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ORIGINAL

The impact of thumb sucking on the stomatognathic system

Repercusión de la succión digital en el sistema estomatognático

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ABSTRACT

Introduction: malocclusion caused by thumb-sucking arises from the effect that this habit has on the oral cavity and depends on several factors.
Objective: to evaluate the impact of thumb-sucking on the stomatognathic system in children aged 6 to 8 years.
Method: an observational, descriptive, cross-sectional study was conducted among children at the "Sarah Cordoneda García" elementary school, affiliated with the "Epifanio Rojas Gil" Polyclinic in the municipality of San Luis, during the period January 2024–December 2025. Population: (N=245) children enrolled at that school. Purposive non-probabilistic sample (n=80), according to predefined inclusion criteria. Summary measures were used for qualitative variables (absolute frequencies and percentages).
Results: the majority of patients were 6 years old (46,3 %), female (35 %), and had a thumb-sucking habit (58,8 %). Most children with this habit (27,5 %) were not breastfed (46,3 %). Based on intensity, passive thumb-suckers were most common (66 %); based on frequency, intermittent sucking was most common (48,9 %). Anterior open bite (60 %) and vestibular inclination of the incisors (56,3 %) were the most frequent dento-maxillofacial anomalies, primarily among thumb-suckers (43,8 % and 37,5 %, respectively). The dolichofacial biotype (53,8 %) predominated in the presence of the thumb-sucking habit (38,8 %).
Conclusions: thumb sucking was present in a large portion of the study sample, predominantly among girls. Most exhibited an anterior open bite and vestibular inclination of the upper incisors. The greater the frequency and intensity of thumb sucking, the more severe the anomalies presented.

Keywords: Thumb Sucking; Dento-maxillofacial Anomalies; Deforming Oral Habits; Malocclusions; Children.

RESUMEN

Introducción: la maloclusión que provoca la succión digital surge con el efecto que existe sobre la cavidad oral ejercido por el hábito de succión digital y depende de varios factores.
Objetivo: evaluar la repercusión de la succión digital en el sistema estomatognático en niños de 6 a 8 años.
Método: se realizó un estudio observacional, descriptivo, transversal en niños de la escuela primaria "Sarah Cordoneda García", pertenecientes al Policlínico "Epifanio Rojas Gil" del municipio San Luis, durante el período enero/2024-diciembre/2025. Universo: (N=245) niños pertenecientes a dicha institución escolar. Muestra intencional no probabilística (n=80), según criterios de inclusión previstos. Se utilizaron medidas de resumen para variables cualitativas (frecuencias absolutas y porcentajes).
Resultados: predominaron pacientes de 6 años (46,3 %), sexo femenino (35 %) y los que presentaban hábito de succión digital (58,8 %). La mayoría de niños con este hábito (27,5 %), no recibieron lactancia materna (46,3 %). Según intensidad, prevalecieron succionadores pasivos (66 %), según frecuencia, la intermitente (48,9 %). La mordida abierta anterior (60 %) y vestibuloversión de incisivos (56,3 %) fueron las anomalías dentomaxilofaciales más frecuentes principalmente en succionadores digitales (43,8 y 37,5 %). Predominó el biotipo dólicofacial (53,8 %) en presencia del hábito de succión digital (38,8 %).
Conclusiones: la succión digital se presentó en gran parte de la muestra estudiada con predominio en niñas. La mayoría reflejaron mordida abierta anterior y vestibuloversión de incisivos superiores. A mayor frecuencia e intensidad en la succión digital, mayores anomalías presentadas.

Palabras clave: Succión Digital; Anomalías Dentomaxilofaciales; Hábitos Bucales Deformantes; Maloclusiones; Niños.

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INTRODUCTION

Oral health is a component of overall health; it is vital for proper growth and development and is associated with nutrition, communication, speech, aesthetics, and, consequently, self-esteem, among other aspects. During childhood, all risk factors involved in oral diseases can be modified through education, promotion, and periodic check-ups, as they have a significant impact; this depends on lifestyle as well as social factors, including certain behaviors, among which are the acquisition and reinforcement of certain habits.[1]

Habits are actions performed mechanically, either unconsciously and automatically or consciously; however, it is the persistence with which they are performed and their execution that leads to long-term problems. A habit becomes more difficult to break when it has persisted over time; therefore, "a professional evaluation is recommended starting at age 3, followed by intervention to stop the established habits." These habits are divided into two groups: beneficial habits and harmful habits.[2]

