RESEARCH ARTICLES

Breastfeeding mothers' self-confidence: A mixed-method study

AUTHORS

CLÁUDIA SILVEIRA VIERA PhD, BN [1]
GÉCICA GRACIELI WUST DE MORAES MsC, BN [1]
BEATRIZ ROSANA GONÇALVES DE OLIVEIRA TOSO PhD, BN [1]
MARIALDA MOREIRA CHRISTOFFEL PhD, BN [2]
GICELLE GALVAN MACHINESKI PhD, BN [1]
ANA MARIA LINARES DNS, RN, IBCLC [3]

1 Western Paraná State University, Paraná, Brazil.
2 Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.
3 University of Kentucky, College of Nursing, Kentucky, USA.

CORRESPONDING AUTHOR

BEATRIZ ROSANA GONÇALVES DE OLIVEIRA TOSO Rua Universitária, 2069.Cascavel, Paraná, Brazil. 85819-110. E: lb.toso@gmail.com

ABSTRACT

Objective: To establish the association of the mother's breastfeeding self-efficacy with infant feeding in the first six months of the child's life and identify the mothers' perception of their confidence to breastfeed.

Background: Breastfeeding is a multi-determined process. Many factors contribute to a mother's ability to exclusively breastfeed until a child reaches six months of age. Among these factors is a mother's confidence in her abilities to breastfeed her baby, referred to as breastfeeding self-efficacy. Thus, self-efficacy for breastfeeding could be an essential predictor of reducing the risk of early weaning.

Study design and methods: This is a mixed-method sequential explanatory study. The short form of the Breastfeeding Self-Efficacy Scale was used to determine the level of the mothers' confidence. 158 mothers were surveyed during their postpartum hospital stay, and 128 were included in a follow-up six months after delivery. Additionally, 22 participants were randomly selected for an in-depth interview (qualitative stage). Data were analysed using inferential statistics and thematic content analysis.

Results: High levels of breastfeeding efficacy were identified during the hospitalisation and after discharge among all participants. Exclusive breastfeeding was practised among 45.31% of mothers six months after delivery. Return to work was a key factor contributing to early weaning. Family and health professional support during the breastfeeding process were associated as crucial for the duration of exclusive breastfeeding.

Discussion: Exclusive breastfeeding for the first six months after delivery involves various factors, such as the mother's confidence in her breastfeeding skills and the specific circumstances she faces while breastfeeding. Thus, through the mixed qualitative and quantitative approaches, it was possible to identify the convergence of self-efficacy scores and the breastfeeding mothers' perception of their confidence and intention to maintain exclusive breastfeeding.

Conclusion: High self-efficacy to breastfeed alone was not enough to maintain exclusive breastfeeding. It is necessary to combine self-efficacy and family or health service support and guidance to clarify the mother's doubts about potential difficulties that may appear throughout the breastfeeding process, the maintenance of lactation when she plans to return to work, and the breastfeeding technique.

Implication for practice: Applying the Breastfeeding Self-Efficacy Scale associated with the breastfeeding mothers' interview during the prenatal and perinatal

period facilitates early identification of mothers at risk for early weaning and helps nurses in planning interventions to support the breastfeeding mother and her child in favour of exclusive breastfeeding duration.

Keywords: Breastfeeding; Confidence; Infant; Mothers; Self-efficacy.

What is already known about the topic?

- Exclusive breastfeeding (EBF) is recommended for the first six months of a child's life; however, many mothers do not follow this recommendation due to multiple barriers such as mental health issues (i.e., postpartum depression or anxiety), educational gaps, physical discomfort like sore nipples, engorgement, return to work, and lack of support.
- Breastfeeding self-efficacy has been associated with the duration of breastfeeding.

What this paper adds

- Breastfeeding mothers' self-efficacy is essential for stimulating maintenance.
- Questions 3 (I always feed my baby without using powdered milk as a supplement) and 11 (I always breastfeed my baby on one breast and then switch to the other) of the Breastfeeding Self-Efficacy Scale (short form) predicted early weaning risk.
- Planning nursing care intervention for breastfeeding mothers in their follow-up after birth should include assessing their breastfeeding self-efficacy and factors that could contribute to early weaning, such as returning to work and the lack of a support network.

OBJECTIVE

To establish the association of a mother's breastfeeding self-efficacy with infant feeding in the first six months of the child's life and to identify the mothers' perception of their confidence to breastfeed.

BACKGROUND

In recognition of breastfeeding's many health benefits for both the mother and infant the World Health Organization recommends that infants are exclusively breastfed for the first six months of a child's life and sustained for up to two years to ensure optimal health for the newborn.1 Exclusive breastfeeding (EBF) refers to the infant receiving only breast milk, and no other liquids or solids, not even water. Despite this recommendation and the recognition of the benefits of EBF, global breastfeeding rates have not increased in the last two decades.[1] The prevalence of EBF among children under six months of age is below 50% in most countries. An analysis of 57 low and middle-income countries showed that the weighted global prevalence of women exclusively breastfeeding up to 6 months was 45.7%.[1,2] Increasing EBF is a multi-determined process. Among these, maternal confidence has been identified as a crucial element for successful breastfeeding during the postpartum period.[3] Maternal self-confidence in breastfeeding is a significant predictor of EBF that should be monitored and supported throughout pregnancy and childbirth.

