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REVIEW

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Effectiveness of educational interventions conducted by telephone to promote breastfeeding: a systematic review of the literature

Eficácia de intervenções educativas realizadas por telefone para promoção do aleitamento materno: revisão sistemática da literatura

Efectividad de las intervenciones educativas por teléfono para la promoción de la lactancia: revisión sistemática de la literatura

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ABSTRACT

Objective: To assess the effectiveness of telephone educational interventions on the duration and exclusiveness of breastfeeding. **Method:** A systematic review of the literature was conducted including only Randomized Clinical Trials. The exposure factor was an educational intervention via telephone, and the outcomes were duration and exclusiveness of breastfeeding. Literature in Portuguese, English and Spanish published between 2010 and 2016 were searched for in the Cochrane, Lilacs, Medline and Scopus databases. The articles were analyzed through a results synthesis. **Results:** 241 articles were identified, of which 231 did not meet the inclusion criteria. Therefore, only 10 articles were reviewed. Four studies showed no efficacy related to breastfeeding. Regarding common characteristics, these studies were performed in short periods and in pairs. The others revealed efficacy regarding duration and/or exclusiveness of breastfeeding. The latter were mostly studies with long-term interventions and carried out by nurse lactation consultants. **Conclusion:** The evidence demonstrates that the telephone is a viable technology for promoting breastfeeding, representing an alternative for the health units and health professionals that can contribute to mother-baby care.

DESCRIPTORS

Breast Feeding; Health Education; Telephone; Maternal-Child Nursing; Review.

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INTRODUCTION

In recent years there has been an interest in planning actions and programs in public health in the maternal and child area emphasizing the practice of breastfeeding, since this has been considered an economic and effective strategy for reducing infant morbimortality[1]. The advantages of breastfeeding for children's health have been reiterated in diverse sociocultural realities, evidencing that this practice contributes to reduced hospitalizations for diarrheal diseases[2], occurrence or severity of gastrointestinal tract infections[3] and atopic dermatitis[4].

Despite the current evidence reinforcing the importance of exclusive breastfeeding (EBF) for children up to 6 months of age, only 41% are breastfed in Brazil[5]. Several aspects can negatively influence breastfeeding (BF) contributing to early weaning, such as: low schooling[6], work away from home[7], the use of pacifiers and supplements[6,8] and lack of support from health professionals[9].

In order to reverse this scenario, health professionals seek factors that can be modified so that they can intervene and obtain favorable results in the adhesion and maintenance of breastfeeding[10]. Thus, health strategies carried out by the World Health Organization seek to promote, protect and support breastfeeding through the effective participation of health services and the support of professionals[11].

In this sense, nursing educators are faced with the search for breastfeeding success in clinical practice, and have been making use of technologies as a resource to assist in the care of this clientele, seeking better results in breastfeeding confidence, adherence and maintenance. The educational practice of nurses should value the use of strategies and technologies that contribute to provide the necessary support, encouragement and guidance for breastfeeding practice[12].

With regard to educational technology, it can be understood as the application of new technologies in education processes. This consists in the systematic way of planning, implementing and evaluating the overall learning and teaching process, employing a combination of human and material resources in order to obtain more effective instruction[13].

Educational technologies appear as ways of facilitating the teaching-learning process, taking into account the more focused approach to providing learning experiences than in an instructional planning, representing a possibility of increasing the efficiency and productivity of health systems[14]. Thus, it is perceived that the use of technologies contributes to the education and health promotion of the population by allowing organization or the use of educational and technological resources to simplify the work and improve teaching and learning[15].

Educational technologies have been showing great relevance for nursing care, since the materials are used to dynamize health education activities performed with the patients[16]. Several technologies have been used to improve breastfeeding rates (flipcharts, booklets, educational videos, manuals, workshops)[17-19]. Among these, telephone support has been increasingly accepted as a useful form of support in the health care field, especially in specific areas of maternity such as BF support[20].

In this context, knowing that evidence-based practice (EBP) seeks to gather the best clinical data for decision-making regarding patient care and these data originates from rigorous research conducted by nurses and other health professionals[21], we sought to investigate the following research question: How effective are telephone educational interventions in the duration and exclusiveness of BF in lactating women?

The accomplishment of a systematic review on this theme is relevant to subsidize the clinical and educational practice of nurses in the context of health promotion. In order for the educational actions developed by nursing to have real efficacy and impact on the phenomena to which they propose to work, it is necessary to recognize, synthesize and critically evaluate the available scientific evidence on the effectiveness of the educational interventions and the implemented technologies. The use of the systematic review allows for obtaining the best clinical data to improve and to scientifically base the educational interventions carried out by nursing in breastfeeding promotion.

Therefore, the present review aims to evaluate the effectiveness of educational interventions via telephone on the duration and exclusiveness of BF in lactating women.

METHOD

This is a systematic review of the scientific literature, developed according to the recommendations of the Cochrane Collaboration[22]. The process of preparing this review followed the steps proposed by the Methodological Guidelines for the Elaboration of Systematic Reviews and Meta-analyzes of Randomized Clinical Trials (RCTs), such as: defining the research question according to the PICO format; defining the eligibility criteria; justification for the systematic review; searching for potential eligible studies; evaluating study eligibility (screening studies according to the abstract and title, and subsequently by reading the full text); extracting relevant data (use of the clinical form); presentation and discussion of the results synthesis[23].

