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## Relationship Between Malocclusion and Deleterious Oral Habits in Preschool Children in Campina Grande, PB, Brazil

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### Povezanost malokluzija i štetnih navika kod predškolske dece u Campina Grande (Brazil)

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#### ORIGINALNI RAD (OR) ORIGINAL ARTICLE

##### SUMMARY

**Purpose:** To evaluate the prevalence of malocclusions in preschool children in the city of Campina Grande, PB, Brazil, and verify the existence of associations between malocclusions and deleterious oral habits, gender and age.

**Methods:** 342 children (3-5-year-old; 196 boys and 146 girls) with complete primary dentition and no previous orthodontic treatment were randomly selected from children regularly attending municipal day care centers. The occurrence of the following malocclusions was evaluated: accentuated overjet and overbite, anterior open bite and posterior crossbite. A calibrated experienced examiner ( $Kappa = 0.86$ ) performed all clinical examinations under natural lightening after drying the teeth and soft tissue with gauze. Yates' chi-square and Fisher's exact tests verified the association between the variables and odds ratio. Significance level was set at 5%.

**Results:** Malocclusions and deleterious oral habits were observed in 74% and 73.4% of the children, respectively. The prevalence of malocclusion was 68.9% in boys and 80.9% in girls. Accentuated overjet (45%) and anterior open bite (42.4%) were the most prevalent malocclusions. There was statistically significant difference ( $P = .008$ ) between genders. However, no statistically significant differences ( $P = .47$ ) were found among the age groups. Accentuated overjet, anterior open bite and posterior crossbite showed a positive association with the presence of deleterious oral habits.

**Conclusions:** The high prevalence of malocclusions and deleterious oral habits observed in this pediatric population is supportive to the fact that oral health professionals that treat patients in these age groups should be aware of the importance of an early and accurate diagnosis in order to avoid the aggravation of occlusal alterations in the future.

**Key words:** Children, preschool; epidemiology; malocclusion.

##### KRATAK SADRŽAJ

**Cilj rada:** Utvrditi prevalenciju malokluzije kod predškolske dece u gradu Campina Grande, u Brazilu, i odnos između malokluzija i štetnih navika, pola i uzrasta.

**Metode:** 342 dece (uzrasta 3-5 godina; 196 dečaka i 146 devojčica) sa kompletnom primarnom denticijom i bez prethodnog ortodontskog tretmana je odabrano metodom slučajnog izbora od dece koja redovno borave u dnevnim dečjim centrima. Ispitivana je pojava sledećih tipova malokluzija: veliki horizontalni preklap i ukršteni zagrižaj, anteriorni otvoreni zagrižaj i bočni ukršteni zagrižaj. Kalibrirani iskusni istraživač ( $Kappa=0.86$ ) je uradio sve kliničke preglede pri dnevnom svetlu i posle posušivanja zuba i mekih tkiva gazom. Yates  $\chi^2$  i Fisherov test su potvrdili povezanost varijabli i stepen verovatnoće. Stepem pouzdanosti je iznosio 95%.

**Rezultati:** Malokluzije i štetne navike su uočene u 74% odnosno 73.4% dece. Prevalencija malokluzija je iznosila 68.9% kod dečaka i 80.9% kod devojčica. Veliki horizontalni preklap (45%) i anteriorni otvoreni zagrižaj (42.4%) su bile dominante malokluzije. Uočena je statistički značajna razlika između polova ( $p=0.008$ ). Međutim, nije bilo značajne razlike ( $p = 0.47$ ) između starosnih grupa. Veliki horizontalni preklap, anteriorni otvoreni zagrižaj i bočni ukršteni zagrižaj su pokazali pozitivnu korelaciju sa prisustvom štetnih navika.

**Zaključak:** Visoka prevalencija malokluzija i štetnih navika uočena u dečjoj populaciji ukazuju na to da dečji stomatolozi moraju biti svesni značaja rane i tačne dijagnoze da bi se izbegla pogoršanja okluzalnih alteracija u kasnijem dobu.

