

Prevalence of Pacifier–sucking Habits and Successful Methods to Eliminate Them—A Preliminary Study

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ABSTRACT

Purpose: The goal of this study was to verify the prevalence of nutritive (breast-feeding and bottle-feeding) and non-nutritive (pacifier) sucking habits, the methods used to eliminate them, and success of these methods.

Methods: To collect the data, 502 questionnaires were distributed to parents of 0- to 6-year-old children.

Results: Bottle-feeding was used by 83% and pacifier by 63% of children. The professional's explanation, the use of substances on the pacifier, the abrupt interruption of the habit, and parents' explanations were efficient in 90%, 80%, 64%, and 38% of the cases, respectively.

Conclusions: Sucking habits had a high prevalence in this sample. An indirect linear relationship between breast-feeding and pacifier use demonstrated that the more the child was breast-fed, the less the pacifier was used. The most efficient method to end the pacifier-sucking habit was professional explanation; however, it was used less often. (*J Dent Child.* 2004;71:148-151)

KEYWORDS: NUTRITIVE SUCKING HABITS, NON-NUTRITIVE SUCKING HABITS, SUCKING HABITS PREVALENCE, HABITS REMOVAL, PACIFIER SUCTION

Suction is an innate reflex that promotes the ingestion of maternal milk. Breast-feeding exercises the facial muscles and achieves exhaustion of the sucking reflex,¹ resulting in a feeling of well-being.²

Studies have shown that breast-fed children tend to develop non-nutritive sucking habits less frequently.^{1,3-5}

An increase in pacifier- and baby bottle-sucking habits has been observed, as evidenced by a prevalence of 75% to 79% in industrialized western countries in recent decades.⁷⁻⁹ However, sucking habits are rarely observed in places like Tanzania and Zimbabwe, and when they occur, typically psychological disturbances are among the causes. Among the Inuit Native American peoples, sucking habits are practically nonexistent.⁹ Hence, nutritive and non-nutritive sucking habits seem to be

associated with cultural and economic factors that affect the population.

Pacifier use, which is the most common non-nutritive sucking habit, is usually introduced by parents to calm the child, not as an extra suction activity.^{4,10} Consequently, every time that child is irritated, the pacifier is offered as a form of amusement and a panacea, and the child develops a strong attachment to the sucking object. Pacifier use alters occlusal development, depending on the intensity, frequency, and duration of the habit.

Prolonged nutritive and non-nutritive sucking habits can also cause open bite. Once the habit is eliminated, spontaneous correction may occur, depending on the child's age and other factors, such as mouth-breathing habits.¹¹⁻¹⁴

The goal of this study was to verify the prevalence of nutritive (breast-feeding and bottle-feeding) and non-nutritive (pacifier) sucking habits, the methods used to eliminate them, and their success among children aged 0 to 6 years.

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Table 1. Sample Distribution According to Age, Period of Nutritive and Non-nutritive Feeding, and Period of Pacifier Use

Age (mos)	*Sample distribution N (%)	†Breast-feeding period (mos) N (%)	‡Bottle-feeding period (mos) N (%)	§Pacifier use period (mos) N (%)
Did not use	0 (0)	79 (16)	32 (6)	160 (32)
0-3	1 (1)	129 (26)	2 (1)	6 (1)
4-6	1 (1)	91 (18)	2 (4)	8 (2)
7-11	10 (2)	64 (13)	18 (3)	10 (2)
12-23	34 (7)	69 (14)	16 (12)	37 (7)
24-35	46 (9)	29 (6)	61 (15)	50 (10)
36-47	62 (12)	14 (3)	74 (17)	53 (11)
48-59	53 (11)	2 (1)	83 (10)	44 (9)
60-71	91 (18)	2 (1)	50 (13)	36 (7)
72-83	204 (41)	0 (0)	63 (9)	51 (10)
Did not answer	0 (0)	23 (5)	55 (10)	47 (9)

*Chi-square=572.3347; df=8; P<.0001; sample size=502.

†Chi-square=407.5817; df=10; P<.0001; sample size=502.

‡Chi-square=251.2231; df=12; P<.0001; sample size=502.

§Chi-square=458.3825; df=11; P<.0001; sample size=502.

METHODS

A total of 1,163 questionnaires were distributed to parents of 0- to 6-year-old children at day care centers in Piracicaba, Brazil, following human subject approval. The questions addressed sucking habits and their starting and finishing ages. Chi-square, likelihood ratio chi-square, Mantel-Haenszel chi-square, phi coefficient, contingency coefficient, and Cramer's v tests were used for statistical analysis. The level of significance considered was $P<.001$. When the questionnaires were distributed, parents were instructed about "oral breathing" to make answers reliable.

RESULTS

Nine hundred eighty-seven questionnaires were returned in a preliminary analysis, and only 502 were randomly collected for use in this preliminary study.

