

# Orofacial injuries in sports and use of mouthguards among university students

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## Abstract

**Aim:** To evaluate the prevalence of orofacial injuries during practice of sports and the use of mouthguards by university students in the southern region of Brazil. **Methods:** In this cross-sectional study, 700 undergraduates from the University of West Santa Catarina, Brazil, filled out a questionnaire with multiple-choice questions addressing social and economic status, education level of parents, orofacial injuries from sport practice, knowledge, importance and use of mouthguards. The collected data were entered into the EpiData 3.2 program, and were analyzed by descriptive statistics and the chi-square test using STATA 8.0 statistical software package with a significance level set at 5%. **Results:** Out of the total number of students surveyed, 37.02% claimed to have already sustained some kind of orofacial injury. Out of these, only 9.90% sought dental assistance after trauma. The most common injuries were: bleeding 54.55%, swelling 23.72%, and dental fractures 16.21%. Among the interviewees, 19.24% had already used mouthguard and 44.89% considered its use as important. **Conclusions:** The prevalence of orofacial injuries during sport activities was high in the studied sample and only few of the interviewed university students used individual protection measures to avoid these injuries.

**Keywords:** epidemiology, mouth health, dental traumas.

## Introduction

Health promotion in Dentistry has been developing in various specific areas. One of them is Sports Dentistry, which focuses on assuring oral health for those practicing sports as well as avoiding accidents that might cause orofacial injuries during training or a sports competition<sup>1</sup>.

The prevention and treatment of orofacial trauma is now considered a very important part of the general practice. Children and adults are participating more in events where the probability of trauma is significant. Increase in orofacial injuries comes along with the increase in sports engagement. The general population is taking its health more seriously<sup>2</sup>.

Mouthguards have been used by athletes who recognize the need for oral protection during their sports activities; however the frequency of mouthguard usage is still limited<sup>3</sup>. Reasons for not wearing a mouthguard are mainly the discomfort and the difficulty in breathing as well as in speaking<sup>4</sup>. To increase mouthguard use, properly fitted mouthguards should be fabricated and provided

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by dental professionals as indicated in the Academy for Sports Dentistry position statements<sup>5</sup>.

Aspects such as the prevalence and incidence of orofacial injuries occurred in sports and the prevalence of mouthguard use are topics often addressed in Sports dentistry<sup>6</sup>.

Dental trauma is a very prevalent orofacial injury in sport practice and differs from other traumas in that it can be prevented<sup>7</sup>, with the possibility of drastically reducing its occurrence by means of mouth devices that promote the protection of all dental and periodontal structures<sup>8</sup>.

Several studies on individual or team sports for different age groups and competition levels have been published. Research suggests that the dental community be more alert to the dental trauma risk. In contact sports, such as basketball, soccer or boxing, where there is a real possibility for direct dental trauma, the use of mouthguards to prevent sports dental injuries is highly indicated<sup>9</sup>.

Sport practice and orofacial injuries are prevalent at schools and universities<sup>10</sup>, where sports are traditionally practiced. The objective of this study was to investigate the prevalence of orofacial injuries from sport practice and the use of mouthguards among university students in the southern region of Brazil.

## Material and methods

The study was approved by the Research Ethics Committee of the University of West Santa Catarina, Joaçaba, Brazil, under the protocol #114/2005.

This study had a cross-sectional design. The study population was composed of university students from the University of West Santa Catarina's Campus of Joaçaba. The University of West Santa Catarina is a community university distant 400 km from the Santa Catarina state capital, Florianópolis, which has 14,000 students attending its several courses at different campi.

The sampling system was made up of conglomerates in two stages. In the first phase, the courses of Business Administration, Accounting, Social Communication/Advertising, Social Communication/Radio and TV, Law, Physical Education, Civil Engineering, Electric Engineering, Mechanical Engineering, Physiotherapy, Languages, Dentistry, Pedagogy, Psychology, Medicine, Tourism and Hotel Management were selected. In the second phase, students from the first and last periods of each course described above were asked to fill out the proposed questionnaire.

In order to meet the goals of the present study, information about the prevalence of orofacial injuries and the use of mouthguards in sport practice and associated factors was collected.

The pre-test and the pilot-study were carried out with students taking the last semester of Dental School. The examining team took a 2-h training session in order to have a standardization of interviewers, and the data were collected in June, 2005. The data were typed into and analyzed on STATA 10.0 statistical software package. Frequency distribution and measures of central tendency and dispersion, and specific statistical tests to test the association of pain

with associated variables were done. The significance level was set at 5% for all the tests.

