



EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS WITH PREGNANT WOMEN ON THE LEVEL OF KNOWLEDGE ABOUT BREASTFEEDING

Eficácia de intervenções educativas com gestantes sobre o grau de conhecimento em aleitamento materno

Eficacia de intervenciones educativas con embarazadas sobre el grado de conocimiento de la lactancia materna

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ABSTRACT

Objective: To evaluate the level of knowledge about breastfeeding in women in the first half of pregnancy receiving prenatal care through the Unified Health System (*Sistema Único de Saúde - SUS*) and carry out health education activities on this subject with the aim of improving pregnant women's level of knowledge. **Methods:** This longitudinal intervention study was conducted at the Primary Health Care (*Atenção Primária à Saúde - APS*) centers of Limoeiro do Norte, Ceará, Brazil with 57 women in the first half of pregnancy. Socioeconomic information on education, ethnicity, professional activity, household income, and marital status was collected and knowledge of four breastfeeding-related thematic blocks was evaluated: prenatal breast care, advantages of breastfeeding for the mother-child binomial, lactation physiology and appropriate breastfeeding techniques. Subsequently, four educational interventions were carried out on a weekly basis either in the PHC centers or at home focusing on the four approaches described in the form. The knowledge evaluation instrument was then reapplied. **Results:** Pregnant women's level of knowledge improved in all the domains of breastfeeding analyzed: from 62.8% to 83.0% of correct answers in thematic block one (range: 20.2%); from 71.6% to 87.5% in block two (15.9%); from 66.9% to 79.7% in block three (12.7%); from 63.6% to 92.6% in block four (29.0%). There was a greater impact on "adequate breastfeeding techniques". **Conclusion:** Pregnant women had adequate knowledge about most questions about breastfeeding. Health education was effective in improving such knowledge, which in the future may reflect on the prolongation of exclusive breastfeeding duration.

Descriptors: Breastfeeding; Health Education; Pregnancy

Registration Number (ReBEC): RBR-3rs7sx

RESUMO

Objetivo: Avaliar o grau de conhecimento sobre aleitamento materno de mulheres na primeira metade gestacional em pré-natal pelo Sistema Único de Saúde (SUS) e desenvolver atividades de educação em saúde sobre essa temática visando melhorar o nível de conhecimento das gestantes. **Métodos:** Estudo longitudinal, de intervenção, realizado nas Unidades de Atenção Primária à Saúde (UAPS) de Limoeiro do Norte, Ceará, Brasil, com 57 mulheres na primeira metade gestacional. Foram coletadas informações socioeconômicas sobre escolaridade, etnia, atividade profissional, renda familiar e situação conjugal, e realizada avaliação do grau de conhecimento acerca de quatro blocos temáticos relacionados ao aleitamento materno: cuidados pré-parto com as mamas, vantagens da amamentação para o binômio mãe-filho, fisiologia da lactação e técnicas adequadas de amamentação. Posteriormente, foram realizadas quatro intervenções educativas, na frequência de uma por semana, nas UAPS ou em domicílio, com enfoque nas quatro abordagens do formulário. O instrumento de avaliação de conhecimento foi, então, reaplicado. **Resultados:** O grau de conhecimento das gestantes melhorou em todos os domínios do aleitamento materno



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investigados: de 62,8% de acertos para 83,0% no bloco temático um (variação: 20,2%); de 71,6% para 87,5% no bloco dois (15,9%); de 66,9% para 79,7% no três (12,7%); de 63,6% para 92,6% no bloco quatro (29,0%). Observou-se maior impacto sobre o aspecto “técnicas adequadas de amamentação”. **Conclusão:** As gestantes avaliadas apresentaram conhecimento adequado sobre a maioria dos questionamentos acerca do aleitamento materno. A educação em saúde foi eficaz em melhorar esses conhecimentos, o que futuramente poderá refletir no prolongamento do tempo de amamentação exclusiva.

Descritores: Aleitamento Materno; Educação em Saúde; Gravidez.

