

**UNIVERSIDADE FEDERAL DE SANTA MARIA
CENTRO DE CIÊNCIAS DA SAÚDE
CURSO DE ODONTOLOGIA**

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**TRAUMATIC DENTAL INJURIES AMONG UNDERGRADUATE
STUDENTS AND PROFESSIONALS OF PHYSICAL EDUCATION:
PRELIMINARY RESULTS**

Santa Maria, RS
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Trabalho de Conclusão de Curso
apresentado ao Curso de Odontologia, da
Universidade Federal de Santa Maria
(UFSM, RS), como requisito parcial para
obtenção do grau de **Cirurgião-Dentista**.

Orientadora: Prof^a. Dr^a. Luana Severo Alves

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RESUMO

TRAUMATISMO DENTÁRIO EM ESTUDANTES E PROFISSIONAIS DE EDUCAÇÃO FÍSICA: RESULTADOS PRELIMINARES

AUTOR: Felipe Lappann Leal
ORIENTADORA: Prof^a. Dr^a. Luana Severo Alves

Um aumento na prevalência de traumatismos dentários (TD) tem sido observado nas últimas décadas, e muitas pesquisas têm sido desenvolvidas com o propósito de identificar populações de maior risco. Neste sentido, profissionais da área da Educação Física podem constituir um grupo de risco ao TD devido à prática rotineira de atividades físicas. O objetivo deste estudo observacional transversal foi avaliar a prevalência, a extensão e a severidade de TD em estudantes e profissionais da área de Educação Física, na cidade de Santa Maria, Sul do Brasil. Estudantes de duas instituições de ensino superior, assim como os profissionais que trabalham em todas as academias registradas da cidade foram convidados a participar do estudo. A coleta de dados incluiu a aplicação de um questionário e a realização de exame clínico, conduzido nas clínicas do Curso de Odontologia da Universidade Federal de Santa Maria por um único examinador calibrado. Foi registrada a presença de TD, bem como a existência de TD tratado e TD com necessidade de tratamento. Até o presente momento, 50 indivíduos foram incluídos no estudo. Os resultados mostraram uma prevalência de TD de 52% (n=26), sendo 32% (n=16) trauma leve e 20% (n=10) trauma severo. A maioria dos indivíduos com TD apresentou um ou dois dentes fraturados. Incisivos centrais superiores foram os dentes mais afetados. Oito participantes apresentaram TD tratado e 4 apresentaram TD com necessidade de tratamento. Tais resultados indicam uma provável população de risco, porém, ainda é necessária uma amostra mais abrangente para tal conclusão.

Palavras-chave: trauma dentário, educação física, esportes, prevalência.

ABSTRACT

TRAUMATIC DENTAL INJURIES AMONG UNDERGRADUATE STUDENTS AND PROFESSIONALS OF PHYSICAL EDUCATION: PRELIMINARY RESULTS.

AUTHOR: Felipe Lappann Leal
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An increasing prevalence of traumatic dental injuries (TDI) has been observed in the last decades, and many studies have been developed in order to identify high-risk populations. In this sense, Physical Education professionals can constitute a risk group for TDI due to routine physical activity. The aim of this cross-sectional observational study was to evaluate the prevalence, extent and severity of TDI among undergraduate students and professionals of Physical Education in the city of Santa Maria, Southern Brazil. Students of two universities as well as professionals working in health clubs in the city were invited to participate. Data collection included the application of a questionnaire and clinical examination in the clinics of the School of Dentistry of the Federal University of Santa Maria by a single calibrated examiner. The presence of TDI, treated TDI, and TDI with treatment needs was recorded. To date, 50 individuals have been included in the study. The results showed a prevalence of TDI of 52% (n=26), being 32% (n=16) mild trauma and 20% (n=10) severe trauma. Most patients with TDI had one or two fractured teeth. Upper central incisors were the most commonly affected teeth. Eight individuals presented treated TDI whereas 4 individuals presented TDI in need of treatment. These results indicate a likely risk population; however, a greater sample size is required to draw such conclusion.

