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Educational and supportive interventions to prolong breastfeeding in Australia: a scoping review

Abstract

Background: The World Health Organization (WHO) recommends exclusive breastfeeding (EBF) i.e. feeding infants breastmilk and no other foods or liquids for the first 6 months of life. In Australia, the initiation rate of breastfeeding is high (90.4%). Yet, breastfeeding duration and exclusivity is well below the WHO recommendation. This scoping review examines the efficacy and characteristics of interventions aimed to improve the duration of breastfeeding whether exclusive or in combination up to 6 months of age in Australia.

Methods: Online databases Medline and Embase were searched for relevant studies. Studies were included if they were undertaken in Australia during the last 10 years, and included educational, support-based or in-hospital breastfeeding interventions and documented duration of breastfeeding.

Results: 11 studies met the imposed criteria. Most interventions improved breastfeeding rates, for example from 6.5% to 19% for EBF when assessed at 6 months, from 75% to 82% for breastfeeding at 6 weeks. The interventions included: accreditation for breastfeeding friendly hospitals, breastfeeding classes, nurse home visits and drop-in clinics, breastfeeding support in primary care, telephone support, breastfeeding smartphone applications, relevant websites and text-messaging services. Interventions that were successful, provided support for mothers beyond their postnatal period. Most common enablers reported were program facilitators that were volunteers who were peers with similar experiences, rather than breastfeeding professionals, in addition to interventions that focussed on psychological factors that influenced breastfeeding outcomes.

Conclusions: While the interventions to date were promising, further prospective randomised controlled trials are needed to determine which interventions would be best in prolonging breastfeeding. The findings would help support the commendable intentions to breastfeed expressed by most Australian mothers shortly after the birth of their infant.

Keywords: breastfeeding, duration, interventions – community/father/internet-based, baby-friendly hospitals

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Abbreviations: EBF, exclusive breastfeeding; WHO, world health organization; RCT, randomised controlled trial; BFHI, baby friendly hospital initiative; MCHN, maternal child health nurse

Introduction

Successful breastfeeding is a global public health priority. The World Health Organization (WHO) recommends 'exclusive breastfeeding' (EBF), defined as feeding infants' breastmilk and no other foods or liquids for the first six months of life, followed by breastfeeding and the addition of solid or semi-solid foods until two years of age.[1] This guideline is based on the premise that breastfeeding in developing countries is essential for the survival of the infant. However, in developed countries EBF despite its proven benefits, is influenced by the ready availability of breastmilk substitutes Table 1.[2]

Table 1 Definition of key breastfeeding terms

Term	Definition
Breastfeeding	An infant-feeding method where the infant receives breast milk either directly from the breast or as expressed milk. The infant can also receive additional food or liquid including formula.[28]
Expressed breast milk	Breast milk that has been removed from the breast without an infant's mouth at the nipple.[29]
Formula feeding	An infant-feeding method where the infant receives infant formula, an industrially produced substitute for human breast milk.[30]
Exclusive breastfeeding	An infant-feeding method where an infant receives only breast milk and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medications.[28]
Predominant breastfeeding	An infant-feeding method where the infant's predominant source of nourishment is breast milk, but he or she may also receive water and water-based drinks (e.g. fruit juice) as well as drops or syrups consisting of vitamins, mineral supplements or medications.[28]
Fully breastfeeding	An infant-feeding method where breast milk is the main source of nourishment. Includes those that are exclusively breastfed or predominantly breastfed.[28]
Complementary breastfeeding	An infant-feeding method where the infant receives solid or semi-solid food in addition to breastmilk.[28]

The benefits of breastfeeding for both mother and infant are well documented and extend beyond the initial protection against infectious diseases as breastmilk has both immunological and anti-bacterial properties.[3] When compared with formula fed infants, it protects against gastrointestinal illnesses, otitis media and respiratory tract infections, in addition to reducing the incidence of necrotising enterocolitis in neonates.[3] Breastmilk has been associated with lower blood pressure readings in adolescents, and a reduced risk of obesity and hypercholesterolaemia in adults.[3,4] There is also compelling evidence that breastfeeding enhances mothers' post-partum recovery through accelerated uterine contraction. In addition, it provides some protection against ovarian cancer and pre-menopausal breast cancer.[3–5]

Initiation of EBF in Australia is comparatively high, at a rate of 90.4% following hospital discharge.[6] This percentage differs from other developed countries such as Canada (69-83%) and the USA, where initiation rates are historically low (27-69.5%).[7] Despite a high initiation rate and the proven benefits of breastmilk for both mother and infant, the duration of the breastfeeding follows a steep decline. The Australian National Infant Feeding Survey conducted in 2010 reported only 39% of infants were exclusively breastfed at 4 months, and at 6 months only 15% of infants were exclusively breastfed, though 60% still received some breastmilk at 6 months.[6] A more recent study found that almost half of infants were exclusively breastfed at 4 months with 68% breastfed at 6 months.[8] There are many factors which influence the successful establishment and maintenance of breast feeding. Breastfeeding outcomes are consistently poorer in mothers that are under 24 years of age, have a lower level of education or socio-economic status, or are overweight or obese.[6] Furthermore, barriers to long term breastfeeding include early return to work, limited family support and suboptimal breastfeeding education.[4,9,10] Mothers tend to lose motivation to breastfeed when they encounter lactation difficulties such as an insufficient milk supply, nipple pain and breast engorgement.[10] Educating mothers in the antenatal period about latching and feeding technique helps reduce the frequency of such problems.[11]

