

USE OF PACIFIERS, BABY BOTTLES, AND ACCESSORIES AS POSSIBLE DETERMINANTS OF THE TYPE OF FOOD RECEIVED BY THE BABY¹

USO DE CHUPETAS, MAMADEIRAS E ACESSÓRIOS COMO POSSÍVEIS DETERMINANTES DO TIPO DE ALIMENTAÇÃO RECEBIDA PELO BEBÊ

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ABSTRACT

Objective: To analyze the association between the use of pacifiers, bottles, and accessories for breastfeeding with the type of food received by the infant at three months of life. **Methodology:** Prospective cohort study with two components: perinatal and follow-up. The sample consisted of mothers and babies born in a public hospital with usual risk in a city in Rio Grande do Sul. The medical records, the pregnant woman's and baby's handbooks were analyzed and a questionnaire was applied to the puerperal women. **Results:** 53 postpartum women and their babies participated in the study. At the maternity ward, 33.3% were already using a pacifier, 2.1% a bottle and 9.6% used breastfeeding accessories. There was a statistically significant difference between the type of feeding and the use of a bottle and pacifier at three months of life of the baby since 92.9% of the babies who were using bottle and pacifier were weaned, as well as 81.3% and 87.5% of the babies who were using pacifier and bottle, respectively, were in predominant or mixed breastfeeding. **Conclusions:** it was found that there was a statistically significant difference between the type of feeding and the use of a bottle and pacifier at three months, with a higher prevalence of children discontinuing breastfeeding when they used these artifacts. It is suggested a greater multidisciplinary action in the follow-up and guidance to puerperal women to have good results in breastfeeding and the use of artifacts should be discouraged in public policies on nutrition and health.

Keywords: Breastfeeding, Weaning, Infant Nutrition, Children's health

RESUMO

Objetivo: analisar a associação entre o uso de chupetas, mamadeiras e acessórios para amamentação com o tipo de alimentação recebida pelo lactente aos três meses de vida. *Metodologia:* estudo longitudinal prospectivo com dois componentes: perinatal e acompanhamento. A amostra foi constituída por mães e bebês nascidos em hospital público de risco habitual em uma cidade do Rio Grande do Sul. *Analisou-se* prontuário, caderneta da gestante e do bebê e aplicação de questionário para as puérperas. *Resultados:* participaram do estudo 53 puérperas e seus bebês. Na maternidade, já estavam em uso de chupeta 33,3%, mamadeira

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2,1% e 9,6% usavam acessórios para amamentação. Houve diferença estatisticamente significativa entre o tipo de alimentação e o uso de mamadeira e chupeta aos três meses de vida do bebê, haja visto que 92,9% dos bebês que estavam em uso de mamadeira e chupeta desmamaram, bem como, 81,3% e 87,5% dos bebês que estavam usando chupeta e mamadeira, respectivamente, estavam em aleitamento predominante ou misto. Conclusões: constatou-se que houve diferença estatisticamente significativa entre o tipo de alimentação e o uso de mamadeira e chupeta aos três meses, sendo que houve uma maior prevalência de crianças em descontinuidade do aleitamento materno quando elas usavam estes artefatos. Sugere-se uma maior atuação interprofissional no acompanhamento e orientações às puérperas para se ter bons resultados na amamentação e o uso a artefatos deve ser desestimulado nas políticas públicas de nutrição e saúde.

Palavras-chave: Aleitamento materno, Desmame, Nutrição do Lactente, Saúde Infantil.

INTRODUCTION

The World Health Organization (WHO) recommends exclusive breastfeeding until 6 months old and complementary breastfeeding until 2 or more years old. The Food Guide for Brazilian children under 2 years old reinforces WHO recommendations that children be breastfed as early as the first hour of life until 2 or more years old. It also recommends that they be exclusively breastfed in the first 6 months and that they need no other food while exclusively breastfeeding (BRASIL, 2019).

