

Association of Nonnutritive Sucking Habits and Malocclusion: A Cross-sectional Study

Nikhitha Ramesh, Deepa Guruanthan, Shanmugaavel A. Karthikeyan

Department of Pediatric Dentistry, Saveetha Dental College, Chennai, Tamil Nadu, India

Abstract

Aim: The aim of this study is to determine the relationship between nonnutritive sucking habits (NNSHs) and development of malocclusion. **Objective:** The objective of the study is to assess the association of NNSHs and malocclusion. **Materials and Methods:** A total of 400 children between the age group of 3–6 years were examined for the presence of NNSHs, and factors that influence the habit were assessed through a questionnaire that was distributed to the parents of all the children and their oral cavity was examined for the presence of malocclusion. **Results:** Out of the 230 children who took part in the study, 61% of them showed the presence of a digit-sucking habit. Factors such as parent's education, socioeconomic factors, and duration of breastfeeding had a positive influence on NNSH. It was found that 58.1% of digit suckers showed the presence of malocclusion. **Conclusion:** Digit-sucking habits were found in three-fourth of the children and found a significant association between NNSH and malocclusion.

Key words: Children, habits, malocclusion

INTRODUCTION

Normally developed infants have an inherent, biological drive for sucking. This need for sucking can be satisfied either through nutritive sucking, including breast- and bottle-feeding, whereby the infant obtains food or through nonnutritive sucking on objects such as digits, pacifiers, or toys that may serve primarily to satisfy psychological needs.^[1]

Habits are acquired automatisms, represented by an altered pattern of muscle contraction with complex characteristics, which proceed unconsciously and on a regular basis.^[2] Some habits occur in the oral region and may have harmful effects on health; promoting changes in dental, bone, and muscle tissues; and their development being determined by intensity, frequency, and duration of inappropriate pressure.^[3]

The craniofacial growth and development, including muscles, bones, and teeth, has been investigated by scientists over the last years. Based on the functional matrix hypothesis of Moss and Salentijn,^[4] one can infer that the breastfeeding process would work as a matrix that provides the biomechanical stimuli ideally necessary for craniofacial development.^[5,6] Conversely, nutritive and nonnutritive suction and oral breathing would also work as inadequate functional

matrices, misshaping the bone, and muscle structures that will form the dental spaces.^[7] In this context, as teeth erupt and get in contact with all the relations already established, visible and transitory or permanent alterations start to appear. These alterations end up causing bone and muscle disorders and malocclusion in children.^[8,9]

Malocclusion is a disorder affecting normal development of the occlusion and has a multifactorial etiology. Factors such as socioeconomic status and parents education have been associated with higher prevalence of nonnutritive sucking habits (NNSHs) which lead to malocclusion.^[10] The objective of this study is to assess the influence of factors such as parents education, birth rank, socioeconomic status, duration of breastfeeding on NNSHs, and the effect of these habits on dentition.

MATERIALS AND METHODS

A cross-sectional survey was conducted through a questionnaire and clinical examination. The sample size was determined

Address for correspondence: Dr. Deepa Guruanthan,
Saveetha Dental College, Chennai, Tamil Nadu, India.
E-Mail: drgdeepa@yahoo.co.in

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How to cite this article: Ramesh N, Guruanthan D, Karthikeyan SA. Association of nonnutritive sucking habits and malocclusion: A cross-sectional study. *Int J Pedod Rehabil* 2016;1:15-8.

using open Epi software 2.1.3 version (Centres of disease control and prevention, georgia, USA), with power of 80% and confidence interval level 95%. The estimated sample size was 230. Ethical approval to conduct the study was given by Saveetha University, Chennai (SRB/STUG15/42). The study included 400 children, out of which 230 children had NNSH. The questionnaires were distributed to the parents of all these children. The questionnaires included a written informed consent form that was filled by each parent. The exclusion criteria included children with any kind of chronic illness and disability. The questionnaire included questions on parent's education, socioeconomic status, duration of sucking habits, birth rank, child's previous or persisting sucking habits, methods used to intervene, and duration of breastfeeding. The assessment of malocclusion was done in children with both primary and mixed dentition. All the examinations were done by one examiner using mouth mirror and pen light. The assessment of malocclusion involved the following parameters of degree of overbite, amount of overjet, and posterior crossbite. Intra-examiner reliability was assessed at 15-day interval and had a kappa value of 0.8. The data were collected over a period of 3 months. Data entry was done in SPSS version 18 (IBM corporation, Chicago, US) and statistical analysis was performed. Chi-square analysis was used to analyze the association of NNSH and malocclusion.

RESULTS

A total of 230 children participated in the study, of which 57% were boys and 43% were girls. Of the 230 questionnaires distributed to the parents of children who were part of the study, 61% of the parents found that their child had a digit-sucking habit while 21% of the parents found that their child had a dummy-sucking habit. Fifteen percent of the parents found that their children used other objects for sucking apart from digit or dummy objects while 3% have noticed that their child possess both digit- and dummy-sucking habit. This is illustrated in Figure 1.

It was seen that 73.9% of the children had 2–5 h duration of sucking habit while 18.3% had duration of less than an hour and 7.8% >6 h. The duration had much a significant relationship with the prevalence of the habit as shown in Table 1.