Early cessation of breastfeeding in Australia has been recognised and has led to the development of a broad range of innovative initiatives. The major strategy at an institutional level has been the Baby-Friendly Hospital Initiative (BFHI), a structured program used in hospitals worldwide and underpinned by ten infant-friendly practices as set by the WHO.[12,13] Implemented in Australia in 1992, the BFHI ensures health care staff educate pregnant women about the benefits of breastfeeding, guide mothers on how to breastfeed, prevent newborns receiving milk other than breastmilk, and practice 'rooming-in' which allows infants to remain with their mothers throughout.[13,14] Non-institutional or community interventions come in a variety of forms and contexts, and may be educational, supportive or both. Educational interventions deliver breastfeeding information in the antenatal and/or postnatal period. They aim to improve knowledge about breastfeeding, which is positively associated with longer EBF duration.[4,15] Breastfeeding support on the other hand is usually emphasised in the postnatal period and involves such psychological tasks as listening to and encouraging the mother.[15] That in turn may improve her breastfeeding self-efficacy, defined as confidence in her perceived ability to breastfeed, which is a strong predictor of breastfeeding duration.[16] Breastfeeding attitudes in particular from the mother's partner, have been shown to be a strong enabler or barrier to breastfeeding.[4,17] Women who perceived their partners to be supportive of breastfeeding were more likely to initiate breastfeeding and breastfed for longer than those whose partners favoured formula feeding.[17]

Prolonging breastfeeding remains an issue in Australia. This review focuses on interventions that seek to lengthen the duration of breastfeeding rather than focussing on the initiation of breastfeeding. It aims to examine the efficacy and characteristics of interventions to prolong breastfeeding whether exclusive or predominant up to 6 months of age when compared with standard care. Not all high-income countries are comparable as they differ in their societal attitudes extent of standard care. This review summarises local breastfeeding education and support in a multitude of contexts.[18–27]

Methods

A scoping reviewed was undertaken to study what interventions have been undertaken within Australia to prolong breastfeeding.[31] The online databases Medline (Ovid) and Embase were searched in June and July 2022 using the keywords in Table 2.

Table 2 search terms used in search strategy

Search field:	Search term:
Title	Breastfed* or breastfeed* or breast-fed* or breast-feed* or breast fed* or breast feed* or infant feeding or infant-feeding
	AND
Abstract	Intervention* or outcome*
	AND
Institution	Australia

Filters applied: English language, publication date 2013 – present.

Inclusion and exclusion criteria

Papers reviewed were those that included pregnant women or couples aged 18 year and over who had expressed their intention to breastfeed or had already initiated breastfeeding at the time of recruitment.

Types of interventions

Only interventions that provided breastfeeding education or breastfeeding support were included. The intervention could be carried out in a primary care setting, a drop-in centre, during a home visit or in-person class, over the phone or via a smartphone application, text message or website. Interventions were implemented in the antenatal and/or postnatal periods. Studies where no intervention occurred, or only identified risk factors resulting in the cessation of breastfeeding were excluded.

Outcomes

Studies measuring breastfeeding rates, whether it was exclusive, fully, complementary or any breastfeeding, from birth to 6 months of age were included if they reported on the duration of breastfeeding

Location, year of publication and study design

To narrow the scope of this review only studies analysing Australian data over the last 10 years were included. The reference lists of these reviews were further screened for studies performed within Australia that had not been identified in the initial search.

Results

Eleven studies were included in this review. Five studies were randomised controlled trials (RCTs), four were cohort studies and two were of quasi-experimental design. All studies were conducted in Australia with publication dates ranging between 2013 and 2021. Sample sizes varied; one study had a particularly small sample

size (n=46)[24] while others ranged from 234 to 7039. Many studies recorded rates of 'any' breastfeeding, with six studies also recording EBF rates. Eight studies measured outcomes to 6 months of age while the others stopped earlier. Strategies implemented in the studies included: antenatal educational classes (n=3), telephone support (n=2), smartphone application (n=3), text-messaging service (n=1), website (n=2), nurse home-visits and drop-in clinics (n=1), hospital-accreditation (n=1), and support in primary care (n=1). All control groups received standard care which varied according to location Figure 1.

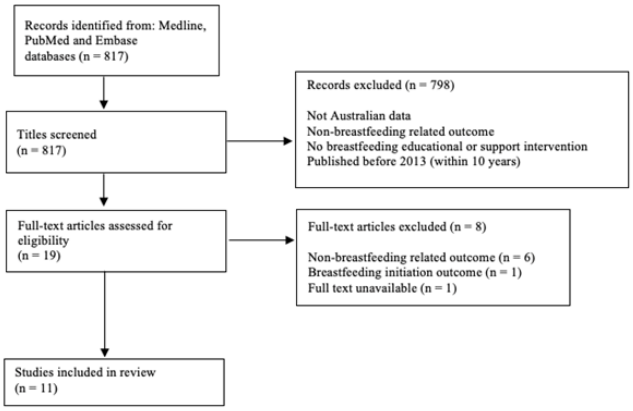

Figure 1 PRISMA flow diagram.