Given the slow progress in the country's breastfeeding indicators, simple and effective interventions addressing modifiable risk factors (e.g., less pacifier use) can be key to promoting breastfeeding (BUCCINI; PÉREZ-ESCAMILLA; VENANCIO, 2019). Currently, breastfeeding prevalence in Brazil is far from meeting the recommendations of WHO and the Ministry of Health (MOIMAZ *et al.*, 2011).

Health professionals diverge on the association between pacifier habitual use, breastfeeding, and early weaning. There is a lack of international consensus on whether pacifier use is a cause or consequence of early weaning (SAMPAIO *et al.*, 2020).

Babies who use pacifiers are breastfed less often, which may compromise milk production. Hence, early weaning can be more recurrent among babies who use pacifiers, although the mechanisms involved in this association have not been fully clarified yet (BRASIL, 2015).

Breastfeeding supplies other than pacifiers and baby bottles are available in the market, including breast milk collection shells and nipple shields. Despite the few studies on the association between them and successful breastfeeding, their use is controversial in the literature, as some older articles report reduced breast milk transfer, while other more recent ones describe positive results when professionals instruct mothers well (CHOW *et al.*, 2015).

Few longitudinal studies currently approach the use of breastfeeding supplies and pacifiers. However, studies with other designs indicate that using pacifiers, baby bottles, and other supplies can interfere with breastfeeding. Hence, this study aimed to analyze the association between the use of pacifiers, baby bottles, and breastfeeding supplies and the type of food babies receive at 3 months old.

METHODOLOGY

This research is part of a project named “Infant Development and Growth: A birth cohort”, approved in the First Projects Program announcement - ARD/PPP 2014, valid through October 2019, and by the Ethics Committee under evaluation report no. 2.091.197.

This longitudinal prospective study has two components: perinatal (hospital screening) and follow-up (home visits). Data were collected between 2017 and 2019. The sample was probabilistic and systematic, comprising mothers and babies born in a low-risk public hospital in a city in inland Rio Grande do Sul, Brazil.

The inclusion and exclusion criteria referred to both mothers and newborns. Mothers who had delivered their babies at the hospital in the preceding 48 hours and lived in the urban area of the municipality in question and the newborns who were able to feed were included in the study. On the other hand, mothers with a gestational age under 37 weeks or undergoing psychiatric treatment and newborns with malformations in general and/or genetic problems, who needed to stay in the neonatal intensive care unit, or who were referred for adoption were excluded from the research.

The first component (perinatal) included hospital screening with the mothers of the newborns at the maternity ward of a low-risk public hospital in inland Rio Grande do Sul. Data were collected in the first 48 hours after birth (first component) and in the follow-up - i.e., in-home visits when babies were 3 months old (second component) - gathering information from the medical records, pregnant woman’s health records, and interviews with the mothers. The questionnaire was standardized, pre-coded, and formulated according to the method by Barros *et al.* (2004).

The questionnaire was divided into sections with the following variables:

Mother/family section: marital status, educational attainment, socioeconomic class, age, reproductive history, and puerperium.

Child section: sex, gestational age, Apgar scores, breastfeeding/feeding.

The gestational age of those born alive was collected from their medical records, based on ultrasound or the last menstruation date. Apgar scores were described according to the American Academy of Pediatrics.

Mothers were asked in the hospital interview about their willingness to breastfeed and their breastfeeding difficulties. Breastfeeding was also categorized according to WHO/Pan American Health Organization criteria (WHO/PAHO) (WHO, 2008), as follows: children in exclusive breastfeeding were those who received only breast milk directly or expressed from the breast, and no other liquid or solid food, except for vitamin, mineral, and/or medication drops or syrup; children in predominant breastfeeding were those who, besides breast milk, received water, tea, or fruit juice; and children in mixed breastfeeding were those who received any amount of breast milk, regardless of receiving other solid or liquid food, including non-human milk.