Keywords: traumatic dental injuries, physical education, sports, prevalence.

Traumatic dental injuries among undergraduate students and professionals of Physical Education: preliminary results.

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Running title

Dental trauma among students/professional of Physical Education

Keywords

Traumatic dental injuries, physical education, sports, prevalence

Abstract

An increasing prevalence of traumatic dental injuries (TDI) has been observed in the last decades, and many studies have been developed in order to identify high-risk populations. In this sense, Physical Education professionals can constitute a risk group for TDI due to routine physical activity. The aim of this cross-sectional observational study was to evaluate the prevalence, extent and severity of TDI among undergraduate students and professionals of Physical Education in the city of Santa Maria, Southern Brazil. Students of two universities as well as professionals working in health clubs in the city were invited to participate. Data collection included the application of a questionnaire and clinical examination in the clinics of the School of Dentistry of the Federal University of Santa Maria by a single calibrated examiner. The presence of TDI, treated TDI, and TDI with treatment needs was recorded. To date, 50 individuals have been included in the study. The results showed a prevalence of TDI of 52% (n=26), being 32% (n=16) mild trauma and 20% (n=10) severe trauma. Most patients with TDI had one or two fractured teeth. Upper central incisors were the most commonly affected teeth. Eight individuals presented treated TDI whereas 4 individuals presented TDI in need of treatment. These results indicate a likely risk population; however, a greater sample size is required to draw such conclusion.

Introduction

Traumatic dental injuries (TDI) are very common during life, being more prevalent in permanent (58.6%) than in primary dentition, when they constitute 36.8% (1,2). Most studies report this public health problem prevalence as high as 15-30% (3,4), being the second most frequent oral injury among children and adolescents (5). In adults, TDI also affect a significant portion of the population, mainly due to traffic accidents and during the practice of sports (6).

The literature reports that the practice of sports is responsible for one third of all dental injuries (7-10). Among the most associated sports, there are the full contact ones, such as taekwondo, jiu-jitsu, kickboxing, boxing, etc.; followed by sports with indirect contact with adversary team (handball, basketball, football, soccer, ice-hockey, etc.) and, lastly, sports with no contact with opponents, as volleyball (11). In this sense, the "Sports Dentistry" comes as a new specialty, which the professional must have knowledge in the areas of oral surgery, endodontics, restorative dentistry, orthodontics, dentistry hospital and patient behavior management (12-13).

The Physical Education College aims to train professionals to be school teachers or professionals related to physical training and sports. During the major of Physical Education, many young people acquire knowledge on the practice of sports as daily activities. Important subjects of the major are deeply involved with contact sports such as basketball, handball and struggles. It is plausible to speculate that undergraduate students in Physical Education may be at an increased risk for dental trauma due to the frequent practice of sports and physical activities over their graduation.

Previous studies reported that TDI cause a negative impact on the quality of life of the affected individuals, since they may cause aesthetic and functional impairment (fractures, color alteration, pain, and tooth mobility) (14); thus justifying investigations on the occurrence of dental trauma in different populations. Therefore, the aim of this study was to assess the prevalence, extent, and severity of TDI among undergraduate students and professionals of Physical Education in South Brazil.

Subjects and Methods

Study design and sample

A cross-sectional survey was conducted to assess the oral health status of undergraduate students and professionals of Physical Education in the city of Santa Maria, South Brazil. The municipality of Santa Maria had an estimated population of 246.544 in 2015 with around 35,000 college students.

Undergraduate students attending two institutions were invited to participate: 1 private institution (Methodist Faculty - FAMES) and 1 public institution (Federal University of Santa Maria - UFSM), totalizing an estimated number of 900 individuals. Participants were collectively invited between classes' intervals as well as through social networks. All academies registered in the municipal records (n=35) were visited and professionals were invited to participate.

Sample size calculation took into account the following parameters: an estimated difference in TDI prevalence between groups of 20%, a confidence interval of 95%, a statistical power of 80%, and an α of 5%. This resulted in a sample of 65 individuals per group. Undergraduate students and professionals of Physical Education constituted the test group whereas undergraduate students of other colleges were considered the control group.