Institutional influences

Institutions may provide a structured and multi-component programme for health care establishments to follow, such as the Baby Friendly Hospital Initiative (BFHI). While breastfeeding initiation rates were high (96%) in both BFHI and non BFHI-accredited hospitals in Queensland, Brodribb et al. suggested there was little or no difference in the rate and duration of breastfeeding in either institutions.[24] Kinnear however strongly disputed these conclusions suggesting that the data provided showed at 1 month 81.1% of women from BFHI-accredited hospitals were breastfeeding with 57.6% EBF.[32] So that 23.5% were having supplementary feeds compared with 32.4% in non BFHI-accredited hospitals.[32] The infant-friendly practices that underpin BFHI-accreditation now extend to a varying extent into non-BFHI hospitals influencing clinical practice including breastfeeding rates.[24,33]

Brodribb et al.,[24] nevertheless reported that the rates of any breastfeeding at 1 and 4 months increased in a dose-dependent manner as the number of infant-friendly practices as reported by the mother increased.[24] These findings suggest that BFHI implementation does little to extend EBF duration at least to 6 months in an Australian context despite the initiation rates being high. More attention may need be paid to providing community-centred support for breastfeeding mothers beyond the early postpartum period.[24,33]

Community influences

Community intervention aimed to improve knowledge about breastfeeding and imbue a desire to breastfeed, whilst providing support to the mother and enriching her interpersonal relationships, may both influence breastfeeding outcomes.[20] Three studies investigated community interventions to prolong the duration of breastfeeding through breastfeeding education classes, telephone support, drop-in centres and primary care settings.[18–20] Successful community interventions focussed beyond the postnatal period and relied on multiple face-to-face encounters over a longer 3 to 6 months and included both ongoing education and supportive measures. To continue breastfeeding, women need to juggle a range of psychological and personal factors over and above their intention to breastfeed, attain self-efficacy further helped by ongoing social support.[34] The two community-based studies that succeeded in prolonging breastfeeding duration, paid close attention to addressing these factors in their intervention.[18,20] For example, one study investigated the combination of antenatal education sessions and postnatal telephone support. It encouraged participants to invite friends and family to the sessions. Take-home activities were designed to initiate discussion and build a committed group of support people.[18] These interventions successfully increased EBF rates at 6 months from 6.5% to 19%. However the study only included those who had previously expressed a desire to breastfeed. Any change in the participants' feelings of self-efficacy, or the increased availability of social supports were not measured.[18]

Further characteristics that were consistent amongst the studies were interventions that were proactive and delivered by trained providers. All three community support studies involved trained health workers (predominantly nurses) to deliver breastfeeding support. Elliot-Rudder et al. reported that general practice nurses trained in motivational interviewing techniques used those techniques to encourage mothers to continue breastfeeding. That resulted in a significantly increased rate of EBF at 4 months.[20] McLachlan et al.,[25] found that proactive interventions established contact with the mothers and provided anticipatory support, rather than waiting for mothers to request such support.[19] All three studies involved telephoning participants in response to their concerns while providing encouragement. In addition, such telephone consultations allowed for identifying mothers who were likely to stop breastfeeding and resulted in organising a home-visit within 1 week of hospital discharge.[19] Embedding community interventions into clinical practice by integrating them into pre-existing health care settings rather than creating new infrastructures was found to be more cost effective. McLachlan et al.,[25] created staffed drop-in centres for breastfeeding advice and education, but were unable to elicit any difference in breastfeeding outcomes.[19] This result was largely attributed to poor attendance at the centres, compounded by staff shortages, while the wider community were generally unaware of the new service.[19] This finding contrasted to that of Elliot-Rudder et al.,[20] which used pre-existing general practice nurses to deliver breastfeeding support to mothers while attending with their infants for their routine vaccination at 2, 4 and 6 months.[20] Taking advantage of such attendance at regular intervals proved effective and allowed for delivery of a meaningful service delivery which contributed to a demonstrable improvement in breastfeeding practice.[20]

Influences generated by fathers

Interventions which involved the fathers created an opportunity to address misinformation, ambivalence and/or negative attitudes towards breastfeeding.[35,36] Two studies explored the importance of educating fathers about breastfeeding using educational classes. A smartphone application (app), aimed to create online discussion between the fathers. Maycock et al. described a father-focused antenatal class which provided further information on infant feeding and to trouble-shoot I common problems that may arise from breastfeeding.[27] Although the study's primary focus was on fathers, maternal attitudes were also influenced. A significant number of mothers in the intervention group subsequently developed favourable attitudes towards breastfeeding.[27] This change then translated to an increase in the breastfeeding rates at 6 weeks from 75% in the non-intervention group to 82% in the intervention group. However, it failed to influence the breastfeeding rates at 6 months.[27] Of note

the intervention tended to be short lived and was undertaken in the antenatal period. This limitation was addressed by a study of Scott et al. that involved a similar antenatal class with an additional application that engaged fathers. It provided them with breastfeeding information and guidance via discussion boards until 6 months postpartum.[21] Classes were run by trained peer facilitators who had a child under 3 years of age who they had breastfed for at least 3 months.[21] However, extending the intervention's duration and involving peer facilitators did not demonstrate any effect on breastfeeding outcomes. This disappointing finding may have been related to a drop in attendance and a self-selection bias as the participants were a socially advantaged and highly educated sample that was already familiar with the importance of breastfeeding and were strongly motivated even before entering the trial.[21]

