Review Article

Journal of Behavioral Health
www.scopemed.org
DOI: 10.5455/jbh.20160224063449

The effectiveness of breastfeeding education: An integrative review

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Received: January 25, 2016
Accepted: February 16, 2016
Published: March 02, 2016

ABSTRACT

Purpose: The objective of this integrative review is to evaluate the effectiveness of breastfeeding education. **Methods:** This integrative review has been composed of the period between January 2000 and February 2015 using the keywords "breastfeeding education, prenatal, and postnatal." After searching through these results, a total of 33 full lengths randomized controlled, cohort, semi-experimental papers in English and Turkish focusing on providing breastfeeding education for the mothers, prenatal and postnatal periods have been chosen for evaluation. **Results:** According to results of the review, to promote breastfeeding, prenatal and postnatal breastfeeding education have been conducted. A significant amount of trials about breastfeeding education contains various methods of breastfeeding in this review. The most prominent methods observed in the trials are phone calls, videos/slides, home visits, brochures/written documents/books, individual support/education, and peer counseling/support. Initiation of breastfeeding, breastfeeding duration, exclusive breastfeeding, breastfeeding rate, and knowledge level are the variants that were concentrated on the trials. It is observed that in the trials breastfeeding duration, exclusive breastfeeding, and breastfeeding rate levels are the most positive affected variants by education and support. Some interventions were also effective on breastfeeding attitude, satisfaction, and self-efficacy in some studies. **Conclusions:** It is of outmost importance that mothers should be educated and counseled by nurses and midwives about initiating breastfeeding, exclusive breastfeeding and effective continuation of it. Other factors which affect breastfeeding beside education should be determined, and appropriate interventions should be applied.

KEY WORDS: Breastfeeding education, postnatal, prenatal

INTRODUCTION

Breastfeeding is the most appropriate method of feeding for infants in order to grow and develop. In all ages and cultures, breast milk has been considered as an invaluable source of nutrition and the best way of feeding the infants with their mother's milk is breastfeeding [1,2]. The World Health Organization (WHO), United Nations International Children's Emergency Fund and American Academy of Pediatrics propose that breastfeeding education encourages mothers to breastfeed and recommend that infants should be exclusively breastfed for the first 6 months of life to achieve optimal growth, development, and health, thereafter; infants should receive complementary foods while continuing to be breastfed for up to 2 years [3-6].

Despite all the educational programs that promote breastfeeding in the world, in practice, infants receive complementary foods in the first 6 months along breastfeeding [7]. According to The American National Immunization Survey data in 2010, 79.6% of women initiated breastfeeding and 47% breastfed to 6 months, but only 16% practiced exclusive breastfeeding to 6 months. Furthermore, low-income women had lower breastfeeding initiation rates, supplemented with formula earlier, and ceased breastfeeding earlier [8]. Demographic and health survey data from 35 countries found that the percentage of breastfed children was lower in urban areas [9].

In numerous trials, it is presented that breastfeeding patterns can be changed with external interventions. Educational programs are considered the most important element in causing this result [10,11]. Breastfeeding behavior provided by breastfeeding education causes infants to receive breast milk for a longer period of time [12]. It is of outmost importance for mothers to breastfeed their infants adequately and efficiently.

The aim of this review is to enrich the health care professionals who will provide breastfeeding education with foresight, by analyzing the trials about breastfeeding education, the methods used in these trials, the period of education and the results.

METHODS

Search Strategy

This integrative review has been composed of the period between January 2000 and February 2015 by using Bmj Online Journals (2007-2009), Ebscohost, Med Line, Ovid, Oxford

Journal, Proquest Hospital Collection, Science Direct, Springer-Kluwer Link, Taylor and Francis, Turkey Citation Index, Up To Date, Web Of Science (Citation Index), Wiley Cochrane-Evidence Base, Wiley Online Library, Pub-Med and Google search databases with "breastfeeding education, prenatal, postnatal" as keywords.

Selection Criteria

Search results were reviewed by two coauthors to determine if they met the study inclusion criteria. After searching through these results, a total of 33 full lengths randomized controlled, cohort, semi-experimental papers in English and Turkish focusing on providing breastfeeding education for the mothers, prenatal and postnatal periods have been chosen for evaluation. Any studies unavailable through electronic journals or at the local library and abstract-only literature were excluded due to insufficient information.

