

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
FACULDADE DE ODONTOLOGIA

BÁRBARA WERLE STEFANELLO

PREVALÊNCIA DE LESÕES DENTÁRIAS TRAUMÁTICAS E FATORES
ASSOCIADOS EM UMA POPULAÇÃO DE ESCOLARES DO SUL DO BRASIL

Porto Alegre

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apresentado ao Curso de Graduação em
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como requisito parcial para obtenção do título
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Porto Alegre, 18 de maio de 2021.

Luciano Casagrande

Universidade Federal do Rio Grande do Sul

Francisco Montagner

Universidade Federal do Rio Grande do Sul

Tathiane Larissa Lenzi

Universidade Federal do Rio Grande do Sul

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RESUMO

O presente estudo avaliou a prevalência de lesões dentárias traumáticas (LDT) e os fatores associados em um grupo de escolares de 8 a 14 anos de idade, de uma cidade do Sul do Brasil. Alunos matriculados em escolas públicas foram selecionados por meio de amostragem por conglomerado. Exames clínicos foram realizados considerando hipomineralização molar incisivo (HMI) conforme os critérios da Academia Europeia de Odontopediatria, cárie dentária (CPO-D) e lesões dentárias traumáticas de acordo com a classificação de O'Brien. Variáveis socioeconômicas e demográficas foram acessadas por meio de um questionário específico enviado aos pais. Razões de prevalência (RP) foram estimadas por meio de análise de regressão ($p < 0,05$). A amostra foi composta por 513 participantes com média de idade de 11,6 ($\pm 1,9$) anos, sendo a maioria adolescentes (84,5%) do sexo feminino (54,8%). A prevalência de LDT foi de 11,3%, com maior ocorrência de fratura de esmalte (90,4%). As lesões dentárias traumáticas foram associadas à HMI (PR:2.22 CI:1.27;3.87; $p=0.005$) e sobressalência $>3\text{mm}$ (PR:2.03 CI:1.19;3.45; $p=0.009$). Sobressalência acentuada e hipomineralização molar incisivo estão associadas à maior prevalência de lesões dentárias traumáticas. Estratégias preventivas relacionadas ao tratamento ortodôntico de pacientes com sobressalência acentuada, bem como a utilização de protetores bucais durante atividades de contato físico, principalmente em pacientes com HMI, podem contribuir para a redução da incidência de lesões dentárias traumáticas.

Palavras-chave: Traumatismos Dentários. Prevalência. Fatores de Risco.

ABSTRACT

The present study evaluated the prevalence of traumatic dental injuries (TDI) and the factors associated in a group of schoolchildren aged 8 to 14 years old, in southern Brazil. Students enrolled in public schools were selected through cluster sampling. Clinical examinations were performed considering molar incisor hypomineralization (MIH) according to the European Academy of Pediatric Dentistry criteria, dental caries (DMFT) and traumatic dental injuries according to the O'Brien criteria. Socioeconomic and demographic variables were accessed through a specific questionnaire sent to the parents. Prevalence ratios (PR) were estimated using regression analysis ($p < 0.05$). The sample consisted of 513 participants (54.8% female) with a mean age of 11.6 (± 1.9) years. The prevalence of TDI was 11.3%, with a higher occurrence of enamel fracture (90.4%). Traumatic dental injuries were associated with MIH (PR: 2.22 CI: 1.27; 3.87; $p = 0.005$) and overjet > 3 mm (PR: 2.03 CI: 1.19; 3.45 $p = 0.009$). Overjet over three millimeters and incisor molar hypomineralization are related to a higher prevalence of traumatic dental injuries. Preventive strategies related to orthodontic treatment of patients with increased overjet, as well as the use of mouthguards during sports practices, especially in patients with MIH, can contribute to reducing the incidence of dental trauma.

Keywords: Tooth Injuries. Prevalence. Risk Factors

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1 INTRODUÇÃO

Lesões dentárias traumáticas (LDT) são resultado da ação de uma força que é transformada em energia e transmitida às estruturas bucais (1). Essa energia pode ter origem química, física ou térmica e suas características como grau de intensidade, tempo de duração e tipo de impacto definirão a gravidade do trauma, que pode acometer dentes, tecidos moles ou estruturas de suporte (2).

Mundialmente, as lesões dentárias traumáticas na dentição permanente apresentam prevalência de 15,2%, e estima-se que 90% dessas lesões ocorram antes dos 20 anos de idade (3). Devido à frequência, impacto na qualidade de vida e impacto econômico, o LDT pode ser considerado um problema de saúde pública. É considerada uma intercorrência passível de acontecer durante as atividades cotidianas, com necessidade de um manejo de urgência, o que pode influenciar no prognóstico (4).

Crianças e adolescentes são a maior parte da população que sofre LDT e, por isso, há uma grande preocupação quanto à perda dentária e suas repercussões ao longo da vida (5). No Brasil, a prevalência de lesões dentárias traumáticas em escolares tem grande variação, com números de 10% a 58% (6). Tais injúrias que acometem estruturas dentais e faciais podem implicar em prejuízo psicológico, gerando impacto negativo e, por consequência, afetar a qualidade de vida dessa população e de seus familiares (7).

