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Original articles

Factors associated with pacifier use among children of working women with childcare in the workplace

Thais Rosa dos Santos[1]
Gabriela dos Santos Buccini[2]
Luciana Tavares Sebastião[3]

[1] Faculdade de Medicina de Marília (FAMEMA), Marília, SP, Brazil.
[2] Faculdade de Saúde Pública. USP, São Paulo, SP, Brazil.
[3] Faculdade de Filosofia e Ciências – UNESP – Campus de Marília, Marília, SP, Brazil.

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ABSTRACT

Purpose: to identify the prevalence of pacifier use as well as the reasons for introducing a pacifier and to analyze factors associated with this practice among children of working women with childcare in the workplace.

Methods: a cross-sectional study was conducted with 46 women working at a higher education institution that offered childcare in the workplace; the children were in the age range 2.6 years. Data collection was carried out using a self-report questionnaire filled at home. Reasons for introducing a pacifier were analyzed descriptively; Poisson regression was used in the multiple analysis.

Results: the prevalence of pacifier use was 63%. Most women offered the pacifier after the infant's 16th day of life, in order to calm the baby. In the multiple analysis, higher maternal education was associated with pacifier use.

Conclusion: a high prevalence of pacifier use was observed, as well as early pacifier introduction, among children of working women with childcare in the workplace. With regard to the factors associated with pacifier use in this population, lower maternal education acted as a protective factor against pacifier use.

Keywords: Working Women; Child Health; Pacifier; Speech, Language and Hearing Sciences

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Mailing address:
Luciana Tavares Sebastião
Rua Guanás 110 ap. 42 - Montola, Marília, São Paulo, Brasil
CEP: 17502–560
E-mail: lutsfono@gmail.com

INTRODUCTION

The implications of pacifier use for child health are widely described in the literature. Pacifier use is associated with a higher incidence of acute otitis media[1,2], dental malocclusion[3,4], oral breathing[5,6], oral motor development alterations[7], and speech problems[8,9], and it also has a negative influence on breastfeeding initiation and duration[10-14]. Pacifier use is discouraged by the World Health Organization (WHO), as established in the ninth step of the Baby Friendly Hospital Initiative, which recommends not giving artificial nipples or pacifiers to breastfeeding infants[15].

In Brazil, a nation-wide survey on breastfeeding prevalence (II Pesquisa Nacional de Prevalência de Amamentação) conducted in all Brazilian capitals and in the Federal District in 2009 found that 42.6% of the infants younger than 1 year used a pacifier[16]. Using a pacifier is a common habit, influenced by socioeconomic, environmental, and/or cultural factors[13,14,17-19]. Studies on the characteristics of pacifier use point to a more frequent use in boys[16,18,19], infants with low birth weight[16,20], infants younger than 6 months[19], those not breastfed at the maternity ward[16],and those breastfed according to a predetermined schedule[21]. Among maternal characteristics, higher frequencies have been reported in younger[16,17] and primiparous[16,20] mothers, those from a low socioeconomic background[19], smokers[22]and those with lower education levels[18,23]. Qualitative studies have related the use of a pacifier with cultural issues, maternal insecurity with breastfeeding, baby cry, and baby behavior[13,21,24]. Mother working outside the home was a determining factor of pacifier use in the Brazilian population investigated in the 2009 survey[17].

Studies involving working mothers in formal employment have evidenced the need for interventions in the workplace to increase the rates of exclusive breastfeeding and reduce the use of pacifiers[25]. In particular, promoting breastfeeding in the workplace may have benefits for women, for babies, and also for the employer. Despite the lack of information on the impact of having childcare in the workplace on breastfeeding outcomes, this strategy has been considered a key intervention to promote breastfeeding among formally employed women[26]. However, the association between the mother's return to work when childcare is available in the workplace and the use of pacifiers has been little explored in the literature. The objectives of this study were to identify the prevalence of pacifier use and the reasons for introducing a pacifier, and to analyze factors associated with this practice among children of working women with childcare center in the workplace.