## Results

Out of 21 regular courses at University of West Santa Catarina, 17 courses made up the study population. The initial and final periods of each course were used, totaling 34 participating classes. The total number of university students involved in the study was 700.

The distribution of participants in relation to the courses was as follows: Business Administration was the course that provided the largest number of participants ( $n=72$ ; 10.29%), and Pedagogy was the course that provided the smallest number of participants ( $n=14$ ; 2%).

The initial periods of all the courses were also accountable for the largest proportion of results, with 461 interviewees (65.86%) in comparison to the final phases, with 239 interviewees (34.14%) (Table 1).

As for gender, women had a larger participation, corresponding to 53.14% of the sample, while men corresponded to 46.86% of the sample (Table 1).

As far as housing is concerned, 65.57% of the interviewees lived with their parents and/or relatives, 20.71% lived with friends and, finally, 13.71% live alone (Table 1).

As for socioeconomic status, 459 (65.57%) of the interviewees had a family income to live on, and 241 (34.43%) relied on their own income. The great majority ( $n=530$ ; 75.72%) fit into the pattern of the Brazilian middleclass family, 20.14% into low-income family, and 4.14% into high-income family.

The parental education level of parents of the 700 interviewees varied a lot: 9.43% of parents had a high-school degree, 23.57% had a college degree, and 23.14% had dropped out of elementary school (Table 1).

As for sport practice, 84.65% of the university students practiced sports regularly and 15.35% reported they were not engaged in any kind of sport activity. The most popular individual sports were track and field, martial arts and tennis. The most popular team sports were soccer, volleyball, handball and basketball. Out of the total of students practicing sports, 90.74% were amateurs and 9.26% did it professionally (Table 1).

In relation to orofacial injuries resulting from sport practice, 37.02% of students reported having already sustained some kind of injury. Out of these, only 9.90% sought dental assistance. Out of the total, 62.98% had never had accidents while practicing sports. The most reported injuries were bleeding (54.55%), swelling (23.72%) and dental fractures (16.21%) (Table 2).

As much as 44.89% of the interviewees reported being aware of the importance of using mouthguards in sport practice, and 55.11% reported that they were not. Out of the 44.89%, 125 (39.56%) got the information from dentists, 109 (34.49%) from television programs, and 18 (5.70%) from other means (Table 2). As for use of mouthguards, 80.76% did not use them and 19.24% reported using them constantly (Table 2).

Gender ( $p=0.01$ ) and team sport practice ( $p=0.01$ )

Table 1. Distribution of university students according to period of courses, gender, housing, income, social class and education level of parents, and profile of sport practice. Joaçaba, SC, Brazil, 2005.

| Variable                           | Categories                   | n   | %     |
|------------------------------------|------------------------------|-----|-------|
| Phase                              | Initial                      | 461 | 65.86 |
|                                    | Final                        | 239 | 34.14 |
| Gender                             | Male                         | 328 | 46.86 |
|                                    | Female                       | 372 | 53.14 |
| Housing                            | Lives alone                  | 96  | 13.71 |
|                                    | Lives with parents/relatives | 459 | 65.57 |
|                                    | Lives with friends           | 145 | 20.71 |
| Income                             | Family                       | 459 | 65.57 |
|                                    | Own                          | 241 | 34.43 |
| Social Class                       | Low                          | 141 | 20.14 |
|                                    | Middle                       | 530 | 75.72 |
|                                    | High                         | 29  | 4.14  |
| Education Level of Parents         | Incomplete Elementary School | 162 | 23.14 |
|                                    | Elementary School Degree     | 70  | 10.00 |
|                                    | Incomplete High School       | 66  | 9.43  |
|                                    | High-School Degree           | 146 | 20.86 |
|                                    | College Dropout              | 91  | 13.00 |
|                                    | College Degree               | 165 | 23.57 |
| Practice or has practiced a sport? | Yes                          | 590 | 84.65 |
|                                    | No                           | 107 | 15.35 |
| Individual Sport Practice          | Track and Field              | 73  | 72.28 |
|                                    | Marcia Art                   | 14  | 13.86 |
|                                    | Motocross                    | 8   | 7.92  |
|                                    | Tennis                       | 6   | 5.29  |
| Team Sport Practice                | Soccer                       | 262 | 53.36 |
|                                    | Volleyball                   | 146 | 29.74 |
|                                    | Handball                     | 48  | 9.78  |
|                                    | Basketball                   | 35  | 7.13  |
| Sports Level                       | Amateur                      | 539 | 90.74 |
|                                    | Professional                 | 55  | 9.26  |

showed a statistically significant association with the prevalence of orofacial injuries. Males showed 2.78 (2.00-5.24) more chances of having injuries than female. Sport practitioners had 3.45 more chances of being injured (Table 3).