Offsite interventions

Breastfeeding intervention may be provided via the telephone, internet websites, smartphone apps or text-messaging services, and may provide an inexpensive, time-efficient and more accessible alternative to face-to-face interventions.[37] A similar approach was used in 2 extensive Australia studies reviewing the feeding profile and growth implications of infants.[8,38] Breastfeeding support delivered remotely and on a one-on-one basis via regular telephone calls from a trained peer volunteer, produced an increase in the breastfeeding rates at 6 months.[25] The study provided further evidence of the strength of proactive intervention as the telephone calls were regular and initiated by the volunteer. The volunteers were mothers themselves and who had breastfed their infant until at least 6 months of age.[25] The efficaciousness of 'peer delivery' was proven in many studies,[39,40,41] may be that was perhaps due to a decrease in the perceived "power" differential in a professional-patient relationship. Instead, a friendly interaction occurred making it less stressful for the mothers to ask questions while at the same time forming a bond as both mother and volunteer had similar experiences.[23]

Expecting couples are increasingly accessing the internet and social media platforms for information on pregnancy and early parenting. Such information allows for instantaneous and accessible information when it is most needed,[21] though concern may be expressed about the accuracy of the information provided and how applicable it may be to a specific couple. Two studies provided breastfeeding information: via a smartphone app[26] and a website where participants could access information and post on discussion forums.[22] A strength of the studies was that they focussed on mothers who lived in rural areas and had difficulty attending breastfeeding support services because of the distance.[26] Both studies reported an improvement in breastfeeding rates. The study of Wheaton et al.,[26] involved a small sample size of 46 participants and had no control group.[26] It was unclear in the study of Giglia et al.,[22] as to how the intervention website was used.[22]

A further remote intervention of Gallegos et al. utilised an automated two-way text messaging service to provide breastfeeding support.[23] A strength of that intervention was that it was proactive. The participants received a text message asking how their breastfeeding was going. If the response indicated a level of distress or a request for help, it prompted a trained breastfeeding counsellor to call within 24 hours.[23] The intervention was reported as having a positive influence on both the maternal psychological factors and EBF rates, though the outcomes were not measured at set infant ages, but at two random times before 3 months of age. Three of the four remote intervention studies reported that participants were self-recruited and/or already highly motivated to breastfeed when compared with the general population.[23,25,26] In two studies, breastfeeding rates in both trial arms were higher than national averages Table 3, 4.[23,25]

Table 3 Summary of papers arising from the scoping review

Study reference	Study design	Sample	Intervention assessed	Outcome measured	Result	Conclusions
Brodribb et al.,[24]	Retrospective cohort study	6752 women who birthed in Queensland, Australia. Mothers stratified based on demographic statistics, primiparous or multiparous, term or pre-term birth and birth weight greater or less than 2500g. From February – May 2010.	Intervention BFHI accreditation and hospital care practices vs. non-BFHI-accredited hospitals.	Outcome: exclusive breastfeeding and any breastfeeding rates at 1 and 4 months postpartum. Hospital care practices recorded: early skin-to-skin contact, attempted breastfeeding within the first hour, rooming-in and no in-hospital supplementation.	At 1 month, women who birthed at BFHI hospitals had lower rates of breastfeeding but higher rates of EBF. There was no difference at 4 months. There was a dose-response association between the number of baby-friendly practices experienced and the odds of breastfeeding at 4 months.	When breastfeeding initiation rates are high and evidence-based practices are common, BFHI accreditation has little effect on breastfeeding rates.
Meedya et al.,[18]	Non-randomised, quasi-experimental study.	366 women. Only primiparous women with basic English literacy and the intention to breastfeed before birth and had an infant that was born at term and could breastfeed. Recruited from a hospital in Sydney, Australia.	Intervention: the program involved three group antenatal breastfeeding classes and take home learning activities followed by two postnatal lactation consultation phone calls (10 days and 3 months postpartum) vs. standard care.	Outcome: any breastfeeding rates at 1, 4 and 6 months postpartum.	Compared to standard care, women in the intervention group had significantly higher rates of any breastfeeding at 1, 4 and 6 months. EBF rates were only significant at 6 months: 19% vs. 6.5%	Assignment to the intervention was associated with significantly higher rates of breastfeeding. See comment[22]

Table 3 Continued...