Número de Registro (ReBEC): RBR-3rs7sx

RESUMEN

Objetivo: Evaluar el grado de conocimiento sobre la lactancia materna de mujeres en la primera mitad del embarazo y en el prenatal por el Sistema Único de Salud (SUS) y desarrollar actividades de educación en salud sobre el tema para mejorar el nivel de conocimiento de las embarazadas. **Métodos:** Estudio longitudinal y de intervención realizado en las Unidades de Atención Primaria de Salud (UAPS) de Limoeiro do Norte, Ceará, Brasil, con 57 mujeres en la primera mitad del embarazo. Se recogieron las informaciones socioeconómicas sobre la escolaridad, la etnia, la actividad profesional, la renta familiar y la situación conyugal y realizada la evaluación del grado de conocimiento sobre los cuatro bloques temáticos relacionados con la lactancia materna: los cuidados preparto con las mamás, las ventajas de la lactancia materna para el binomio madre-hijo, la fisiología de la lactación y las técnicas adecuadas de lactancia. Se han realizado, a posteriori, cuatro intervenciones educativas una vez a la semana en las UAPS o en el domicilio con énfasis en los cuatro abordajes del formulario. El instrumento de evaluación de conocimiento ha sido reaplicado. **Resultados:** El grado de conocimiento de las embarazadas ha mejorado en todos los dominios de la lactancia materna que han sido investigados: del 62,8% de aciertos para el 83,0% del bloque temático uno (variación: 20,2%); del 71,6% para el 87,5% del bloque dos (15,9%); del 66,9% para el 79,7% del tres (12,7%); del 63,6% para el 92,6% del bloque cuatro (29,0%). Se ha observado mayor impacto en el aspecto “técnicas adecuadas de lactancia”. **Conclusión:** Las embarazadas evaluadas presentaron conocimiento adecuado sobre la mayoría de las preguntas acerca de la lactancia materna. La educación en salud ha sido eficaz para la mejoría de los conocimientos lo que en el futuro podrá reflejar en el aumento del tiempo de lactancia materna.

Descriptorios: Lactancia Materna; Educación en Salud; Embarazo.

Número de Registro (ReBEC): RBR-3rs7sx

INTRODUCTION

The health needs of a population are constantly changing. When thinking about these needs in the context of physical health, one immediately remembers the search for care, which consists mainly of the search for health information. In primary health care, the dissemination of information is often flawed and causes harms such as women's lower motivation for breastfeeding⁽¹⁾.

As a result, several countries are found to use inappropriate practices, such as early weaning and inadequate food supplementation. These practices can be associated with malnutrition in infants and with problems related to growth, development and mortality in this age group⁽²⁾. Thus, information regarding the advantages of exclusive breastfeeding needs to be reinforced, and so do information on the potential losses resulting from early weaning⁽³⁾.

Breastfeeding has benefits for both the health of the woman and the child involved⁽³⁾. Exclusive breastfeeding up to the sixth month of life fully nourishes the infant and hence promotes adequate growth and development and provides systemic immune support, which translates, for example, into a reduction in the risk of developing gastroenteritis, respiratory diseases, types 1 and 2 diabetes, obesity and leukemia⁽⁴⁾.

Regarding women's health, the benefits include the prevention of breast and ovarian cancers, obesity, diabetes mellitus and hypertension. Another benefit is the convenience of having ready-to-serve food, which avoids expenses with breast milk substitutes⁽³⁾.

Thus, breastfeeding is an effective strategy to reduce child mortality, mainly due to its ability to prevent diarrhea and respiratory infections, at least in developing countries – its effect on the rate of deaths in developed countries is still uncertain⁽⁴⁾. Despite such evidence, there are several aspects that lead mothers not to breastfeed⁽⁵⁾ or to perform early weaning⁽²⁾. In Brazilian capitals, for example, the prevalence rate of exclusive breastfeeding (EB) in infants under six months of age is only 41%. The worst results are found in the North (45.9%) and the Northeast of the country⁽⁵⁾.

Information and motivation are two determinants of breastfeeding. Motivation is what permeates the mother's decision in a favorable or unfavorable way in between willingness to breastfeed and successful breastfeeding, although social factors also interfere⁽¹⁾. Prenatal care should be an opportune moment to talk to pregnant women about their reality and their willingness to breastfeed. In addition, since early weaning is a public health problem, it is necessary

for health professionals at different levels of care to establish educational practices aimed at breastfeeding in order to intervene during weaning time⁽⁶⁾.

