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ORIGINAL

Behavior of deforming oral habits in children from 5 to 12 years of age in a primary school

Comportamiento de hábitos bucales deformantes en niños de 5 a 12 años de una escuela primaria

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ABSTRACT

Introduction: oral habits are an undoubted primary or secondary cause of malocclusions or dentomaxillofacial deformations.
Objective: to determine the behavior of deforming oral habits in children from 5 to 12 years of age, from the "Isidro de Armas" primary school in the Pinar del Río municipality.
Method: an observational, descriptive, cross-sectional research was carried out. The universe was 85 children, the sample determined from a non-random sampling, stratified by age, was made up of 65 children from the "Isidro de Armas" primary school in Pinar del Río, in the period september-november 2022. The results obtained were recorded in a database of the STATISTIC statistical system. From the inferential statistical point of view, the Chi square test in its contingency table variant and the hypothesis test were used to compare proportions corresponding to mutually exclusive categories.
Results: the age group 9-10 years old predominated with 21 children (32,3 %) and the female sex 39 children (60 %). There were no highly significant differences in relation to age groups, but there were differences in relation to sex. Finger sucking predominated in 20 children for 60,6 %, followed by atypical swallowing in 18 (54,5 %), mouth breathing in 14 (42,4 %) and bottle sucking in 10 children. A significant predominance of children who have malocclusions due to practicing one or more deforming oral habits (55,4 %) was found compared to the percentage of those who have malocclusions despite not having deforming oral habits (13 %).
Conclusions: prevention plays a fundamental role in avoiding malocclusions, having a prophylactic objective.

Keywords: Oral habits; Malocclusions; Children; Prevention.

RESUMEN

Introducción: los hábitos bucales son una indudable causa primaria o secundaria de maloclusiones o deformaciones dentomaxilofaciales.
Objetivo: determinar el comportamiento de hábitos bucales deformantes en niños de 5 a 12 años de edad, de la escuela primaria "Isidro de Armas" del municipio Pinar del Río.
Método: se realizó una investigación observacional, descriptiva, de corte transversal. El universo 85 niños, la muestra determinada a partir de un muestreo no aleatorio, estratificado por edades, quedó compuesta por 65 niños de la escuela primaria "Isidro de Armas" de Pinar del Río, en el período septiembre-noviembre de 2022. Los resultados obtenidos fueron registrados en una base de datos del sistema estadístico *STATISTIC*. Desde el punto de vista estadístico inferencial se utilizaron la prueba de Chi cuadrado en su variante de tabla

de contingencia y la prueba de hipótesis para la comparación de proporciones correspondientes a categoría mutuamente excluyentes.
Resultados: predominó el grupo de edades 9-10 años de edad con 21 niños (32,3 %) y el sexo femenino 39 niños (60 %). No existieron diferencias altamente significativas en relación a los grupos de edades, y sí con relación al sexo. Predominó la succión digital en 20 niños para un 60,6 %, seguida por la deglución atípica en 18 (54,5 %), respiración bucal en 14 (42,4 %) y la succión del biberón en 10 niños. Se comprobó un predominio significativo de niños que presentan maloclusiones por practicar uno o más hábitos bucales deformantes (55,4 %) con respecto al porciento de los que tienen maloclusiones a pesar de no tener hábitos bucales deformantes (13 %).
Conclusiones: la prevención desempeña un papel fundamental destinado a evitar las maloclusiones, teniendo un objetivo profiláctico.

Palabras clave: Hábitos Bucales; Maloclusiones; Niños; Prevención.

INTRODUCTION

Health is achieving the highest level of physical, mental, and social well-being and functional capacity, which is possible given the social factors in which individuals and communities live. Oral health is integral to overall health, as an individual cannot be considered completely healthy if oral diseases are present.

Two areas of work are being developed regarding oral health: research and care. These areas cover the three oral conditions most frequently affecting the world's population: dental caries, periodontal disease, and malocclusion. Significant progress has been made due to the high priority given by the state to these fundamental aspects that are decisive for citizens' quality of life.[1]

In today's world, aesthetic demands are a cause of concern for people. Among these, the smile is the gateway to human relationships, which is why so much importance is being placed on dental care, especially the alignment of the teeth.[2]

The study of habits and their effects is crucial because they occur in 56 % to 75 % of the population and cause countless abnormalities in the jaw muscles and teeth. The main problem is the lack of knowledge among parents and their children about deforming oral habits and their repercussions.[3] Oral conditions, particularly caries, periodontal disease, and malocclusion, have traditionally been underestimated as medical problems because they do not cause direct mortality.[4]