Breastfeeding confidence is considered a significant variable in the continuation of breastfeeding; however, this concept has suffered from a theoretical perspective in the literature. Self-confidence is defined as personal confidence in effectively performing a task or achieving a particular goal. Related to a mother's self-confidence these tasks refer to child-rearing, such as breastfeeding.[4] Considering the duration of breastfeeding, this characteristic can create a woman's confidence or positive expectation regarding her knowledge and skills to breastfeed her baby successfully.[5,6] To promote the conceptual development of breastfeeding confidence and guide effective supportive interventions, Dennis (1999) incorporated Bandura's theory of self-efficacy and developed the concept of self-efficacy for breastfeeding, creating the Breastfeeding Self-Efficacy Scale (BSES), validated in Brazil by Dodt.[4,5,6] Breastfeeding self-efficacy refers to the mother's perceived ability to breastfeed her baby and predicts whether the mother chooses to breastfeed or not; how much effort will she make in this process; whether she will have self-improving or self-destructive thought patterns regarding breastfeeding, and how she will emotionally respond to breastfeeding difficulties.[5]

Self-efficacy in breastfeeding is influenced by perception of performance (previous experiences with breastfeeding); vicarious experiences (observing other women breastfeeding); verbal persuasion (encouragement of influential people such as family members and health professionals), and physiological responses (fatigue, stress, anxiety, and pain).[4] Nursing interventions to increase self-efficacy are an effective approach to maintaining EBF. Research on support for breastfeeding and health education offered during prenatal care to promote EBF have indicated that self-efficacy for breastfeeding is a modifiable factor.[7] In the daily practice of caring for breastfeeding mothers, health professionals can use tools to assess maternal self-efficacy and identify needs for support in maintaining EBF. The use of the BSES makes it possible to identify maternal difficulties and strengths in breastfeeding, contributing to the planning of effective interventions to encourage the maintenance of

EBF.[8] Nurses could apply the BSES-short form to plan clinical practices with women, in all stages of pregnancy and the puerperal period, acting on exclusive items with low scores to improve self-confidence in breastfeeding. Otherwise, involving family and other people who support women during pregnancy, and counselling about breastfeeding, could help women with self-confidence.

In addition to measuring breastfeeding self-efficacy, it is necessary to capture the mother's perception of breastfeeding. Specific elements of the particular social and family context can influence the maintenance of EBF. Based on these two aspects, the health professional can plan women's health care to improve their confidence in breastfeeding. Health workers could provide support to increase women's self-confidence and take advantage of opportunities during regular prenatal care encounters during pregnancy and childbearing to assess women's breastfeeding difficulties and identify the degree of maternal self-efficacy to encourage women's empowerment for this process.

It is believed that breastfeeding mothers with higher scores on the BSES, which characterises high efficacy for breastfeeding, have a positive perception of their confidence in the breastfeeding process. Thus, this mixed method study aims to establish the association of the mother's breastfeeding self-efficacy with infant feeding in the first six months of the child's life and identify the mothers' perception of their confidence in breastfeeding. A quantitative approach will be used to determine the level of breastfeeding self-efficacy using the BSES-SF and a qualitative approach will be used to identify the breastfeeding mother's perception of breastfeeding self-efficacy.

METHODS

Breastfeeding is considered a complex and multifactorial theme. To explore this, a sequential mixed-methods approach (QUAN-qual) was conducted, according to the methodology developed by Creswell.[9] The mixed aim of this study is to compare the score of the Breastfeeding Self Efficacy Scale – Short Form (BSES-SF) with the breastfeeding mother's perception of her confidence in providing EBF, to identify factors that influence EBF maintenance during the first six months of a child's life.

The study employed a longitudinal prospective cohort design that followed a group of breastfeeding mothers from the immediate postpartum period (24–48 hours after birth) to six months. The exposure variable was the mother's self-efficacy scores, and the outcome variable was breastfeeding exclusively until the sixth month. The quantitative variables analyses were participants' sociodemographic characteristics, like the mother's age, education level, job, marital status, income, prenatal characteristics, such as type of delivery, number of prenatal appointments, vaccines, among others, duration of the EBF, newborn clinical values, as gestational age, weight, cephalic circumference, Apgar index and BSES-SF scores. The perception of the mother about her confidence to maintain exclusive breastfeeding was the qualitative component of the study.

PARTICIPANTS

The participants were enrolled from a teaching hospital in Paraná state, Brazil. The sample's composition followed the precepts indicated for each type of approach, according to the following inclusion criteria: a postpartum woman living in the city of study, given birth between 37 - 42 weeks of gestational age, and not having had clinical or physiological complications in childbirth and during the immediate postpartum period. Complications included diabetes, high blood pressure, haemorrhage, mental disorders, or breast injuries that could have prevented them from responding to the questionnaire and/or prevented them from breastfeeding (reported in the medical records). Adolescent breastfeeding mothers and/or newborns with a known congenital disability, premature infants, multiple pregnancies, as well as newborns hospitalised at the neonatal intensive care unit were also excluded.

STUDY DEVELOPMENT

The study was conducted through two phases: phase I, a quantitative approach and phase II, a quantitative and qualitative approach.

Phase I

Quantitative data was collected from a non-probabilistic sample, consisting of 158 breastfeeding mothers in the immediate postpartum period (from 24 to 48 hours after birth) between June and October 2017.

The researchers contacted the sample in the immediate period after birth and explained to them the purpose of the study. After informed consent was gained, the mothers were given a questionnaire that gathered sociodemographic and clinical data about the newborn and the mother, and the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) Brazilian version was applied.

The BSES-SF is a 14-item scale, divided into two subscales: breastfeeding technique and interpersonal thoughts. The *breastfeeding technique* subscale includes questions about the correct position of the baby at the breast, comfort in the act of breastfeeding, recognition of good lactation signs, and areolar nipple suction. The *intrapersonal thoughts* subscale includes questions about the desire to breastfeed, internal motivation for breastfeeding, satisfaction with the experience of breastfeeding, and recognising signs of when the child is full.[6] It uses a Likert-type scale, for each question scores from 1 (totally disagree) to 5 (totally agree), with scores ranging from 14 to 70 points. BSES final score is characterised

as low efficacy when the score ranges between 14 to 32 points, medium efficacy from 33 to 51 points, and high efficacy from 52 to 70 points.[6]

During this first contact, the researcher informed the participants that they would be followed by mobile phone contact in the first and third months after hospital discharge. A home visit was scheduled by the researcher for the sixth month.

