

# Effects of a telephone educational intervention on breastfeeding: a clinical trial

Efeitos de uma intervenção educativa por telefone no aleitamento materno: ensaio clínico  
Efectos de una intervención educativa telefónica en la lactancia materna: ensayo clínico

Hilana Dayana Dodou<sup>1</sup>  <https://orcid.org/0000-0003-4411-8783>

Anne Fayma Lopes Chaves<sup>1</sup>  <https://orcid.org/0000-0002-7331-1673>

Monique Albuquerque Teles Pinho<sup>2</sup>  <https://orcid.org/0000-0001-7486-693X>

Bárbara Brandão Lopes<sup>2</sup>  <https://orcid.org/0000-0002-2397-4460>

Bárbara Gomes Santos Silva<sup>2</sup>  <https://orcid.org/0000-0001-8892-2293>

Dafne Paiva Rodrigues<sup>3</sup>  <https://orcid.org/0000-0001-8686-3496>

Juliana Cristina dos Santos Monteiro<sup>4</sup>  <https://orcid.org/0000-0001-6470-673X>

Mônica Oliveira Batista Oriá<sup>2</sup>  <https://orcid.org/0000-0002-1483-6656>

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## Corresponding author

Mônica Oliveira Batista Oriá  
E-mail: [profmonicaoria@gmail.com](mailto:profmonicaoria@gmail.com)

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Márcia Barbieri  
(<https://orcid.org/0000-0002-4662-1983>)  
Escola Paulista de Enfermagem, Universidade Federal de São Paulo, São Paulo, SP, Brasil

## Abstract

**Objective:** To assess the effect of a long-term educational intervention by telephone on breastfeeding duration rates.

**Methods:** This is a controlled randomized clinical trial conducted at a maternity hospital in the city of Fortaleza. A so-called 240 women were answers in the immediate puerperium. An educational intervention was used by telephone centered on the principles of self-efficacy and with motivational interview approach at 7, 30, 90 and 150 days postpartum for the intervention group. The control group received the standard guidelines from the health service. Breastfeeding duration rates were verified using a questionnaire elaborated by the researcher applied to the intervention group and control group at 60, 120 and 180 days. To verify the effect of the intervention on the variables studied, the chi-square test and the Mann-Whitney U test were used. Brazilian Clinical Trial Registry: RBR-7m7vc8.

**Results:** There was a difference between the groups regarding non-exclusive and exclusive breastfeeding duration and rates. The intervention group had higher breastfeeding rates at 60 ( $p<0.001$ ), 120 ( $p=0.001$ ) and 180 days ( $p=0.001$ ), and exclusive breastfeeding, at 180 days ( $p=0.005$ ), as well as non-exclusive ( $p<0.001$ ) and exclusive ( $p<0.001$ ) breastfeeding longer duration.

**Conclusion:** the educational intervention by telephone has the potential to increase breastfeeding rates, duration and exclusivity, and can be used as an alternative to improve breastfeeding rates in the country.

## Resumo

**Objetivo:** Avaliar o efeito de uma intervenção educativa de longa duração por telefone nas taxas e duração do aleitamento materno.

**Métodos:** Ensaio clínico randomizado controlado realizado em uma maternidade na cidade de Fortaleza. Foram alocadas 240 mulheres no puerpério imediato. Utilizou-se intervenção educativa por telefone centrada nos princípios da autoeficácia e com abordagem de entrevista motivacional aos 7, 30, 90 e 150 dias pós-parto para o grupo intervenção. O grupo controle recebeu as orientações padrão do serviço de saúde. A duração e as taxas do aleitamento materno foram verificadas com uso de questionário elaborado pela pesquisadora aplicados ao grupo intervenção e grupo controle aos 60, 120 e 180 dias. Para verificar o efeito da intervenção sobre as variáveis estudadas utilizou-se o teste Qui-quadrado e o Teste U de Mann-Whitney. Registro Brasileiro de Ensaio Clínico: RBR-7m7vc8.

<sup>1</sup>Instituto de Ciências da Saúde, Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Redenção, CE, Brazil.

<sup>2</sup>Departamento de Enfermagem, Universidade Federal do Ceará, Fortaleza, CE, Brazil.

<sup>3</sup>Centro de Ciências da Saúde, Universidade Estadual do Ceará, Fortaleza, CE, Brazil.

<sup>4</sup>Escola de Enfermagem, Universidade de São Paulo, Ribeirão Preto, SP, Brazil.