**Cljučne reči:** deca, predškolski uzrast, epidemiologija, malokluzija

## Introduction

The epidemiological scenario of oral health in Brazil has alarming levels of precariousness. Brazilian children present one of the highest indices of premature dental extractions without space maintenance. Untreated extensive carious lesions are aggravating factors for the development of malocclusions, which are ranked third in the scale of oral health problems and priorities in Brazil<sup>[1]</sup>. Therefore, the analysis of the oral health conditions of different groups and age ranges aggregates essential information for planning and establishment of health promotion actions.

Several studies<sup>[2,3,4,5,6,7,8]</sup> have determined the prevalence of malocclusions in the primary dentition as ranging from 38.4%<sup>[9]</sup> to 75.8%<sup>[10]</sup>. Knowledge of the normal dentofacial characteristics in the primary dentition is of paramount importance because the early adoption of preventive measures might avoid the onset of diverse abnormalities during the development of teeth and occlusion<sup>[11]</sup>.

Traditionally, the Brazilian health programs have been focused on elementary school students, which means that preventive and curative dental care is mostly provided to children aged 6-7 years or older. Little attention is directed to infants and preschoolers, which justifies the small number of epidemiological studies in children with exclusive primary dentition. Therefore, the purposes of this study were to evaluate the prevalence of malocclusions in 3-to-5-year-old children attending municipal day care centers in the city of Campina Grande, PB, Brazil and verify the existence of associations between malocclusions and deleterious oral habits, gender and age.

## Methods

This study was conducted in compliance with the ethical guidelines issued by the Resolution 196/96 of the Brazilian National Health Council/Ministry of Health on research involving human subjects. The research project was independently reviewed and approved by the Ethics in Research Committee of the State University of Paraíba, Brazil.

A transversal study was performed with the sample universe population constituted by all children aged 3 to 5 years regularly attending municipal day care centers in the city of Campina Grande, state of Paraíba, located in the northeast of Brazil. The city has an estimated population of population 379,871 habitants and a municipal human development index (HDI) value of 0.72. According to the data provided by the municipal Bureau of Education, there are currently 3,166 children regularly attending 21 municipal day care centers, among which 2,464 are in the 3-5-year-old age range. A probabilistic sample was constituted with 95% confidence interval and 5% error margin.

## Uvod

Epidemiološka slika stanja oralnog zdravlja u Brazilu pokazuje alarmantni nivo karijesa. Brazilska deca imaju jedan od najviših indeksa prevremenih ekstrakcija bez očuvanja prostora. Nelečene karijesne lezije pogoduju razvoju malokluzija koje su na trećem mestu stomatoloških problema i prioriteta u Brazilu.<sup>1</sup> Zato analiza uslova za očuvanje oralnog zdravlja u različitim grupama i uzrastima daje neophodne informacije za planiranje aktivnosti za unapređenje zdravlja.

Nekoliko studija<sup>2-8</sup> je pokazalo da se prevalencija malokluzija u primarnoj denticiji kreće od 38.4%<sup>9</sup> do 75.8%<sup>10</sup>. Poznavanje normalnih dentofacijalnih karakteristika primarne denticije je od najvećeg značaja jer rano usvajanje preventivnih mera može da spreči pojavu različitih anomalija u toku razvoja zuba i okluzije.<sup>11</sup>

Tradicionalno, brazilski programi zdravstvene zaštite su fokusirani na decu školskog uzrasta, što znači da se preventivne i kurativne mere pretežno sprovode kod dece uzrasta 6-7 godina i starije. Malo pažnje se posvećuje odojčadi i predškolskoj deci na šta ukazuje i mali broj epidemioloških studija koje obuhvataju decu sa isključivo primarnom denticijom.

Zbog toga je cilj ove studije bio da se utvrdi prevalencija malokluzija kod dece uzrasta 3-5 godina koja pohađaju dnevne centre u gradu Campina Grande, u Brazilu. Kao i povezanost malokluzija i štetnih navika, uzrasta i pola.

## Subjekti i metode

Ova studija je u skladu sa etičkim smernicama istraživanja koja uključuju humane subjekte, koje je izdao brazilski Nacionalni zdravstveni savet / Ministarstvo zdravlja. Projekat je nezavisno ocenio i odobrio Etički komitet Državnog univerziteta u Paraibi, u Brazilu.

