

# Efeito da interceptação precoce dos hábitos orais no desenvolvimento da oclusão\*\*\*\*

## Effect of the early intervention of oral habits on the development of dental occlusion

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### Abstract

**Background:** sucking habits are related to malocclusion. **Aim:** to evaluate the effect of a counseling interview about inhibiting this oral habit and, its influence on dental occlusion and labial-lingual posture. **Method:** 40 children (mean age = three years), with a sucking habit and anterior open bite, received counseling aiming for the interruption of this habit. Measurements of the open bite were made, as well as a myofunctional evaluation, prior to counseling and, three and six months after it. **Results:** 26 children stopped with the habit of sucking, with 25 children presenting a reduction of the open bite. No change was observed in labial-lingual posture. **Conclusion:** the counseling interview favored the interruption of the oral habit and the correction of the open bite.

**Key Words:** Habits; Open Bite; Malocclusion.

### Resumo

**Tema:** hábitos de sucção associam-se às más oclusões dentárias. **Objetivo:** analisar o efeito da entrevista de esclarecimento sobre a interrupção do hábito e sua influência na oclusão dentária e postura lábio-lingual. **Método:** 40 crianças (média de idade = três anos) com hábito de sucção e mordida aberta anterior foram orientadas visando a interrupção do hábito. Realizou-se medições da mordida aberta e avaliação miofuncional no início da orientação, três e seis meses após. **Resultados:** 26 crianças cessaram o hábito, com redução da mordida aberta em 25. Não houve mudança na postura lábio-lingual. **Conclusão:** a entrevista de esclarecimento propiciou a interrupção do hábito e a correção da mordida aberta anterior.

**Palavras-Chave:** Hábitos; Mordida Aberta; Má oclusão.

## Introduction

Sucking habits are frequent in children and tend to begin during the first three years of age (Lutaif, 1999; Nagem, 1999; Soncini & Dornelles, 2000). The explanations for these habits installation vary between the physiologic need of sucking (Douglas, 1999; Larsson, 2001), cultural matters (Levine, 1998) and socio-economic matters (Farsi et al., 1997). The sucking without nutritive aim may condition the installation of unwanted habits, directly or indirectly promoting dento-alveolar morphology disorders, depending on the frequency, intensity and duration of the habit (Robles et al., 1999; da Costa & Orenuga, 2002; Zardetto et al., 2002; Bishara, 2004), and, furthermore, it may interfere on the normal pattern of facial growing. (Larsson, 2001). The balance burst between muscles and perioral tissues may generate abnormal pressures and, consequently, change the normal growth stimulus of the jaws (Josell, 1995; Enlow & Hans, 1998; Karjalainen et al., 1999; Cayley et al., 2000; Warren et al., 2000; Warren et al., 2001; Warren & Bishara, 2002).

Oral habits, such as pacifier and bottle sucking, when performed very often and intensively may cause occlusion disorders, such as frontal openbite, crossbite of the back teeth and disorders in lingual and labial posture (Graber & Vanarsdall, 1994; Soligo, 1999; Ramos-Jorge et al., 2000; Tomita et al., 2000; Martinez & Assêncio-Ferreira, 2001; Amary et al., 2002; Charchut et al., 2003). However, Santana et al. (2001) verified that the presence of habits does not determine the existence of frontal openbite.

The tongue is connected to the frontal region of the palate acting with a powerful strength of vacuum traction capable of maintaining the mandible elevated, leaving the posterior airway unblocked, in normal conditions (Tessitore & Crespo, 2002). Proffit (2000) described that, after the breaking of the sucking habit in children, the openbite tends to close spontaneously, however the tongue thrust persists while the openbite is closing.

Fayyat (2000) affirmed that the pacifiers and bottle use until the two and a half years of age does not hinder the occlusion, or if so, it hinders only the anterior segment.

Boni (1997) found that there were changes in the positioning of the incisors and, consequently decrease or closure of the anterior openbite in children from 4 to 6 years of age, due to the breaking of the sucking habit of pacifier or bottle through an awareness method and positive reinforcement.

Degan et al. (2001) described that pacifier or bottle sucking habits must be removed, so that malocclusions, such as openbite are avoided, reduced or even corrected, allowing an harmonic development of the estomatognathic system structures and its functions.

