DOI: 10.15253/2175-6783.20192041351
www.periodicos.ufc.br/rene

Original Article

Factors associated with breastfeeding self-efficacy according to nipple types

Fatores associados à autoeficáica da amamentação segundo os tipos de mamilos

Érica de Brito Pitilin[1], Manuela Polleto[1], Vanessa Aparecida Gasparin[2], Patrícia Pereira de Oliveira[3], Taize Sbardelotto[1], Janine Schirmer[4]

Objective: to analyze factors associated with breastfeeding self-efficacy according to nipple types. **Methods:** cross-sectional study conducted with 60 mothers admitted to rooming-in. A questionnaire was used in addition to the application of the State-Trait Anxiety Scale and the Breastfeeding Self-Efficacy Scale. **Results:** the proportion of protruding and non-protruding nipples was 31 (51.6%) and 29 (48.3%), consecutively. The anxiety evaluated was higher in women with non-protruding nipples. While breastfeeding self-efficacy was higher in women with protruding nipples (p=0.027). Factors associated with breastfeeding according to nipple types were: difficulty in gripping (p=0.019), breastfeeding aid (p=0.003) and breastfeeding satisfaction (p=0.043). **Conclusion:** the Breastfeeding Self-Efficacy Scale score was higher in the group of women with protruding nipple promoting greater satisfaction during practice, while non-protruding women are related to difficulty in gripping, as well as the need for assistance during breastfeeding.
Descriptors: Breast Feeding; Maternal-Child Nursing; Postpartum Period; Nipples; Rooming-in Care.

Objetivo: analisar os fatores associados à autoeficáica da amamentação segundo os tipos de mamilo. **Método:** estudo transversal realizado com 60 puérperas internadas em alojamento conjunto. Foi utilizado um questionário, além da aplicação da Escala de Ansiedade Traço-Estado e da Escala de Autoeficácia na Amamentação. **Resultados:** a proporção de mamilos protusos e não protusos foi de 31(51,6%) e 29(48,3%), consecutivamente. A ansiedade avaliada foi maior nas mulheres com mamilos não protusos. Enquanto a autoeficácia na amamentação foi maior nas mulheres com mamilos protusos (p=0,027). Os fatores que se associaram a amamentação segundo os tipos de mamilos foram: dificuldade na pega (p=0,019), auxílio durante a amamentação (p=0,003) e satisfação ao amamentar (p=0,043). **Conclusão:** o escore da Escala de Autoeficácia na Amamentação foi maior no grupo de mulheres com mamilo protuso promovendo maior satisfação durante a prática, enquanto os não protusos relacionam-se a dificuldade na pega, bem como a necessidade de auxílio durante a amamentação.
Descritores: Aleitamento Materno; Enfermagem Materno-Infantil; Período Pós-parto; Mamilos; Alojamento Conjunto.

[1]Universidade Federal da Fronteira Sul. Chapecó, SC, Brazil.
[2]Universidade do Estado de Santa Catarina. Chapecó, SC, Brazil.
[3]Universidade Comunitária da Região de Chapecó. Chapecó, SC, Brazil.
[4]Universidade Federal de São Paulo, Escola Paulista de Enfermagem. São Paulo, SP, Brazil.

Corresponding author: Érica de Brito Pitilin
Rodovia SC 484 Km 02, Fronteira Sul, CEP: 89815-899. Chapecó, SC, Brazil. E-mail: erica.pitilin@gmail.com

Received: June 8th 2019; Accepted: Aug. 29th 2019.

Introduction

Despite the widely recognized benefits of breastfeeding, the worldwide rate of exclusive breastfeeding up to six months of age does not correspond to international recommendations and guidelines. For the World Health Organization the goal is to achieve exclusive breastfeeding by 50.0% for all infants from 0 to 06 months of life by 2025, as currently only about 40.0% of babies worldwide are breastfed during this period[1]. In Brazil, the behavior of this indicator is quite heterogeneous in the capitals and regions of the country, and the prevalence of exclusive breastfeeding in children under six months is 36.6%[2].