Beneficial or functional habits: those whose correct execution helps the child develop their structures properly. The most notable are proper chewing, digestion, and breathing.[3]

Harmful, nonfunctional, or deformative habits result from improper execution because of repetitive practice and can cause malocclusions or dento-maxillofacial deformities. The clearest examples are thumb sucking, tongue thrusting, nail biting, lip biting, mouth breathing, and object chewing.[3]

Nonphysiological habits are among the main etiological factors that cause malocclusions or dento-skeletal deformities, which can alter the normal development of the stomatognathic system and cause an imbalance between oral and perioral muscular forces, ultimately leading to bone deformation that will have a greater or weaker impact depending on the age at which the habit begins; the younger the child is, the greater the degree of damage because the bone has a greater capacity to be molded.[2]

Over the years, it has become evident that a very common health issue affecting humans has been problems with occlusion and oral function, with these being the most prevalent deformative habits in children during early childhood.[4]

Its importance lies in the fact that establishing healthy sucking habits—whether nutritive or nonnutritive—contributes to the prevention of occlusal problems, dental malformations, crowding, and the eruption of primary teeth during early childhood, thereby supporting the proper development of cranial, oral, and maxillary bone and dental structures.[4]

Thumb-sucking is among the most common deformative habits in children; it involves the insertion of fingers into the oral cavity, primarily the thumb, and generally involves active contraction of the perioral muscles. The sucking reflex is present in humans even before birth. This makes it difficult to eliminate because of the child's limited understanding, making it a significant and sometimes complex task for the dental professional.[1]

In ancient times, thumb-sucking was considered an expression of happiness and tranquility. This habit is regarded as a common childhood behavior; its prevalence varies widely and depends heavily on the group studied.[5]

The incidence of malocclusions worldwide ranges from 35 % to 75 %, with differences based on sex and age. In Latin America, a high incidence and prevalence of malocclusions are reported, affecting more than 85 % of the population. It is estimated that between 20 and 30 million children in Latin America suffer from some type of dento-maxillofacial anomaly.

In Mexico, a study conducted by Martínez Ortiz et al.[6] revealed that thumb sucking was the second most common oral habit, accounting for 50,7 % of harmful habits. Owing to the high prevalence of thumb sucking, a high number of children with malocclusions triggered by harmful oral habits have been reported. These habits alter tooth position and structural morphology, interfering with normal bone growth and the function of the orofacial musculature.

In Cuba, rates of 73,5 % and 60,7 % have been reported in Las Tunas and Santiago de Cuba, respectively, with a higher prevalence among females.[7,8]

Most instances of thumb-sucking that occur in early childhood generally disappear spontaneously by the age of four following the development of other coping mechanisms for any psychological or emotional distress the child may face. This behavior is very common in children because it elicits pleasurable, protective, and satisfying sensations and provides them with a sense of complete emotional well-being.[9]

Malformations that develop because of thumb sucking are generally more severe than those caused by pacifier use since the thumb exerts more pressure on the premaxilla.[4]

Some general alterations that thumb sucking can cause in the stomatognathic system include the following: Vestibularized upper incisors and lingualized lower incisors, marked overjet, deep and narrow palate, hypertrophic palatal folds, unilateral or bilateral crossbite, shortening of the upper lip, anterior tongue position at rest to facilitate sealing, mandibular distalization, and a clean, thumb-sucked finger with a flat appearance that may have a fungal infection.[4]

Normal occlusion and malocclusion are not necessarily well-defined entities; however, the latter can trigger various problems through the mechanical forces induced by thumb or finger sucking, although other factors may also contribute to it.[10]

The malocclusion caused by finger sucking arises from the effect exerted on the oral cavity by the finger-sucking habit, which in turn depends on several factors; thus, it has a direct relationship with the number of fingers inserted (the most common being the thumb), the manner of insertion, frequency, intensity, and duration. Frequently, placing the finger in contact with the palate tends to facilitate outward pressure, deforming the occlusion of the upper incisors and causing dentoalveolar protrusion.[11]

The repercussions of thumb-sucking in infants result from a lack of parental awareness; it occurs at different ages, with the most common age being between 3 and 4 years, when children typically begin to suck their thumbs. In some cases, this habit persists until the age of 6 to 12 years.[1,4]

Thumb-sucking is a problem that has always been of interest to healthcare professionals because of its harmful effects on dentition and supporting structures, given that it has both social and psychological components in children.[12]

Early detection and timely treatment of thumb sucking increase the chances of modifying the growth pattern of the jaws and the development of the dental arches. Similarly, if the deformative oral habit is eliminated before the age of three, the problems may resolve spontaneously.[12]

Despite all the research conducted in the field of dentistry regarding deformative oral habits and their impact on the stomatognathic system, there is still some confusion regarding the relationship between nonnutritive sucking (thumb sucking) and dento-maxillofacial anomalies.

