

Original articles

Factors associated to pacifier use in preterm infants

Fatores associados ao uso de chupeta por lactentes nascidos pré-termo

Elaine Cristina Vargas Dadalto⁽¹⁾Edinete Maria Rosa⁽²⁾

⁽¹⁾ Departamento de Clínica Odontológica da Universidade Federal do Espírito Santo (UFES), Vitória-ES, Brasil.

⁽²⁾ Departamento de Psicologia Social e do Desenvolvimento da Universidade Federal do Espírito Santo (UFES), Vitória-ES, Brasil.

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ABSTRACT

Purpose: to investigate the evaluation of mothers of preterm newborns about the introduction and use of pacifiers and its relationship with socioeconomic variables, prematurity and breastfeeding, in the context of their children hospitalization in neonatal intensive care unit.

Methods: in the initial stage, 62 preterm newborns' mothers participated in this study, 52 of them came back for follow-up within six months and 40 within 24 months. Data were tabulated using software SPSS version 18.0 and statistical analysis, chi-square, Fisher and Mann-Whitney tests.

Results: the attempt to introduce a pacifier took place for 96.2% of preterm infants discharged from neonatal intensive care unit, and it was used by 50%. The use of pacifiers was high among family members (siblings – 51.9%; cousins – 76.9%), which reinforced cultural aspects. The following showed statistically significant association with higher use of pacifiers: prematurity assessed by weight/gestational age ratio ($p=0.044$), difficult to start or continue breastfeeding after discharge ($p=0.012$) and primiparity ($p=0.02$); relation with lower frequency of pacifier: exclusive breastfeeding ≥ 3 months ($p=0.026$) and breastfeeding length ≥ 6 months ($p=0.004$). Difficulty in breastfeeding after discharge was associated to higher hospital length ($p=0.007$) and higher length of orogastric tube ($p=0.006$).

Conclusion: offering pacifiers to preterm infants discharged from neonatal intensive care unit showed strong cultural influence, but their acceptance occurred mainly due to mothers' difficulty to start or continue breastfeeding.

Keywords: Pacifiers; Breastfeeding; Culture; Infant, Premature

RESUMO

Objetivo: investigar a avaliação de mães de recém-nascidos pré-termo acerca da introdução e uso de chupeta e sua relação com variáveis socioeconômicas, prematuridade e aleitamento materno, partindo-se do contexto da internação de seus filhos em unidade de terapia intensiva neonatal.

Métodos: na etapa inicial, participaram 62 mães de recém-nascidos pré-termo, tendo comparecido 52 para acompanhamento aos seis meses de idade e 40 aos 24 meses. Os dados foram tabulados utilizando o programa SPSS versão 18.0 e análise estatística com testes Qui-quadrado, Fisher e Mann-Whitney.

Resultados: a tentativa de introdução da chupeta ocorreu para 96,2% dos bebês nascidos pré-termo, egressos de unidade de terapia intensiva neonatal, e seu uso em 50%; o hábito de sucção de chupeta foi alto entre crianças da família (irmãos - 51,9%; primos - 76,9%), reforçando aspectos culturais. Apresentaram associação estatisticamente significativa com maior uso de chupeta: prematuridade avaliada pela relação peso/idade-gestacional ($p=0,044$), dificuldade para estabelecer ou manter o aleitamento materno após a alta hospitalar ($p=0,012$) e primiparidade ($p=0,02$); relação com menor frequência de chupeta: aleitamento materno exclusivo ≥ 3 meses ($p=0,026$) e tempo de aleitamento materno ≥ 6 meses ($p=0,004$). A dificuldade para o aleitamento materno após a alta hospitalar foi associada com maior tempo de internação ($p=0,007$) e maior tempo de sonda orogástrica ($p=0,006$).

Conclusão: a oferta da chupeta para lactentes nascidos pré-termo, egressos de unidade de terapia intensiva neonatal, apresentou grande influência cultural, mas sua aceitação pelo bebê ocorreu principalmente devido às dificuldades encontradas pelas mães para estabelecerem o aleitamento materno.