The causes of dental-maxillofacial anomalies are multiple and complex, but incorrect or deforming oral habits stand out among them, all of which are generated in the neuromuscular system since they become reflex patterns of muscle contraction that are learned through practices or habits acquired by frequent repetition of the same act, initially conscious and then unconscious through habituation, such as nasal breathing, chewing, phonation, and swallowing, which are considered physiological or functional; However, there are also some non-physiological ones, such as sucking (which can be digital), pacifier use, mouth breathing, tongue thrusting, nail-biting, cheilophagia, and others.[2]

Oral habits are undoubtedly a primary or secondary cause of malocclusions or dental-maxillofacial deformities, despite discussions regarding the age at which they can be considered normal. The dental-maxillofacial anomalies that arise will depend on the patient's age, biotype, and duration and intensity of the habit. The appearance of various dentomaxillary anomalies is influenced by factors that act from a very early age and produce manifest alterations in the first years of life.[6]

They are common in children and occur at an early age. Problems with space and the anterior-posterior, transverse, and vertical maxillomandibular relationship are aggravated by abnormal oral habits, such as protruding tongue and thumb sucking, which can alter the position of the teeth, as well as the relationship and shape of the dental arches.[4]

The multiple causes of these anomalies and their appearance at an early age in a child's development make it necessary to implement preventive programs based on different measures and procedures to reduce their incidence. In recent years, stomatology has undergone a remarkable transformation, evolving from a mechanical to a scientific phase, applying preventive measures aimed at the anatomical and physiological preservation of tissues and, as a result, better oral and general health.[10]

To determine the behavior of deforming oral habits in children aged 5 to 12 years at the Isidro de Armas primary school in Pinar del Río.

METHOD

An observational, descriptive, cross-sectional study was conducted between September and November 2022. The universe consisted of 85 children, and the sample was determined using simple random sampling and inclusion and exclusion criteria. The sample comprised 65 Isidro de Armas primary school children in Pinar del Río.

Inclusion criteria

- Children aged 5 to 12 years.
- Children whose parents or guardians consented to participate in the study.

Exclusion criteria

- Children whose parents or guardians did not consent to participate in the study.

Exit criteria

- Children who changed schools or residences during the study.

The variables used in the research were age, sex, deforming oral habits, malocclusions, and dental-maxillofacial anomalies.

Each patient underwent a clinical oral examination, and the information was collected in a data collection model created for this research. In addition, a survey was administered to the children and their families to obtain information related to the presence of deforming oral habits.

An informed consent form was prepared, read to each patient, and presented to them, explaining that they would be the subject of a study and its purposes. The informed consent document confirmed the patient's acceptance with their name and signature.

Empirical Methods

Survey of children and their families to obtain information related to the presence of deforming oral habits.

Statistical Methods

Summary measures for qualitative variables (proportion X and percentage %). Correlation analysis between two variables, also known as association analysis, assigns a strong statistical significance to values closest to one, both negative and positive. Chi-square statistical test with 95 % confidence for comparing frequencies of categorical variables according to each specific combination.

The results obtained were recorded in a database using the STATISTIC statistical system, which allowed for applying point estimates of relative frequencies for the descriptive statistical analysis of the results. From an inferential statistical point of view, the Chi-square test in its contingency table variant and the hypothesis test were used to compare proportions corresponding to mutually exclusive categories. In all cases, a significance level of 5 % was preferred, contributing to fulfilling the proposed objectives and achieving conclusions and recommendations.

Information collection

The data were obtained from surveys administered to the children and their families. They were recorded in a model created for this purpose and then entered into a database using the STATISTIC statistical system. This allowed for applying point estimates of relative frequencies for the descriptive statistical analysis of the results. A Pentium V PC with Windows XP was used. The texts were processed using Word XP, and the tables and figures were created using Excel XP.

Ethical considerations

This research was conducted with children who agreed to participate after their parents were informed of the objectives and methodology. No invasive or therapeutic techniques were used that would alter the biopsychosocial balance of the children who participated in the study.

RESULTS

Table 1. Distribution of the sample according to age groups and gender

Age Groups (years)	Sex					
	Feminine		Male		Total	
	No.	%	No.	%	No.	%
5-6	9	13,8	6	9,2	15	23
7-8	10	15,3	7	10,7	17	26,1
9-10	13	20	8	12,3	21	32,3
11-12	7	10,7	5	7,6	12	18,4
Total	39	60	26	40	65	100

Note: $X^2 = 18$, DF=2, prob.= 8,149

The 9-10 age group predominated with 21 children (32,3 %), and females outnumbered males with 39 children (60 %). There were no highly significant differences between age groups, but there were differences between sexes, which was confirmed by applying the comparison test for proportions corresponding to mutually exclusive categories (table 1).

It can be observed that there was a predominance in the 7-8 age group with 11 children (33,3 %), followed by those aged between 5 and 6 with 9 children (27,2 %), with a predominance of females with 18 girls (54,5 %) (table 2).