In light of the issue discussed above, the following question arises:

What impact does thumb sucking have on the stomatognathic system in 6- to 8-year-old children at the Sarah Cordoneda García Elementary School in the municipality of San Luis, Pinar del Río Province?

There is a lack of objective criteria for quantifying the effects of thumb sucking on the development of dentofacial structures. Given the importance of timely detection and control of thumb sucking as a risk factor for malocclusions, this study was conducted to evaluate the impact of thumb sucking on the stomatognathic system in children aged 6 to 8 years at the Sarah Cordoneda García Elementary School, affiliated with the Epifanio Rojas Gil Polyclinic in the municipality of San Luis, during the period from January 2024 to December 2025.

METHOD

An observational, descriptive, cross-sectional study was conducted on children aged 6 to 8 years who were attending the "Sarah Cordoneda García" elementary school, which is affiliated with the "Epifanio Rojas Gil" Polyclinic in the municipality of San Luis, during the period from January 2024 to December 2025.

The study population comprised the children (N=245) enrolled at that institution during the study period.

As an example of nonprobabilistic purposive sampling, the sample consisted of 80 patients, taking into account the following inclusion and exclusion criteria:

The study included patients of both sexes, aged 6 to 8 years, with mixed dentition, who had not received orthodontic treatment, and whose parents and/or guardians agreed to participate in the study.

Patients were excluded if they had premature tooth loss; a history of congenital or hereditary abnormalities; medical or surgical treatment that could have altered maxillary and facial development; had received orthodontic or orthopedic treatment; exhibited other deformative habits, such as mouth breathing, lip sucking, or atypical swallowing; or had any type of physical or mental disability.

Dialectical materialism was applied as a method for studying reality and concrete historical thought, serving as the general logic and methodology for the acquisition of knowledge.

Theoretical Methods: historical-logical, analysis-synthesis, induction-deduction, systemic and structural approaches.

Empirical Methods: Document analysis, observation, questionnaire.

Mathematical Methods: Processing and tabulation of information collected during the research to support the qualitative analysis of results from the measurements taken, as well as organizing and creating tables to present the obtained data comparatively.

Information Collection Techniques

Clinical methods were used through questioning and physical examination following the preparation of the Individual Dental Medical Record.

Clinical observations were conducted in classrooms under natural light, using tongue depressors to separate the cheeks and identify any existing dento-maxillofacial abnormalities related to thumb sucking. In addition, a caliper, a millimeter ruler, a Korkhaus three-dimensional compass, and a curved-arm external caliper were used to measure the variables under study.

To detect thumb-sucking habits, in addition to interviewing children and parents or guardians, the fingers were examined for calluses or unusual cleanliness, and questions were asked about the presence of any other habits the child might have. To determine which children used a pacifier, a bottle, or both, the children, parents, or guardians were interviewed; this was corroborated by clinical findings.

Occlusion analysis was performed in the three planes of space: anteroposterior, transverse, and vertical. Palatal depth was measured in millimeters using a Korkhaus three-dimensional caliper at the level of the intermolar diameter. The two tips of the caliper were placed at the deepest point of the mesiobuccal fossa of the first molar, and the palatal height was obtained by moving and reading the millimeter scale.

To detect swallowing abnormalities such as tongue dysfunction, the children were instructed to swallow saliva without separating their teeth. Their lips were then removed to observe whether the tongue protruded between the dental arches.