**Conflicts of interest:** nothing to declare.

**Resultados:** Houve diferença entre os grupos no que diz respeito à duração e taxas de aleitamento materno não exclusivo e exclusivo. O grupo intervenção apresentou taxas mais elevadas de aleitamento materno aos 60 ( $p<0,001$ ), 120 ( $p=0,001$ ) e 180 dias ( $p=0,001$ ), e de aleitamento exclusivo aos 180 dias ( $p=0,005$ ), bem como maior duração do aleitamento materno não exclusivo ( $p<0,001$ ) e exclusivo ( $p<0,001$ ).

**Conclusão:** a intervenção educativa por telefone possui potencial para elevar as taxas, duração e a exclusividade do aleitamento materno, podendo ser utilizada como alternativa para melhorar os índices do aleitamento materno no país.

## Resumen

**Objetivo:** Evaluar los efectos de una intervención educativa telefónica de larga duración en los índices de duración de la lactancia materna.

**Métodos:** Ensayo clínico aleatorizado controlado realizado en una maternidad en la ciudad de Fortaleza. Se asignaron 240 mujeres en puerperio inmediato. Se utilizó intervención educativa por teléfono centrada en los principios de la autoeficacia y entrevista con enfoque motivacional a los 7, 30, 90 y 150 días del posparto en el grupo experimental. El grupo de control recibió las instrucciones estándar del servicio de salud. La duración y los índices de lactancia materna fueron verificados mediante cuestionario elaborado por la investigadora, aplicado al grupo experimental y al grupo de control a los 60, 120 y 180 días. Para verificar el efecto de la intervención sobre las variables estudiadas, se utilizó la prueba  $\chi^2$  de Pearson y la prueba U de Mann-Whitney. Registro Brasileño de Ensayo Clínico: RBR-7m7vc8.

**Resultados:** Hubo diferencia entre los grupos en lo que se refiere a la duración e índices de lactancia materna no exclusiva y exclusiva. El grupo experimental presentó índices más elevados de lactancia materna a los 60 ( $p<0,001$ ), 120 ( $p=0,001$ ) y 180 días ( $p=0,001$ ), y de lactancia exclusiva a los 180 días ( $p=0,005$ ), así como mayor duración de la lactancia materna no exclusiva ( $p<0,001$ ) y exclusiva ( $p<0,001$ ).

**Conclusión:** La intervención educativa telefónica tiene potencial para elevar los índices, duración y exclusividad de la lactancia materna y puede ser utilizada como alternativa para mejorar los índices de lactancia materna en el país.

Brazilian Clinical Trial Registry (ReBEC): RBR-7m7vc8

## Introduction

Breastfeeding has been shown to be a protective factor against several diseases in children, whether infectious, cardiovascular, gastrointestinal, pneumonia, otitis and it also helps to prevent some diseases in the future, such as asthma, diabetes and obesity, in addition to favoring physical, emotional and intelligence development.<sup>(1)</sup> The current recommendation is that children should be breastfed within the first hour of birth and for 2 years or more, as this practice has lifelong repercussions.<sup>(1)</sup>

However, in Brazil, the prevalence of exclusive breastfeeding (EBF) in children under 6 months of age was 45.7% in the last Brazilian National Study of Child Food and Nutrition.<sup>(2)</sup> This rate is far from recommended, requiring actions and interventions that promote breastfeeding (BF) and reduce BF difficulties of women.

From this perspective, interventions should reach factors that influence it. Among these, maternal self-efficacy is identified as a modifiable variable, accessible to health professionals and, therefore, should be considered when planning interventions and educational strategies to increase BF indicators.

The use of educational interventions based on self-efficacy has demonstrated satisfactory results on

BF rates and duration. This is what can be seen in a Randomized Clinical Trial (RCT) carried out in northeastern Brazil, which showed an improvement in maternal self-efficacy to breastfeed, as well as in BF duration at two months of life.<sup>(3)</sup> A study developed in Thailand also observed improvement in self-efficacy scores and longer EBF duration in women who received the educational intervention.<sup>(4)</sup>

Therefore, health professionals have developed educational technologies focused on self-efficacy to promote BF. A clinical trial developed in northeastern Brazil using a serial album with women in the 3<sup>rd</sup> trimester of pregnancy found a difference in the average scores on the self-efficacy scale ( $p<0.001$ ) and EBF rates ( $p<0.001$ ) among women in the intervention (IG) and control (CG) groups. It also showed that the probability of EBF was twice as high in IG than in CG (RR 2.2; CI 1.51-3.21).<sup>(5)</sup>

