of the different variables that made up each study’s intervention and would determine what component of an intervention was effective irrespective of all other components that made up the intervention. Meta-regression was implemented in WinBUGS 1.4.3 (Spiegelhalter 2003).

For the purpose of the meta-regression analysis, each study under this intervention category was categorised using the following variables:

- number of contact visits
    - 0 contacts, code in WinBUGS: contact0
    - 1 contact, code in WinBUGS: contact1
    - 2 to 3 contacts, code in WinBUGS: contact23
    - 4 to 8 contacts, code in WinBUGS: contact48
    - 9 or more contacts, code in WinBUGS: contact9
- how delivered
    - Face-to-face on an individual basis, code in WinBUGS: Individual
    - Face-to-face in a group, code in WinBUGS: Group
    - Remote, code in WinBUGS: Remote
    - Self-help, code in WinBUGS: Selfhelp
- duration of contact
    - contact with the intervention lasted more than 8 weeks, code in WinBUGS: contactmore8
    - contact with the intervention lasted less than 8 weeks, code in WinBUGS: contactless8
- where the intervention was delivered
    - at the woman’s home, code in WinBUGS: Home
    - in a healthcare setting code in WinBUGS: healthcaresetting
    - combination of both home and healthcare setting code in WinBUGS: Mixed

Individual models were first run for each of the variable categories (number of contacts, how delivered, duration of contact and where the intervention was delivered). We attempted to run a final ‘combined’ model, ideally incorporating all variables in one analysis. However, there was significant collinearity between the variables, which did not allow the model to converge. To avoid this, a number of variables and/or categories within variables needed to be omitted or merged – this considerably reduced the information provided by the combined model and increased the uncertainty around the resulting study effects, so it was decided not to consider an analysis using the combined model.

WinBUGS code, goodness of fit assessment and outputs of the analysis

A sample WinBUGS code for the analysis of any breastfeeding at 16 to 26 weeks is given in Table 35 for the variable “how” the intervention was delivered. The code was adapted from Welton 2009. Other analyses used the same substantive code, but were modified to include

the relevant predictor variable categories for the model under consideration. Each WinBUGS model was run with an initial burn-in period of 100,000 iterations, followed by 100,000 further iterations. Two initial chains were used.

Results were reported as risk ratios (RRs) with 95% CIs of each intervention component versus standard care.

Table 35. Sample WinBUGS code for the analysis of any breastfeeding at 16 to 26 weeks for the variable "how" the intervention was delivered

Sample WinBUGS code

```
model{

for (i in 1:ndata){
        r[i]~dbin(p[i],n[i])
        logit(p[i])<- mu[s[i]] + delta[i]*(1-equals(trt[i],1))
        delta[i]~dnorm(md[i],taud[i])
                md[i]<- d[2]*(1-equals(Individual[i],0)) + d[3]*(1-equals(Group[i],0))  + d[4]*(1-
equals(Remote[i],0)) + d[5]*(1-equals(Selfhelp[i],0)) + sw[i]*equals(m[i],3)
        taud[i]<- tau*(1+equals(m[i],3)/3)

#Deviance contribution
    rhat[i] <- p[i] * n[i]
    dev[i] <- 2 * (r[i] * (log(r[i])-log(rhat[i]))  +  (n[i]-r[i]) * (log(n[i]-r[i]) - log(n[i]-rhat[i])))
}
        resdev<- sum(dev[])

sw[1]<- 0
for (i in 2:ndata){sw[i]<- (delta[i-1] - (d[2]*(1-equals(Individual[i-1],0)) + d[3]*(1-equals(Group[i-1],0))
+ d[4]*(1-equals(Remote[i-1],0)) + d[5]*(1-equals(Selfhelp[i-1],0))  ))/2}

for (j in 1:nstudy){
        mu[j]~dnorm(0,.01)
}

tau<- 1/(sd*sd)
sd~dunif(0,2)

A ~ dnorm(-0.405465108,1184.4)

d[1]<-0
for (k in 2:ntrt){
        d[k]~dnorm(0,.01)
        or[k]<- exp(d[k])
}
for (k in 1:ntrt) { logit(Td[k]) <- A + d[k] }
rrd[1]<-1
for (k in 2:ntrt) {
rrd[k] <- Td[k]/Td[1]
}
dum1<- usual[1]
dum2<-contact0[1]
```