Descritores: Chupetas; Aleitamento Materno; Cultura; Prematuro

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Mailing address:

Elaine Cristina Vargas Dadalto
Rua Alaor de Queiroz Araújo, 135/802 –
Enseada do Suá
Vitória – ES – Brasil
CEP: 29050-245
E-mail: elainedadalto@gmail.com

INTRODUCTION

The understanding of the elements involved in adults' decision for offering the pacifier to infants crosses the analysis of cultural studies, as a product of human thinking development deriving from the connections between individual history and social history, which is represented by the accumulation of information, reflected on beliefs and practice¹. Aiming at verifying the presence of cultural aspects in studies published on pacifier sucking habits, Dadalto and Rosa² observed that the pacifier is a *cultural object* and its offer by adults and its use by infants represent a *cultural phenomenon*, which has undergone changes over the centuries.

The moment of pacifier removal is also culturally influenced. It is an attempt to transfer this responsibility from the individual sphere to the collective one. We can list examples such as taking the infant to hang the pacifier on a tree (pacifier tree) in Denmark and Sweden parks; throwing a farewell party, exchanging the pacifier for a gift or leave it to Santa Claus are solutions found in Norway³; and in Germany, a short story about the pacifier fairy aims at suggesting to children that the parents were not the ones who removed it, but the fairy⁴. In Brazilian families, conversation and gift exchanging happen more frequently. However reports of more radical solutions such as "throwing the pacifier away" can also be found⁵.

The pacifier use has been frequent in many western countries⁶⁻⁸, which might be analyzed from the perspective of the many duties of modern life, making it difficult for women to make breastfeeding available on free demand for meeting the suction needs of the infant and the fact reported by mothers that the pacifier calms the infant down^{7,9}. The intergenerational aspect was discussed by Serra-Negra et al.¹⁰, whose result has shown that in 78.9% of the cases of pacifier sucking performed by mothers in their childhood there was statistically significant coincidence, with the same habit presented by the child today.

The statistical analysis between the pacifier use and demographic, economic and social variables was performed in some studies. Mauch et al.⁷ have found a lower frequency when mothers' education level corresponded to higher education. Buccini, Benício and Venancio⁸ associated a higher pacifier use and artificial nipples in the first year of life to working mothers, primiparity, younger mothers, cesarean delivery and low-birth weight.

The age in which the pacifier introduction occurs might influence as the cause of breastfeeding time length reduction, being the critical period associated to age lower than two weeks of life¹¹ or four weeks of life⁷, which justifies not using pacifier in the neonatal period. In the study by Soares et al.¹², despite the recommendation for mothers not to give pacifiers or bottle to newborns, the pacifier use was at least attempted in 87.8% of cases, during the first month of life, and 61.6% used it at the age of one month, with the primary goal of ceasing crying, because mothers reported it calmed the infant down.

The challenge for mothers and low-birth weight newborns, admitted at neonatal intensive care unit (NICU) and fed through orogastric tube is the establishment of breastfeeding, because the beginning of sucking feeding is directly related to lower hospitalization length^{13,14}. The lower the breastfeeding time, the higher the possibility of introducing sucking habits^{6,15,16}.

Studies on the acquisition and extension of pacifier sucking habits in preterm infants are scarce in the relevant literature, showing frequency of 45.7% in the first six months of life¹⁷ and significant association to premature birth¹⁸. In the latter, children between two and four years old, preterm born with very low birth weight and extremely low birth weight presented pacifier frequency of 56% compared to average birth weight children, whose frequency was 33%, with p -value=0.02. Taking into consideration the increase in preterm newborns survival over the past decades¹⁹ and the paucity of studies on pacifier sucking habits in this segment of children population, the present study aims to investigate the evaluation of mothers of preterm newborns about the introduction and use of pacifiers and its relationship with socioeconomic variables, prematurity and breastfeeding, in the context of their children hospitalization in neonatal intensive care unit.