Transverzalna studija je urađena na uzorku iz celokupne populacije dece uzrasta 3-5 godina koja redovno posećuju dneve centre u gradu Campina Grande, u državi Paraíba na severo-istoku Brazila. Grad ima oko 379 870 stanovnika i gradski indeks humanog razvoja (HDI) od 0.72. Na osnovu podataka lokalnog Biroa za obrazovanje, trenutno 3166 dece redovno borave u centrima za dnevni boravak dece (21 centar), od toga je 2464 dece uzrasta 3-5 godina. Uzorak za ispitivanje je sastavljen sa intervalom sigurnosti od 95% i mogućom 5% greškom.

Children who presented mixed dentition, those with current or previous use of orthodontic appliances (e.g.: space maintainers or space-regaining devices) and those with extensive carious lesions were excluded from the trial. After application of the inclusion/exclusion criteria, the study population comprised 342 children from 8 municipal day care centers, who were allocated in 3 groups, according to their age: G1 (3 years) with 127 children (37.1%); G2 (4 years) with 115 children (33.6%) and G3 (5 years) with 100 children (29.2%).

Prior to data collection, the parents/caregivers were fully instructed by the examiner on the study purposes, relevance and possible benefits arising from its development. All parents/guardians were asked to sign a written informed consent form authorizing the enrollment of their children in the trial.

### Occlusal Examination

Data were collected by a single calibrated examiner (Kappa = 0.86) and were recorded in study-specific forms.

After supervised toothbrushing, the children were examined in a room with good natural lightening by visual inspection using a wooden spatula after drying the teeth and soft tissue with gauze. A CPI (community periodontal index) probe was used to record occlusal measurements and determine the presence of alterations in dental occlusion. The following malocclusions were present: anterior open bite, anterior and/or posterior crossbite, and accentuated overjet and overbite. At the time of examination, the mandible was positioned in centric relation.

### Anterior Open Bite

Anterior open bite was defined as the condition in which the incisal borders of the primary mandibular central incisors were located below the level of the incisal borders of the dos primary maxillary central incisors, with no occlusal contact in centric relation. Anterior open bite was classified as absent or present. If present, it was rated as mild (negative overbite  $\leq 1$  mm), moderate (negative overbite  $> 1$  mm and  $< 3$  mm) and severe (negative overbite  $\geq 3$  mm).

### Crossbite

Crossbite was defined as the condition in which the maxillary teeth were palatally displaced in relation to the mandibular teeth in either the posterior segment (unilateral/bilateral) or the anterior segment, or in both segments (anterolateral or total), in one or more teeth<sup>[12]</sup>, being classified as anterior, posterior, unilateral and bilateral.

Deca sa mešovitom denticijom, ona koja nose ili su nosila ortodontske aparate (čuvare prostora, ili aparate za sticanje prostora), kao i ona deca sa visoko zastupljenim kariosnim lezijama nisu uključena u istraživanje. Primenom kriterijuma o obuhvaćenosti istraživanjem, ukupan broj ispitanika obuhvatao je 342 dece iz osam centara za dnevni boravak dece. Ispitanici su podeljeni u tri grupe na osnovu uzrasta i to G1 (3 godine) sastojala se od 127 dece (37.1%); G2 (4 godine) 115 dece (33.6%) i G3 (5 godina) sačinjavalo je 100 dece. (29.2%).

Pre pristupanju samom istraživanju, roditelji i vaspitači su bili upoznati sa ciljevima istraživanja, značajnostima kao i mogućom koristi koji bi proistekli nakon istraživanja. Svi roditelji/staratelji su potpisali pismenu saglasnost o prihvatanju učešća svoje dece u istraživanju.

### Analiza okluzije

Podatke je prikupljao kalibrirani iskusni ispitivač (Kappa = 0.86) i beleženi u formulare specifično dizajnirane za istraživanje.

Posle nadgledanog pranja zuba, deca su ispitivana u prostoriji sa dobrim prirodnim osvetljenjem, vizuelnom inspekcijom drvenom špatulom nakon što su zubi i meka tkiva osušeni tupferom gaze. Parodontalna sonda (community periodontal index) je korišćena za određivanje okluzalnih merenja i utvrđivanje prisustva malokluzija. Sledeće malokluzije su uočene: anteriorni otvoren zagrižaj, prednji i bočni ukršten zagrižaj, izraziti vertikalni i horizontalni preklap. Tokom ispitivanja mandibula je pozicionirana u položaj centralne relacije.