Considering these aspects, the purpose of this study was to analyze the effect of a clarifying interview about the interruption of the pacifier and bottle sucking habits and its influence on the dental occlusion and labial-lingual posture.

## Method

The project was approved by the Ethics Committee of the Speech and Hearing Pathology Course of University of Ribeirão Preto (process number 13/2002). Forty children from 2 to 6 years old, males and females, were selected from the preventive program "Odonto-bebê" of the Health Unity José de Mello I of Batatais, São Paulo. All of them presented pacifier and/or bottle sucking habits and anterior openbite, associated or not to crossbite of the back teeth. The parents or legal guardians of the children agreed with the conduction of the research and with the following publication of the results, signing the Informed Consent according to the Resolution 196/96 of the Health Ministry/ National Health Counsel/ National Commission of Research Ethics.

Initially, the anamnesis was performed with the parents and the children, questioning about: the type of feeding, the presence of respiratory disorders and oral habits, such as pacifier, bottle or both, and the frequency of the habit.

Furthermore, the children underwent myofunctional evaluation regarding lips posture, tongue positioning and the presence of anterior openbite and crossbite of the back teeth. The evaluation protocol used was developed by Felício (1999; 2002) regarding the aspect of lips and tongue posture.

The lips posture and tongue position were observed since the entrance of the child in the clinic until his departure, and when the child was distracted. When a child presented alteration of lips posture, his parents were asked about: colds, nose blocking among other causes of oral breathing. In the presence

of these problems, the lips posture and tongue position were not considered in this evaluation. For the analysis of the lips posture, an altered posture was considered when a child presented separated lips. For the analysis of the tongue position, only the interdentalization of the tongue was considered an altered position.

The measurement of the anterior openbite was performed through a ruler from the incisal edge of the lower central incisor until the incisal edge of the upper central incisor and it was registered in the evaluation protocol.

The oral cavity was inspected regarding the presence or absence of unilateral or bilateral posterior crossbite. It was considered a crossbite when there was an abnormal relation vestibule-lingual of the back teeth, that is, the vestibular cusps of the maxillary back teeth occluding the vestibular cusps of the lower teeth (Moyers, 1991).

In the first evaluation, the children and at least one of the parents received counseling concerning the need to interrupt the pacifier and bottle sucking habits. Clinical photographs, book pictures, mirror and photographs of already treated patients were used to clarify the harmful effects caused by the habit.

After three months, the child returned for the re-evaluation and the same guidance about the damages caused by the pacifier and bottle sucking habit was given. The same clarifying material of the first session was used in cases where there was no interruption of the habit.

Six months after the initial clinical exam, the same evaluation was performed in order to obtain information about the breaking of oral habits and the lips posture and tongue position. The anterior openbite of the 40 subjects was also measured in the three phases. A reduction in the openbite was considered when the inter-incisor distance decreased at least 1 mm from Phase 1 to Phase 3.

To analyze the habits' incidence and frequency, the binomial test was used. Afterwards, the sample was divided in two groups: one with children who had broken the pacifier and/or bottle sucking habit (GI); and another with children who didn't break the habit (GNI). The two groups were compared in the three phases concerning the lips posture, through Chi-square test, and concerning the tongue position, through the Fisher test. The openbite measure was analyzed intra-group, by the Wilcoxon test.

## Results

Forty subjects from 2 to 6 years old, 16 female and 24 male, were evaluated (mean age = 3 years old). Eight of them had only pacifier sucking habit, 32 used pacifier and bottle and none presented only bottle sucking habit. The prevalence of the pacifier sucking habit associated with the bottle use was significant at 1% level, when compared to the isolated pacifier sucking habit ( $Z=3,64$ ,  $p<0,01$ ). The number of subjects who used the pacifier in the three periods of the day was also significant when compared to the number of children who used it only at night or during two periods of the day, according to the Binomial test ( $Z=3,64$ ,  $p<0,01$ ). The frequencies can be seen in Table 1.

It was verified that, besides the anterior openbite, 6 children presented unilateral posterior crossbite and one child presented bilateral posterior crossbite, although there was no statistical significance ( $p>0,05$ ).

