Prevalence and risk factors related to traumatic dental injuries in Brazilian schoolchildren

Soriano EP, Caldas Jr AF, Carvalho MVD, Amorim Filho HA. Prevalence and risk factors related to traumatic dental injuries in Brazilian schoolchildren.

Abstract – The aim of this study was to investigate the risk factors associated with the occurrence of dental trauma in permanent anterior teeth of schoolchildren in Recife, Brazil. It included a random sample of 1046 boys and girls aged 12 attending both public and private schools. The sample size was calculated using a 95% confidence interval level; a statistical significance of 5% (α); a sample power of 80%; and an odds ratio of 1.55. The sample selection was carried out in two stages: first, schools were selected by simple sampling, and then children were chosen using a proportionality coefficient. Data were collected through clinical examinations and interviews, after examiner calibration. Dental trauma was classified according to Andreasen criteria. Overjet was considered a risk factor when it presented values higher than 5 mm. Lip coverage was classified as adequate or inadequate, while obesity was considered according to National Center for Health Statistics procedures for the assessment of nutritional status. Data were summarized and analyzed using the statistical software SPSS. The prevalence of dental injuries was 10.5%. Boys experienced more injuries than girls, 12.2% and 8.8%, respectively ($P > 0.05$). Children attending public schools presented more traumatic injuries than those from private schools, 11.4% and 9.5%, respectively, but there was no statistically significant difference ($P > 0.05$). There was a statistically significant difference between traumatic dental injuries and overjet ($P < 0.05$); between traumatic dental injuries and inadequate lip coverage ($P = 0.000$), and between obesity and dental trauma ($P < 0.05$). It was concluded that boys attending public schools and presenting an overjet size >5 mm, inadequate lip coverage, and obesity were more likely to have traumatic dental injuries in Recife, Brazil.

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Traumatic dental injuries in schoolchildren have been reported by many authors (1–7), and the prevalence of injured teeth varies in different populations and at various ages (8). During the last few decades various kinds of data have been found by authors using different methods of study. Nevertheless, there is no doubt that traumatic dental injuries nowadays still present a high prevalence, especially in young people (Table 1).

An oral traumatic injury can frequently lead to tooth lesions, affecting both supporting dental structures and hard tissues (9). Besides these local injuries, dental trauma can, directly or indirectly, influence people's lives, affecting their appearance,

Table 1. Results of previous studies of traumatic dental injuries from 1981 to 2004

Author	Country	Year	Age	Sample	Prevalence (%)
García-Godoy et al. (40)	Dominican Rep.	1981	7–14	596	18.1
García-Godoy (32)	Dominican Rep.	1984	5–14	1633	10
García-Godoy et al. (41)	Dominican Rep.	1985	6–17	1200	12.2
García-Godoy et al. (31)	Dominican Rep.	1986	7–16	1200	18.9
Uji & Teramoto (57)	Japan	1988	6–18	15822	21.8
Hunter et al. (58)	Wales	1990	11–12	968	15.3
Sanchez & García-Godoy (43)	Mexico	1990	3–13	1010	28.4
Forsberg & Tedestam (59)	Sweden	1993	7–15	1635	30
Zerman & Cavalleri (60)	Italy	1995	6–21	2798	7.3
Delattre et al. (61)	France	1994	6–15	2020	13.6
Josefsson & Karlander (62)	Sweden	1994	7–17	88	11.7
Otuyemi (51)	Nigeria	1994	12	1016	10.9
Hargreaves et al. (23)	África	1995	11	1035	15.4
Petti & Tarsitani (52)	Italy	1996	6–11	824	20.2
Borssén & Holm (63)	Sweden	1997	1–16	3007	35
Hamilton & Holloway (64)	England	1997	11–14	2022	34
Marcenes et al. (4)	Syria	1999	9–12	1087	33.2
Caldas & Burgos (7)	Brazil	2001	6–15	250	50.8
Nicolau et al. (56)	Brazil	2001	13	652	20.4
Cortes et al. (6)	Brazil	2001	9–14	3702	13.6
Marcenes et al. (15)	Brazil	2001	12	652	58.6
Traebert et al. (46)	Brazil	2003	12	307	18.9
Soriano et al. (65)	Brazil	2004	12	116	23.3

speech, and position of teeth (10), reinforcing the assertion that traumatic dental injuries may cause functional, esthetic, psychological (11) and social (12) problems.