Phase II

Quantitative and qualitative data was collected through home visits from December 2017 to May 2018, six months after phase I. After hospital discharge, effective contact was maintained with 128 breastfeeding mothers'; 18.9% of the sample attrition was due to a change of address, no longer wanting to participate the baby being given up for adoption, or the baby's death after hospital discharge. Participants with whom effective contact was maintained answered the BSES-SF.

From the 128 participants in phase II, 22 participants were randomly sampled selected for qualitative study. To ensure diverse representation among the sample, mothers were first categorised by the five geographic city regions then random sampling was conducted from each category. Selected participants were then invited to participate in in-depth interviews.

The in-depth interview was conducted during the home visit, in a private setting within the breastfeeding mother's home, where she was accompanied only by the baby and the interviewer. Interviews typically lasted between 20 to 30 minutes. The content of the interviews was about the mother's perception of their confidence in breastfeeding their babies. Thus, the interviews were audio-recorded on the main research mobile device, the individual files were uploaded to the individual Dropbox cloud from the main research with a personal key to access. The data are not in public repositories with free access and will be kept for 10 years, after that will be destroyed.

The interviews were guided by the triggering question: "Tell me how your experience with breastfeeding has been until this moment?" followed by an interview script. The interview scripting included the following questions: "How do you perceive your ability to breastfeed your child?" (objective: identify maternal confidence for this purpose); "Describe what it has been like for you to breastfeed your child since leaving the maternity ward?" (objective: recognising the difficulties in the breastfeeding process); "Who are the people providing support and assistance to you while you need to breastfeed your child?" (objective: identifying the support received by the mother). Data collection continued until it represented a set of information for a theoretical construct to answer the objectives, following the theoretical saturation.

The development of the study can be seen in Figure 1.

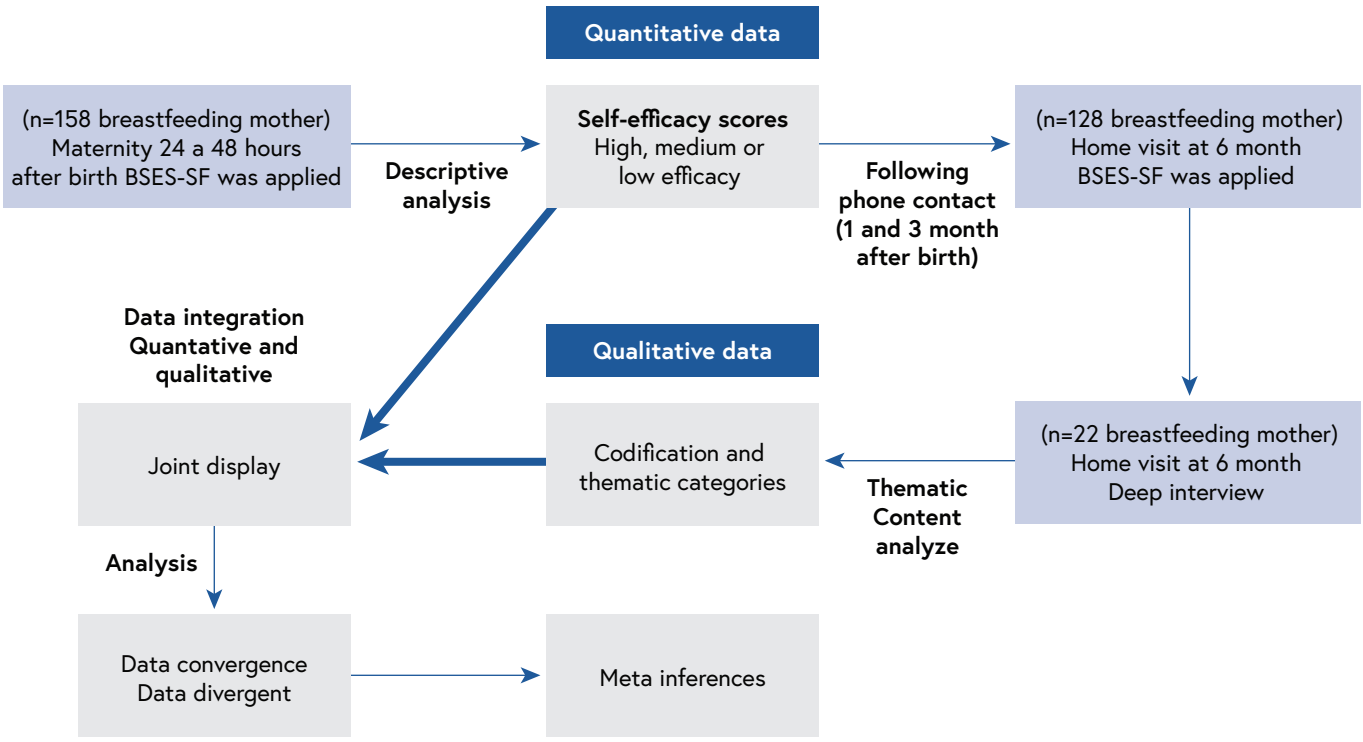

FIGURE 1: DATA COLLECTION PROCEDURES

DATA ANALYSIS

Quantitative data were statistically analysed by the XL Stat program (2010), and qualitative data were submitted for thematic content analysis.[10]

The quantitative analysis established the incidence and/or prevalence of breastfeeding and the relative risk between the groups in the immediate postpartum period and after six months, in this period the breastfeeding mothers were divided into two groups: 1. EBF, and 2. not exclusively breastfeeding. The internal consistency of the BSES-SF scale items was evaluated using Cronbach's Alpha Coefficient, considering high consistency when alpha levels ranged between 0.70 and 0.95, assuming a significance level of 5%. The scale items associated with the EBF duration were also identified by logistic regression (Hosmer and Lemeshow model). The Mann-Whitney-U test was used to analyse whether there was a difference between the BSES-SF scores in the mediate postpartum period and the sixth month of the postpartum period.