There is evidence that brief motivational intervention (BMI) improves self-efficacy in BF, as the mean scores increased in the group that received BMI, from 59.14 ( $\pm 9.35$ ) to 64.62 ( $\pm 7.91$ ) in the first month ( $p<0.001$ ). However, this finding was limited to mothers' educational level, when only women with higher education had an improvement in self-efficacy.<sup>(6)</sup>

In contemporary times, nursing has used Information and Communication Technologies

(ICTs) to develop care in different health scenarios, with the telephone being an effective tool for this.<sup>(7)</sup> Thus, the use of technologies in the educational process can contribute to providing the support and guidance necessary for BF. The telephone has been increasingly accepted as an instrument to support BF, proving to be effective when educational health interventions are carried out by professionals with experience and domain in the area and during the postpartum period.<sup>(8)</sup>

An RCT involving women up to the 4<sup>th</sup> month postpartum applied a telephone intervention focused on self-efficacy in BF and showed that IG and CG were similar at 2 months ( $p=0.773$ ), however, at 4 months, the IG showed greater self-efficacy than the CG ( $p=0.011$ ). Regarding BF duration, there was a difference between the groups at 2 months ( $p=0.035$ ), but not at 4 months ( $p=0.109$ ). There was no difference in EBF rates at 2 and 4 months ( $p=0.983$ ;  $p=0.573$ , respectively). The research did not follow the outcome until the 6<sup>th</sup> month, in addition to having presented a high sample loss, which limits generalizations.<sup>(9)</sup>

Thus, evidence indicates that the use of telephone as support for educational interventions contributes to BF promotion and is configured as a potential strategy for the educational practice of nurses, expanding the field of nursing work.<sup>(8,9)</sup> In Brazil, evidence from studies focused on the effect of educational interventions by telephone on BF is limited.

This study contributes to professional practice, whether in primary care, milk banks or supplementary health, by proposing an easily accessible technology, which reduces care time, does not require displacement, and provides direct access to experts.<sup>(10)</sup> It aimed to assess the effect of a long-term educational intervention conducted by telephone on non-exclusive and exclusive BF rates and duration.

## Methods

Single-blind RCT developed in the rooming-in (RI) of a public secondary-level hospital in Fortaleza,

Northeast Brazil. This RCT followed consort guidelines for non-pharmacological interventions<sup>(11)</sup> and was recorded in the Brazilian Registry of Clinical Trials (ReBEC) database with primary identifier: RBR-7m7vc8.

We included women in the immediate postpartum period with a single and full-term baby, with at least six hours postpartum, aged 12 or over, with newborns admitted to the RI, who were practicing BF, with at least one telephone contact. We excluded postpartum women who declared the intention not to breastfeed; with clinical complications at the time of data collection (decompensated diabetes, hypertension or hypotension, syncope, among others); with contraindication to BF (Acquired Immunodeficiency Syndrome, chemical dependence, among others); with intellectual disability of moderate, severe and profound type of mental retardation, detected by consulting the patient's chart; with children hospitalized in an Intensive Care Unit or with disabilities that prevented or made BF difficult; with severe or profound deafness; puerperal women who underwent breast reduction or put on a prosthesis, because, although these procedures do not contraindicate BF, some women who undergo them may decide not to breastfeed; postpartum women who presented breast alterations that interfered with the BF process.

The discontinuation criteria were the woman's withdrawal from participating; mother and/or baby death; newborn offered for adoption; absence of BF practice; telephone change; not answering calls after three attempts on consecutive days and at different times. For the purpose of sample inclusion and other analysis procedures, the types of BF defined by the World Health Organization (WHO) were used.<sup>(12)</sup>

The sample was calculated for both groups, assuming a significance level of 5% and test power of 80%, considering an expected clinical difference of 20% for the IG. Thus, a sample of 90 postpartum women per group was obtained, by adding a safety percentage of 30% for possible losses, it was found that 120 postpartum women would be needed per group (control and intervention), making a total of 240 participants. Randomization was performed

in blocks using a tool contained in the SPSS itself (version 20 for Windows) by a statistician without direct involvement with the study, and resulted in 12 chunks of 20 puerperal women.

Figure 1 presents the flowchart of participants during the study, among which 45 were excluded for not answering the telephone contact after three attempts, which represents an overall percentage of 18.75% of losses in relation to the initial sample.

Moreover, in the course of the study, 70 women discontinued BF. These women were not considered as losses, as the interruption of BF before children

were six months old was also one of the outcomes assessed.