The total morphological facial index was used to determine the facial biotype. Measurements were taken using a 200 × 0,02 mm Vernier caliper and a curved arm outside the micrometer. Formula for determining the facial index.[27]

Indice Facial= Altura Facial x 100/ Ancho facial

Where facial height is the distance between the Ofrion (point located on the midline at the level of the supraorbital arch) and the Gnation (most anteroinferior point of the mandibular symphysis).[13]

Facial width is represented by the bicigomatic distance in soft tissue:

Table 1. Bicigomatic distance in soft		
Facial Index	**Facial Type**	**Characteristics**
Greater than 104	Dolichofacial	Long, narrow face
97–104	Mesofacial	Intermediate
Less than 97	Short face	Wide and short face

Instruments and techniques

The Individual Dental Medical Record was completed according to instructions; most of the information necessary for the study was collected from this record.

Other data relevant to the study were obtained from the patient information collection form designed by the researchers.

Statistical processing

The information required for the study of each patient was recorded in a database structured by variables in Microsoft Excel spreadsheets. Descriptive methods were used to organize, present, and summarize the information in tables and graphs using absolute and percentage frequencies.

Ethical considerations

Fundamental ethical principles were followed, such as beneficence and nonmaleficence, the principle of justice, and the autonomy of each individual; an informed consent form was prepared, which documented voluntary participation in the research, and family members were informed about the characteristics of the study and the procedures to be performed, ensuring that no therapeutic interventions would be used that could alter the children's biopsychosocial balance.

The anonymity of the participants and the confidentiality of the data obtained were respected; the data were used solely for strictly scientific purposes. The study was approved by the institution's Scientific Council and Ethics Committee.

RESULTS

The sample consisted mainly of 6-year-old patients (46,3 %) and females (35 %). Forty-seven patients (58,8 % of the total sample) reported thumb-sucking (table 2). "Epifanio Rojas Gil" Teaching Polyclinic, San Luis, Pinar del Río. 2024–2025.

Table 2. Distribution of the sample according to the presence of thumb sucking, age, and sex						
Ages (years)	**Presence of thumb-sucking**					
	Present		**Not present**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
6	23	28,8	14	17,5	37	46,3
7	15	18,8	8	10,0	23	28,8
8	9	11,3	11	13,8	20	25,0
Total	47	58,8	33	41,3	80	100
Gender						
Male	19	23,8	18	22,5	37	46,3
Female	28	35,0	15	18,8	43	53,8
Total	47	58,8	33	41,3	80	100

Table 2 shows that patients who were not breastfed predominated (46,3 %); of these, 27,5 % exhibited thumb sucking. These results highlight that children who were breastfed for 6 or more months were the least likely to exhibit this habit, at 23,8 %.

As shown in table 3, passive thumb suckers predominated (66 %), with an intermittent daily sucking frequency (48,9 %). Among active thumb-suckers, which represented 34 % of patients with this habit, continuous thumb-sucking was more frequent (23,4 %).

Table 3. Distribution of patients according to the frequency and intensity of thumb-sucking habits						
Intensity of thumb-sucking	**Daily frequency of thumb-sucking**					
	Intermittent		**Continuous**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Passive suction device	23	48,9	8	17,0	31	66,0
Active suction device	5	10,6	11	23,4	16	34,0
Total	28	59,6	19	40,4	47	100

The results shown in table 4 reveal a predominance of anterior open bite (60 %) and vestibular inclination of the incisors (56,3 %). These anomalies were observed most frequently in patients with a thumb-sucking habit (43,8 % and 37,5 %, respectively).

Table 4. Distribution of dento-maxillofacial anomalies according to the daily frequency of thumb sucking

Dento-maxillofacial anomalies	Presence of thumb sucking (n=80)					
	Present		Not present		Total	
	No.	%	No.	%	No.	%
Anterior open bite	35	43,8	13	16,3	48	60,0
Posterior crossbite	28	35,0	11	13,8	39	48,8
Vestibular inclination of incisors	30	37,5	15	18,8	45	56,3
Lingual inclination of incisors	13	16,3	3	3,8	16	20,0
Lip dysfunction	16	20,0	6	7,5	22	27,5
Tongue dysfunction	8	10,0	4	5,0	12	15,0

The data in table 5 show a greater number of patients with the dolichofacial biotype, which accounted for 53,8 % of the study sample. In the presence of thumb-sucking, this biotype predominated at 38,8 %.

Table 5. Facial biotype according to the presence of thumb sucking

Facial biotype	Presence of thumb-sucking					
	Present		Not present		Total	
	No.	%	No.	%	No.	%
Facial pain	31	38,8	12	15,0	43	53,8
Short-faced	9	11,3	13	16,3	22	27,5
Mesofacial	7	8,8	8	10,0	15	18,8
Total	47	58,8	33	41,3	80	100

DISCUSSION

With respect to sex, the data obtained are consistent with most of the results of previous studies,[7, 8,14] which have shown that the majority of children who suck their thumbs are female, a situation attributed to the greater pressure exerted by family members on boys regarding thumb sucking.

