

# Knowledge, Attitude and Practice (Kap) of Teachers Regarding Dental Traumatic Injuries Among School Children of Shimla City

Anika Uppal\*, Seema Thakur, Parul Singhal, Deepak Chauhan, Cheeranjevi Jayam and Divya Doneriya

Department of Pediatric and Preventive Dentistry, HP Government Dental College and Hospital, Shimla, Himachal Pradesh, India

## Research Article

Received: 29/04/2016

Accepted: 27/12/2016

Published: 03/01/2017

### \*For Correspondence

Anika Uppal, Department of Pediatric and Preventive Dentistry, HP Government Dental College and Hospital, Shimla, Himachal Pradesh, India, Tel: 9872155804

**E-mail:** drannika.sml@gmail.com

**Keywords:** Traumatic injury, Knowledge, Teachers, School, Children

### ABSTRACT

Traumatic dental injuries occur frequently in children and adolescents contributing to major psychosocial and economic problems. The participation of school teachers in emergency situation is fundamental to provide appropriate care to injured child. This cross-sectional study was conducted in the schools of Shimla city of Himachal Pradesh. A self-administered questionnaire was formulated to assess the knowledge, attitude and practice of school teachers towards traumatic dental injury. Knowledge of teachers regarding emergency treatment of traumatic dental injuries should be increased by providing educational and preventive programmes for better prognosis of child's injury.

## INTRODUCTION

Dental traumatic injuries are common in infancy, childhood, adolescence. It is, in infancy and childhood, particularly relevant in terms of public health burden, because of the economic cost and number of hours of the treatment and absence from the school, the long-term consequences of trauma can in the form of compromised oral health and especially the psychological impact when there is loss of front tooth <sup>[1]</sup>.

It may affect teeth, soft tissues and supporting tooth structures, and can lead to psychological, social, masticatory, phonological and esthetic changes <sup>[2]</sup>. Accidents are the main cause of dental injuries and frequently occur when the child reaches school age <sup>[3,4]</sup>.

Several epidemiological studies have shown that the majority of traumatic dental injuries in school-aged children occur at home or at school <sup>[5]</sup>. Sports and school injuries account for 60% of traumatic dental injuries <sup>[6]</sup>. One to two and half years is the most common age of occurrence in the primary dentition. This is the age when a child learns to toddle and is relatively uncoordinated. Also there is a high prevalence of trauma to permanent dentition among school children aged between 8 to 11 years <sup>[7]</sup>.

A large number of studies reported that 34.9% of boys and 23% of girls might be assumed to have sustained damage to their teeth by the age of 14 years <sup>[4]</sup>. The teeth most commonly involved in the primary and permanent dentitions are the maxillary anterior teeth. Primary and permanent anterior teeth are not only important for aesthetics but also are essential for biting, speech in the form of phonetics, integrity of supporting tissues, psychological and mental well-being of children <sup>[6,8]</sup>.

Emergency management of traumatic dental injuries is not only the responsibility of dentists alone but a great role can also be played by school teachers who are available at the site of the accident. So, School teachers are likely to be among the first to see a child immediately after an injury has occurred. Moreover, children spend about 40% of their awake time in school and are more engaged in sports or playing activities. Therefore the knowledge and attitude of school teachers regarding emergency management of dental trauma is critical to ensure good prognosis of the clinical treatment <sup>[9,10]</sup>.

However, they have few or limited knowledge regarding the recommended course of action in such an emergencies situations like avulsions etc. It is therefore of utmost importance for physical trainers, teachers and school staff should have the basic knowledge about dental injuries and the treatment protocol for such injuries <sup>[11]</sup>.

## MATERIALS AND METHODS

A total of 381 participants from different 21 schools of Shimla city were included in the study. All the available subjects who were willing to participate in the survey were included in the study. Those who were absent on the day of examination were excluded. Before scheduling the present study, the required ethical clearance was obtained from institutional ethical clearance committee of HP Government Dental College and Hospital. Permission for conducting the survey in the schools was obtained from the Principal/Headmaster/Head Mistress of the respective schools. Before the data collection and clinical examination, the purpose and the methodology of the survey was explained to each of the subject and informed consent was obtained. Data were collected through a survey, which included a self-administered questionnaire.

The questionnaire was pretested on 15 teachers, other than those who participated in the study. The questionnaire consisted of five major parts containing multiple-choice questions.

Part I comprised of information on the personal and professional profile of the respondents, including age, gender, teaching experience, educational qualification and training on first aid.