Research has been guided by the theory of planned behavior, that is, cognitive behavioral theories postulating that behavior and the intention to breastfeed are motivated results influenced by attitudes, beliefs, subjective norms and perceptions[3-4]. This disconnect between intention and behavior in the practice of breastfeeding can be observed due to some difficulty related to the correct handling of the baby, painful nipples, absence of suction, unmet expectations, among others[5].

About 24.5% of the mothers report or have a problem during breastfeeding and of these 7.7% of the complaints are related to the type of nipple[6]. Nipple anatomy has been seen as a determinant of early weaning, especially in the case of flat and/or inverted nipples[7].

In this context, breastfeeding can still be influenced by behavioral factors, including anxiety and confidence, and the adoption of instruments that enable the measurement of these factors can help in its fight, such as the State-Trait Anxiety Inventory (STAI), considered one of the most used instruments to quantify subjective components related to anxiety[8].

Regarding confidence, the self-efficacy nomenclature has been well accepted when it relates to health behaviors, being defined as an individual's confidence in his or her ability to perform a specific task or behavior. When pertinent to the breastfeeding scenario, breastfeeding self-efficacy is an important variable in breastfeeding duration, and can be measured by Breastfeeding Self-Efficacy Scale (Short Form--BSES-SF)[9].

Taking into account the approach of these two elements in the context of breastfeeding, it was observed the small number of studies published on the subject in the national and international scientific production so far, which takes into consideration the nipple anatomy. Thus, this study aimed to analyze the factors associated with breastfeeding self-efficacy according to nipple types.

Methods

This is a cross-sectional study conducted with mothers admitted to the rooming-in at the only regional hospital accredited by the Unified Health System and a reference for low risk births in the western state of Santa Catarina, Brazil.

Data collection took place from May to July 2018. The mothers were invited to participate in the research during the period of hospitalization, about 24 hours after delivery.

The selection of participants was by convenience according to the following inclusion criteria: being in rooming-in and exclusively breastfeeding, who had their children with gestational age at term (between 37 and 42 full weeks, calculated by the date of last menstrual period and/or by the result of early ultrasound performed until the 13th gestational week), minimum age of 18 years and newborn weight greater than 2,500kg.

Postpartum women with any condition that prohibited breastfeeding (positive Human Immunodeficiency Virus, galactosemia, herpes simplex), carriers of mental disorders documented in the medical records, users of psychoactive drugs, and those who were embarrassed to breastfeed with the presence of a professional watching, were excluded. There was no refusal of the subjects to participate in the study.

In order to analyze the factors associated with

breastfeeding self-efficacy according to nipple types, the sample size was calculated from the test of the difference between the non-protruding and protruding nipples groups. Thus, the two-mean difference test was used at a significance level of 5% and a test power of 80%. To detect a difference of at least 1.6% in nipple ratio, 48 patients would be required (standard deviation 2.0 - two-tailed hypothesis test). It was added 20% for possible losses which resulted in 60 postpartum women.

As a tool for the collection, a semi-structured questionnaire prepared by the researchers themselves with questions that addressed sociodemographic and economic, obstetric information, observation of breastfeeding, as well as the application of the State-Trait Anxiety Inventory (STAI)[8] and the Breastfeeding Self-Efficacy Scale - Short Form-BSES-SF[9], was used.

This last validated instrument consists of 14 items designed to assess mothers' confidence in breastfeeding in the immediate postpartum period (first 24 hours) and which require additional support. Each question is answered on a *Likert* scale and can range from 14 to 70 points[9].

Anxiety intensity was assessed using the STAI Trait and Status validated scales, which comprise two instruments composed of 20 items that describe how the subject feels "now, at this moment" in relation to the presented items. Each question is assigned a score corresponding to the answer, and the total score may vary from 20 to 80 points for each scale. These scales do not have defined cutoff points, as responses vary according to individual characteristics[8].

The practice of breastfeeding was considered when breastfeeding occurred on free demand exclusively during the immediate postpartum period in the hospital environment. The observation of breastfeeding was performed by the research team over a period of 15 minutes, observing the general aspect of mother, baby, breasts, nipples, position, grip and suction, as proposed by the guidelines[10] of the Health Department.

