

OCCLUSOPATHIES IN CHILDREN IN EARLY CHILDHOOD UNDER SOCIAL VULNERABILITY

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Abstract: This study aimed to estimate the prevalence of malocclusion in children under social vulnerability in the early childhood period. This is an observational and cross-sectional study carried out at an institute aimed at monitoring children in socially vulnerable conditions in the city of Fortaleza, Ceará. A representative sample of 363 children aged zero to six years was calculated. Data collection, carried out in 2018 and 2019 by trained examiners and annotators, through intraoral examination under natural lighting, using a wooden spatula and personal protective equipment. The methodological parameters of the SB Brasil 2010 epidemiological survey were used to identify four types of malocclusions, including overbite, anterior crossbite, posterior crossbite and anterior open bite. Data were analyzed using descriptive statistics and application of the chi-square test. The research project was approved by the ethics committee of the University of Fortaleza under opinion number 2,790,414. The profile of the participants had the majority male (51%), with a family income of one minimum wage or less (76.5%), emaciated nutritional status (54.5%), responsible with elementary education (61.7 %). Of the total number of participants, 295 (81.3%) had never had dental care and 201 (55.3%) had some type of malocclusion. The anterior open bite had a prevalence of 20.4%, the overbite of 17.4% and the anterior and posterior crossbites of 8.8%. Statistical significance ($p=0.017$) was found in the association between the variable minimum wage and anterior open bite. The prevalence of malocclusion in children in early childhood points to the need for early preventive interventions to minimize the impacts on skeletal and dental development.

Keywords: Malocclusion, Children, Social Vulnerability.

INTRODUCTION

The National Oral Health Policy has, among its assumptions, ensuring integrality in oral health actions, articulating the individual with the collective, in addition to integrating promotion and prevention with treatment. However, epidemiology and health surveillance are of great importance to identify the health situation of the Brazilian population based on the damages, risks and determinants of the health-disease process.¹

According to Campos et al.,² the abnormal relationship of teeth and dental arches, assuming an undesirable contact with the elements of the antagonistic arch, is understood as malocclusion.^{3,4} Dental malocclusions are a public health problem, due to their high prevalence and because they affect young children.⁵ About 20% of children have an occlusal problem within the early childhood period.⁶

The malocclusions are present in the ranking of oral problems according to the World Health Organization (WHO), occupying the third position, being below only carious lesions and periodontal diseases.⁷ The most prevalent types of malocclusions identified in the primary dentition are: anterior open bite and posterior crossbite, which have prevalence rates of approximately 46.2% and 18.2%, respectively.⁸

According to Boeck et al.,⁹ and Brizon et al., 10 malocclusions have a multifactorial character, since several factors directly or indirectly interfere in their establishment, such as: economic, social, cultural, nutritional and parafunctional habits.

Among the factors associated with the occurrence of malocclusions, the following stand out: behavioral factors, non-nutritive sucking habits, anthropometric and nutritional characteristics, dietary patterns, use of bottle and early weaning. Aggravating factors such as premature tooth extractions,

without maintenance of the lost space, have a high prevalence among Brazilian children, in addition to this, there is also the occurrence of extensive untreated carious lesions.⁵

The quality of life of children and adolescents is affected by social determinants such as the socioeconomic conditions in which they live associated with social vulnerability, characterized by the fragility of the sociopolitical system linked to precarious sociodemographic factors (housing; education; health; basic infrastructure; food security), beyond the socioeconomic^{10,11}

Despite not being a problem that poses a risk to the lives of those affected, malocclusions have a negative impact on the well-being of individuals, given that they influence aesthetics, speech, swallowing, chewing and, consequently, the individual's quality of life.¹² This way, it is important to develop public policies in oral health aimed at the early diagnosis of malocclusions in order to establish adequate treatment in early childhood and in an interdisciplinary perspective.^{5,7}

In this context, social vulnerability may be associated with the development of malocclusion, and early diagnosis is important for planning interventions that will improve orofacial morphofunctionality. Given the above, this study aimed to estimate the prevalence of malocclusion in children under social vulnerability in the early childhood period.

METHODS

The research consisted of an observational, cross-sectional study that investigated the association between social vulnerability and malocclusion in early childhood.

The work was carried out at the Instituto da Primeira Infância (Iprede) located in the city of Fortaleza, Ceará. Founded in 1986, its mission is to act on malnutrition and

early childhood development, focusing on prevention and treatment.

To calculate the sample size, a sampling error of 5% and a confidence level of 95% were considered in a population of 1,200 children, defining a total of 363 participants. Inclusion criteria were children in early childhood accompanied by the institution, whose guardians accepted to participate in the research.

Data collection took place between August 2018 and March 2019, through interviews with those responsible for the children and through intraoral examination of the children participating in the research. The questions were designed to consider the sociodemographic and socioeconomic variables of those responsible, as well as the children involved. In addition, aspects related to the general and oral health of the researched target audience were also addressed during the interviews.