The prevalence of nutritive and non-nutritive sucking habits was 84% for the subjects studied. Among the 502 children, the highest percentage was in the 60- to 71-month (18%) and 72- to 83-month (41%) age groups (Table 1).

A higher prevalence of breast-feeding was observed during the first 3 months of life (26%). There was a gradual decrease in the percentage of breast-feeding until 12 months (14%), when the decrease became abrupt (Table 1).

Bottle-feeding was used by 83% of the children. Its use increased until the 36- to 47-month age group, decreasing 53% after this age but continuing up to 71 months of age (Table 1).

Table 2. Frequency of the Pacifier Use in the Sample*

Pacifier	Frequency (%)
Used	316 (63)
Did not use	178 (36)
Did not answer	8 (2)

*Chi-square=284.4781; df=2; P<.0001; sample size=502.

Table 3. Age of Pacifier-sucking Habit Removal

Pacifier removal (mos)	Frequency (%)
Did not use	158 (31)
Did not remove	175 (35)
0-3	2 (1)
4-6	6 (1)
7-11	1 (1)
12-23	19 (4)
24-35	29 (6)
36-47	36 (7)
48-59	21 (4)
60-71	20 (4)
72-83	2 (1)
Did not answer	33 (7)

*Chi-square=497.8606; df=8; P<.0001; sample size=502.

The pacifier was used by 63% of the sample (Table 2). Its use increased gradually until the 36- to 47-month age group, when the increase peaked.

There was a clear tendency to decrease breast-feeding as ages increased. Bottle and pacifier use presented an inverse tendency.

Children in the 36- to 47-month (11%) and 60- to 71-month (10%) age groups maintained the habit for the longest time.

In this study, pacifier use cessation was observed most frequently in the 36- to 47-month (7%) and 24- to 35-month (6%) age groups (Table 3). For these age groups, the methods of pacifier use elimination were:

1. placing unpleasant flavor substances on the pacifier (24- to 35-month age group);
2. abrupt interruption (36- to 47-month age group).

Abrupt interruption means the parents refused to give the pacifier to the children, determining the habit removal (Figure 1).

Figure 2 verifies that, although the abrupt interruption of pacifier use was the most used method, the habit was most successfully interrupted when a professional explained the method to the child.

The methods used most often in this study to eliminate the pacifier-sucking habit were:

1. abrupt interruption (111; 22%);
2. parents' explanations to the children (29; 6%);
3. use of unpleasant flavor substances on the pacifier (5; 1%);
4. spontaneous removal by the children (13; 3%);
5. professionals' explanation to the children (10; 2%).

Of the parents, 23% had decided not to curb the sucking habit, and 12% did not answer the questionnaires.

The professionals' explanations, use of substances on the pacifier, abrupt interruption of the habit, and parents' explanations were efficient in 90%, 80%, 64%, and 38% of the cases, respectively (Figure 2). The use of substances on the pacifier and the abrupt interruption of the habit were most effective for the 24- to 35-month and 36- to 47-month age groups, respectively.

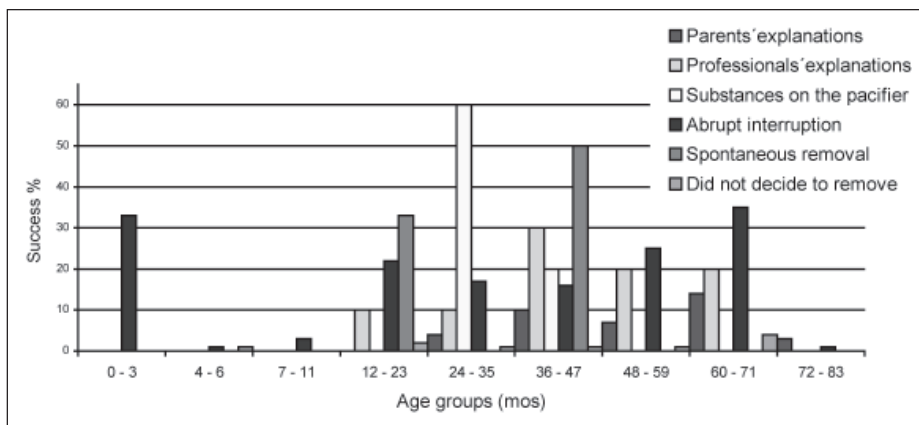


Figure 1. Success percentage of pacifier-sucking habit elimination methods, according to age groups.*

*Chi-square=1051.7331; df=12; P<.0001; sample size=502.