METHODS

The first stage in this study took place in the city of Vitória-ES in both, a public and a private NICU, for five months, when the participants were selected. The criteria for being included in the study consisted of mothers of preterm infants who were admitted at NICU, at medium risk situation. When the infants turned six months old chronologically, the mothers were invited by telephone to participate in the second stage, which was performed at the Pediatric Dentistry clinic associated to a public university, as well as the longitudinal follow-up. The project was approved by the Research Ethics

Committee of the Health Science Center of the Espírito Santo Federal University, under number 249/10, and the participants, volunteers, signed the "Informed Consent Form", following the regulations of Resolution 196/96 of the National Health Council.

The newborns were classified according to gestational age at birth into: extremely preterm (<30 weeks), very preterm (30 to 33 weeks and six days) and late preterm (34 to 36 weeks and six days). According to birth weight, the classification was as follows: extremely low birth weight (<1,000 grams), very low weight (1,000 to 1,499 grams) and low birth weight (1,500 to 2,499 grams). Newborns were also classified according to adequacy to weight and gestational age in SGA (small for gestational age) when the birth age was inferior to the suggested weight at the percentile 10 for the gestational age, AGA (appropriate for gestational age), when they stood between percentile 10 and percentile 90, and LGA (large for gestational age), when the weight was higher than the suggested value by percentile 90 for the gestational age¹⁹.

In the early stage, 62 mothers of preterm infants admitted at NICU participated. For the second stage, 52 mothers (83.9%) attended. The follow-up occurred on a half-yearly basis throughout two years, simultaneously with infants' dental appointments. In the assessment performed at the infants' age of 24 months old, 40 mothers attended.

For data collection in the first stage, the instrument presented questions on demographic, economic, social and cultural data. From NICU's record were collected data concerning prematurity, birth weight, admission and use of orogastric tube. In the six-month evaluation and in the following half-yearly ones, the questions were about the infant's general health, eating and habits.

As for the economic classification, the participants distribution was performed according the criteria of The

Brazilian Association of Research Companies²⁰, which emphasizes the segmentation according to family income and the education background of the family's main provider, performing the division by socioeconomic classes, being A1, A2, B1, B2, C1, C2, D and E, in descending order. Education background was classified according to the Brazilian school system, complete primary education (CPE), incomplete primary education (IPE), incomplete secondary education (ISE), complete secondary education (CSE), incomplete higher education (IHD) and complete higher education (CHE).

The questions were tabulated using statistical package SPSS (*Statistical Package for Social Sciences*) windows version 18.0 (SPSS INC., CHICAGO, IL, USA). For data analysis, descriptive statistical procedures and bivariate analysis were performed in order to verify the connection between the variables, mainly with Chi-square test. For cross tabular grids that presented cells with expected results lower than five for the null hypothesis, Fisher's exact test was used for the two-category cases, or Likelihood Ratio for more than two categories. The variables metrics were compared after performing the Shapiro-Wilk test for normality through the t-test for means when the distribution was adequate to the Gaussian model, or through the use of Mann-Whitney test (nonparametric) when the distribution was not Gaussian.

RESULTS

The participants' distribution according to demographic and socioeconomic data can be seen in Table 1, the mothers' age varied from 17 to 42 years old, with average age of 28.3 years old (standard deviation of 6.9). These results were tabulated for 62 mothers of preterm infants admitted at NICU, who took part in the study during its first stage.