Data Extraction Procedures

Data from included studies were extracted by the two coauthors independently using the data extraction form. The extracted data included the following: Training time, sample size, participant characteristics, type of intervention, effectiveness of the interventions on some of the breastfeeding variations and other factors.

Of the 299 articles identified, after eliminating duplicates and except English and Turkish, 272 abstracts were reviewed by two independent coauthors to determine whether the study was eligible for inclusion. 97 full-text articles were reviewed. 12 references were added from manual searches of the reference lists. Most of the studies excluded had an irrelevant study population with different study purposes, insufficient data. Finally, 33 articles met the inclusion criteria. The search process is presented as a flow diagram in Figure 1.

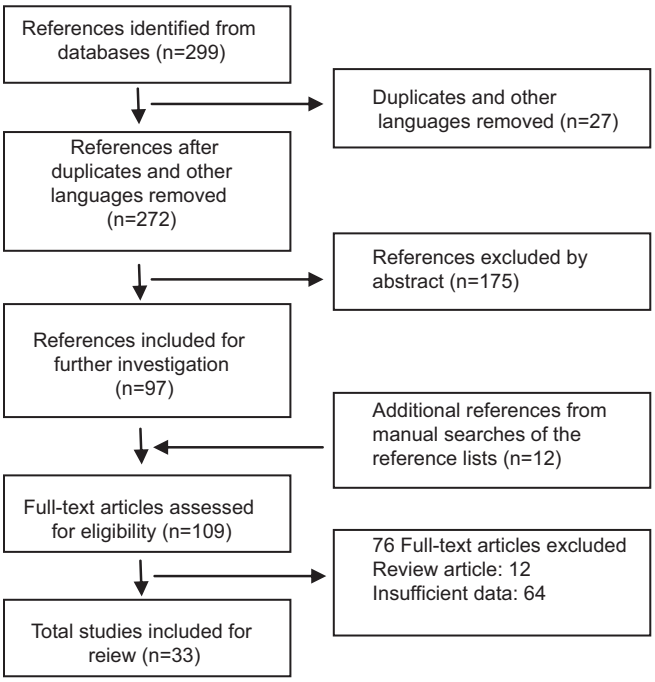

Figure 1: Flowchart of selection process

RESULTS

From the evaluated trials of which two of them are in Turkish and 31 of them are in English. List of the trials is shown in Table 1.

Breastfeeding education have been provided in 13 of the trials (1, 13, 14, 15, 16, 20, 22, 23,28, 34, 40, 42, 43) prenatal period, in 10 of them postnatal period (17, 18, 24, 25, 31, 32, 35, 37, 38, 41), and in another nine of them began in prenatal and continued in postnatal (8, 19, 21, 26, 27, 29, 33, 36, 39). One trial group for prenatal and one trial group postnatal have been composed in one trial (30). 17820 of women out of 39783 have been trained. One of the trials has been done in a total of 32 infant friendly hospitals and 17042 women out of 8865 women have been trained (29). As a result of this, the total number of participants has been found high. About 11 of the trials have been done in primiparouses (14, 17, 18, 20, 23, 31, 34, 36, 37, 38, 40), five of them in low-income women (8, 19, 22, 33, 35), two of them in adolescents (13, 27), one of them in a would be cesarean delivery (16) and the others in all the women without any complications (1, 15, 21, 24, 25, 26, 28, 29, 30, 32, 39, 41, 42, 43) [Table 2].

The most prominent methods observed in the trials are phone calls, videos/slides, home visits, brochures/written documents/books, individual support/education, and peer counseling/support. In most of the trials, more than one method has been used [Table 3]. Although some of the phone calls are used to give breastfeeding education, a significant amount of the phone calls have been used to reach the breastfeeding knowledge of the mothers.

Initiation of breastfeeding, breastfeeding duration, exclusive breastfeeding, breastfeeding rate and breastfeeding knowledge level are the variants that were concentrated on the trials. These interventions are stated in Table 4. It is observed that in the trials breastfeeding duration, and exclusive breastfeeding is the most positively affected variants by education and counseling [Table 4].

Breastfeeding initiation has been examined in nine of the trials. While four trials (8, 19, 21, 27) that began in prenatal period and continued in postnatal period positively affected the initiation of breastfeeding, the four trials (1, 13, 14, 43) conducted only in prenatal period and the one trial (21) conducted in postnatal period have not been effective [Table 4].