METHODS

All stages of this research study were conducted according to the ethical principles that regulate research involving humans, as described in Resolution no. 466/12 of the Brazilian National Health Council and related legislation. The project was reviewed and approved by the Research Ethics Committee of Faculdade de Medicina de Marília (FAMEMA; protocol no. 1.128.554).

This cross-sectional study was carried out at the childcare centerin the workplace offered by FAMEMA for children of employees, students, and residents of the institution. This child care center has100 children enrolled, with ages ranging from 4 months to 6 years. The FAMEMA health care complex includes three hospitals, a specialty outpatient unit, and a blood center. All female workers are granted 120 days of maternity leave.

All children enrolled into the childcare center whose mothers worked at the complex were included. No speech/language or anatomo-physiological restrictions were applied. Because one of the aspects under investigation was the enjoyment of rights granted to nursing mothers, the following cases were excluded from the sample: (1) children of undergraduate and graduate professors; (2) children whose fathers, rather than mothers, worked at the complex; and (3) children whose mothers did not work at the complex at the time of the child's birth.

The data collection instrument was specifically developed for this study based on the questionnaire used in the previously mentioned Brazilian nation-wide survey on breastfeeding (II Pesquisa Nacional de Prevalência de Amamentação), which included children under 1 year of life[16]. Some adaptations were made because of the specificity of the present sample. In order to guarantee instrument reliability, a pretest was run at the childcare centerin the workplace offered to employees of another higher education institution in the same municipality. The questionnaire was sent out to be answered at home, along with a letter explaining the study objectives and the free informed consent form.

The following data were collected: pacifier use (yes/no); among those reporting to use or to have used a pacifier, child age upon pacifier introduction (≤15 days, 16-30 days, 31-60 days, 61-90 days, 91-120

days, 121-150 days, and >150 days), and the reasons for pacifier introduction (open question). The outcome variable "pacifier use" was defined as the child currently using or having used a pacifier at some point in life; analyzing the frequency or duration of pacifier use was beyond the scope of this study.

Other information collected and analyzed were: child sex; low birth weight (yes/no); birth at a Baby-Friendly Hospital (yes/no); breastfeeding within the first hour of life (yes/no);maternal age (<35 years; ≥35 years); maternal education (higher education; secondary education), primiparity (yes/no); being a health professional (yes/no); taking breastfeeding breaks(yes/no); and child age upon enrollment into the childcare center(≤5.0 months; 5.1-6.0 months; 6.1-24.0 months). The latter variable was stratified as equal to or less than 5 months, as the institution grants a maternity leave of 120 days, and women usually add to that an additional 30 days of vacation.

The profile of study participants was descriptively analyzed, as was pacifier use (prevalence of pacifier use, age upon introduction, and reasons for introduction). The use of a pacifier was described according to child age upon introduction and child age upon enrollment into the childcare center.

In the multiple analysis of the association between pacifier use and covariates, Poisson regression with robust variance was used to estimate prevalence ratios. Any variables showing $p<0.05$in the multiple model were considered to be associated with the outcome.

Considering that (1) the study population comprised exclusively working mothers with childcare in the workplace, and that (2) providing childcare in the workplace has been pointed out as a powerful strategy to increase the rates of exclusive breastfeeding and reduce pacifier use, for every factor significantly associated with pacifier use, an exploratory analysis was conducted of the prevalence of pacifier use according to child age upon enrollment into the childcare center.

RESULTS

Of the 100 questionnaires sent out, four were excluded because the children's mothers did not work at the institution at the time the child was born, five were returned blank, and 45 were not returned even after a second deadline request. As a result, the questionnaires answered by 46 mothers were analyzed in the present study.

The prevalence of pacifier use was 63%. Table 1 presents the characteristics of mothers and children participating in the study. Mean child age was 2.6 years, with a predominance of females. Over half of the children had been enrolled into the childcare center before 6 months of age. There were no cases of children with speech/language or anatomic-physiological disorders.

Among the women, most were aged ≥35 years, and none was younger than 20 years. Most mothers had completed higher education and were health professionals. All mothers reported having enjoyed a 120-day maternity leave. At the moment of data collection, all children were bottle-fed.

