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Physical education undergraduates and dental trauma knowledge

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Abstract – The aim of the present study was to assess the level of knowledge of undergraduates from the College of Physical Education (Toledo, Araçatuba) concerning dental avulsion injuries. Data showed that 95% of the respondents did not know what dental avulsion is, 73.5% said they know how to define dental replantation, however, only 26% were able to do it correctly. When asked about first emergency measures after an avulsion, 50% of the respondents said they know what they should do, and the most cited measure was to seek a dentist. When asked about optimal storage media, 45.5% would keep it in a favorable one, and 28% did not know where to keep the tooth until treatment. Only 25.6% indicated a suitable extra-oral time for replantation; 90.3% of the respondents had received no advice about the emergency management of dental avulsion; 90% said they consider this an important and necessary subject. The results indicated that educational campaigns are necessary to improve the emergency management of dental injuries by those future P.E. professors for a better prognosis of dental replantation.

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Injury to both the primary and the permanent dentitions and their supporting structures is frequent in children and teenagers (1). Among dental traumatic injuries, avulsion results in major functional and aesthetic disturbances for patients. Replantation of exarticulated teeth must be performed as soon as possible. The use of a suitable storage media and a minimal root surface manipulation are of great importance for the success of the maneuver (2–5).

The prognosis of traumatized teeth depends on prompt and appropriate treatment, which often relies on knowledge of lay people such as the children's parents and their school teachers, who are present at the site of accident, prior to the initial dental contact (6). From published work it is clear that a high percentage of the lay population and of healthcare professionals, including dentists, has inadequate knowledge for managing such conditions (7–11). As sports have been implicated in the etiology of dental trauma (12), it would be desirable for coaches and teachers of physical education to be capable of managing such injuries when they occur (10). Despite several papers have been published (10,13), none have reported dental trauma knowledge of physical education undergraduates.

The objective of this study was to investigate, by means of questionnaires, the knowledge of a group of physical education undergraduates about the emergency management of avulsed teeth.

Material and methods

The questionnaire was designed and distributed to all undergraduates ($n = 257$) enrolled at the year of 2003 at the College of Physical Education (Faculdades Integradas Toledo) at Araçatuba, São Paulo, Brazil. It contained survey questions on terminologies and concept of management of avulsed teeth. The respondents received no informative material prior to the study and all had to fill in the

questionnaire in the classroom. The questionnaire contained objective and subjective questions for analysis of the knowledge and dental trauma experience (Table 1). This study was approved by the Institutional Review Board for Human Studies and all participants read and signed informed consent statements prior to study initiation.

Results were expressed as a number and percentage of respondents for each question and were analyzed using the GMC software (GMC 2002 Ribeirão Preto: School of Dentistry, n.d. Available at: http://www.forp.usp.br/restauradora/gmc/gmc.html#gmc). Chi-square test was performed and the level of significance was set at $P = 0.05$.

Results

In the first question ('What is a tooth avulsion?'), 5% (13) of the respondents gave the correct answer ($P = 0.0000001$). Regarding the concept of tooth replantation (question 2), 73.5% (189) reported they knew how to define it, however, only 26% (49) were able to do it correctly ($P = 0.0000001$).

The knowledge on management of avulsed teeth was evaluated considering time elapsed between dental trauma and treatment, storage media and other attitudes towards dental trauma. In the third question, 128 respondents reported they knew what should be done: 64 students (50%) would immediately refer to a dentist; 43 (33.6%) would keep the tooth in a humid environment (water, milk and physiological saline solution); and 21 (16.4%) would have another idea. There was a statistically significant difference among the groups ($P = 0.0000001$).

In the fourth question, students were asked if replantation of the avulsed tooth is a suitable procedure. The majority (199; 77.4%) replied 'yes' ($P = 0.0000001$).

A great variety of answers concerning the length of extra-alveolar period before tooth replantation was observed (question 5): 3.5% chose '5 min', 7.7% chose '30 min', 14.4% chose '1 h', 5.4% chose '6 h', 7% chose '24 h', 1.7% chose '72 h', 60.3% chose 'I do not know' (Table 2). For statistical analyses, three groups were set: (i) number of all respondents that checked 5 min or 30 min; (ii) number of respondents that checked 1 h, 6 h, 24 h, or 72 h; (iii) number of respondents that checked 'I do not know'. There was a statistically significant difference among the groups ($P = 0.0000001$).