Table 1. Distribution of participants according to demographic and socioeconomic data

VARIABLES	n	%
Educational background:		
IPE, CPE, ISE*	26	41.9
CSE, IHE, CHE*	36	58.1
Place of residence:		
Vitória/ES.	15	24.2
Vitoria Metropolitan area	40	64.5
Countryside of the states of ES, MG, BA, Brazil	07	11.3
Type of residence:		
Own	41	66.2
Rented	11	17.7
Lent	02	3.2
Lives with relatives	08	12.9
Inserted in labor market:		
Yes	39	62.9
No	23	37.1
Socioeconomic classification:		
A2, B1, B2	26	41.9
C1, C2, D	36	58.1
Marital status:		
Stable relationship	54	87.1
Single	05	8.1
Separated/divorced	03	4.8
Newborn's father's education:		
IPE, CPE, ISE*	24	38.7
CSE, IHE, CHE*	37	59.7
Could not inform	01	1.6
Primiparity:		
Yes	34	54.8
No	28	45.2
Total	62	100.0

* Incomplete Primary Education (IPE), Complete Primary Education (CPE), Incomplete Secondary Education (ISE), Complete Secondary Education (CSE), Incomplete Higher Education (IHD) and Complete Higher Education (CHE)

The data related to preterm newborns have shown that 51.6% were female, 43.5% had gestational age between 27.4 weeks and 33 weeks and six days, while 56.5% completed 34 weeks until gestational age of less than 37 weeks; birth weight was lower than 1,500 grams for 17.7%, higher or equal to 1,500 grams, but lower than 2,500 grams for 61.3%, while 21% presented weight of 2,500 grams or more. The hospitalization length at NICU for the majority was between 5 and 30 days (72.6%), 31 to 60 days (16.1%), while 11.3% were hospitalized for a period between 61 to 180 days; 45.2% needed orogastric tube feeding for up to seven days, 45.2% for eight days or more, and for 9.6%, there was no use of tube.

The metric variable concerning hospitalization length in days ($p=0.614$), and length (in days) of orogastric tube use ($p=0.977$) did not present statistically significant differences concerning the NICU type (public or private). The categorical variables primiparity ($p=0.352$) and prematurity classification by gestational age ($p=0.258$) also did not differ statistically concerning NICU type. The variables concerning the mother's education and social classification presented statistically significant differences between the two units ($p=0.001$ and $p=0.025$, respectively). At the private NICU, it was more frequent the mother's education corresponding to CSE, IHD and CHE (77.1%) and social classes A2, B1 and B2 (54.3%) compared to public NICU. Nevertheless, as there were five users

of Brazilian Public Unified Health System (SUS) at private NICU, in beds made available by the Brazilian government, the NICU type was not used in other statistical comparisons. Only the variables concerning social classification and mother's education were considered for socioeconomic analysis.

The evaluation of results for six-month old infants corresponded to answers of 52 participants. In these first six months, 50% of infants born preterm were using ($n=25$) or used ($n=1$) pacifier. The age for the beginning of the pacifier habit in 26.9% of the cases was before three months old but in most cases (73.1%) the pacifier introduction was at the age of three months or more. The stratification by age was less than one month old (3.6%), one month (17.8%), two months (7.1%), three months (39.3%), four months (28.6%) and five months (3.6%).

The socioeconomic categorical variables and those related to prematurity were statistically tested using chi-square test and when necessary Fisher's exact test or Likelihood Ratio (Table 2) in order to verify if there would be independence or not with pacifier use in the first six months. The variable metric regarding time of NICU stay (in days), time of orogastric tube use (in days), birth weight and mother's age were compared so as to investigate whether or not there would be difference concerning pacifier use or not, applying the Mann-Whitney nonparametric test or t test for means. Results can be seen in Table 3.

Table 2. Distribution of participants as per socioeconomic and prematurity variables according to the use of pacifier during the first six months (n=52)