Sample WinBUGS code

```
dum3<-contact1[1]
dum4<-contact23[1]
dum5<-contact48[1]
dum6<-contact9[1]
dum7<-contactless8[1]
dum8<-contactmore8[1]
dum9<-healthcaresetting[1]
dum10<-Home[1]
dum11<-Both[1]
}
```

Results

Table 36 reports the results of the meta-regression individual models for the comparison of education, advice or support from peer or professional provided postnatally and initiated antenatally or postnatally (Intervention 1) versus standard care for the outcomes 'any breastfeeding between 6 and 12 weeks', 'exclusive breastfeeding between 6 and 12 weeks', 'any breastfeeding between 16 and 16 weeks', and 'exclusive breastfeeding between 16 and 26 weeks'. Results in bold indicate a statistically significant result.

Table 36: Results of the meta-regression – individual models. Comparison of each variable category versus standard care

Variable	Outcome			
	Any BF at 6-12 weeks	Exclusive BF at 6-12 weeks	Any BF at 16-26 weeks	Exclusive BF at 16-26 weeks
How	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**
F-2-F – individual	**1.11 (1.05 to 1.18)**	**1.45 (1.18 to 1.75)**	**1.08 (1.01 to 1.15)**	1.15 (0.82 to 1.58)
F-2-F – group	**1.58 (1.19 to 1.81)**	**1.93 (1.09 to 2.90)**	**1.64 (1.34 to 1.93)**	**6.06 (2.48 to 11.15)**
Remote	**1.11 (1.00 to 1.20)**	**1.59 (1.30 to 1.93)**	**1.14 (1.04 to 1.25)**	**2.92 (1.79 to 4.47)**
Self-help	1.05 (0.86 to 1.23)	1.48 (0.98 to 2.06)	1.03 (0.82 to 1.24)	1.07 (0.45 to 2.09)
Number of Contacts	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**
0	0.95 (0.68 to 1.22)	1.31 (0.50 to 2.42)	1.05 (0.65 to 1.49)	0.89 (0.33 to 1.92)
1	1.06 (0.93 to 1.17)	1.13 (0.47 to 2.08)	1.05 (0.90 to 1.19)	
2 – 3	1.05 (0.96 to 1.14)	1.30 (0.98 to 1.68)	1.09 (0.95 to 1.23)	1.28 (0.62 to 2.32)
4 – 8	**1.19 (1.11 to 1.28)**	**1.76 (1.44 to 2.12)**	**1.20 (1.09 to 1.31)**	**2.42 (1.53 to 3.64)**
9+	**1.14 (1.05 to 1.23)**	**1.53 (1.23 to 1.86)**	1.09 (0.97 to 1.23)	1.45 (0.78 to 2.48)
Duration of contact	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**
< 8 weeks	**1.08 (1.02 to 1.15)**	**1.53 (1.27 to 1.82)**	1.07 (0.98 to 1.16)	1.27 (0.79 to 1.91)
> 8 weeks	**1.16 (1.09 to 1.23)**	**1.55 (1.29 to 1.84)**	**1.17 (1.08 to 1.27)**	**2.15 (1.41 to 3.13)**
Where delivered	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**	**mean RR (95% CrI)**
Healthcare setting	**1.13 (1.02 to 1.24)**	**1.39 (1.04 to 1.78)**	**1.15 (1.02 to 1.29)**	1.57 (0.86 to 2.60)
Home	**1.07 (1.00 to 1.14)**	**1.57 (1.30 to 1.86)**	**1.09 (1.01 to 1.18)**	**2.05 (1.28 to 3.12)**
Mixed	**1.21 (1.10 to 1.30)**	**1.67 (1.26 to 2.14)**	**1.21 (1.04 to 1.38)**	1.28 (0.64 to 2.30)

Table abbreviations: BF = breastfeeding; F-2-F = face-to-face; RR = risk ratio
All statistically significant effects are shown in bold.
For the variable 'number of contacts' in 'exclusive BF at 16-26 weeks', 0 and 1 contacts were merged into one category, otherwise the model could not converge.

References

Spiegelhalter D., Thomas A., Best N., Lunn D. WinBUGS user manual: version 1.4. Cambridge: MRC Biostatistics Unit, 2003

Welton NJ., Caldwell DM., Adamopoulos E., Vedhara K. Mixed treatment comparison meta-analysis of complex interventions: psychological interventions in coronary heart disease. American Journal of Epidemiology. 1;169(9):1158-65, 2009