Children and adolescents in general are more susceptible to these problems than adults (13). In 1990 it was stated that at least half of all schoolchildren had a chance of suffering traumatic dental injuries before leaving school (14). A recent study conducted in Brazil presented a prevalence of 58.6% of traumatic dental injuries among 12-year-old schoolchildren (15). Because traumatic dental injuries can be prevented (16, 17), there needs to be a better understanding about the risk factors associated with trauma, in order to allow the application of adequate preventive actions.

Therefore, considering the importance of dental trauma in a population (9) and the risk factors closely associated with it, the aim of this study was to investigate and describe the prevalence and risk factors related to traumatic injuries to permanent anterior teeth in 12-year-old children attending private and public schools in Recife, Brazil.

Methods

A cross-sectional survey was carried out with 1046 schoolchildren aged 12 years, of both sexes, attending public and private elementary schools in Recife, Brazil. The 95% CI level, a standard error of 5%, an estimated prevalence of dental injury of 20% (18), and an odds ratio (OR) of 1.55 were used for the calculation. The minimum sample size to satisfy the requirements was estimated to be 958 children. A correction factor equal to 1.2 was applied to increase accuracy. Thus, the final sample size consisted of 1150 children, divided into two groups of 575 individuals, representing the public and private schools. These children were randomly selected to represent the population of schoolchildren living in Recife.

In order to obtain the list of all schools in Recife, contact was made with the local education authorities, who provided the following information: name, addresses, phone number and total number of students aged 12 years at each school. A letter was sent to the parents of the selected children explaining the aim, importance and methods of the study, and requesting their consent to the children's participation.

One dentist (EPS) participated in standardization and calibration training sessions before the baseline field phase began (kappa = 0.92). Data were collected at the clinical examination and were recorded on a specific form, according to the Andreasen criteria (19). The instruments were sterilized before use. A plain front-surface mouth mirror (Duflex, MG, Brasil) and a blunt probe (WHO 621, Trinity, Campo Mourão/PA, Brasil) were used to identify the presence and extent of restorations or to remove debris. In order to increase the accuracy of diagnosis teeth were dried before examination using gauze squares. Artificial lighting was used, and the subjects were examined at school during class hours in a predetermined order. The examiner used gloves

and mask during all the clinical examinations, which included only permanent maxillary and jaw incisors. Intraexaminer variability was checked by examining every 10th subject for a second time.

Overjet, which was measured using a WHO 621 probe, was considered as a risk factor when it presented values higher than 5 mm. Lip coverage was classified as adequate when the lips completely covered the anterior teeth in the at-rest position and as inadequate when they did not.

Children were also weighted to the nearest 0.1 kg on a digital scale and height was measured to the nearest 5 mm using a stadiometer (Fisiotech, Campinas/SP, Brasil). Three readings were made and the mean height was considered. Nutritional status was evaluated on the basis of National Center for Health Statistics (NCHS) procedures and the child was considered as an obese subject when weight for age (WA) and height for age (HA) variables showed values equal to or higher than the value of the 97th percentile.

All results were analyzed using the Statistical Package for Social Science (SPSS 10.0). The frequency distributions and means were calculated. The chi-square test and multinomial logistic regression were used for a number of comparisons. The significance level was set at 5%.

Results

Of the 1046 children examined in the survey, 486 (46.5%) were from private and 560 (53.5%) were from public schools. The group consisted of 520 (49.7%) females and 526 (50.3%) males (Table 2). The response rate was 90.9%. Intraexaminer agreement was calculated and a score of 0.91 indicated an optimal agreement.

The prevalence of traumatic injuries to permanent anterior teeth was 10.5% ($n = 110$). With 95% of reliability it is estimated the incidence of traumatic dental injuries in this population is between 8.7% and 12.4%. Boys experienced more injuries than girls, 12.2% and 8.8%, respectively, but there were no statistical significant differences (OR = 1.43, CI = 0.96–2.13, $P = 0.080$). Children attending public schools had sustained more traumatic injuries than those from private schools, but there were no statistically significant differences (OR = 1.23, CI = 0.83 to 1.84, $P = 0.302$).

The teeth most commonly affected were numbers 11 and 21 (Table 2). Fracture in enamel only was the most frequent type of injury (47.3%), followed by fracture in enamel/dentin without pulp exposure (Tables 3 and 4).