When the students were asked how urgently tooth replantation maneuver must be performed after dental trauma (question 6), 33% felt that it should be managed immediately; 7.7% felt that 'within the first hour'; 37% answered they did not know (Table 3). For statistical analyses, three groups were set: (i) number of all respondents that checked immediately or 30 min; (ii) number of respondents that checked 1 h, 6 h, 24 h, or 72 h; (iii) number of respondents that checked 'I do not know'. ($P = 0.0006$).

In question 7, the students were asked if they would replant the avulsed tooth into the socket by themselves. The majority of respondents (222; 86.3%) said they would not do so ($P = 0.0000001$).

The mentioned storage media were also evaluated (question 8). The physiological media (liquid storage, i.e. milk, physiological saline solution and saliva) were chosen by 117 (45.5%) of the respondents. The non-physiological media (tap water, mineral water, ice and dry storage, i.e. napkin, paper tissue, cotton balls...) were chosen by 68 (26.5%) of the students. The remaining 72 (28%) of the respondents did not know what to do (Table 4). There was a statistically significant difference between the group of respondents that checked physiological media and the group that did not know and between the group that checked physiological media and the group that checked non-physiological media ($P = 0.0002$).

Regarding the manipulation of the avulsed tooth (question 9), 77 (30%) of the students reported unfavorable maneuvers (i.e. they would brush its root and crown, wash it with tap water or just not wash it). A further 25% (64) answer 'I do not know'. Favorable maneuvers (wash with milk or physiological saline solution) were chosen by 116 (45%) of the respondents (Table 5). There was a statistically significant difference between the group of respondents that reported unfavorable maneuvers and the group of respondents that reported favorable ones and between the group of respondents that reported favorable maneuvers and the group of respondents that checked 'I do not know'. ($P = 0.0002$).

When asked where they would seek professional help (question 10), 50% of the students said they would contact the dentist nearby. The remaining 50% said they would go to a specialist, emergency hospital, School of Dentistry at Araçatuba – UNESP, private dentist or to a local hospital. There was no statistically significant difference between those two groups ($P = 0.9503$).

With reference to previous advice on dental trauma (question 11), 232 (90.3%) of the respondents reported they have never received any information in this regard ($P = 0.0000001$). In the 12th question, 90% (229) considered this training important and necessary for their formation ($P = 0.0000001$).

When asked if they have ever suffered any kind of dental trauma, 7% (18) said 'yes'. Falls were the most common cause of injury. All of them reported that a private dentist was first contacted and responsible for the treatment.

Table 1. Questionnaire distributed to undergraduates about tooth replantation

1. Do you know what is a tooth avulsion?
( ) Yes ( ) No
Definition:.....
2. Do you know what is a tooth replantation?
( ) Yes ( ) No
Definition:.....
3. If an avulsed tooth falls on the ground, do you know what should be done?
( ) Yes ( ) No
What?.....
4. Should this avulsed tooth be repositioned?
( ) Yes ( ) No
5. How urgently should tooth replantation maneuver be performed after dental trauma?
( ) 5 min
( ) 30 min
( ) 1 h
( ) 6 h
( ) 24 h
( ) 72 h
( ) I do no know
6. In your opinion, what is the ideal time regarding the length of extra-alveolar period before tooth replantation for a better prognosis?
( ) immediately
( ) 30 min
( ) 1 h
( ) 6 h
( ) 24 h
( ) 72 h
( ) I do no know
7. Would you replant the tooth back into the socket from which it came?
( ) Yes ( ) No
Why? .....
8. If you did not replant the tooth, how would you transport it to the dentist?
( ) Napkin
( ) Paper tissue
( ) Cotton balls
( ) In your pocket
( ) In an envelope
( ) Tap water
( ) Physiological saline solution
( ) Milk
( ) Others, please state.....
( ) Do not know
Can you justify your answer? .....
9. If the tooth falls on the ground and gets dirty, what would you do?
( ) Brush its root and crown
( ) Wash it with tap water
( ) Wash it with milk
( ) Wash it with physiological saline solution
( ) Do not wash it
( ) Do not know
10. If your student came to you with an avulsed tooth in the hand, which would be the first place you would seek treatment?
( ) Emergency hospital
( ) Local hospital
( ) Dentist nearby
( ) Private dentist
( ) School of Dentistry
( ) Specialist
( ) Others, please state.....
11. Have you ever received advice on what to do in the event of an avulsed tooth?
( ) Yes ( ) No
How long ago?.....
12. Do you consider this information important and necessary?
( ) Yes ( ) No
Why?.....
If you have ever suffered any kind of dental trauma, answer the following questions:
1. How did it happen?
2. Where did you first seek treatment?
3. Where was the rest of the treatment performed?