The PICO strategy considered P = pregnant or lactating women, I = telephone educational intervention, C = no intervention, O = duration and exclusiveness of breastfeeding to elaborate the guiding question of the study: How effective are educational interventions applied via telephone to pregnant or lactating women in the duration and exclusiveness of breastfeeding?

The search for studies was performed independently and concomitantly by two researchers in the period of June 2016. This search was carried out in relevant databases of impact to the health context, predetermined by the principal investigator which were: Cochrane, MEDLINE, LILACS and SCOPUS.

In order to perform searches in the databases, the controlled descriptors of *DeCS*/MeSH (*Descritores em Ciências da Saúde*/Medical Subject Headings) used were: Intervention Studies (*estudos de intervenção*), Telephone (*telefone*) and Breast Feeding (*aleitamento materno*). The Boolean operator *and* was used and the following crossing was performed: *Intervention Studies* and *Telephone* and *Breast Feeding*.

The search in the MEDLINE and Cochrane databases was performed using the advanced search option using the associated descriptors *Intervention Studies, Telephone* and *Breast Feeding*. The publication date limit of 2010 to 2016 was also applied. A document search was carried out in the SCOPUS database using the three English descriptors associated with application of the publication period filter, while the search in LILACS was performed using the descriptors intervention studies, telephone and breastfeeding in an associated manner.

The following eligibility criteria was adopted for the selection of articles: being a complete research article, published in English, Portuguese or Spanish, with an evidence level of 2 (derived from at least one well-delineated RCT), published between 2010 and 2016 (published until the date of the search conducted by the researchers), using the telephone for educational interventions on breastfeeding and having the duration and/or exclusiveness of BF as an outcome. The exclusion criteria were: articles published in other languages, out of the period specified in the review protocol, which did not adequately address the issue or that did not use the telephone as an intervention tool.

After conducting the search for studies, an evaluation of their eligibility was performed through a step of screening the articles by reading the titles and abstracts, which allowed for discarding a relative number of references that did not fit the eligibility criteria. This was followed by a confirmation step by reading the full manuscript.

It should be noted that when there was disagreement over the eligibility judgment among the reviewers, it was sufficient for only one reviewer to judge the article as eligible for it to go through to the next stage. At the end of this process the total sample consisted of 10 articles.

Data extraction from the articles was guided by a standard clinical form previously elaborated by the authors based on the recommendations proposed in the literature[23], containing the information and variables that were considered important for interpreting and applying the results: identification of the article (article title, authorship, year of publication, database, country), participants (population, initial and final sample, study losses, inclusion criteria), intervention (description of the intervention, theoretical reference used, intervention provider and intervention period), outcomes (outcomes assessed and evaluation period) and results. The PRISMA protocol was used with the purpose of improving the presentation of the results of this research.

For analysis and later synthesis of the reviewed articles, the authors followed the reference framework proposed in the literature[23] which includes the following aspects: Extraction of quantitative data, Synthesis of the outcomes as BF and EBF rates (presented in percentage) and duration of BF and EBF (in days), Summary of the effect measures, Presentation of the descriptive data in tables and a flowchart of the article selection in a figure. The articles were then categorized according to their efficacy related to breastfeeding based on the analysis: 1. Non-effective interventions regarding the duration and/or exclusiveness of breastfeeding; and 2. Effective interventions regarding the duration and/or exclusiveness of breastfeeding.

RESULTS

241 articles were retrieved from selected databases according to the implemented search strategy. A total of 231 studies were excluded because they did not meet the eligibility criteria, resulting in a sample of 10 articles, as shown in the systematic review flowchart (Figure 1).

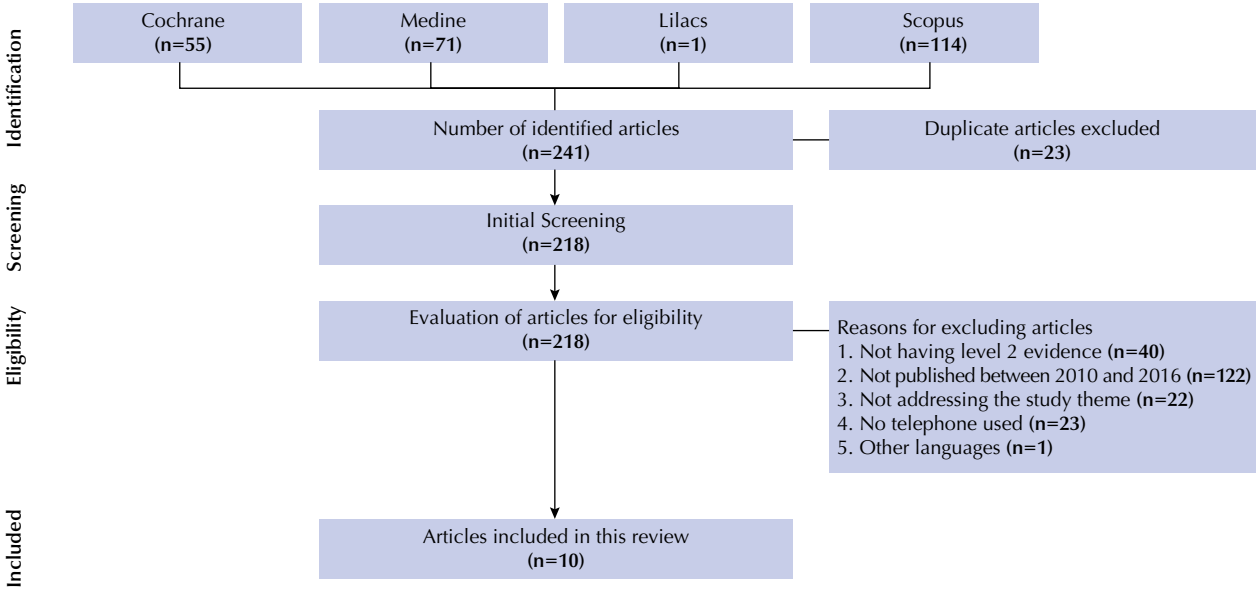

Figure 1 – Flowchart for the study inclusion eligibility – Fortaleza, CE, Brazil, 2016.