Breastfeeding duration has been examined in 21 of the trials. Three trials (13, 14, 28) that began in the prenatal period, four trials (19, 21, 29, 33) that began in prenatal period and continued in postnatal period, and four trials (18, 31, 35, 37) conducted in postnatal period positively affected breastfeeding duration. Three trials (34, 40, 43) conducted in prenatal period,

Table 1: List of the articles included in the review (article numbers was made according to references number)

No	First author (year/design)	Aim	Intervention	
			Duration/frequencies	Outcome variables
1	Onbası *et al.* (2011) intervention study [1]	To test the effect of prenatal breastfeeding and breast-milk training given to expectant mothers on the behavior of breastfeeding	Each expectant mother was given prenatal training once. Trainings on and breast-milk were held for the pregnant women on 2 days in a week. The control group received education at the end of the study	The percentage and duration of feeding only with breast-milk could be increased if pregnant women are given training about breast-milk
8	Srinivas *et al.* (2015) RCT [8]	To improve rates of any and exclusive breastfeeding at 1 and 6 months using a low-intensity peer counseling intervention beginning prenatally	The intervention initiated between 28 weeks' gestation and 1 week prior to delivery. The peer counselor contacted the intervention group by telephone or in clinic up to 4 months post-delivery. Women in the control group who initiated breastfeeding and were then contacted monthly by the study coordinator to assess breastfeeding status. Both intervention and control group received standard care	Women with positive attitudes had higher rates of initiation and breastfeeding at 1 and 6 months, regardless of intervention. After adjusting for self-efficacy, women who received peer counseling had significantly higher breastfeeding rates at 1 month. Breastfeeding rates in all women improved during the study period. Breastfeeding attitude was more strongly associated with breastfeeding behavior than peer support. Peer counseling supported women with low self-efficacy and helped women achieve their breastfeeding goals
13	Wambach *et al.* (2011) RCT [13]	To test the effects of breastfeeding support and education for adolescent mothers	Intervention, composed of prenatal, in-hospital, and postnatal education and support, face-to-face visit, telephone contact through 4 weeks postpartum. In-hospital experimental intervention was a from the peer counselor who provided encouragement and support for early breastfeeding efforts	The intervention positively influenced breastfeeding duration experimental group, but not breastfeeding initiation or exclusive breastfeeding rates. This education/support intervention was partially effective in enhancing breastfeeding outcomes
14	Artieta-Pinedo *et al.* (2012) prospective cohort [14]	To assess the association between attendance at antenatal education sessions and breastfeeding during the 1st year of life among primiparas	Women were classified into three groups according to whether they had received antenatal education and, if so, how many classes (0, 1-4, or 5 or more). Telephone interviews at 1.5, 3, 6 and 12 months were used to estimate the risk of cessation of any breastfeeding and to compare the groups for potential confounders	Initially, 90% of women breastfed their infants, with no differences between the groups. During the 1st month, the risk of cessation of any breastfeeding was three times as high among non-attendees and twice as high among women who attended 1-4 classes compared with those who attended 5 or more classes
15	Lin *et al.* (2008) Quasi-experimental [15]	To evaluate the effectiveness of a prenatal breastfeeding education program on breastfeeding outcomes	The experimental group received a 90-min group educational program on breastfeeding during their 20-36th week of pregnancy. Control subjects did not receive any intervention. Data were collected at preintervention, post-intervention, 3 days postpartum and 1 month postpartum	The experimental group had higher scores in breastfeeding knowledge and breastfeeding attitude at 3 days postpartum. They showed higher breastfeeding satisfaction at 3 days and 1 month postpartum. The rate of exclusive breastfeeding was higher for the experimental group at 3 days and 1 month postpartum, but the differences were not statistically significant
16	Lin *et al.* (2008) Quasi-experimental [16]	To evaluate the effectiveness of a prenatal breastfeeding education program for primigravida women who have elected caesarean section	The experimental group received a breastfeeding education program consisted of booklet and videotape program with two follow up phone calls. Both the control groups and the intervention group of women received standard hospital care	The results of the study show that the subjects of the experimental group exhibited a more positive breastfeeding attitude, a higher 24 h rooming-in rate and a higher exclusive breastfeeding rate during hospital stays and a higher exclusive breastfeeding rate for the 1 month postpartum period
17	Khresheh *et al.* (2011) RCT [17]	To test the effect of a postnatal education and support program on breastfeeding among primiparous women	The intervention group received one-to-one postnatal educational session and follow-up phone calls at 2 months and 4 months postpartum. The control group received routine postnatal care	The postnatal education and support program significantly improved breastfeeding knowledge for the intervention group. The proportion of women fully breastfeeding their babies at 6 months was not found to be significantly different between the intervention group and the control group
18	Aksu *et al.* (2011) randomized trial [18]	To determine the effects of breastfeeding education/ support offered on breastfeeding duration and knowledge	In addition to a standard breastfeeding education in the first few hours after delivery, the mothers in the intervention group received breastfeeding education at home on day 3 postpartum from supporters	Breastfeeding education was effective in increasing the breastfeeding duration and knowledge. Increase in the percentage of exclusively breastfed infants was also associated with a significant increase in exclusive breastfeeding