Os fatores de risco de maior relevância relacionados à ocorrência de TAD variam de acordo com a faixa etária da população estudada (8). Crianças e adolescentes em idade escolar estão mais propensos ao seu acontecimento devido à prática de esportes e atividades de contato (8). A associação da maior prevalência de trauma a pessoas do sexo masculino já é conhecida na literatura, e é explicada pela hipótese que de essa população tem maior interesse em atividades esportivas de contato, bem como comportamentos violentos (4). Apesar disso, vem sendo observada uma diminuição dessa diferença entre sexo feminino e masculino ao longo do tempo, pois estão expostos a fatores de risco urbanos da mesma forma. Igualmente, é importante considerar as características oclusais como sobressaliência acentuada e falta de selamento labial (9). Por último, uma meta-análise concluiu que os indivíduos com histórico de LDT têm maior risco de sofrer novas lesões (10).

O conhecimento dos fatores de risco que podem levar a certos eventos é importante no gerenciamento de risco e na promoção de saúde (11). Junto aos fatores de risco de TAD, é importante que se tenha entendimento de sua prevalência, pois a compreensão do perfil epidemiológico possibilita que sejam traçadas estratégias de prevenção em saúde, e a identificação das necessidades de tratamento (9,11). Assim, o presente estudo epidemiológico tem como objetivo analisar a prevalência de lesões de traumatismo alvéolo-dentário; investigar o tipo de TAD mais prevalente; e investigar os fatores sócioeconômicos, clínicos e demográficos associados a ocorrência de TAD em uma população de crianças e adolescentes, do ensino fundamental, de escolas públicas de uma cidade do sul do Brasil.

2 ARTIGO CIENTÍFICO

Prevalence of dental traumatic injuries and associated factors in a schoolchildren population in southern Brazil

Abstract: Background/Aim: School-aged children and adolescents are the age group with the highest prevalence of traumatic dental injuries due to exposure to contact and impact activities. Knowing the risk factors related and the epidemiological profile of certain populations is important for the development of prevention and health promotion strategies. Material and Methods: The present cross-sectional study evaluated the prevalence of traumatic dental injuries and the factors associated in a group of schoolchildren in southern Brazil. Students enrolled in public schools were selected through cluster sampling. Clinical examinations were performed considering molar incisor hypomineralization according to the European Academy of Pediatric Dentistry criteria, dental caries (DMFT) and traumatic dental injuries according to the O'Brien criteria. Socioeconomic and demographic variables were accessed through a specific questionnaire sent to the parents. Prevalence ratios were estimated using regression analysis ($p < 0.05$). The sample consisted of 519 participants (54.8% female) with a mean age of 11.6 (± 1.9) years. Results: The prevalence of traumatic dental injuries was 11.3%, with a higher incidence of enamel fracture (90.4%). Traumatic dental injuries were associated with MIH (PR: 2.22 CI: 1.27; 3.87; $p = 0.005$) and overjet > 3 mm (PR: 2.03 CI: 1.19; 3.45; $p = 0.009$). Conclusions: Overjet over three millimeters and incisor molar hypomineralization are related to a higher prevalence of traumatic dental injuries. Preventive strategies related to orthodontic treatment of patients with increased overjet, as well as the use of mouthguards during sports practices, especially in patients with molar incisor hypomineralization, can contribute to reducing the incidence of dental trauma.

Keywords: Tooth Injuries. Prevalence. Risk Factors. Health Profile. Incisor Molar Hyponimeralization.

Introduction

It has been estimated that over one billion people already suffered from traumatic dental injuries over the world. Traumatic dental injuries (TDIs) are ranked the fifth position in the list of the world's most frequent acute/chronic diseases and injuries (1). Longitudinal data also reports that the incidence of dental trauma in children has not decreased in the last two decades (2). Traumatic injuries and their consequences may exceed the damage caused by dental caries and periodontal disease in the young population (3).

TDIs are considered an important public health problem, due to their prevalence and impact on the quality of life of the young patients (4,5), besides the high cost and time required for treatment of severe traumatic lesions (6). Due to the complexity of specific cases, many of these injuries require an integrated approach of several specialties, with a long recovery and follow-up period. In addition, young patients, such as children and adolescents, may need prolonged and temporary treatments, due to the development of dentition and possible late complications, thus postponing more definitive interventions (7).

The prevalence and variables potentially associated with dental trauma have been extensively investigated in young patients (8–12). Although, given the accumulating information on population-based studies on TDIs, contradictory results have been found on the risk factors for TDIs in adolescents, which can be attributable to study population characteristics (11). In addition, there is a variable that has not been previously studied, the incisor molar hypomineralization. This enamel defect increases the risk of developing carious lesions, dentin sensitivity and esthetic damage, affecting the quality of life of children who have their teeth affected (13).

Investigate the prevalence and the risk factors related to TDIs are essential to help establish preventive strategies as well as the treatment needs in each population. Thus, this cross-sectional study aimed to determine the prevalence of TDIs in 8 to 14 years old schoolchildren in a city of southern Brazil, and to verify the potential associations between clinical and contextual related factors with traumatic dental injuries.