Nipple classification was performed by observing the protruding nipple as a reference and defined as a nipple located in a plane superior to the areola, with a raised plateau without constriction, usually located just below the center of the breast[11].

All aspects were defined as independent variables and classified dichotomously. The parameters analyzed were only those verified from the breastfeeding self-efficacy scale such as grip, aid, nipple, satisfaction, stimulus and sensitivity.

The collected data were tabulated and evaluated by pairs to correct any typing errors and then analyzed using the Statistical Package for the Social Sciences version 20.0. First, descriptive statistics were performed for numerical variables through measures of central tendency (mean, median, quartiles, minimum and maximum) and for those of categorical nature proportions.

The statistical calculation performed to test the differences between the means in the groups was the Mann-Whitney test (non-parametric) and t-test when the data presented normal distribution. To study the association between independent variables and nipple type, univariate analysis of variables at each level of determination was performed using Pearson's chi-square test. For the association between the variables, Odds Ratio (OD) was used. Outliers were excluded and the multicollinearity test was evaluated according to the Tolerance and Variance Inflation Factors (VIF) parameters.

Variables that were statistically significant in this first analysis ($p<0.20$) were selected for multivariate analysis using the unconditional forwardstepwise (likelihood ratio) method. For all inferential statistical tests, significance level $p<0.05$ and Nagelkerke R2 values were used. The quality of fit was assessed by the Hosmer-Lemeshow test. To verify the normality of the data, the Kolmogorov-Smirnov test was used, which is better used for samples smaller than 100.

The study was approved by the Ethics Committee on Research with Human Beings of the Universidade Federal da Fronteira Sul, Presentation Certificate

for Ethical Appraisal nº 82382618,30000,5564 and approved Opinion nº 2,548,970/2018.

Results

Sixty pairs (mother-newborn binomials) were evaluated. The average age among women was 26.5 years (SD +/- 5.7 years). Regarding the type of delivery, 30 (50.0%) had vaginal delivery and 30 (50.0%) cesarean section. They had immediate skin-to-skin contact at birth 28 (46.7%) of the women and 35 (58.3%) breastfeeding in the first hour of life. Regarding the position during breastfeeding 41 (68.3%) breastfed sitting and 19 (31.7%) lying down.

Regarding the type of nipple 31 (51.6%) of the women presented protruding nipple and 29 (48.3%) non-protruding. In the intensity of anxiety, assessed by the STAI trait and state scale in puerperal women according to nipple type, the mean score was 53.45 (standard error 2.74) for women with non-protruding nipples and 33.55 (standard error 1.11) for those with protruding nipple, with statistically significant difference between groups (p<0.000).

By comparing the differences between BSES--SF breastfeeding self-efficacy scale scores and nipple types, it was possible to observe that the rates were higher in women with protruding nipple when compared to those with non-protruding nipple, and this difference was significant. Sums of the highest items indicate high levels of self-efficacy in breastfeeding and greater confidence of women in their potential to breastfeed. It is noteworthy that in this scale there are no defined cutoff points after the answers vary according to the individual characteristics of each woman.

Table 1 – Differences between BSES-SF breastfeeding self-efficacy scale scores according to nipple types

Nipple	N	Minimum	25%	Median	75%	Maximum	Z*	p†
Protruding	31	47	56	61	68	70	-2.210	0.027
Not protruding	29	16	45	56	64	70		

*Test value; †Mann-Whitney test

Table 2 shows the results of the bivariate analysis according to some individual aspects related to the BSES-SF scale used in its construction and the nipple types. In this first analysis, all variables were associated. Difficulty in gripping, need for stimulation in the newborn, and need for assistance were associated with the non-protruding nipple, while the presence of nipple sensitivity was associated with the protruding nipple. Still, the women who had the highest breastfeeding satisfaction were those who had this type of nipple.