Besides the questions on breastfeeding, the home interviews included a feeding history to investigate the introduction of liquid and solid foods and other types of milk into the children's diet. Mothers were also asked about pacifiers, baby bottles, and breastfeeding supplies, such as nipple shields, breast milk collection shells, etc. These questions were present in both the 48-hour and 3-month questionnaires, except for those on supplies in the third month.

Baby bottles, baby bottle nipples, and pacifiers were defined according to Decree no. 9.579, of November 22, 2018, which addresses topics related to infants, children, and adolescents and makes other provisions (BRASIL, 2018). It defines baby bottles as objects used to give liquid or pureed food to children, having a recipient and a nipple and possibly having a bottle collar to attach the nipple to the recipient. The decree also defines baby bottle nipples as objects indicated for children's nutritive sucking and through which children receive solid or liquid foods from a recipient or the breast (thus encompassing nipple shields). Lastly, it defines pacifiers as products intended for sucking without providing solid or liquid foods or medications.

Results were stored in an Excel database and then submitted to descriptive statistical treatment (mean, median, standard deviation, and frequency) in the Statistical Package for the Social Sciences (SPSS), version 25.0. The chi-square test with and without layers was used to associate the babies' diet types with demographic and health variables and the use of pacifiers, baby bottles, and breastfeeding supplies. The level of significance was set at 5% ($p < 0.05$).

RESULTS

The study assessed 53 mothers in the first 48 hours after delivery and when their babies were 3 months old. The variables regarding the mothers and their families are shown in Table 1, highlighting that the mothers' mean age was 24.77 ± 5.50 years. Most mothers were married or lived in a domestic partnership (73.6%).

Another point to emphasize in the analyzed descriptive variables is the many women in economic class C - i.e., families whose income ranged from R\$ 1,691.44 to R\$ 2,965.69.

Table 1 - Description of the mothers' and families' sociodemographic variables.

Descriptive variables	N (%) or mean \pm standard deviation
Age	24.77 \pm 5.50
Marital status	
Married	39 (73.6)
Single/Separated	14 (26.4)
Socioeconomic class	
A	2 (3.8)
B	17 (32.1)
C	27 (50.9)
D-E	7 (13.2)

Source: Developed by the author

Descriptive variables regarding mothers and babies are shown in Table 2. Some aspects that stand out are the mean number of prenatal visits to physicians that met recommended values, breastfeeding difficulties faced by 54.9% of mothers, and the use of pacifiers by 33.3% of babies, baby bottles by 2.1%, and breastfeeding supplies by 9.6% as early as the first 48 hours of life.

Table 2 - Description of variables on the babies' and mothers' health.

Descriptive variables	N (%) or mean ± standard deviation
Previous pregnancies	
None	24 (46.2)
More than one	28 (53.8)
Prenatal care (number of visits)	9.17 ± 3.71
Gestational age (weeks)	39.58 ± 1.06
1-minute Apgar	9.11 ± 1.17
5-minute Apgar	9.87 ± 0.44
Willingness to breastfeed	
No	1 (1.9)
Yes	52 (98.1)
Breastfeeding difficulties	
No	23 (45.1)
Yes	28 (54.9)
Pacifier 48 h	
No	32 (66.7)
Yes	16 (33.3)
Baby bottle 48 h	
No	47 (97.9)
Yes	1 (2.1)
Breastfeeding supplies 48 h	
No	47 (90.4)
Yes	5 (9.4)

Source: Developed by the author

The association between the babies' diet types in the first 48 hours and the use of pacifiers, baby bottles, and supplies is shown in Table 3. It indicates that 37.5% of those who used pacifiers, 12.5% of those who used baby bottles, and 25% of those who used breastfeeding supplies were already in predominant or mixed breastfeeding.

Table 3 - Association between the babies' diets in their first 48 hours of life and the use of pacifiers, baby bottles, and breastfeeding supplies in their first 48 hours of life.