Material and Methods

This study was reported according to the guidelines proposed by the *Strengthening the Reporting of Observational Studies in Epidemiology – STROBE* (14).

Ethical aspects

The study was approved by the Research Ethics Committee of the Federal University of Rio Grande do Sul (n° 2.632.694). The participants signed the consent form, and the parents or legal guardians signed the informed consent form.

Study design and sample size

This cross-sectional study is part of an epidemiological survey that aimed to assess the health of elementary school students, from the first to the ninth year, enrolled in public schools at Estância Velha city, Rio Grande do Sul, Brazil.

The sample size calculation was performed using the Power and Sample Size software, considering the prevalence of dental caries data in a previous study (15). A significance level of 5% and power of 80% were considered, requiring at least 472 participants. Considering eventual losses or incomplete data, 10% was added to the sample size, resulting in 519 participants.

For the secondary analysis, the study power calculation was performed, and the parameters used were the difference in means and standard deviation of molar-incisor hypomineralization (MIH) between the exposed 0.32 (SD 0.47) and unexposed 0.18 (SD 0.38) groups, concerning traumatic dental injuries, finding a power of 73%. Participants were selected by through of cluster sampling, was obtained the list of classes from all public schools and their draws were carried out (<https://www.random.org>). Students in the selected classes were invited to participate in the study.

Data collection

The collection of clinical data was carried out in schools by two trained and calibrated examiners (A.S.A. and L.I.L.B.), between April and December 2019. Prior to the clinical examination, dental biofilm was removed through a toothbrush with

fluoridated toothpaste by dental students. The examinations were performed according to the criteria proposed by the World Health Organization – WHO (16).

The dental examination was performed with a flat mirror (Duflex, SS White, Brazil), ball-point probe (WHO-621, Trinity, Brazil), gauze and artificial light (Pelican table lamp, Startec127V, Brazil), and registered dental carious lesions, according to the decayed, missing and filled teeth index (DMF-t) (16); incisor molar hypomineralization - HMI, according to the European Academy of Pediatric Dentistry criteria (17); dental trauma, considering the 8 permanent incisors and classified as healthy, discoloration, fracture in enamel, fracture in dentin, fracture in enamel, dentin and pulp; missing teeth, restoration and fistula according to the O'brien criteria (18); overjet ($\leq 3\text{mm}$ or $> 3\text{mm}$); and lip coverage (present or absent). To assess the body mass index (BMI), students were weighed barefoot and wearing light clothing on a weigh balance (Techline®). Height was assessed using a stadiometer (Seca®), fixed on a smooth wall, the participant remained with an upright posture and with the heels pressed against the wall. Students were classified as underweight, eutrophic (adequate weight), overweight and obesity (19,20).

A self-administered questionnaire developed specifically for the study purposes with questions about socioeconomic data were sent to the parents. Monthly family income (dichotomized at ≤ 1 minimum wage and > 1 minimum wage) and level education of guardians (dichotomized at ≤ 8 years or > 8 years) were also collected.

Calibration

Before the start of the study, the examiners (A.S.A. and L.I.L.B.) were trained and calibrated. In the first moment, an expository class was held for two hours, where the indexes that would be used in the collection of clinical data were discussed. In the second step, the researchers were trained to diagnose clinical variables using computer images. Finally, the calibration was carried out, which patients were examined by the researchers and compared with the exams performed by an experienced specialist in Pediatric Dentistry. Kappa values were 0.90 (A.S.A.) and 0.86 (L.I.L.B.) for MIH, 0.89 (A.S.A.) and 0.91 (L.I.L.B.) for dental caries, 0.82 (A.S.A.) and 0.82 (L.I.L.B.) for TDIs, and 1.00 (A.S.A. and L.I.L.B.) for overjet and lip coverage. Upon reaching 50% of the study sample, the examiners were re-calibrated, and reproducibility was adequate.