Table 1. Profile of mothers and children participating in the study, Marília, 2015

	N = 46	
	N	%
Child gender		
Female	29	63.0
Male	17	37.0
Low birth weight (≤2500g)		
Yes	4	8.7
No	42	91.3
Birth at Baby-Friendly Hospital		
Yes	10	21.7
No	36	78.3
Breastfeeding within first hour of life		
Yes	32	71.1
No	13	28.9
Pacifier use		
No	17	37.0
Yes	29	63.0
Age upon enrollment in the childcare center		
≤5.0 months	17	37.0
5.1-6.0 months	10	21.7
>6 months	19	41.3
Maternal age		
<35 years	22	47.8
≥35 years	24	52.2
Maternal education		
Secondary education	16	24.8
Higher education	30	65.2
Primiparity		
Yes	28	60.9
No	18	38.1
Health professional		
Yes	34	73.9
No	12	26.1
Breastfeeding breaks		
Yes	5	10.8
No	41	89.2

Table 2 presents the age of children upon the introduction of the pacifier, as well as the reasons informed by mothers for introducing the pacifier. Early introduction of the pacifier (i.e., ≤30 days of life) was observed in half of the population assessed. The main reasons informed for introducing a pacifier were aspects related to the baby's behavior (cry, sleep, fussiness). Few mothers informed having introduced the pacifier due to their return to work or to their children's enrollment into the childcare center.

Table 2. Age and reasons for pacifier introduction as informed by mothers, Marília, 2015

Variable	N = 29*	
	N	%
Age upon pacifier introduction		
≤15 days	10	35.7
16-30 days	4	14.3
31-60 days	3	10.7
61-90 days	2	7.1
91-120 days	2	7.1
121-150 days	3	10.7
>150 days	4	14.3
Reason for pacifier introduction		
Helps at sleep time	8	27.6
Soothes the baby	20	69.0
Mother's return to work	3	10.3
Other people taking care of the baby	4	13.8
Baby started to suck finger	3	6.9
Other**	3	10.3

*Number of mothers who reported pacifier introduction.
**Other reasons: child took everything to mouth; child had too much colic.

Figure 1 shows rates of pacifier use according to age at the moment of pacifier introduction and age upon enrollment into the childcare center. Mean age upon pacifier introduction among the children enrolled into the childcare center before 5 months of age was 92.3 days (median=60days); for those enrolled at 5.1-6.0 months, the mean was 67.5 days (median=52.5 days); and for those enrolled after 6 months of age, the mean was 74.1 days (median=30 days). No statistically significant differences were observed between the categories analyzed (p=0.30; chi-square).However, pacifier introduction at 120 and 150 days of life, which is the approximate time of the mother's return to work, was more frequent among the children enrolled into childcare after 6 months of age.