Study reference	Study design	Sample	Intervention assessed	Outcome measured	Result	Conclusions
Elliott-Rudder et al.,[20]	Cluster RCT	15 rural family doctor's offices and 330 women who were currently breastfeeding. 8 practices (154 women) were in the intervention group and 7 practices (176 women) formed the control group.	Intervention: practice nurses in general practice used a specially designed motivational flowchart to speak to the mothers when they brought their child for immunisation at 2, 4 and 6 months. Nurses also attended preparatory workshops on breastfeeding management, counselling skills, motivational interviewing, and reflective practice.	Outcome: any, exclusive and full breastfeeding rates at 4 and 6 months, in the last 24h and since birth.	4 months: significantly higher rates of exclusive breastfeeding and predominant breastfeeding in the 24h before recall. There were no differences at 6 months. There were no differences at 4 or 6 months when recalled since birth.	Motivational interviewing intervention by primary care health professionals is feasible and effective in increasing breastfeeding rates at 4 months.
McLachlan et al.,[19]	Cluster RCT	7039 women in 10 local government areas in Victoria, Australia.	Two intervention groups: 1. Home-based breastfeeding support from a MCHN earlier than what is provided in standard MCHN care, to women at high risk of breastfeeding cessation. Intervention 1 plus access to a community-based breastfeeding drop-in centre led by a MCHN.	Outcome measures: any breastfeeding at 3, 4 and 6 months.	No difference in breastfeeding at 3, 4 or 6 months in either treatment arm compared to usual care.	Home-based and community-based support proved difficult to implement, low attendance. Interventions require sufficient time to build partnerships with existing services and the target population, to understand when and how to offer interventions for optimum benefit.
Maycock et al.,[27]	RCT	699 couples from 8 public maternity hospitals in Perth, Western Australia. No inclusion criteria other than they must be >18 years old.	Intervention: 2-hour antenatal education session for the couple to attend together, led by a male facilitator. Followed by promotional materials mailed at weekly intervals until 6 weeks postpartum.	Outcome: rates of any breastfeeding, full breastfeeding and full formula feeding at 6 weeks.	Breastfeeding rate was significantly higher for the intervention vs. control group (82% vs 75%) at 6 weeks. No significant difference at 6 months.	A minimal intervention was found to significantly increase any breastfeeding at 6 weeks.
Scott et al.,[21]	RCT	1426 expecting couples. 443 recruited from public and 983 from private hospitals in Perth, Australia. Recruited from antenatal classes.	3 intervention groups: 1.A face-to-face father-focused antenatal breastfeeding class run by a male peer facilitator 2.A breastfeeding app for fathers, involved conversation forums, twice-weekly push notifications (until 6 months postpartum) linking to polls and conversation starters, breastfeeding information, and links to external websites. 3.A combination of both interventions.	Each partner surveyed at recruitment, 6 weeks, and 26 weeks postpartum. Primary outcomes: duration of exclusive and any breastfeeding. Secondary outcomes: age of introduction of formula and complementary foods, maternal breastfeeding self-efficacy and partner postpartum support.	No significant differences between control and any of the intervention groups in any of the recorded outcomes.	The application should be tested under conditions designed to reduce barriers for those Australians who are less digitally included.

Table 3 Continued...

Study reference	Study design	Sample	Intervention assessed	Outcome measured	Result	Conclusions
Forster et al.,[25]	RCT	1152 nulliparous women assigned to intervention (n=574) or control groups (n=578) in Melbourne, Australia. Recruited between February 2013 and December 2015.	Intervention: telephone-based support from a trained peer volunteer for up to six months post-partum. Women were eligible to be a peer volunteer if they had breastfed a baby until at least 6 months of age.	Primary outcome: proportion of infants receiving any breast milk at 6 months of age. Secondary outcomes: proportion of infants receiving any breast milk in the last 24h, at six months (not excluding solids) and Time to cessation of breastfeeding.	Infants of women allocated to intervention were more likely to be receiving breast milk at six months of age (75% vs. 69%)	Providing first time mothers with telephone-based support from a peer is an effective intervention for increasing breastfeeding maintenance in settings with high breastfeeding initiation.
Wheaton et al.,[26]	Prospective longitudinal cohort design	Convenience sample (n=46) of new mothers. Rural Southwest Victoria, Australia.	To explore usability of 'Breastfeeding Solutions' a smartphone application for breastfeeding mothers among rural Australian breastfeeding women.	Outcomes: any breastfeeding at 6 months. Survey information about the use of the app at 3 and 6 months.	79% of infants were receiving any breastmilk at 6 months, higher than recent rates in southwest Victoria, ranged from 44-51%.	No control group, cannot ascertain whether access to the app increased breastfeeding rates.
Giglia et al.,[22]	Longitudinal cohort study	414 women in regional Western Australia. Recruited during first week of infant life and followed for 12 months.	Evaluate the effect of a breastfeeding support Internet website where participants were able to post on discussion forums, initiate e-mail conversations and contact a certified lactation consultant or chief investigator online with any questions.	Outcome: number of women exclusively breastfeeding at discharge, 4, 10, 16 and 26 weeks comparing intervention and control as well as remote vs non-remote mothers. Also measured the number of mothers who accessed different parenting websites.	Women in the intervention group are significantly more likely to be exclusively breastfeeding at 5 months postpartum compared to control group participants. Women experiencing breastfeeding problems were more likely to access the internet.	Internet provides another possible method for promoting positive long term breastfeeding outcomes.
Gallegos et al.,[23]	Non-concurrent, prospective, comparison trial.	120 and 114 women recruited into comparison groups respectively. Women were currently breastfeeding, and their infant was less than three months of age.	Intervention: A two-way text messaging service with automated responses delivered once a week for 8 weeks.	Outcome: online surveys at week 0 and week 9 measuring breastfeeding exclusivity and duration as well as coping, emotions, accountability, and self-efficacy	Women receiving the intervention were more likely to continue exclusive breastfeeding at 9 weeks. They also demonstrated active coping and were less likely to display emotions-focussed coping. No effect on self-efficacy or accountability.	The service appears to empower women to actively resolve breastfeeding issues.
Laws et al.,[38]	Quasi-experimental study	301 and 344 parents in intervention and control groups respectively. Parents were either pregnant (30+ weeks gestation) or a parent or main carer of an infant < 3 months of age.	Intervention: the 'Growing Healthy Program' delivered via a website and smartphone application with articles and videos with practical advice and strategies. Included reminders in the form of push notifications, SMS and weekly emails. In addition, there was a Facebook group forum for participants to discuss infant feeding experiences.	Outcome: online surveys at < 3 months of age, 6 and 9 months of age assessing breastfeeding duration and exclusivity, best practice formula feeding, timing of solids introduction, child anthropometrics and demographic characteristics.	There was no statistically significant difference in the mean duration of any breastfeeding at 9 months or breastfeeding exclusivity at 6 months.	An mHealth intervention is a feasible mode for delivering obesity prevention intervention to parents but further work is required to sustain engagement and use over time.