Part II of the questionnaire comprised questions assessing participants' knowledge with regard to dental trauma.

Part III of the questionnaire was aimed at evaluating the knowledge of participants regarding soft tissue injuries.

Part IV of the questionnaire included questions related to knowledge and practice of teachers in relation to avulsed, fractured and mobile teeth.

Part V comprised of questions concerning attitude of teachers towards dental trauma and dentistry.

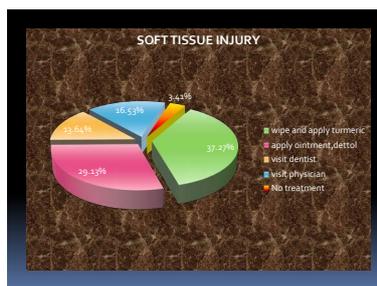
All the data were entered in Microsoft excel and analyzed using SPSS package (version 22). The Chi-square test was used to investigate the effect of gender, length of service, educational background, and participants teaching topics on their knowledge and attitudes. The significance level was set at 0.05.

## RESULTS

The general characteristics of the participants. A total of 381 teachers participated in the study. Out of which 300 were females and 81 males. Majority of respondents, that is, 168 (44.10%) were in the age group of 31–40 years. Most respondents, that is, 185 (48.80%) had 1–10 years of teaching experience. Majority of the teachers, that is, 178 (46.80%) had Master's Degree as educational qualification. 74.54% of the teachers had their first aid training. Out of those who had the first aid training 60.30% received knowledge in the teachers training college.

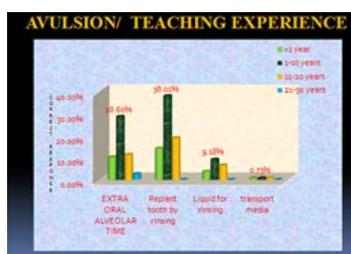
Only 5.51% of the teachers received the knowledge through the dentists. 282 teachers think that Tetanus toxoid injection is necessary after dental trauma occurs.

In part III- teachers were asked about the treatment of the injured soft tissue (**Figure 1**).



**Figure 1.** Shows the preference of the teachers in percentage as how to clean the injured area.

Most of the teachers preferred wiping the injured area and then applying turmeric for managing soft tissue injury. In Part IV questions were related to avulsion of tooth (**Figure 2**).



**Figure 2.** Avulsion to teaching experience.

Teachers with Bachelors arts and master’s degree gave more correct answers for the amount of extra alveolar time of the tooth and how would they replant the tooth back.

Answers to the questions regarding liquid to be used for rinsing and the transport media used for carrying the avulsed tooth were unsatisfactory and non-significant (**Figure 3**).

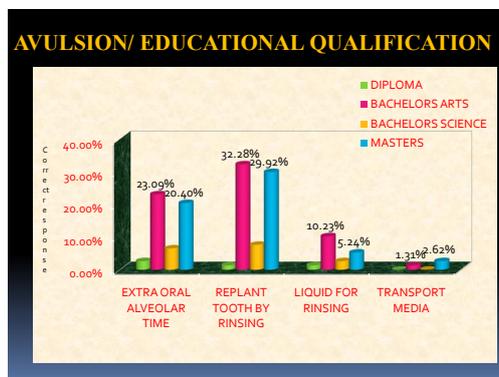


Figure 3. Avulsion to educational qualification.

Teachers with graduate arts gave more correct answers. The results for liquid to be used for rinsing and transport media were again non-significant (**Figure 4**). 52.2% of the teachers would seek the professional help immediately as depicted in **Figure 4**.



Figure 4. The teachers would seek professional help if avulsion has occurred.

Figures 5 and 6 gives the information that teachers were not confident to replant the tooth back into the socket.

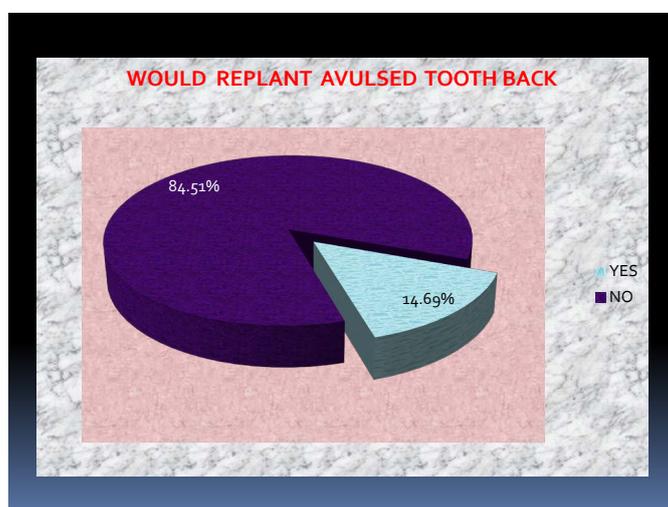


Figure 5. The percentage of the teachers who were confident to replant the tooth back into the socket.