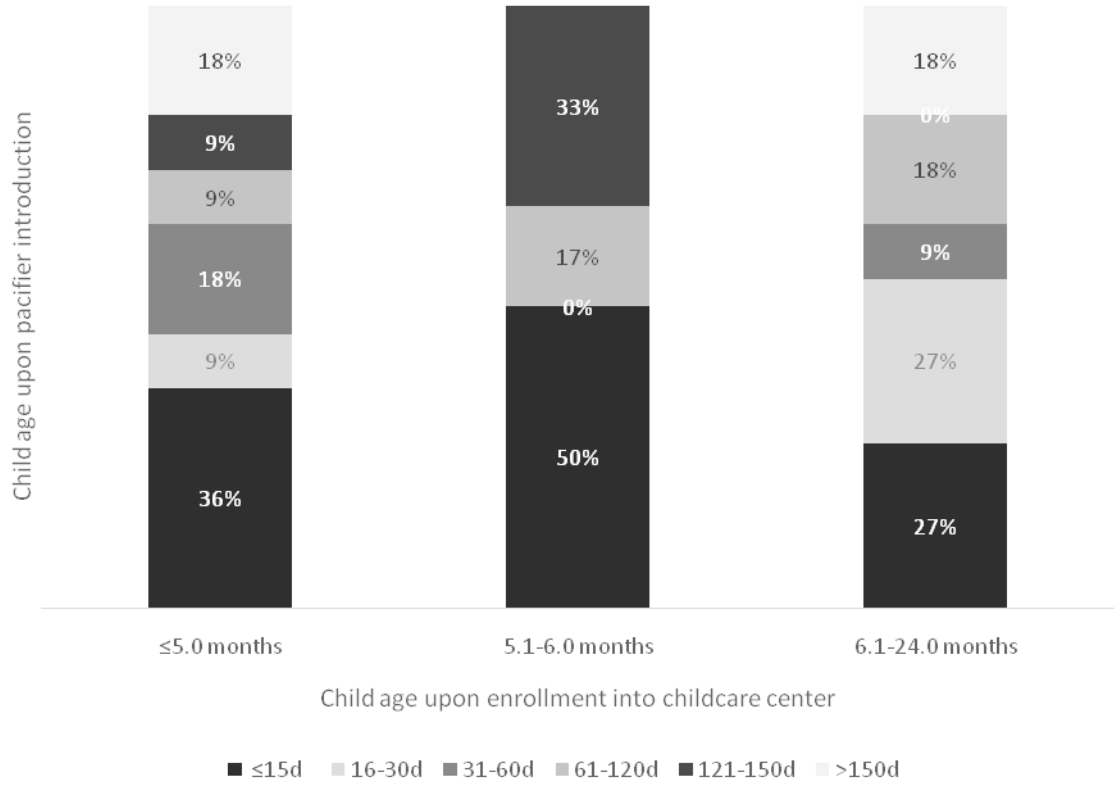

Figure 1. Child age at the moment of pacifier introduction according to age upon enrollment in the childcare center, Marília, 2015

Table 3 describes associations between pacifier use and the variables investigated. The only variable that remained independently associated with pacifier use in children of mothers with childcare in the workplace was maternal education. Lower maternal education (secondary education), in this population, was a protective factor against pacifier use.

Table 3. Factors associated with pacifier use in children of working women with childcare center in the workplace (poisson multiple regression analysis), Marília, 2015

	Pacifier use		Adjusted prevalence ratio	p*
	N	%		
Child gender				
Female	20	69.0	1	0.323
Male	9	31.0	0.77 [0.46 - 1.29]	
Low birth weight (≤2500g)				
No	26	89.7	1	0.508
Yes	3	10.3	1.26 [0.63 - 2.52]	
Birth at Baby-Friendly Hospital				
Yes	5	17.2	1	0.718
No	24	82.8	0.92 [0.57 - 1.48]	
Breastfeeding within first hour of life				
Yes	21	72.4	1	0.752
No	8	27.6	0.88 [0.44 - 1.74]	
Age upon enrollment in the childcare center				
≤5.0 months	12	41.4	1	
5.1-6.0 months	6	20.7	0.82 [0.50 - 1.32]	0.504
>6 months	11	37.9	1.07 [0.65 - 1.76]	0.655
Maternal age				
<35 years	13	44.8	1	0.545
≥35 years	16	55.2	1.18 [0.69 - 1.99]	
Maternal education				
Higher education	23	79.1	1	0.031**
Secondary education	6	20.7	0.47 [0.23 - 0.93]	
Primiparity				
Yes	12	41.4	1	0.875
No	17	58.6	0.96 [0.60 - 1.54]	
Health professional				
Yes	21	72.4	1	0.456
No	8	27.6	1.18 [0.75 - 1.84]	
Breastfeeding breaks				
Yes	2	6.9	1	0.368
No	27	93.1	1.66 [0.55 - 5.03]	

*Significance level in Poisson multiple regression analysis.
**p<0.05.

As seen in Figure 2, regardless of child age upon enrollment into the childcare center, pacifier use was more frequent among children of mothers with higher education (p=0.03). Among the children enrolled into the childcare center before 6 months of life, virtually all the children who used a pacifier had mothers with higher education.