In the RI, an instrument was used with questions related to the identification of women, socio-demographic variables, obstetric history and current pregnancy and the Breastfeeding Self-Efficacy Scale - Short Form (BSES-SF), which assessed mothers' self-efficacy in BF.<sup>(13)</sup>

Subsequently, the CG underwent a standard intervention, which consisted of routine care performed by the IR team (guidance from the health service nursing team on BF while the woman was

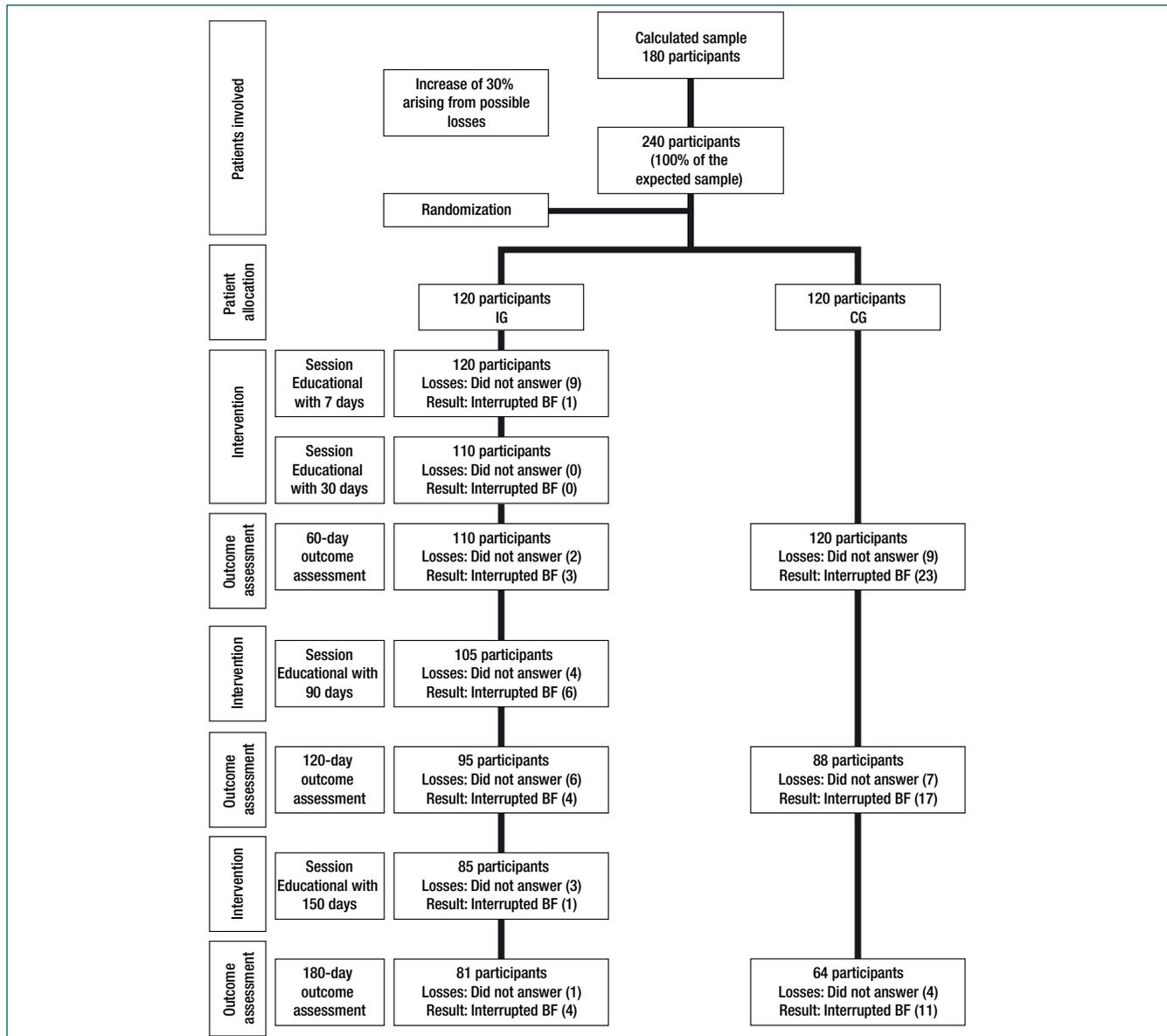


Figure 1. Representation of the flow of participants in each phase of the study

hospitalized), in addition to a visit from a professional from the milk bank who passed daily guiding mothers about the importance of BF, its benefits and about the function of the milk bank, explaining to women that they could contribute with the donation of breast milk or seek support in that service should they ever need it.

