

# ORIGINAL ARTICLE

# MATERNAL SELF-EFFICACY FOR PREMATURE NEWBORN CARE AND BREASTFEEDING MAINTENANCE

#### HIGHLIGHTS

- 1. Assess maternal self-efficacy to promote exclusive breastfeeding.
- 2. Low maternal self-efficacy for care indicates weaknesses in her confidence.
- 3. Assessing maternal self-efficacy makes it possible to promote exclusive breastfeeding.

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## ABSTRACT

**Objective:** to assess maternal self-efficacy for the care of premature newborns in the neonatal intensive care unit and after hospital discharge and relate it to the duration of breastfeeding at home. **Method:** longitudinal study that used self-efficacy assessment scales of 38 mothers of premature newborns in the period from November 2020 to January 2022 in the city of Cascavel - PR - Brazil. Data analyzed by descriptive and inferential statistics. **Results:** Maternal self-efficacy during hospitalization turned out to be high, remaining so in the assessment after discharge. Self-efficacy for breastfeeding had no statistically significant differences during hospitalization (p=0.335) and after discharge (p=0.640). However, mothers with high self-efficacy in hospitalization and at home maintained exclusive breastfeeding longer. **Conclusion:** Identifying maternal self-efficacy should be a routine in nursing clinical practice during hospitalization and after discharge, to enhance the maintenance of exclusive breastfeeding.

**DESCRIPTORS:** Breast Feeding; Infant, Premature; Self Efficacy; Neonatal Nursing; Mothers.

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## INTRODUCTION

Exclusive breastfeeding (EBF) is the act of the child receiving breast milk directly from the breast, milked, or human milk from another source. This act promotes the interaction between mother and child, affecting the child's nutritional status, immunity, physiology, cognitive and emotional development, and long-term health. In addition, it also affects the mother's physical and psychological health<sup>1</sup>.

To promote child health, the maintenance of EBF is recommended by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), together with the Brazilian Ministry of Health (MS- in Portuguese) until six months of age, and continued breastfeeding until two years of age or older <sup>1-2</sup>.

When it comes to the maintenance of EBF, premature newborns (PTNB) are a vulnerable population segment because the main reasons evidenced for total or partial weaning of these babies are cultural and educational for the mothers<sup>3</sup>, as well as psychological related to the hospitalization of the newborn (NB) in the Neonatal Intensive Care Unit (NICU). Now, mothers may show concern, insecurity, fear, sadness, despair, and guilt for the child's hospitalization, making breastfeeding difficult<sup>4</sup>.

Some mothers show greater psychological resources for coping during the hospitalization of the PTNB, while others are more fragile. In these cases, the negative aspects of hospitalization may lead to unhealthy parenting formation and negative beliefs regarding their ability to perform care with the PTNB<sup>4</sup>.

In this context, it is up to the health team to constantly assess the self-efficacy (SE)<sup>5</sup> of mothers of PTNB during hospitalization and after hospital discharge. Since the use of SE scales is the basis for nursing to provide humanized and quality care, contributing to the promotion of EBF and identifying aspects of low SE, allowing early detection of maternal weaknesses in their confidence and ability, both in the care of PTNB and in the act of breastfeeding<sup>6</sup>.

Based on the above, we aimed to assess maternal self-efficacy for the care of premature newborns in the neonatal intensive care unit and after hospital discharge, and to relate it to the duration of breastfeeding at home.

## **METHOD**

A quantitative, longitudinal study developed in a NICU of a teaching hospital in the city of Cascavel-PR and in the outpatient clinic for follow-up of PTNB.

The study sample was composed primarily of mothers of PTNB hospitalized in the NICU under study, in the period from July 2020 to November 2021 and by all those who returned to the follow-up clinic, or answered the survey by Google Forms application, in the period from November 2020 to January 2022. The following criteria for the hospitalization of PTNB in the NICU were listed: PTNB with gestational age (GA) less than 37 weeks; minimum stay at the NICU of seven days; absence of severe congenital malformations. And, as exclusion criteria: adolescent mothers (under 18 years of age), illiterate, who did not speak Portuguese or who presented mental health problems diagnosed and recorded in the PTNB medical records or self-reported, and PTNB who died during the study period. In the follow-up after hospital discharge, the criteria of the hospitalization stage were maintained, adding some more exclusion criteria: mothers who did not attend the consultation scheduled in the outpatient clinic; and mothers who did not return the contact made when sending the scale via quick messaging application after three contact attempts.