Study Characteristics

An analysis of the 10 articles that composed the sample showed that all were published in international journals and in the English language. Medline was the database that presented the largest number of studies with eight, followed by SCOPUS and COCHRANE, each with one study. The LILACS database had its article excluded because it was not classified as level of evidence 1 or 2. Publications in the United States predominated (60%), followed by Malaysia, China, Denmark and Nigeria, each with one publication. According to the methodological classification, all included articles were Controlled Randomized Clinical Trials.

Characterization of articles according to the method and the educational interventions via telephone

For analysis of the studies included in this systematic review, it is necessary to initially present some methodological aspects which are important for understanding the performed clinical trials such as population and sample of each study, sample losses and inclusion criteria.

Moreover, it is necessary to present the telephone interventions that were performed in the clinical trials, considering important factors such as the provider of the intervention, the period in which it was performed, the theoretical reference used and its description. Chart 1 presents the studies included in this review according to the sample and the implemented interventions.

In relation to the population selected for the studies, it is noticed that both pregnant women and puerperal women were chosen since some authors believe that it is necessary to initiate the support and encouragement of BF even during pregnancy through prenatal care[24,27,29].

Overall, the study sample consisted of women who had healthy full-term infants without obstetric complications or incidents, or in the puerperal period without contraindications for breastfeeding and who had telephone contact.

Only two studies[28,31] involved a specific group of puerperal women who were obese, since maternal obesity is associated with worse BF and EBF rates, requiring support and interventions for this specific population.

Regarding the sample losses, the studies had significant rates varying from 0.3% to 59.55% of the sample. All analyzed studies reported having performed randomization of the participants into control and intervention groups using techniques such as block randomization, in groups and stratified using computational algorithms, using sealed envelopes and tables with random numbers. The implemented randomization technique was only not reported in two studies[28-29].

Chart 1 – Characterization of the studies according to the sample and the implemented interventions – Fortaleza, CE, Brazil, 2016.

Author	Sample/ Losses	Intervention provider	Period of intervention	Description of the Intervention
Efrat et. al., 2015[24]	298 pregnant women/ 59.55%	A health professional lactation consultant by the IBLCE (*International Board of Lactation Consultant Examiners*) and with experience as a lactation educator	Early in the third trimester of pregnancy until the 6th month postpartum	**Instrument used:** Intervention monitoring protocol created by the principal investigator. Aspects considered: Prenatal: increasing the support to start breastfeeding, reducing barriers related to breastfeeding and providing advance guidance about what to expect during the first weeks of breastfeeding. Postpartum: increasing support for exclusive breastfeeding, reinforcing the knowledge received during the prenatal care phone call, addressing any concerns related to breastfeeding and referrals of participants who report breastfeeding problems to health services. **Compared to the use of the telephone:** 1) Control group received routine service guidelines. 2) Intervention group received routine service in addition to guidance over the phone, with 4 calls in the prenatal period and 17 calls in the postpartum period. **Assessment of BF and EBF:** The type of BF and duration rates at 72 hours, 1 month, 3 months and 6 months were evaluated.
Bunik et al., 2010[25]	341 low-income latin puerperal women/ 27%	Trained bilingual nurses (English and Spanish)	First two weeks postpartum (daily phone calls)	**Instruments used:** Culturally adapted protocols developed based on national and public health references regarding BF. **Aspects considered:** Cultural issues of BF, advantages of colostrum and of a good latch; benefits of breastfeeding; engorgement; breast pain; causes for baby crying; supplementary formulas; family support; support groups; maternal diseases; medications and diet; milk storage; return to work or to school, and other difficulties. **Compared to the use of the telephone:** 1) Control group received routine service guidelines. 2) Intervention group received routine service guidelines plus two more weeks of daily telephone calls. **Assessment of BF and EBF:** The type of BF and duration rates at 1 month and 6 months were evaluated.
Tahir et al., 2013[26]	357 puerperal women/ 10.9%	Midwife nurses certified as lactation consultants	Up to the sixth month postpartum, two phone calls per month	**Instruments used:** Educational materials about guidelines on breastfeeding and the use of the standard operating procedure to standardize the intervention. Aspects considered: Definitions concerning the BF practice in accordance with the recommendations of the World Health Organization. **Compared to the use of the telephone:** 1) Control group received routine service guidelines. 2) Intervention group received the routine service guidelines plus phone calls held twice a month. **Assessment of BF and EBF:** The type of BF and duration rates at 1, 4 and 6 months were evaluated.