The main reported causes of traumatic injuries to the permanent incisors were falls, collisions with people or inanimate objects and unspecified accidents, respectively. The most frequent sites of dental injuries were home and street (Table 5).

Table 2. Frequency distribution of traumatic injuries according to affected teeth in Recife, Brazil

Injured teeth	School		Total group [*n* (%)]
	Public [*n* (%)]	Private [*n* (%)]	
12	–	3 (6.5)	3 (2.7)
11	33 (51.6)	13 (28.3)	46 (41.8)
21	20 (31.3)	24 (52.2)	44 (40.0)
22	5 (7.8)	1 (2.2)	6 (5.5)
31	2 (3.1)	–	2 (1.8)
32	–	1 (2.2)	1 (0.9)
41	–	1 (2.2)	1 (0.9)
11 and 21	2 (3.1)	2 (4.3)	4 (3.6)
31 and 41	1 (1.6)	–	1 (0.9)
21 and 41	–	1 (2.2)	1 (0.6)
32 and 41	1 (1.6)	–	1 (0.9)
Total	64 (100.0)	46 (100.0)	110 (100.0)

Children with inadequate lip coverage presented more traumatic dental injuries than those with adequate lip coverage. The OR value was 4.29, indicating that schoolchildren with inadequate lip coverage presented a fourfold higher risk of traumatic dental injuries (Table 6).

There was also a significant association between the occurrence of traumatic injuries and the presence of overjet higher than 5 mm. Children with increased overjet were 3.29 times more likely to have dental injuries (Table 7).

Traumatic dental injuries were more prevalent among obese children from public schools. Nevertheless there was no significant association between dental trauma and obesity (Table 8). The prevalence of traumatic injuries was also higher among obese boys than obese girls (17.2% and 16.2%, respectively), but there were no statistical significant differences (Table 9).

Discussion

The present study identified a prevalence of 10.5% of traumatic dental injuries to the permanent anterior teeth among 12-year-old schoolchildren in Recife. This result corroborates the assertion that dental injuries among children frequently present prevalence between 10% and 20% (8).

Traumatic dental injury is not a result of disease but a consequence of several factors that will accumulate throughout life if not properly treated. Thus, data presented in this study represent the sum of dental trauma experience of 12-year-old schoolchildren in Recife, because it was observed that the time of dental injuries occurrence varied, that is, some had occurred in the same year as the examination and others occurred up to 6 years

Table 3. Frequency distribution of types of traumatic dental injuries according to sex

Type of traumatic injury	Sex		Total [*n* (%)]	*P*-value
	Male [*n* (%)]	Female [*n* (%)]		
Enamel fracture	28 (43.7)	24 (52.2)	52 (47.3)	<0.05
Enamel and dentin fracture without pulp exposure	20 (31.2)	18 (39.1)	38 (34.5)	
Crown fracture without pulp exposure	10 (15.6)	1 (2.2)	11 (10)	
Crown fracture with pulp exposure	2 (3.1)	1 (2.2)	3 (2.7)	
Extrusive luxation	1 (1.6)	–	1 (0.9)	
Lateral luxation	3 (4.7)	–	3 (2.7)	
Enamel fracture + enamel and dentin fracture	–	2 (4.3)	2 (1.8)	
Total group	64 (100.0)	46 (100.0)	110 (100.0)	

Table 4. Frequency distribution of types of traumatic dental injuries according to school

Type of traumatic injury	School		Total [*n* (%)]	*P*-value
	Public [*n* (%)]	Private [*n* (%)]		
Enamel fracture	31 (48.4)	21 (45.6)	52 (47.3)	>0.05
Enamel and dentin fracture without pulp exposure	16 (25.0)	22 (47.8)	38 (34.5)	
Crown fracture without pulp exposure	10 (15.6)	1 (2.2)	11 (10)	
Crown fracture with pulp exposure	2 (3.1)	1 (2.2)	3 (2.7)	
Extrusive luxation	1 (1.56)	–	1 (0.9)	
Lateral luxation	2 (3.1)	1 (2.2)	3 (2.7)	
Enamel fracture + enamel and dentin fracture	2 (3.1)	–	2 (1.8)	
Total	64 (100.0)	46 (100.0)	110 (100.0)	

Table 5. Distribution of traumatic dental injuries according to cause and place of occurrence