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Table 1: *Contd...*

No	First author (year/design)	Aim	Intervention	
			Duration/frequencies	Outcome variables
19	Chapman *et al.* (2004) RCT [19]	To evaluate the effectiveness of an existing, breastfeeding peer counseling program within the United States	The intervention group received all of the services of the control group, plus 1 prenatal home visit, daily perinatal visits, 3 postpartum home visits, and telephone contact as needed. The control group received the routine breastfeeding education	The proportion not initiating breastfeeding was significantly lower in the intervention group than among controls. The probability of stopping breastfeeding also tended to be lower in the intervention group at both 1 month and 3 months. Peer counselors can significantly improve breastfeeding initiation rates and have an impact on breastfeeding rates at 1 and 3 months postpartum
20	Huang *et al.* (2007) [20] Quasi-experimental	To evaluate the effects of a prenatal web-based breastfeeding education program in Taiwan	The experimental group received web-based breastfeeding education. The control group received regular health teaching for breastfeeding	There was a significant effect in breastfeeding knowledge score, more positive attitude about breastfeeding, and exclusive breastfeeding for the experimental group
21	Hoddinott *et al.* (2006) intervention study [21]	To evaluate the effectiveness of a breastfeeding peer coaching intervention in Rural Scotland	The experimental group received antenatal, birth, and postnatal care from community midwife-led units. The control group received some or all care in district maternity units	Group-based and one-to-one peer coaching for pregnant women and breastfeeding mothers increased breastfeeding initiation and duration in an area with below average breastfeeding rates
22	Anderson *et al.* (2005) Randomized trial [22]	To assess the efficacy of peer counseling to promote exclusive breastfeeding among low income inner-city women in Hartford, Conn	The intervention group received peer counseling support offering 3 prenatal home visits, daily perinatal visits, 9 postpartum home visits, and telephone counseling as needed. The control group only received conventional breastfeeding education prenatally	Breastfeeding support provided by hospital and community-based peer counselors is effective in improving exclusive breastfeeding rates among low-income women
23	Noel-Weiss *et al.* (2006) RCT [23]	To determine the effects of a prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration	Both groups received standard care and were not limited in the types of breastfeeding support they could seek before and after their infant's birth. The intervention group received 2.5-h prenatal breastfeeding workshop	Women who attended the workshop had higher self-efficacy scores and a higher proportion was exclusively breastfeeding compared to women who did not attend the workshop. The workshop increased maternal breastfeeding self-efficacy and exclusive breastfeeding
24	McDonald *et al.* (2010) RCT [24]	To evaluate the effects of an extended midwifery postnatal support program on the duration of breastfeeding	In addition to their standard care, the intervention group received a comprehensive individual educational session in their hospital room and follow-up support at home. The control group received standard midwifery postnatal care	There was no difference between the groups at 6 months postpartum for either full breastfeeding or any breastfeeding
25	Labarère *et al.* (2011) prospective study [25]	To assess the effectiveness of a CD-ROM-based intervention in increasing the rates of breastfeeding	In intervention units, mothers were introduced to the CD-ROM during prenatal childbirth classes. At discharge, all mothers were given a copy of the CD-ROM and were encouraged to use it at home. They followed-up with telephone interviews at 4 and 26 weeks	No significant differences were found in secondary outcomes between the two study groups. A CD-ROM-based intervention for breastfeeding mothers provides no additional benefit to usual postnatal care
26	Kools *et al.* (2005) Randomized trial [26]	To evaluate the effectiveness of a breastfeeding promotion and support program on increasing the continuation of breastfeeding	The intervention group received a breastfeeding promotion and support program. Pregnant mothers who applied for home health care in the intervention or usual care regions were enrolled and were followed up from pregnancy until 6 months postpartum	The program was not effective. No significant differences were found in breastfeeding rates between the two study groups
27	Pobocik *et al.* (2000) Intervention study [27]	To examine the effect of a breastfeeding education and support program on breastfeeding initiation and duration in a culturally diverse group of adolescents	The intervention group received EXCEL program at school. The EXCEL program was a 3 year nutrition education intervention, which was approved by the university of Guam and Guam public schools	Intervention mothers had higher rates of breastfeeding initiation were approximately twice as likely to initiate breastfeeding and more were breastfeeding at 2 months than comparison mothers
28	Kavuncuoglu *et al.* (2005) Randomized cross-sectional [28]	To assess the effect of nursing education on breastfeeding in a baby-friendly hospital	Mothers' who educated about breastfeeding examined about breastfeeding rates	The relation between education and duration of breastfeeding were statistically significant