The IG received in addition to the standard care of the maternity team, the educational intervention centered on the principles of self-efficacy<sup>(13)</sup> and the motivational interview<sup>(14)</sup> at 7, 30, 90 and 150 days postpartum, totaling four educational interventions via telephone. All interventions were conducted by a single nurse researcher with experience in BF.

In each session, a form created by the researcher was filled out with data regarding the contact made, whether or not she was BF, main reason for weaning, type of BF, BF duration and EBF and the difficulties presented. Then, the motivational interview (MI) approach was used to guide the telephone educational intervention.

To perform MI, we chose the “evoke-inform-evoke” strategy, in which professionals start with an open-ended question, then provide the necessary information, ending with an evocation, in the form of an open question, to encourage participants to respond consolidating the knowledge of what was discussed in the session.

During the information technique, an adapted instrument<sup>(9)</sup> was used to guide the information provided, consisting of two parts: 1. Guidance on the items of the self-efficacy scale and 2. Doubts and difficulties in BF. In each session, two BSES-SF items were addressed, starting with the items in which patients showed lower self-efficacy in the previous contact.

It is important to mention that the interventions continued. Therefore, when initiating a new contact, the researcher provided feedback on what was discussed in the previous contact, in order to find out if women remained confident in relation to the items that had been worked on previously. This allowed the best direction of the intervention. For the educational sessions, the best day and time with each participant was always agreed in advance. Each session lasted an average of 10 minutes.

The assessment of the outcomes of interest (BF duration and rates and EBF, interruption of BF before a child's six months of life) and self-efficacy scores (BSES-SF) were performed at 60, 120 and 180 days postpartum. delivery via telephone for both groups. This assessment was performed by research assistants who were blinded to the allocation of women in the assessed groups. At this stage, the form included questions about BF duration, type of BF, difficulties and reasons that led to early weaning.

Therefore, the study was single-blind, since the assistants responsible for assessing the outcome did not know which group the women belonged to. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 20.0, for Windows. The Kolmogorov-Smirnov test showed data abnormality and, therefore, non-parametric tests were chosen. Comparison between groups was performed at baseline and at 60, 120 and 180 days postpartum using chi-square tests for categorical variables. Fisher's exact test was used when the percentage of expected values below 5 was greater than 20%. The Mann-Whitney U test was used to compare numerical variables. To verify the clinical significance of the educational intervention, the Number Needed to Treat (NNT) was calculated, an indicator that expresses the magnitude of the intervention's effect on usual care. To obtain it, it was necessary to determine the experimental group event rate (EER), the control group event rate (CER) and the absolute risk reduction (ARR). All these indicators were verified at 60, 120 and 180 days postpartum.

The study complied with the norms of Resolution 466/2012, which deals with research on human beings, respecting participants' right to seek compensation for eventual damages, the right to terminate participation in the research even in cases of monitoring and guarantee of full freedom to refuse to participate or withdraw consent, at any stage of the research, without any penalty.<sup>(15)</sup>

The research was approved by the Research Ethics Committee of the *Universidade Federal do Ceará*, under Opinion 42495114.4.0000.5054. It should be noted that the data in this manuscript come from a doctoral thesis of one of the authors of the study.

## Results

Regarding the sociodemographic profile, CG and IG were similar with median age equal to 23 years (IG: 19-30.7; CG: 19.2-29), income equal to R\$259.45 (*reais*, Brazilian currency, which correspond to about US\$47). (IG: 259.45-383.48; CG: 259.45-429.20) and 10 years of education (IG: 8-12; CG: 7-12). The groups were also similar in terms of self-reported color (IG: 80.8% and CG: 83.8% were non-white), marital status (IG: 79.2% and CG: 74.2% had partner) and occupation (IG: 50.8% and CG: 55% worked at home).

The intervention and control groups were also homogeneous in terms of obstetric history, current pregnancy and delivery. As for parity, primiparous women predominated in both groups (IG: 51.7% and CG: 46.7%). Most underwent cesarean section (IG: 52.5% and CG: 50.8%). Among the multiparous women, the majority had previous experience of BF (IG: 91.7% and CG: 90.8%). During the current pregnancy, women underwent prenatal care (IG: 99.2% and CG: 92.8%) and were encouraged to breastfeed (IG: 72.5% and CG: 79.2%).

Regarding the difficulties presented by women during interventions, they were related to low milk production, difficulties in latching and sucking, BF technique, breast engorgement, nipple pain and nipple trauma, return to work/study, being briefly clarified and not interfering with the intervention schedule, in addition to ratifying its relevance, since the difficulties presented are related to self-efficacy in BF.

The first outcome assessed was the effect of educational intervention on non-exclusive and EBF rates assessed at three different times, at 60, 120 and 180 days postpartum (Table 1).