Variables	Pacifier use during the first 6 months				p-value
	Yes		No		
	n	%	n	%	
Mother's educational background					
IPE, CPE, ISE*	11	42.3	11	42.3	1,000**
CSE, IHE, CHE*	15	57.7	15	57.7	
Inserted in labor market:					
Yes	11	42.3	9	34.6	0.569**
No	15	57.7	17	65.4	
Socioeconomic classification:					
Classes A2 / B1 / B2	13	50.0	9	34.6	0.262**
Classes C1 / C2 / D	13	50.0	17	65.4	
Father's education (n=51)					
IPE, CPE, ISE*	8	30.8	11	44.0	0.329**
CSE, IHE, CHE*	18	69.2	14	56.0	
Primiparity					
Yes	21	80.8	10	38.5	0.002**
No	5	19.2	16	61.5	
Prematurity classification as per gestational age					
≤ 33 weeks and 6 days	9	34.6	12	46.2	0.286***
34 to < 37 weeks	17	65.4	14	53.8	
Prematurity classification as per gestational age X birth weight					
Small for gestational age (SGA)	14	53.8	7	26.9	0.044***
Appropriate or large for gestational age (AGA or LGA)	12	46.2	19	73.1	
Sex					
Male	14	53.8	11	42.3	0.405
Female	12	46.2	15	57.7	
Total	26	100.0	26	100.0	-

* Incomplete Primary Education (IPE), Complete Primary Education (CPE), Incomplete Secondary Education (ISE), Complete Secondary Education (CSE), Incomplete Higher Education (IHD) and Complete Higher Education (CHE)

**Chi-Square Test

*** Fisher's Exact test

Table 3. Distribution of metric variables according to use or non-use of pacifier among preterm newborns discharged from NICU as per mothers' reports.

Variables	Pacifier use 6 months	Median	Mean	Standard-deviation	p-value
Days at NICU**	Yes	20.00	27.65	21.64	0.301
	No	19.00	23.92	24.41	
Days using orogastric tube	Yes	6.00	11.62	15.56	0.905
	No	5.00	14.19	21.95	
Birth weight In grams*	Yes	1860.00	1888.50	453.09	0.214
	No	1925.50	2123.35	833.02	
Mother's age	Yes	26.50	27.08	6.11	0.318
	No	28.00	28.92	7.05	

*t-test for means

**Mann-Whitney test

The categorical variables concerning breastfeeding and its association or not to the use of pacifier during the first six months of life are presented in Table 4. The participants also reported that they had not had difficulties establishing breastfeeding in 55.8% (n=29) of the cases and were breastfeeding at the six months, but 44.2% (n=23) reported problems. In some cases, these problems were related to low breast milk production, and because of this, they started using bottle with consequent reduction of breastfeeding until the total refusal by the infant (11.5%). In other cases, despite

having enough milk, the infants could not suck it; they got tired and lost weight (9.6%). Some have reported having problems such as mastitis and fissures in the nipple, but they did not stop breastfeeding (7.8%), and eight participants did not breastfeed, due to their general health (3.8%) or due to the absence of breast milk production (11.5%)s at the nipple, but they did not stop breast feeding (7,8%), and eight participants did not breastfed, due to their general health (3.8%) or due to the absence of breast milk production (11.5%)

Table 4. Distribution of participants according to pacifier use by infants and association to variables related to breastfeeding (n=52)

Variables	Pacifier use in the first 6 months				p-value
	Yes		No		
	n	%	n	%	
Type of feeding					
Breastfeeding (BF) without bottle	3	11.5	10	38.5	0.071*
Mixed feeding	18	69.2	13	50.0	
Bottle	5	19.2	3	11.5	
Exclusive breastfeeding					
Did not breastfeed, did not have exclusive BF or exclusive BF <3 months	16	61.5	8	30.8	0.026**
Exclusive BF for 3 months or more	10	38.5	18	69.2	
Difficulty to establish or maintain breastfeeding after NICU discharge					
No	10	38.5	19	73.1	0.012**
Yes	16	61.5	7	26.9	
Type of breastfeeding					
Did not breastfeed	5	19.2	3	11.5	0.004*
Less than 6 months	9	34.6	1	3.8	
6 months or more	12	46.2	22	84.6	
Total	26	100.0	26	100.0	-

* Likelihood Ratio

**Chi-Square Test

The difficulty in establishing or keeping breastfeeding after NICU discharge presented statistically significant association to the pacifier use, as shown in Table 4. This variable was compared by performing Mann-Whitney nonparametric test, in which it is seen that the group that had difficulties establishing or keeping breastfeeding after NICU discharge presented longer NICU hospitalization ($p=0.007$) and a longer use of orogastric tube ($p=0.006$).

