

# Prevalence of non-nutritive sucking habits and its relation with anterior open bite in children seen in the Odontopediatric Clinic of the University of Pernambuco

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**Objective:** The aim of this work was to establish the prevalence of non-nutritive sucking habits (pacifier and/or digit sucking) and to assess its relation with anterior open bite.

**Methods:** The sample consisted of 980 records of children of both genders, with ages between 3 and 12 years, who were treated at the Pediatrics Clinic of the University of Pernambuco (FOP/UPE), from February 2000 through December 2005, both sexes. Pearson's Chi-square test at 5% level of significance was used for statistical assessment.

**Results:** It was observed that 17,7% of the sample had some habit at the moment of the anamnesis (9,6% of digit sucking habit, 8,8% of pacifier sucking habit and 0,7% of both habits) and that the prevalence of open bite was 20,3%. The prevalence of sucking habits in girls was much higher than in boys (22,6% and 12,9%, respectively) and this difference was statistically significant ( $p = 0,000$ ). A correlation between habits and open bite was proved statistically ( $p = 0,000$ ): Children with sucking habits had 8 times more chances of developing anterior open bite.

**Conclusions:** Anterior open bite was associated to the presence of non nutritive sucking habits; sucking habits were more prevalent in girls and in children between three and six years of age.

**Keywords:** Habits. Open bite. Suction. Prevalence.

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## INTRODUCTION

Suction is a primitive and innate reflex, which starts on the 29<sup>th</sup> week of intrauterine life and is one of the earliest patterns of behavior exhibited by the newborn.<sup>33</sup> It is crucial for the survival of the newborn and is responsible for the first emotional link with the mother.<sup>8</sup>

In the early years of life, muscle exercises carried out by suction during breastfeeding promotes the correct development of the structures of masticatory system, through the balance of muscular forces of inner and external containment.<sup>4</sup>

Whenever there is a disturbance of these forces, dentofacial deformations will occur in regions of atypical pressures. It is what happens in the presence of non-nutritive sucking habits, bringing a series of disorders to the stomatognathic system, i.e., a reduced vertical growth of the anterior portion of alveolar process, upper incisors proclination and anterior displacement of maxilla due to horizontal force. The lower incisors can undergo proclination or even retroinclination, in owing to the tension of lower lip, to the tongue during swallowing and/or to the presence of the digital pressure.<sup>35</sup>

Therefore, the dental arch form depends on a harmonious balance between all the soft tissues that surround it. Any change in this muscular balance, along with the other causes, may cause a malocclusion, especially when this balance is broken by a detrimental oral habit.<sup>2</sup> The habit, on its turn, is originated by the repetition of an act, which becomes unconscious and starts to be incorporated into the personality of an individual.<sup>29</sup>

Some oral habits are part of the behavior of small children, however they may become harmful or damaging when occurring in a extensive or inappropriate way. Nevertheless, the harmful effect of prolonged sucking habits in the development of occlusion and facial growth of the child depends on some parameters like: Duration, frequency and intensity of sucking habits (Graber's triad), position of the pacifier in the mouth, age when the habit was ceased and growth pattern of the child.<sup>11,16</sup>

The extensive duration of non-nutritive sucking habit has been strongly associated with anterior open bite,<sup>1,9,15,18,23,37,42,43</sup> which is defined as the presence of negative overbite existing between the

incisal edges of upper and lower anterior teeth.<sup>31</sup>

Children in pre-school age, presenting non-nutritive sucking habits, have four-fold risk in developing open bite compared to children not presenting such habits<sup>41</sup>. Worth noting, however, is that the self-correcting of this malocclusion is observed if the deleterious habits cease during the period the deciduous dentition and beginning of mixed.<sup>18,22,27</sup>

Within this context, This study aimed to verify the prevalence of non-nutritive sucking habits and its relationship to anterior open bite in children assisted in the clinic of Pediatric Dentistry, Faculty of Dentistry of Pernambuco (UPE/FOP).

## MATERIALS AND METHODS

The sample consisted of 980 records of children from 3 to 12 years of age, of both genders, who were treated at the pediatric clinic of Dental School of the University of Pernambuco (FOP/UPE) from February of 2000 to December of 2005. The legal guardians of the patients signed a free and informed consent allowing the analysis and publication of data collected.

The database was composed of information about gender, date of birth, year of anamnesis, presence or absence of non-nutritive sucking habits, type of sucking habit (pacifier and/or digital sucking), type of dentition (deciduous or mixed), and presence or absence of anterior open bite. In order to simplify data analysis, it was decided to divide the sample into age (3 - 6 years, 7 - 9 years and 10 - 12 years).

The results were analyzed using the software Statistical Package for the Social Sciences (SPSS), version 11.0. Pearson's Chi-square test ( $\chi^2$ ) and Fisher's exact test, whenever  $\chi^2$  couldn't be performed, a significance level of 5% were used for data analysis.

## RESULTS

The sample consisted of all patients seen in the Pediatrics Clinic of FOP/UPE, from 3 to 12 years old with the purpose of obtaining a representative sample.

After data analysis it was verified that 17.7% of children were exposed to non-nutritive sucking habits (9.6% digital sucking, 8.8% pacifier sucking and 0.7% digital and pacifier sucking) and that 20.3% presented anterior open bite.

In this study there was difference between

genders regarding the prevalence of non nutritional sucking habits, with the girls showing a higher prevalence of sucking habit (Table 2).

In Table 3, the prevalence of sucking habits according to age group can be seen. It was significantly greater in the age group between 3 and 6 years of age ( $p = 0.022$ ) and there was a reduction

of habits prevalence with age increase.