## Discussion

The uneven distribution of university students in the different courses is due to the fact that there are more students

Table 2. Distribution of university students according to the use of mouthguards. Joaçaba, SC, Brazil, 2005.

| Variable   | Categories                   | N   | %     |
|--|------------------------------|-----|-------|
| Knows the importance of the use of mouthguards in sport practice     | No                           | 383 | 55.11 |
|  | Yes                          | 312 | 44.89 |
| Got information about mouthguards from                               | Dentist                      | 125 | 39.56 |
|  | Television                   | 109 | 34.49 |
|  | Sport Team                   | 42  | 13.29 |
|  | Teammates                    | 22  | 6.96  |
|  | Others                       | 18  | 5.70  |
| Has already used mouthguard in sport practice                        | No                           | 256 | 80.76 |
|  | Yes                          | 61  | 19.24 |
| Remembers having hit or being hit on the mouth during sport practice | No                           | 439 | 62.98 |
|  | Yes and didn't look for help | 189 | 27.12 |
|  | Yes and looked for help      | 69  | 9.90  |
| Result of hit on the mouth during sport practice                     | Bleeding                     | 138 | 54.55 |
|  | Swelling                     | 60  | 23.72 |
|  | Dental Fracture              | 41  | 16.21 |
|  | Dental Avulsion              | 8   | 3.16  |
|  | Dental Extrusion             | 4   | 1.58  |
|  | Dental Intrusion             | 2   | 0.79  |

**Table 3.** Distribution of university students according to gender, team sport practice and presence of orofacial injuries. Joaçaba, SC, Brazil. 2005.

| Variable                   | Categories | Presence of injuries | Absence of injuries | ODSS (IC 95%)   | P    |
|----------------------------|------------|----------------------|---------------------|-----------------|------|
| <b>Gender</b>              | Male       | 162                  | 166                 | 1               | 1    |
|                            | Female     | 96                   | 273                 | 2.78(2.00-3.86) | 0.01 |
| <b>Practice team sport</b> | Yes        | 219                  | 272                 | 1               | 1    |
|                            | No         | 39                   | 167                 | 3.45(2.30-5.24) | 0.01 |

in certain courses, such as Business Administration. Another fact is the larger number of interviewees in the initial periods of the courses, since several students end up dropping out of college for different reasons. The university student's profile in the present research is similar to the one found in the Brazilian setting<sup>11</sup>.

Most students interviewed for this survey, almost 85% of them, practiced sports. It has been reported that the sport practice is prevalent at schools and universities<sup>10</sup>.

The prevalence of orofacial injuries resulting from sports was 37.02%. Though high, it was similar to that of other studies<sup>12-13</sup>. The prevalence of dental injuries, even dental trauma, was associated with the gender and with the practice of team sports<sup>1,6,14</sup>.

In the present study, only 19.24% of the university students used mouthguards and 44.89% found their use important, which reveals a huge lack of information on the importance of mouthguards. Likewise, Kvittem et al.<sup>15</sup> found that only 6% of sportspeople at the University of Minnesota (USA) used mouthguards and 50% found their use important.

Although the use of mouthguards is important and necessary<sup>16</sup>, Newsome et al.<sup>17</sup> explain that their use alone is not the most efficient way to prevent orofacial injuries, mainly the mouthguards commercially sold. This study comes to show the importance of setting up effective programs to promote mouth health in the age groups which most practice sports amateurishly.

The limitation of this study has to do with the fact that it is a cross-sectional study in which the analytical power is low; to go further into this subject, it would be interesting to do some research with a qualitative approach<sup>18-19</sup>.

In light of the obtained results, it may be concluded that the prevalence of orofacial injuries during sport activities was high in the studied sample and only few of the interviewed university students used individual protection measures to avoid these injuries.

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