

# Evaluation of Knowledge of Physical Education Students on Dental Trauma

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## Abstract

**Introduction:** Sports' practitioners are vulnerable to dental trauma; if this occurs, the emergency treatment should be fast and efficient. This may be performed by any person at the site of the accident, not only by dental professionals. Physical educators may face dental trauma and should be able to provide proper care. This study had the objective evaluated the knowledge of physical education graduates on dental trauma. **Materials and Methods:** A questionnaire containing questions on dental trauma was applied to 199 physical education students; after collection of the questionnaires, data were tabulated and processed on the software Epi Info 2000 (Centers for Disease Control and Prevention, 1600 Clifton Rd., Atlanta, GA 30333, USA). As a result, only 36.7% of participants would take the individual suffering trauma to the dental professional, 56.8% believe that the avulsed tooth should be replanted, and 42.2% would replant it. Only 7.5% would store the avulsed tooth in an ideal storage medium for transportation. **Conclusion:** It was concluded that there is a lack of knowledge on dental trauma among physical education graduates, evidencing the need of public policies to allow education on this issue.

**Keywords:** Dental avulsion, dental injuries in sports, dental trauma

## INTRODUCTION

Sports practicing is beneficial and healthy and should be performed by all individuals; however, during it, individuals are at risk to dental trauma, with possibility of lesions to the teeth and soft tissues.<sup>[1,2]</sup> Some authors report that direct contact sports as boxing, basketball, soccer, and volleyball pose higher risk to dental trauma,<sup>[2-5]</sup> with possibility of tooth crown fractures or even more complex lesions as tooth avulsion.<sup>[2,6]</sup>

The emergency care in these cases is fundamental to allow a better prognosis and to increase the survival of traumatized teeth, especially in cases of tooth avulsion. These initial emergency procedures may be performed by any person at the site of the accident, not only by dental professionals.<sup>[2,3,7,8]</sup> Therefore, physical education student and professors, who have direct contact with people practicing sports, should know how to proceed if dental trauma occurs in their presence.<sup>[3,8-11]</sup>

The tooth should always be replanted after tooth avulsion, which is characterized by complete displacement of the tooth from its socket.<sup>[6,12]</sup> The immediate replantation, which should be performed up to 15 min after tooth avulsion,<sup>[12]</sup> maintains

a greater quantity of vital cells on the root surface, favoring the prognosis.<sup>[6,7,12,13]</sup> Therefore, time is fundamental for the success of treatment for dental trauma.<sup>[12]</sup>

If immediate replantation is not possible, the avulsed tooth should be stored in proper storage media,<sup>[6,12]</sup> which aim at maintaining the vitality of cells present on the root surface for longer time (>15 min). In some cases, these media may also stimulate the multiplication of these cells.<sup>[6,12-14]</sup> This allows later replantation of the avulsed tooth with possibility of success.<sup>[6,13]</sup>

Several storage media may be used in cases of tooth avulsion. These include the milk, propolis, and specific solutions for cell maintenance, as Hank's Balanced Saline Solution, Eagle's medium, and Viaspan.<sup>[6,13]</sup> At present, milk has been the storage medium of choice because of its easy access, low cost, and effectiveness for maintenance of cell vitality for up to 6 h.<sup>[6,12,14]</sup>

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However, in most cases, the teeth are stored in inadequate media or are not replanted immediately.<sup>[6,12]</sup> Several studies evidenced that people affected by dental trauma or facing accidents do not know how to proceed in such cases, maintaining the avulsed tooth without replantation and in inadequate storage media.<sup>[1-3,7]</sup>

Teeth maintained for long periods outside the socket or in storage media that do not maintain the cell vitality lead to late replantation,<sup>[1-3]</sup> predisposing to the occurrence of tooth ankylosis and root resorption,<sup>[7,12]</sup> which are undesirable consequences and may lead to loss of the traumatized tooth in a mean period of 4–6 years.<sup>[6]</sup>

Physical education students present great chances of facing cases of dental trauma.<sup>[14]</sup> Therefore, this study evaluated the knowledge of physical education graduates on dental trauma, aiming to contribute with information for the development of actions to enhance the public policies in the country.