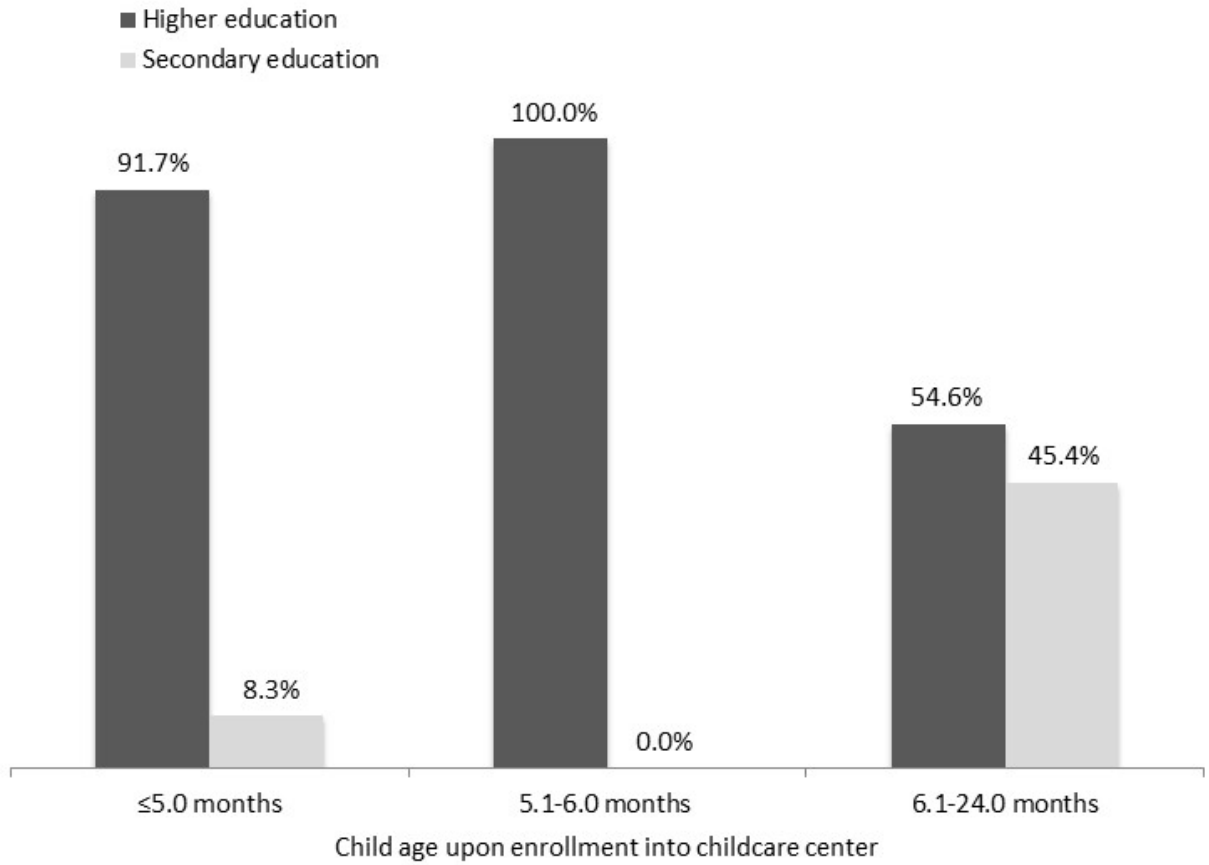

Figure 2. Pacifier use according to maternal education and age upon enrollment in the childcare center, Marília, 2015

DISCUSSION

To the authors' knowledge, this is the first study designed to analyze pacifier use among children of women with childcare center in the workplace. A high prevalence of pacifier use was observed, as well as early pacifier introduction. Maternal education was the only factor independently associated with pacifier use in this sample. The peculiar characteristics of this population should be taken into consideration when planning and implementing preventive health strategies in the context of infant education, especially in childcare centers available in the workplace.

The prevalence of pacifier use identified in this study was higher than the national rate of 42.6% identified among infants younger than 1 year assessed in the previously mentioned 2009 nation-wide survey[16]. Also, another study involving working women found a prevalence of 43.5% of pacifier use among infants younger than 1 year[22]. High rates of pacifier use, ranging from 43.5 to 80%, have been reported in children attending childcare centers[22,27,28]. Variations in the prevalence of pacifier use in different populations may be related to socioeconomic and cultural aspects[17,21].