The second outcome assessed was the final BF duration considering all its types (predominant, complemented, mixed or partial), compared with EBF among women in the intervention and control groups (Table 2).

The data reveal that the intervention was effective in increasing the final BF duration and EBF in the intervention group when compared to the control group. BF duration in IG had a median of 180

**Table 1.** Effect of intervention on non-exclusive and exclusive breastfeeding rates among groups aged 60, 120 and 180 days

Variables	Total n(%)	Intervention n(%)	Control n(%)	OR (CI)	p-value*
Breastfeeding					
60 days	n = 219	n = 108	n = 111	9.1 (2.6-31.4)	
Yes	193(88.1)	105(97.2)	88(79.3)		p<0.001
No	26(11.9)	3(2.8)	23(20.7)		
120 days	n = 170	n = 89	n = 81	5.7 (1.8-17.9)	
Yes	149(87.6)	85(95.5)	64(79.0)		p=0.001
No	21(12.4)	4(4.5)	17(21.0)		
180 days	n = 140	n = 80	n = 60	4.3 (1.3-14.1)	
Yes	125(89.3)	76(95)	49(81.7)		p=0.012
No	15(10.7)	4(5.0)	11(18.3)		
Exclusive breastfeeding					
60 days	n = 193	n = 105	n = 88	-	
Yes	135(69.9)	79(75.2)	56(63.6)		p=0.101
No	58(30.1)	26(24.8)	32(36.4)		
120 days	n = 149	n = 85	n = 64	-	
Yes	68(45.6)	42(49.4)	26(40.6)		p=0.283
No	81(54.4)	43(50.6)	38(59.4)		
180 days	n = 125	n = 76	n = 49	3.4 (1.4-8.2)	
Yes	38(30.4)	30(39.5)	8(16.3)		p=0.005
No	87(69.6)	46(60.5)	41(83.7)		

n - absolute frequency; % - relative frequency; OR - Odds Ratio; CI - confidence interval = 95%; (\*) - Pearson's chi-square test

**Table 2.** Data distribution according to the effect of the educational intervention on the final breastfeeding duration and exclusive breastfeeding

	Total Md (p25-p75)	Groups		p-value <sup>†</sup>
		Intervention Md (p25-p75)	Control Md (p25-p75)	
BF	n = 195 140.2 (100-180)	n=95 180 (180-180)	n=100 150 (61.2-180)	p<0.001
EBF	n = 195 96 (45-70)	n=95 110 (60-180)	n=100 61.5 (20.5-119.7)	p<0.001

Md - Median; (p25-p75) - 25<sup>th</sup> percentile to 75<sup>th</sup> percentile; n - absolute frequency; <sup>†</sup> - Mann-Whitney U test

days, while in the CG it was 150 days (p<0.001). This demonstrates that the control group breastfed about a month less than the intervention group. EBF duration in the IG had a median of 110 days, while in the CG it was 61.5 days (p<0.001). At 180 days 5% of the women in the IG and 18.3% of the CG had interrupted BF. Therefore, to calculate the NNT, EER = 5%, CER = 18.3% and ARR = 13.3% were considered. Therefore, the NNT obtained at 180 days was 7.5, which should be rounded to the nearest whole number. This means that 1 in 8 women who receive an educational intervention by telephone up to the 5<sup>th</sup> month postpartum

are more likely to promote BF up to the 180<sup>th</sup> day of their child's life. The NNT was also calculated for 60 and 120 days, being equal to 6 in both.

## Discussion

This RCT was restricted to postpartum women from a health unit in Fortaleza, Ceará, which had a relative sample loss due to the interruption of telephone contact, however, due to the percentage of safety added to the sample, the results are valid, reproducible, and amenable to generalization to other populations.

This study contributes to the scientific knowledge of nursing, by presenting an educational intervention to be used by nursing professionals as a potential resource for the promotion of BF. The use of the telephone as a technology in educational practices, if used properly, can optimize professionals' time and reach many users.

The results showed that the intervention was effective to increase BF rates in the intervention group when compared to the control at the three moments of assessment of the outcome. In addition, the intervention was effective in keeping BF rates in the ICG always above 90%. The IG also had a greater chance of BF in the three assessments when compared to the CG, which reinforces the impact of the intervention on BF rates.