Then, oral examinations were performed in order to assess the condition of the children's dental occlusion, using wooden spatulas and under natural light. The exams were performed by dental students, duly calibrated by a dentist. The parameters of the Epidemiological Survey on Oral Health SB Brasil 2010 were used as a reference.

During the intraoral examination, the presence of: overbite (overbite between the upper and lower anterior teeth above three millimeters), anterior crossbite (lower arch is anterior to the upper), posterior crossbite (lower arch is proclined in relation to the superior in the posterior region) and anterior open bite (absence of occlusal contact between the anterior teeth in the antagonistic arches and negative overjet).

The collected data were organized, tabulated and consolidated in the Statistical Package for the Social Sciences (SPSS) version 22, enabling the performance of descriptive

statistical analyzes and application of the chi-square test. A significance level of 95% was considered.

The project was approved by the Research Ethics Committee of the University of Fortaleza with opinion number 2,790,414.

RESULTS

A total of 363 children who underwent intraoral examination were evaluated, 185 (51%) were male and 178 (49%) were female. A total of 295 (81.3%) had never been to the dentist.

In table 1, it is observed that 278 (76.58%) of the families have an income lower than or equal to 1 minimum wage, in 224 (61.7%) of the evaluated cases, those responsible reported having elementary school as the highest schooling. Regarding the nutritional status of the children, 198 (54.5%) were underweight.

Table 2 shows that 262 (72.1%) of those surveyed did not have an overbite and only 32 (8.8%) of the cases had anterior and posterior crossbite. A total of 74 (20.4%) children showed anterior open bite. Conditions that could not be identified due to the absence of teeth, either due to early loss or because they were erupted at the time of oral examination, were recorded as not evaluated.

Table 3 presents the comparative analysis between all malocclusions (overbite, anterior crossbite, posterior crossbite and anterior open bite) and socioeconomic variables (low salary, nutritional status, consultation with the dentist, education of parents or guardians).

Still in table 3, we have that from the comparison between the anterior open bite and the gender of the children, we obtained a frequency of 38 (51.35%) for females and 36 (48.65%) for males.

Table 4 presents the comparative analysis between sociodemographic and socioeconomic variables by type of malocclusion. Statistical significance

($p=0.017$) was found only in the association between the variable minimum wage and anterior open bite.

DISCUSSION

The research findings showed that an association was identified between the existence of malocclusion and the number of people living on the poverty line (earning an amount below or equal to 1 minimum wage). Among the malocclusions evaluated in the research, anterior open bite was the most prevalent, with no gender predilection.

A total of 201 (55.4%) participants had some type of occlusal disorder, while 278 (76.58%) caregivers reported living with an income lower than or equal to the minimum wage, which is in line with studies of Brizon et al¹⁰ who claim there is a direct relationship between these variables.

According to Dias et al.,¹³ the correct diagnosis, in the initial phase, together with the well-indicated treatment performed by an orthodontist, favors the success of the case and the correction of the malocclusion in both the deciduous and permanent dentition. Among those surveyed who had some type of malocclusion, 155 (55.3%) of those responsible reported having an income equal to or below the minimum wage, a fact that significantly proves that there is a broad relationship between malocclusion and social vulnerability. However, Miotto et al.¹⁴ concluded that there was no relationship between these factors in their research carried out with a sample of 150 children from public schools in Espírito Santo.

The anterior open bite presented the highest percentage (20.4%) when compared to the other disorders. Other researchers found similar results in their studies that looked at the prevalence of malocclusions in children.^{8,14}

VARIABLES	N	%
GENDER		
Male	185	51%
Female	178	49%
INCOME (Minimum Wage)*		
Less than or equal to 1 minimum wage	278	76,58%
More than 1 minimum wage	47	12,94%
The person does not know	38	10,46%
SLIM NUTRITIONAL STATUS		
Absent	165	45,5%
Present	198	54,5%
EDUCATION OF THE PEOPLE IN CHARGE		
Illiterate	9	2,48%
Elementary School	224	61,7%
High School and University	130	35,81%
HAS THE PERSON EVER BEEN TO THE DENTIST?		
Yes	68	18,7 %
No	295	81,3%

Table 1 - Socioeconomic variables of participants in Iprede - Fortaleza, 2019.

Source: Research data. * Minimum wage 2019.

OCCLUSOPATHY	N	%
OVERBITE		
Yes	63	17,4%
No	262	72,1%
Not evaluated	38	10,5%
PREVIOUS CROSS BITE		
Yes	32	8,8%
No	292	80,4%
Not evaluated	39	10,8%
POSTERIOR CROSS BITE		
Yes	32	8,8%
No	283	78%
Not evaluated	48	13,2%
PREVIOUS OPEN BITE		
Yes	74	20,4%
No	255	70,2%
Not evaluated	34	9,4%

Table 2 - Prevalence of malocclusions among participants in Iprede - Fortaleza, 2019.