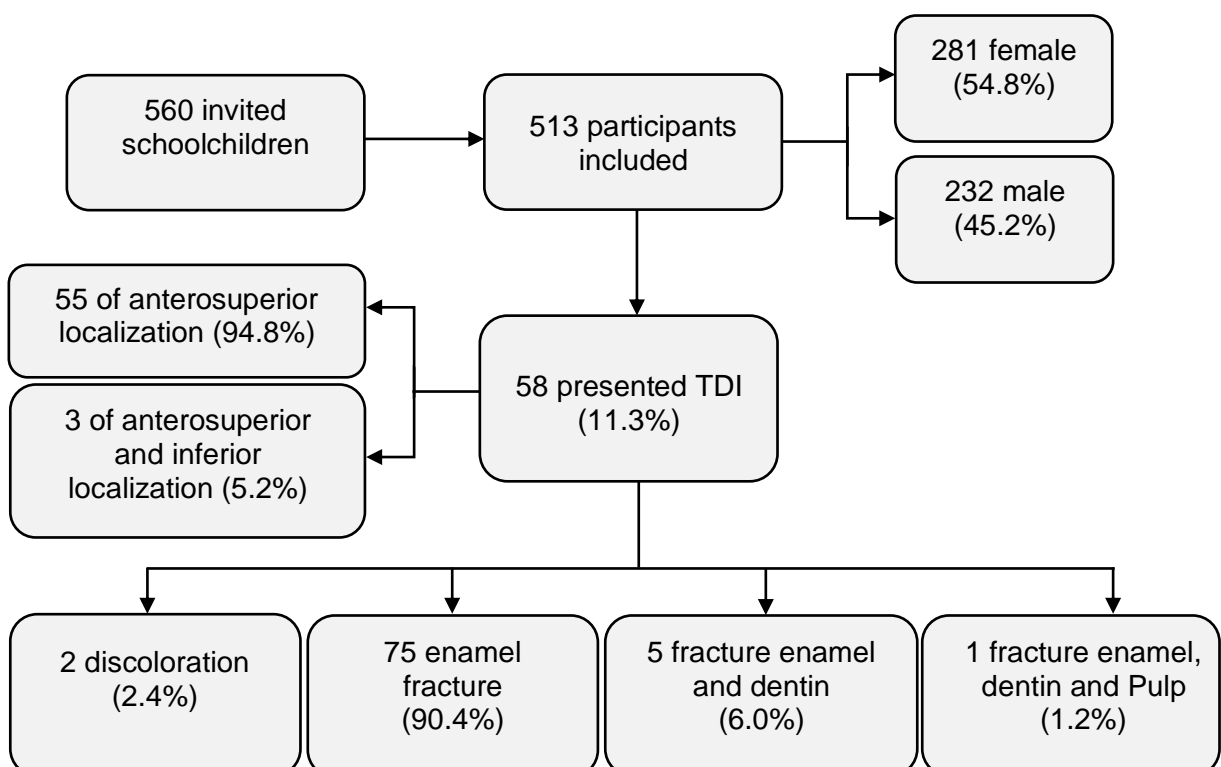
Data analysis

Data analyses were with STATA v.14.0 software (Stata Corp., College Station, TX, USA). Dental trauma was set as the main outcome. The descriptive analysis was used to describe the clinical and socioeconomic characteristics of the sample. Poisson regression was used to TDIs, considering the crude and the adjusted model, according to the predictor variables. Variables with $p < 0.20$ in the unadjusted analysis were included in the adjusted model. The results were presented in prevalence ratio (PR) and respective 95% confidence interval (95% CI).

Results

From a total of 560 initially selected, 513 schoolchildren participated in the study (91.6% participation rate) (Figure 1). Monthly family income above one minimum wage was reported by 78.9% of families and the main caregiver presenting less than eight years of study (54.4%). The mean age of the participants was 11.6 (± 1.94) years, most adolescents (84.5%) and females (54.8%). Most participants were classified as eutrophic according to the BMI (53.6%).

Figure 1. Flow diagram of sample and results on traumatic dental injuries.



The dental caries disease prevalence was 27.3% (140), considering cavitated lesions, with a mean DMF-t of 1.22 (\pm 1.86).

Table 1. Distribution of the sample of traumatic dental injuries according to the socioeconomic, demographic and clinical characteristics of the sample.

| <i>Variables</i> | <i>n (%)</i> | <i>TDI n (%)</i> |
|---|--------------------|----------------------|
| Demographic and socioeconomic | | |
| Sex | | |
| Female | 281 (54.8) | 30 (51.7) |
| Male | 232 (45.2) | 28 (48.3) |
| Age | | |
| Child | 115 (22.6) | 9 (15.5) |
| Adolescent | 394 (77.4) | 49 (84.5) |
| Family income | | |
| ≤ 1 Minimum wage | 89 (21.1) | 11 (21.1) |
| > 1 Minimum wage | 333 (78.9) | 38 (77.6) |
| Caregiver's education | | |
| ≤ 8 years | 260 (54.4) | 30 (55.6) |
| > 8 years | 218 (45.6) | 24 (44.4) |
| Clinical Variables | | |
| Trauma Type | | |
| Discoloration | | 2 (2.4) |
| Enamel Fracture | | 75 (90.4) |
| Fracture enamel and dentin | | 5 (6.0) |
| Fratura enamel, dentin and pulp | | 1 (1.2) |
| Body Mass Index | | |
| Underweight | 18 (3.7) | 1 (1.8) |
| Eutrophic | 304 (62.2) | 30 (53.6) |
| Overweight | 89 (18.2) | 16 (28.6) |
| Obesity | 78 (16) | 9 (16.1) |
| Incisor Molar Hypomineralization | | |
| Absent | 412 (80.3) | 39 (67.2) |
| Present | 101 (19.7) | 19 (32.8) |
| Overjet | | |
| ≤ 3 mm | 307 (60.9) | 25 (44.6) |
| > 3 mm | 197 (39.1) | 31 (55.4) |
| Lip Coverage | | |
| Absent | 64 (12.5) | 8 (13.8) |
| Present | 449 (87.5) | 50 (86.2) |
| Anterosuperior carious lesions | | |
| Absent | 471 (91.8) | 53 (91.4) |
| Present | 42 (8.2) | 5 (8.6) |
| Clinical Variables | | |
| | Média (DP) | |
| CPOD | 1.22 (\pm 1.86) | |
| Age (Years) | 11.6 (\pm 1.94) | |

Values less than 513 due to data loss.

Minimum wage US\$ 248.94 SD, standard deviation.