Table 2. Percentage distribution of deformative oral habits according to age and gender

Age Groups (years)	Sex					
	Feminine		Male		Total	
	No.	%	No.	%	No.	%
5-6	5	15,1	4	12,1	9	27,2
7-8	6	18,1	5	15,1	11	33,3
9-10	5	15,1	3	9,0	8	24,2
11-12	3	9,0	2	6,0	5	15,1
Total	18	54,5	15	45,5	33	100

Note: X_c^2 =5,018, gl= 7, p= 0,658

Digital sucking was predominant in 20 children (60,6 %), followed by atypical swallowing in 18 (54,5 %), mouth breathing in 14 (42,4 %), and bottle sucking in 10 children (30,3 %), all of which were more frequent in the 7-8 age group, except for bottle sucking, which was more frequent in children aged 5-6 years (18,1 %) (table 3).

Table 3. Distribution of deforming oral habits present in children according to age groups

Deforming Oral Habits	Age groups									
	5-6		7-8		9-10		11-12		Total	
	No	%	No	%	No	%	No	%	No	%
Digital suction	7	21,1	8	24,2	3	9,0	2	21,1	20	60,6
Bottle suction	6	18,1	2	6,0	1	3,0	1	3,0	10	30,3
Atypical swallowing	2	6,0	7	21,2	5	15,1	4	3,0	18	54,5
Mouth breathing	2	6,0	5	15,1	4	12,1	3	9,0	14	42,4
Queilophagia	1	3,0	9	27,2	2	6,0	2	6,0	14	42,4

Note: c^2 = 18, DF= 2, prob.= 5,132

The percentage of dentomaxillofacial anomalies in children with deforming oral habits, according to age groups, can be seen in table 4, showing that of the total number of children with deforming oral habits(33), the total number of dentomaxillofacial anomalies was 79, with an average of 1,4 anomalies per child, with vestibuloversion predominating in 23 children, representing 29,1 % of the sample (table 4).

Table 4. Percentage of dentomaxillofacial anomalies in children with deformative oral habits, according to age groups

Anomalies Dento-maxillofacial	Age groups									
	5 a 6 years		7 a 8 years		9-10 years		11-12 years		Total	
	No	%	No	%	No	%	No	%	No	%
Vestibular version	3	3,7	10	30,3	6	18,1	4	5,2	23	29,1
Open bite	2	2,5	8	10,1	5	15,1	2	2,5	17	21,5
Anterior crossbite	2	2,5	1	3	2	2,5	3	3,7	8	10,1
Glossitis	1	3	6	18,1	7	8,8	5	15,1	19	24
Maxillary narrowing	3	3,7	4	5,2	4	5,2	1	3	12	15,1
Total	11	13,9	29	87,8	24	30,3	15	18,9	79	100

Note: X_c^2 =10,757; gl=7 p= 0,150 X_t^2=14,1

A significant predominance of children with malocclusions due to one or more deformative oral habits (55,4 %) was found compared to the percentage of those with malocclusions despite not having deformative oral

habits (13 %) (table 5).

Tabla 5. Percentage distribution of children according to the presence of deformative oral habits and malocclusions

Oral habits that cause deformities	Malocclusion					
	Absent		Present		Total	
	No	%	No	%	No	%
Do not practice	19	29,2	13	20	32	49,2
Practice	10	15,4	23	35,4	33	50,7
Total	29	44,6	36	55,4	65	100

Note: X_c^2 =10,757; gl=7; p= 0,150; X_t^2=14,1

DISCUSSION

Authors such as Estrada Guerra Y. et al.[12] show similar results regarding the predominance of females. The predominance of females in this series coincided with the findings of other authors, such as Reyes DE et al.[13], with 60,5 %, and the age of 9 years, with 37,2 %.

The study by Fernández Martínez J et al.[5] states that of the total number of children examined, 51,9 % were female and 48,1 % were male. The most common ages were 6 and 8 years old, with 18,0 % and 19,5 %, respectively, which matched our study in gender, while the most common age group was 9 and 10 years old.

In research conducted by Buitrago López AM et al.[14], a higher number of female patients (60,4 %) was found, while males accounted for only 39,6 %. When performing the proportion comparison test for independent groups, a predominance of females was found, with a probability value of p=0,658 compared to males.

Our research coincides with Silva Contreras AM et al.[3] in terms of the distribution of deforming oral habits according to age and sex. These habits are more prevalent in the 7-8 age group, where a predominance of females over males was observed. Similarly, Murrieta Pruneda et al.[15] state that girls showed a higher frequency than boys in their study.

Studies conducted by Estrada Guerra Y. et al.[12] agree with this research, stating that females are the most affected sex and, therefore, have a higher risk of malocclusion. However, in the study by Reyes DE et al.[13], the same is not true for males, who more frequently presented more than one deforming oral habit, mainly at the age of 9. The predominant clinical feature in both sexes was the vestibular version of the upper incisors.