Early pacifier introduction (i.e., in the first month of life) was frequent among the children of working women with childcare in the workplace analyzed in the present study. Other Brazilian studies with similar populations corroborate this finding[9,19,29-32]. Early pacifier introduction is associated with early interruption of exclusive breastfeeding[9-11,18]. In this sense, there is evidence suggesting that women participating in breastfeeding promotion programs that include information about the influence of pacifier use on child health are less likely

to use the device[19]; indeed, in that study, pacifier introduction in the first month of life was much lower than in the present sample (13.3 vs. 50.0%). Even though few studies have investigated the timing of pacifier introduction, this information is extremely important, as it may determine the frequency, intensity, and persistence of the habit in early childhood[10].

The most frequent reasons for introducing a pacifier as reported by the mothers assessed were "to soothe the baby," followed by "to help at sleep time." These findings demonstrate the naturalization of the soothing effect associated with pacifiers, as evidenced in qualitative studies on the topic[21,24,33]. Even though working outside the home was not the main cause of pacifier introduction in the population assessed, analysis of populational data in Brazil has revealed that the mother's return to work is one of the factors associated with exclusive pacifier use(i.e., using a pacifier but not using a bottle or other artificial teats) among infants younger than 1 year[17]. In this sense, the mother's return to work may not be a primary cause for pacifier introduction, but it may strengthen its use. Future analyses are warranted to confirm this hypothesis.

This was the first time that low maternal education was identified as a protective factor against pacifier use, in contrast with previous studies[34-39]. This discrepancy may reflect two peculiarities of the population assessed, namely: (1) all mothers were health professionals; and (2) all had completed at least secondary education (>8 years of formal education). In this sense, these findings should be considered a tolerant and perhaps underestimated view of the implications of pacifier use in terms of child health and breastfeeding, even among mothers working in the health sector[40]. Further studies involving working women with childcare in the workplace are needed before we can achieve a better understanding of the relationship between pacifier use and lower maternal education, if possible considering child age upon enrollment into childcare. Also in contrast with the literature[17,19],the other factors assessed were not associated with pacifier use, further underscoring the singularity of this population and the importance of conducting more studies with working mothers who have childcare available in the workplace.

The results here presented expand the current knowledge on factors associated with pacifier use among working women with childcare in the workplace. One limitation of our data analysis was the impossibility of exploring the relationship between pacifier use and bottle feeding, as the whole sample was bottle fed. Another limitation is related to our high rate of non-responders, urging caution in generalizing the findings. Still, exploratory studies are important to raise hypotheses and essential to advance scientific knowledge.

The implementation of childcare centers in the workplace has been designed as a strategy to promote, protect, and support breastfeeding among women in formal employment. Early pacifier introduction and the consequences of this practice for breastfeeding and child health make this topic a top priority in the scenario of infant education. In this sense, based on the results observed, some measures could help working women maintain breastfeeding and avoid the use of a pacifier, e.g.: (1) expanding the number of vacancies in childcare centers so as to provide the service to all female employees in each company; (2) developing pro-breastfeeding actions, such as encouraging the use of cups and offering expressed breast milk; (3) developing educational actions aimed at parents and continued education activities for caretakers addressing the pros and cons of pacifier use for child health, including alternative ways to soothe infants without the use of artificial nipples; and(4) establishing institutional guidelines about the use of pacifiers and strategies to avoid its constant use in the childcare setting.

When working with infants, the main challenge of school teams in general and of speech therapists in particular is the adoption of strategies that will encourage the maintenance of exclusive breastfeeding, as well as preventive measures against the use of pacifiers during the time the child remains in childcare. Further research involving working women with childcare in the workplace is warranted to corroborate the exploratory findings of this study.

CONCLUSION

A high prevalence of pacifier use was observed, as well as early pacifier introduction, among children of working women with childcare in the workplace. Of the factors assessed, lower maternal education was associated with the outcome, acting as a protective factor against pacifier use in this population.

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