### Anteriorni otvoren zagrižaj

Anteriorni otvoren zagrižaj se može definisati kao stanje gde su incizalne ivice mlečnih centralnih sekutića ispod nivoa incizalnih ivica gornjih centralnih sekutića i ne postoji njihov kontakt u centralnoj relaciji

Anteriorni otvoren zagrižaj je klasifikovan kao prisutan ili odsutan. Ukoliko je prisutan, opisivan je kao blag (negativni vertikalni preklap  $\leq 1$  mm), srednji (negativni vertikalni preklap  $> 1$  mm and  $< 3$  mm) i izražen (negativni vertikalni preklap  $\geq 3$  mm).

### Ukršten zagrižaj

Ukršten zagrižaj definiše se kao stanje gde su gornji zubi pomereni palatinalno u odnosu na donje zube, u posteriornom segmentu (jednostrano/obostrano), u anteriornom segmentu, u oba segmenta (anterolateralno ili totalno) ili se uočava na jednom ili više zuba<sup>12</sup>, i to klasifikovan kao anteriorni, posteriorni, jednostrani ili obostrani.

## Overjet and Overbite

Overjet was measured horizontally from the incisal borders of the primary maxillary central incisors to the buccal surface of the primary mandibular central incisors, using the CPI probe. Normal overjet was considered when a distance of less than 2 mm was recorded.

Overbite was measured vertically from the incisal borders of the primary mandibular central incisors to the incisal borders of the primary maxillary central incisors using the CPI probe resting against a wooden. Normal overbite was considered when a distance of less than 2 mm was recorded<sup>[2]</sup>.

Children were classified as having normal occlusion when neither of the above described malocclusions was noted.

## Deleterious Oral Habits

The following deleterious oral habits were observed: pacifier sucking, thumb sucking, onychophagia, biting of objects and tongue thrusting.

## Statistical Analysis

All statistical analyses were performed using the Epi Info 2005 software (Centers for Disease Control and Prevention, Atlanta, GA, USA). The absolute and percent frequencies were obtained for data analysis (descriptive statistical techniques). The existence of significant association among the variables was verified by means of bivariate analysis (Yates' chi-square and Fisher's exact tests) considering a value of  $\alpha=0.05$  for rejection of the null hypothesis. Odds ratio (OR) was used for analysis of the strength and direction of association.

## Results

From the study population, 196 (57.3%) were males and 146 (42.7%) were females. A total of 253 children (74.0%) presented malocclusions and 89 children (26.0%) had normal occlusion.

The analysis of malocclusion distribution according to gender showed a prevalence of 68.9% for males and 80.8% for females, with statistically significant difference between genders ( $P = .008$ ) [Table 1].

## Veliki horizontalni i vertikalni preklap

Veliki horizontalni preklap se meri u horizontali od incizalnih ivica mlečnih gornjih centralnih sekutića do labijalnih površina mlečnih donjih centralnih sekutića korišćenjem parodontalne sonde. Normalni horizontalni preklap je smatran kada je izmereno rastojanje manje od 2mm.

Vertikalni preklap je određivan kao rastojanje od incizalnih ivica mlečnih donjih centralnih sekutića do incizalnih ivica mlečnih gornjih centralnih sekutića, merenje je izvršeno parodontalnom sondom oslonjenom na drvenu špatulu. Normalni vertikalni preklap je smatran kada je izmereno rastojanje manje od 2mm.

Smatrano je da deca imaju normalnu okluziju ako nije uočena ni jedna od navedenih malokluzija.

## Štetne loše navike

Sledeće štetne loše navike su uočavane: sisanje cucle laže, sisanje palca, disanje na nos, grickanje predmeta i guranje jezika.

## Statistička analiza

Sve statističke analize su obavljene u programu Epi Info 2005 software (Centar za kontrolu i prevenciju bolesti Atlanta, USA). Apsolutne i procentualne frekvence podataka su korišćene za analizu podataka (deskriptivna statistička metoda). Postojanje značajnosti između varijabli je verifikovano bivarijatnom analizom (Yates' i Fisher'ov test), gde je vrednost od  $\alpha=0.05$  dovoljna za odbijanje nulte hipoteze.