Table 2 – Univariate analysis of BSES-SF scale-related aspects used in its construction according to nipple types

Variables	Protruding n=31	Not protruding n=29	Total	OR* gross	CI† 95%	p
	n (%)	n (%)	n (%)			
Grip difficulty						<0.000
No	27 (45.0)	11 (18.3)	38 (63.3)	1		
Yes	4 (6.7)	18 (30.0)	22 (36.7)	11.04	3.03- 40.14	
Nipple Injury						0.022
No	14 (23.3)	21 (35.0)	35 (58.3)	0.31	0.10- 0.92	
Yes	17 (28.3)	8 (13.3)	25 (41.7)	1		
Newborn stimulus						0.006
No	18 (30.0)	7 (11.7)	25 (41.7)	1		
Yes	13 (21.7)	22 (36.7)	35 (58.3)	4.35	1.43- 13.20	
Aid						<0.000
No	25 (41.7)	7 (11.7)	32 (53.3)	1		
Yes	6 (10.0)	22 (36.7)	28 (46.7)	13.09	3.82-44.88	
Satisfaction in breastfeeding						0.001
No	5 (8.3)	16 (26.7)	21 (35.0)	0.15	0.04-0.52	
Yes	26 (43.3)	13 (21.7)	39 (65.0)	1		

*Odds Ratio; †Confidence Interval

In the final analysis of multiple logistic regressions, the variables that were statistically associated with the model adjusted according to the nipple types were: difficulty in gripping, breastfeeding aid and breastfeeding satisfaction (Table 3).

Table 3 – Multivariate logistic regression factors associated with nipple types

Variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
	$OR_{adjusted}$	$OR_{adjusted}$	$OR_{adjusted}$	$OR_{adjusted}$	$OR_{adjusted}$	$OR_{adjusted}$
	0.935					
	<0.000					
Grip difficulty		11.04	19.69	22.11	8.13	24.72
		<0.000	0.001	0.001	0.048	0.019
Aid			22.10	17.39	34.64	39.47
			<0.000	0.001	0.002	0.003
Satisfaction				4.81	6.32	8.30
				0.066	0.049	0.043
Newborn stimulus					8.96	2.45
					0.084	0.518
Nipple Sensitivity						1.07
						0.240
Deviance		66.59	47.12	43.46	39.71	32.96
R^2		0.321	0.602	0.645	0.687	0.756

Model 0: considering no variables. Model 1: Adjusted for difficulty in grip. Model 2: Adjusted by aid, difficulty in gripping. Model 3: Adjusted for breastfeeding satisfaction, aid and difficulty in catching. Model 4: Adjusted by stimulus to the newborn, breastfeeding satisfaction, aid and difficulty in gripping. Final model: adjusted by all previous variables.

Discussion

It is highlighted as a limitation of the study the form of sampling of the participants, given the possibility that the sample is not representative of the population. However, further studies are suggested that include probabilistic selection for possible comparison of findings. The results brought by this study may provide subsidies for professionals to be able to direct their practices meeting the real needs of breastfeeding women, not forgetting the various aspects that may be related to the success of breastfeeding, in addition to the nipple anatomy.

Breastfeeding nipple type seemed to hinder or facilitate breastfeeding practice, reinforcing the initial hypothesis of the study. The BSES-SF breastfeeding self-efficacy scale score was higher in the group of women with protruding nipple, showing greater confidence in their potential for breastfeeding and more practicality when compared to the other group.

Although the success of breastfeeding is not limited to the type of nipple, the anatomical prevalence of mammary protrusion proved to be a facilitating factor during this process. A positive practice actively influences breastfeeding, increasing confidence, motivation, self-efficacy and the intention to breastfeed[12].

Self-efficacy is a component of motivation, built on practice and persistence, and that plays an important role in changing behavior[13]. Thus, when breastfeeding self-efficacy is low, women are more likely to be influenced by factors that may lead to breastfeeding cessation.

In addition to nipple protrusion, other factors such as intention to breastfeed, time elapsed after delivery until the start of practice; previous experience with breastfeeding and the professional and partner support network were related to breastfeeding self-efficacy in research conducted in China[14], which used the same scale proposed by this study.

Although the nipple protrusion favors the satisfaction, grip and self-efficacy of breastfeeding, it is worth stressing that different anatomies do not

prevent the practice, only require the use of different strategies and the possibility of using devices that help, providing the child the benefits granted by breast milk. In addition, educational actions, qualified listening, and technical and emotional support may favor the achievement of breastfeeding self-efficacy, which should be initiated during prenatal care.