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Author	Sample/ Losses	Intervention provider	Period of intervention	Description of the Intervention
Srinivas et al., 2015[27]	120 pregnant women/ 14.2%	By pairs (trained women with successful experiences in breast-feeding)	Until the fourth month postpartum	**Instruments used:** Iowa Infant Feeding Attitude Scale and the Breastfeeding Self-Efficacy Scale to guide the intervention. Aspects considered: Basic guidelines on breastfeeding. **Compared to the use of the telephone:** 1) Control group received routine service guidelines. 2) Intervention group received routine service guidelines plus telephone contact within 3 to 5 days after delivery, weekly over the 1st month, every 2 weeks up to the 3rd month and once a month up to 4 months. **Assessment of BF and EBF:** The type of BF and duration rates at 1 and 6 months were evaluated.
Rasmussen et al., 2011[28]	50 obese puerperal women/ 20%	Lactation consultant certified by the IBLCE	Up to 72 hours postpartum (a phone call before the delivery and two other calls at 24 and 72 hours)	**Instrument used:** A script to standardize the intervention created by the researchers, however the consultants also addressed other important issues that came up during the phone calls. Aspects considered: Knowledge, expectations and questions of women in relation to BF in the prepartum; demands and difficulties with BF in the postpartum. **Compared to the use of the telephone:** Group 1: a) Group that received the routine service; b) Group that received a call in the prepartum and two in the postpartum, the first at 24 hours and the second at 72 hours. **Assessment of BF and EBF:** EBF and duration rates at 7 and 30 days and the type of BF at 30 and 90 days were evaluated.
Reeder et al., 2016[29]	1,948 pregnant women/ 3.2%	By pairs (trained women with successful experiences in breast-feeding)	Up to 4 months postpartum	**Instrument used:** A report generated by the data system that included previous calls made. Aspects considered: Benefits of BF, breastfeeding techniques and difficulties with BF. **Compared to the use of the telephone:** 1) Group that received the routine service. 2) Group that received the routine service plus low-frequency counseling: four calls, two in prenatal care and two up to the second week postpartum. 3) Group that received the routine service plus high-frequency counseling: eight calls, four in the prenatal period and four up to the fourth month postpartum. **Assessment of BF and EBF:** The type of BF and duration rates at 1, 3 and 6 months were evaluated.
Fu et al., 2014[30]	724 Chinese puerperal women/ 0.3%	Nurses with extensive experience and certified lactation consultants	Up to the fourth week postpartum	**Instrument used:** Intervention Protocol created by the principal investigator. Aspects considered: Benefits of exclusive breastfeeding, lactation physiology and common issues related to early breastfeeding, breastfeeding techniques, evaluation of feeding behaviors and manual expression of breastmilk, emotional and physical health of the mother, and guidance on issues such as low weight gain, insufficient milk, return to work, milk storage. **Compared to the use of the telephone:** 1) Group that received the routine service; 2) Group that received the routine service plus three more sessions of breastfeeding support in the maternity ward, 30-45 minutes each; 3) Group that received routine services plus weekly phone support of 20-30 minutes up to the fourth week postpartum. **Assessment of BF and EBF:** EBF and its duration at 1, 2 and 3 months postpartum were evaluated.
Carlsen et al., 2013[31]	226 obese puerperal women/ 8.5%	Health professional certified as lactation consultant by the IBLCE	Up to the sixth month postpartum	**Instrument used:** A structured Protocol. Aspects considered: Issues related to physical and psychological aspects of breastfeeding and the well-being of mother and child, the difficulties and possible solutions. **Compared to the use of the telephone:** 1) Group that received routine services. 2) Group that received routine services plus three calls in the first month, a call at every 2 weeks until the second month and subsequently once a month until 8 weeks postpartum. **Assessment of BF and EBF:** Comparison of the duration medians of the EBF at 3 and 7 days, at 4 weeks and at 3 months after delivery. Comparison of the BF median at 6 months.
Flax et al., 2016[32]	461 pregnant women/ 4.8%	Partners of an American non-governmental organization in partnership with four community organizations	Up to the sixth month postpartum	**Instruments used:** Posters and leaflets on BF during the sessions. Aspects considered: Recommendations for the early onset of BF and for EBF, benefits of BF, breastfeeding techniques and time for introducing other foods. **Compared to the use of the telephone:** 1) Group that received counseling sessions on BF during microcredit meetings; 2) Group that received text and voice messages recorded and sent by phone about matters discussed in the sessions; and 3) Group who received songs and dramatizations created by the participants. **Assessment of BF and EBF:** EBF and its duration at 1, 3 and 6 months were evaluated; the initiation of breastfeeding within 1 hour after delivery and the use of colostrum or breast milk exclusively during the first 3 days of the child's life.
Pugh et al., 2010[33]	328 puerperal women/ 29%	Support group formed by nurses and lactation consultants and advising peers	Up to the sixth month postpartum	**Instrument used:** Intervention Protocol created by the principal investigator. Aspects considered: Strengthening of maternal competence with the commitment to breastfeeding, parental education on breastfeeding, identification of social support, ways to reduce breast issues and information regarding the health services that facilitate the process of BF. **Compared to the use of the telephone:** 1) Group that received the routine service. 2) Group that received the routine service plus an intervention, which initially consisted of daily hospital visits of the support group up to hospital discharge, twice at home during the first week, and a third visit up to 4 weeks postpartum. Mothers subsequently received phone calls scheduled at every 2 weeks up to the sixth month. **Assessment of BF and EBF:** BF at 6, 12 and 24 weeks postpartum was evaluated.

In most of the studies (six), the telephone intervention providers were health professionals, mainly nurses, with professional experience as breastfeeding consultants. It should be noted that the nurses who conducted the telephone interventions in five of these studies were certified as lactation consultants[24,26,28,30-31], with three of them certified by the *International Board of Lactation Consultant Examiners* (IBLCE)[24,28,31]. The intervention providers were nurses without certification as lactation consultants in only one of these studies[25], yet despite that they worked in the area and were trained to carry out the support for BF via telephone.

