



## University student's dental and maxillofacial fractures characteristics and epidemiology in sports

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**ABSTRACT.** Current study analyzes the characteristics and epidemiology of oral and nasal fractures and knowledge degree regarding the use of a mouthguard by an amateur university handball team in Brazil. A cross-sectional study comprised 138 students who practiced the sport. They were interviewed on dental and nasal fractures and on the need of mouthguards in games such as amateur handball. Data were processed by descriptive analysis. Results showed that 19.6% had suffered some type of dental injury during the practice of sports, namely 40 fractured teeth; 12% had fractured nasal bones; 57% underwent head and neck injuries; 32% were unaware of the need to use a mouthguard during sports; 68% had heard of mouthguards, but only 4.5% of the interviewees made use of this protection device. There was a high prevalence of nasal and dental fractures in the group under analysis. The upper central incisors were most susceptible to fracture. Even though most athletes knew a mouthguard was needed during sports activities, only 4.5% actually used one.

**Keywords:** tooth injuries, traumatic dental injuries, athletic injuries, personal protection, epidemiology, sports.

## Características e epidemiologia das fraturas maxilo-faciais no esporte em estudantes universitários

**RESUMO.** O presente estudo analisou as características epidemiológicas de fraturas orais e nasais, bem como o grau de conhecimento sobre o uso de um protetor bucal no esporte amador, cujo corpus é a equipe de handebol da Universidade no Brasil. Em um estudo transversal foram entrevistados 138 atletas sobre a ocorrência de fraturas dentais e nasais, além de seu conhecimento acerca da necessidade na prática de handebol amador universitário; os dados foram tabulados e apresentados por meio de análise descritiva. Um total de 19,6% sofreu algum tipo de lesão dental durante a prática do esporte, totalizando 40 dentes fraturados, 12% sofreram fraturas dos ossos nasais, 57% sofreram ferimentos na cabeça e pescoço, 32% não sabiam da necessidade de usar um protetor bucal para o esporte; 68% referiram já ter ouvido falar de protetores bucais, mas apenas 4,5% dos entrevistados fizeram uso deste dispositivo de proteção. Houve alta prevalência de fraturas nasais e dentais no grupo analisado. Os incisivos centrais superiores foram os dentes mais suscetíveis a fraturas. Mesmo que a maioria dos atletas saiba da necessidade de usar um protetor bucal, apenas 4,5% realmente fazem uso desse equipamento.

**Palavras-chave:** trauma dentário, lesões traumáticas dentárias, lesões esportivas, proteção pessoal, epidemiologia, esportes.

### Introduction

University sports are widely practiced in Brazil, featuring competitions between teams of the same course or between teams of the same university. Since considerable practice and game load are available, athletes are consequently more exposed to injury risks and, needless to say, sports with a high degree of physical contacts offer greater risks. Athletes are prone to suffer injuries on different parts of the body, but 50% of sport injuries occur on the head and neck region, as demonstrated in studies from the 1960s to the present (ANDRADE et al., 2010, HEINTZ, 1968; LEVIN et al., 2007).

Moreover, sports practice has been growing on a global basis and it starts at a very early age (COTO et al., 2007). This expansion offers risks associated to an increase in maxillofacial traumas among athletes. Since the face is the most exposed part of the head, it is subject to injuries stemming from direct impact from hits or falls (DELANEY et al., 2008). Team handball is a contact sport with a medium risk in dental trauma (FDI, 1990) but no studies have been undertaken on this sport as practiced by amateur university athletes. Post-trauma instructions are reported (LEVIN et al., 2007) but the knowledge on risks and types of protection is insufficient (PACHECO et al., 2003) and compromise the physical, mental and social well-being.

The prevalence of dental trauma varies according to the mandatory use of protective equipment, such as a mouthguard (ANDRADE et al., 2010). A number of different types of mouthguards are available on the market, but the most indicated for effective protection is a custom-fitted mouthguard manufactured by a dentist (COTO et al., 2007; FERRARI; MEDEIROS, 2002; HEINTZ, 1968).

Current study determines the occurrence of oral and nasal fractures among amateur handball teams from the several faculties of the Universidade de São Paulo, São Paulo State, Brazil, as well as the degree of knowledge that these university students have on wearing a mouthguard during the sport. The data obtained could be used to draft awareness strategies on the wearing of devices designed to protect athlete's health.

## Material and methods

Current research was approved by the Ethics Committee of the Dental School of the Universidade de São Paulo, São Paulo State, Brazil, in Process 38/2008 - FR183204.

A cross-sectional study was conducted in which 138 (74 males and 64 females; mean age: 21 years 4 months) amateur team handball practitioners were interviewed and asked to fill a questionnaire on dental and nose fractures and their knowledge of the use of mouthguards. They were also asked whether mouthguards were a necessary protection equipment and whether they used a mouthguard during sports and recreational activities. Data were processed by descriptive analysis.

The questions were formulated to receive a simple "yes" or "no" answer, except that on fractured teeth. In this case, the athletes were asked: 1) Have you had a fractured tooth? If so, which tooth? 2) Have you ever suffered a nasal fracture during sport activities? 3) Do you believe you have sufficient information on a mouthguard? 4) Do you wear a mouthguard for sports activities? 5) Do you think mouthguards are important to prevent injuries?