As shown in Table 1, the prevalence of dental trauma was 11.3% (58), with the enamel fracture corresponding to 90.4% of the TDIs. The vast majority of the TDIs (94.8%) occurred in the anterosuperior teeth, with 55.4% of the participants with TDIs showing overjet greater than three millimeters. A high prevalence of MIH was found to be 19.7%, while the MIH prevalence in students with TDIs was 32.8%.

A Poisson regression model was applied to analyze the prevalence ratio of factors associated with TDIs (Table 2). Patients with overjet greater three millimeters (PR: 2.03 CI: 1.19; 3.45 p = 0.009) and participants with MIH (PR: 2.22 CI: 1.27; 3.87 p = 0.005) had a higher prevalence of traumatic dental injuries. The others sociodemographic variables were not statistically associated with outcome (TDIs).

Table 2. Poisson regression analysis for traumatic dental injuries according to the socioeconomic, demographic and clinical variables.

| Variables | Not adjusted PR (95% CI) | P-value | Adjusted PR (95% CI) | P-value |
|---|--------------------------|---------|----------------------|---------|
| Sex | | | | |
| Female | 1.00 | 0.641 | | |
| Male | 1.13(0.67;1.89) | | | |
| Age | | | | |
| Child | 1.00 | 0.202 | 1.00 | 0.238 |
| Adolescent | 1.58 (0.78;3.23) | | 1.53 (0.75;3.14) | |
| Family income | | | | |
| ≤ 1 Minimum wage | 1.00 | 0.816 | | |
| > 1 Minimum wage | 0.92 (0.47;1.80) | | | |
| Caregiver's education | | | | |
| ≤ 8 years | 1.00 | 0.864 | - | - |
| > 8 years | 0.95 (0.55;1.63) | | | |
| Body Mass Index | | | | |
| Underweight | 1.00 | | | |
| Eutrophic | 1.77 (0.24;13.02) | 0.572 | | |
| Overweight | 3.23 (0.42;24.40) | 0.255 | | |
| Obesity | 2.07 (0.26;16.39) | 0.488 | | |
| Incisor Molar Hypomineralization | | | | |
| Absent | 1.00 | 0.014 | 1.00 | 0.005 |
| Present | 1.98 (1.14;3.43) | | 2.22 (1.27;3.87) | |
| Overjet | | | | |
| ≤ 3 mm | 1.00 | 0.014 | 1.00 | 0.009 |
| >3 mm | 1.93 (1.14;3.27) | | 2.03 (1.19;3.45) | |
| Lip Coverage | | | | |
| Absent | 1.00 | 0.762 | | |
| Present | 1.12 (0.53;2.36) | | | |
| Anterosuperior carious lesion | | | | |
| Absent | 1.00 | 0.904 | | |
| Present | 1.05 (0.42;2.64) | | | |

PR, prevalence ratio; 95% CI, 95% confidence interval

Discussion

This cross-sectional observational study was conducted in municipal schools at Estância Velha city (Rio Grande of Sul, Brazil), and investigated the prevalence and factors associated with TDIs in a population of 513 schoolchildren. It was observed that 11.3% of the examined students presented TDIs, being enamel fracture the most prevalent (90.4%). TDIs were significantly associated with increased overjet (>3mm) and with molar-incisor hypomineralization diagnosis. To date, this is the first study that evaluated the association of TDIs with MIH.

Studies have shown that the prevalence of TDIs is quite varied in the Brazilian population, with rates ranging from 10.5% to 58.6% (9,21–25). This variation is possibly related to the different methodologies employed in the studies and can be attributed to differences in age range, sample origin and calculation, and the diagnostic parameters used in each study (8). Among all categories of TDIs, enamel fracture has been identified as the most prevalent type in children and adolescents (2,9,21,26), which corroborates with the present epidemiological survey that identified enamel fracture as the most prevalent, corresponding to 90.4% of cases, mostly in the anterosuperior region (94.%).

In the present study, participants with increased overjet (>3mm) had a higher prevalence of TDIs, this association was already reported in the literature (11,27). A recent systematic review concluded that the increased risk for TDI occurs with an overjet greater than or equal to 5mm in children (28). However, as of 3mm, an association has already been found in the present study. Thus, it highlights the importance of paying attention to cases of overjet even if it is less than 5mm. There is a greater risk of dental trauma in cases of severe overjet since it increases the projection of anterior teeth in the dental arch, making them more prone to trauma (11). Moreover, this factor may be associated with the anatomical position/angulation of greater exposure of the upper incisors (29).

Besides the association of TDIs with overjet, the presence of molar-incisor hypomineralization also presented a significant association. MIH is characterized as a qualitative defect in dental enamel, that affects at least one permanent first molar (30). In the composition of hypomineralized dental enamel there is a higher concentration of proteins, which makes bonds to minerals and thus prevent enamel mineralization. Moreover, there is a reduction of mineral content in the enamel matrix, so there is an

increase of the organic content and a decrease of the inorganic content. These two events result in the formation of a limited mechanical structure that makes the enamel more susceptible to post-eruptive fractures (27).