In another study[32], the intervention was conducted by partners of an American non-governmental organization in collaboration with four community organizations from the localities where the research took place; however, the authors did not report who these partners were, or whether they were health professionals or not.

In this review, three studies used peer telephone counseling involving women who had had successful breastfeeding experiences to counsel the intervention group participants. In addition to prior breastfeeding experience, the peers were trained by the researchers to carry out the telephone counseling. In this type of intervention, women received support and encouragement from their peers for breastfeeding and to overcome the difficulties that they encountered, as well as basic guidelines such as the benefits of BF, correct latching and breastfeeding techniques[27,29,33].

Among the aspects addressed in the calls made by the health professionals in the prenatal care were: increasing the motivation of the woman, supporting the beginning of BF, knowledge, expectations and questions regarding BF[24,27,29]. In the postpartum period, the goals were: increasing EBF support up to the sixth month of life, reinforcing the knowledge of prenatal care, discussing cultural issues related to BF and difficulties for its accomplishment (engorgement, pain, traumas, baby crying, low-weight, insufficient milk supply, supplementary formulas, lack of support, maternal diet and diseases), family support, return to work and studies, milk storage, and referrals to health services when necessary.

The telephone interventions in three RCTs were associated with other types of interventions. Counseling sessions were held in person once a month using; text messages associated with songs; dramatizations related to the issues discussed in the sessions[32]; visits to health centers for health and BF monitoring[25]; maternity visits; and three home visits by health professionals[33].

The studies included in this review did not report using a theoretical framework to support the study intervention, except one of them[25] reported using a protocol based on national and public health references on BF. However, the authors in another study[26] emphasized the importance of using educational materials to guide breastfeeding counseling and of using Standard Operating Procedures to standardize the intervention.

Regarding the intervention period, the studies were quite heterogeneous, ranging from the first week postpartum up to the sixth month. For this review, we chose to adopt the terminology of short-term interventions for those that occurred only up to the first month postpartum, and long-term interventions for those that continued throughout the puerperium, extending beyond the first month of child's life.

Thus, we can highlight that most studies (seven) used long-term interventions, while only three used short-term interventions, and that the adopted intervention periods were up to 72 hours postpartum[28], 2 weeks postpartum[25], and up to 4 weeks postpartum[30].

Assessing the effectiveness of telephone educational interventions

In the present review, we chose to present the results of the studies according to the effectiveness of their interventions in order to facilitate understanding of the characteristics of clinical trials that had a positive impact on the investigated outcomes, and those which did not show differences associated with these interventions.

Thus, this topic is subdivided into two categories: 1. Non-effective interventions regarding the duration and/or exclusiveness of breastfeeding; and 2. Effective interventions regarding the duration and/or exclusiveness of breastfeeding.

Non-effective interventions regarding the duration and/or exclusiveness of breastfeeding

Of the total sample of 10 articles that were included in this review, four did not show significant efficacy on breastfeeding[25,27-29]. In relation to the three studies that performed short-term interventions (up to the first month postpartum), two had no efficacy over the duration or exclusiveness of breastfeeding[25,28].

Among these, one RCT[25] carried out with 341 puerperal latin women with low incomes evaluated the support to BF performed via telephone by nurses during the first two weeks postpartum. The intervention group (IG) and the control group (CG) did not present significant differences regarding the breastfeeding rates or BF duration (at 1 month: IG: 74% *vs.* CG: 74% (p=0.9). No differences were also observed in relation to the exclusive breastfeeding rates between the IG and CG.

A study involving 50 obese puerperal women[28] evaluated whether increased breastfeeding support via telephone within 72 hours postpartum performed by lactation consultants was effective in improving breastfeeding in this specific group. This study had negative efficacy in relation to the intervention group when compared to the control group, in which the breastfeeding duration was 4.3 weeks shorter in the IG than in the CG (p=0.08), which was also observed at 30 and 90 days (p=0.10 and p=0.08, respectively). The EBF duration was 4.7 weeks shorter in the IG than in the CG (p=0.08).

Among the seven studies that used long-term interventions, two were not effective in duration or exclusiveness of BF. A common factor in these two articles was that the intervention providers were peers (women with successful experiences in breastfeeding).

In an RCT performed with 120 pregnant women, the intervention consisted of phone calls made by peers up to the fourth month postpartum to support and provide guidelines

on BF. The results showed that there was no significant difference in the duration of breastfeeding between IG and CG, with a mean of 6 weeks (IG=7.0 weeks, CG=6.0 weeks). There was also no differences for EBF rates between the IG and the CG either at 1 month (p=0.51) or at 6 months (p=0.51)[27].

A study using peer counseling by telephone to 1,948 pregnant women divided into three groups (one control and two intervention), sought to evaluate low-frequency counseling (four phone calls) and high-frequency counseling (eight phone calls) in promoting BF[29]. Although the high-frequency counseling increased the probability of non-exclusive breastfeeding at 3 months in the IG by 22% (RR: 1.22), no significant difference was found for the duration of BF or EBF between IG and CG in both types of counseling.

Effective interventions regarding the duration and/or exclusiveness of breastfeeding

In this review, six of the 10 analyzed articles showed significant efficacy in duration and/or exclusiveness of breastfeeding[24,26,30-33]; among them only one study used a short-term intervention[30] and five used long-term interventions[24,26,31-33].