Content analysis in the thematic modality enabled identifying aspects that expressed the mother's self-confidence with breastfeeding their babies at home. After transcribing the interviews made by two researchers; one transcribed the interview, and the other checked the transcription. The participant was invited to review, confirm, or clarify the data or even obtain new information where it was not clear. The validation of the interview was carried out with all participants; two researchers manually and independently coded the categories, for later confrontation. After coding, the categories were compared to each other and then grouped into themes, seeking to establish conceptual relationships.[11]

Data integration occurred from the research problem question and the presentation of results and data analysis when the data set of each approach was integrated. For qualitative and quantitative data presentation, a joint display with thematic categories was elaborated according to the score obtained in the BSES-SF of the 22 participants of the qualitative stage. Each data set is presented separately, and a joint display describes the integration and interpretation of qualitative and quantitative data.

ETHICAL CONSIDERATIONS

The development of the investigation respected all Ethical precepts of Research with Human Beings, and the project was approved by the Ethics and Research Committee of the Western Paraná State University (reference number: 2.195.270).

RESULTS

PARTICIPANTS CHARACTERISTIC

Breastfeeding mothers were characterised by age, education, type of delivery, and duration of EBF. Participants have similar characteristics in terms of age, ranging from 18 to 24 years old, with most of them completing eight years or more of schooling, and had a vaginal birth. Most participants in the immediate postpartum period were classified with high breastfeeding efficacy according to the BSES-SF. However, the frequency of EBF was different between the initial period and the 6th month after delivery. In the initial period at the maternity, 80% of the total sample (N=128) were EBF. In the 6th month, among the 128 breastfeeding mothers participating in the second phase of the study, only 45.31% were EBF. In the group from the qualitative phase (n=22) 80% were EBF at maternity and 50% kept EBF until the sixth month. The relative risk of weaning at each stage was 0.2 at birth, and at the 6th month after birth was 0.3 in the total sample (n=128), while the selected participants in the qualitative interview had 0.5 (n=22).

BSES-SF quantitative data

Internal consistency of the BSES-SF, Brazilian version ranged from 0.942 to 0.951 between the scale's items and 0.9481 of the scale. Items on the scale associated with the duration of EBF were analysed (Table 1).

TABLE 1. BSES-SF QUESTIONS AND BREASTFEEDING DURATION AT SIXTH MONTH AFTER BIRTH. CASCAVEL-PARANA, BRAZIL, 2019 (N=128)

Source	Value	p-value	OR [IC95%]
Intercept	-4.823	0.006	
Q3			
1	0,000		
2	-0.755	0.641	0.470 [0.020 – 11.180]
3	1.216	0.121	3.372 [0.727 – 15.648]
4	2.573	0.038	13.110 [1.156 – 148.728]
5	3.618	< 0.0001	37.250 [9.678 – 143.387]
Q11			
1	0.000		
2	0.114	0.969	1.120 [0.004 – 324.360]
3	2.188	0.245	8.920 [0.222 – 358.215]
4	2.969	0.139	19.481 [0.382 – 994.249]
5	3.100	0.077	22.195 [0.714 – 689.995]

Statistic test:
Hosmer & Lemeshow Model (Chi-Square=1.374; GL=5; p=0.927).

Legend: 1 – not at all confident, 2 – disagree, 3 – sometimes agree, 4 – agree, 5 – completely agree.

Questions Q3 and Q11 were considered statistically significant in relation to EBF in the sixth month. These questions were the most likely to identify whether breastfeeding mothers will maintain EBF (Chi-square= 1.374; GL=5; p= 0.927). According to the logistic regression model, as detailed in Q3 (with the formula as a supplement), the mothers' responses that showed a statistically significant relationship with the duration of breastfeeding were 4 (agree) and 5 (strongly agree). Thus, the probability of EBF until the sixth month for breastfeeding mothers who answered, 'I agree' to Q3 ('there is no need to introduce formula as a supplement') is 13.11 times greater than those who answered, 'I totally disagree'. For those who answered, 'I totally agree', the probability of maintaining EBF was 37.25 times higher (Table 1).

For Q11 (breastfeeding technical subscale and breastfeeding in both breasts at the same feeding) none of the answers was statistically significant. Although not statistically significant, the response 'I totally agree' indicated that breastfeeding mothers were 22.19 times more likely to maintain exclusive breastfeeding until the sixth month compared to those who answered 'I totally disagree (p=0.077) (Table 1).

Comparing the BSES-SF final score in the 6th month, a statistically significant (p<0.5) difference was identified between the final self-efficacy scores. The mothers who exclusively breastfed had a higher median final score (Md=66.00) compared to those who did not exclusively breastfeed (Md=55.00), suggesting that EBF resulted in greater confidence.

QUALITATIVE DATA RESULTS

The qualitative analysis highlighted the importance of giving voice to breastfeeding mothers to express their breastfeeding experience. After the qualitative data processing, the following thematic categories were obtained:

- Mother breastfeeding perception act, which encompasses the subcategory *feelings towards breastfeeding.*
- Mother breastfeeding confidence perception, including the subcategories: *difficulties with breastfeeding* and *support for women during breastfeeding.*
- Breastfeeding experiences from hospital discharge to the sixth month of infant life with the subcategories: *back to work* and *reasons that led to the introduction of the formula.*

In each identified thematic category, the statements of the breastfeeding mothers are shown according to the scores obtained in the BSES-SF, namely, low efficacy, medium efficacy, and high efficacy, as observed in the joint display (Table 2).

MIXED METHOD APPROACH RESULTS

Among participants with a low score of the BSES-SF, the discontinuation of breastfeeding was linked to the child's behaviour, interpreted as dissatisfaction with breastfeeding, despite the desire to breastfeed. Those with medium efficacy reported interest in breastfeeding, as this act represents the possibility of establishing a bond with the child. When breastfeeding in public places, participants mentioned feeling embarrassed. This feeling could be a reason for choosing to feed supplementary formula or to give up breastfeeding altogether. Highly efficacy breastfeeding mothers commented about the benefits of breastfeeding for the child and the importance of nurturing the child wherever and whenever there was a demand.