The National Health Promotion Policy (*Política Nacional de Promoção da Saúde - PNPS*) states that continuing education of health workers and development of health promotion actions for the population must be prioritized in governmental and non-governmental dialogs and actions⁽⁷⁾. However, in practice, it is clear that the Primary Health Care teams (*equipes de Atenção Primária à Saúde - UAPS*) have overrated goals in relation to the number of consultations and face a lack of adequate physical structure and a lack of basic material resources, which makes it difficult for professionals to prioritize educational practice focused on health promotion, including exclusive breastfeeding⁽⁸⁾.

Thus, this study aimed to evaluate the level of knowledge about breastfeeding in women in the first half of pregnancy receiving prenatal care through the Unified Health System (*Sistema Único de Saúde - SUS*) and carry out health education activities on this subject with the aim of improving pregnant women's level of knowledge.

METHODS

This longitudinal interventional study was carried out in ten UAPS in Limoeiro do Norte, Ceará, Brazil, with women in the first half of pregnancy.

The population consisted of 182 pregnant women who received prenatal care in one of the UAPS in Limoeiro do Norte in January 2018. The sample was calculated using a finite population of 182 pregnant women, a 95% confidence interval and a 5% sampling error⁽⁹⁾, which resulted in 50 women.

Potential withdrawals were expected as this is a follow-up study. Therefore, in addition to the 50 women, other seven women were included in the study. All of them met the following criteria: being a pregnant adult, that is, aged 19 years old or older⁽¹⁰⁾ and being in the first half of pregnancy, that is, 20 weeks or more of pregnancy. Exclusion criteria were illiteracy or presence of cognitive deficits that could prevent the participants from filling the data collection instrument.

First, visits were made to the UAPS to talk to the pregnant women about the purpose and procedures of the study. The participants were then asked about their interest in participating. After acceptance, the women read and signed an informed consent form. The women were approached according to the methodology summarized in Figure 1.

In the first stage of data collection, the pregnant women filled a socioeconomic form with items addressing education, ethnicity, professional activity, household income and marital status and 30 "yes" or "no" questions that assessed their knowledge about breastfeeding and its determinants⁽¹¹⁾. The questions were grouped into four thematic blocks: mothers' knowledge about prenatal breast care, advantages of breastfeeding for the mother-child binomial, lactation physiology and appropriate breastfeeding techniques. The duration of application of the instrument ranged from 12 to 15 minutes for each participant.