Like the present study, a study conducted in Peru by Espinoza Álvarez[15] revealed a 73 % incidence of nonnutritive sucking habits among children aged 2 to 5 years; it also revealed the presence of thumb sucking in approximately 48 % of children aged 4 and 12,1 % of children over 7 years.

Similar results were reported by Massón Amarán et al.[1], who reported that the prevalence of thumb-sucking behavior was high (37,2 %) and was predominant among females (54,8 %).

In a study conducted in Mexico by Martínez Ortiz et al.[6], the authors reported that nonnutritive sucking behaviors, such as thumb-sucking, constitute a normal part of early development that can become a bad habit as a self-soothing behavior, occurring in 70 to 90 % of infants across various populations.

According to the results of Espinosa González et al.[9], the only finding that coincided was the average age of the children, which was 6,5 years. In contrast, males predominated at 53,2 %, and 22,6 % of the patients reported having a thumb-sucking habit. Other differing results were reported by Gutiérrez Diéguez et al.[16], who reported that thumb sucking occurs at higher rates among males.

Armijos Saca et al.[17], in their study conducted in Ecuador, reported that the most prevalent oral habit among children aged 4 to 12 years was thumb sucking, with a frequency of 40 %, which occurred more frequently among males.

The results demonstrate that families are still influenced by theories that differ in child-rearing practices based on gender. Most studies[1,7,8,14] agree that thumb-sucking habits are not associated with any particular gender but appear to be more difficult for girls to give up—a problem indirectly influenced by various factors such as the education they receive, the role society deems appropriate for them, and parental acceptance and reinforcement of the habit.

There is evidence of a tendency toward greater overprotection in the upbringing of girls. Purely macho attitudes sometimes place demands on boys. It is common to hear popular sayings such as “boys don’t suck their thumbs,” but not because of a true understanding of what the practice entails. This results in—and is corroborated by the present study—the fact that females are more prone to the habit of thumb-sucking and, therefore, girls experience adverse effects more frequently.[1,7,8,14]

Armijos Saca et al.[17] suggested that if breastfeeding is unsatisfactory, the child tends to suck their thumb or tongue after feeding; bite their nails, arms, lips, or hair; and put foreign objects in their mouth.

In this context, Gutiérrez Arrobo et al.[18] reported similar results, in which dento-maxillofacial anomalies were prevalent in 76 % of the children studied, and they identified thumb sucking (36 %) as one of the most common habits observed. These authors reported a direct association between a breastfeeding duration of less than 6 months and the development of the thumb-sucking habit.

In the study by Quezada Quiñonez et al.[19], the behavior of transverse micrognathism was examined according to the duration of breastfeeding. Among the total number of children who had been breastfed for less than 6 months, 77,2 % had insufficient transverse maxillary development. In infants who were breastfed for more than 6 months, transverse micrognathia occurred at a lower rate.

Similarly, Ordaz Galván et al.[20] reported that there is a relationship between the type and duration of breastfeeding infants and the development of deformative habits. In their study, the majority of the sample received exclusive breastfeeding for less than 4 months, which is similar to the results of the present study, from which it is inferred that the type of breastfeeding influences dental malocclusions.

This differs from the findings of Tasayco[21], who reported that 67,8 % of his sample did not present dento-maxillofacial anomalies, with similar rates (50 %) observed in both children who were exclusively breastfed and those who were not. From a stomatological perspective, exclusive breastfeeding during the first 6 months of life allows for adequate growth and development of the oral apparatus and favorably stimulates muscle activity through the mechanical effort the baby exerts to suck and swallow milk, which contributes to proper jaw positioning during the transverse growth of the jaws and provides the appropriate environment for the development of dental occlusion. Children who are not exclusively breastfed during the first 6 months of life are at greater risk of developing dental abnormalities.

The frequency and intensity of sucking are factors that exacerbate these abnormalities. This is confirmed by Massón Amarán et al.[1], who reported that 95,3 % of their patients with ADMF exhibited a continuous frequency of thumb sucking, and 97,9 % exhibited marked intensity.