Feeling confident influenced the mothers' empowerment for breastfeeding, evident in their ability to breastfeed their child, which converged with the high efficacy scores. The positive thinking towards breastfeeding shows that breastfeeding mothers feel essential in this process, as they can take care of their child.

The breastfeeding mothers with a low score on the BSES-SF reported that they received guidance and help at the hospital, but they lacked the support network at home. Consequently, they introduced formula because they felt their milk did not adequately feed the child. Breastfeeding mothers with medium and high efficacy reported support from professionals in the maternity ward, contributing to their breastfeeding autonomy at home. The family support network was important for this care at home, helping to increase the confidence to breastfeed.

Reasons to introduce formula feeding to infants of breastfeeding mothers with low efficacy included family influence and the belief that breast milk was not enough. Those with medium effectiveness returning to work decreased milk production and reported fear of breastfeeding in public. Breastfeeding mothers with high efficacy introduced formula due to medical indications and the impression that breast milk was not satisfying the child. In addition, return to work constitutes a hindering inhibiting factor for maintaining EBF, in which the breastfeeding mother is unaware of how to manage returning to work and maintaining breastfeeding.

Question Q3 of the BSES-SF demonstrated that breastfeeding mothers who planned to use formula milk as a complement were more likely to wean early. This information converges with breastfeeding mothers' responses during the deep interview, who reported using formula early, which corroborates the fact that only 50% of respondents breastfed exclusively in the first six months of the infant's life.

TABLE 2. JOINT DISPLAY TO PRESENT THE BREASTFEEDING MOTHER'S PERCEPTIONS OF BREASTFEEDING SELF-EFFICACY CLASSIFIED BY THE BSES-SF SCORES. CASCAVEL-PARANA, BRAZIL, 2019 (N=22)

	LOW EFFICACY (14–32 points)	AVERAGE EFFICACY (33–51 points)	HIGH EFFICACY (52–70 points)
Mother breastfeeding perception act			
Feelings towards breastfeeding	The time I breastfeeding was good, I liked to breastfeed (...) because of me I would have continued breastfeeding, but He was just complaining all the time, it seemed that my milk was not sustaining him (I11).	I've always wanted to breastfeed, when the baby breastfeeds, I feel it closer, more mine (I4). I find it interesting, but I don't feel comfortable to breastfeed (in public) ... it depends on the person I'm ashamed of (I124).	For God, He doesn't know what flu is, and I advise other mothers to breastfeed too, it's a good return we have due to their health (I24). It's a pleasure for you to feed the child, because I don't know, it's something like that for you, you're taking care of Him (I85). Breastfeeding for me is an act of love, it's an exchange of love between me and my daughter, the fact that every time we go to breastfeed, she looks at me and we look at each other, so it's an exchange of affection between me and her, so for me, breastfeeding is very important (E146).
Mother breastfeeding confidence perception			
Difficulties with breastfeeding	I had a lot of pain in my breast, it was a terrible time for me … and I gave up breastfeeding … (I11).	The first week was very painful ... at the beginning, he vomited a lot, it came out of his nose a lot, even there in the hospital… (I4).	I really suffered during the first few days, but because we didn't know how to breastfeed, because even with the injured breast, I breastfed well, to see how important it is (I30). From the beginning my nipple was inside, even making the pout for her to breastfeed was difficult, it cracked when I was in the hospital, but when I left the hospital and came home it was easier, because I was managing the situation (I38).
Support for women during breastfeeding	At the hospital I was able to breastfeed … Then, at home, he sucked even five or ten minutes and started to cry… my mother said I was low on milk, so I started giving the formula and he didn't cry anymore (I11)	In the first days I received a lot of help from my mother, my father, my husband, my sister helped me too (I4). At the hospital the nurses helped me, but at home I managed alone, I breastfed myself (I124).	My husband proved to be a partner, at the beginning when I sat down to breastfeed, I felt very thirsty, then he already came with the bottle of water to give me, he helped me with everything, when I went to take a shower, he took care of the baby and cut the vegetables to make my soup (I89). So, when I left the hospital, they gave me guidance, when I got home my mother-in-law was with me (I122)
Breastfeeding experiences from hospital discharge to the sixth month of infant life			
Back to work		Actually, I didn't even want to go back to work, but... I went back to work he was already 5 months old. Breastfeeding during this period was very complicated, because I only breastfeed early in the morning and after six o'clock in the afternoon (E4).	When she was three months old, I had to go back to work, and I tried to give her a bottle, she didn't take it at all, so I pumped the milk and let it be given to her because she didn't even want to know about a bottle, of course, she liked the mother's milk more. But then after a while I stopped working to dedicate myself to her (E10)
Reasons that led to the introduction of the formula	Ah, it was more by influence (introducing formula), because I would have continued breastfeeding, but I was breastfeeding and soon he would start crying (E11).	After I went back to work, he was on the chest a lot… I just cried and I realised that my chest was very empty, then the other day, I told my mother I was going to buy some milk (E4) I don't want to breastfeed anymore because I'm ashamed to breastfeed in public (E124)	When she was five months old, I started giving her formula, because she suckled and it was not easy, and she complained (E95). At three months or so, the doctor thought she was not at the ideal weight and ordered a supplement, so I supplemented two to three times, but I never stopped breastfeeding (E44).