## MATERIALS AND METHODS

This quantitative cross-sectional study investigated the knowledge of physical education students on dental trauma. This study was approved by the Institutional Review Board under no. 707, on June 29, 2011.

A specific questionnaire was used for this study, which was validated in the previous study of Silva.<sup>[15]</sup> This questionnaire included questions on age, gender, school period, and sports practice [Table 1]. Questions about training on first aid and experience with dental trauma were also present as well as specific questions on tooth avulsion [Table 2]. The students were also asked about their interest participating in informative campaigns on dental trauma and the use of mouthguards [Table 3].

This questionnaire was applied to 199 physical education students. The selection criteria for participation of students in the investigation were their availability and interest and signing an informed consent form. The questionnaire was distributed to the students and collected after 7 days and did not contain identification about the participants.

After collection of questionnaires, the responses to the questions were digitized on the software Epi Info 3.5.1 (Centers for Disease Control and Prevention, 1600 Clifton Rd., Atlanta, GA 30333, USA). This software revealed the responses to each question present on the questionnaire. Unanswered questions were also indicated by the software, which validated the answers.

Thus, it was possible to indicate the most frequent type of dental trauma in the studied population, the measures taken by these individuals, the importance assigned to the use of mouthguards, and if they would be interested in participating in lectures and activities related with learning on dental trauma.

## RESULTS

The questionnaire was answered by 199 physical education graduates. Most participants were males (62.3%), aged

**Table 1: Part I - Questionnaire applied to physical education students**

1. Gender  Male  Female
2. Age: \_\_\_\_\_
3. Semester of college? \_\_\_\_\_
4. What is your main sports activity? (indicate if does not practice sports) \_\_\_\_\_

18–19 years (30.2%), and were attending the second and fourth semesters of the course (43.2% and 32.7%, respectively).

The main physical activity was soccer (36.7%), followed by weight training (13.1%), volleyball (11%), and fights in general (5%). Individuals who did not practice any sports added up to 12.5%.

A total of 62.3% of participants had training on first aid. Among these, only 9.5% had training on first aid for dental trauma; 36.7% did not respond to this question. A total of 88.9% stated that this type of training is important.

When questioned about the personal experience with dental trauma, 34.7% of participants had suffered accidents involving the teeth and oral region. Among these, 17.6% had tooth crown fracture, 6% had injured the lips, 4% had root fracture, and 4% had tooth luxation. Tooth avulsion accounted for 1% in the group of participants.

Only 11.1% of all participants had immediately searched for a dental professional, 8.5% attended the dental office 1 day after the accident, and 9.5% did nothing after dental trauma.

Nearly 23.6% of those reporting accident did not have sequels, 7% reported that they followed the treatment indicated and achieved success, and 1.5% needed extraction of the affected teeth.

If they faced an accident involving dental trauma, 40.2% of participants would reassure the individual and take him or her to a basic health unit. 36.7% would take the individual to the dental office, 13.1% to a hospital, 4.5% did not respond, 3.5% would not know what to do, 1% would do nothing, and 1% would look for a medical doctor.

Concerning the experience with tooth avulsion, 13.6% had already faced such occurrence; among these, 50% reported that they replanted the avulsed tooth. Among the participants, 87.9% believed that deciduous teeth should not be replanted, and 56.8% believed that permanent teeth should be replanted.

If they faced a case of tooth avulsion, 43.2% would replant the avulsed tooth. If they decided to perform replantation, 26.1% would rinse the tooth with tap water before replantation, 9.5% would gently rub the tooth with a brush, 2.5% would do nothing, 2.5% did not respond, and 2.5% indicated that they would take other measures yet did not describe them.

With regard to the storage medium for the avulsed tooth, 31.1% would maintain the tooth in a dry medium (paper, plastic, cloth, or hand); 26.6% would place it in a flask with saline, 21.6% in