Self-efficacy was assessed by scales validated in Brazil: Perception of Maternal Parenting Self-Efficacy – (PAEPM- in Portuguese)<sup>7</sup>, in the NICU and the Preterm parenting & self-efficacy checklist<sup>8</sup>, 30 days after hospital discharge.

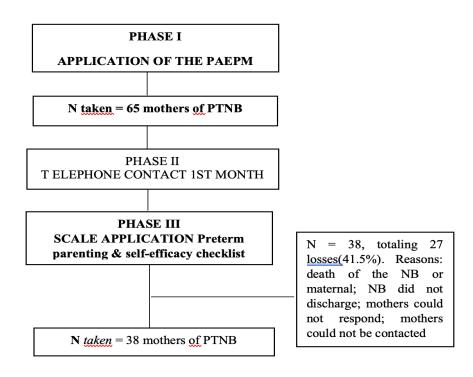
The sociodemographic and clinical profile included age, education, marital status, employment status, family income, number of children and type of delivery; date of birth, gender, gestational age, birth weight, height, head circumference (HC), APGAR, length of hospital stay, feeding, and complications/complaints/evidence of health and baby care at home, to characterize the sample and identify the prevalence of EBF.

The authorization for the use of both scales was given through contact via e-mail. The final score of the 20 questions assessed in the PAEMP varies between 20 and 80 points<sup>7</sup>. LA is classified as: low self-efficacy (20 to 39 points); medium self-efficacy (40 to 59 points); high self-efficacy (60 to 80 points).

The PAEMP scores at the NICU are categorized into four domains: taking care, score of four to eight points (low self-efficacy); nine to 12 points (medium self-efficacy) and 13 to 16 points (high self-efficacy); eliciting care, low self-efficacy refers to scores of seven to 14; medium self-efficacy 15 to 21 points and high self-efficacy 22 to 28 points; reading behavior, scores between six and 12 points refer to low self-efficacy; 13 to 18 points refer to medium self-efficacy and high self-efficacy from 19 to 24 points; situational beliefs, low self-efficacy presents from three to six points; in Medium self-efficacy ranges from seven to nine and high self-efficacy from 10 to 12 points.

The Preterm parenting & self-efficacy checklist has a final score of 36 and 252 points8. The classification of the scale scores at the first month follow-up occurred according to each of the three domains: parental self-efficacy-low self-efficacy (12 to 28 points); medium self-efficacy (29 to 56 points) and High self-efficacy (57 to 84 points); importance of tasks, low self-efficacy (12 to 28 points); medium self-efficacy (29 to 56 points) and High self-efficacy (29 to 56 points) and High self-efficacy (27 to 84 points); and High self-efficacy (57 to 84 points); self-perceived parental competence, low self-efficacy (12 to 28 points); medium self-efficacy (57 to 84 points); the total score is the sum of all domains, classifying the overall AE as low (36 to 84 points); medium (85 to 168 points); high (169 to 252 points).

It should be noted that there was sample loss at follow-up, in which the inclusion and exclusion of participants is noted in the flowchart (Figure 1).



**Figure 1 -** Flowchart describing the inclusion and exclusion of mothers of PTNB. Cascavel, Paraná, 2021.

Source: The authors (2021).

To compare the values at admission of PTNB and those obtained at follow-up during the first month after NICU discharge, the data were transformed into percentiles and compared using the non-parametric Wilcoxon test.

To evaluate the maternal SA scores regarding the practice of breastfeeding in the NICU and follow-up during the first month of life, the data were assessed for normality (Shapiro-Wilk test) and homoscedasticity (Levene's test), and then analyzed by the Single Factor Analysis of Variance (Factor: breastfeeding practice; levels: 1- exclusive breastfeeding; 2breastfeeding plus water, tea, formula or complementary feeding and 3- formula milk), followed by the Tukey-HSD test.

