

# Dental trauma and mouthguard: knowledge and attitudes in Physical Education undergraduates

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## Abstract

To evaluate the knowledge and attitudes in a group of Brazilian physical education undergraduate students, relative to dental trauma and use of mouthguard. A total of 373 undergraduates from three public universities of Rio de Janeiro were interviewed by means of a semi-structured standardised questionnaire. The data were tabulated and analyzed using the statistical program SPSS, 17.0. Frequency was performed and it was also applied the qui-quadrado ( $p < 0.05$ ) test, to establish a relation between variables of interest. Only 3.21% of the interviewees had been given information on dental trauma and use of mouth protector during their undergraduate course. With regard to their attitudes, only 19.83% responded correctly about how to act towards a tooth avulsion; 54.69% about how to manage the avulsed tooth, and 7.77% about how to transport the avulsed tooth. By comparing these attitudes in relation to the undergraduate period (before or after the 5th semester), previous information and experience on dental trauma, it was observed no significant difference ( $p > 0.05$ ). With regard to prevention, 89.81% knew mouthguard although only 17.96% wore it during sport activities. The students were given no information during their undergraduate course, even though the curriculum has the discipline of first aid. The dentist are supposed to develop actions so that such knowledge meets the needs of the future physical education practitioners.

KEY WORDS: Tooth avulsion; Traumatic injury; Physical education; Training; Sports; Dental injury.

## Introduction

The practice of physical activities provides a series of benefits to people's health. However, these activities end up exposing its practitioners to the risk of certain injuries, including orofacial traumas<sup>1</sup>. Dental trauma, including caries lesions, periodontal disease and oral cancer, can be considered as one of the main public health problems<sup>2</sup>. Dental trauma is a distressing event often causing psychological as well as physical problems<sup>3</sup>, affecting the quality of life of the individual and his family<sup>4</sup>.

Most of the orofacial injuries occur during the practice of recreational and sport activities<sup>5</sup> and have a great differential: their effects can be avoided or at least minimised by wearing protective devices<sup>1,6</sup>. It is desirable that physical education trainers and professionals, who have direct contact with sport

practitioners, be able to provide immediate care in cases of orofacial trauma<sup>7</sup> because managing the avulsed tooth and/or dental fragment is directly associated with a more favourable prognosis<sup>8</sup>.

A possible solution for reducing the rates of orofacial lesions or minimising the injuries would be the implementation of educational programs addressing the importance of preventing orofacial traumas, transporting avulsed/fractured teeth properly, and the benefits from immediate treatment<sup>9</sup>.

In this way, the present study was aimed at investigating and delineating the profile of the future physical education professionals graduated from public universities in the State of Rio de Janeiro regarding their knowledge and attitudes about dental trauma and use of mouthguard. With these data

in hands, the dentist should provide guidance and motivation of the sports-related professionals about

their attitudes towards dental trauma as well as about the importance of implementing preventive measures.

## Method

### Ethical aspects

This study was submitted to the Antonio Pedro Hospital Research Ethics Committee of the Federal Fluminense University, Niteroi, State of Rio de Janeiro, and approved according to protocol number 246/11. With regard to ethical aspects, the physical education undergraduate students were given previous explanation about the objective of the study, including its scientific importance and the importance of their participation in the study. All the participants signed an informed consent form.

### Type of study

This is a cross-sectional investigative study involving physical education undergraduate students.

### Study subjects

A total of 373 physical education undergraduate students were selected for study, all from three public universities in the State of Rio de Janeiro, Brazil.

### Inclusion criteria

Only those participants who were attending the physical education course of these three public universities on a regular basis were selected for study. In addition, those who did not sign the informed consent form or who were interchange students were excluded as well.

## Results

A total of 373 physical education undergraduates students were interviewed, with a mean age of 21.75 years old ( $\pm 4.14$ ) and 50.93% of them being male students. The participants were distributed according to course semester (TABLE 1).

Only 3.21% ( $n = 12$ ) of the students reported they had received information on dental trauma and use of mouthguard during their undergraduate

### Methodology

The analysis instrument was based on a semi-structured self-questionnaire consisting of open and closed questions. Inclusion of open questions allowed physical education undergraduate students to express themselves in a sincere way, thus both preserving multiple information and preventing limited questions. The questionnaire was applied in the classroom to first-semester to eighth-semester physical education undergraduates of the three public universities. Aspects relative to dental trauma and use of mouthguard were also evaluated. The questionnaire was applied between August 2013 and August 2014. The questionnaire was pre-tested with 10 participants in order to identify problems regarding the understanding of poorly-written questions, which were then changed. The pre-test questionnaire was not considered for study.