	School		
	Public [*n* (%)]	Private [*n* (%)]	Total group [*n* (%)]
Cause of traumatic dental injuries			
Sports	6 (9.4)	3 (6.5)	9 (8.2)
Road accidents	2 (3.1)	1 (2.2)	3 (2.7)
Fun and leisure activities	5 (7.8)	5 (10.9)	10 (9.1)
Violence	4 (6.3)	3 (6.5)	7 (6.4)
Falls	18 (28.1)	12 (26.1)	30 (27.3)
Collisions	11 (17.2)	9 (19.6)	20 (18.2)
Hit by something	2 (3.1)	2 (4.3)	4 (3.6)
Bad use of teeth	2 (3.1)	–	2 (1.8)
Non-specified accidents	14 (21.9)	11 (23.9)	25 (22.7)
Total	64 (100.0)	46 (100.0)	110 (100.0)
Place of occurrence			
Do not remember	12 (18.8)	11 (23.9)	23 (20.9)
At home	17 (26.6)	11 (23.9)	28 (25.5)
At school	9 (14.1)	6 (13.0)	15 (13.6)
On street	16 (25)	10 (21.7)	26 (23.6)
Clubs	2 (3.1)	2 (4.3)	4 (3.6)
Parks	4 (6.3)	–	4 (3.6)
Other places	4 (6.3)	6 (13.0)	10 (9.1)
Total	64 (100.0)	46 (100.0)	110 (100.0)

before. The prevalence of dental trauma presented in this study is therefore considered as a cumulative prevalence.

In 2003, a study (11) that used the same diagnosis the criteria for traumatic dental injuries (19) was carried out in Jordan and found a 14.2% prevalence of traumatic injuries. In Valparaiso, Chile, in 1994 (20) and in Ankara, Turkey (21), a prevalence of dental trauma of 33% and 33.7%, respectively, was observed. Other studies on traumatic dental injuries were conducted in Brazil. Nevertheless, different methods for diagnoses were used. The results varied from 13.6% (6), 15.3% (17), to 58.6% (15).

Boys presented more traumatic injuries than girls, which corroborates the findings of other studies (3, 6, 12, 22), so much so that no statistical significance was observed between sex and the occurrence of trauma in the present study. The fact that the boys had suffered more traumatic injuries than girls is basically explained by behavioral or even cultural factors (4), in that boys engage in leisure activities or sports of a generally more aggressive nature or with a greater accident risk than girls do (2, 11). On the contrary, some studies already indicate an increasing trend of dental trauma among girls, because of their increasing participation in sports or activities formerly practiced by boys only (12, 23, 24).

Behavior can be very important in the occurrence of traumatic dental injuries among children and adolescents. This factor must always be taken into consideration in developing effective preventive strategies for preserving dental health, as behavioral risk factors frequently involve aggressive or violent attitudes.

Table 6. Distribution of traumatic dental injuries according to lip coverage

	Traumatic dental injury				
Lip coverage	Yes [*n* (%)]	No [*n* (%)]	Total [*n* (%)]	P value[†]	OR and CI[‡] with 95.0%
Inadequate	44 (25.9)	126 (74.1)	170 (100.0)	$P < 0.001$*	4.29 (2.80–6.56)
Adequate	66 (7.5)	810 (92.5)	876 (100.0)		1.00
Total group	110 (10.5)	936 (89.5)	1046 (100.0)		

*Significant association set at 5.0%.
[†]Chi-square test.
[‡]CI is a confidence interval to odds ratio (OR).

Table 7. Distribution of traumatic dental injuries according to overjet

	Traumatic dental injury				
Overjet	Yes [*n* (%)]	No [*n* (%)]	Total [*n* (%)]	P value[†]	OR and IC[‡] with 95.0%
>5 mm	47 (21.1)	176 (78.9)	223 (100.0)	$P < 0.001$*	3.22 (2.13–4.86)
≤5 mm	63 (7.7)	760 (92.3)	823 (100.0)		1.00
Total group	110 (10.5)	936 (89.5)	1046 (100.0)		

*Significant association set at 5.0%.
[†]Chi-square test.
[‡]CI is a confidence interval to odds ratio (OR).