Although it is not feasible to establish a causal relationship through the methodological design of this study, the association between TDIs and IMH may be related to the aforementioned structural characteristics of the affected enamel. Thus, repetitive, and lower force impacts may be sufficient to generate this type of enamel damage. As there are no previous studies that have addressed this possible association, discussion of this finding is limited.

The management of TDIs depends on the extent and localization of the fracture, generally, in cases of enamel fractures, smoothing of the fracture edges and, if necessary, adhesive restoration with composite resin can be performed (31).

Despite evidence that enamel fractures, in particular, do not negatively impact on oral health-related quality of life, studies are needed to evaluate the implications of this type of TDIs over time (32). More severe cases of TDIs, in which there is major damage to the tooth structure, discoloration, and tooth loss negatively impact on adolescents' quality of life, affecting interpersonal relationships (33). Given that oral health is part of an individual's overall health status and may imply psychological harm, and that the treatment and follow-up of TDIs, even in cases of simple fractures, present high costs (6), the adoption of preventive measures is necessary.

The children, adolescents, and their family's knowledge about risk factors and behaviors is important for the prevention of TDIs. It is the function of the dental professionals to provide guidance on the measures that can be adopted to protect oral structures, such as the use of mouthguards, especially by those students who practice contact and impact activities (34). Its correct use reduces the incidence and extension of injuries resulting from sports practices (35). Besides mouthguards, another tool that can be used for prevention is early orthodontic treatment. When performed in two stages, in children with severe overjet especially in cases of Angle Class II (1st division) malocclusion, it reduces the injuries incidence on the upper incisors (36). Overjet correction is related to the development of facial growth while the patient is in the mixed dentition stage and should be started soon after the eruption of maxillary incisors. Thus, it can be employed as a prophylactic measure(37).

Regarding the socioeconomic variable, there was no difference in the prevalence of TDIs between the groups; likewise, no difference was found regarding

the caregiver's education. These data are probably related to the sample selection, which was originated from public schools, in which the students' socioeconomic level is homogeneous.

Although the literature encompasses a significant number of studies about the risk factors associated with TDIs, there is still no consensus on the relationship BMI with TDIs. A cohort study found that children with high BMI (overweight and obesity) were 2.78 times more likely to experience TDIs (38). On the other hand, a study that investigated the association of obesity, physical activity, and TDIs, found no significant difference in the occurrence of TDIs between obese and eutrophic adolescents (39), agreeing with the results found.

A recent systematic review showed that there is an association between dental caries and traumatic dental injuries (10). However, this association was not found in the present study. Data from SB Brasil 2010 epidemiological survey showed that the CPO-D at 12 years old is 2.07 affected teeth (40). The studied sample had a CPO-D of 1.22, that is, lower than the national average, and this characteristic may be related to the non-association between dental caries and traumatic dental injuries.

The present study has some limitations, such as the impossibility of causal inference of the associations found due to its design. Besides, it is a secondary study that investigated factors associated with dental trauma. Another limitation would be related to the criteria used to assess trauma since it does not report injuries to support tissues, nor root fractures. Despite the limitations reported, the present study presents satisfactory power, bringing new data, and the results are likely to be extrapolated to similar populations.

Conclusion

Overjet over three millimeters and incisor molar hypomineralization are related to a higher prevalence of traumatic dental injuries. Preventive strategies related to orthodontic treatment of patients with increased overjet, as well as the use of mouthguards during sports practices, especially in patients with MIH, can contribute to reducing the incidence of dental trauma.

Conflict of Interest

The authors confirm that they have no conflicts of interest.

Acknowledgements

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3 CONCLUSÕES

Os dados encontrados no presente estudo permitem concluir que fatores como sobressalência acentuada e hipomineralização molar incisivo estão associados à maior prevalência de lesões dentárias traumáticas.

Estratégias preventivas relacionadas ao tratamento ortodôntico de pacientes com sobressaliência aumentada, bem como o uso de protetores bucais durante a prática esportiva, principalmente em pacientes com HMI, podem contribuir para a redução da incidência de traumas dentais.

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ANEXO A – Declaração STROBE (continua)

| | Item No | Recommendation | Page No |
|------------------------------|---------|--|---------|
| Title and abstract | 1 | (a) Indicate the study's design with a commonly used term in the title or the abstract | 12 |
| | | (b) Provide in the abstract an informative and balanced summary of what was done and what was found | 12 |
| Introduction | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | 13 |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | 13 |
| Methods | | | |
| Study design | 4 | Present key elements of study design early in the paper | 14 |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 14/15 |
| Participants | 6 | (a) Give the eligibility criteria, and the sources and methods of selection of participants | 14 |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 17 |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | 14/15 |
| Bias | 9 | Describe any efforts to address potential sources of bias | 14/15 |
| Study size | 10 | Explain how the study size was arrived at | 14 |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | 15 |
| Statistical methods | 12 | (a) Describe all statistical methods, including those used to control for confounding | 16 |
| | | (b) Describe any methods used to examine subgroups and interactions | 14/15 |
| | | (c) Explain how missing data were addressed | - |
| | | (d) If applicable, describe analytical methods taking account of sampling strategy | 14 |
| | | (e) Describe any sensitivity analyses | - |
| Results | | | |
| Participants | 13* | (a) Report numbers of individuals at each stage of study— eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | 14 |
| | | (b) Give reasons for non-participation at each stage | 14 |
| | | (c) Consider use of a flow diagram | 16 |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | 17 |
| | | (b) Indicate number of participants with missing data for each variable of interest | 17 |
| Outcome data | 15* | Report numbers of outcome events or summary measures | 18 |