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No	First author (year/design)	Aim	Intervention	
			Duration/frequencies	Outcome variables
29	Kramer *et al.* (2001) RCT [29]	To assess the effects of breastfeeding promotion on breastfeeding duration and exclusivity	The intervention group received to initiate and maintain breastfeeding and lactation and postnatal breastfeeding support by health care worker assistance. The control group received usual infant feeding practices and policies	The intervention increased the duration and exclusivity of breastfeeding and decreased the risk of gastrointestinal tract infection and atopic eczema in the 1st year of life
30	Su *et al.* (2007) RCT [30]	To investigate whether antenatal breastfeeding education alone or postnatal lactation support alone improves rates of exclusive breastfeeding	First intervention group received one session of antenatal breastfeeding education. Second intervention group received two sessions postnatal lactation support program. The control group received routine care	Antenatal breastfeeding education and postnatal lactation support, as single interventions based in hospital both significantly improve rates of exclusive breastfeeding up to 6 months after delivery. Postnatal support was more effective than antenatal education
31	Dennis *et al.* (2002) RCT [31]	To evaluate the effect of peer support on breastfeeding duration among primiparous women	The peer support group received conventional care plus telephone-based support, initiated within 48 h after hospital discharge, from a woman experienced with breastfeeding. The control group received conventional care	The intervention was effective in maintaining breastfeeding to 3 months postpartum and improving satisfaction with the infant feeding experience
32	Muirhead *et al.* (2006) Randomized trial [32]	To test if a specified program of peer support affects the initiation and duration of breastfeeding	All peer support and control group mothers received normal professional breastfeeding support. Additionally, those in the peer support group still breastfeeding on return home from hospital had peer support until 16 weeks	A specified programme of peer support did not increase the initiation and/or the duration of breastfeeding population by a statistically significant amount
33	Bonuck *et al.* (2005) RCT [33]	The pre and postnatal lactation consultation on duration and intensity of breastfeeding	Study lactation consultants attempted 2 prenatal meetings, a postpartum hospital visit, and/or home visits and telephone calls. Control subjects received the standard of care	This "best-practices" intervention was effective in increasing breastfeeding duration and intensity up to 12 months
34	Wong *et al.* (2014) RCT [34]	The effectiveness of a professional antenatal breastfeeding education on the exclusivity and duration of breastfeeding.	Intervention group received standard antenatal care, plus one 20- to 30-min, one-to-one antenatal educational and support session conducted by a registered nurse	In a setting with a high breastfeeding initiation rate, one-to-one antenatal breastfeeding support and education did not increase the exclusivity or duration of breastfeeding
35	Howel *et al.* (2014) RCT [35]	To assess an intervention to extend breastfeeding among black and Latina mothers after delivery	The behavioral educational intervention included an in hospital educational session with a social worker, educational materials, and a 2-week follow-up call. Enhanced usual care participants received a list of community resources and received a 2-week control call	A behavioral educational intervention increased breastfeeding duration among low-income, self-identified black and Latina mothers during the 6-month postpartum period
36	Meedya *et al.* (2014) Quasi-experimental study [36]	The effectiveness of multiphased midwifery intervention on any breastfeeding rates until 6 months among nulliparous women	The intervention group received milky way program. The program started in early second trimester. It included three antenatal breastfeeding classes and take home learning activities followed by two postnatal lactation consultation phone calls	Assignment to the Milky Way intervention was associated with significantly higher rates of breastfeeding compared with assignment to standard care only
37	Fu *et al.* (2014) RCT [37]	To evaluate the effect of two postnatal professional support interventions on the duration of any and exclusive breastfeeding among primiparous	1. Standard postnatal maternity care; 2. Intervention: Standard care plus three in-hospital professional breastfeeding support sessions, of 30-45 min in duration; 3. Intervention: Standard care plus weekly post-discharge breastfeeding telephone support, of 20-30 min in duration, for 4 weeks	Rates of any and exclusive breastfeeding were higher among participants in the two intervention groups at all follow-up points. Participants receiving telephone support were significantly more likely to continue any breastfeeding at 1 and at 2 months, and to be exclusively breastfeeding at 1 month. Participants in the in-hospital support group were also more likely to be breastfeeding at all-time points, but the effect was not significant