Through the Chi-square test, the group of subjects who interrupted the sucking habits (GI=26 subjects) was compared to the group of subjects who didn't interrupt the habits (GNI=14 subjects) regarding the presence or absence of lips posture alteration. There was no statistical difference between the groups in any of the three phases, that is, in the initial phase (P1), in the intermediary phase (P2) and in the final phase (P3). Also, there was no statistical difference between the groups GI and GNI regarding the tongue position in the three phases, according to the Fisher test (Table 2).

Considering the inter-incisor distance in P1 and P3, it was observed that 27 children presented reduction of the openbite, 10 didn't present reduction, and 3 presented increase of the openbite. In the group GI, 25 children presented reduction of the openbite while in the group GNI, only two children presented reduction of it (Table 3). Figure 1 shows three examples of reduction of the anterior openbite.

The openbite measures were compared intra-group in the three phases, through the Wilcoxon

test. There was statistical difference of the measures of the openbite between the phases in the group GI ( $p < 0,01$ ), but not in the group GNI (Table 4).

## Discussion

The prevalence of the pacifier sucking habit associated with the bottle use was significantly higher when compared to the isolated habit of pacifier sucking. Usually, the habits start in the first months of life (Lutaif, 1999; Nagem, 1999; Soncini & Dornelles, 2000). Larsson (2001) affirmed that the discontinuing of the natural breastfeeding or the lower frequency of it lead to the use of bottle and, furthermore, predispose the child to develop a nonnutritive sucking habit. The child has a sucking instinct that varies in degree, although it is significant; if the child is not satisfied after feeding, he/she is likely to search whatever is available to obtain the satisfaction, that is, the finger or the pacifier.

According to Douglas (1999), the bottle feeding does not allow the child to exercise the main muscles involved in sucking and swallowing, once during breastfeeding the child needs to suck with intensity, leading to the exhaustion of the sucking reflex and to a well being sensation. Levine (1998) stated that the prevalence of nonnutritive sucking varies and depends on various aspects, such as culture for example. These habits are not common in Africa and are unknown by the Eskimos. While in western countries, 95% of the children present some kind of habit. The digit sucking is more common in higher socio-economic groups and in girls. Farsi et al. (1997) evidenced that the prevalence of sucking habits seems to be higher in industrialized countries' children. These differences suggest that these habits are influenced by the handling of children that differs from one population to another, insinuating that environment factors have a more important role on the appearance of the habit than genetics influence itself.

According to the results obtained in this study, the number of children who had the pacifier sucking habit during the three periods of the day was statistically higher when compared to those who had it only at night or in two periods, indicating a very high frequency of this habit in the studied sample. Many authors agree that the effect of nonnutritive sucking habits on teeth positioning, dental arches, and growing of alveolar processes depends on the frequency, intensity and duration of the habit (Robles et al., 1999; Proffit, 2000; Da Costa & Orenuga, 2002; Zardetto et al., 2002). However, Moyers (1991) reported that besides these factors, entities such as original morphology, feeding and swallowing pattern, swallowing maturation cycle, and growing pattern contribute to the worsening of the effects produced by the sucking habit.

Usually, it is observed an anterior openbite, a posterior crossbite and myofunctional disorders as consequence of the sucking habit (Graber & Vanarsdall, 1994; Soligo, 1999; Ramos-Jorge et al., 2000; Tomita et al., 2000; Martinez & Assêncio-Ferreira, 2001; Amary et al., 2002; Charchut et al., 2003). According to Fayyat (2000), until two and a half years of age the consequence of the sucking in the occlusion is restricted to the anterior segment.

This study showed that among the 40 children of the sample, with mean age of three years old, besides the openbite 6 children presented unilateral posterior crossbite and one presented bilateral posterior crossbite. Bishara (2004) affirmed that sucking habits lead to deformation of dental arches and of alveolar processes; although, when the habit persists beyond the eruption of the permanent incisors, the deformation can continue more constantly, once the occlusion modification allows the action of powerful muscular forces, creating a more accentuated malocclusion. Warren et al. (2000), Warren et al. (2001) and Warren & Bishara (2002) reported that during the sucking the contractions of the oral walls produce negative pressure inside the mouth resulting in narrowing of the maxillary arch. These altered strengths modify the normal growing stimulus (Josell, 1995; Enlow & Hans, 1998; Karjalainen et al., 1999; Cayley et al., 2000), producing unilateral or bilateral crossbites.