Questions on age, gender, institution and course semester were included to characterise the sample. The other questions were aimed at knowledge and attitudes towards dental trauma and its prevention.

### Statistical analysis

For quantitative analysis of the results, data were tabulated by using a statistics software (SPSS 16.0) in a single typing, thus giving more reliability and credibility to the study. Frequency was used as statistical methodology for further discussion of the results. Chi-square test was also used at a significance level of 5% ( $p < 0.05$ ) to establish a relationship between the variables of interest.

course, with no significant difference between knowledge acquisition and educational institution ( $p = 0.40$ ). Therefore, we opted for not stratifying the sample in function of the educational institution attended.

When the participants were asked whether they had knowledge about dental trauma, only 74 (19.84%) answered positively. Of these, 68.91%

reported that they acquired this information through a dentist, 18.91% through the media (i.e. television, radio and newspaper), 13.51% through school, 5.40% through physicians, and 4.05% through healthcare units (TABLE 2).

With regard to dental traumas in sport activities, only 88 undergraduate students (23.59%) reported that they had already suffered/seen such an event and only 44 (11.80%) felt they were prepared to provide first aid to the injured student.

TABLE 1 - Characterization of Physical Education undergraduates (N = 373).

Age			
Mean (SD)		21.75 (± 4.14)	
Gender		N	%
	Female	183	49.37
	Male	190	50.93
Undergraduate period		N	%
	1º and 2º semestre	159	42.63
	3º and 4º semestre	59	15.82
	5º and 6º semestre	96	25.75
	7º and 8º semestre	59	15.81

TABLE 2 - Knowledge and attitudes about dental trauma.

Knowledge about dental trauma		N	%
	Yes	74	19.84
	No	299	80.16
Have you experienced or witnessed traumatic injuries in recreational sports practices?		N	%
	Yes	88	23.59
	No	285	76.41
How would you hold the avulsed tooth?		N	%
	Hold the crown only	204	54.69
	Hold the root only	10	2.68
	I don't know	159	42.62
Media for storing an avulsed tooth		N	%
	Fresh milk	4	1.07
	Patient's mouth/saliva	6	1.60
	Water	19	5.09
	Paper/cloth	152	40.75
	Dry	133	35.65
	I don't know	59	15.81
Do you feel prepared to assist a student with dental trauma?		N	%
	Yes	44	11.80
	No	329	88.20
Do you know methods to prevent dental trauma?		N	%
	Yes	104	27.88
	No	269	72.12

Only 104 undergraduate students (27.88%) reported they know ways to prevent dental trauma during sport activities. These, when asked about how they prevented it, 88 (84.62%) answered accordingly and 16 (15.38%) erroneously.

With regard to the mouthguard, 335 undergraduate students (89.81%) reported they know it and 261 (69.97%) reported they are even acquainted with its functions. However, after categorising the answers given by those reporting they had knowledge on the function of the mouthguard, it was observed that only 22.60% (n = 59) answered accordingly, 70.11% (n = 183) answered accordingly but not completely, and 7.28% (n = 19) answered erroneously.

With regard to the use of mouthguard during sport activities, only 67 undergraduate students (17.96%) make use of such a protective device and 43.28%

(n = 29) found difficulty in using it. Although 145 undergraduates (38.87%) believe that mouthguard can interfere with sports practices, the great majority (91.42%) consider that its use is important during the practice of sport activities (TABLE 3).

With regard to the undergraduates' attitudes towards tooth avulsion, only 19.83% answered accordingly regarding how to behave in the case of avulsed tooth; 54.69% answered accordingly how to manage the avulsed tooth; 7.77% answered accordingly regarding transportation of the avulsed teeth; and 58.98% are acquainted with the handling difference between permanent and deciduous teeth. By comparing these attitudes in relation to the undergraduate period (before and after the 5th semester) and previous information and experience on dental trauma, it was observed no significant difference ( $p > 0.05$ ) (TABLE 4).

TABLE 3 - Knowledge and attitude about mouthguard.