	Diet types in the first 48 hours			P
	Exclusive BF	Predominant and mixed BF	Weaned	
48 hours				
Pacifier				
No	25 (65.8)	5 (62.5)	2 (100)	0.584
Yes	13 (34.2)	3 (37.5)	0	
Baby bottle				
No	38 (100)	7 (87.5)	2 (100)	0.078
Yes	0 (0.0)	1 (12.5)	0	
Supplies				
No	40 (93)	6 (75)	1 (100)	0.269
Yes	3 (7)	2 (25)	0	

Caption: BF = breastfeeding. Values presented in n (%); Pearson's chi-square test; $p < 0.05^*$

Source: Developed by the author

Table 4 shows statistically significant differences between the diet types and the use of baby bottles and pacifiers at 3 months old. Of the babies who were using baby bottles and pacifiers, 92.9% had weaned, and respectively 81.3% and 87.5% were in predominant or mixed breastfeeding.

Table 4 - Association between the babies' diet types at 3 months old and the use of pacifiers, baby bottles, and breastfeeding supplies in the first 48 hours and at 3 months old.

	Diet types			P
	Exclusive BF	Predominant and mixed BF	Weaned	
3 months				
Pacifier 48 h				
No	13 (68.4)	9 (60)	10 (71.4)	0.791
Yes	16 (31.6)	6 (40)	4 (28.6)	
Baby bottle 48 h				
No	19 (100)	14 (93.3)	14 (100)	0.325
Yes	0 (0.0)	1 (6.7)	0 (0.0)	
Supplies 48 h				
No	20 (90.9)	16 (94.1)	18 (84.6)	0.678
Yes	2 (9.1)	1 (5.9)	2 (15.4)	
Pacifier 3 months				
No	14 (70)	3 (18.8)	1 (7.1)	< 0.01*
Yes	6 (30)	13 (81.3)	13 (92.9)	
Baby bottle 3 months				
No	14 (77.8)	2 (12.5)	1 (7.1)	< 0.01*
Yes	4 (22.2)	14 (87.5)	13 (92.9)	

Caption: BF = breastfeeding. Values presented in n (%); Pearson's chi-square test; $p < 0.05$.

Source: Developed by the author

The chi-square test found no statistically significant differences between the babies' diet types at 48 hours and 3 months old and the mothers' marital status, educational attainment, previous

pregnancies, willingness to breastfeed, breastfeeding difficulties, having the use of pacifiers, baby bottles, and breastfeeding supplies as layers.

DISCUSSION

In this study, 33.3% of the newborns were using pacifiers, 2.1% were using baby bottles, and 9.6% of the mothers were using breastfeeding accessories in the first 48 hours of life.

The association between the babies' diet types in the first 48 hours and the use of pacifiers, baby bottles, and supplies showed that 37.5% of those who used pacifiers, 2.1% of those who used baby bottles, and 9.6% of the mothers who used breastfeeding supplies were already in predominant or mixed breastfeeding.

The percentages found in this study are inverted (i.e., a higher percentage of pacifier use and a lower one of baby bottle use) in relation to a cross-sectional study using data from the II National Breastfeeding Prevalence Survey, with questions on the previous 24 hours. It found that 9.1% of the children used only pacifiers, 24.8% used only baby bottles, and 33.5% used artificial nipples (pacifiers and baby bottles) (BUCCINI; BENÍCIO; VENANCIO, 2014).

The study by França *et al.* (2008) likewise found higher percentages than the 2.1% who used baby bottles in the first 48 h in the present study. Despite the longer data collection period, the authors demonstrated that baby bottles were used by 21.3% of babies at 7 days old and 46.9% of them at 30 days old. Baby bottle use at 30 days old was due to nipple trauma and pacifier use at 7 days old. Children who used baby bottles at 30 days old had an inadequate technique, in contrast with those who were in exclusive breastfeeding.

In a recent study conducted in Western Amazon, the author Martins *et al.* (2021) reports that the risk of weaning in the first 6 months of life was greater among children who had been discharged from the hospital in predominant or mixed breastfeeding, who used pacifiers, or who had not been breastfed in the first hour of life.