Abbreviations: BFHI: baby friendly health initiative, EBF: exclusive breastfeeding, RCT: randomised controlled trial, MCHN: maternal child health nurse, app: smartphone application.

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Table 4 Summary of study interventions and primary outcomes

	Intervention	Outcome
Brodribb et al.,[24]	BFHI accreditation	BFHI participants had lower breastfeeding rates at 1 month, no difference at 4 months.
Meedya et al.,[18]	3x antenatal breastfeeding classes + 2x postnatal phone calls.	Intervention group had higher rates of breastfeeding at 1, 4 and 6 months. Higher rates of EBF at 6 months.
Elliot-Rudder et al.,[20]	Breastfeeding support delivered by GP nurses	Intervention group had higher rates of EBF and predominant breastfeeding at 4 months. No difference at 6 months.
McLachlan et al.,[19]	MCHN staffed drop-in centres and home-visits	No significant differences
Maycock et al.,[27]	1x antenatal breastfeeding class for fathers + 6 weeks of mailed promotional materials.	Intervention group had higher rates of breastfeeding at 6 weeks. No difference at 6 months.
Scott et al.,[21]	1x antenatal breastfeeding class for fathers + breastfeeding smartphone app for fathers	No significant differences.
Forster et al.,[25]	Telephone based support for 6 months post-partum.	Intervention group had higher rates of breastfeeding at 6 months.
Wheaton et al.,[26]	Breastfeeding smartphone app	No control group but had increase in breastfeeding at 6 months when compared to local breastfeeding rates.
Giglia et al.,[22]	Breastfeeding support website	Intervention group had higher rates of EBF at 5 months.
Gallegos et al.,[23]	Breastfeeding support text-messaging service.	Intervention group had higher rates of EBF at 9 weeks.
Laws et al.,[38]	Breastfeeding smartphone app and website	No significant differences.

Discussion

Despite many mothers initiating breastfeeding following hospital discharge, few mothers breastfeed exclusively for the recommended duration in Australia.[6] The studies reviewed varied in both the nature of the interventions used and the measurement of breastfeeding outcomes. Considering the effectiveness of these interventions, studies which involved mothers over an extended period proved to have a significant impact on breastfeeding rates up to 6 months.[18,20,25] This outcome is congruent with reviews conducted globally that identified the postnatal phase to be the most effective time to promote exclusive breastfeeding.[39] Maternal breastfeeding confidence experienced during the antenatal period tends to wane following the birth of the infant when breastfeeding challenges are first encountered.[41] Other characteristics which were shown to consistently improve breastfeeding outcomes were interventions that involved both education and support but which may be delivered in multiple settings - local health services, at home, or within the community at large.[39,42–44]

Our review supported findings from elsewhere. Individualised, peer support appeared to be an effective way to improve breastfeeding confidence and ability. In addition, it would appear that one-on-one encounters with mothers were more effective than group sessions as mothers preferred non-judgemental, encouraging and individualised support.[39,44,45] Interventions delivered by peer counsellors were more successful in increasing EBF rates amongst young mothers.[46] The association between maternal mental health and breastfeeding outcomes has been consistently demonstrated.[47] Mothers need to manage a range of psychological and personal factors including breastfeeding intention and self-efficacy, both of which are influenced by the support received from her family and social network[30] As an example the Caring Mother Program, a Melbourne-based community initiative, involves weekly visits from peer volunteers aimed at providing emotional support to new mothers. Participants in the program felt that peer volunteers created a non-judgemental space allowing them to gain confidence and trust within themselves in meeting their baby's needs. Supporting motherhood is a community effort and has been shown to improve EBF when efforts are made in enhancing breastfeeding intentions, self-efficacy and providing social supports.[18,20,47] A further example is a complementary residential service provided by an experienced grandmother for new mothers and their infants which also has been found to improve the mothers' confidence and wellbeing providing the mothers a safe and quiet "dwelling space".[48] It also allowed the mothers an opportunity to acquire mothercraft skills enhancing their breastfeeding efforts, in a non-threatening and supportive environment remembering that most women in Australia are discharged from hospital within 24 – 48 hours, maybe a day or two later if there is a surgical delivery or if confined in a private hospital.