ANEXO A – Declaração STROBE (conclusão)

| | Item No | Recommendation | Page No |
|--------------------------|----------------|--|----------------|
| Main results | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | 18 |
| | | (b) Report category boundaries when continuous variables were categorized | 15 |
| | | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | - |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | - |
| Discussion | | | |
| Key results | 18 | Summarise key results with reference to study objectives | 19 |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | 21 |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | 19/20/21 |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | 21 |
| Other information | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | 21 |

ANEXO B - Aprovação do Comitê de Ética (continua)



UFRGS - PRÓ-REITORIA DE
PESQUISA DA UNIVERSIDADE
FEDERAL DO RIO GRANDE DO



PARECER CONSUBSTANCIADO DO CEP

Elaborado pela Instituição Coparticipante

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: AVALIAÇÃO DA SAÚDE DE ESCOLARES DO ENSINO FUNDAMENTAL DO SUL DO BRASIL

Pesquisador: ELIANA MARCIA DA ROS WENDLAND

Área Temática:

Versão: 1

CAAE: 70213717.1.3001.5347

Instituição Proponente: Faculdade de Odontologia

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 2.632.694

Apresentação do Projeto:

Trata-se de uma emenda a projeto aprovado no CEP-UFRGS em 11 de janeiro deste ano. A emenda tem por finalidade incluir teste pulmonar, a partir de medida simples de espirometria com medidas de volumes e fluxos pulmonares na expiração forçada (CVF, VEF 1, VEF 1 /CVF, FEF 50% e FEF 75%). Também é incluída na equipe de pesquisa a professora Margaret Gerbase

Objetivo da Pesquisa:

Objetivo Primário:

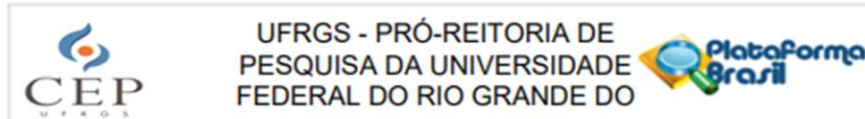
Avaliar a prevalência dos principais problemas de saúde em crianças e adolescentes que frequentam a escola (2o ao 9o ano).

Objetivos Secundários:

- * Avaliar a distribuição e prevalência de agravos de saúde bucal;
- * Avaliar a relação entre fatores contextuais referentes ao local de moradia e o local de estudo e a saúde bucal de escolares;
- * Identificar o padrão alimentar e fatores associados;
- * Estimar a prevalência de sobrepeso e obesidade;
- * Verificar associação entre padrão alimentar e gordura corporal (% de gordura);

Endereço: Av. Paulo Gama, 110 - Sala 317 do Prédio Anexo 1 da Reitoria - Campus Centro
Bairro: Farroupilha **CEP:** 90.040-060
UF: RS **Município:** PORTO ALEGRE
Telefone: (51)3308-3738 **Fax:** (51)3308-4085 **E-mail:** etica@propeq.ufrgs.br

ANEXO B - Aprovação do Comitê de Ética (continua)



Continuação do Parecer: 2.632.694

- * Verificar associação do padrão alimentar com determinantes socioeconômicos, demográficos e comportamentais (grau de escolaridade e idade dos responsáveis, tempo de aleitamento materno, tempo de introdução da alimentação complementar, tempo de permanência na escola);
- * Avaliar a frequência de adesão dos escolares as indicações do Novo Guia Alimentar da População Brasileira;
- * Avaliar a associação entre a prevalência de hipertensão arterial sistêmica e alimentação saudável;
- * Avaliar a associação entre a prevalência de anemia e alimentação saudável;
- * Avaliar a associação entre alimentação saudável e nível de atividade física;
- * Mensurar a frequência de uso de medicamentos entre os escolares;
- * Avaliar a associação entre alimentação saudável e saúde bucal.

Avaliação dos Riscos e Benefícios:

Riscos:

Os participantes envolvidos no estudo estarão submetidos aos possíveis riscos inerentes ao exame odontológico, às necessidades de procedimentos de odontologia minimamente invasiva e ao exame de coleta de hemoglobina capilar. Durante a realização do exame de hemoglobina capilar poderá ocorrer sangramento, que será manejado por enfermeira capacitada através de técnica padrão (compressão), bem como poderá ocorrer pequeno hematoma local.

Benefícios:

Os benefícios que se espera com o estudo são um melhor entendimento dos problemas apresentados pelos estudantes do município e fim de se planejar melhorias futuras para estes estudantes e os dados poderão ser utilizados para orientar as políticas públicas, nas áreas estudadas, no município.

Comentários e Considerações sobre a Pesquisa:

A emenda ao projeto apresenta justificativa adequada, anexada em documento próprio. O TCLE e TALE foram alterados para incluir o teste pulmonar.

