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Evaluation of sixth grade primary schoolchildren's knowledge about avulsion and dental reimplantation

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Abstract – Dental trauma, particularly tooth avulsion, is a frequent cause of tooth loss in children, adolescents, and young adults. The avulsed tooth should be immediately reimplanted in its alveolus. This procedure can be performed by anyone at the accident site and not only by dental surgeons. Therefore, the purpose of this study is to evaluate the knowledge of sixth graders of the city of Araçatuba, SP, about dental avulsion and tooth reimplantation through a structured and standardized survey. Our sample consisted of 778 students. The data collected was processed using the program EPIINFO 2000. Most students were around 12 years of age and 94.5% related to practice some kind of sports. Results demonstrated that the possibility of tooth reimplantation after dental avulsion is not acknowledged among these students and dental traumatism was associated to caries, toothache, and use of orthodontic appliances. Only 18.9% of the students associated dental traumatism to an impact trauma; 3.6% would store the tooth in milk, and 3.1% believed the tooth could be reimplanted by anyone present at the accident site. In summary, the results show an overall the lack of knowledge about dental traumatism and highlight the need of special programs designed to educate school-aged students about emergency procedures to handle cases of dental traumatisms.

Accidents involving the teeth are very frequent occurrences. The consequences may range from small tooth fractures to a complete dislocation of the tooth from its alveolus, characterizing a scenario of dental avulsion (1). According to Pavek and Radtk (2), approximately 10% of the population in general has experienced some sort of dental traumatism. Of these, around 0.5–16% report cases of dental avulsion (3).

Frontal impacts absorbed by the upper lip may cause movement of the tooth and further dislocation from the alveolus, which characterizes a case of dental avulsion (1). Newly erupted teeth, due to their less abundant periodontal ligament fibers, are more susceptible to avulsion; therefore children between 7 and 12 years of age are most frequently affected (1).

If avulsed, a tooth must be reimplanted in its socked as soon as possible, in an attempt to reestablish normal function (1). Hence, immediate tooth reimplantation or storage in appropriate solution for periodontal ligament cell survival is a critical procedure (4–7). It is well established that milk is the best conventional liquid method to store the avulsed tooth. Of easy access, milk increases the chances for repair even if reimplantation is performed at later stages (up to 6 h) (8, 9).

Although recommendations regarding the best treatment for dental avulsion are constant, the lack of knowledge of the population in general about emergency handling procedures in cases of dental avulsion is rather elevated. This observation has been sequentially demonstrated through several survey-type studies (10–16). Nevertheless, none of these studies used standardized surveys.

One of the greatest advantages of the Item Response Theory (IRT), with regards to the Classical Theory, is that it allows comparison among populations, once submitted to tests consisting of common items, or yet, comparison among individuals of a same population submitted to totally different tests. This is because one of the main characteristics of the IRT is that it considers the items as central and not the test as a whole (17).

Evaluating the knowledge of school-aged children about dental avulsion and reimplantation procedures is fundamental to further understand the need of educational campaigns for the population. Therefore, considering the aforementioned aspects about dental traumatisms, the purpose of this study was to evaluate the knowledge of sixth graders of the city of Araçatuba, SP, about dental avulsion and tooth reimplantation through a structured and standardized survey.

Material and methods

The research sample was composed of 22 State Schools with sixth grade primary schoolchildren in 2007, consisting of 1974 students according to the Regional Office of Education in Araçatuba. For this selection the following design was adopted: A maximum difference of 0.15 between the sampled results and the population was accepted, over the percentage of the most representative answers to the trauma problem, which obtained a percentage of correctness of about 18% in the result of application of the questionnaire during the development of the pilot project. Based on these parameters a minimum sample size was calculated. This was of 778 schoolchildren that answered the questionnaire. Considering the possibilities of loss due to the non-location of the students drawn, this number increased to 932 schoolchildren which corresponded to a 20% increase in the minimum sample size required.

The survey (Table 1) was handed to the students who answered it in an unidentified format. Thereafter the surveys were handed back to the responsible investigator. The answers were analyzed with the program EPIINFO 2000.