Another factor that may have contributed to the dynamics of breastfeeding in the study women was the intensity of anxiety. By comparing the means of the STAI trait and state anxiety scales between the groups, it was observed that women with non-protruding nipples had higher anxiety during breastfeeding. A study conducted in Rio Grande do Sul, Brazil, presented the nipple anatomy as a difficult point of practice, providing higher anxiety level in women with flat nipples[15].

The level of maternal anxiety has already been shown to be a detrimental factor for breastfeeding, since infants with such symptoms are less likely to start and maintain breastfeeding, increasing the chances of early weaning and supplementation through industrialized formulas[16].

In this study, the difficulty in correct grip presented almost 25 times the chance of occurring in women with non-protruding nipples, as well as about 40 times the chance of needing breastfeeding aids. Aid in this study is understood to be the use of the auxiliary silicone nipple or also called the intermediate.

The use of this tool allows a mold that facilitates breastfeeding by preventing slipping through the nipple and stimulating the onset of the sucking reflex, benefiting and assisting breastfeeding infants who have flat or inverted nipples[17]. The level of satisfaction and comfort when using this breastfeeding intervention was high in a survey conducted in the northern United States, in light of the results of this study[18]. On the other hand, its use interferes with the exclusive nature of breastfeeding, suggesting the need to individually evaluate the benefits and harms, as well as the duration of its use.

Another important point that may impact on the success of breastfeeding was the satisfaction with breastfeeding. Being satisfied was about eight times as likely to occur in women with a protruding nipple as compared to women with a non-protruding nipple. Satisfaction with practice is related to success and success in the full realization of nurturing offspring without difficulty and/or frustration.

An unsatisfactory and short-lived experience may negatively affect subsequent breastfeeding. A multicenter study has stated that the chances of initiating subsequent breastfeeding increase 11.0% each additional week of pleasurable breastfeeding of the first child, as well as reducing the chances when this process is permeated by problems[19].

Finally, the application of scales has become a predictor tool for professionals who provide assistance to this population, since it shows a vulnerable public regarding breastfeeding. The measurement of these findings supports strategies to maintain breastfeeding during the period established by current organs.

Conclusion

The nipple protrusion seems to favor the practice of breastfeeding from the reduction of anxiety and increased maternal self-efficacy. Among the factors that were associated with breastfeeding according to nipple types, it was observed that the non-protruding ones are related to the difficulty in gripping as well as the need for help during breastfeeding, while the protruding ones promote satisfaction during the practice.

Collaborations

Pitilin EB, Polleto M and Schirmer J contributed to the conception and design, analysis and interpretation of data, and approval of the final version to be published. Gasparin VA, Oliveira PP and Sbardelotto T collaborated with the rewriting of the article, relevant critical review of the intellectual content and approval of the final version to be published.