Data collection

Data collection was conducted from September 2015 to June 2016 and included a questionnaire and a clinical examination.

The questionnaire gathered information on socio-demographic characteristics, professional variables as well as the frequency of physical activities practiced by the participants.

The clinical examination was performed by a single calibrated examiner in the dental clinics of the School of Dentistry of the Federal University of Santa Maria. The clinical examination was performed in a dental unit using artificial light, clinical mirror, periodontal probe, gauze and cotton rolls. Prophylaxis was done before the examination when necessary. After tooth drying, TDI in the 12 permanent incisors and canines was recorded according to the Children's Dental Health Survey criteria (15) as follows: 0 = no trauma; 1 = enamel fracture only; 2 = enamel-dentin fracture; 3 = enamel-dentin fracture with pulp exposure; 4 = signs of pulp involvement without signs of fracture; 5 = missing tooth due to TDI; or 6 = other TDI. The type of treatment was recorded as follows: 0 = untreated; 1 = treated with composite restoration; 2 = treated with endodontics and composite restoration; 3 = treated with

a single crown; 4 = treated with a removable partial denture; or 5 = other treatment. Finally, treatment needs were assessed on the basis of the presence of aesthetics/functional involvement or pain/sensibility as follows: 0 = no treatment need; 1 = needing composite restoration; 2 = needing endodontic treatment and composite restoration; 3 = needing endodontic treatment, composite restoration, and bleaching; 4 = needing a single crown; 5 = needing endodontic treatment and a single crown; 6 = needing a removable partial denture; or 7 = needing other treatment.

Measurement reproducibility

Clinical examinations were performed by a single examiner. Before the beginning of the study, training sessions on the TDI index were performed by the assessment of 30 photographs. To assess intra-examiner reproducibility, double examinations were conducted in 10 individuals with a minimal time interval between examinations of 7 days. The kappa value obtained was 0.80.

Ethical considerations

This study was approved by the Research Ethics Committee of the Federal University of Santa Maria (process no. 45104515.8.0000.5346). All participants provided written informed consent. Participants were forwarded to dental treatment when necessary.

Data analysis

The primary outcome of the study was the prevalence of TDI, defined as the percentage of participants having any TDI score. TDI severity was categorized into no trauma (all teeth having scores 0), mild trauma (≥ 1 tooth with a score 1), or severe trauma (≥ 1 tooth with scores 2, 3, 4, 5, or 6). TDI extension was defined as the number of affected teeth.

Participants were described according to socio-demographic characteristics as well as to professional variables using mean and standard deviation for quantitative variables and using percentages for qualitative variables. The frequency of physical activities practiced by the participants was also described using percentages.

Descriptive analysis was performed using STATA software (Stata 11.1 for Windows; Stata Corporation, College Station, TX, USA).

Results

A total of 50 undergraduate students and professionals of Physical Education have been included in the study till the present moment. Table 1 describes the sample regarding socio-demographic characteristics as well as to professional variables. It was possible to observe an even distribution of the sample according to gender and socioeconomic status. The majority of individuals were undergraduate students, attending the UFSM, at the bachelor degree.

Table 2 describes the frequency of physical activities practiced by the included individuals. Weight training was the most commonly practiced modality, practiced by 42% of the participants on a weekly basis and by 26% on a daily basis. Among the sports, soccer was practiced on a weekly basis more often than the other modalities, followed by volleyball. Participants reported a lower frequency of practice of other sports (handball, rugby and basketball).

The prevalence of TDI was 52% (n=26) in this sample. Considering the severity of TDI, 32% (n=16) of individuals had mild trauma whereas 20% (n=10) had severe trauma. The majority of affected individuals had one (n=18) or two teeth (n=5) with TDI. Three individuals had 3 or 4 affected teeth. Upper central incisors were the most commonly affected teeth. Eight individuals presented treated trauma whereas 4 presented TDI with treatment needs. All cases of treated trauma and trauma with treatment needs were composite resin restorations, with the exception of one case of severe TDI in which an upper first premolar was in need of root filling and prosthetic rehabilitation after a traumatic event suffered by a rugby player.