Table 8. Distribution of traumatic dental injuries by school according to obesity

		Traumatic dental injuries				
School	Obesity	Yes [*n* (%)]	No [*n* (%)]	Total [*n* (%)]	*P*-value	OR and CI[†] with 95.0%
Public	Obese	7 (21.2)	26 (78.8)	33 (100.0)	$P = 0.086$[‡]	2.22 (0.92–5.35)
	Non-obese	57 (10.8)	470 (89.2)	527 (100.0)		1.00
Total		64 (11.4)	496 (88.6)	560 (100.0)		
Private	Obese	8 (14.3)	48 (85.7)	56 (100.0)	$P = 0.190$[§]	1.72 (0.76–3.90)
	Non-obese	38 (8.8)	392 (91.2)	430 (100.0)		1.00
Total		46 (9.5)	440 (90.5)	486 (100.0)		
Total group	Obese	15 (16.8)	74 (83.2)	89 (100.0)	$P = 0.042$*,§	1.84 (1.02–3.33)
	Non-obese	95 (9.9)	862 (90.1)	957 (100.0)		1.00
Total		110 (10.5)	936 (89.5)	1046 (100.0)		

*Significant association set at 5.0%.
[†]CI is a confidence interval to odds ratio (OR).
[‡]Fisher's Exact test.
[§]Chi-square test.

Table 9. Distribution of traumatic dental injuries by sex according to obesity

		Traumatic dental injuries				
Sex	Obesity	Yes [*n* (%)]	No [*n* (%)]	Total [*n* (%)]	*P*-value	OR and IC* with 95.0%
Male	Obese	9 (17.3)	43 (82.7)	52 (100.0)	$P = 0.232$[†]	1.59 (0.74–3.45)
	Non-obese	55 (11.6)	419 (88.4)	474 (100.0)		1.00
Total		64 (12.2)	462 (87.8)	526 (100.0)		
Female	Obese	6 (16.2)	31 (83.8)	37 (100.0)	$P = 0.125$[‡]	2.14 (0.84–5.44)
	Non-obese	40 (8.3)	443 (91.7)	483 (100.0)		1.00
Total		46 (8.8)	474 (91.2)	520 (100.0)		

*CI is a confidence interval to odds ratio (OR).
[†]Chi-square test.
[‡]Fisher's Exact test.

Sports, in particular, are often mentioned in the literature on dental trauma, highlighting the importance of using mouthguards (25–29). The authors consider that if the instructions for their use were followed, it would probably have a major impact by reducing dental trauma, especially in children and

adolescents. The use of personalized mouthguards in sport would reduce the risk of dental trauma by 80%, while the non-use of mouthguards would produce a 60-fold increase (30).

Similarly to a study carried out in 1986 (31), children attending public schools presented more traumatic injuries, but results from San Domingo, Dominican Republic (32), showed a higher prevalence of dental trauma among children attending private schools. Jordanian children attending private schools also presented more traumas when compared with those at public schools (33). Nevertheless, in the present study there were no statistically significant differences in the experience of dental trauma between the two types of school.

A study that observed private schoolchildren with more traumatic dental injuries related this finding to the supposition that these children, particularly in developing countries, have access to different types of contact sports, swimming pools and toys, such as skates and skids, and are thus more susceptible to dental trauma (6). Children from public schools belong to the less privileged social classes, which reduces their access to sports and toys like the ones mentioned above, as a result of which they presented fewer traumatic dental injuries (31). In Brazil, generally, this relationship between type of school and socioeconomic status is much debated, and it is argued that whether the child goes to a private or public school is an indication of its socioeconomic condition and, consequently, determines the type of environment where he or she lives, the toys that they possess and the activities, sporting or non-sporting, in which they take part.

People from families with a low income and educational level generally tend to live in poorer areas, where they have neither decent housing nor opportunities for leisure. In the present study, these children, who were the ones attending public schools, presented more dental trauma than those from private schools, although there were no statistically significant differences between the two types of school.

Because the schoolchildren examined suffered trauma mostly at home and on the streets, as was also observed in previous studies (7, 11, 34, 35), the discussion about healthy environments becomes highly relevant, because 'environment and health are interdependent and non-separable. Therefore, every place, appraised as alive territory, where exists a relation between men and nature (family, work relationship, leisure, education), are environments that can and must be favorable to health' (36). When it comes to developing preventive strategies for dealing with dental trauma, socioeconomic differences must be taken into consideration, as the behavior of adolescents may be influenced by the environment or context in which they live.