Similar results were described in a study in nurses from Paraná, which verified that of the factors that contributed to early weaning, 9.52% of cases were due to using infant formula and pacifiers early because the mother had to work, and 14.29% were due to fear, pain, early use of infant formula and pacifiers, and the mothers' lack of interest (JUSTINO *et al.*, 2021).

The present study verified statistically significant differences between diet types and the use of baby bottles and pacifiers at 3 months old, considering that 92.9% of babies who were using baby bottles and pacifiers had weaned, and 81.3% and 87.5% of babies who were using pacifiers and baby bottles, respectively, were in predominant or mixed breastfeeding.

A literature review shows that pacifier use is the factor most associated with early weaning (SANTA *et al.*, 2018). WHO contraindicates the use of pacifiers, arguing that the oral dynamics of

sucking the mother's breasts differ from that of the pacifier, causing infants to "mistake nipples", and leading to early weaning (WHO, 2019).

This study could not analyze the use of breastfeeding supplies as a possible determinant of the babies' diet types because this item was not inquired about in the third month, only in the 24 hours.

No statistically significant differences were found between newborns' diet types at 48 hours and 3 months old and the mothers' marital status, educational attainment, previous pregnancies, willingness to breastfeed, breastfeeding difficulties, having the use of pacifiers, baby bottles, and breastfeeding supplies as layers. However, the study by Alvarenga *et al.* (2017) found that the main factors that influence early weaning are the mothers' work (33.3%), pacifier use (30.8%), a belief that their milk is not enough (17.9%), nipple trauma and pain (17.9%), the introduction of other types of milk (15.4%), and the mother's/father's educational attainment (15.4%).

Unlike these results, a recent integrative literature review found that authors approached the following as the most important reasons why exclusive breastfeeding is discontinued before 6 months old: mothers who work away from home, mothers' low educational attainment, low milk supply, nipple trauma, artificial nipple use, and deficient prenatal care (PINHEIRO; NASCIMENTO; VETORAZO, 2021).

Similar results were found in a study by Araújo *et al.* (2021), which observed various factors that interfere with weaning, including socioeconomic and cultural ones, breast complications, mothers' return to work, low educational attainment, pacifier use, and lack of guidance.

The results reinforce the importance of promoting and supporting breastfeeding and preventing related problems to avoid discontinuing exclusive breastfeeding in the babies' first months of life. It is also essential that professionals be updated and provide humanized and effective attention in prenatal, maternity, and postnatal care (JUSTINO *et al.*, 2021). Moreover, professionals, institutions, and society must protect breastfeeding, as provided by existing norms (BRASIL, 2018).

This research had some limitations during data collection, such as not asking about the use of breastfeeding supplies in all interviews. Also, the number of participants who reported having weaned prevented more robust statistical analyses. Nevertheless, few longitudinal studies address the topic, and the results presented in this one identify factors associated with discontinued exclusive breastfeeding, helping health professionals provide preventive and objective interventions.

CONCLUSIONS

The association analysis between the use of pacifiers, baby bottles, and breastfeeding supplies and the babies' diet types at 3 months old showed statistically significant differences between the diet types and the use of pacifiers and baby bottles at 3 months old. Discontinued breastfeeding was more prevalent among children who used these devices.

There should be greater interprofessional follow-up and guidance for postpartum mothers to achieve good breastfeeding results. Furthermore, nutrition and health public policies should discourage the use of such devices.

REFERENCES

ALVARENGA, S. C. *et al.* Fatores que influenciam o desmame precoce. **Aquichan**, v. 17, n. 1, p. 93-103, 2017.

ARAÚJO, S. C de. *et al.* Fatores intervenientes do desmame precoce durante o aleitamento materno exclusivo. **Revista Eletrônica Acervo Saúde**, v. 13, n. 4, p. e6882, 2021.