DISCUSSION

The association of the mother's breastfeeding self-efficacy with infant feeding in the first six months of the child's life was identified based on the statistical significance and logistic regression about the duration of EBF and the BSES-SF scores. It was observed that breastfeeding mothers with high efficacy for breastfeeding had a positive perception of their confidence for breastfeeding and breastfed exclusively until the infant was six months of age. In addition, it was demonstrated that the intention to use formula as a possibility to feed the child and the mother's lack of knowledge regarding the need to breastfeed from both breasts at each feeding were markers for early weaning. Another relevant point identified was the importance of support for breastfeeding continuation. In this sense, mothers who presented medium and higher self-efficacy

scores mentioned in their responses good family or professional support to stimulate or help them to breastfeed their child. Many women, however, do not breastfeed or stop soon after childbirth, often due to a lack of support.[18]

Qualitative and quantitative data showed that the introduction of formula was an aspect that converged between the Q3 of the BSES-SF and the breastfeeding mothers' statements. In this question, mothers who are at risk of introducing formula early are identified and the reasons for this behaviour were evident in the interview. Among these reasons, mothers cite in their responses the need to return to work, the perception that their milk supply was insufficient, the absence of support from their spouse or family, the infant's difficulty in latching to breastfeed, and the paediatrician's recommendation due to the baby's poor weight gain or gastroesophageal reflux. The prevalence of EBF is positively associated with higher breastfeeding self-efficacy, mothers' level of education, and early initiation of breastfeeding, while preterm birth and preparation for infant formula before delivery were barriers to EBF.[18]

In the quantitative approach of this study, from the model created by logistic regression aiming to find the associated factors between the BSES-SF questions and the duration of breastfeeding, the probabilities can predict approximately 95.7% of the factors associated (Q3 and Q11) with the outcome (EBF at six months of age). The sensitivity of the adjusted model reflects its effectiveness in identifying mothers who could exclusively breastfeed until six months, which in this proposal is equivalent to 85.71%. Its specificity reflects how effectively it can correctly identify those who would not breastfeed until six months, which in this study is equivalent to 88.24%. In other words, the model can very effectively identify the association between women who will breastfeed and those who will not breastfeed until the infant is six months old.[19]

Another factor that influences the duration of breastfeeding is returning to work, as noted by the participants. Full-time employment for Ethiopian mothers was found to have a negative correlation with EBF compared to those who are unemployed. [20] Therefore, it is imperative to enact policies that empower women. Additionally, both government and non-government organisations should strive to establish supportive environments in the workplace for mothers to practice EBF.[20]

The mother's confidence in her ability to breastfeed can be studied within the construct of self-efficacy, where a woman must believe she is capable of successfully performing certain tasks or behaviours to achieve desirable outcomes.[5,6] In the immediate postpartum period, the BSES assessment revealed that women with moderate to high levels of self-efficacy were more likely to continue EBF. Consequently, the positive perception of maternal confidence reflects their breastfeeding capability and can inform targeted interventions aimed at promoting and sustaining EBF.[21]

Thus, difficulties in handling breastfeeding, such as maternal beliefs, family culture, and lack of support from the partner and family are aspects that impair EBF.[22] In this study, breastfeeding mothers reported the association of breastfeeding with feelings of pleasure, as an act of love, and satisfaction because the mothers might contribute to the child's health. They also recognised the benefits of breastfeeding and the excellent bond between both mothers and babies. A similar perception was evidenced in other studies in the literature, showing that, independent of culture, lifestyle, and country uses are similarly related to breastfeeding.[7,23]

Participants reported difficulties with breastfeeding, which were associated with factors such as challenges in the breastfeeding process, lack of knowledge, insecurity, and inadequate latch causing nipple pain. These perceptions, appear to be consistent regardless of the participants' place of residence and reflect a recurring pattern in breastfeeding experiences, as evidenced in the literature.[15] These occurrences represent a risk factor for self-efficacy, which demonstrates the importance of health professionals in providing anticipated guidance, supporting the mothers, and encouraging them to continue in the breastfeeding process.[7] Thus, the support offered to mothers in the breastfeeding process, whether by their partner, family members, or health professionals, is essential for them to feel comfortable in EBF until the sixth month and be able to solve any difficulties breastfeeding, should they appear.[24] Participants referred to the support given by professionals during their maternity stay but, they did not mention the support of the health team in the prenatal period or after hospital discharge.

Our study identified some domains of support that could be offered to breastfeeding mothers during the prenatal period, such as, providing information about the benefits of EBF, proper breastfeeding techniques, and how to overcome common challenges, this can significantly support their breastfeeding journey; offering emotional support through counselling, peer support groups, and access to lactation consultants can help mothers navigate the emotional aspects of breastfeeding, such as feelings of doubt, frustration, or anxiety; assisting mothers with practical aspects like childcare, household chores, and meal preparation can alleviate their burden, allowing them more time and energy to focus on breastfeeding; ensuring mothers have access to essential resources such as breast pumps, breastfeeding-friendly workplaces, and breastfeeding-friendly public spaces can facilitate their ability to breastfeed exclusively, especially after returning to work or when outside the home; encouraging partners and family members to actively support breastfeeding mothers by understanding their needs, offering encouragement, and actively participating in caregiving responsibilities can create a supportive environment conducive to EBF and building a supportive community network that promotes breastfeeding, including local support groups, online forums, and community

events, can provide mothers with a sense of belonging and encouragement throughout their breastfeeding journey.

In addition, the prenatal period is considered the golden time to prepare the future breastfeeding mother for breastfeeding. Applying the BSES-SF before leaving the maternity ward can identify those who need more targeted follow-up, especially when mothers exhibit low efficacy and their responses to Q3 and Q11 of the scale demonstrate a higher risk of early weaning.