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Table 1: *Contd...*

No	First author (year/design)	Aim	Intervention	
			Duration/frequencies	Outcome variables
38	Abbas-Dick *et al.* (2015) RCT [38]	To evaluate the effectiveness of a co-parenting intervention on exclusive breastfeeding among primiparous mothers and fathers	The trial intervention was a multifaceted co-parenting breastfeeding support intervention. Intervention components: In-hospital discussion, co-parenting booklet, breastfeeding booklet, video, web site, e-mails and telephone call	Significantly more mothers in the intervention group continued to breastfeed at 12 weeks postpartum. Although more mothers in the intervention group were exclusively breastfeeding at 6 and 12 weeks, these differences were not significant. Significantly more mothers in the intervention group reported that their partners provided them with breastfeeding help in the first 6 weeks
39	Jolly (2012) RCT [39]	To assess effectiveness of a peer support service on breastfeeding continuation in the UK	To give postnatal support, the Peer Support Workers were informed directly when women were discharged from hospital, so that they could contact and visit them within 24-48 h. Further contact would be needs-based, but with a minimum of one more contact in the 1st week. Additional needs-based contacts could be by telephone or home visits	Universal antenatal peer support and postnatal peer support for women who initiated breast feeding did not improve breastfeeding rates up to 6 months in this UK population
40	Kronborg *et al.* (2012) randomized trial [40]	To assess the effect of an antenatal training program on knowledge, self-efficacy and problems related to breast feeding and on breastfeeding duration	The intervention group received a structured antenatal training program attended between the 30th and 35th weeks of pregnancy with usual practice. The program comprised three modules, each lasting 3 h. The women in the reference group received the standard care offered by the antenatal clinic	After participation in the course in week 36 of gestation women in the intervention group reported a higher level of confidence, and 6 weeks after birth they reported to have obtained sufficient knowledge about breastfeeding. Women with sufficient knowledge breastfed significantly longer than women without sufficient knowledge
41	Kronborg *et al.* (2007) Cluster-randomized community based trial [41]	To assess the effect of early postnatal breastfeeding support on the duration of breastfeeding	52 health visitors and 781 mothers in the intervention group, and 57 health visitors and 816 mothers in the comparison group. Health visitors in the intervention group received an 18-h course. The intervention addressed maternal psychosocial factors and consisted of 1-3 home visits during the first 5 weeks post-partum. Comparison group received usual practice	Home visits in the first 5 weeks following birth may prolong the duration of exclusive breastfeeding. Postnatal support should focus on both psychosocial and practical aspects of breastfeeding. Mothers with no or little previous breastfeeding experience require special attention
42	Mattar *et al.* (2007) RCT [42]	To address the impact of simple antenatal educational interventions on breastfeeding practice	Group A received breastfeeding educational material and individual coaching from a lactation counselor. Group B received breastfeeding educational material with no counseling. Group C received routine antenatal care only	Mothers receiving individual counseling and educational material practiced exclusive and predominant breastfeeding more often than others at 3 months and 6 months postpartum. More mothers practiced exclusive and predominant breastfeeding at 6 months among women receiving individual counseling
43	Forster *et al.* (2004) RCT [43]	To determine the influence of mid-pregnancy breastfeeding education on the initiation and duration of breastfeeding	The interventions were a 1.5 h class on practical aspects of breastfeeding using a previously tested tool (practical skills), and two 1 h classes exploring family and community attitudes toward, and experiences of, breastfeeding (Attitudes). Breastfeeding initiation was ascertained by interview 2-4 days after birth, and breastfeeding duration was assessed by telephone interview 6 months after birth. Control group could access the standard care	Neither intervention increased breastfeeding initiation or duration compared with standard care

EXCEL: Early Experiences and Counseling for Effective Lactation, RCT: Randomized controlled trial

the three trial (8, 27, 39) that began in prenatal period and continued in postnatal period, and the four trials (17, 32, 38, 41) conducted in postnatal period have not been effective [Table 4].