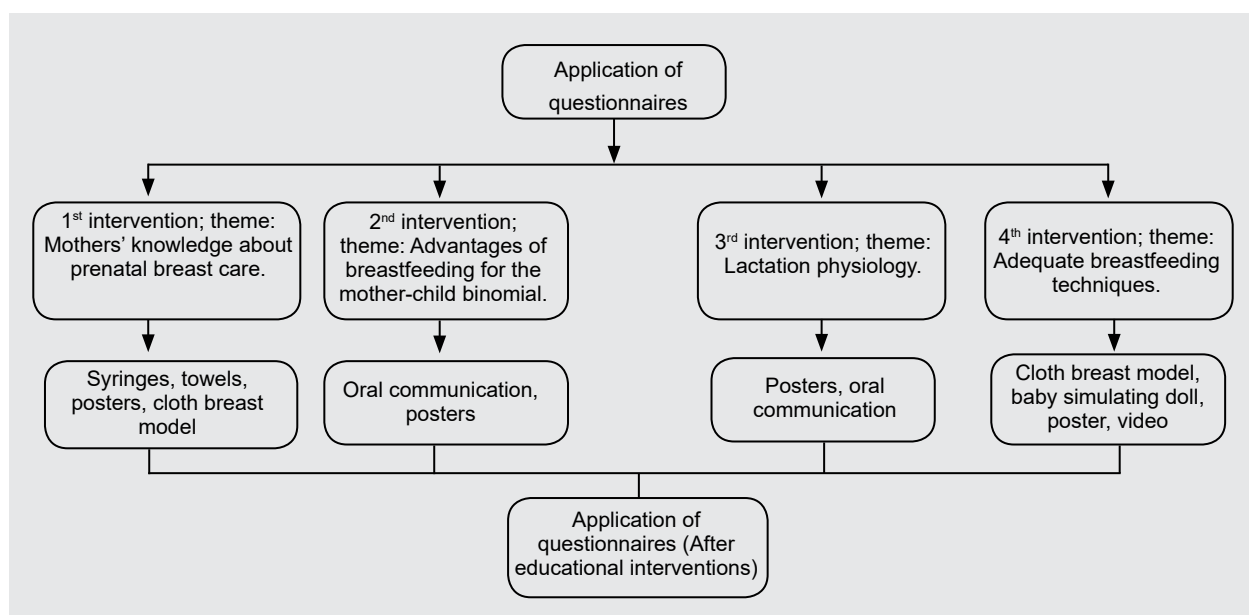


Figure 1 – Flow chart describing the methodology used.

Meetings scheduled to take place in each of the UAPS during the morning shift took place on the respective days set for pregnant women to carry out the educational intervention. The dates of the activities were communicated on the day of application of the questionnaires and remembered by community health workers (*Agente Comunitário de Saúde - ACS*). Home visits were made with the help of community health workers whenever a pregnant woman missed a meeting.

The intervention was carried out in four different moments – once a week, each referring to a thematic block of the form. The intervention methodology used consisted of the elaboration of posters to be used as an educational resource in oral communications and which were posted on the UAPS flannelgraphs. A cloth breast model was produced to demonstrate the manual milking technique and the types of nipples and their relationship with breastfeeding. The educational resources were elaborated based on important references in the field of maternal and child nutrition, with a specific focus on breastfeeding and/or strategies to be adopted in the critical and reflective teaching and learning process related to the theme⁽¹²⁻¹⁵⁾. A video authored by the Ministry of Health in partnership with the Brazilian Society of Pediatrics⁽¹⁶⁾ was also shown to summarize most of the questions addressed in the form.

After each day of activity, women were asked about possible doubts for prompt clarification. Finally, the knowledge assessment form⁽¹¹⁾ previously used was reapplied to assess post-intervention knowledge.

The data were tabulated in an Excel spreadsheet. All pregnant women were listed with their respective socioeconomic data and number of correct answers for each approach before and after intervention.

Socioeconomic data were presented as absolute and percentage frequencies. To present the results of the knowledge assessment, the mean number of correct answers obtained by the pregnant women in each theme was calculated before and after intervention for comparison.

Student's t test was used to assess the difference in the percentage of correct answers before and after intervention. The significance threshold was set at $p < 0.05$.

The study was carried out only after its approval by the Research Ethics Committee of the Federal Institute of Education, Science and Technology of Ceará (*Instituto Federal de Educação, Ciência e Tecnologia do Ceará - IFCE*) (Approval No. 2.457.636). The study was registered to the Brazilian clinical trials platform, with registration number (ReBEC): RBR-3rs7sx.

RESULTS

A total of 57 women participated in the first stage (assessment of pregnant women's knowledge). However, five (8.8%) pregnant women did not complete the four educational approaches: two (3.5%) of them moved to another city, one (1.8%) did not provide an address or telephone number in the questionnaire – and these data were also not known by the ACS – and the other two (3.5%) were not found at the address provided, thus making it impossible for them to continue the study. Thus, 52 (91.2%) women were included in all the stages of the study.

Table I shows the distribution of pregnant women according to socioeconomic variables.

Women's age ranged from 19 to 39 years, with a mean of 27 years. There was a predominance of complete secondary education (40.4%; $n=21$), *pardas* (mixed-race Brazilians) (56.0%; $n=28$), household income below one minimum wage (48.9%; $n=23$) and married women (70.6%; $n=36$).

Table II shows pregnant women's level of knowledge about breastfeeding according to thematic approaches before and after the educational intervention.

Pregnant women's level of knowledge about breastfeeding before intervention was greater than 50% in all approaches to the theme, with greater emphasis on "the advantages of breastfeeding for the baby" (mean of 71.6% of correct answers). After educational activities, knowledge improved in all thematic blocks, which corresponded to a mean of 20.2% increase in correct answers about "prenatal breast care", 15.9% improvement in the theme "advantages of breastfeeding for the baby-child binomial", 12.7% for "lactation physiology" and 29.0% for "appropriate breastfeeding techniques". In the end, the mean knowledge of pregnant women was higher in the approach aimed at appropriate breastfeeding techniques.