## Rezultati

Od ukupno ispitanika, 196 (57.3%) su bili muškog pola i 146 (42.7%) ženskog. Ukupno 253 dece (74.0%) je imalo malokluziju dok je 89 dece (26.0%) imalo normalnu okluziju.

Analiza distribucije malokluzije po polovima prikazuje prevalencu od 68.9% za muški pol i 80.8% za ženski, sa statistički značajnom razlikom između polova  $P=0.008$  (Tabela I).

**Table 1.** Distribution of the preschool children according to the gender and presence of malocclusion.

Gender	Presence of malocclusion				Total		P value <sup>1</sup>
	Yes		No		n	%	
	N	%	N	%			
Male	135	68.9	61	31.1	196	100.0	P=0.008*
Female	118	80.8	28	19.2	146	100.0	
Total	253	74.0	89	26.0	342	100	

(\*) Statistically significant association at 1.0% significance level; (1) - Fisher's exact test.

On the other hand, the analysis of the presence of malocclusions as a function of age revealed no statistically significant difference ( $P = .47$ ) and a decrease in the prevalence was observed with the increase of age. In this way, the prevalence of malocclusions in children aged 3, 4 and 5 years was 77.2%, 73.9% and 70.0%, respectively. Table 2 displays the prevalence of malocclusions with their respective frequencies. The data on Table 2 show that the most frequent malocclusions were accentuated overjet (45.0%), followed by anterior open bite (42.4%), crossbite (18.5%) and accentuated overbite (15.5%). The sum of the percentages is not 100.0% because many children presented more than one type of malocclusion.

Sa druge strane, analiza prisustva malokluzija u zavisnosti od uzrasta nije prikazala statistički značajnu razliku  $P = 0.47$ , smanjivanje prevalencije je uočeno sa povećanjem broja godina. Prevalenca malokluzija u u dece uzrasta 3,4 i 5 godina iznosi 77.2%, 73.9% i 70.0%. U tabeli su prikazane prevalencije malokluzija sa njihovom odgovarajućom učestalošću. Podaci iz tabele 2 prikazuju da je najčešća malokluzija: veliki horizontalni preklap (45.0%), zatim slede anteriorno otvoreni zagrižaj (42.4%), ukršten zagrižaj (18.5%) i izraziti ukršten zagrižaj (15.5%). Ukupna suma procenata nije 100.0% iz razloga što je kod mnoge dece uočeno više od jedne vrste malokluzija.

**Table 2.** Distribution of the preschool children according to the types of malocclusions observed.

Type of Malocclusion	Absent		Present	
	n	%	n	%
Accentuated Overjet	188	55.0	154	45.0
Anterior open bite	197	57.6	145	42.4
Crossbite	279	81.0	63	18.4
Accentuated overbite	289	84.5	53	15.5

The analysis of the types of malocclusion and their distribution according to gender showed a statistically significant association among accentuated overjet ( $P = .04$ ), open bite ( $P = .009$ ) and crossbite ( $P = .03$ ) [Table 3].

Analiza pojedinih tipova malokluzije i njihova distribucija prema polovima pokazuje statistički značajnu povezanost između izrazitog horizontalnog preklopa ( $P = 0.04$ ), otvorenog zagrižaja ( $P = 0.009$ ) i ukrštenog zagrižaja ( $P = 0.03$ ) (Tabela 3).

**Table 3.** Distribution of the types of malocclusions observed in the preschool children according to the gender.

Type of Malocclusion	Gender				P value <sup>1</sup>
	Male		Female		
	n	%	n	%	
Accentuated overjet					
Present	80	40.8	74	50.7	$P = 0.04^*$
Absent	116	59.2	72	49.3	
Open bite					
Present	72	36.7	73	50	$P = 0.009^{**}$
Absent	124	63.3	73	50	
Crossbite					
Present	29	14.8	34	23.3	$P = 0.03^*$
Absent	167	85.2	112	76.7	
Accentuated overbite					
Present	30	15.3	23	15.8	$P = 0.51$
Absent	166	84.7	123	84.2	

(\*) Statistically significant association at 5% significance level; (\*\*) Statistically significant association at 1% significance level; (<sup>1</sup>) Fisher's exact test.