Exclusive breastfeeding has been examined in 18 trials. Seven trials conducted (1, 16, 20, 22, 23, 30, 42) in the prenatal period, one trial (29) that began in prenatal period and continued in postnatal period, and one trial (37) conducted in postnatal period positively affected exclusive breastfeeding. Three trials (13, 15, 34) conducted in prenatal period, three trials (8, 19, 33) that began in prenatal period and continued in postnatal period, and three trials (35, 38, 41) conducted postnatal period have not been effective [Table 4].

The rate of breastfeeding has been examined in 11 trials. Three trials (14, 28, 42) conducted in prenatal period and three

Table 2: Training time of intervention, sample size and participant characteristics

Training time of intervention	Number of articles
Prenatal period	1, 13, 14, 15, 16, 20, 22, 23, 28, 34, 40, 42, 43
Postnatal period	17, 18, 24, 25, 31, 32, 35, 37, 38, 41
Beginning prenatal and continuing postnatal	8, 19, 21, 26, 27, 29, 33, 36, 39
Comparing two different groups, prenatal and postnatal	30
Sample size	
50-100	15, 16, 17, 18, 23
101-200	1, 8, 19, 20, 22
201-500	13, 27, 30, 31, 32, 33, 34, 36, 38, 42
501-1000	14, 21, 24, 25, 26, 28, 35, 37, 39, 43
>1000	29, 40
Participant characteristics	
Primiparouses	14, 17, 18, 20, 23, 31, 34, 36, 37, 38, 40
Low-income women	8, 19, 22, 33, 35
Adolescents	13, 27
Cesarean delivery	16
Uncomplicated all women	15, 21, 24, 25, 26, 28, 1, 29, 30, 32, 39, 41, 42, 43
Research location	
Spain	14
France	25
Netherlands	26
Denmark	40, 41
U.K	39
Scotland	21, 32
Belarus	29
Turkey	1, 18, 28
Jordan	17
United States	8, 13, 19, 22, 27, 33, 35
Canada	23, 31, 38
Taiwan	15, 16, 20
Singapore	30, 42
China	34, 37
Australia	24, 36, 43

The number of articles refer to the number in the Table 1

Table 3: Type of intervention

Type of intervention	Number of articles
Telephone call	8, 13, 14, 16, 17, 18, 20, 22, 23, 24, 25, 26, 27, 31, 32, 33,34, 35, 36, 37, 38, 39, 42,43
Video/slides	1, 13, 14, 15, 16, 19, 20, 22, 23, 24, 25, 30, 36, 38, 40, 42, 43
Home visit	15, 18, 19, 22, 24, 26, 27, 30, 32, 33, 36, 39, 40, 41, 43
Brochures, written documents, books	16, 18, 20, 24, 25, 26, 30, 34, 35, 36, 38, 41, 42
Individual support and education	13, 17, 18, 24, 27, 28, 29, 30, 34, 35, 37, 38, 42
Peer counseling/support	8, 13, 19, 21, 22, 31, 32, 39
Educational class, workshop, discussion	1, 13, 14, 15, 23, 27, 36, 40, 43
Clinical/hospital visit	13, 19, 30, 33
Web based education	20, 38

The number of articles refer to the number in the Table 1

trial (8, 19, 36) that began in prenatal period and continued in postnatal period, one trial (30) conducted in postnatal period positively affected rate of breastfeeding. Two trial (26, 39) that began in prenatal period and continued in postnatal period and two trials (24, 25) conducted in postnatal period have not been effective [Table 4].

Breastfeeding knowledge level has been examined in six trials. Four trials (1, 15, 20, 40) conducted in prenatal period and two trials (17, 18) conducted in postnatal period positively affected breastfeeding information levels. Among the trials that examine breastfeeding knowledge level variable, non-effective trials have not been observed [Table 4].

In some trials, interventions were also effective on breastfeeding attitude (15,16,20), breastfeeding satisfaction (15), rooming in (16), mixed feeding rate (20), breastfeeding self-efficacy (23), the risk of baby infection (28), gastrointestinal tract infection (29), and atopic eczema (29) [Table 5]. In one study (8), in addition to education, breastfeeding attitude and self-efficacy were effective on breastfeeding initiation.