Larsson (2001) stated that the high prevalence of posterior crossbite in young pacifier users is probably due to the increased activity of the cheeks combined with reduced lingual support for the upper deciduous molars and canines. The low position of the tongue may enlarge the lower arch and, this way, contribute to the crossbite of the back deciduous teeth.

After following the 40 children of the sample during 6 months, it was observed that 16 interrupted

the pacifier and bottle sucking habit and 10 discontinued only the pacifier habit and continued with the bottle. The habit interruption usually occurred after the clarifying session, or one month after. During the evaluated period it was verified that the anterior openbite was reduced in 1 mm or more in the majority of the cases. The results allowed to perceive that 27 children presented reduction of the openbite; there was no change in the intensity of the openbite in 10 children; and 3 children presented increase of the openbite. An useful information is that of the 26 children who interrupted the pacifier habit, 25 presented reduction of the anterior openbite, showing the importance of the discontinuing of sucking habits as early as possible in order to remove the interferences, to maintain the functions and the development of the facial skeleton, as declared Boni (1997), Palanse et al. (2000), Proffit (2000), Degan et al. (2001), Degan (2004). If the interruption of the sucking habit occurs around 3 or 4 years of age, normal pressures of lips and cheeks reposition the teeth to the original position; although, if it persists after the eruption of the permanent incisors, it may be necessary an orthodontic treatment. Larsson (2001) affirmed that when the sucking habit stops, the openbite will be corrected spontaneously in a few years. Despite the fact that this malocclusion is associated with tongue thrust in swallowing, it isn't strong enough to avoid that the incisors reach normal contact. Bishara (2004) stated that some malocclusions due to sucking habits can be self corrected when the habit stops; although, it is crucial that the skeletal pattern is normal, that the habit is early interrupted, and that the deformation is mild.

The evaluation performed in this study showed that the crossbite of the back teeth was maintained after six months of the interruption of the habit, stressing Levine's (1998) statement that many disorders usually disappear when the habit is discontinued, although, the crossbite persists. Therefore, the posterior crossbite, in the majority of the cases, is not a self correcting problem (Farsi, 1997). However, for Larsson (2001), the posterior crossbite can disappear with the eruption of the permanent teeth, once the pacifier sucking habit is interrupted before the eruption of the canines and pre-molars.

The lips posture was altered in 18 subjects of the sample, remaining altered until the end of the evaluation. Josell (1995) observed that the digit sucking habit associated with malocclusion promotes labial incompetence and alteration in the resting position of the tongue. The same way, Moyers (1991) describes that the digit sucking habit favors the hypotonia of the upper lip and hypertonia of the lower lip, due to contractions of the orbicular muscle to a position between the badly positioned incisors during swallowing.

The children were not followed after the 6 months, indicating that maybe this period was too short to enable the observation of a better lips posture. Planas (1997) and Yashiro & Takada (1999) described that after the occlusion balance, the child needs to be followed every six months in order to analyze his evolution regarding the muscle and the temporo-mandibular joint (TMJ) functionality.

The tongue position was also altered in 32 subjects of the sample probably due to the pacifier use. Larsson (2001) stated that the pacifier beak forces the tongue to assume an altered position. Besides that, the motor behavior during the swallowing may be altered. Hanson & Barret (1995) reported that normal swallowing pattern patients may rest the tongue in the lower and anterior part of the mouth, in the dental arches limit, spread over the lower teeth, or protruded in constant contact with the lower lip. Factors, such as bottle feeding, environment pressure, oral breathing contribute to the maintenance of the atypical swallowing. According to Fujiki et al. (2000), the subjects with anterior openbite showed tongue protrusion, slow movement of the dorsal part of the tongue and early closure of nasopharynge during swallowing.

According to Proffit (2000), the tongue positioning between the anterior teeth persists while the openbite is being corrected. This was also seen in this study, once there was no statistical changes concerning the tongue position during the three phases of evaluation of the openbite. The tongue was positioned between the arches or settled in the lower dental arch limit.

Such findings about lips and tongue postures suggest the necessity of specific approaches to correct them. Degan (2004) verified that the myofunctional therapy was effective in reducing the anterior openbite and the muscular and functional alterations after the interruption of the pacifier and bottle sucking habits.