## Results

Among the 138 athletes interviewed, 27 (19.6%) had suffered some type of dental injury, totaling 40 fractured teeth, during the practice of the sport (Table 1).

Among the 138 interviewees, 21 (12%) had suffered nasal bone fractures, 57% of whom reported head and neck injuries. Among the total sample, 32% were unaware of the need to wear a mouthguard during sports activities; 68% had heard of mouthguards, but only 4.5% made use of this

protection device. When asked about the need and/or importance of the use of this device, the group's response was as follows: 28.5% believed that the use of a mouthguard could avoid fractures; 12.5% said they would indicate wearing a mouthguard, albeit depending on the sports practiced; 8% believed a mouthguard was uncomfortable; and 5% declared that a mouthguard was unnecessary.

**Table 1.** Occurrence of dental fractures during sport activities.

Tooth	Total Fractures	
	n	(%)
Right upper central incisor	14	35
Left upper central incisor	11	27.5
Left lower central incisor	5	12.5
Right lower central incisor	3	7.5
Right upper canine	2	5
Right upper lateral incisor	1	2.5
Right upper first molar	1	2.5
Left upper lateral incisor	1	2.5
Left upper canine	1	2.5
Right lower canine	1	2.5

## Discussion

In current study, 19.6% of interviewed athletes reported having suffered some type of dental fracture during sports activities, which is similar to that reported in previous studies. Studies carried out with amateur team handball practitioners (FERRARI; MEDEIROS, 2002) reported that the occurrence of dental fractures among young people and adolescents ranged between 15 and 30% (PETTI et al., 1997), with climax at 37.1%. The rate of occurrence with experienced athletes was approximately 26% (KEÇECI et al., 2005). In a survey (BOFFANO et al., 2012) with Italian rugby athletes, a higher number (53.85%) of mouthguard wearers was found.

Current study showed that the most affected teeth were the upper central incisors. This is due to the fact that they are located at the most anterior region of the mouth and are therefore the first to be affected by frontal blows. The incidence of dental fractures in contact sports was very high and the numbers reported on the lack of knowledge and use of a mouthguard proved this point. Among the interviewees, 32% were unaware of the need to wear a mouthguard during the practice of sports, whereas 68% reported having heard of mouthguards, but most related its use to activities in the martial arts. Another research group (AZODO et al., 2011) conducted a self-administrated questionnaire and the results showed that 62.8% of the athletes had suffered some kind of facial or oral injuries, mainly caused by impacts against other players or the ground.

Whereas 58.7% of the interviewees believed wearing a mouthguard was necessary and would recommend this type of protection to others, and 28.5% believed the use of a mouthguard could avoid fractures, only 4.5% of the athletes interviewed made use of a mouthguard during the sport. Moreover, 13.0% of the interviewees believed this protective device was uncomfortable or unnecessary. Above rates demonstrated the need to transmit reliable information to this group of athletes, who did not differ from those who practiced other sport modalities in other countries (ANDRADE et al., 2010; BIAGI et al., 2007; COTO et al., 2007; HERSBERGER et al., 2012; RANALLI, 2005). In fact, it revealed a lack of awareness on the benefits of using protective devices, such as a custom-fitted mouthguards.

The nasal bone is one of the most injured part in sports accidents, accounting for approximately 56% (FRENGUELLI et al., 1991) and 15% of recurring fractures (CROW, 1991). In the present study, 12% of the respondents reported the occurrence of nasal fractures during the practice of the sport. This corroborates the statement of researchers that the frequency of nose fracture has risen considerably in the last 15 years, perhaps due to the 40% increase in sports practiced in closed environments (ANTOUN; LEE, 2008; LINN et al., 1986). Facial trauma has accounted for a large percentage of hospitalizations and surgeries in recent years, with a significant increase in the number of facial fractures occurring during sport activities (ANTOUN; LEE, 2008; FRENGUELLI et al., 1991).

Maxillofacial injuries during sports should be studied further to determine the most frequent causes and indicate proper treatment and protection equipment to minimize the risk of an injured athlete being absent from practice and competition for a long period of time (TANAKA et al., 1996; WITHNALL et al., 2005). In one study, it was decided to survey the parents of several students in Ireland (O'MALLEY et al., 2012). When researchers noted that the rate of wearing mouthguards was significantly higher in schools and clubs with a mouthguard policy, they concluded that dental professionals should promote the development of mouthguard-wearing policies during sports activities.

Based on the findings of current study, planning strategies in educational lectures will be adopted to inform athletes on injury risks and trauma prevention through the manufacture of custom-fitted mouthguards by a dentist for those interested in using these devices.

## Conclusion

Current research demonstrated that the most fractured teeth were the upper central incisors (62.5%) and that, although 58.7% of athletes stated that a mouthguard was a necessary type of protection from dental injuries, only 4.5% wore mouthguards. Dental and nose fractures are highly common in university team handball players in São Paulo, Brazil.

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