Table 1. Questionnaire distributed in schools about dental reimplant

1. Sex: ( ) male ( ) female
2. Age: _____ years old
3. What kind of sport do you practice?
   ( ) Volleyball
   ( ) Football
   ( ) Cycling
   ( ) Swimming
   ( ) Skating
   ( ) Do physical education in school
   ( ) Other, what_____
   ( ) Does not do any sport.
4. If you fell down and hit your mouth and one of your permanent teeth fell out, what would you do? You would:
   ( ) Go back home crying
   ( ) Pick up the tooth and take it home
   ( ) Pick up the dirty tooth and put it in its place in your mouth.
   ( ) Pick up the tooth, look for a tap, wash it, put in its place in your mouth and go back home
   ( ) Pick up the tooth, look for a tap, wash it, put in its place in your mouth and look for a dentist
   ( ) Pick up the tooth and look for a dentist immediately
5. What do you mean by trauma in the teeth?
   ( ) Carie in the tooth
   ( ) Is a violent knock on the teeth
   ( ) Tooth ache
   ( ) Unit in the tooth
   ( ) Finger sucking
   ( ) Go to the dentist
   ( ) I do not know
6. Choose the alternatives which are the risk to your permanent tooth:
   ( ) Sleeping
   (X) Car, motorcycle, on bicycle accidents
   ( ) Eating
   ( ) Walking
   ( ) Running
   ( ) Fighting
   ( ) Swimming
   ( ) None of the above
7. Have you ever suffered a knock the permanent tooth?
   ( ) Yes
   ( ) No
8. Have you ever heard of a tooth which was knocked and fell completely out of the mouth?
   ( ) Yes
   ( ) No
9. Choose the riskiest situation to your permanent tooth
   ( ) Sleeping
   ( ) Car, motorcycle and bicycle accident
   ( ) Eating
   ( ) Walking
   ( ) Running
   ( ) Fighting, quarreling
   ( ) Swimming
   ( ) None of the above
10. What is the part of the tooth that you can see in the mirror called?
   ( ) Crown
   ( ) Root
   ( ) I don't know

Results

A total of 778 students answered the survey. Most students were female (51.3%) and of 12 years of age (60.3%). Of all the students, 94.5% reported to practice some kind of sports. Soccer was the most frequently reported sport, practiced by 48.1% of the students. With regards to their procedures when facing a case of dental avulsion, 61.7% reported that would pick up the tooth and look for a dentist immediately. Only 18.8% of the students related to know about dental traumatisms, whereas 80.7% did not know anything about the subject (Table 2).

Approximately 75% were able to relate the situations of higher risk as far as dental traumatisms, such as automobile, motorbike, or bicycle accidents, running, fighting, and wrestling. Of all the students, 29.9% had heard about dental traumatism through their dentist, 15.7% through their parents, and 16.1% through a previously affected friend or relative. When asked: 'if you look in the mirror, the part of the tooth that is visible, what is it called?', about 49% of the students answered correctly.

For every emergency situation concerning a dental avulsion, the students would look for a dentist, for not having the courage or the appropriate knowledge to handle the necessary procedures. Corroborating this observation, we may use question 15 as an example. Eighty percent of the students answered that only the dentist would be able to reimplant the avulsed tooth (Table 3).

In the case that the tooth is not reimplanted, the students would store it in sterile saline (23.9%), wrapped in paper (23.7%), in tap water (9.1%), in alcohol (12.1%), in their pockets (2%), in other places/solutions (4.5%) and 20.3% did not know how to proceed. Only 28 students (3.6%) would store the tooth in milk (Table 4). About 34% did not know the ideal timeframe that the avulsed tooth could remain out of its original place. (Table 5).

When asked about the importance of knowing about dental traumatism, 62.6% answered it was critical, since they could be victims and should be prepared themselves.

Table 1. Continued

11. Once the permanent tooth is out of the mouth, what should we do with it? We should:
( ) Throw it away as it is useless
( ) Wash it and put it in its place
( ) Give it to my mom (mother) to keep it
( ) Take it to the nearest dentist
( ) Take it to the dental school
( ) I do nothing

12. If the permanent tooth falls on the dirty ground, what do you do? Which answers are correct? We should:
( ) Throw it away because it is useless
( ) Wash it and put it in its place
( ) Brush the tooth
( ) Look for a dentist
( ) I don't know

13. Where should we keep the permanent tooth in case it was not put in its place?
( ) Wrapped in paper
( ) In a container with some tap water
( ) In a container with saline solution
( ) In the pocket
( ) In a container with milk
( ) In a container with alcohol
( ) Other, which_____
( ) I don't know

14. In your opinion, what is the ideal time for permanent tooth to be out the mouth before being put in its place?
( ) It must be placed immediately
( ) 30 min
( ) 1 h
( ) 6 h
( ) 24 h
( ) I don't know

15. The permanent tooth can be placed again in your mouth by
( ) The dentist only
( ) Anyone
( ) Nobody because the tooth is useless

16. Why is it important to know about this subject?
( ) It may happen to me, so, I can save my tooth
( ) I was told it is important
( ) It can be of any help to someone
( ) I don't think it is important
( ) It is important only to the dentist

17. When you are doing any physical activities do you think you might break or lose a permanent tooth?
( ) Yes
( ) No

18. Have you ever heard of anything that you can put in your mouth to protect you permanent teeth while you are practicing sports?
( ) Yes
( ) No

The majority of students (56%) had previously heard about the use of mouthguards, however they did not associated sports practice to the risk of occurrence of dental traumatism (51.4%).