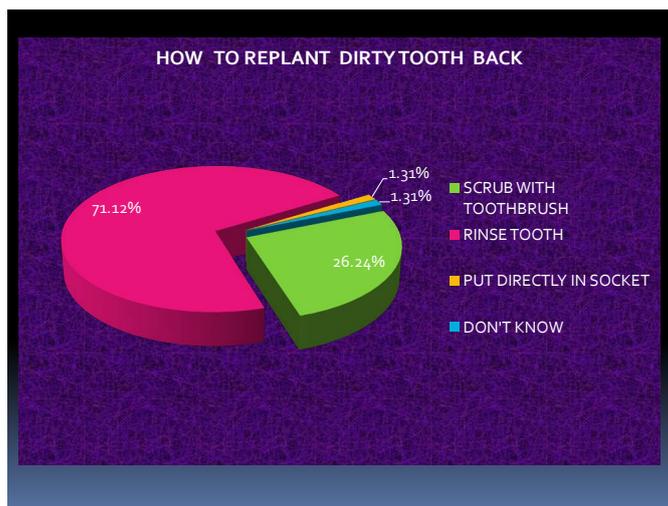


Figure 6. The teachers would replant the avulsed dirty tooth back.

As depicted in Figure 7 most of the teachers (71.12%) preferred to rinse the avulsed tooth before replanting it back in the socket. Most of the teachers wrongly preferred the use of salted water for rinsing.

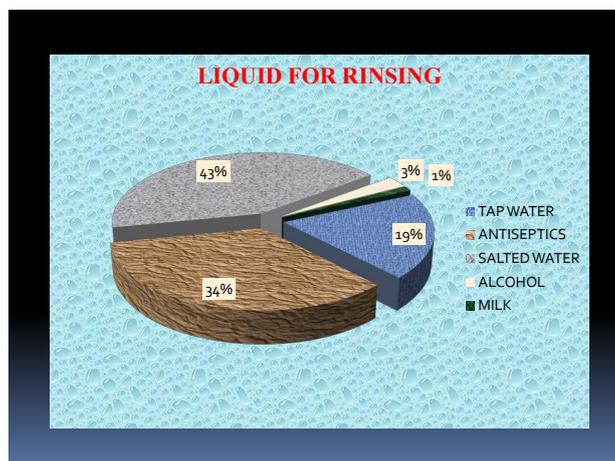


Figure 7. Teachers were asked about the liquid to be used for rinsing the avulsed tooth before replanting.

Figure 8 shows that 81% of the teachers would use handkerchief/tissue/towel for transporting the avulsed tooth to the hospital.

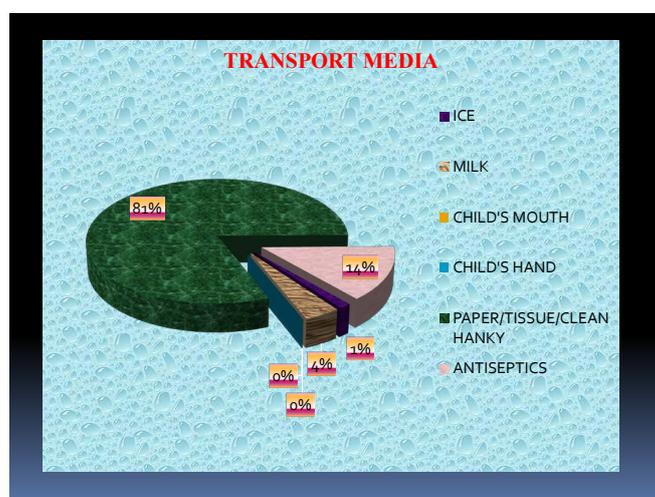


Figure 8. The transport media teachers would prefer for avulsed tooth.

Figure 9 shows that teachers who had first aid training were unable to answer the questions correctly. 68.50% of the teachers considered fractured teeth as an emergency and 71.65% were ready to carry the fractured segment of the tooth to the hospital.