Source: Research data

VARIABLES	N	%
1 minimum wage or less	155	55,3%
Slimming nutritional status	108	54,5%
People who have never been to the dentist	164	55,6%
Elementary school (people in charge)	129	57,6%

Table 3 - Frequency of malocclusion by type of variable, in Iprede - Fortaleza, 2019.

Source: Research Data

VARIABLES	OVERBITE			PREVIOUS CROSS BITE			POSTERIOR CROSS BITE			PREVIOUS OPEN BITE		
	N	%	p	N	%	p	N	%	p	N	%	p
1 minimum wage or less	50	17,9%	0,095	27	9,6%	0,180	27	9,6%	0,557	51	18,2%	0,017
Slimming nutritional status	32	16,2%	0,805	16	8,1%	0,848	19	9,6%	0,772	41	20,7%	0,968
People who have never been to the dentist	52	17,6%	0,952	26	8,8%	0,930	26	8,8%	0,986	60	20,3%	0,717
Elementary education	43	19,2%	0,286	17	7,6%	0,041	18	8,0%	0,336	51	22,8%	0,495

Table 4 - Frequency of types of malocclusion in socioeconomic conditions, in Iprede - Fortaleza, 2019.

Source: Research Data. p = significance level.

This high number in relation to other disorders can be justified by some hypotheses, such as: the emaciated state (child underweight adequate for their age under nutritional diagnosis) in a large portion of the research participants; the high number of reports of children who make indiscriminate use of pacifiers; digital suction; bottle use.

Regarding the habits that can trigger occlusal disorders, Dias et al.,¹³ reported that the masticatory function, in addition to aesthetics, will suffer negative consequences due to the consolidation of malocclusions in children and emphasize that the early action of trained professionals is necessary for the prevention and indication of early treatment.

No major discrepancies were found between genders and the establishment of anterior open bite in this study. The female participants showed a slight percentage higher than the male ones, in line with the results exposed by Vilain et al.,¹⁵; Bauman et al.,¹⁶, and differing from the results found by Miotto et al.,¹⁴, which revealed a statistically significant association in the prevalence of anterior open bite for males.

When relating the nutritional status of the participants to the presence of malocclusion, a non-significant prevalence was found, since among the 108 participants who were under the ideal weight for their respective heights, 54.5% had some occlusal disorder. Therefore, we cannot say whether or not there is any correlation between these variables, as the prevalence is slightly high, and further studies are needed. A total of 295 (81.3%) children were never consulted by a dental surgeon (CD), a worrying fact because it is an age group that must be regularly monitored in order to promote health and prevent oral diseases, in addition to encouraging the practice of healthy habits. In relation to children who had never been to the CD, a total of 55.6% had at least one occlusal disorder, a relevant number

that suggests some association between the variables, however, this hypothesis has not been confirmed by any previous study¹⁷.

Kaieda et al.,¹⁸ emphasize that it is essential that the professionals of the oral health team are attentive to the identification and referral of malocclusion cases, aiming at greater attention to these patients, considering that the precocity of diagnosis and treatment favors the patient.

The results of this research were similar to those found by Guimarães et al.,¹⁹, which demonstrated a direct relationship between the reduced financial condition of the family and the prevalence of malocclusion in children. This association is due to the fact that the cost of treatment is high in private services and the public network does not perform this type of intervention, mainly because it constitutes an elective treatment.

It is known that malocclusion is a disease carried by several influencing factors (individual, socioeconomic, cultural) that can initiate or worsen the installed disorder.^{17,20,21} This study identified a considerable prevalence (61.7%) of parents/guardians with only elementary school education, and of this total, 129 (57.6%) had some occlusal disorder.

Bauman et al.,¹⁶ emphasize that the control of caries, considered a priority in the health care network, associated with the high prevalence of malocclusion in children, has gradually changed the focus of health care. This change results in a greater coverage of other problems that affect the mouth and dental arches, including malocclusions. All this will contribute to improving the quality of life of patients, especially with regard to aesthetic, dental, phonetic and masticatory factors.

According to Bauman et al.,¹⁶ health planning must consider the influence of economic and social factors and some determinants such as literacy and access to

basic health services on oral health.

The study had as limitations the difficulty to approach the target audience, since it is children in early childhood in which the majority had never had contact with an oral health professional, as well as the option to examine children in the age group from zero to six years old, whose dento-skeletal profile finds different conformations.

CONCLUSION

The prevalence of malocclusion in children in early childhood under socially vulnerable conditions has a similar profile to the general population in this age group, pointing to the need for early preventive interventions to minimize the impacts on skeletal and dental development.

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