Table I - Characterization of socioeconomic data on pregnant women from Limoeiro do Norte, Ceará, 2018 (n=57).

Variables	n	(%)
Education		
Illiterate	1	1.9
Incomplete primary education	8	15.4
Complete primary education	2	3.8
Incomplete secondary education	7	13.5
Complete secondary education	21	40.4
Incomplete higher education	9	17.3
Complete higher education	4	7.7
TOTAL	52*	100.0
Ethnicity		
White	17	34.0
Black	3	6.0
Pardo	28	56.0
Yellow	2	4.0
TOTAL	50*	100.0
Household Income		
Below one minimum wage	23	48.9
1-3 minimum wages	20	42.5
4-6 minimum wages	2	4.3
Above six minimum wages	2	4.3
TOTAL	47*	100.0
Marital Status		
Single	14	27.4
Married	36	70.6
Divorced	1	2.0
TOTAL	51*	100.0

*: The total differed between the variables as some women left questions unanswered.

Table II - Percentage of right answers given by pregnant women before and after educational interventions divided by the blocks of questions, Limoeiro do Norte, Ceará, 2018 (n=57).

Approaches	Before (%)	After (%)	Increase in right answers (%)	p-value*
1) Prenatal breast care	62.8	83.0	20.2	<0.001
2) Advantages of breastfeeding for the mother-child binomial	71.6	87.5	15.9	<0.001
3) Lactation physiology	66.9	79.7	12.7	<0.001
4) Adequate breastfeeding techniques	63.6	92.6	29.0	<0.001

*: Student's t test p<0.05 as significant

DISCUSSION

In the present study, pregnant women presented adequate knowledge about most of the questions asked about breastfeeding. In addition, interventions based on the themes through health education were effective in improving such knowledge.

This theme is of fundamental importance since – according to data from 2008 – the prevalence rate of exclusive breastfeeding in Brazil in children under six months of age was 41%⁽⁶⁾ considering this practice should be a rule until the sixth month of life^(17,18).

Although our study was not intended to relate socioeconomic factors to the level of knowledge about breastfeeding or to the practice of breastfeeding itself, it is important to highlight that the mean age of pregnant women in this study (27 years) is, when it comes to Northeastern Brazil, in an age group (20 to 29 years) whose estimated median of

breastfeeding duration is 183 days. For breastfeeding mothers aged 15 to 19 years, this median seems to be 159.3 days and for those over 30 years old it is 265.5 days⁽¹⁹⁾. These data suggest that the duration of breastfeeding is directly proportional to the age of the breastfeeding mothers and below the recommendation of two or more years of breastfeeding as established by the World Health Organization since 2002, or at least 12 months according to the American Academy of Pediatrics^(17,18).

The level of education among pregnant women was predominantly high (complete secondary education) considering that incomplete primary education predominates in the Brazilian population⁽²⁰⁾. This finding is favorable since there seems to be a direct relationship between years of study and better maternal care for children, which may include adequate breastfeeding duration and exclusive breastfeeding⁽²¹⁾.

The most prevalent marital status among the interviewees (married women) can have a positive impact since the existence of a comfortable family structure and the presence of the spouse in the home as someone who encourages breastfeeding are determinants for the mother-child binomial's longer period of stay in the process⁽²²⁾.

With regard to the findings prior to the interventions, the percentage of errors in the questions was above 28% in all approaches, with questions about prenatal breast care standing out with the highest percentage of wrong answers (37.2%), followed by questions about appropriate breastfeeding techniques (36.4%). A study carried out in Fortaleza, which also addressed these four thematic domains, found that question number one – about nipple exercises during pregnancy – in the first approach was the one with the highest rate of wrong answers (27.0%)⁽¹¹⁾. Stimulating the nipples through exercises is contraindicated during pregnancy since the stimulation of the areola and nipple induce the release of oxytocin, which can lead to uterine contractions and hence increase the risk of premature delivery⁽¹²⁾.

The educational intervention was found to substantially increase the number of correct answers in the questions in the fourth approach, which deals with adequate breastfeeding techniques. This was also observed in a previous study conducted in Fortaleza⁽¹¹⁾, where the mean number of correct answers reached 90.3% after lectures. This finding is satisfactory since the baby's correct latching on the breast keeps milk production adequate and protects the nipple from fissures⁽¹⁴⁾.