BARROS, A. J. D. *et al.* Coorte de nascimentos de Pelotas, 2004: metodologia e descrição. **Revista de Saúde Pública**, v. 40, n. 3, p. 402-413, 2006.

BRASIL. Decreto n. 9.579, de 22 de novembro de 2018. Consolida atos normativos editados pelo Poder Executivo federal que dispõem sobre a temática do lactente, da criança e do adolescente e do aprendiz, e sobre o Conselho Nacional dos Direitos da Criança e do Adolescente, o Fundo Nacional para a Criança e o Adolescente e os programas federais da criança e do adolescente, e dá outras providências. Brasília, DF: **Diário Oficial da União**. Acesso em: 23 nov. 2018.

BRASIL. Ministério da Saúde. **Guia alimentar para crianças brasileiras menores de 2 anos**. Brasília: Ministério da Saúde, 2019. Disponível em: http://189.28.128.100/dab/docs/portaldab/publicacoes/guia_da_crianca_2019.pdf. Acesso em: 19 set. 2022.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. **Aleitamento materno e alimentação complementar**. 2. ed. - Brasília: Ministério da Saúde, 2015. Disponível em: <https://portaldeboaspraticas.iff.fiocruz.br/biblioteca/cab-no-23-saude-da-crianca-aleitamento-materno-e-alimentacao-complementar/>. Acesso em: 19 set 2022.

BUCCINI, G. S.; BENÍCIO, M. H. D. A.; VENANCIO, S. I. Determinantes do uso de chupeta e mamadeira. **Revista de Saúde Pública**, v. 48, n. 4, p. 571-582, 2014.

BUCCINI, G, PÉREZ-ESCAMILLA, R, VENANCIO SI. Uso rotineiro de chupeta por bebês: prós e contras. **Jornal de Pediatria**, v. 95, n. 5, p. 619-621, 2019.

CHOW, S. *et al.* The Use of Nipple Shields: A Review. **Frontiers in Public Health**, v. 3, p. 236, 2015.

FRANÇA, M. C. T. *et al.* Uso de mamadeira no primeiro mês de vida: determinantes e influência na técnica de amamentação. **Revista de Saúde Pública**, v. 42, n. 4, p. 607-614, 2008.

JUSTINO, M. J. F. *et al.* Desmame precoce em puérperas na percepção dos profissionais de enfermagem. **Brazilian Journal of Development**, v. 7, n. 3, p. 33330-33337, 2021.

MARTINS, F. A. *et al.* Padrões de amamentação e fatores associados ao desmame precoce na Amazônia ocidental. **Revista de Saúde Pública**, v. 55, n. 21, 2021.

MOIMAZ, S. A. S. *et al.* Relação entre aleitamento materno e hábitos de sucção não nutritivos. **Revista Ciência & Saúde Coletiva**, v. 16, n. 5, p. 2477-2484, 2011.

PINHEIRO, B. M.; NASCIMENTO, R. C.; VETORAZO, J. V. P. Fatores que influenciam o desmame precoce do aleitamento materno: uma revisão integrativa. **Revista Eletrônica Acervo Enfermagem**, v. 11, p. e7227, 2021.

SAMPAIO, R. C. T. S. *et al.* Associação entre o uso de chupetas e interrupção da amamentação: Uma revisão de literatura. **Brazilian Journal of Health Review**, v. 3, n. 4, p. 7353-7372. 2020.

SANTANA, G. S. *et al.* Fatores associados à manutenção da amamentação por 12 meses ou mais: revisão sistemática. **Jornal de Pediatria**, v. 94, n. 2, p. 104-122, 2018.

WHO. World Health Organization. **Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6-8 November**. Washington, DC, 2008. Disponível em: http://whqlibdoc.who.int/publications/2008/9789241596664_eng.pdf. Acesso em: 02 set 2022.

WHO. World Health Organization. **Ten steps to successful breastfeeding (revised 2018)**. 2019. Disponível em: <https://www.who.int/nutrition/bfhi/ten-steps/en/>. Acesso em: 09 set 2022.