The study with the short-term intervention[30] was a multicenter study performed in Chinese hospitals with a representative sample (n=724), in which telephone support was provided up to 4 weeks postpartum by lactation consultant nurses with extensive experience in breastfeeding. In that study, the intervention significantly increased the duration of BF in the first 6 months (p=0.01). The BF rates up to the sixth month were also higher in the IG when compared to the CG, and the IG was significantly more likely to continue breastfeeding at both 1 month (IG= 76.2% CG=67.3% OR=1.63 p=0.01) and at 2 months (IG=58.6% CG= 48.9% OR= 1.48, 95% p=0.03). The risk of early interruption of BF was significantly lower in the IG when compared to CG (RR: 0.79 p=0.03). Regarding exclusive breastfeeding, the IG was more likely to maintain EBF until the sixth month; however, the intervention was only significant for increasing EBF rates at 1 month (IG= 28.4% CG= 16.9% OR= 1.89 p=0.003).

Regarding the seven studies that used long-term interventions, the majority (n=5) proved to be effective in the duration and/or exclusiveness of breastfeeding. In the study conducted with 298 women[24], telephone support provided by prenatal lactation consultants was evaluated up to 6 months postpartum. Despite significant sample losses over the course of the study (59.5%), the intervention proved to be effective for increasing the duration of BF in the IG, with a mean of 20.2 weeks of breastfeeding, while CG had a mean of 13.7 weeks (p=0.024). The women who received the intervention were more likely to continue with EBF throughout the several evaluation periods (OR at 72 h=1.1, OR at 1 month=1.6, OR at 3 months=1.7 and OR at 6 months=2.6).

A RCT performed with 357 puerperal women[26] tested a telephone support provided by lactation consultants performed up to the sixth month postpartum. The authors evidenced that the BF rates were higher in the IG when compared to CG, although the difference was not significant (6 months: IG=90.6% *vs*. CG=86.1% p=0.276). Another positive result was the fact that more puerperal women completely discontinued BF in CG than in IG at all assessment periods (at 1 month IG=4.2% *vs*. CG=7.4%; at 4 months: IG=9.9% *vs*. CG=12.6%; at 6 months: IG=9.4% *vs*. CG=13.9%). The intervention in this study was effective in increasing the EBF rate in the IG at the first month postpartum (IG: 84.3% vs. CG: 74.7% p=0.042), although the women who received the intervention were also more likely to continue EBF at 4 and 6 months postpartum (at 1 month OR: 1.83; at 4 months OR: 1.13; at 6 months OR: 1.04).

In the study involving 226 puerperal obese women[31], the women received calls from lactation consultants up to the sixth postpartum month addressing physical and psychological aspects related to breastfeeding and their encountered difficulties. The intervention was effective in increasing the duration of BF in the IG, with an average of 184 days in comparison to CG, with a mean of 108 days (p=0.002). In addition, the intervention was able to significantly increase the duration of exclusive breastfeeding with the IG presenting a mean of 120 days of EBF, while the CG of only 41 days (p=0.003).

The RCT carried out with 461 women members of Nigerian communities who were part of a microcredit program implemented counseling with the aim to increase the early onset of BF and to maintain the exclusiveness of breastfeeding[32]. This counseling consisted of sessions, phone follow-ups, text messages, and the use of songs and dramatizations at the time of the meetings. The findings demonstrated that the intervention was effective in relation to EBF, as the chances of EBF in the IG were higher than in those in the CG at 1 month (73% *vs*. 61%, OR: 1.6 CI: 0.6-1.8 p=0,10), at 3 months (71% *vs*. 58%, OR: 1.8 CI: 1.1-3.0 p<0.05) and at 6 months (64% *vs*. 43%, OR: 2.4 CI: 1.4-4.0 p<0.01), being significant at 3 and 6 months. This study did not evaluate the breastfeeding duration. These microcredit organizations are part of the strategies created in Nigeria to promote adherence to healthy behaviors, including best practices for breastfeeding.

Finally, a study of 328 puerperal women also tested telephone support provided by a group of nursing lactation consultants and peers up to the sixth month postpartum, associated with hospital and home visits performed by nurses[33]. The BF rate was only higher in the IG at 6 weeks postpartum, being significant (IG: 66.7% *vs*. CG: 56.9% p=0.05); while these rates were similar between the two groups at 3 and 6 months. The exclusiveness of breastfeeding was not evaluated in this study.

DISCUSSION

The use of technologies for assisting the mother-child binomial and in the educational process contributes to the support, encouragement and guidance necessary for the practice of breastfeeding[34]. In this context, a technology that has been gaining prominence in the national and international scope is telephone support, which has proven to be a useful and accessible way to promote breastfeeding support[20].

It has been shown that RCTs that used educational telephone interventions to promote BF involved different

populations of pregnant women and puerperal women. When the population was composed of pregnant women, the intervention started in the third gestational trimester due to the belief that this is the period in which the woman should be prepared for issues that involve the experience of childbirth and delivery, puerperium and child feeding[24,27,29].

In studies in which the population was composed of puerperal women, the intervention started in the immediate puerperium as a way to help and support women to initiate BF, providing information and support to overcome the difficulties present at the beginning of the breastfeeding journey and to make mothers more confident in maintaining exclusive breastfeeding[25-26,30-31,33].

RCTs in general and especially those which address BF-related interventions, are studies that involve longer follow-up periods of the subjects; therefore, it is necessary to consider the sample losses that can occur throughout the study[35]. Sample losses in this review varied widely among the investigated trials, reaching losses of more than 20% in some studies[24-25,33].