The suggestions for mothers to introduce the pacifier was really frequent among family members (63.5%), in which 44.3% by up to two relatives and in 19.2% by

three relatives or more, whereas in 36.5% of the cases no one suggested. Among the mothers themselves, 40.4% had used pacifiers in their infancy, 40.4% had not and 19.2% could not say. Among the infant's fathers, 23.1% had used, 25% had not, but 51.9% of the participants could not inform. Among the infants who already had sibling(s), 57.1% of them used or had used pacifiers, while the use of pacifier by one or more of the infant's cousin(s) was reported by 76.9% of the participants. According to chi-square and Fisher's exact tests, there was no statistically significant association to the use or not of pacifier in the present study concerning

the number of people who have advised pacifier use ($p=0.375$), the use of pacifier by the mother ($p=0.217$), father ($p=0.217$), siblings ($p=1.000$) and cousins ($p=1.000$).

The attempts to get the infant used the pacifier occurred for 96.2% of infants. Most of the times, this offer was made by their own mother (65.4%), grandmother (11.5%), father (5.8%) or other family member (13.5%) and for only two infants (3.8%) the pacifier was

not made available. For the 50 cases in which there was an attempt of pacifier use, in 48% the adult only put the pacifier in the infant's mouth to check whether the infant "would want" or "would accept" it, 16% insisted a few times for up to three days, and 36% insisted several times, for over a week. In Table 5, it is possible to see the connection between the attempt for pacifier introduction and its effective use by the infant as sucking habit in the first six months of life.

Table 5. Distribution of participants according to attempt to get infants used to pacifier and the pacifier sucking habits during the first six months of life ($n=50$)

Attempts to get infant used to pacifier	PACIFIER – 6 MONTHS				p-value
	Yes		No		
	n	%	n	%	
01 attempt	15	57.7	9	37.5	0.035*
Up to 3 days	1	3.8	7	29.2	
Several attempts	10	38.5	8	33.3	
Total	26	100.0	24	100.0	-

* Likelihood Ratio

The reasons why adults have attempted to introduce the pacifier habit were many. In cases in which infants acquired this sucking habit, for 34.6% the reason was to calm infants down because they cried a lot; 26.9% the pacifier offer was for helping the infant fall asleep faster and for a longer time; 23.1% were in order to provide a longer sucking period for the infant, who had been breastfed all night long or who had been crying after breastfeeding because they wanted to suck more; 11.5%, because the infant had started finger sucking; and 3.8% to check if the infant needed the pacifier.

As for the cases in which infants did not acquire the pacifier sucking habit, the reason reported for its attempt by most mothers (54.2%) was in order to see if the infant would accept, since many other infants did. A lower number of mothers claimed that it was in order to calm the infant down that cried too much (33.3%); to help infants fall asleep faster (8.3%); to prevent continued finger sucking (4.2%); and none of them mentioned difficulties while breastfeeding.

At the infants' chronological age of 24 months, 40 participants showed up for their children's follow-up. Reports of pacifier use by 24 infants were observed. Since the evaluation performed at the age of six months, pacifier habit occurred in more than one case by the age of eight months; and two cases between 12 and 18 months. Regarding interruption of this habit

until the end of the study, from the 24 infants who presented pacifier habit, six have broken it until the age of 18 months (25%), but most of them ($n=18$) still remained with habit by the age of 24 months old. The maintenance of breastfeeding for 12 months or more occurred in 15 cases, only four children had never used bottle and by 24 months old, 27 of them kept on feeding through bottle, even when breastfeeding was still offered.