The natural aggressiveness of children considered a normal attitude of adaptation, increases with age and varies with the passing of time. Between the ages of 6 and 14 years, the purpose of aggressive behavior is to compete and win (37). A study that set out to associate social and economical levels with the development of behavioral problems observed that a high percentage of aggressive children belonged to the lower social classes (38). Fighting occurs mostly among children from economically underprivileged environments, and those from the lower social strata tend to develop more disorganized relationships (39).

Fractures involving only enamel, and also enamel and dentine, were the most frequent types of traumatic injuries observed in the study sample, corroborating the findings of previous studies (4, 6, 17, 20, 34, 40–46). Upper central incisors were the teeth most involved in dental trauma, as in previous studies (9, 11, 12, 47, 48). The importance of this finding lies in the fact that these incisors play an important role in esthetic, phonetic and functional activities. Moreover, because of their morphology and location they are susceptible to traumatic injuries (49).

In addition, traumatic experience in primary dentition influences their daily lives in activities such as feeding, oral hygiene, smiling and interacting with other people more often than among those who have not suffered dental trauma (6). In the present study, it was observed that many individuals did not seek treatment or advice from a dentist after an accident. For reasons mentioned above, seeking help and advice is of great importance in preventing, or at least minimizing, the effects of dental trauma in the lives of these adolescents.

The etiology of traumatic dental injuries observed in the present study is in accordance with the results found in several studies in the literature that have demonstrated that falls and collisions are among the main causes of dental trauma (1, 3, 6, 11, 12, 17, 20, 46, 50). The difficulty of grouping falls as a cause of trauma was reported in 1970 (9). In the present study, the adolescents that suffered dental trauma were asked about the cause of fall for the purpose of distinguishing falls without pushing from the ones in which the individual was pushed, which were grouped in the 'violence' category, because they represent a form of aggression (17). Many accidents had been grouped in the 'non-specified' category and, additionally, the percentage of schoolchildren that did not remember the accident was also high, which could result in the underreporting of violent incidents.

In relation to overjet, different authors have argued over which particular value should be regarded as an increased overjet or not. Thus, some recognize an increased overjet when the value is over 3 mm (47, 51, 52), and others when it is higher than 5 mm (4, 6, 17, 50). The results of the present study showed a significant association between the presence of dental trauma and overjet, when it presented a value higher than 5 mm, corroborating the assertion that the frequency of dental trauma increases proportionally in relation to an increased overjet (19).

It was also observed that the adolescents who presented an overjet higher than 5 mm had a threefold greater risk of suffering traumatic injuries in permanent anterior teeth than those that presented an overjet of 5 mm or less. In a study carried out in 2001 (6), it was found that schoolchildren with an overjet higher than 5 mm had a 50% greater risk of traumatic injuries than those with an overjet of 5 mm or less. For this reason, overjet is considered as an important risk factor in dental trauma.

Traumatic dental injuries are also associated with normal function deviation and position of perioral tissues (50). In the present study it was observed that the schoolchildren that presented inadequate lip coverage showed a statistically significant association between the presence of this condition and the occurrence of dental trauma. In a study carried out with adolescents (53), the 12-year-old group also presented a strong positive relationship between the presence of inadequate lip coverage and traumatic dental injuries. A fourfold greater risk of dental trauma was found in the present study among subjects that presented inadequate lip coverage than in those with adequate lip coverage. Initially, an association between inadequate lip coverage and overjet could be made, as, clinically, there seems to be a relationship between the two factors. However, it was observed (54, 55) that the position of the upper lip would not be the major factor influencing the determination of overjet; it could only exhibit the ability to influence an existing overjet because of factors related to habit or even the position of the incisor teeth, circumstances that do not depend on the position of the lips. They therefore suggested that the position of the incisors and, consequently, incisal relationships, would be determined by the growth and eruption of teeth, while lip position and functions would be only secondary factors.

Obesity was a risk factor in the sample studied. Two previous studies (35, 56) had produced a similar result, namely that the overweight or obese schoolchildren presented a higher risk of dental trauma than the non-obese ones, highlighting the fact that, in this case, obese individuals present less agility, which could make them more prone to accidents and, consequently, to dental trauma (35). However, the results of this study cannot be compared with those of the two abovementioned ones as the method of evaluating obesity used by those authors (the BMI) was different from the analysis carried out in the present study, which used the NCHS reference tables. Another study (46) that investigated obesity as a risk factor for traumatic dental injuries did not detect any statistically significant relationship between obesity and dental trauma, similarly to the findings of the present study. However, the methods used in the evaluation of this factor were not mentioned.

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