References

1. World Health Organization. Maternal, infant and young child nutrition. Comprehensive implementation plan on maternal, infant and young child nutrition: biennal report [Internet]. 2018 [cited Jun 10, 2019]. Available from: http://apps.who.int/gb/ebwha/pdf_files/EB142/B142_22-en.pdf
2. Boccolini CS, Boccolini PMM, Monteiro FR, Venâncio SI, Giugliani ERJ. Tendência de indicadores do aleitamento materno no Brasil em três décadas. Rev Saúde Pública. 2017; 51:108. doi: https://doi.org/10.11606/S1518-8787.2017051000029
3. Arshad SM, Khani-Jeihooni A, Moradi Z, Kouhpayeh SA, Kashfi SM, Dehghan A. Effect of theory of planned behavior-based educational intervention on breastfeeding behavior in pregnant women in Fasa City, Iran. J Educ Community Health. 2017; 4(2):55-63.doi: https://doi.org/10.21859/jech.4.2.55
4. Duckett LJ. Commentary: "Validation of a theory of planned behavior-based questionnaire to examine factors associated with milk expression" by Y. K. Bai& L. M. Dinour. J Hum Lact. 2017; 33(4):666-9. doi: doi.org/10.1177/0890334417726306
5. Sipsma HL, Jones KL, Cole-Lewis H. Breastfeeding among adolescent mothers: a systematic review of interventions from high-income countries. J Hum Lact. 2015; 31(2):221-9. doi: https://doi.org/10.1177/0890334414561264
6. Karaçam Z, Sağlık M. Breastfeeding problems and interventions performed on problems: systematic review based on studies made in Turkey. Turk Pediatr Ars. 2018; 53(3):134-48. doi: https://doi.org/10.5152/TurkPediatriArs.2018.6350
7. Urbanetto PDG, Gomes GC, Costa AR, Nobre CMG, Xavier DM, Jung BC. Facilities and difficulties found by mothers to breastfeed. J Res Fundam Care Online. 2018; 10(2):399-405. doi: doi.org/10.9789/2175-5361.2018.v10i2.399-405
8. Biaggio AMB, Natalcio L, Spielberger CD. Desenvolvimento da forma experimental em português do IDATE. Arq Bras Psicol [Internet]. 1977 [citado 2019 jun. 18]; 29(3):31-44. Disponível em: http://bibliotecadigital.fgv.br/ojs/index.php/abpa/article/view/17827/16571
9. Dennis CL, Brennenstuhl S, Abbass-Dick J. Measuring Paternal Breastfeeding Self-Efficacy: A Psychometric Evaluation of the Breastfeeding Self-Efficacy Scale – Short Form among Fathers. Midwifery. 2018; 64:17-22. doi: https://doi.org/10.1016/j.midw.2018.05.005
10. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Saúde da criança: aleitamento materno e alimentação complementar. Brasília: Ministério da Saúde; 2015.
11. Shiffman MA. Nipple-areolar complex reconstruction: principles and clinical techniques. Tustin Springer. 2018. doi: https://doi.org/10.1007/978-3-319-60925-6
12. Huang Y, Ouyang YQ, Redding SR. Previous breastfeeding experience and its influence on breastfeeding outcomes in subsequent births: a systematic review. Women Birth. 2019; 32(4):303-9. doi: https://doi.org/10.1016/j.wombi.2018.09.003
13. Margotti E, Epifanio M. Exclusive maternal breastfeeding and the Breastfeeding Self-efficacy Scale. Rev Rene. 2014; 15(5):771-9. doi: https://doi.org/10.15253/2175-6783.2014000500006
14. Yang X, Gao LL, Ip WY, Chan WCS. Predictors of breast feeding self-efficacy in the immediate postpartum period: a cross-sectional study. Midwifery. 2016; 41:1-8. doi: https://doi.org/10.1016/j.midw.2016.07.011
15. Castro e Carneiro LMM, Barbieri F, Moro ASS, Freitas HMB, Colomé JS, Backes DS. Breastfeeding women: risk factors for early weaning. Disciplinarum Scientia [Internet]. 2014 [citado 2019 ago. 28]; 15(2):239-48. Disponível em: https://periodicos.ufn.edu.br/index.php/disciplinarumS/article/view/1085/1028
16. Tan DJA, Lew JP, Jumhasan MB, Pang C, Sultana R, Sng BL. Investigating factors associated with success of breastfeeding in first-time mothers undergoing epidural analgesia: a prospective cohort study. Int Breastfeed J. 2018; 13(42):1-9. doi: https://doi.org/10.1186/s13006-018-0184-7
17. Froh EB, Hallowell S, Spatz DL. The use of technologies to support human milk & breastfeeding. J Pediatr Nur. 2015; 30(3):521-3.doi:https://doi.org/10.1016/j.pedn.2015.01.023
18. Hanna S, Wilson M, Norwood S. A description of breast-feeding outcomes among U.S. mothers using nipple shields. Midwifery. 2013; 29(6):616-21. doi: https://doi.org/10.1016/j.midw.2012.05.005
19. Schafer EJ, Campo S, Colaizy TT, Mulder PJ, Ashida S. Influence of experiences and perceptions related to breastfeeding one's first child on breastfeeding initiation of second child. Matern Child Health J. 2017; 21(6):1288-96. doi: https://doi.org/10.1007/s10995-016-2228-1