Limitations

This review specifically explored practices within Australia that helped prolong breastfeeding. A wider study would determine if similar findings are seen in other developed countries, influenced by differing practices, social customs and/or health care systems. This review did not explore why some mothers chose not to breastfeed or ceased breastfeeding early. The interventions assessed were varied and took place in a range of health care and community contexts making them difficult to compare with each other. Additionally, some studies did not provide definitions of standard care and what other services were also available. There was a lack of clear definition of breastfeeding outcomes. Focus was often placed on 'any' breastfeeding rather than EBF, creating a broad continuum of breastfeeding practices for infants and may have included those who had supplementary formula feeds. The timing of the assessments and therefore of the outcomes varied, some providing a snapshot of breastfeeding practices in the preceding 24 hours. Other studies relied on maternal recall to record practices from birth. At risk groups such as young mothers or those who were obese were not specifically assessed in the studies reviewed. Finally varying the search terms and exploring further databases such as CINAHL database, may have captured additional breastfeeding interventions.

Conclusion

This review evaluated the efficacy of educational and support interventions on breastfeeding outcomes. Proactive interventions that extended across the pregnancy and into the post-natal period, and which involved both educational and supportive components, while

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addressing psychological factors such as breastfeeding intentions, self-efficacy and the provision of social supports, were more successful in improving the duration of breastfeeding. At risk groups such as young or obese mothers need further study. In addition, future studies need describe the details of the interventions over and above that provided by standard care to allow for comparable assessments so as to better quantify outcomes.

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Declarations

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Authors' contributions: EG composed the search strategy, analysis of included papers and drafted the work. SM revised and edited the work whilst providing guidance about scope and direction of the paper. All authors read and approved the final manuscript.

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References

1. World Health Organization, United Nations Children's F. *Planning guide for national implementation of the global strategy for infant and young child feeding*. Geneva: World health organization; 2007.
2. Neves PAR, Gatica-Dominguez G, Rollins NC, et al. Infant formula consumption is positively correlated with wealth, within and between countries: a multi-country study. *J Nutr*. 2020;150(4):910–917.
3. Allen J, Hector D. Benefits of breastfeeding. *N S W Public Health Bull*. 2005;16(3–4):42–46.
4. National health MRC. *Eat for health: Australian dietary guidelines Canberra: national health and medical research council 2013*.
5. World Health Organization. *Nutrition: exclusive breastfeeding.* 2012.
6. Health AIo, Welfare. *2010 Australian national infant feeding survey: indicator results*. Canberra: AIHW; 2011.
7. Callen J, Pinelli J. Incidence and duration of breastfeeding for term infants in Canada, United States, Europe, and Australia: a literature review. *Birth*. 2004;31(4):285–292.
8. Netting MF, Moumin NA, Makrides M, et al. The Australian feeding infants and toddlers study (OzFITS) 2021: highlights and future directions. *Nutrients*. 2022;14(20):4343.
9. Johnston ML, Esposito N. Barriers and facilitators for breastfeeding among working women in the United States. *J Obstet Gynecol Neonatal Nurs*. 2007;36(1):9–20.
10. Sayres S, Visentin L. Breastfeeding: uncovering barriers and offering solutions. *Curr Opin Pediatr*. 2018;30(4):591–596.
11. Duffy EP, Percival P, Kershaw E. Positive effects of an antenatal group teaching session on postnatal nipple pain, nipple trauma and breast feeding rates. *Midwifery*. 1997;13(4):189–196.
12. Beake S, Pellowe C, Dykes F, et al. A systematic review of structured versus non-structured breastfeeding programmes to support the initiation and duration of exclusive breastfeeding in acute and primary healthcare settings. *JBI Libr Syst Rev*. 2011;9(36):1471–1508.
13. World Health O, United Nations Children's F. *Protecting, promoting and supporting breastfeeding: the special role of maternity services / a joint WHO/UNICEF statement*. Geneva: World Health Organization; 1989.
14. Kramer MS, Chalmers B, Hodnett ED, et al. Promotion of breastfeeding intervention trial (PROBIT): a randomized trial in the republic of Belarus. *JAMA*. 2001;285(4):413–420.
15. Lumbiganon P, Martis R, Laopaiboon M, et al. Antenatal breastfeeding education for increasing breastfeeding duration. *Cochrane Database Syst Rev*. 2016;12(12):CD006425.
16. O'Brien M, Buikstra E, Hegney D. The influence of psychological factors on breastfeeding duration. *J Adv Nurs*. 2008;63(4):397–408.
17. Scott JA, Binns CW, Aroni RA. The influence of reported paternal attitudes on the decision to breast-feed. *J Paediatr Child Health*. 1997;33(4):305–307.
18. Meedya S, Fahy K, Yoxall J, et al. Increasing breastfeeding rates to six months among nulliparous women: a quasi-experimental study. *Midwifery*. 2014;30(3):e137–144.
19. McLachlan HL, Forster DA, Amir LH, et al. Supporting breastfeeding in local communities (SILC) in Victoria, Australia: a cluster randomised controlled trial. *BMJ Open*. 2016;6(2):e008292.
20. Elliott-Rudder M, Pilotto L, McIntyre E, et al. Motivational interviewing improves exclusive breastfeeding in an Australian randomised controlled trial. *Acta Paediatr*. 2014;103(1):e11–16.
21. Scott JA, Burns SK, Hauck YL, et al. Impact of a face-to-face versus smartphone app versus combined breastfeeding intervention targeting fathers: randomized controlled trial. *JMIR Pediatr Parent*. 2021;4(2):e24579.
22. Giglia R, Cox K, Zhao Y, et al. Exclusive breastfeeding increased by an internet intervention. *Breastfeed Med*. 2015;10(1):20–25.
23. Gallegos D, Russell-Bennett R, Previte J, et al. Can a text message a week improve breastfeeding? *BMC Pregnancy Childbirth*. 2014;14:374.
24. Brodribb W, Kruske S, Miller YD. Baby-friendly hospital accreditation, in-hospital care practices, and breastfeeding. *Pediatrics*. 2013;131(4):685–692.
25. Forster DA, McLardie-Hore FE, McLachlan HL, et al. Proactive peer (Mother-to-Mother) breastfeeding support by telephone (ringing up about breastfeeding early [RUBY]): a multicentre, unblinded, randomised controlled trial. *E Clinical Medicine*. 2019;8:20–28.
26. Wheaton N, Lenehan J, Amir LH. Evaluation of a breastfeeding app in rural Australia: prospective cohort study. *J Hum Lact*. 2018;34(4):711–720.
27. Maycock B, Binns CW, Dhaliwal S, et al. Education and support for fathers improves breastfeeding rates: a randomized controlled trial. *J Hum Lact*. 2013;29(4):484–490.
28. Meedya S, Fernandez R, Fahy K. Effect of educational and support interventions on long-term breastfeeding rates in primiparous women: a systematic review and meta-analysis. *JBI Database System Rev Implement Rep*. 2017;15(9):2307–2332.
29. Flaherman VJ, Lee HC. "Breastfeeding" by feeding expressed mother's milk. *Pediatr Clin North Am*. 2013;60(1):227–246.
30. Martin CR, Ling PR, Blackburn GL. Review of infant feeding: key features of breast milk and infant formula. *Nutrients*. 2016;8(5):279.
31. Peters MDJ, Marnie C, Colquhoun H, et al. Scoping reviews: reinforcing and advancing the methodology and applications. *Syst Rev*. 2021;10(1):263.