Knowledge about mouthguard	N	%
Yes	335	89.81
No	38	10.19
Knowledge about mouthguard functions	N	%
Yes	261	69.97
No	112	30.03
Do you use mouthguard during sports practices	N	%
Yes	67	17.96
No	306	82.04
Do you found difficulty in using mouthguard	N	%
Yes	29	43.28
No	38	56.72
Do believe that mouthguard can interfere with sports practices	N	%
Yes	145	38.87
No	228	61.13
Do you think it's important to use it during sports practice	N	%
Yes	341	91.42
No	27	8.58

TABLE 4 - Attitudes towards tooth avulsion considering undergraduate period, previous information and experience on dental trauma.

	Total	Undergraduate period		p- Value	Previous information on dental trauma		p- Value	Experience on dental trauma		p- Value
		< 5° period	> 5° period		Yes	No		Yes	No	
<b>Attitude about how to behave in the case of avulsed tooth</b>										
Correct	74 (19.84%)	38 (17.43%)	36 (23.22%)	0.166	17 (23.29%)	57 (19%)	0.410	21 (23.86%)	53 (18.60%)	0.278
Incorrect	299 (80.16%)	180 (82.57%)	119 (76.78%)		56 (76.71%)	243 (81%)		67 (76.14%)	232 (81.40%)	
<b>Attitude about how would you hold the avulsed tooth</b>										
Correct	204 (54.69%)	117 (53.67%)	87 (56.13%)	0.638	161 (53.84%)	43 (58.11%)	0.509	47 (53.41%)	157 (55.10%)	0.782
Incorrect	169 (45.31%)	101 (46.33%)	68 (43.87%)		138 (46.16%)	31 (41.89%)		41 (46.59%)	128 (44.90%)	
<b>Media for storing an avulsed tooth</b>										
Correct	29 (7.77%)	15 (6.88%)	14 (9.03%)	0.444	4 (5.48%)	25 (8.33%)	0.414	8 (9.09%)	21 (7.37%)	0.597
Incorrect	344 (92.23%)	203 (93.12%)	141 (90.97%)		69 (94.52%)	275 (91.67%)		80 (90.91%)	264 (92.63%)	
<b>Do you know the handling difference between permanent and deciduous tooth</b>										
Yes	220 (58.98%)	137 (62.84%)	83 (53.55%)	0.072	37 (50.68%)	183 (61%)	0.108	50 (56.81%)	170 (59.65%)	0.636
No	153 (41.02%)	81 (37.16%)	72 (46.45%)		36 (49.32%)	117 (39%)		38 (43.19%)	115 (40.35%)	

Chi-square test. p < 0.05 considering statistical significance.

## Discussion

As the practice of sport activities is one of the main aetiological factors for orofacial injuries<sup>5</sup>, it is thought that dentist should develop ways to minimise these traumas or even prevent them from occurring. The physical education professionals who deal with athletes can become strategic partners in the emergency care. In this way, the present study aimed at delineating the profile of the physical education undergraduates students regarding their knowledge and attitudes about dental trauma, since they are the ones who will soon be entering the labour market.

The knowledge acquired on the theme by the undergraduate students is extremely important for guiding their attitudes as future professionals. With regard to the knowledge acquired during the undergraduate course, CHAN et al.<sup>7</sup> revealed a significant lack of information on such themes, since only few participants reported discussing the theme on dental trauma in classroom, although they had been instructed on first aid. EMERICH et al.<sup>10</sup> found a low level of initial knowledge concerning first-aid measures in the case of dental trauma. This finding corroborates our study, since only 3.21% of the students reported they had received information on dental trauma and use of mouthguard during their physical education undergraduate course. This situation can be explained by the absence of this theme in the discipline of first aid.

With regard to the basic knowledge on how to provide first-aid care in the case of avulsed tooth, JORGE et al.<sup>11</sup> found that among the physical education undergraduates interviewed, less than half of them knew how to proceed accordingly. Similarly, PANZARINE et al.<sup>12</sup> reported a high rate of misinformation about tooth avulsion. These results are in accordance with ours. This fact is of concern as the correct management of the avulsed tooth and/or dental fragments is directly associated with a more favourable prognosis.

With regard to the ways to prevent dental trauma, a study conducted by JORGE et al.<sup>11</sup> with teachers and students in physical education's faculties showed that although 74% of the overall sample stated having knowledge of mouthguards, few reported making use or indicating the use of this device. This finding is in accordance with ours as most of our students answered positively to this question. The fact that so many students know the mouthguard in the present study can be explained by the higher number of sporting events being

currently broadcasted by open TV channels, thus showing the use of this protective device, although some undergraduates have no full knowledge about the functions of the mouthguard.