International studies that used telephone educational interventions aimed at BF promotion were also successful. RCT conducted in Croatia, used an educational intervention in prenatal and postnatal care involving proactive telephone support and written materials, showed higher EBF rates for the IG both at 3 months (OR: 4.6; CI: 95%: 2, 7 - 8.1; EB: 81%) and at 6 months (OR: 15.7; 95% CI: 9.1-27.1; EB: 64%). TIG participants also had more positive attitudes towards infant feeding and greater self-efficacy in BF ( $p=0.001$ ).<sup>(16)</sup>

In India, one study sought to assess the effectiveness of weekly cell phone counseling calls and daily text messages in improving BF rates. The results showed that the EBF rate was similar between the groups in the first 24 hours after delivery ( $p=1.0$ ),

but significantly higher in the IG in all subsequent visits ( $p<0.001$ ). Women in the IG were also more likely to breastfeed exclusively than those in the CG (OR: 6.3; 95% CI: 4.9 - 8.0). Therefore, it is perceived that telephone counseling is effective for promoting BF, and it is possible to be inserted in the context of public and private health services.<sup>(17)</sup>

In a North American study using telephone calls as an intervention performed by an International Council Certified Lactation Consultant (IBCLC) there was no statistical difference in EBF between the IG and the CG (2 weeks  $p=0.54$ ; 2 months  $p=0.70$ ; 4 months  $p=0.97$ ; 6 months  $p=0.97$ ). This intervention addressed women only during prenatal care, which may have decreased the favorable impact on EBF.<sup>(18)</sup>

A study conducted in Australia to determine the effectiveness of nurse-led telephone support in improving infant feeding practices and reducing screen time pointed out that there were no differences in BF rates between the telephone support and control groups, however, it was effective in reducing screen time and bottle-feeding at bedtime.<sup>(19)</sup>

Regarding exclusivity, the intervention presented here was able to increase EBF rates in IG at 180 days postpartum. One of the factors that may have contributed to this result was the educational intervention carried out at 150 days postpartum, which addressed aspects of maternal trust, encouraging that the woman maintained the exclusivity of BF even with the return to her usual activities of study and/or work.

This type of educational intervention using technology has also been applied in the African context, where telephone use influenced a slower rate of decline in EBF practice in the group that received telephone support. There was a difference in the mean of 0.6 months (CI: 95%; 0.22-1.42) in EBF duration between THE and CG ( $t= 1.45$ ;  $p= 0.149$ ).<sup>(20)</sup> In Brazil, an RCT tested an educational intervention by telephone, focused on self-efficacy in BF, and proved to be effective in increasing maternal self-efficacy and BF duration at two months ( $p=0.35$ ).<sup>(9)</sup>

In northeastern Brazil, a clinical trial that developed a participatory online intervention to pro-

mote and support EBF showed that EBF frequencies were higher in the IG compared to the CG, in all follow-up months (1 month  $p=0.031$ ; at 2, 3, 4, 5 and 6 months  $p = 0.000$ ). The median EBF duration was 149 days (95% CI: 129.6- 168.4) in IG and 86 days (95% CI: 64.9 - 107.1) in CG ( $p < 0.0001$ ). The intervention consisted of monitoring the women, through a closed group of an online social network, in which weekly posters were published on topics related to BF and active communication was established with the mothers.<sup>(21)</sup>

The cell phone has also been useful due to the use of mobile applications capable of favoring BF. A RCT performed with 40 primiparous women who used education via a mobile application as an intervention showed differences in the IG compared to the CG in the knowledge ( $p < 0.001$ ) and attitude ( $p < 0.001$ ) of women about BF. Regarding self-efficacy in BF, a significant evolution was seen in favor of the IG ( $p < 0.001$ ), pointing out that smartphones are effective tools to educate mothers about BF.<sup>(22)</sup>

In this context, it is clear that BF support in both prenatal and puerperium has been indispensable to improve EBF rates. A systematic review that assessed educational interventions to improve BF among primiparous women showed that the EBF rate in the IG was higher than in the CG (OR= 1.37; 95% CI 1.01-1.86,  $p= 0.04$ ). The interventions were implemented both in the prenatal and postnatal periods. When interventions were of a multicomponent type (antenatal workshop with postnatal telephone follow-up; and antenatal conversation associated with coaching and postnatal telephone follow-up), the effect on EB was even greater (OR= 3.06; 95% CI 1.22–7.66;  $p = 0.02$ ).<sup>(23)</sup>

Although our intervention had an impact on the increase in EBF rates in the IG at 180 days, it was evident that over time the EBF rates progressively decreased (60 days: 69.8%; 120 days: 45.3%; 180 days: 30.4%).