Deleterious oral habits were found in 73.4% of the children. Table 4. summarizes the distribution of malocclusions according to the presence of deleterious oral habits. According to these data, children with deleterious oral habits have 5.2 times more chance of developing accentuated overjet, 21.6 more chance of presenting anterior open bite and 4.1 times chance of having crossbite.

From the children with anterior open bite, 66.2% were classified as having severe, 17.90% had mild and only 15.9% had moderate anterior open bite. Regarding the types of crossbite, the most prevalent was posterior crossbite (87.3%), followed by its association with anterior crossbite (9.5%) and anterior crossbite alone, which occurred in only 3.2% of the cases. From the categories of posterior crossbite, right unilateral crossbite was the most frequent (52.2%), followed by left unilateral crossbite (29.5%) and bilateral crossbite, which occurred in 18.0% of the cases.

Prisustvo štetnih navika je uočeno kod 73.4% od ukupnog broja dece. Podaci iz tabele 4 sumiraju distribuciju malokluzija u odnosu na prisutnost štetnih navika. Sudeći prema tim podacima, deca kod kojih postoje štetne navike imaju 5,2 puta veće šanse da dobiju izraziti horizontalni preklop, 21,6 više šanse za prisustvo otvorenog i 4,1 puta više šanse za ukršteni zagrižaj.

Od dece kod kojih je uočen otvoreni zagrižaj, 66.2% je imalo izražen, 17,9% je imalo blagi a samo 15,9% je imalo srednji otvoreni zagrižaj. Analizirajući vrste ukrštenih zagrižaja, najveću prevalencu je imao bočni ukršteni zagrižaj (87.3%), zatim ukršteni zagrižaj udružen sa anteriornim (9.5%), i anteriorni ukršteni zagrižaj koji je uočen u samo 3.2% slučajeva. Prevalenca posteriornog ukrštenog zagrižaja je uočena sledeća desni jednostrani ukršteni zagrižaj (52.2%), zatim levi jednostrani ukršteni zagrižaj (29.5%) i obostrani ukršteni zagrižaj koji je uočen u 18.0% slučajeva.

**Table 4.** Distribution of malocclusions according to the presence of deleterious oral habits.

Types of Malocclusion	Deleterious Oral Habit				P value <sup>1</sup>	Odds Ratio(IC=95%)
	Present		Absent			
	n	%	n	%		
Accentuated Overjet						1
Present	137	54.6	17	18.7	P=0.000*	5.23
Absent	114	45.4	74	81.3		(2.92-9.36)
Open bite						1
Present	140	55.8	5	5.5	P=0.000*	21.69
Absent	111	44.2	86	94.5		(8.51-55.28)
Crossbite						1
Present	57	22.7	6	6.6	P=0.001*	4.16
Absent	194	77.3	85	93.4		(1.72-10.02)
Accentuated overbite						1
Present	34	13.5	19	20.9	P=0.13	0.59
Absent	217	86.5	72	79.1		(0.31-1.10)

(\*) Statistically significant association at 1% significance level; (<sup>1</sup>) Yates' chi-square test.

## Discussion

Malocclusion is a common finding in the populations worldwide, regardless of the geographic area, ethnic group, gender, age or social class<sup>[13]</sup>.

The prevalence of malocclusion in the primary dentition has a varied frequency in distinct populations<sup>[10]</sup>. These differences may be explained by individual characteristics, such as socioeconomic factors, cultural issues and sample sizes. The study design and the mode of analysis of the results may also contribute to the great discrepancies existing among the data available about different populations<sup>1</sup>.

The prevalence of malocclusion reported in several studies<sup>[5,7,8,10,14]</sup> ranges from 40.5% to 75.8%. In the present study, 74.0% of the children had some type of malocclusion. The literature is controversial with respect to malocclusion distribution between genders<sup>[1,3,4,10,15]</sup>. In this study, there was a statistically significant higher prevalence in girls compared to boys.