All analyzes obeyed the significance level of 0.05 with all tests performed in the program XIStat Version 2014.

The ethical precepts in research with human beings were respected, and this study was part of the research project "Repercussions of prematurity: maternal stress and metabolic programming after hospital discharge/stress and maternal role after an educational intervention", approved by the Research Ethics Committee by opinion 1.836.186.

#### RESULTS

Table 1 shows the variables related to the sociodemographic and clinical data of mothers of PTNB, such as maternal age, maternal education, employment relationship, number of children and type of delivery.

This same table also presents the variables related to the clinical data of PTNB in the same evaluation period, such as gender, weight, height, head circumference (HC) and gestational age (GA).

**Table 1** - Characterization of the sample of mothers and their PTNB enrolled in the study inthe period of hospitalization and post-discharge follow-up. Cascavel, Paraná, 2021

Characterization of the sample of mothers of PTNB					
Variables	Hospitalization (n = 65) n (%)	Follow-up (n = 38) n (%)	p value		
Mother's Age					
18–29 years old	40 (61.5)	25 (65.7)	0.870		
30–42 years old	25 (38.5)	13 (34.3)			
Mother's Education					
H.S.* complete	29 (44.7)	16 (42.2)			
H.S. incomplete	14 (21.6)	9 (23.7)			

Higher Education complete	12 (18.5)	7 (18.5)	0.998
E.S.* complete	4 (6.1)	2 (5.2)	
E.F. incomplete	4 (6.1)	3 (7.8)	
Absence of data	2 (3.0) 1 (2.6)		
Employment Relationship			
Housewife	27 (41.6) 21 (55.3)		0.133
Works Outside the Home	24 (36.9)	15 (39.5)	
Student	1 (1.5)	0 (0.0)	
No data	13 (20.0)	2 (5.2)	
Number of children			
1	23 (35.3)	15 (39.5)	
2	17 (26.2)	12 (31.5)	0.434
3	12 (18.5)	7 (18.5)	
4 or +	7 (10.7)	4 (10.5)	
No data			
Type of childbirth			
Cesarean section	37 (56.9)	24 (63.2)	
Vaginal	22 (33.8)	14 (36.8)	0.176
No data	6 (9.3)	0 (0.0)	
Characterization of PTNB			
Variables	Hospitalization (n=75)* n (%)	Follow-up (n=46) n (%)	p valor
Gender			
Male	40 (53.4)	24 (52.1)	0.901
Female			
Weight			
500g - 1.500g	40 (53.4)	0 (0.0)	
1.501g - 2.500g	33 (44.0)	20 (43.5)	
2.501g - 3.500g	1 (1.3)	17 (36.9)	< 0.0001
Height	1 (1.3) 7 (15.2)		
30 - 40 cm	0 (0.0) 2 (4.4)		
41 - 50 cm			
51 cm or +	46 (61.3)	0 (0.0)	
Head Circumference	Circumference 29 (38.7) 37 (80.5)		< 0.0001
20 - 30 cm	_ ( ( ) ) )	0 (0.0) 9 (19.5)	
20 30 611		9 (19.5)	
31 - 40 cm		9 (19.5)	
		9 (19.5) 2 (4.4)	
31 - 40 cm	0 (0.0)		< 0.0001
31 - 40 cm No data	0 (0.0) 60 (80.0)	2 (4.4)	< 0.0001
31 - 40 cm No data Gestational Age (GA)	0 (0.0) 60 (80.0) 13 (17.3)	2 (4.4) 42 (91.2)	< 0.0001

34 to 36 weeks	14 (18.7)	6 (13.0)	
Height	53 (70.6)	34 (74.0)	0.7012
30 - 40 cm	8 (10.7)	(13.0)	

Source: The authors(2021)

\*H.S. = High School; E.S. = Elementary School; \* N=75 due to twin childbirths.