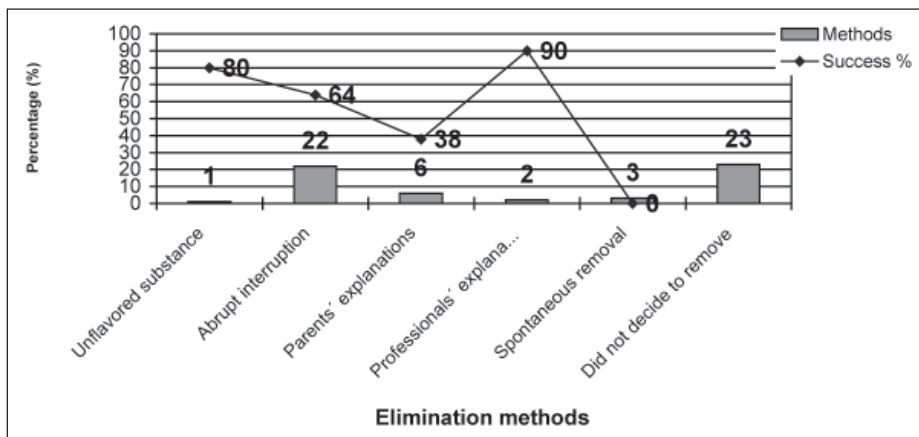


Figure 2. Pacifier-sucking habit elimination methods*

*Chi-square=28.4781; df=2; P<.0001; sample size=502.

DISCUSSION

The increase in the incidence of pacifier sucking has been attributed to interruption of breast-feeding, or even its decrease.^{1,3,5,6}

In the present study, the low frequency of breast-feeding, induced by baby bottle use as a feeding method, corroborates previous findings. In this study only 16% of parents reported not to have used breast-feeding as the only way to feed their children. Even so, the breast-feeding period was short, on average (3 months)—peaking in the 0- to 3-month age group then decreasing until the 12- to 23-month age group, when it decreased abruptly. This performance could be explained by the fact that all children in the sample attended a day care center full time. For that reason, most mothers stopped breast-feeding their babies exclusively, and the children were bottle fed while at the day care centers.

In this sample, some children were breast fed until 3 years of age. However, this percentage is very low (3%). This differed from the results found by Van der Laan,¹⁵ which affirmed that, among Amazonian Indians, the breast-feeding period lasted until 3 years of age, when the children had already become accustomed to adult feeding.

Lutaif⁶ showed indiscriminate pacifier use as more a need of the parents than the child—a fact confirmed in this study. The pacifier is often used after a child is fed, even when the child does not show a need to continue sucking. Parents often rely on it to calm their child, and not to provide an extra suction experience, as stated by Bowden and Orth.^{4,10}

This study demonstrated that sample children who were breast fed until 3 years of age did not use a pacifier and baby bottle. This corroborated the results of Van der Laan¹⁵ who observed that many Indians—having been breast fed exclusively until 3 years of age—retain their teeth as they grow old, with no registrations of open bites, malocclusion, and oral breathing.

The pacifier use pattern showed gradual increase among children until 12 to 23 months of age. After that, there was an abrupt increase in the habit rate, peaking at 36 to 47 months. From that age on, a decrease in the indexes, which increased in the 72- to 83-month age group, showed a percentage similar to the peak. Studies of Larsson¹² showed that pacifier-sucking habits declined quickly

until 3 years of age. Larsson¹⁷ observed that, until 2 years of age, half the children had stopped the pacifier-sucking habit and at 6 years of age, only 1% continued the habit. Children in the study sample came from low-income families and attended day care centers full time, which could have influenced the continuity of the pacifier-sucking habit. Hence, the habit may be attributed to the cultural level of that population. A significant percentage of people responsible for the children were not interested in eliminating the habit, suggesting ignorance of occlusal alterations provided by the habit.

Sucking habits are considered deleterious when prolonged, so non-nutritive sucking habits have been well studied. Several methods have been advocated for that habit's eradication, among them: (1) counseling and awareness; (2) placing unpleasant-tasting substances on the pacifier; and (3) abrupt removal of the pacifier. However, many of these methods are empirical.

Tartaglia et al¹⁸ concluded that the most used method was "counseling and awareness" (81%). In this study, however, the most frequently used methods were, in order: (1) abrupt interruption; (2) parental explanations to the child; (3) use of substances on the pacifier; (4) spontaneous removal of the pacifier; and (5) explanation to the child by professionals.

Abrupt interruption means the parents refused to give the pacifier to their children. Although this method was the most used, the best results were achieved when professionals' explanations were given to the children. They were warned about the harmful consequences of the extended pacifier use related to low-income level, which did not allow easy access to professionals, such as dentists, speech language pathologists, and pediatricians.

CONCLUSIONS

Based on this study's results, it can be concluded that:

1. Bottle-feeding and the pacifier were used frequently by the children.
2. An indirect linear relationship exists between breast-feeding and pacifier use: the more the child was breast fed, the less the pacifier was used.
3. Among children breast fed until 12 to 23 months, the pacifier-sucking habit was observed 3.7 times less than among children breast fed until 0 to 3 months.
4. A significant portion of the parents in this sample did not try to remove pacifier-sucking habits.
5. The most efficient method for pacifier-sucking elimination was the explanations given by professionals to the children; however it was used less often.
6. The most used method for pacifier-sucking elimination was the habit's abrupt interruption made by the parents.

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