Another study carried out in the Karnataka district in India investigated breastfeeding techniques knowledge, attitudes and practices in 118 women in the first week postpartum before and after training based on images that showed wrong and right positioning of the mother and baby during breastfeeding. The authors found a significant improvement in the knowledge and attitudes of these women after the training program⁽²³⁾. It is important to emphasize that the Indian women's experience of breastfeeding – although for a week or less – may have contributed to the apprehension of knowledge. These authors also concluded that women who were educated about the technique of breastfeeding during prenatal care improved more significantly, which reinforces the importance of permanent multiprofessional approach to breastfeeding since the beginning of pregnancy.

The second approach that showed the greatest impact after intervention dealt with prenatal breast care. In the previous study conducted in Fortaleza⁽¹¹⁾, this place was occupied by the thematic block that asked about the advantages of breastfeeding for the baby and the mother.

An interventional study carried out in Mississippi with 29 women who were currently pregnant, thinking of becoming pregnant or who had an infant <1 year old developed educational sessions that focused on increasing women's knowledge and awareness of prenatal and postnatal nutrition and physical activity, smoking, breastfeeding, safe infant sleep, maternal mental health and stress reduction. Its long-term objective regarding breastfeeding was to increase its practice and reduce infant mortality by to improving mothers' level of knowledge. In all, 90.5% of the participants successfully identified at least four benefits of breastfeeding⁽²⁴⁾.

Accordingly, a study carried out in Italy with 503 mothers of children under the age of two found that most women had adequate knowledge about the benefits of exclusive breastfeeding for the mother and the child⁽²⁵⁾. Women in the present study presented greater knowledge about this theme in relation to all the others even before the educational interventions, which suggests that pregnant women are well informed about the benefits of breast milk for the mother-child binomial and that probably the lack of knowledge about it is not a determinant of the low prevalence of breastfeeding.

A cross-sectional study carried out in Recife to evaluate the work of 84 Family Health teams (*equipes de Saúde da Família - ESF*) from 42 Health Centers (HC) showed that only six (7.1%) out of the 84 ESF had actions to encourage breastfeeding effectively implemented in their routine. This finding shows how much the public health system needs to evolve to change the Brazilian situation of low exclusive breastfeeding practice or low predominant breastfeeding⁽²⁶⁾, as women are more likely to breastfeed when encouraged by health professionals. Professionals' attitude during prenatal care in relation to breastfeeding is still inadequate⁽³⁾, which does not occur in Brazil only.

Encouraging breastfeeding and healthy eating for children under two years of age is a fundamental strategy for promoting the health of a population as it effectively increases the prevalence of the practice and reduces child morbidity and mortality⁽¹³⁾. In addition, the impact goes beyond childhood. According to theory of metabolic imprinting, healthy eating during this phase of life will determine future health conditions of people and their descendants⁽²⁷⁾. For breastfeeding mothers, it contributes to the prevention of breast and ovarian cancers, obesity, diabetes mellitus and arterial hypertension⁽³⁾.

Therefore, what has been exposed so far shows that intervening on breastfeeding improves knowledge and attitudes⁽¹⁹⁾, motivates women to exercise⁽³⁾ and contributes to promoting the health of the population in the long term⁽¹³⁾.

These actions should initially prioritize low-income communities as the prevalence of early weaning is higher among them. Moreover, they should comprehensively address the losses resulting from the introduction of non-dairy foods and the use of bottles⁽²⁸⁾ and involve fathers in the process for a successful practice⁽²⁹⁾.

However, it is difficult to be a health professional who encourages women to breastfeed when they do not believe in the advantages of it. There is evidence that it is common for pediatric doctors to discredit that the benefits of breastfeeding outweigh the difficulties or inconveniences that surround the act⁽¹⁸⁾. Thus, permanently improving the skills and abilities of health professionals to promote breastfeeding as a routine activity in the UAPS can contribute to the reduction of breastfeeding discouraging attitudes.