**Table 2: Part II - Questionnaire applied to physical education students**

5. Did you have training on first aid?  Yes  No
6. If yes, was there training for dental trauma?  Yes  No
7. Do you think this type of training is important?  Yes  No
8. Have you already suffered some dental trauma?  Yes  No
- If yes, respond to Questions 9 to 11, otherwise respond from Question 12
9. What type of lesion did you have?
- I broke part of the tooth
  - I broke the tooth root
  - The tooth was loose but did not fall
  - The tooth completely fell off the mouth
  - I broke my facial bone
  - I cut my lip
  - Others (what happened? \_\_\_\_\_)
10. What did you do in this case?
- Nothing
  - I immediately searched for a dentist
  - I searched for a dentist on the following day
  - I searched an emergency clinic
  - I searched for care at the dental school
  - Others (what did you do? \_\_\_\_\_)
11. Did you have any sequelae?
- I had no sequel
  - I underwent the treatment indicated by the professional and everything is ok
  - The tooth was darkened
  - The tooth had to be extracted
  - Others (what happened?)
12. If you witnessed some accident involving dental trauma, what would you do?
- I would take the person immediately to the dentist
  - I would reassure the person and search for a health care unit
  - I would not know what to do
  - I would look for a medical doctor
  - I would look for a hospital
  - I would not do anything
13. Did you have some experience with tooth avulsion (tooth that completely falls off the mouth after a trauma) (either with you or someone else)?
- Yes  No
14. If yes, did you or another person (it may be a dentist) replant the tooth (positioned it back in its place) after tooth avulsion?
- Yes  No
15. Do you think that permanent teeth may be replanted?  Yes  No
16. Do you think that deciduous teeth (milk teeth) should be replanted?  Yes  No
17. If you witnessed a tooth avulsion, would you replant the tooth?  Yes  No
18. If you decided to replant the tooth in its socket (site of origin), what would you do before replantation?
- I would rub the tooth gently with a toothbrush
  - I would rinse it in tap water
  - I would place the tooth in its socket and nothing else
  - I do not know
  - Others (what would you do? \_\_\_\_\_)
19. If you would not make the replantation, how would you carry the tooth to the dentist?
- In a flask with saline
  - Inside the patient's mouth, in contact with saliva
  - In the hand
  - Wrapped in paper, cloth, or plastic
  - In a flask with water
  - In a flask with milk
  - Others (where would you carry it? \_\_\_\_\_)

**Table 3: Part III - Questionnaire applied to physical education students**

20. During sports practice, do you think that you may break or lose a tooth?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
21. Do you know mouthguards used for sports practice?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
22. Do you use mouthguards during sports practice?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
23. If no, why?		
<input type="checkbox"/> It impairs the communication		
<input type="checkbox"/> It impairs the breathing		
<input type="checkbox"/> Esthetics		
<input type="checkbox"/> I never heard of it/I did not know it existed		
<input type="checkbox"/> I do not think it is necessary		
<input type="checkbox"/> I did/do not have the opportunity to use a mouthguard		
24. Would you recommend the use of mouthguards during sports practice?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
25. If yes, when would mouthguards be indicated?		
<input type="checkbox"/> When the person practicing sports uses orthodontic appliances (fixed appliance on the teeth)		
<input type="checkbox"/> Collective games with interaction between players (basketball, volleyball, soccer, futsal, handball)		
<input type="checkbox"/> During sports practice involving combats or fights (karate, judo, boxing, etc.)		
<input type="checkbox"/> Other situation (which? _____)		
26. Do you think that campaigns are necessary to enhance the awareness on what to do in cases of dental trauma?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

a flask with water, 7.5% in the individual's mouth, and only 7.5% would place the tooth in a flask with milk [Table 4].

During sports practice, 56.3% of participants stated that they believed in the possibility of dental trauma. A total of 83.9% know about mouthguards yet only 11.1% use them.

Among the rationales for not using mouthguards, 36.2% mentioned that they never had an opportunity to use; 28.1% do not think that it is necessary, 12.6% reported that it impairs the communication, and 6% stated that it impairs breathing.

However, 83.4% recommend the utilization of mouthguards during sports practice. Among the participants, 44.7% believe that mouthguards should be used during combat sports (as fights), 19.1% by individuals undergoing orthodontic treatment, 18.1% in games involving interaction among participants (as soccer, volleyball, and others), and 16.1% did not respond to this question.

It was observed that 91% of participants acknowledge the need of informative campaigns on dental trauma.