Follow-up over the first six months of the child's life can identify difficulties that arise in the BF breastfeeding process over time and, thus, enable the healthcare provider to conduct direct actions to promote EBF duration. The nurse should initiate an individual assessment to evaluate the mother's unique breastfeeding requirements and obstacles. This assessment may involve identifying problems related to positioning and latch, milk supply, emotional well-being, or any other challenges she may encounter. Monitoring breastfeeding mothers in the puerperium period is essential to avoid weaning; this is a maternal fragility period, which requires social and family support to maintain breastfeeding. Social support was also presented as a positive factor associated with mother's high levels of breastfeeding efficacy in other studies.[25,26]

The high score on the BSES-SF is a protective factor for EBF.[12] In our research, breastfeeding mothers with the highest score on the BSES-SF were the most favourable to maintaining EBF for at least six, a fact also observed in other studies.[13,14]

Confidence in the ability to successfully breastfeed results from maternal self-efficacy, which permeates health behaviours. Efficacy beliefs can be developed from direct, vicarious experience, social persuasion, and physical and emotional state.[5] Therefore, previous successful experiences, good practices experiences, empowerment about breastfeeding benefits, and the pleasure that breastfeeding provides, are factors that influence breastfeeding success. These elements were presented by the breastfeeding mothers with the highest score in the BSES-SF in our study.

Despite the high efficacy scores, the prevalence of EBF at six months was low, demonstrating that the management of breastfeeding at home represents many difficulties that lead to early weaning. Therefore, high mother's confidence to provide breastfeeding at discharge from a hospital stay does not mean she will maintain EBF; a factor that was proven when comparing the qualitative data to the BSES-SF scores at six months after birth. It is evident that extrinsic factors to early weaning are primiparity, lack of family support, caesarean delivery, difficulties with breastfeeding, insufficient milk supply and return to work,[7,15,16] and signs of depression and maternal stress.[17] In our study, these factors were also identified, except depression and stress aspects. Our results also showed that all these factors are significantly associated with early weaning; however, we did not assess depression and stress in this sample.

The data from the BSES-SF among the breastfeeding mothers who participated in the deep-interview showed aspects that are not identified in the scale, such as feelings reported towards the act of breastfeeding or the difficulties in handling breastfeeding. Thus, the BSES-SF scores need to be considered to promote the EBF associated with the breastfeeding mother's social, family, cultural, and economic aspects. So, using this information requires studies based on the analysis of a phenomenon, as well as quantitative, and qualitative data. Mothers with a BSES-SF score below 58 points in primary health care are at risk of early withdrawal of EBF, within the first two months.[27] Therefore, identifying self-efficacy scores for breastfeeding, associated with qualitative discourses of mothers obtained during interviews during the postpartum consultation in primary health care, are essential elements for nurses to recognise mothers at risk of early weaning and enable effective interventions to promote the maintenance of EBF until the infant's sixth month of life.

BSES-SF demonstrated high efficacy for breastfeeding among the breastfeeding mothers in the study, showing an association between higher scores and longer duration of EBF. Self-efficacy appears to be a significant predictor of EBF. Therefore, EBF could be enhanced by safe education during pregnancy, reinforcing pregnant women's self-efficacy and considering their personality traits.[28] It is noteworthy that using the BSES-SF as a facilitating tool to identify the self-confidence of breastfeeding mothers in breastfeeding associated with comprehensive and individualised care for them will enable a broader approach to managing breastfeeding by health professionals. Therefore, encouraging maternal self-efficacy and empowerment helps to develop confidence in her ability to breastfeed. In addition, the BSES-SF results can be used to recognise the efficacy of different kind of interventions offered in the health services to support breastfeeding among pregnant women and breastfeeding mothers.[6]

Despite the many reports that maternal self-efficacy is a factor that can influence the duration of EBF, in our study we present as new knowledge, the establishment of the relationship between specific issues of BSES-SF (breastfeeding from both breasts and intention not to use formula) as predictive for the duration of EBF. In addition, another innovative aspect was the integration of qualitative-quantitative approaches, in which the convergence of self-efficacy scores and the perception of breastfeeding mothers about their confidence and intention to maintain EBF were observed.

LIMITATIONS

This study had limitations, such as bias in the sample selection and lost follow-up in the quantitative stage, the non-probabilistic sampling, and the lack of identification of all mechanisms that may explain how the independent variables influenced the dependent variable, which was not evaluated in the study. Further research is suggested in this context and with this methodology, as this research model with mixed methods allowed distinct associations between qualitative and quantitative data, contributing to the production of results that complement each other.

CONCLUSION

The design of mixed methods studies to analyse the breastfeeding phenomenon, which identified self-efficacy, and self-perception of knowledge associated with the experience of early breastfeeding problems, evidenced a theoretical construct encompassing different views of the same phenomenon.

Considering an early identification of mothers with low self-efficacy allows assessment nurses to start preparing the breastfeeding mothers to avoid difficulties related to the breastfeeding technique and give the necessary time to investigate other risk factors for early weaning.

IMPLICATIONS FOR PRACTICE

Applying the Breastfeeding Self Efficacy Scale associated with the breastfeeding mothers' interview from the prenatal period enables the identification of risks for early weaning and helps health providers in planning care for mothers and babies in favour of breastfeeding maintenance.

Declaration of conflicting interests: None.

Acknowledgments: This study is part of an international multicentric project with the University of Kentucky-USA entitled Exclusive Maternal Breastfeeding: Determinants socio and cultural in Latin América. In Brazil, the project was called EBF: Sociocultural Determinants in Brazil, the local coordination is at UFRJ. The manuscript now submitted refers to data from the center in Paraná, specifically at Cascavel city.