Table 2. Knowledge of sixth grade schoolchildren in Araçatuba, São Paulo, Brazil, 2007, about dental trauma

What do you understand by trauma in teeth?	No. of respondents	%
a. Caries	286	36.8
b. Blow on tooth	146	18.8
c. Toothache	121	15.6
d. Orthodontic appliance	18	2.3
e. Finger sucking	17	2.2
f. Going to the dentist	70	9
g. Don't know	115	14.8
Total	778	100

Table 3. Conduct of sixth grade schoolchildren in Araçatuba, São Paulo, Brazil, 2007, as regards dental reimplant

15. When hit, if the whole permanent tooth comes out, who can immediately put it back in the same place:	Number of respondents	%
a. Only a dentist	623	80.1
b. Any person	24	3.1
c. Nobody, the tooth is lost	116	14.9
Total	778	100

Table 4. Conduct of sixth grade schoolchildren in Araçatuba, São Paulo, Brazil, 2007, as regards means of conservation of avulsed tooth

13. If the permanent tooth is not put back in its place, where should we keep it?	Number of respondents	%
a. Wrapped up in paper	186	Conduct
b. Tap water	71	9.1
c. Physiological solution	184	23.7
d. Pocket	9	1.2
e. Milk	28	3.6
f. Alcohol	94	12.1
g. Other	35	4.5
h. Don't know	158	20.3
Total	778	100

Table 5. Conduct of sixth grade schoolchildren in Araçatuba, São Paulo, Brazil, 2006, as regards period of extra-alveolar time

14. In your opinion, what is the ideal time that a permanent tooth can be kept out of the mouth before being put back?	Number of respondents	%
a. Immediately	229	29.4
b. 30 min	102	13.1
c. 1 h	66	8.5
d. 6 h	26	3.3
e. 24 h	77	9.9
f. Don't know	264	33.9
Total	778	100

Discussion

The main factors that influence treatment success of the avulsed tooth are: extra-alveolar period and storage solution, both critical to the maintenance of viable cells present on the radicular surface (6, 18, 19). Since dentists are not likely to be present at the accident site, such procedures may not be followed. What happens in most

cases in that the tooth is reimplanted after a long extra-alveolar period when the periodontal ligament is already necrosed (2, 20, 21). Hence, the prognosis is unfavorable and may ultimately lead to the loss of the tooth.

According to the present results, the students show lack of knowledge about situations related to dental avulsion and reimplantation, and are not isolated findings. Raphael and Gregory (22), in their studies realized in Australia, demonstrated the lack of information about dental avulsion in the studied population. Hamilton et al. (23), in England, also showed the general population does not know about dental avulsion. In 2001, Sae-Lim (11) reported about the lack of knowledge of professors in Singapore. Chan et al. (10) observed similar results to previous studies. Andersson et al. (14), observed in their studies that the knowledge of school-aged children in Kuwait about dental avulsion is really limited, as well as knowledge about the extra-alveolar period and storage solutions.

The lack of knowledge about dental avulsion of sixth graders in the city of Araçatuba, SP, Brazil, was evident, and based on the observed results, we may suggest that educational campaigns for prevention of dental traumatisms are a timely demand. These campaigns should benefit the entire population, including students, teachers, and administrative staff. Chan et al. (10) emphasized the importance of including health professionals in the campaigns, to improve acknowledgement of the subject and subsequently the prognosis in cases of dental traumatism.

Mori et al. (24) realized an educational campaign about dental avulsion in the city of Adamantina, São Paulo, Brazil, with school professionals as the targeted population. Previously to the campaign, the lack of knowledge of the professionals was noted (15). After the campaign, the authors observed that the school professionals were able to establish emergency procedures in cases of dental avulsion. These results have come to strengthen the idea of developing educational campaigns for students also.

Thus, according to the results of this study, we may conclude that the students do not know the correct procedures to be followed in case of dental avulsion and tooth reimplantation. Educational campaigns for prevention of accidents involving the dental tissues and for improvement of the prognosis of avulsed teeth are noteworthy as a urgent necessity.

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