Figure 9. Avulsion to the first aid training.

76.37% teachers had the positive attitude towards learning about the traumatic dental injuries. Also 74.27% teachers would refer the patient with traumatic dental injury to dental hospital.

## DISCUSSION

In this study majority of the respondents had 1-10 years of teaching experience (48.80%). Whereas in a study done by Mala Singh et al. in Mathura India in 2015 respondents mainly belonged to 10-20 years of teaching experience (34.1%).

In the present study 52.5% of the teachers would seek immediate professional help in case of dental trauma whereas 43% of the teachers would do so as reported in a study done by Mala Singh et al. in Mathura India in 2015.

In this study only 14.6% of the teachers would perform immediate replantation of the avulsed tooth which is similar to a study done by Toure B et al. in Tehran in 2011 in which the percentage was 15.8%. The major factors that may influence the success of treatment of an avulsed tooth are the extra alveolar time and the storage medium 27-29 Andreasen <sup>[12]</sup>, in a study with monkeys, showed that the re-implanted teeth after 2 hours had more root resorption than after 18 min. In 1981, he affirmed that the prognosis is better when the extra alveolar time is short <sup>[13]</sup>.

In the present study, 71.1% of the teachers would clean the tooth before replanting which is far less than the study done by Olatossio OO et al. in Nigeria in 2013 (93.3%).

Olatossio OO et al. found that 44% of the teachers would scrub the avulsed tooth with a tooth brush whereas only 26.24% of the teachers would do the same in the study conducted by us.

In the present study, 19% of the teachers would use tap water to rinse the avulsed tooth which is in contrast to the study by Olatossio OO et al. where the percentage is 2.2% only.

74.27% of the teachers in the present study preferred trauma referral to the dental hospital. On the contrary, study done by Mala Singh et al. concluded that only 14% of the teachers would do so.

Only 4% of the teachers in the present study would prefer the use of milk as storage media in the present study. In contrast, 87% of the teachers preferred milk to other storage media in a study done by Mala Singh et al. in Mathura India in 2015.

Between various wet media, milk is better than saliva due to its composition and its osmolarity. Furthermore, milk is a storage medium of relatively easy access at the location of trauma. In milk, the storage may be as long as 6 hours. In addition Lindskog and Blomlof <sup>[14]</sup> showed that saliva contains microorganisms which may affect the survival of the cells.

Different storage media have been suggested for an avulsed tooth, Trope <sup>[15]</sup> in his study arranged them in order of preference as; milk, saliva, either in the vestibule of the mouth or in a container into which the patient spits physiologic saline and water. Water is the least preferred as it can cause rapid cell lysis and increased inflammation due to its hypotonic environment <sup>[15,16]</sup>.

Hank's Balanced Salt Solution is a specialized transport medium, it has the ability to maintain the viability of the periodontal ligament for a longer period, but the shortcoming of this is that it is not readily available at the place which the accident occurred <sup>[17]</sup>. HBSS (Hank's Balanced Salt Solution) and Viaspan, showed better results compared to milk with longer storage times <sup>[14,18,19]</sup>. Storing a tooth in an inappropriate environment, in addition to rapidly transporting the child and the tooth to a dentist is crucial for favorable prognosis <sup>[8,20]</sup>.

Regarding the use of tissue paper/handkerchief/towel as transport media, 81% of the teachers in the present study gave this as answer but only 41% gave this answer in a study done by Olatossio OO et al. in Nigeria in 2013 which was wrong.

When the tooth is not immediately re-implanted, it must be preserved in an appropriate media to maintain cellular vitality

as long as possible. Oswald et al. <sup>[17]</sup> found better results for preservation in a wet medium like saliva for 90 minutes than in a dry medium.

In the present study, 76.37% of the teachers were ready to gain knowledge about traumatic dental injury whereas 93.4% of the teachers were ready to learn about traumatic dental injuries according to the study done by Olatossio OO et al. in Nigeria.

At least half of schoolchildren face the possibility of suffering dento-alveolar trauma during school time <sup>[21]</sup>. Dental trauma is relevant in children and adolescents, since their permanent teeth are erupting at this phase <sup>[22]</sup>. Children spend great part of their time at school where sporting activities become predisposing factors for dental trauma <sup>[23]</sup>.