This finding is confirmed by research, which demonstrates that, over the course of months, women tend to interrupt EBF. The probability of infant EBF at hospital discharge remaining on EB at six months is only 16.4%, with some factors re-

lated to this outcome: breastfeeding at hospital discharge (Hazard Ratio = 1.82; 95%CI 1.06–3.11), using a pacifier (Hazard Ratio = 6.23; 95%CI 4.52–8.60) intend to breastfeed for less than six months (Hazard Ratio = 1.93; 95%CI 1.25–2.98), not breastfeeding in the first hour of life (Hazard Ratio = 1.45; 95%CI 1.10–1.92) and consuming alcohol during pregnancy (Hazard Ratio = 1.88; 95%CI 1.34–2.90).<sup>(24)</sup>

Despite all the scientific evidence proving the superiority of BF over other forms of feeding children and the efforts made by various national and international organizations and research centers, the prevalence of BF in Brazil, and especially of BF, is still below the recommended levels, and Fortaleza, Northeast of Brazil is no exception to this reality, with nurses having a fundamental role in reversing this situation.

Regarding BF duration, it is evident that the intervention was effective in increasing the duration in the IG, since this group had a median BF duration of 180 days, while the CG had 150 days ( $p<0.001$ ). The educational intervention also influenced the final EBF duration (Median= 110 days in the IG and 61.5 days in the CG,  $p<0.001$ ).

These results show the impact of the use of verbal persuasion, one of the sources of self-efficacy, during the educational intervention, since the use of information to motivate the woman to believe that she is able to practice BF effectively reinforces the positive beliefs about this practice.<sup>(25)</sup> In addition, the continuity of follow-up over the six months may have been one of the factors that contributed to these results.

The impact of the intervention on BF rates also resulted from the fact that the postpartum women's self-efficacy beliefs were addressed at the time of telephone calls, with these beliefs having a fundamental role in human behavior.<sup>(10)</sup> By strengthening this woman's belief, she is able to successfully breastfeed.

Thus, the use of educational interventions based on the self-efficacy framework has shown positive effects on the BF process. In this regard, a study developed in Thailand showed an increase in the mean BF self-efficacy scores of women in the IG

(58.73) in relation to the CG (51.21) ( $p=0.001$ ) and an increase in EBF in the first six months in the IG (36.6%), being higher than the CG (14.3%) ( $p=0.011$ ). The mean EB duration for mothers in the IG (131.33 days) was also longer than in the CG (73.31 days) ( $p < 0.001$ ).<sup>(4)</sup>

The data presented here reveal that the NNT achieved with the proposed intervention was eight women. This indicator allows us to understand that it is worth providing 8 women with a safe intervention to prevent a woman from interrupting the practice of BF before the baby is 180 days old. Moreover, they allow us to understand that, even with scarce resources, health services can carry out an intervention up to the 4<sup>th</sup> month and obtain interesting results since NNT at 60 and 120 days was 6 women, a considerably low and accessible number, which also justifies the choice of this type of intervention.

The lower the NNT value, the greater the benefit of the intervention. The magnitude of the intervention effect reinforces the importance of maternal guidance and can positively influence health professionals in the process of assessing their efforts. For carrying out educational strategies to guide BF and its impact on BF indicators.<sup>(26)</sup>

Therefore, long-term educational interventions performed by trained nurses have had significant effects on BF self-efficacy, as well as on BF rates and its exclusivity<sup>(4)</sup> demonstrating the importance of monitoring and supporting women who begin the process of BF and continuing health education during the puerperium, contributing to offer support and guidance necessary to deal with the various difficulties and changes that may arise and influence early weaning.

It should be noted that one of the aspects that contributed to the results achieved was the long duration of the intervention, which took place in a continuous and distributed manner throughout the child's six months of life, thus impacting on BF not only in the short, but also in the long term. Therefore, there is a need for further studies with more comprehensive samples and more sophisticated designs in order to obtain more robust evidence of their impact on BF duration and exclusivity.

## Conclusion

The study showed that there was a difference between the groups in terms of rates, as well as duration and exclusivity of BF, demonstrating that long-term educational intervention by telephone, based on the principles of self-efficacy and motivational interviewing, is a potential strategy that can be used in nursing care for lactating women. The use of an educational intervention with guidelines focused on the self-efficacy items in which women have low scores, as well as on their difficulties related to BF, contributed to achieving higher percentages of BF until the 6<sup>th</sup> month of life, demonstrating its benefit and effectiveness in promoting BF.

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## Collaborations

Dodou HD, Chaves AFL, Pinho MAT, Lopes BB, Silva BGS, Rodrigues DP, Monteiro JCS and Oriá MOB declare that they contributed to the study design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published.

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