In the study conducted by León J et al.[16], the distribution of children with deforming oral habits according to gender showed that the highest frequency of habits corresponded to females at 13,4 %, with little difference from males, who accounted for 11,2 %. The results obtained in terms of gender coincide with those cited by Díaz H et al.[17] in their study, which was 44,7 %, with females being the most affected (55,3 %).

According to gender, Narváez MF et al.[18] state in their study that 43 % of girls had habits and 57 % of boys had them. Regarding age, oral habits are observed in children over 8. However, García C et al.[19] observed a predominance of dental anomalies in both sexes, with a higher prevalence in males (60,62 %) than in females, a result that is opposite to ours.

It is necessary to consider the presence of deforming oral habits in children due to their relationship with the appearance of dental-maxillofacial anomalies, as well as the factors that may trigger their frequent practice. The disturbances caused are, in many cases, challenging to treat and highly recurrent due to their persistence.

According to León J et al.[16], in the distribution of children with deforming oral habits according to the type of habit, thumb sucking was the most frequent habit, with 11,5 %.

Thumb sucking has been described as a common habit in childhood that is considered normal until the age of 3 or 4. Although most children who suck their thumbs stop this habit between the ages of 2 and 3, in some cases, this habit persists until the ages of 6 and 12.

Its presence after age 4 causes changes in the muscle tone of the lips and buccinators, hinders normal swallowing, and creates harmful mechanisms that lead to the development of compensatory muscle activity to achieve swallowing, which can also affect other functions such as phonation and breathing, among others.[20]

Risk YC et al.[4] observed in their research a higher number of children with protruding tongues, followed by those who presented digital sucking, which differs from this study. In this regard, certain malocclusions caused by digital sucking can be self-corrected if the harmful habit is eliminated early.

In contrast to this study, Álvarez MC et al.[20] reported that 58,7 % of children were identified with deformative oral habits according to age. The highest prevalence was found in atypical swallowing (25,3 %) and thumb sucking (14,0 %). The highest number of affected children was observed at 7 years of age, of whom 17,8 % had thumb sucking and 37,6 % had atypical swallowing.

In the study by González RM et al.[10], mouth breathing was the most prevalent habit (19 %), followed by tongue thrusting (18,2 %) and thumb sucking (14 %), which does not coincide with the results obtained by the researcher.

However, when analyzing the parafunctional oral habits evaluated in the population, according to the study

conducted by Murrieta JF et al.[15], the most frequent habit was onychophagia. In general, digital sucking is reported as the most frequent habit; however, this significant difference was observed in this study.

Buitrago López AM et al.[14] show a prevalence of oral habits in the population of 86,1 % (n=87), with the highest frequency in tongue thrusting and atypical swallowing at 78,2 % (n=79). In comparison, the least common habit was digital sucking 4 % (n=4). In our study, the results differed, with thumb-sucking prevailing (60,6 %).

Zapata M et al.[21] obtained results that differed from this study, finding that nail-biting was the most frequent habit (25,3 %), followed by thumb-sucking (18,2 %). Other authors, such as Carvajal J et al.[22], when analyzing oral habits, report atypical swallowing and mouth breathing as the most prevalent habits in these patients, followed by thumb sucking, which differs significantly from the results obtained in this study.

Ayala Y et al.[23] state in their research that the most frequent deforming oral habits were pacifier or bottle sucking, mouth breathing, and tongue thrusting, with 52 %, 31 %, and 21,5 %, respectively. These data have no points in common with our study.

Alay Baque PJ[24] found that nail biting was more prevalent in 7-year-old girls, thumb sucking was more common in 8- and 9-year-old boys, lip sucking was more commonplace in 7-year-old boys. Atypical swallowing was more common in 9-year-old boys, and Mouth breathing was more common in 7-year-old boys and 11-year-old girls, respectively.

Regarding the behavior of dentofacial anomalies according to sex, a predominance of females over males was observed, results that are consistent with those of González Ramos RM et al.[10]. In a study conducted by Díaz Méndez H et al.[17], the results coincide in the frequency of malocclusions, where vestibular incision of the incisors was the most frequent at 73,4 %, which does not coincide with the results for open bites (6,3 %) shown in this study, where grazes were the second most frequent.

CONCLUSIONS

Prevention plays a fundamental role in avoiding malocclusions, with a prophylactic objective; it includes the control of habits that are harmful to the normal development of the stomatognathic system, the use of space maintainers in cases of premature extraction of primary teeth, the extraction of supernumerary teeth or any other factor that alters the eruption pattern of permanent teeth, and other mechanical or surgical measures that prevent malocclusion.

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FINANCING

None.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Jadier Wong Silva.
Data curation: Jadier Wong Silva.
Formal analysis: Jadier Wong Silva.
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