DISCUSSION

Although the planning had not been directed for studying the prevalence of the pacifier use among preterm infants, the frequency found at the age of six months ($n=52$) was of 52%. This result is similar to the one verified by Brusco and Delgado²¹, in which half of the sample formed by preterm infants used pacifiers, and near the result of 45.7% found by Benevenuto de Oliveira et al.¹⁷

Primiparity has presented statistical association to the use of pacifier (80.8%) compared to infants who did not use it (38.5%), which was also observed by Buccini, Benício and Venancio⁸. This is probably related to the mother's lack of experience in interpreting her child's needs. There was no statistically significant difference between the use or not use of pacifier and the mother

and father's education, mother's age, integration in the labor market, socioeconomic classification and the infant's sex. On the other hand, in the relevant literature, pacifier sucking habit has been significantly associated to mother's lower education⁷, to the mother's work outside their homes, to younger mothers, and to cesarean delivery⁸.

In spite of the lack of association between pacifier use and prematurity evaluated by gestation age ($p=0.126$) and birth weight ($p=0.214$), when the classification was performed according to the relation between birth weight and corresponding gestational age, the group of newborns classified as small for gestational age (SGA) presented statistically significant association with the use of pacifier ($p=0.044$). Also in the present study, hospitalization length at NICU and the time of orogastric tube were not related to a longer time of pacifier use. Studies for associating the prevalence of pacifier use and prematurity were scarce, but literature points out the trend for a longer prevalence of use in this segment compared to full term infants and proper birth weight^{17,18}. Likewise, low birth weight was associated to a higher frequency of pacifier use⁸.

The type of feeding (bottle, breastfeeding or mixed feeding) did not present statistically significant association with the use or not of pacifier ($p=0.071$). The difficulty for establishing or maintaining breastfeeding after hospital discharge had statistical association to higher pacifier use ($p=0.012$) and it was reported by 44.2% as being related specially to the absence or poor production of breast milk. As protective factors related to lower pacifier use, the variables that presented statistically significant association were exclusive breastfeeding for a period of three months or more and the maintenance of breastfeeding for six months or more. These results have contributed for a discussion about pacifier use as a *consequence* of difficulties found by mother and infant to maintain breastfeeding as a source of satisfaction of non-nutritive sucking, which was also presented by Silva e Guedes²². The inverse relationship between longer breastfeeding time and lower frequency of non-nutritive sucking habits was also shown^{6,15}, whereas Carrascoza et al.¹⁶ associated the lower frequency of pacifier use with the presence of exclusive breastfeeding at the end of the first month of life, at the moment of hospital discharge and at the age of six months old.

Confirming the results that the infant's acceptance of the pacifier is a consequence of the difficulties found for breastfeeding is the fact that, due to hospital

guidance against pacifier use, its initial offer happened in most of the cases in the present study, at age equal or superior to three months (73.1%), when problems related to breastfeeding had already been installed, and only one case before the age of one month old (3.6%). According to Lindau et al.¹¹ the early pacifier introduction, in the first two weeks of life compared to its late use, has decreased breastfeeding length. This fact is also verified by Mauch et al.⁷ in the first four weeks, which reinforces the recommendation to avoid its use during the neonatal period.

The variable regarding mothers' difficulty to establish or to maintain breastfeeding was compared to the variables metric length of hospitalization at NICU (in days) and length of orogastric tube use (in days). This was the initial setting in this study planning for verifying the use or non-use of pacifier among newborns who presented restriction to breastfeeding, due to orogastric tube or due to temporary separation from the mother, as a consequence of hospitalization. Results pointed out that the group with difficulties in establishing or maintaining breastfeeding after hospital discharge presented longer time of NICU hospitalization ($p=0.007$) and a longer time of orogastric tube use ($p=0.006$). Considering the biological risk of the studied population because of prematurity and NICU hospitalization, the results were similar to the ones found in Crestani et al.²³, which observe lower frequency of exclusive breastfeeding significantly associated to low birth weight, in cases of peri and post-natal complications. Likewise, small gestational age infants were associated to late establishment of exclusive breastfeeding in 5,6 days²⁴, while the best conditions for the beginning of breastfeeding in preterm infants were verified in cases of higher gestational age and more days of life²⁵. The difficulty found to breastfeed preterm infants born with low weight ($\leq 2000g$) and the mother's complaint about breast sucking in the first month were factors related to the interruption of exclusive breastfeeding¹⁴.