Accentuated overjet was the most prevalent type of malocclusion, being detected in 45.0% of the children, which is a higher prevalence than that published elsewhere<sup>[4,7,16,17]</sup>. However, anterior open bite is the most frequently observed malocclusion<sup>[3,8,10,14,18]</sup> and its prevalence ranges from 6.22%<sup>[7]</sup> to 38.8%<sup>[12]</sup>. In the present study, anterior open bite was detected in 42.4% of the children, which is a higher prevalence than that presented in other investigations<sup>[3,10]</sup>. There was a positive association between gender and presence of accentuated overjet, anterior open bite and crossbite.

Posterior crossbite was found in 16.0% of the sample. This is a higher prevalence than that described in the literature, which varies between 7% and 13%<sup>[3,4,6,7,14,16,17,19]</sup>. Thilander et al.<sup>[20]</sup> have advocated that the treatment of posterior crossbite should be initiated in the primary dentition because this malocclusion is not self-correctable and should be treated as soon as diagnosed.

Among the children with crossbite, the most prevalent type was posterior crossbite (87.3%), followed by its association with anterior crossbite (9.5%). Anterior crossbite occurred in only 3.2% of the cases, as previously reported<sup>[3]</sup>. Nevertheless, Onyeaso and Sote<sup>[7]</sup> found a prevalence of 11.9% for anterior crossbite among 3-5-year-old Nigerian children.

From the categories of posterior crossbite, right unilateral crossbite was the most frequent, being detected in 52.2% of the children with posterior crossbite, whereas left unilateral crossbite occurred in 29.5% of cases and bilateral was detected in 18% of the children with posterior crossbite. Carvalho et al.<sup>[3]</sup> observed bilateral posterior crossbite in only 5.26% of the cases. In the primary dentition, unilateral posterior crossbites are more prevalent than bilateral crossbites<sup>[12,17,21]</sup>.

## Diskusija

Malokluzije se često sreću u populaciji širom sveta, bez obzira na geografsko područje, etničku grupu, pol, uzrast, socijalni status.<sup>13</sup>

Prevalenca malokluzija u mlečnoj denticiji je različita u različitim populacijama.<sup>10</sup> Ove razlike se mogu objasniti individualnim karakteristikama, kao što su socio-ekonomski faktori, kulturalnim pitanjima kao i vrstom i veličinom ispitivanog uzorka. Dizajn istraživanja i način analize rezultata takođe značajno doprinose postojanju razlika u podacima koji su dostupni za različite populacije.<sup>1</sup>

Prevalenca malokluzija prikazana u nekoliko studija<sup>5,7,8,10,14</sup> kreće se u rasponu od 40.5% do 75.8%. U prikazanom istraživanju 74.0% dece je imalo neku vrstu malokluzija. Podaci iz literature su kontroverzni što se tiče distribucije malokluzija po polovima.<sup>1,3,4,10,15</sup> U prikazanom istraživanju postojala je statistički značajna veća prevalenca u devojčica nego u dečaka.

Izraziti horizontalni preklap je vrsta malokluzije sa velikom prevalencom 45.0% ukupne dece, što je velika prevalenca nego objavljena do sada u literaturi.<sup>4,7,16,17</sup> Najčešće opisivana malokluzija u literaturi je anteriorni otvoreni zagrižaj<sup>3,8,10,14,18</sup> sa prevalencom u rasponu od 6.22%<sup>7</sup> do 38.8%<sup>12</sup>. U prikazanom istraživanju anteriorni otvoreni zagrižaj je uočen u 42.4% dece, što je veća prevalenca nego prikazana u drugim istraživanjima.<sup>3,10</sup> Postoji pozitivna povezanost između polova i prisustva izrazitog horizontalnog preklopa, anteriorno otvorenog zagrižaja i ukrštenog zagrižaja.

Posteriorni ukršteni zagrižaj je uočen u 16.0% uzorka. Ovo je veća prevalenca nego opisana u literaturi, koja varira između 7% i 13%<sup>(3,4,6,7,14,16,17,19)</sup> Thilander i sar.<sup>(20)</sup> su napomenuli da terapiju posteriornog ukrštenog zagrižaja treba započeti u mlečnoj denticiji iz razloga što ova malokluzija nije samo korektivna, i treba je tretirati čim se dijangostikuje.