Discussion

This cross-sectional study was conducted to assess the prevalence, extent, and severity of dental trauma among undergraduate students and professionals of Physical Education, a population that is expected to be at high risk for TDI due to the usual practice of sports. It was observed a high prevalence of TDI in this population, with more than a half of the examined individuals presenting TDI, being mild trauma in the majority of cases. Furthermore, most individuals presented one or two affected teeth, and the upper central incisors were the most commonly affected teeth.

The prevalence of TDI observed in this population can be considered high when compared to other studies. A prevalence of 19.9% was found in adolescents

aged 15 to 18 years in Taiwan (16). Similarly, 15.5% of 18-50-year-old Canadians reported a history of injury to the mouth and teeth (17). Upper central incisors were the most commonly affected teeth in this sample, which is in agreement with a literature review (18).

Weight training was the most commonly practiced modality, practiced by 42% of the participants on a weekly basis and by 26% on a daily basis; however, it is not expected that this kind of activity is associated with TDI. Soccer (classified as a sport with indirect contact with adversary team) and volleyball (classified as a sport with no contact with opponents) were practiced more often than the other modalities. Among the sports most commonly associated with TDI, there are the full contact ones, such as combat sports. In this study, few volunteers reported the practice of such activities, with only 8% reporting the practice of combat sports weekly or daily. Despite these findings, a high prevalence of TDI has been found in this population.

This study has important shortcomings. The first one is related to the study design. Using a cross-sectional design, it is not possible to test hypotheses of causality since it is not possible to define temporality. However, cross-sectional studies are useful to identify risk indicators or risk populations to be included in further longitudinal assessments. In our study, all individuals attending the college in Physical Education of two institutions were invited to participate as well as professionals of all health clubs registered in the municipal records. Despite this fact, we need to recognize that this is a convenience sample. This study reports preliminary results, which prevent us to draw a definite conclusion. After the conclusion of data collection of both groups, the test (composed by undergraduate students and professionals of Physical Education) and the control group (composed by undergraduate students of other colleges), it will be possible to definitely state whether this population is at an increased risk for TDI.

Within the limitations of this study, it was possible to conclude that undergraduate students and professionals of Physical Education presented a high prevalence of TDI, thus composing a likely high-risk population; however, a greater sample size is required to draw a definite conclusion.

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Table 1

Table 1. Sample description of undergraduate students and professionals of Physical Education. N=50.

	Mean (\pm SD)
Age	25.6 (\pm 5.2)
	N (%)
Gender	
Male	25 (50)
Female	25 (50)
Socioeconomic status	
\leq 2 BMW	24 (48)
\geq 3 BMW	26 (52)
Institution	
UFSM (public)	37 (74)
FAMES (private)	13 (26)
Degree of formation	
Bachelor degree	35 (70)
Licentiate degree	15 (30)
Professional status	
Undergraduate	31 (62)
Professional	19 (38)

SD = standard deviation;

BMW = Brazilian minimum wage (approximately U\$250);

UFSM = Federal University of Santa Maria;

FAMES = Methodist Faculty.

Table 2

Table 2. Most commonly practiced physical activities by undergraduate students and professionals of Physical Education. N=50.

	Rarely/Never	Sometimes	Once a week	> Once a week	Daily
Soccer	21 (42)	10 (20)	11 (22)	8 (16)	0 (0)
Handball	37 (74)	8 (16)	2 (4)	3 (6)	0 (0)
Rugby	48 (96)	1 (2)	0 (0)	1 (2)	0 (0)
Volleyball	28 (56)	11 (22)	7 (14)	2 (4)	2 (4)
Basketball	42 (84)	6 (12)	2 (4)	0 (0)	0 (0)
Combat sports	43 (86)	3 (6)	1 (2)	2 (4)	1 (2)
Weight training	10 (20)	6 (12)	2 (4)	19 (38)	13 (26)