As far as cultural context analysis is concerned, family members' advice for the introduction of the pacifier has occurred in most of the cases, and it is possible to evaluate that its use was common among other children in the family, including the mother herself in her infancy, the oldest child and cousins. The study by Serra-Negra et al.¹⁰ found statistically significant association between the use of the pacifier by the mother in her infancy and by her children. Although there had not been statistical difference between the

pacifier use by preterm infants in the present study and these variables, the frequency was very high, showing how common pacifiers have been between generations. From old traditions of making available devices made of cloth for the infant to suck, over the centuries, the pacifier has been improved through a cultural appropriation process by repeated generations^{2,3}. In western countries, the pacifier prevalence has been increasing for infant populations in general, due to modern life duties, which makes it difficult for mothers to make breastfeeding available in free demand and thus supply the infant's sucking needs^{7,9}.

The attempt to get the infant used to the pacifier made by an adult from the family, especially the mother herself, occurred in 96.2% of the cases. Similar results were also found by Soares et al.¹², with attempt in 87.8% of cases. The offer, in the present study, was also made for infants who apparently did not present a higher need for sucking, it was merely to verify if the infant needed or accepted the pacifier (54.2% in the group who did not use the pacifier). Participants in this group claimed they had seen that many infants used pacifiers. These results reinforce the cultural influence feature in mothers' beliefs and decisions concerning this object offer^{2,3,7}.

Among the infants who did not accept the pacifier in the first attempt, only those to whom many attempts were made by family members were using it by the age of six months. The most frequent reasons were to calm the infant down, who was crying a lot; to help him or her to fall asleep faster and for a longer period of time; and because many children use it, confirming the discussion about the insistence of family members to implement the habit with the infant so as to calm them down⁷.

It is fundamental to implement professional home assistance for nursing mothers, especially when taking into account the context of preterm birth and NICU admission. Programs with actions of health education, guided by qualified professionals and focused on mothers from pregnancy to the infant's two first years of life should be implemented with adequacy to values and beliefs^{26,27}.

In the evaluation concerning breaking the pacifier sucking habit, the present study has observed that most of the infants still kept this habit by the age of 24 months, which might be compared to the work by Martins et al.⁵, when observed that only among 20% of the children the pacifier removal occurred before the age of two years old. A relevant point can be highlighted

by the cultural aspects discussed^{3,4}, in which the very culture in some countries searches for solutions for the moment of removing the pacifier. Brazilian families, however, opt for dialoguing in most cases⁵. This can demand more time for convincing the child and, thus, prolong the habit.

A larger sample is necessary to confirm the results of the present study and to determine the prevalence of pacifier sucking habits among preterm infants. The sample calculation for this purpose was not the objective in this study, which would aim at a broader population diagnosis.

CONCLUSION

The use of pacifier was reported in 50% of cases at the age of six months. However, the mother or the family's attempt to get the infant used to it occurred in 96.2%. Primiparity was directly associated to a higher pacifier use. There was no statistically significant association between pacifier use and prematurity evaluated by age and birth weight, but the newborn group classified as small for the gestational age presented statistically significant connection with higher pacifier use.

The difficulties found to establish or to remain breastfeeding after hospital discharge were significantly connected to longer pacifier use, longer time of NICU hospitalization, and a longer time of orogastric tube. The initial age for pacifier introduction was equal or greater than three months old, when problems related to breastfeeding had already been installed. The protective factors related to a lower pacifier use were exclusive breastfeeding until the age of three months old or more, and breastfeeding maintenance for six months or more.

Based on the results pointed out by this study, we may also conclude that the pacifier offer presented cultural influence, but its acceptance by the infant, with the consequent habit installation, occurred mainly due to difficulties found by the mother of preterm infants discharged from NICU to establish or to keep breastfeeding. On the other hand, cultural interference was also present in pacifier acceptance in cases in which family offer was performed based on insistence.

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