## DISCUSSION

Many studies indicate a great number of dental traumas involving athletes. The prevalence varies according to the sport. Usually, dental trauma occurs in contact sports, such as soccer, basketball, volleyball, and fights in general.<sup>[2-5]</sup>

According to the present results, 34.70% of participants had suffered accidents involving the teeth and oral region. Mori *et al.*<sup>[2]</sup> in 2009 evidenced that 28.4% of athletes interviewed in their study had already experienced dental trauma, also corroborating the outcome of 28.8% observed by Ferrari and Ferreria de Medeiros<sup>[4]</sup> in 2002.

Dental trauma may be classified from complicated or uncomplicated crown fractures up to more complex lesions,

**Table 4: Storage medium used in cases of tooth avulsion**

Storage medium	Percentage
Maintain the tooth in a dry medium	31.1
In a flask with saline	26.6
In a flask with water	21.6
Individual's mouth	7.5
In a flask with milk	7.5

such as tooth avulsion.<sup>[2,6]</sup> Mori *et al.*<sup>[2]</sup> in 2009 observed that 28.4% of athletes interviewed had previously experienced dental trauma, being 41.9% coronal fractures and 5.64% tooth avulsion. These results evidence the significant occurrence of dental trauma among individuals practicing sports or involved with sports practice. Caglar *et al.*<sup>[16]</sup> in 2005 observed that among 78 physical education professors interviewed, 23 had previously suffered dental trauma.

Coronal fractures were the most frequent type of dental trauma (17.6%), and avulsion accounted for 1% of those with previous history of trauma. With higher rates of trauma, Mori *et al.*<sup>[2]</sup> in 2009 observed 41.9% of cases of coronal fracture and 5.64% of tooth avulsion.

The prognosis for dental trauma may be impaired by the inadequate initial care, especially at the site of the accident.<sup>[1-3]</sup> Thus, the initial care at the site of the accident is fundamental for treatment success, and the care should be correct, effective, and fast.<sup>[17]</sup>

In the present study, nearly 36% of participants would take the individual immediately to the dental professional. This result is similar to the findings of Panzarini *et al.*<sup>[14]</sup> in which the percentage of immediate care by the dental professional was smaller than 50%. This reinforces the need to provide additional information to the participants concerning the emergency care for dental trauma.

Avulsed teeth should be replanted as fast as possible<sup>[18]</sup> and adequate handling of this tooth is fundamental for the repair and prevention of root resorption.<sup>[10,18]</sup>

With regard to the experience with tooth avulsion, only 42.20% would replant the avulsed tooth. Before replantation, 26.10% would rinse the tooth in tap water and only 7.5% of participants would place the tooth in a flask with milk. Mori *et al.*,<sup>[2]</sup> in 2009, observed that 51.7% of sports practitioners replanted or would replant the teeth in case of avulsion and only 6.5% of participants would store the tooth in milk before replantation. The authors observed that most individuals would store the tooth in inadequate media, as saline, inside the individual's mouth in contact with saliva, in water, in the hand of wrapped in paper, plastic, or cotton. Milk is the ideal storage medium to enhance the success of replantation.<sup>[12]</sup> These data reveal the lack of knowledge of participants on tooth avulsion, in agreement with previously published data.<sup>[2,3,14]</sup>

In this study, 83.9% of participants have knowledge about mouthguards, but only 11.1% use them. Among the rationales for not using them, 36.2% stated that they never had the opportunity to use, 28.1% do not consider them necessary, 12.6% mentioned that it impairs the communication, and 6% reported that it impairs the breathing. These results are similar to the reports of Ferrari and Ferreria de Medeiros<sup>[4]</sup> in 2005. Conversely, according to Hendrick *et al.*,<sup>[19]</sup> in 2007, 88% of participants had knowledge about mouthguards, yet only 69% made frequent use of mouthguards. These data demonstrate that the participants may be informed and may then give proper value to the utilization of mouthguards.

This study revealed that physical education students present little knowledge on dental trauma and related first aid measures. The results indicate that the development of a training program with information on dental trauma and the use of mouthguards would be very important for the success of treatment of dental trauma. Mori *et al.*<sup>[20]</sup> observed that 91% of participants in their campaign approved it, and there was a significant increase in the knowledge about dental trauma.

## CONCLUSION

This study evidenced the lack of knowledge on dental trauma among physical education graduates and showed the need of learning on the first aid to dental trauma by professionals related to sports activities.

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## Conflicts of interest

There are no conflicts of interest.

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