In recognizing that, the Ministry of Health, through the Breastfeed and Feed Brazil Strategy (*Estratégia Amamenta e Alimenta Brasil*), encourages the health secretariats of the municipalities and Federal District with the support of the state health secretariats to create collective spaces for the permanent development of education, training and critical and reflective health practices to enhance the quality of care. Actions must be based on the guidelines of national policies on Primary Care, Health Promotion, Food and Nutrition, and Promotion, Protection and Support of Breastfeeding⁽¹³⁾.

Given that health education is part of the object of study in our research, it should be noted that its benefits go beyond those for the mother and child. Permanent education of health workers^(7,13) and health education centered on the active participation of all people and the establishment of a link between the assisted public and professionals represent instruments of empowerment and encouragement of health service users to self-care and, therefore, for the adoption of practices that benefit their health and quality of life. Thus, it is understood that education and health promotion are connected⁽³⁰⁾.

It is important to mention some limitations that may have compromised the quality of this study: it was common among pregnant women to report the difficulty in understanding some questions, apparently elaborated in a confusing way, despite the explanations provided by the researcher. The methodological differences between studies on women's knowledge about breastfeeding ranging from sample size to the life cycle in which the women were (pregnancy, postpartum, lactation) to the knowledge domains covered in the questionnaires hindered the dialog of this study with those developed by other authors.

Finally, it is important to emphasize the importance of having health managers, health professionals and even the academy, when exercising their social function, prioritize actions to encourage breastfeeding in their routines in health services. More intervention studies on breastfeeding should be conducted with women in the municipality studied and these should be followed up in the long term in order to obtain concrete findings about the impact of educational strategies on the extension of breastfeeding duration.

CONCLUSION

The pregnant women analyzed presented adequate knowledge about most of the questions about breastfeeding since the pre-intervention period, mainly regarding the benefits of this practice for the mother and the baby. However, health education proved to be effective in improving such knowledge, which suggests that if it is properly and permanently carried out throughout the prenatal period it may result in an improvement in the numbers associated with the practice of breastfeeding.

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CONTRIBUTIONS

Andreza Kathiuze Maia contributed to the research project conception, data collection, tabulation and analysis of data and writing of manuscript; **Luis Clenio Jário Moreira** contributed to the analysis of data and writing of manuscript; **Bruna Yhang da Costa Silva** contributed to the research project conception, tabulation and analysis of data and writing of manuscript.

REFERENCES

1. Takushi SAM, Tanaka ACA, Gallo PR, Machado MAMP. Motivação de gestante para o aleitamento materno. *Rev Nutr.* 2008;21(5):491-502.
2. Zeleke LB, Gebremichael MW, Adinew YM, Gelaw KA. Appropriate weaning practice and associated factors among infants and young children in northwest Ethiopia. *Int J Sport Nutr Exerc Metab.* 2017;2017(8):1-7.
3. Schwarz EB, Nothnagle M. The maternal health benefits of breastfeeding. *Am Fam Physician.* 2015;91(9):603-4.
4. Motee A, Jeewon R. Importance of exclusive breast feeding and complementary feeding among infants. *Curr Res Nutr Food Sci.* 2014;2(2):56-72.
5. Ministério da Saúde (BR). II Pesquisa prevalência de aleitamento materno nas capitais brasileiras e Distrito Federal. Brasília (DF): Ministério da Saúde; 2009.
6. Amorim MM, Andrade ER. Atuação do enfermeiro no PSF sobre aleitamento materno. *Perspect Online.* 2009;3(9):93-110.
7. Ministério da Saúde (BR). Política nacional de promoção da saúde: anexo I da portaria de consolidação nº 2, de 28 de setembro de 2017, que consolida as normas sobre as políticas nacionais de saúde do SUS. Brasília (DF): Ministério da Saúde; 2018.
8. Silva JAR, Lemos EC, Hardman CM, Santos SJ, Antunes MBC. Educação em saúde na estratégia de saúde da família: percepção dos profissionais. *Rev Bras Promoç Saúde.* 2015;28(1):75-81.
9. Triola MF. Introdução à estatística. 12ª ed. Rio de Janeiro: LTC; 2017.
10. National Health Service England (UK). Physical activity guidelines for children and young people [Internet]. London: NHS; 2018 [accessed on 2019 Oct 03]. Available from: <https://www.nhs.uk/live-well/exercise/physical-activity-guidelines-children-and-young-people/>
11. Freitas GL, Joventino ES, Aquino PS, Pinheiro AKB, Ximenes LB. Evaluating the knowledge on breastfeeding among pregnant women. *REME Rev Min Enferm.* 2008;12(4):461-8.
12. Ministério da Saúde (BR). Saúde da criança: aleitamento materno e alimentação complementar. Brasília (DF): Ministério da Saúde; 2015.
13. Ministério da Saúde (BR). Estratégia nacional para promoção do aleitamento materno e alimentação complementar saudável no sistema único de saúde. Brasília (DF): Ministério da Saúde; 2015.
14. Vitolo MR. Nutrição: da gestação ao envelhecimento. 2ª ed. Rio de Janeiro: Rubio; 2015.
15. Carvalho MR, Tavares LAM. Amamentação: bases científicas. 3ª ed. São Paulo: Guanabara Koogan; 2010.
16. Ministério da Saúde (BR), Sociedade Brasileira de Pediatria. Amamentação: muito mais que alimentar a criança [Internet]. Brasília (DF): Ministério da Saúde; c2009 [accessed on 2019 Oct 17]. Available from: <https://www.sbp.com.br/departamentos-cientificos/aleitamento-materno/videos/>
17. World Health Organization. Global strategy for infant and young child feeding. Geneva: WHO; 2002.
18. Meek JY, Hatcher AJ. The breastfeeding-friendly pediatric office practice. *Pediatrics.* 2017;139(5):e20170647.
19. Lima TM, Osório MM. Perfil e fatores associados ao aleitamento materno em crianças menores de 25 meses da Região Nordeste do Brasil. *Rev Bras Saúde Mater Infant.* 2003;3(3):305-14.
20. Instituto Brasileiro de Geografia e Estatística. Pesquisa nacional por amostra de domicílios contínua: educação 2018. Rio de Janeiro: IBGE; 2019.