DISCUSSION

This review consists of 33 trials by the dates of January 2000 and February 2015. This review contains all the trials that examine the variables like initiation of breastfeeding, breastfeeding duration, exclusive breastfeeding, breastfeeding rate and breastfeeding knowledge level and the ones that meet our criteria.

A significant amount of trials about breastfeeding education contains various methods of breastfeeding in literature reviews [13,25,38]. It is determined that the most prominent methods used in the trials were phone calls, videos/slides, home visits, brochures/written documents/books, individual support/education, and peer counseling/support in this review [20]. It is most likely that various practices like interactive breastfeeding education classes (information, role-play, and video) increase the preparedness level of the mothers and the success of the continuation of breastfeeding [7]. In most of the trials, more than one method has been used in this review. It is stated that using a method of more than one educational model is more effective than using a method of a single educational model and it promotes a more effective breastfeeding behavior [20,44]. On the contrary Lumbiganon *et al*. argues that multi-educational interventions are not more effective compared to single educational interventions in initiating or continuation of breastfeeding [20,45].

In our review, generally peer counselors have been enlisted into the educational programs in order to equip them with the necessary information and ability. Most of the time peer counseling has began with pregnancy and continued in postnatal period. Some of these trials were a more effective on breastfeeding initiation and duration. Dyson *et al*. conclude that health education and peer support interventions included in their review are likely to result in some improvements in initiation rates, and they propose practical sessions [46]. In their systematic analysis Kaunonen *et al*. state that in order for mothers to sustain breastfeeding a method of combining both professional counseling and peer support is important [47]. On

Table 4: Effectiveness of the interventions on some of the breastfeeding variations

Breastfeeding variations	Significant difference			No significant difference		
	Prenatal	Prenatal and postnatal	Postnatal	Prenatal	Prenatal and postnatal	Postnatal
Breastfeeding initiation		8, 19, 21, 27		1, 13, 14, 43		32
Breastfeeding duration	13, 14, 28	19, 21, 29, 33	18, 31, 35, 37	34, 40, 43	27, 8, 39	17, 32, 38, 41
Exclusive breastfeeding	1, 16, 20, 22, 23, 30, 42	29	37	13, 15, 34	8, 19, 33	35, 38, 41
Breastfeeding rate	14, 28, 42	8, 19, 36	30*		26, 39	24, 25
Breastfeeding knowledge level	1, 15, 20, 40		17, 18			

The number of articles refer to the number in the Table 1, *One trial group in prenatal period and one trial group in postnatal period have been composed in 30th trial

Table 5: Effectiveness of the interventions on other factors

Factors	Significant difference	No significant difference
Breastfeeding attitude	15, 16, 20	
Breastfeeding satisfaction	15	
Rooming in	16	
Mixed feeding rate	20	
Breastfeeding self-efficacy	23	40
Reducing the infection risk of baby	28	
Reducing gastrointestinal tract infection	29	
Reducing atopic eczema	29	
Reducing respiratory tract infection		29

the other hand in their review Lumbiganon *et al*. present that peer counseling is important for initiating breastfeeding and lactation counseling is responsible for exclusive breastfeeding in the first 6 months [45].

According to results of this review, in increasing exclusive breastfeeding and breastfeeding knowledge levels, education in prenatal period seemed more effective. In increasing breastfeeding initiation, education beginning from prenatal period and continuing with postnatal period seemed the most effective. In a systematic analysis about the efficiency of intervention through professional counseling in breastfeeding, it is shown that beginning from prenatal period and continuing with postnatal period professional counseling is more effective [44].

CONCLUSION

It is of outmost importance that mothers should be educated and counseled by nurses and other healthcare professionals about breastfeeding initiation, exclusive breastfeeding and effective continuation of it. Nurses and midwives should pay extra attention to breastfeeding education which is very important for maintaining a healthy society. Educational programs about breastfeeding should be evaluated anew and applied according to planned and present standards. Each and every expectant mother should receive correct and appropriate education about breastfeeding and mothers should always be monitored thoroughly and supported accordingly. Moreover, we observed that some interventions were not effective on breastfeeding behaviors. That's why we think that other factors which affect breastfeeding beside education should be determined, and appropriate interventions should be applied.

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Source of Support: Nil, Conflict of Interest: None declared.