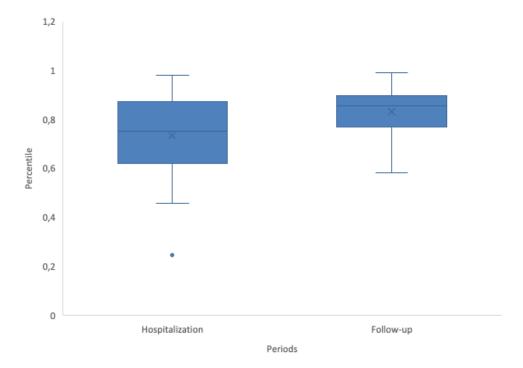
During the PTNB hospitalization, the mean SE values showed a high maternal self-efficacy for the PAEPM scale domains "taking care", "eliciting care" and "situational beliefs", while "reading the behavior" showed a medium maternal self-efficacy rating (Table 2). At post-discharge follow-up of PTNB, we observed mean values calculated for the parental self-efficacy domain of 71  $\pm$  9; 77  $\pm$  6 for the domain Importance of tasks and 69  $\pm$  8 for self-perceived parental competence, indicating high maternal self-efficacy (Table 2).

Table 2 - Scores by domains of the self-efficacy scale during hospitalization of pretermnewborns and during post-discharge follow-up. Cascavel, Paraná, 2021

PAEMP Scale				
Domains	Average	Standard Deviation	Classification	
Taking Care	13	3	High self-efficacy	
Eliciting Caring	23	4	High self-efficacy	
Reading behavior	18	3	Medium self-efficacy	
Situational beliefs	11	1	High self-efficacy	
Preterm parenting & self-efficacy checklist				
Domains	Average	Standard Deviation	Classification	
Parental self-efficacy	71	9	High self-efficacy	
Importance of tasks	77	6	High self-efficacy	
Self-perceived parenting competence	69	8	High self-efficacy	

Source: The authors (2021)

Comparing the total percentiles of the different periods (hospitalization and postdischarge follow-up) there was a significant perception of self-efficacy for mothers during the follow-up when compared to the inpatient period for PTNB (V = 617.00; p = 0.0004) (Figure 2).



Legend: X: mean. Line at the bottom and top of the square: 1st and 3rd guartiles. Line inside the square: median. Line at the bottom and top of the vertical bar: 10th and 90th percentiles.

**Figure 2** - Relationship between the values of the total percentiles of the periods of stay in the neonatal ICU and post-discharge follow-up. Cascavel, Paraná, 2021

Source: The authors (2021).

To correlate the maternal self-efficacy scores for care with the type of breastfeeding (1- exclusive breastfeeding; 2- breastfeeding plus water, tea, formula, or complementary feeding, and 3- formula milk), these scores were assessed according to breastfeeding practices in the NICU hospitalization period and in the post-discharge follow-up of PTNB (Table 1).

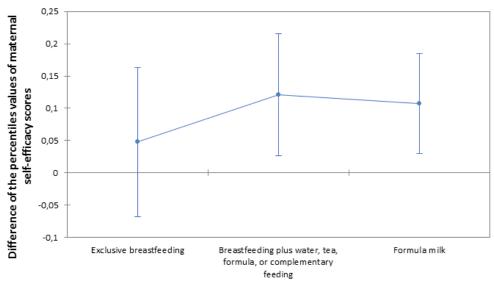
It was found that there were no statistically significant differences in the period of NICU hospitalization (F2, 37 = 1.13; p = 0.335; Chart 1), nor in the post-discharge follow-up (F2, 37 = 0.452; p = 0.640; Chart 1).

	5		
Hospitalization Follow-up		Hospitalization Follow-up	

**Chart 1** - Total scores of the self-efficacy scale according to the classification of breastfeeding

	Hospitalization		Follow-up	
Type of Breastfeeding	Average	Standard Deviation	Average	Standard Deviation
Exclusive breastfeeding	69.8	9.7	223,4	25,1
Breastfeeding plus water, tea, formula, or complementary foods	62.8	9.6	214,7	20,2
Formula milk	64.0	11.5	215,8	20,5
p-value	0.335		0.	640

Although there was no statistically significant difference between the groups (F2, 43 = 0.539; p = 0.588), it is noteworthy that mothers who underwent EBF showed the smallest difference in their scores between the two evaluation periods (Figure 3).