Među decom sa ukrštenim zagrižajem, najčešći je posteriorni ukršteni zagrižaj (87.3%), zatim sledi posteriorni ukršteni zagrižaj udružen sa anteriornim (9.5%). Anteriorni ukršteni zagrižaj je uočen u samo 3.2% od ukupnog broja kao što je već prikazano.<sup>3</sup> Onyeaso i Sote<sup>7</sup> su prikazali prevalencu od 11.9% za anteriorni ukršteni zagrižaj u dece uzrasta 3-5 godina u Nigeriji.

Od kategorija posteriornog ukrštenog zagrižaja, najčešći je desni ukršteni zagrižaj, uočen je u 52.2% ispitivane dece, levi ukršteni zagrižaj je uočen u 29.5% dok je obostrani opisan u 18% ispitivane dece sa posteriornom ukrštenim zagrižajem. Carvalho i sar.<sup>3</sup> je pronašao obostrano ukršteni posteriorni zagrižaj u samo 5.26% slučajeva. U mlečnoj denticiji jednostrano ukršteni posteriorni zagrižaj je češći nego obostrani.<sup>12,17,21</sup>



In the present study, 15.5% of the children presented accentuated overbite, which is a lower prevalence than that reported in another study with Brazilian children (24.5%)<sup>[12]</sup>.

Knowledge of the oral health conditions of different populations by means of epidemiological surveys is essential for adoption of preventive /interceptive actions that best meet their needs and manage their risks. This also allows establishing comparison patterns to evaluate the actual impact of these actions<sup>[5]</sup>. Planning and organization of oral health programs and public services should include prophylactic and health promotion measures directed towards prevention of malocclusions with a multiprofessional and interdisciplinary perspective<sup>[4]</sup>. Furthermore, the treatment of less complex occlusal problems, based on etiologic, morphologic and functional diagnostic approaches, should be initiated at early ages. Recognizing the conditions that might predispose young children to develop malocclusions is an important but sometimes overlooked part of dental care to pediatric patients.

## Conclusions

The outcomes of the present study showed a high prevalence of malocclusions in a pediatric population under the age of 5 and a positive association with deleterious oral habits. These findings demonstrate the need of implementation of immediate educative-preventive programs by the municipal managers and local government health authorities, in order to allow an effective and timely care to these children and avoid the aggravation of occlusal alterations at a later age.

U prikazanom istraživanju 15.5% ispitivane dece je imalo izraziti vertikalni preklap, što je mala prevalenca u odnosu na drugu studiju dece iz Brazila (24.5%)<sup>[12]</sup>.

Poznavanje stanja oralnog zdravlja različitih populacija pomoću epidemioloških studija je neophodno kao bi se prihvatile preventivne/interceptivne mere koje najbolje odgovaraju njihovim potrebama i mogućim rizicima. Takođe omogućava i adekvatno poređenje stanja kako bi se ocenila uspešnost ovih akcija.<sup>5</sup> Planiranje i organizacija programa zaštite oralnog zdravlja i promocija zdravstvenih mera treba da obuhvati promociju profilaktičkih i mera zaštite oralnog zdravlja usmerenih prema prevenciji malokluzija i to sa multiprofesionalnog i interdisciplinarnog stanovišta.<sup>4</sup> Takođe terapija manjih okluzalnih problema, u zavisnosti od etiološkog, morfološkog i funkcionalnog pristupa treba da je inicirana u ranom uzrastu. Prepoznavanje stanja koja mogu dovesti do razvoja malokluzija je veoma važan deo ali ponekad zapostavljen deo stomatološke zaštite dece.

## Zaključak

Rezultati navedenog istraživanja prikazuju veliku prevalencu malokluzija u pedijatrijskoj populaciji uzrasta manjeg od 5 godina, kao i pozitivnu povezanost između prevalencu i prisutnih štetnih navika. Navedeni rezultati ukazuju na potrebu uključivanja neposrednih edukativnih-preventivnih mera od strane lokalnih menadžera i lokalnih zdravstvenih radnika, da bi se omogućilo efikasno i pravovremeno zbrinjavanje ove dece i sprečilo pogoršanje malokluzija u kasnijem dobu.

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