



Assessment of knowledge among public and private elementary school teachers in dental trauma management

Merve Bayram¹, Mine Koruyucu², Figen Seymen²

¹Istanbul Medipol University, School of Dentistry, Department of Pedodontics, Istanbul, Turkey

²Istanbul University, Faculty of Dentistry, Department of Pedodontics, Istanbul, Turkey

Abstract

Purpose: Traumatic dental injuries, majority of which occur at school and primary care given by teacher, should managed as soon as possible. The knowledge and attitudes of teachers is critical for the best prognosis of traumatized teeth. The purpose of this study was to evaluate knowledge and attitudes among elementary public and private school teachers in dental trauma management. **Materials and Methods:** A modified three-part questionnaire comprised of questions regarding demographic data, attitude and knowledge about dental trauma was distributed to 328 teachers (public schools:164/private schools:164). The results of the questionnaire were expressed as frequency distributions. Statistical analysis was performed by version 20.0 of the SPSS statistics software. **Results:** The average correct knowledge score was 4.96 out of 10. Two individual predictors significantly improved the respondents' knowledge: being more than 50 years old age ($p=0.001$) and more than 15 years teaching experience group ($p<0.001$). While 84.5% of public, 79% of private school teachers found their knowledge poor; and 85% of public, 76% of private school teachers state they're not satisfied with their level of knowledge. Private school teachers had given significantly more correct answers to the questions about dental avulsion management than public school teachers ($p=0.01$). There was no significant difference between public and private school teachers' knowledge regarding dental trauma management. **Conclusion:** The level of knowledge in dental trauma management determined in this study was unsatisfying. Programs on increasing the awareness and motivation of teachers on dental trauma management in both types of schools are recommended.

Citation: Bayram, et al. (2017) Assessment of knowledge among public and private elementary school teachers in dental trauma management. Dentistry 3000. 1:a001
doi:10.5195/d3000.2017.60

Received: October 4, 2016

Accepted: May 25, 2017

Published: June, 2017

Copyright: ©2017 Bayram, et al. This is an open access article licensed under a Creative Commons Attribution Work 4.0 United States License.

Email: mine.yildirim@istanbul.edu.tr

Introduction

Traumatic dental injuries (TDI) are prevalent in schoolchildren and is a public health concern [1,2]. The prevalence rate of injuries to permanent teeth varies between 6.1% and 58.6% [3-16] depending on type of study, trauma classification, methodology, study size and population, geographical location and culture [17]. A TDI has several consequences such as physiological, psychological, financial and affect the quality of life of both parents and children [18].

Severe TDI can damage the pulp and periodontal ligament and lead to tooth loss. Optimally, for

long-term success, the management or treatment of traumatized teeth should be carried out as soon as possible [1]. Immediate care is particularly important for the avulsed permanent tooth as the replantation takes place as soon as possible after avulsion and preferably with 30 minutes [19-21]. Avulsion of permanent teeth is the most serious of all types of traumatic tooth injuries because the complete dislodgement of the tooth from its socket causes severe damage to the supporting tissues and vascular and nerve structures. The ideal treatment for an avulsed permanent tooth is its immediate replantation into the socket [19]. Immediate tooth replantation leads to a better PDL

repair and reduces significantly the occurrence of root resorption. Therefore, shortening as much as possible the time elapsed between trauma and tooth replantation and maintaining the avulsed tooth in a suitable transport medium may attenuate the deleterious effects of the extrabuccal period on root surface and increase the prognosis considerably [1, 19].

Most incidences happen during school time where the primary care is given by a teacher. Reports also show, in some instances that more than half of the children interviewed are affected by TDI's in school [22]. Since most TDI's occur during school time, it follows that suitable and timely



New articles in this journal are licensed under a Creative Commons Attribution 4.0 United States License.



This journal is published by the [University Library System](#), [University of Pittsburgh](#) as part of its [D-Scribe Digital Publishing Program](#) and is cosponsored by the [University of Pittsburgh Press](#).

action is imperative to the long-term prognosis of an affected child by a teacher or school staff member [23].