**Breastfeeding Practice Groups** 

**Figure 3** - Percentiles of the SE score in the periods of stay in the neonatal ICU and postdischarge follow-up among mothers, classified according to breastfeeding practice. Cascavel, Paraná, 2021

Source: The authors (2021).

# DISCUSSION

Parental self-efficacy has become of particular interest in studies of the transition to parenthood because it is associated with a variety of parent and child outcomes, including parental competence and affection and child socioemotional and behavioral functioning. In our study, the focus was on maternal SE for caregiving, which contributes to the formation of parental self-efficacy. It was found that during the NICU stay, mothers of PTNB demonstrated high SE. Except in the domain "reading the behavior", which showed a rating of average maternal self-efficacy, which can be explained by the difficulty in recognizing what the child is showing. For this reason, it is important that by the initial assessment of the SE for the care of PTNB, the health professional recognizes high and low scores, paying attention mainly to the negative perceptions of the mother regarding this care. From this assessment, it is necessary to employ strategies to contribute to the increase in the maternal SE for the care of PTNB, and the educational-behavioral intervention is one of these tools, strengthening the mothers' belief in themselves and the knowledge about their newborns and, consequently, increases their ability to care for and interact with their child<sup>9</sup>.

It was observed that, for the three domains analyzed in the SE scale during the post-discharge follow-up of PTNB, mothers showed a situation of high self-efficacy, which refers to high self-confidence in providing care for their children at home. High SE is predictive of positive maternal psychological well-being at three months after discharge, as well as a reduction in the baby's medical complexity was associated with higher

maternal psychological well-being.<sup>10</sup> In this context, the scientific literature<sup>9,11</sup> supports the importance and need to increase parents' self-efficacy, since the degree of self-efficacy is effective in the quality of care provided, as well as their degree of satisfaction with the parental experience<sup>8</sup>. Moreover, the perceived competence in the parental role is directly associated with emotional and parenting behaviors, quality of care for the newborn, and future developmental outcomes of the infant<sup>12</sup>.

When comparing the total scores of SE at hospitalization and post-discharge followup, there was a higher perception of SE for mothers during the follow-up. This can be explained by the fact that mothers feel freer and more comfortable when they are at home, which is a more pleasant phase to be experienced than the hospitalization period, besides feeling more capable of meeting the demands and needs of their children in this environment<sup>13</sup>.

When establishing the relationship between SE and breastfeeding, it was observed that, among all the mothers assessed in the post-discharge follow-up, exclusive breastfeeding was less frequent when compared to complemented and mixed breastfeeding, the latter corresponding to almost 50% of the sample. The findings of this study differ from those found in southeastern Brazil, in which EBF among PTNB was 31.0% and artificial breastfeeding was 11.9%<sup>14</sup>. PTNB are more vulnerable to early weaning, due to difficulties in initiating breastfeeding during hospitalization due to factors such as prolonged hospitalization, prematurity, extreme low weight, twin pregnancy, invasive mechanical ventilation, immature sucking ability, among others<sup>15</sup>.

Considering this vulnerability inherent to prematurity, the NICU team should employ strategies to identify mothers at higher risk of early weaning, such as those with higher levels of anxiety and stress, those with decreased milk production due to lack of stimulation, those who need to return to work<sup>16</sup>, and cultural and educational factors<sup>3</sup>. As well as those mothers with lower SE score for breastfeeding, as well as lower SE score for care, since by identifying the items of low SE it is possible to recognize early the maternal weaknesses in her confidence and ability both in the care and breastfeeding of the PTNB<sup>6</sup>.

When comparing the maternal EBF scores related to the practice of breastfeeding, it was found that there were no statistically significant differences in the period of hospitalization in the NICU or in the post-discharge period during follow-up. However, it is known that PTNB are a vulnerable population group in relation to the maintenance of EBF as mentioned above, reinforcing the need for support and guidance from health professionals to mothers regarding the breastfeeding process and milk production<sup>3</sup>.