A significant association could be observed ( $p = 0.000$ ) between sucking habits and the previous open bite.

The anterior open bite was more prevalent in females (24.4%) than in males (16.3%), and this difference was statistically significant (Table 5).

**Table 1** - Prevalence of anterior open bite and non-nutritive sucking habits.

Variables	Present	Absent	Total
	n (%)	n (%)	n (%)
Anterior open bite	199 (20.3)	781 (79.7)	980 (100.0)
Sucking habit (digital and/or pacifier)	173 (17.7)	807 (82.3)	980 (100.0)
Digital sucking	94 (9.6)	886 (90.4)	980 (100.0)
Pacifier sucking	86 (8.8)	894 (91.2)	980 (100.0)
Digital and pacifier sucking	7 (0.7)	973 (99.3)	980 (100.0)

**Table 2** - Prevalence distribution of sucking habits, according to gender.

Gender	Sucking habit		Total	p Value
	Present	Absent		
	n (%)	n (%)	n (%)	
Male	64 (12.9)	433 (87.1)	497 (100.0)	$p = 0.000^{(1)}$
Female	109 (22.6)	374 (77.4)	483 (100.0)	

(1) By Pearson's chi-square test. OR = 0.507; IC = 0.362 - 0.711.

**Table 3** - Prevalence distribution of non-nutritive sucking habit according to age.

Age	Pacifier sucking habit		Total	p Value
	Present	Absent		
	n (%)	n (%)	n (%)	
3 to 6 years	76 (22.1)	268 (77.9)	344 (100.0)	$p = 0.022^{(1)}$
7 to 9 years	62 (16.1)	323 (83.9)	385 (100.0)	
10 to 12 years	35 (13.9)	217 (86.1)	251 (100.0)	

(1) By Pearson's chi-square test

**Table 4** - Association between anterior open bite and non-nutritive sucking habits.

Sucking habit	Anterior open bite		Total	p Value
	Present	Absent		
	n (%)	n (%)	n (%)	
Present	94 (54.3)	79 (45.7)	173 (100.0)	$p = 0.000^{(1)}$
Absent	105 (13.0)	702 (87.0)	807 (100.0)	

(1) By Pearson's chi-square test. OR = 7.955; IC = 5.535 - 11.453.

**Table 5** - Anterior open bite prevalence, according to gender.

Gender	Anterior open bite			p value
	Present n (%)	Absent n (%)	Total n (%)	
Male	81 (16.3)	416 (83.7)	497 (100.0)	p = 0.002 <sup>(1)</sup>
Female	118 (24.4)	365 (75.6)	483 (100.0)	

(1) By Pearson's chi-square test. OR = 0.602; IC = 0.439 - 0.826

## DISCUSSION

Digital and pacifier sucking habits have been the subject of research for many years. In this study, the prevalence of sucking habits was lower than what other have reported,<sup>21,23</sup> this was probably due to the wide-range of ages in the studied sample, since children from 3 to 12 years of age were evaluated.

Girls showed a higher prevalence of sucking habits than boys. These results agree with other papers which point out the existence of a cultural feature of differentiation between genders in relation to sucking habits.<sup>19,25,32,34</sup>

Studies show that the non-nutritive sucking habits are common among children in pre-school age.<sup>6,23,40,41</sup> These data have been ratified by the results found in this study. It was possible to see a reduction of habits prevalence with age increase, indicating a natural tendency of the children to cease such habits.<sup>1,18,22</sup>

The results of this study clearly showed the influence of non-nutritive sucking habits in the presence of anterior open bite. Children with sucking habits had almost 8 times more chance of showing anterior open bite.

There is a consensus on the literature, that non-nutritive sucking habits increase the risk factors for skeletal malocclusions, particularly on the anterior open bite.<sup>1,5,6,10,14,17,23,24,37,40,41,43</sup> The presumable cause of anterior open bite in children with sucking habits is the vertical growth inhibition in the anterior part of alveolar process, but if the habit ceases during the growth phase, the possibility of spontaneous correction could be very satisfactory.<sup>28</sup> A gradual reduction in the prevalence of anterior open bite was observed, possibly due to occlusal development itself by the maturation of the

individual, what facilitates the elimination of deleterious habits by the adenoids size decrease and by the establishment of a normal adult swallowing, due to the removal of external causal factors.<sup>7,13,38</sup>

Differences were found between the genders in regards to the prevalence of malocclusion, differing from the findings of other authors.<sup>20,36</sup> This difference can be explained by the higher prevalence of sucking habits observed in girls, since the presence of malocclusion was strongly associated with such habits.

Due to the transversal nature of this study, it was not possible to verify if children without sucking habit and that showed anterior open bite had some kind of sucking habit before the examination.

Given the results found and in regards to preventive measures, an early intervention on these habits is suggested. This can be done through guidance and awareness of patient and/or guardians,<sup>44</sup> in order to prevent or intercept the appearance of unwanted occlusal changes, which can become more complex and may involve more expensive treatments.<sup>39</sup> Moreover, the elimination of sucking habits between four and six years of age can allow a self-correction of anterior open bite.<sup>3,12,22,26,30</sup>

## CONCLUSIONS

Based on obtained results it can be concluded that:

- » The prevalence of digital and pacifier sucking habits were 9.6 and 8.8%, respectively.
- » Non-nutritive sucking habits were more prevalent in females, in children ranging from three to six years of age.
- » The anterior open bite was associated with the presence of non-nutritive sucking habits and was more prevalent in females.

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