As stated in his study by Espinoza Álvarez[15], prolonged thumb sucking plays an important role in children's occlusal function and leads to the development of malocclusions, such as anterior open bites and posterior crossbites.

According to research by Vera Veloz[3], harmful oral habits are prevalent in childhood; her study revealed that the most common oral habits are thumb sucking, pacifier use, and mouth breathing. Most of her patients who engaged in thumb sucking (58,3 %) reported an intermittent frequency of the habit, as the times of highest frequency were during periods of low activity (during rest and/or sleep). The frequency and intensity of sucking, duration exceeding 4–6 years, and finger position (e.g., thumb sucking with upward pressure) are factors that exacerbate dento-maxillofacial anomalies.[3] Therefore, early intervention and the elimination of factors that hinder the harmonious development of the dental arches in the primary and mixed dentition are necessary, such as nonnutritive sucking habits—regarding their intensity, frequency, and duration—which promote the development of muscular and structural alterations in the oral cavity.[12]

With respect to DMFAs, Massón Amarán et al.[1] reported their presence in 94,3 % of children with thumb sucking, which interferes with the sagittal and transverse development of the dento-maxillofacial structure and hinders its potential for development, growth, and physiological function. The most commonly reported DMFAs were vestibular inclination of the upper incisors (94,6 %) and anterior open bite (93,2 %), which were similar to those in the present study.

With results similar to those of our study, Ramírez Herrera[22] identified the anterior open bite as the primary dento-maxillofacial anomaly, which accounted for 29,5 %. In the study by Vera Veloz et al.[3], the most common malocclusion was crowding (70 %), followed by anterior edge-to-edge bite (20 %), unilateral posterior crossbite (13 %), and exaggerated overjet, hyperdaquia, and adaquia, both at 11 %.

Similarly, in the study by Hattan et al.[23], the authors reported that prolonged thumb sucking was associated with a higher incidence of anterior open bite and protrusion of the upper incisors. In the study by López Pazmiño[24], overjet and anterior open bite were significantly greater in those with a thumb-sucking habit. Conversely, the deep bite and lower arch width were significantly lower in children who sucked their thumbs than in those who did not.

Espinosa González et al.[9] reported that anterior or lateral open bite (6,4 %) and unilateral or bilateral crossbite (1,6 %) were the resulting occlusal consequences.

Early intervention (before age 4) reduces the need for complex treatments. If the habit persists after the eruption of permanent teeth, the abnormalities may become more severe and require corrective orthodontics. Recommended treatments include behavioral therapy (positive reinforcement, reminders); orthopedic appliances or interceptive orthodontics; lingual guards, direct splints, or appliances; and myofunctional therapy to correct swallowing and tongue posture.[12]

In an analysis of research studies on facial biotypes and their relationship to harmful oral habits, according to Affur,[25] a predominance of the dolichofacial biotype was observed in the presence of thumb sucking in 80,7 % of cases and a lower percentage (26,4 %) of patients reporting pacifier use and bottle feeding.

Children who suck their thumbs for prolonged periods may develop abnormalities in facial growth and dental occlusion, which can influence their facial biotype.[25] The facial biotype most commonly associated with prolonged thumb sucking is the dolichofacial type, characterized by an elongated face, a receding or posteriorized chin, and a more open mandibular angle. Therefore, the prevalence of this facial biotype is due to the constant pressure of the finger against the palate and upper incisors, which prevents normal lip closure, thereby altering muscle balance and promoting excessive vertical growth of the mandible.[25]

The main associated consequences include an anterior open bite, where the upper and lower teeth do not make contact when biting; a narrow, ogival palate; and hypotonic (flaccid) lips and mouth breathing in some cases.[25] For these patients, treatment options include early intervention (before age 4–5) to prevent this biotype from becoming established; myofunctional therapy to correct habits and strengthen the lips and tongue; and interceptive orthodontics (such as palatal expanders) in cases of open bite

or narrow palate. When the habit persists beyond 6–7 years of age, the abnormalities may become more difficult to correct.[25] The results obtained allowed us to conclude that thumb sucking was present in a large portion of the study sample, predominantly among girls. Most exhibited an anterior open bite and vestibular rotation of the upper incisors. The greater the frequency and intensity of thumb sucking, the more severe the anomalies presented.

FINANCING

No funding was received for this research.

CONFLICT OF INTEREST

This study presents no conflicts of interest.

AUTHORSHIP CONTRIBUTION

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