REFERENCES

1. Zonga X, Wua H, Zhaoc M, Magnussend CG, XI B. Global prevalence of WHO infant feeding practices in 57 LMICs in 2010-2018 and time trends since 2000 for 44 LMICs. *E Clinical Medicine*. 2021;37:100971.
2. Universidade Federal do Rio de Janeiro. Breastfeeding: prevalence and practices among Brazilian children under 2 years old [Internet]. Rio de Janeiro (RJ): UFRJ; 2021 [cited 2023 Nov 22]. Available from: https://enani.nutricao.ufrj.br/wp-content/uploads/2021/11/Relatorio-4_ENANI-2019_Aleitamento-Materno.pdf.
3. Li F, Huang C, Lin Q, Xi Y, Xiang C, Yong C, Deng J. Maternal characteristics, intention, self-efficacy, perceived social support, and exclusive breastfeeding practice: Structural equation modelling approaches. *Healthcare*. 2022;11(1):87.
4. Bandura A. Social learning theory. USA: Prentice Hall, 1977.
5. Dennis CL. Theoretical underpinnings of breastfeeding confidence: a self-efficacy framework. *J Hum Lact*. 1999;15(3):195–201.
6. Dodt RCM. Application and validation of the Breastfeeding Self-Efficacy Scale – Short Form (BSES-SF) in postpartum women. Universidade Federal do Maranhão; 2008.
7. De Lima CM, De Sousa LB, Costa EC, Santos MP, Cavalcanti MC e. SL, Maciel NDS. Self-efficacy in exclusive breastfeeding: assessment of the technical domains and intrapersonal thoughts in postpartum women. *Enferm em Foco*. 2019;10(3).
8. Campos ROLO, Interaminense INCS, Rodrigues A, Lima APE, Leal LP, da Silva ATSG et al. Factors associated with breastfeeding self-efficacy in primiparous women in the immediate postpartum period. *Int J Dev Res*. 2020;10(09):40503-40508.
9. Creswell JW, Clarck VLP. Designing and conducting mixed methods research. Brazil: Sage Publications, 2021.
10. Minayo MC. The challenge of knowledge: Qualitative research in health. Hucitec; 2004. 406 p.
11. Hitchcock JH, Onwuegbuzie AJ. Developing mixed methods crossover analysis approaches. *J Mix Methods Res*. 2020;14(1):63-83.
12. Minharro MC de O, Carvalhaes MADBL, Parada CMG de L, Ferrari AP. Breastfeeding self-efficacy and the relationship with breastfeeding duration. *Cogitare Enferm*. 2019;24.
13. Souza ML, Santos TP, Alves OM, Leite FMC, Lima LFA, Primo CC. Assessment of breastfeeding self-efficacy in postpartum women. *Enferm Em Foco*. 2020;11(1):153-57.
14. Roza JG, Fong MF, Ang BL, Sadon RB, Koh EYL, Teo SSH. Exclusive breastfeeding, breastfeeding self-efficacy and perception of milk supply among mothers in Singapore: A longitudinal study. *Midwifery*. 2019;79:102532.
15. Babakazo P, Bosonkie M, Mafuta E, Mvuama N, Mapatano MA. Common breastfeeding problems experienced by lactating mothers during the first six months in Kinshasa. *PLoS One*. 2022;17(10):e0275477.
16. Ricci, C., Otterman, V., Bennett, TL. et al. Rates of and factors associated with exclusive and any breastfeeding at six months in Canada: an analysis of population-based cross-sectional data. *BMC Pregnancy Childbirth*. 2023;23(56):1-11.
17. Woldeyohannes D, Tekalegn Y, Sahiledengle B, Ermias D, Ejajo T, Mwanri L. Effect of postpartum depression on exclusive breast-feeding practices in sub-Saharan Africa countries: a systematic review and meta-analysis. *BMC Pregnancy Childbirth*. 2021;21(113):1-10.

18. Li J, Zhao C, Wang Y, Wang YP, Chen CY, Huang Y, et al. Factors associated with exclusive breastfeeding practice among mothers in nine community health centers in Nanning city, China: a cross-sectional study. *Int Breastfeed J*. 2021;16(1):71.
19. Moraes GGW de, Christoffel MM, Toso BRG de O, Viera CS. Association between duration of exclusive breastfeeding and nursing mothers' self-efficacy for breastfeeding. *Rev Esc Enferm USP*. 2021;55:e03702.
20. Wake GE, Mittiku YM. Prevalence of exclusive breastfeeding practice and its association with maternal employment in Ethiopia: a systematic review and meta-analysis. *Int Breastfeed J*. 2021;16(1):86.
21. Impact of maternal self-efficacy and associated factors on maintaining exclusive breastfeeding in the city of Piracicaba-SP: Cohort study. *O Mundo da Saúde*. 2019; 43(2):326-343.
22. Blixt I, Johansson M, Hildingsson I., Papoutsi Z, Rubertsson C. Women's advice to healthcare professionals regarding breastfeeding: "offer sensitive individualized breastfeeding support"- an interview study. *Int Breastfeed J*. 2019;14(51):1-12.
23. Giannì ML, Lanzani M, Consales A, Bestetti G, Colombo L, Bettinelli ME, et al. Exploring the emotional breastfeeding experience of first-time mothers: implications for healthcare support. *Front Pediatr*. 2020;8:199.23.
24. Souza EFDC, Pina-Oliveira AA, Shimo AKK. Effect of a breastfeeding educational intervention: a randomized controlled trial. *Rev Lat Am Enfermagem*. 2020;28:e3335.
25. Corby K, Kane D, Dayus D. Investigating predictors of prenatal breastfeeding self-efficacy. *Can J Nurs Res*. 2021;53(1):56-63.
26. Maleki-Saghooni N, Amel Barez M, Karimi FZ. Investigation of the relationship between social support and breastfeeding self-efficacy in primiparous breastfeeding mothers. *J Matern Fetal Neonatal Med*. 2020;33(18):3097-102.
27. Balaguer-Martíneza JP, García-Pérezb R, Gallego-Iborrac A, Sánchez-Almeidad E, Sánchez-Díaze MD, Ciriza-Bareaf E. Predictive capacity for breastfeeding and determination of the best cut-off point for the breastfeeding self-efficacy scale-short form. *An Pediatr*. 2022;96(1):51-58.
28. Yadollahi P, Padashian F, Doostfatemeh M. Five-factor model personality traits, exclusive breastfeeding, and self-efficacy: a mediational analysis. *BMC Pregnancy Childbirth*. 2024;24:279.