21. Cavalcante MCV, Lamy F Filho, França AKTC, Lamy ZC. Relação mãe-filho e fatores associados: análise hierarquizada de base populacional em uma capital do Brasil-estudo BRISA. *Ciênc Saúde Colet.* 2017;22(5):1683-93.
22. Brito RS, Oliveira EMF. Opinião do pai sobre o aleitamento materno. *Rev RENE.* 2006;7(1):9-16.
23. Tella K, Guruvare S, Hebbar S, Adiga P, Rai L. Knowledge, attitude, and practice of techniques of breast-feeding among of postnatal mothers in a coastal district of Karnataka. *Int J Med Sci Public Health.* 2016;5(1):28-34.
24. Fastring D, Mayfield-Johnson S, Madison J. Evaluation of a health education intervention to improve knowledge, skills, behavioral intentions and resources associated with preventable determinants of infant mortality. *Divers Equal Health Care.* 2017;14(6):290-5.
25. Cascone D, Tomassoni D, Napolitano F, Giuseppe G. Evaluation of knowledge, attitudes, and practices about exclusive breastfeeding among women in Italy. *Int J Environ Res Public Health.* 2019;16(1):2118-29.
26. Bezerra LCA, Fruas PG, Vidal SA, Macedo VC, Vanderlei LC. Breast-feeding: assessment of the implementation of a program at basic healthcare units in Recife, Pernambuco State (2002). *Ciênc Saúde Colet.* 2007;12(5):1309-17.
27. Mozetic RM, Silva SDC, Ganen AP. A importância da nutrição nos primeiros mil dias. *Rev Eletrônica Acervo Saúde.* 2016;8(2):876-84.
28. Akinyinka MR, Olatona FA, Oluwole EO. Breastfeeding knowledge and practices among mothers of children under 2 years of age living in a military barrack in Southwest Nigeria. *Int J MCH AIDS.* 2016;5(1):1-13.
29. Vijayalakshmi P, Susheela T, Mythili D. Knowledge, attitudes, and breast feeding practices of postnatal mothers: a cross sectional survey. *Int J Health Sci (Qassim).* 2015;9(4):364-74.
30. Janini JP, Bessler D, Vargas AB. Educação em saúde e promoção da saúde: impacto na qualidade de vida do idoso. *Saúde Debate.* 2015;39(105):480-90.

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