In the present study, it is seen that 33.8% had malocclusion when breastfed for 1–2 years while 66.2% were found with the presence of malocclusion with a breastfeeding duration between 0 and 1 year as shown in Table 1.

According to this study, it is seen that 17.8% of the children with digit sucking had parents with middle school level of education and 47.4% of the digit suckers were found to belong to the lower economic status of the society as illustrated in Table 2.

DISCUSSION

The study was based on parent's opinion on their child's NNSHs and a clinical examination of the child. Hence, the

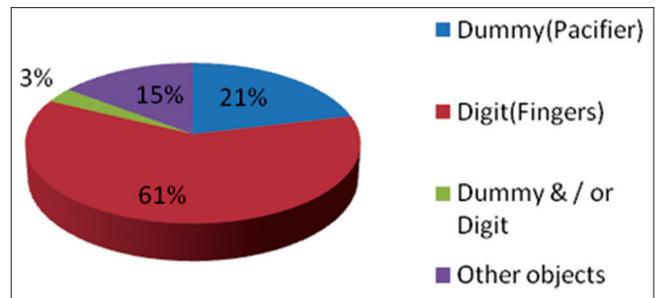


Figure 1: Distribution of the nonnutritive sucking habit.

Table 1: Association of the habit and breastfeeding to malocclusion

	n	Malocclusion		P*
		Yes	No	
NNSH				
Pacifier	49	25	24	0.04*
Digit	0	79	61	
Both	7	5	2	
Others	34	27	7	
Duration of habit (h)				
<1		25	17	0.03
1-3		96	74	
>3		15	3	
Duration of breastfeeding (years)				
0-1		90	70	0.04
1-2		46	24	

*P value calculated using Chi-square test, P<0.05 considered statistically significant. NNSH: Nonnutritive sucking habit

questions were addressed to the parents of the children who were examined. NNSHs have aroused considerable interest because of their association with dental occlusal disorders and the child behavior as a whole. Knowledge about the factors associated with the development and persistence of these habits is of paramount importance.^[11]

Studies show that participants had a higher frequency of finger sucking in relation to other objects or the pacifier^[12,13] since the finger is always more accessible than the pacifier.^[14] The present study also shows that digit sucking is more common than dummy sucking as children also have easy access to their fingers and these children are usually not exposed to pacifiers.

It was reported that in the district of Baghdad, the percentage of children having increased overjet, overbite, openbite, and crossbite is higher in the group having NNSHs.^[15] This was in accordance with the present study which showed an increased presence of malocclusion in children with an NNSH.

The findings of a study done by Wareen *et al.* (2002)^[16] indicated that longer the duration of the NNSH, higher was the prevalence of malocclusion in children with mixed dentition. However, the present study did not show any statistically significant association of duration of sucking and malocclusion. This can be attributed to the smaller sample

Table 2: Distribution of the socioeconomic status, education of the parents, birth order of the child to the type of habit

Contributing factors	Pacifier suckers (%)	Digit suckers (%)	Pacifier and digit (%)	Other objects (%)
Parents education				
No formal education	1.3	2.2	0.4	0.9
Elementary school	3.5	9.1	0.4	2.2
Middle school	6.5	17.8	0.4	5.7
High school	7.8	17.4	0.9	2.2
Degree	2.2	0.3	0.9	3.9
Socioeconomic status				
Lower middle class	0.4	3	0	1.3
Upper lower class	3	10.4	1.3	3
Lower class	17.8	47.4	1.7	10.4
Child's birth order				
First	7.3	28.2	1.7	5.6
Other	13.9	32.6	1.3	9.1

size and poor memory of the parents on the exact duration of sucking.

A study conducted in Pune suggested that a reduced duration of breastfeeding leads to the child's indulgence in various NNSHs, and disturbance of orofacial equilibrium takes place which has been associated with various malocclusions.^[17] This is in accordance with the present study which shows that longer the duration of breastfeeding, lower is the prevalence of malocclusion.

A study by Larsson^[18] showed results in accordance to the present study which reported no significant relationship between the child's birth rank and the NNSH.

In a study conducted in Saudi, it found that the association of parent's education and the NNSH showed that the higher the level of parents' education, the greater was the probability that the child was a dummy sucker and the findings of digit sucking did not show significant association between the level of parent's education and the prevalence of the habit.^[19] The present study showed that parents with middle school education showed greater prevalence of digit-sucking habits and this can be due to the fact that they have noticed the habit more.

The results from previous studies show that family income did not predict digit- or dummy-sucking habits.^[20-22] This in contrast to the present study showed that children belonging to the lower socioeconomic class had a higher prevalence of digit sucking. This may be due to fact that these parents had low awareness and did not take measures to intervene.

CONCLUSION

The results of the study show that digit-sucking habits were found in three-fourth of the children who were part of the study. There was a significant association between NNSH and malocclusion. It was also found that there was no significant effect of birth rank and the prevalence of the habit. The duration of the habit did not significantly alter the presence of malocclusion.

Limitations

The limitations of this study were the small sample size and the study was done over a large area.

Recommendation

A longitudinal study over a period to evaluate the association between various factors and NNSHs and to evaluate the association between NNSHs and malocclusion is recommended.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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