Additionally, at school, during sporting and recreational activities, children and adolescents are the main groups with an increased likelihood of dental trauma <sup>[23,24]</sup>. There by rendering investigation of school teachers knowledge with regard to dental injuries and treatment approaches <sup>[25-31]</sup>.

Early loss of a primary tooth due to trauma may affect the physiological sequence of permanent teeth, and may be etiological factors for malocclusions, <sup>[22]</sup> thus stimulating incorrect exercise of perioral musculature and/ or cause phonological changes related to teeth <sup>[20,22,24]</sup>.

## **RECOMMENDATION**

Interaction between dentists and teachers in the public school is necessary to prevent complications and building up healthy children <sup>[32]</sup>. This can be done through posters, leaflets, and information through lectures <sup>[29]</sup> television, magazines, radio and newspapers, or the Internet (<http://www.iadt-dentaltrauma.org>).

Emergency procedures and educational preventive programs should be included in the curriculum. An educational program <sup>[23]</sup> that discusses the importance of preventing dental trauma and the benefits of immediate treatment, conservation of fractures or avulsed teeth would significantly reduce dentoalveolar trauma and sequelae <sup>[33]</sup>.

Knowledge about primary and permanent dentitions is also important to know for the teachers <sup>[34]</sup>.

The International Association of Dental Traumatology (IADT) <sup>[35-37]</sup> guidelines states 'that in the first aid treatment of an avulsed tooth:

1. One should make sure the tooth is a permanent tooth (primary teeth should not be replanted)
2. Patient should be kept calm
3. If the tooth is found it should be picked up by the crown (the white part of the tooth)
4. Avoid touching the root
5. If the tooth is dirty, wash it briefly (10 seconds) under cold running water and reposition it. Try to encourage the patient/parent to replant the tooth. Bite on a handkerchief to hold it in position
6. If it is not possible, place the tooth in a suitable medium e.g. a glass of milk or in saline. The tooth can also be transported in the mouth, keeping it between the molars and inside the cheek. Avoid storage in water
7. Seek emergency dental treatment immediately

## **CONCLUSION**

1. Variables like age, longer career span, better educational level and undergone first aid training did not provide more knowledge and better attitude towards management of traumatic dental injuries.
2. Teachers had Least knowledge on:
  - Whether to replant tooth back or not
  - Liquid for rinsing the avulsed tooth
  - Transport media for the avulsed tooth
3. Fair knowledge on:
  - When and where to refer child