Table 2. How urgently tooth replantation maneuver must be performed after dental trauma?

Time	No. of respondents	%
5 min	09	3.5
30 min	20	7.7
1 h	37	14.4
6 h	14	5.4
24 h	18	7.0
72 h	04	1.7
I do not know	155	60.3
Total	257	100

Table 3. Ideal time regarding the length of extra-alveolar period before tooth replantation for a better prognosis

Time	No. of respondents	%
Immediately	85	33
30 min	20	7.7
1 h	23	9
2 h	9	3.5
6 h	9	3.5
24 h	14	5.4
72 h	2	0.9
I do no know	95	37
Total	257	100

Table 4. Storage media

Storage media	No. of respondents	%
Napkin	13	5
Paper tissue	8	3.1
Cotton balls	21	8.2
In your pocket	0	0
In an envelope	0	0
Tap water	19	7.4
Physiological saline solution	77	30
Milk	37	14.4
Others: saliva (three), mineral water (two), ice (five)	10	3.9
Do not know	72	28
Total	257	100

Table 5. Type of tooth manipulation if it falls on the ground and gets dirty

Type of manipulation	No. of respondents	%
Brush its root and crown	26	10.1
Wash it with tap water	35	13.6
Wash it with milk	38	14.7
Wash it with physiological saline solution	78	30.3
Do not wash	16	6.3
Do not know	64	25
Total	257	100

Discussion

The major factors that may influence the success of treatment of an avulsed tooth are storage period and media, which are directly related to a minimal insult to the periodontal cells, keeping them viable (6). As dentists are not usually present at the site of accident, those factors are out of their control.

It has been reported that most of replantation procedures are performed after a long extra-alveolar period, when the periodontal ligament is already necrotic (2,14,15). Thus, the prognosis is unfavorable leading to tooth loss. However, dentists may control this situation through educational campaigns that would ensure knowledge of immediate dental trauma management, favoring tooth replantation prognosis. Frequent comprehensive public awareness campaigns focusing on dental trauma should be organized, mainly to improve the knowledge of professionals that are involved with children, teenagers and adults during sport practice, as that is when many tooth avulsions happen (1,16,17).

According to an American Organization for prevention of sports-related trauma, the athletes playing contact sports have a 10% chance of suffering an orofacial injury (18,19) reported that 18.9% of 307 12-year-old children have suffered a dental traumatic injury during leisure (72.1%) and sports activities (11.6%).

The present study indicates the weakness in the P.E. undergraduates' knowledge of immediate dental trauma management: only 5% of the respondents knew what a tooth avulsion is and 50% of them did not know what should be done in case an avulsion happened. The present results are in accordance with previous data (7,8,10,11,13) and indicates that educational and preventive programs on dental trauma must be organized. It is interesting to note that 90% of the respondents consider this information important and necessary. That means they are willing to take part in educational campaigns.

When asked if they have ever suffered any kind of dental trauma, 7% of the undergraduates said 'yes'; none of them knew what should be done or which storage media was the most suitable for the maintenance of an avulsed tooth. That fact confirms the poor educational assistance performed by the dentist. This is the best moment to clarify the family and patient; they will certainly spread their knowledge at their communities, which is an effective educational resource. Traebert et al. (19) reported that the majority of accidents occurred at home (60.4%) followed by school (18.6%) and outside in the street (18.6%).

The findings published by and Pacheco et al. (17) showed the lack of knowledge of dental professionals regarding management of an avulsed tooth, suggesting there is a need for frequent potentially effective dental health education in relation to this problem. Andreasen & Andreasen (1) reported that the low level of awareness of the importance of

immediate management of an avulsed tooth is the major cause for failure after replantation.

Based on the results of this paper, dental trauma management should be part of the teacher-training curriculum, which is in accordance with Chan et al. (10). Awareness campaigns on dental traumatic injuries and their consequences must be target at public community, including healthcare professionals.

Conclusion

It was possible to conclude that physical education undergraduates have a poor knowledge on avulsion and tooth replantation. Educational campaigns are necessary to improve the emergency management of dental injuries, as those future P.E. teachers will be present at the site of accident.

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