In telephone interventions to promote breastfeeding, several causes can increase the number of participants lost such as change of telephone number, telephone off, not answering the calls, dropping out of the survey, and interruption in breastfeeding, among others. In an attempt to overcome the possible limitations caused by the decrease in the number of participants throughout the study, it is necessary to consider a percentage of possible losses in the sample calculation[35].

Another important aspect in the design of clinical trials evidenced in this review is the creation of instruments, materials and standards that can guide implementation of the intervention with methodological rigor in order to guarantee its quality and homogeneity, avoiding possible biases in the study.

A pilot study developed in Canada used a standardized and individualized intervention protocol with two postpartum workshops and telephone contacts. The results evidenced higher levels of self-efficacy, duration and exclusiveness of breastfeeding until the second postpartum month among the mothers who participated in the intervention[10].

One of the limitations observed in the analyzed clinical trials was the fact that they did not describe whether or not they used any theoretical framework to support the intervention, which may represent a gap in planning the intervention or in describing the articles, not thoroughly detailing the intervention that was tested.

It was found that in most of the studies (six), the intervention providers were nurses with extensive experience as lactation consultants, evidencing the competence of these professionals to conduct interventions aimed at the promotion of breastfeeding[24,26,28,30-31]. It should be emphasized that there are currently international entities focused on training and certifying health professionals to act as lactation consultants. In three studies of this review, the professionals providing the intervention were certified by the *International Board of Lactation Consultant Examiners* (IBLCE), which consists of an international certification body that confers the credential of International Breastfeeding Consultant for professionals with the necessary knowledge, cognitive skills and clinical experience for effective breastfeeding consultant performance[24,28,31].

It is important to emphasize that in the performance of clinical trials in which educational interventions are applied and evaluated, they are not a "ready" and "concrete" intervention, but rather are developed at the moment of contact and dialogue between the professional and the participants; thus, the knowledge and experience of the researcher on the addressed subject is fundamental for the intervention's success and its effectiveness on the desired outcomes, and the professionals' training and qualifications responsible for intervening are promising for this type of study.

Peer counseling was used in the educational intervention in three of the analyzed clinical trials. Peer counseling is a form of intervention that has been consolidated in international studies, and which consists of people who have had positive experiences with certain situations promoting support and counseling for their peers[36-37]. Although the peers were trained by health professionals to provide telephone support for women who were breastfeeding, two studies investigated in this review that used peer counseling over the telephone found no significant efficacy in the duration or exclusiveness of BF[27,29,33].

Thus, the effectiveness observed in this review by peer counseling (via telephone) on breastfeeding differs from the results found in other studies or reviews in the literature, in which peer counseling (when well delineated) has been configured as a source of support and encouragement for puerperal women, obtaining good results in relation to the duration and exclusiveness of BF[36-37].

It is also important to note that the positive effectiveness of peer counseling proven by other studies is associated with face-to-face counseling (with peer contact), while the peer counseling evaluated in the studies included in the present review was carried out via telephone, which is a differential factor. Thus, we cannot ignore the significant contributions that this type of counseling has brought to breastfeeding, yet further studies investigating this support by telephone are necessary.

Regarding the efficacy of telephone interventions on the duration and exclusiveness of BF, four studies included in this review showed no significant efficacy in duration or exclusiveness of breastfeeding. However, most of these studies presented some limitations or differential factors that may have contributed to these results such as the reduced sample size, the intervention period, short-term interventions and peer counseling over the telephone.

One of the studies that was not effective for BF was carried out with obese puerperal women, in which a telephone follow-up was tested up to 72 hours postpartum[28]. This study presents several limitations that may have influenced the results such as the small sample number (n=50), the period when the calls were made, the specific audience, and not using theoretical reference for the intervention with this group.

In addition, the calls were performed at inappropriate times, such as in the prepartum when the women is very vulnerable and anxious about the birth of the child, which is not the ideal moment for guidance on BF, and in the period of 24 and 72 hours after delivery in which some women are still hospitalized or have just been discharged.

At this point, it is more appropriate that such interventions take place in the joint accommodations, valuing the personal contact of the professional with the patient in order to demonstrate the practice of BF and to minimize difficulties that may arise. Other studies that started the intervention even before delivery emphasize the importance of it being performed in the third trimester of gestation during the prenatal period in order to prepare the woman for this practice[24,27,29].

Another limiting factor was the physical condition of puerperal women, as BMI values were higher in the IG than in the CG, and this variable was associated with shorter breastfeeding time. Some studies have shown that obesity is associated with worse breastfeeding rates, since obese women have more difficulties to start breastfeeding and lower chances of maintaining this practice, in addition to biological factors such as difficulty in positioning the baby, larger breasts, delayed onset of lactogenesis and decreased prolactin response[38-39].

Six studies in this review had significant efficacy in duration and/or exclusiveness of breastfeeding, of which one study used a short-term intervention and five used long-term interventions.

Regarding the study that used short-term intervention, it was a multicenter RCT performed in hospitals in China with a representative sample of participants, and the intervention was performed by lactation consultant nurses[30]. The study design and its methodological rigor are factors that may have contributed to its effectiveness in the BF duration and exclusiveness.

Among the five studies that used long-term interventions and had significant efficacy in BF, we can point out that all had representative samples and performed interventions up to sixth months postpartum[24,26,31-33], demonstrating the importance of the follow-up of these women and of continuous health education during the puerperium, helping to provide the support and guidance that women need to deal with the several difficulties that may arise and influence early weaning.