## REFERENCES

1. Andreasen JO and Andreasen FM. Dental traumatology: quovadis. *Endodontics and Dental Traumatology*. 1990;6:78-80.
2. Bittencourt AM, et al. Evaluation of the knowledge of teachers in relation to the management of tooth avulsion in children. *J Dent UNESP*. 2008;37:15-19.
3. Caglar E, et al. Dental trauma management knowledge among a group of teachers in two south European cities. *Dent Traumatol*. 2005;21:258-262.
4. Young C, et al. Emergency management of dental trauma: knowledge of Hong Kong primary and secondary school teachers. *Hong Kong Med J*. 2012;18:362-370.
5. Bastone EB, et al. Epidemiology of dental trauma: a review of the literature. *Aust Dent J*. 2000;45:2-9.
6. Pujita C, et al. Informative promotional outcome on school teachers' knowledge about emergency management of dental trauma. *J Conserv Dent*. 2013;16:21-27.
7. McDonald RE and Avery DR. *Traumatic injuries and their management in young children*. Dentistry for Child and Adolescent. 8th ed. CV Mosby Co, St Louis, Missouri; 2004.
8. Adekoya-Sofowora CA, et al. Prevalence and causes of fractured permanent incisors in 12 year-old suburban Nigerian school children. *Dent Traumatol*. 2009;25:314-317.
9. Shashikiran ND, et al. Knowledge and attitude of 2000 parents (urban and rural-1000 each) with regard to avulsed permanent incisors and their emergency management in and around Davangere. *J Indian Soc Pedo Prev Dent*. 2006;24:116-121.
10. Sanu OO and Utomi IL. Parental awareness of emergency management of avulsion of permanent teeth of children in Lagos, Nigeria. *Niger Postgrad Med J*. 2005;12:115-120.
11. Krishnan B and Joseph J. Knowledge of basic dental physiology among teachers can improve preliminary management of acute dental avulsion in school children. *Int J Clin Exp Physiol*. 2014;1:63-67.
12. Andreasen JO. Analysis of topography of surface and inflammatory root resorption after replantation of mature permanent incisors in monkeys. *Swed Dent J*. 1980;4:135-144.
13. Andreasen JO and Kristerson L. The effect of limited drying or removal of the periodontal ligament. Periodontal healing after replantation of mature permanent incisors in monkeys. *Acta Odontol Scand*. 1981;39:1-13.
14. Lindskog S and Blomlof L. Influence of osmolality and composition of some storage media on human periodontal ligament cells. *Acta Odont Scand*. 1982;40:435-441.
15. Trope M. Clinical management of avulsed tooth: present strategies and future directions. *Dent Traumatol*. 2002;18:1-11.
16. Berrett EJ and Kenny DJ. Avulsed permanent teeth: a review of the literature and treatment guidelines. *Endod Dent Traumatol*. 1997;13:153-163.
17. Oswald RJ, et al. A post replantation evaluation of air-dried and saliva stored avulsed teeth. *J Endod*. 1980;6:546-551.
18. Trope M and Friedman S. Periodontal healing of replanted dog teeth stored Viaspan, milk and Hanks balanced salt solution. *Endod Dent Traumatol*. 1992;8:183-188.
19. Hiltz J and Trope M. Vitality of human lip fibroblasts in milk, Hanks balanced salt solution and Viaspan storage media. *Endod Dent Traumatol*. 1991;7:69-72.
20. Tzigiounakis V and Merglova V. Attitude of Pilsen primary school teachers in dental trauma. *Dent Traumatol*. 2008;24:528-531.
21. Glendor U. Aetiology and risk factors related to traumatic dental injuries: A review of the literature. *Dent Traumatol*. 2009;25:19-31.
22. Campos MICC, et al. Level of Information about the conduct of emergency trauma dental front. *Pesq Bras OdontopedClinIntegr*. 2006;6:155-159.
23. Trope M, et al. Traumatic injuries. In: Cohen S, Burns RC, editors. *Pathways of the pulp*. 8th ed. Mosby, St Louis; 2002.
24. Marcenes W, et al. Socio-economic correlates of traumatic injuries to the permanent incisors in schoolchildren aged 12 years in Blumenau, Brazil. *Dent Traumatol*. 2001;17:222-226.
25. Vergotine RJ and Govoni R. Public school educator's knowledge of initial management of dental trauma. *Dent Traumatol*. 2010;26:133-136.
26. Feldens EG, et al. Understanding school teacher's knowledge regarding dental trauma: A basis for future interventions.

- Dent Traumatol. 2010;26:158-163.
27. Haragushiku GA, et al. Knowledge and attitudes toward dental avulsion of public and private elementary school teachers. *J Dent Child (Chic)*. 2010;77:49-53.
  28. Skeie MS, et al. Traumatic dental injuries: knowledge and awareness among present and prospective teachers in selected urban and rural areas of Norway. *Dent Traumatol*. 2010;26:243-247.
  29. Lieger O, et al. Impact of educational posters on the lay knowledge of school teachers regarding emergency management of dental injuries. *Dent Traumatol*. 2009;25:406-412.
  30. Sae-Lim V and Lim LP. Dental trauma management awareness of Singapore pre-school teachers. *Dent Traumatol*. 2001;17:71-76.
  31. Mesgarzadeh AH, et al. Evaluating knowledge and attitudes of elementary school teachers on emergency management of traumatic dental injuries: a study in an Iranian urban area. *Oral Health Prev Dent*. 2009;7:297-308.
  32. Panzarini SR, et al. Physical education undergraduates and dental trauma knowledge. *Dent Traumatol*. 2005;21:324-328.
  33. Walker A and Brenchley J. It's a knockout: survey of the management of avulsed teeth. *Accid Emerg Nurs*. 2000;8:66-70.
  34. Silva MB, et al. Evaluation of the knowledge of the approach of dental trauma by day care professional. *Con Scientiae Saúde*. 2009;8:65-73.
  35. Andersson L, et al. International Association of Dental Traumatology guidelines for management of traumatic dental injuries: 2. Avulsion of permanent teeth. *Dent Traumatol*. 2012;28:88-96.
  36. Andreasen JO. Interrelation between alveolar bone and periodontal ligament repair after replantation of mature permanent incisors in monkeys. *J Periodontal Res*. 1981;16:228-235.
  37. Pettiette M, et al. Periodontal healing of extracted dogs' teeth air-dried for extended periods and soaked in various media. *Endod Dent Traumatol*. 1997;13:113-118.