## Conclusion

The results obtained in this study allowed to conclude that:

1. The clarifying interview about the harmful effects of pacifier and bottle sucking and the necessity of early the interruption of it was valuable to lead children to break the habit.
2. The early interruption of pacifier and bottle sucking habit was an important factor for the spontaneous correction of the anterior openbite. The posterior crossbite wasn't modified after the interruption of the pacifier sucking.
3. The malocclusion persisted after the evaluated period, claiming for orthodontic intervention for its correction. The lips and tongue postures remained the same as in the beginning of the evaluation, indicating that they are not influenced by the interruption of the habit during the studied period. It must be considered the physiologic adaptation period and the acting of secondary factors, functional disorders such as oral breathing and tendency to vertical growing. Therefore, it would be necessary a Speech-Language therapy follow up of these children in order to observe the evolution or not of the lips posture and tongue position.

FIGURA 1. Exemplos de mudanças na oclusão dentária após a interrupção do hábito de sucção.



L. R. Id: 2a  
m. a. a. 5mm



M. D. R. J Id: 3 a 6 Meses  
m. a. a. 8mm



L. C. O Id: 3 a 2 Meses  
m. a. a. 3mm



L. R Após 6 Meses



M. D. R. J Após 6 Meses



L. C. O Após 6 Meses

TABELA 1. Frequências absolutas de acordo com os hábitos e períodos de uso da chupeta.

Chupeta		Mamadeira		Mamadeira e Chupeta		Hábitos (N = 40)					
f	f%	f	f%	f	f%	Integral		Noturno		Dois Períodos	
						f	f%	f	f%	f	f%
8	20	0	0	32	80	32	80	5	12,5	3	7,5

Legenda: f - frequência absoluta; f % frequência relativa.

TABELA 2. Comparação entre os grupos GI e GNI quanto à postura dos lábios.

Fases	Grupos	Lábios				Valor de p	Língua				Valor de p
		Normal		Alterado			Normal		Alterado		
		f	f%	f	f%		f	f%	f	f%	
F1	GI (26)	17	65,38	9	34,61	p > 0,05	6	23,08	20	76,92	p > 0,05
	GNI (14)	5	35,71	9	64,38		2	14,28	12	85,71	
F2	GI (26)	17	65,38	9	34,61	p > 0,05	6		20	76,92	p > 0,05
	GNI (14)	5	35,71	9	64,38		2		12	85,71	
F3	GI (26)	17	65,38	9	34,61	p > 0,05	6		20	76,92	p > 0,05
	GNI (14)	5	35,71	9	64,38		2		12	85,71	

Legenda: f - frequência absoluta; % f - frequência relativa; F1 - fase inicial; F2 - fase intermediária; F3 - fase final.

TABELA 3. Distribuição de frequência de acordo com o comportamento da mordida aberta da F1 à F3.

Comportamento da Mordida Aberta Anterior (N = 40)									
Redução da Mordida Aberta Anterior		Não Redução da Mordida Aberta Anterior		Aumento da Mordida Aberta Anterior		Redução da Mordida Aberta Anterior por Grupos			
f	f%	f	f%	f	f%	GI		GNI	
						f	f%	f	f%
27	67,50	10	25	3	7,5	25	96,15	2	14,28

Legenda: f - frequência absoluta; % f - frequência relativa; GI - grupo de sujeitos que interromperam os hábitos de sucção, GNI - grupo de sujeitos que não interromperam os hábitos de sucção.

TABELA 4. Resultados da comparação entre as fases, quanto às medidas de mordida aberta, de acordo com o teste de Wilcoxon.

Grupos	F1-F2		F1-F3		F2-F3	
	Valor de Z	Valor de p	Valor de Z	Valor de p	Valor de Z	Valor de p
GI	4,29	p < 0,01	4,37	p < 0,01	3,92	p < 0,01
GNI	0,53	p > 0,05	0,42	p > 0,05	0,0	p > 0,05

Legenda: F1 - fase inicial, F2 - fase intermediária; F3 - fase final; GI - grupo de sujeitos que interromperam os hábitos de sucção, GNI - grupo de sujeitos que não interromperam os hábitos de sucção.

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