According to some studies, telephone support consists of a promising intervention that can increase the duration of breastfeeding[20,40]. A survey carried out with puerperal women in Scotland used a daily telephone follow-up provided by health professionals to support breastfeeding as an educational intervention. The results showed that the intervention was effective as it increased breastfeeding rates by 23% and EBF by 22% among women who participated in the intervention group at 6-8 weeks postpartum, in addition to providing mothers' satisfaction with the intervention[40].

Still in relation to the studies that had significant efficacy in BF (n=6), the professionals responsible for carrying out the interventions in four of them were lactation consultant nurses, reinforcing the importance of the training and professional experience of the researchers involved for the intervention's success and the promotion of BF. In one of the studies, the intervention provider was a support group comprised of lactation consultant nurses and peers.

With regard to nursing, using the telephone can be a strategy for holistic care, expanding health actions and representing an advance in face of traditional care. However, care should be taken so that the use of this technology does not diminish the contact between professional and patient[41].

In only one study[32], the intervention providers were partners of a non-governmental organization, and it was not clear whether or not they were health professionals. This clinical trial was conducted with female members of Nigerian communities who were part of a microcredit program designed to offer small loans to low-income women to start or expand small businesses, seeking to improve their living conditions and consequently the health and the development of their children. Several studies that integrate microcredit programs with health interventions aimed at communities have been successful in modifying health behaviors[42-43].

Regarding the abovementioned information, it is important to know and analyze all the available evidence about the technologies and interventions that nursing can use for educational processes focused on BF in order to make the best decision regarding the technology and how to implement it.

CONCLUSION

With this review it has been evidenced that the studies that were effective in improving the duration and rates of BF and EBF were well-designed clinical trials with representative samples and interventions which were carried out by health professionals with knowledge and clinical experience on breastfeeding, considered as lactation consultants.

The evidence indicates that the use of the telephone as a support for educational interventions contributes to promoting BF and represents a potential strategy for the educational practice of nurses, thereby broadening the scope of nursing. Despite the limitations associated with the use of this technology, if it is used correctly it can bring benefits to the populations involved, since it optimizes time and can be used to reach a large number of users.

The use of educational interventions by telephone is seen as a possibility that can be added to those already used in basic health care as a way to facilitate access, guidance, support and follow-up of puerperal women and their children in relation to child feeding, and also regarding several other aspects that permeate this period in the lives of women.

Most of the studies in this review that had a positive impact on BF used long-term interventions that continued during the puerperium, which evidences the need for further investigations using this type of intervention, as well as studies comparing the effectiveness of short- and long-term interventions on the duration and exclusiveness of BF, contributing to the choice for the best alternative for each context. In addition, it is necessary to research about the cost-effectiveness of educational interventions by telephone to provide subsidies on the feasibility of its large-scale implementation by health services.

RESUMO

Objetivo: Avaliar a eficácia das intervenções educativas por telefone na duração e exclusividade do aleitamento materno. **Método:** Revisão sistemática da literatura, incluindo somente Ensaios Clínicos Randomizados. O fator de exposição foi uma intervenção educativa por telefone, e os desfechos foram a duração e a exclusividade da amamentação. Literatura em português, inglês e espanhol publicadas entre 2010 e 2016 foram procuradas na Cochrane, Lilacs, Medline e Scopus. Os artigos foram analisados mediante a síntese dos resultados. **Resultados:** Foram identificados 241 artigos, dos quais 231 não atenderam aos critérios de inclusão, de modo que apenas 10 artigos foram revisados. Quatro estudos não apresentaram eficácia relacionada à amamentação. Como características comuns, estes estudos foram realizados em períodos curtos e por pares. Os demais revelaram eficácia sobre a duração e/ou exclusividade da amamentação. Estes últimos eram majoritariamente estudos com intervenção de longa duração e realizados por enfermeiros consultores em lactação. **Conclusão:** As evidências demonstram que o telefone é uma tecnologia viável para a promoção do aleitamento materno, concedendo às unidades e aos profissionais de saúde uma alternativa que pode contribuir para o cuidado mãe-bebê.

DESCRITORES

Aleitamento Materno; Educação em Saúde; Telefone; Enfermagem Materno-Infantil; Revisão.

RESUMEN

Objetivo: Evaluar la efectividad de las intervenciones educativas por teléfono en la duración y exclusividad de la lactancia **Método:** Revisión sistemática de la literatura, incluyendo solo Ensayos Clínicos Randomizados. El factor de exposición fue una intervención educativa por teléfono, y los resultados fueron la duración y la exclusividad de la lactancia. Se buscaron literaturas en portugués, inglés y español publicadas entre 2010 y 2016 en Cochrane, Lilacs, Medline y Scopus. Los artículos fueron analizados mediante la síntesis de los resultados. **Resultados:** Fueron identificados 241 artículos, de los que 231 no atendieron a los criterios de inclusión, de modo a que se revisaron solo 10 artículos. Cuatro estudios no presentaron efectividad relacionada con la lactancia. Como características comunes, esos estudios se llevaron a cabo en períodos cortos y por pares. Los demás revelaron efectividad acerca de la duración y/o exclusividad de la lactancia. Estos últimos eran en su mayoría estudios con intervención de largo plazo y realizados por enfermeros consultores en lactancia. **Conclusión:** Las evidencias demuestran que el teléfono es una tecnología viable para la promoción de la lactancia, brindando a las unidades y los profesionales sanitarios una alternativa que puede contribuir al cuidado madre-bebé.

DESCRIPTORES

Lactancia Materna; Educación en Salud; Teléfono; Enfermería Maternoinfantil; Revisión.

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