32. Kinnear A. Conflicting message about baby-friendly hospital accreditation in Australia. *Pediatrics*. 2013;131:692

33. Fallon A, Crepinsek M, Hegney D. The baby-friendly hospital initiative and breastfeeding duration: relating the evidence to the Australian context. *Birth issues*. 2005;14(3):90–95.

34. Meedya S, Fahy K, Kable A. Factors that positively influence breastfeeding duration to 6 months: a literature review. *Women Birth*. 2010;23(4):135–145.

35. Sherriff N, Hall V, Pickin M. Fathers' perspectives on breastfeeding: ideas for intervention. *British Journal of Midwifery*. 2009;17(4):223–237.

36. Scott JA, Binns CW, Oddy WH, et al. Predictors of breastfeeding duration: evidence from a cohort study. *Pediatrics*. 2006;117(4):e646–e655.

37. Giglia R, Binns C. The effectiveness of the internet in improving breastfeeding outcomes: a systematic review. *J Hum Lact*. 2014;30(2):156–160.

38. Laws R, Denny-Wilson E, Taki S, et al. Key lessons and impact of the growing healthy mHealth program on milk feeding, timing of introduction of solids, and infant growth: Quasi-experimental study. *JMIR Mhealth Uhealth*. 2018;6(4):e78.

39. Skouteris H, Bailey C, Nagle C, et al. Interventions designed to promote exclusive breastfeeding in high-income countries: A systematic review update. *Breastfeed Med*. 2017;12(10):604–614.

40. Britton C, McCormick FM, Renfrew MJ, et al. Support for breastfeeding mothers. *Cochrane Database Syst Rev*. 2007(1):CD001141.

41. Babakazo P, Donnen P, Akilimali P, et al. Predictors of discontinuing exclusive breastfeeding before six months among mothers in Kinshasa: a prospective study. *Int Breastfeed J*. 2015;10:19.

42. Kim SK, Park S, Oh J, et al. Interventions promoting exclusive breastfeeding up to six months after birth: A systematic review and meta-analysis of randomized controlled trials. *Int J Nurs Stud*. 2018;80:94–105.

43. Wong MS, Mou H, Chien WT. Effectiveness of educational and supportive intervention for primiparous women on breastfeeding related outcomes and breastfeeding self-efficacy: A systematic review and meta-analysis. *Int J Nurs Stud*. 2021;117:103874.

44. Pezley L, Cares K, Duffecy J, et al. Efficacy of behavioral interventions to improve maternal mental health and breastfeeding outcomes: a systematic review. *Int Breastfeed J*. 2022;17(1):67.

45. Da Silva Tanganhito D, Bick D, Chang YS. Breastfeeding experiences and perspectives among women with postnatal depression: A qualitative evidence synthesis. *Women Birth*. 2020;33(3):231–239.

46. Buckland C, Hector D, Kolt GS, et al. Interventions to promote exclusive breastfeeding among young mothers: a systematic review and meta-analysis. *Int Breastfeed J*. 2020;15(1):102.

47. Chipojola R, Chiu HY, Huda MH, et al. Effectiveness of theory-based educational interventions on breastfeeding self-efficacy and exclusive breastfeeding: A systematic review and meta-analysis. *Int J Nurs Stud*. 2020;109:103675.

48. Withanage R HM, Menaham S. Exploring a volunteer community residential care facility for new mothers. *International Journal of Pregnancy & Child Birth*. 2020;6(4):86–91.

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