However, it is noteworthy that although there was no statistically significant difference between the groups, the mothers who underwent the EBF showed the least difference in their scores between the two assessment periods. Therefore, based on the concept that SE is the belief that an individual has about the ability to perform an activity successfully and, therefore, this perception can directly affect his choices and performance when performing a particular activity<sup>5</sup>, it is up to the health team to constantly assess the SE, enabling nursing to provide quality care, promoting EBF and early detection of possible maternal weaknesses in their confidence and ability to breastfeed<sup>6</sup>.

Furthermore, through observations of successful situations (vicarious experiences) like their own, mothers can increase their belief that they have the capacity and skills to successfully perform the same activity as others.<sup>5</sup> Therefore, health care professionals should play a vital role in increasing parental self-efficacy in mothers during pregnancy, <sup>17</sup> as well as after birth. In cases of NICU hospitalizations, they should stimulate the SE in groups of parents of PTNB and in post-discharge consultations, as this can be a strategy for mothers to exchange experiences on breastfeeding and be stimulated by the vicarious experience in maintaining EBF after hospital discharge. New technologies, such as smartphone applications, may be promising to support parents in difficult and stressful situations, such as in parents of PTNB, in which a study indicated that the use of the app called NICU2HOME<sup>18</sup> identified that the use of the app contributed to greater parental

self-efficacy in the NICU, and this continued after discharge home.

Social persuasion is a source of contribution to self-efficacy because when there is verbal reinforcement that the individual can perform a certain activity, he feels more motivated and empowered, concentrating efforts for a successful activity. Moreover, the emotional and somatic state can also intensify the performance in an activity, providing or not providing, strengthening the individual's belief in his own capabilities<sup>5</sup>. Thus, the community, as well as the family and everyone around the breastfeeding mother, should provide positive verbal reinforcement to empower her in her abilities and capabilities to maintain EBF.

The clinical applicability of the scales used to evaluate the maternal SE for care, both during hospitalization and after discharge, both validated for Brazilian Portuguese, stand out as potentialities of this study. The use of validated tools can help nurses in their clinical diagnosis in care practice, providing scientifically anchored evidence to plan care. Likewise, recognizing the positive SE as a protective factor for adequate care of PTNB can improve maternal confidence in their ability to breastfeed, constituting relevant knowledge for neonatal nursing to assist the mother in maintaining EBF after discharge from the NICU.

Clinical implications include targeting self-efficacy in perinatal support programs and interventions to mitigate mental health symptoms during the transition to parenthood, particularly among mothers and fathers of PTNB.

The study, however, has limitations regarding the number of participants in the sample, since it is a longitudinal study, which has as one of its disadvantages the loss of the sample over the follow-up. Thus, it was not possible to maintain, at the follow-up after NICU discharge, the total number of mothers and PTNB enrolled in the first assessment during hospitalization. This fact may be due to the pandemic moment experienced at the time of the study, which prevented mothers from attending follow-up consultations. Therefore, it is suggested the development of a study with the same population, but with an extension of time to obtain a larger sample and re-evaluate the results because the non-statistical significance observed in the relationship between EBF, and the SE scores may be due to the sample size.

# CONCLUSION

When comparing the maternal self-efficacy scores regarding breastfeeding practice, there were no statistically significant differences during hospitalization at the NICU and post-discharge at follow-up, which may be related to the high scores in most domains of the two scales at both moments. This study contributed to the field of nursing in neonatology with relevant results that correlated the maternal SE with the breastfeeding practices of PTNB during hospitalization and after discharge, providing subsidies to assist nursing professionals in building strategies in hospital and primary care for the empowerment of mothers of PTNB, enabling resilience, overcoming obstacles and difficulties encountered in the process of caring for the PTNB and breastfeeding. In addition to providing guidance and confidence to the mother, to facilitate the continuity of EBF until the child's sixth month of life, as well as continued breastfeeding, reducing maternal and child morbidity and mortality.

Studies related to maternal self-efficacy are recent in Brazil, making it difficult to compare them with individualized studies that describe maternal self-efficacy according to the scales applied in this study. Therefore, more specific studies on the subject are indispensable.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - Squizato L, Silva AD da, Martinelle E, Viera SC; Drafting the work or revising it critically for important intellectual content - Machineski GG, Toso BRG de O, Viera SC; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - Squizato L, Viera SC. All authors approved the final version of the text.

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