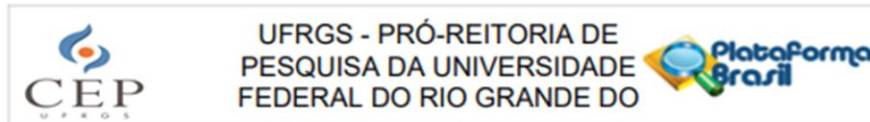
O equipamento a ser utilizado será um espirômetro digital portátil para pesquisa de campo que será disponibilizado pela pesquisadora responsável pelo módulo respiratório deste projeto.

Considerações sobre os Termos de apresentação obrigatória:

Além dos documentos já apresentados no projeto original, a emenda inclui o TALE e o TCLE alterados.

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 UF: RS Município: PORTO ALEGRE
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ANEXO B - Aprovação do Comitê de Ética (continua)



Continuação do Parecer: 2.632.694

Conclusões ou Pendências e Lista de Inadequações:

Não há pendências adicionais. Encaminha-se para aprovação pelo CEP-UFRGS.

Considerações Finais a critério do CEP:

Aprovação.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

| Tipo Documento | Arquivo | Postagem | Autor | Situação |
|---|---|------------------------|-------------------------------|----------|
| TCLE / Termos de Assentimento / Justificativa de Ausência | Termo_Assentimento_alterado.pdf | 29/11/2017 17:38:52 | Fernanda Henemann Barboza | Aceito |
| Outros | ProjetoEstanciaVelha_Justificativa.pdf | 29/11/2017 17:35:33 | Fernanda Henemann Barboza | Aceito |
| TCLE / Termos de Assentimento / Justificativa de Ausência | Termo_Assentimento.pdf | 29/11/2017 17:32:08 | Fernanda Henemann Barboza | Aceito |
| TCLE / Termos de Assentimento / Justificativa de Ausência | TCLE alterado.pdf | 29/11/2017 17:10:28 | Fernanda Henemann Barboza | Aceito |
| TCLE / Termos de Assentimento / Justificativa de Ausência | Termo_Anuencia.pdf | 06/10/2017 23:10:43 | Larissa Edom Bandeira | Aceito |
| Outros | CARTA_RESPOSTA.pdf | 09/08/2017 20:48:03 | Larissa Edom Bandeira | Aceito |
| TCLE / Termos de Assentimento / Justificativa de Ausência | APENDICE_E_TCLE_novo.pdf | 09/08/2017 20:47:26 | Larissa Edom Bandeira | Aceito |
| Projeto Detalhado / Brochura Investigador | 2017_Projeto_Inquerito_EV.docx | 13/06/2017 17:19:13 | ELIANA MARCIA DA ROS WENDLAND | Aceito |
| TCLE / Termos de Assentimento / Justificativa de Ausência | APENDICE_F_Termo_Assentimento.pdf | 07/06/2017 18:38:31 | Larissa Edom Bandeira | Aceito |
| Outros | APENDICE_D_Ficha_Coleta_Exame_Bucal.pdf | 07/06/2017 18:37:29 | Larissa Edom Bandeira | Aceito |
| Outros | APENDICE_C_Ficha_Coleta_Indicadores Saude.pdf | 07/06/2017 18:36:32 | Larissa Edom Bandeira | Aceito |

Endereço: Av. Paulo Gama, 110 - Sala 317 do Prédio Anexo 1 da Reitoria - Campus Centro
 Bairro: Farroupilha CEP: 90.040-060
 UF: RS Município: PORTO ALEGRE
 Telefone: (51)3308-3738 Fax: (51)3308-4085 E-mail: etica@propesq.ufrgs.br

ANEXO B - Aprovação do Comitê de Ética (conclusão)



Continuação do Parecer: 2.632.694

| | | | | |
|--------|--|------------------------|--------------------------|--------|
| Outros | APENDICE_B_Questionario_Adolescent es.pdf | 07/06/2017 18:35:51 | Larissa Edom Bandeira | Aceito |
| Outros | APENDICE_A_Questionario_Familiares. pdf | 07/06/2017 18:35:24 | Larissa Edom Bandeira | Aceito |
| Outros | ANEXO_1_Questionario_Crianças_CAA FE.pdf | 07/06/2017 18:26:33 | Larissa Edom Bandeira | Aceito |

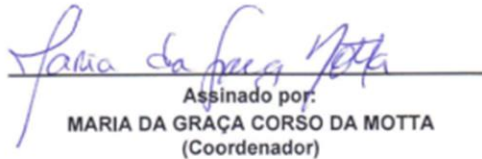
Situação do Parecer:

Aprovado

Necessita Apreciação da CONEP:

Não

PORTO ALEGRE, 03 de Maio de 2018


Assinado por:
MARIA DA GRAÇA CORSO DA MOTTA
(Coordenador)

Endereço: Av. Paulo Gama, 110 - Sala 317 do Prédio Anexo 1 da Reitoria - Campus Centro
Bairro: Farroupilha **CEP:** 90.040-060
UF: RS **Município:** PORTO ALEGRE
Telefone: (51)3308-3738 **Fax:** (51)3308-4085 **E-mail:** etica@propesq.ufrgs.br