Even considering the importance of the mouthguard, a few interviewees wear the device. This can be explained by the lack of indication on the part of the teachers and/or trainers, including even dentist-surgeons who are not fully prepared. Among the undergraduates who wore the device, most of them reported difficulty in using it. One of the main reasons for this may be due to the great availability of pre-made mouthguards in the market, although these are less indicated. It is necessary to obtain more information on the different types of mouthguards and the advantages of an individual protective device.

The present study has been carried out at a moment in which recreational sport activities is increasingly more practiced and people are more interested in taking care of their health. One can realise, however, that physical education professionals are completing their undergraduate course with this gap in the curriculum. Therefore, it is extremely necessary to reformulate the curriculum by specifically including themes related to orofacial injuries and forms of prevention, thus complementing and improving the quality of education for these students so that they can become prepared for emergency situations.

It should be pointed out that the lack of information on dental trauma and its forms of prevention is not limited to the area of physical education only. This poor preparation also affects other professionals who can play a key role in terms of immediate care, such as school teachers, community health workers and the athletes themselves<sup>13-16</sup>. The dentist have an important role in contributing to this knowledge, since their function is to promote health, regardless of working in public or private sector. In this way, the dentist are supposed to develop strategies to convey information to physical education professionals, as well as to any other sports-related practitioner involved in sport activities, and to develop actions to promote health for all.

The present study used a convenience sample. Despite the limitations of the present study, there was evidence of the importance of this theme on the basis of the results found. In this sense, further studies should be carried out in other private and/or public

universities located in other regions to either support or refute our findings. In addition, they will help mapping data and contributing to further research aimed at guiding the sports-related professionals.

Furthermore, this study can be considered a preliminary one because it investigates the physical education undergraduates' perception on dental trauma and use of mouthguard as preventive method. Our epidemiological findings are important because they can serve as a warning and useful source of information to support and guide the preventive and educational strategies. Expressive measures should be taken to develop methods so that information reaches the physical education students, thus contributing to a better and more complete formation and making them prepared for emergency situations. According EMERICH et al.<sup>10</sup> preventive-educational measures such as a lecture and an extra educational task significantly improved the knowledge level of physical education students.

In addition, informative folders, banners, and incentives for promoting sporting events in schools and colleges with the presence of both physical education students and dentist can be important and efficient means of information as students were found to be interested in the theme during the application of the questionnaires.

Considering the aspects involving the data collected in the present study, one can conclude the following: The physical education undergraduates' knowledge on dental trauma and use of mouthguard are insufficient; The majority of the physical education undergraduates have inconsistent attitudes towards tooth avulsion; It is necessary to include this theme in the discipline of first aid of the physical education undergraduate curriculum; The dentist-surgeon is supposed to be updated and prepared to provide such knowledge to physical education professionals and other sports-related practitioners involved in sport activities.

## Resumo

Trauma dental e protetor bucal: conhecimento e atitudes em estudantes de graduação em Educação Física

Este estudo objetivou avaliar o conhecimento e as atitudes de estudantes de Educação Física de Universidades públicas do Estado do Rio de Janeiro, Brasil, em relação ao traumatismo dentário e uso de protetor bucal. Foram entrevistados 373 graduandos de três universidades públicas do Rio de Janeiro, através de questionário semiestruturado e padronizado. Os dados foram tabulados e analisados (SPSS 16.0), sendo obtida a frequência (%) e a relação dos mesmos (Teste qui-quadrado,  $p < 0,05$ ). Apenas 3,21% dos entrevistados haviam recebido informação sobre traumatismo dentário e utilização do protetor bucal durante a graduação. Com relação à atitude dos graduandos, responderam corretamente apenas 19,83% a conduta frente a uma avulsão; 54,69% ao manuseio do dente avulsionado e 7,77% ao transporte do dente avulsionado. Ao se comparar essas atitudes em razão do período de graduação ( $< 5^{\circ}$  período ou  $\geq 5^{\circ}$  período), informações prévias de trauma e experiências prévias de trauma, não se observou diferença significativa ( $p > 0,05$ ). Tratando de prevenção, 89,81% conheciam o protetor bucal, embora apenas 17,96% o utilizavam durante atividades esportivas. Conclui-se que os alunos não recebem tais informações durante a graduação, mesmo possuindo em sua grade curricular a disciplina de primeiros socorros. Cabe aos cirurgiões dentistas desenvolver ações para que este conhecimento supra as necessidades dos futuros profissionais de educação física.

PALAVRAS-CHAVE: Avulsão dentária; Injúria traumática; Educação física; Treinamento; Esportes; Injúria dentária.



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