The purpose of this study was to (I) evaluate the knowledge of elementary school teachers' toward common dental trauma management, (II) compare the knowledge of public and private elementary school teachers' attitudes toward dental trauma management for crown fracture and avulsion injuries.

Materials and Methods

A questionnaire consisting of three parts was applied to teachers (164 public and 164 private school teachers) in 15 randomly chosen elementary schools in Istanbul, Turkey. Part 1 consists of questions on gender, age, teaching experience, first aid training and dental trauma experience. Part 2 consists of questions on subjective self-assessment of attitude. Part 3 consists of questions about dental trauma management. Introduction of the questionnaire included consent of confidentiality information. The teachers and the school administrations who agreed to take part in the study were assured of strict confidentiality. Similar questionnaires were used with Oliveira et al [24]. This questionnaire is included in Table 1.

Table 1. Questionnaire					
Part I					
1. Gender: Male		Female			
2. Age:	20-34 years	35-49 years	≥50 years		
3. Length of teaching experience?	< 1	1-5	5-10	10-15	>15
4. Do you have kids?			Yes		No
5. Have you had first aid training in your own organization?			Yes		No
6. Have you had first aid training in another organization?			Yes		No
7. If you did, have it included dental trauma first aid?			Yes		No
8. Did you have personal experience (yourself/your student) in dental trauma?	Yes				No
Part II					
1. Self assessed knowledge in dental trauma management:					
a-none	b-little	c-moderate		d-high	
2. Satisfaction with self assessed knowledge:					
a-very low	b-low	c-moderate		d-high:	
3. Enthusiasm for more education in the subject:					
a-not interested	b-little interested	c-very interested:			
Part III					
1. An 8 year old boy was hit in the face with a football during the school time and his upper front tooth was broken. He was otherwise unhurt and didn't lose consciousness.					
1(a) Is the damaged front tooth likely to be primary or permanent?					
a.Primary		b.Permanent			
1(b) Which of the following actions would you considered as the most appropriate?					
a.After class, contact his parents to explain what had happened.					
b.Give him a warm drink and contact his parents					
c.Send him immediately to the doctors or infirmary					
d.Send him immediately to the dentist					
2. A 12 year old girl fell from the stairs and hit in the mouth during the school time. Her mouth is bleeding and an upper front tooth is found to be missing.					
2(a) Which of the following would you do?					
a.Sideline the injured girl, getting her to bite on a hankerchief to control the bleeding.					
b.Look for the tooth, wash it and give it to the girl to take home.					
c.Look for the tooth and put it back into the socket.					
d.Put the tooth in liquid and send the girl home straight away.					
e.Find the tooth and put it in liquid and send the girl to the nearest dentist.					
2(b) In case of this condition, which would be the first place you would contact to?					
a.Doctor		b.Dentist	c.Hospital	d. I would tried to treat	
2(c) In case of this condition, how urgent do you think it is to seek professional help?					
a. Immediately - Within 30 min		b. Within 1 hour			
c. Within a few hours		d. Within 1 day			
3.Would you replant the primary tooth that has been knocked out?					
a.Yes		b.No			
4.Would you replant the permanent tooth back into socket yourself?					
a.Yes, I would		b.No, I would get professional help			
4(a) If your answer is "Yes", when you get the tooth from the ground you saw the tooth was dirty what would you do?					
a.Scrub the tooth gently with a toothbrush.					
b.Rinse the tooth under tap water.					
c.Put the tooth straight back into the socket without any pretreatment.					
d.Rinse the tooth with detergent or soap.					
4(b)If your answer is "No", how would you transport the tooth to the dentist?					
a.in Tap water		b.in milk		c.in alcohol	
d.in physiologic water (saline)		e.in paper tissue		f.in ice	
5.Would you search for if the child had tetanus vaccine?					
a.Yes		b.No			

Teachers received a grade for part III. The grades were then according to their correct answers normalized by 10. The results of

Table 2. Demographic characteristics of 15 randomly chosen public and private elementary school teachers

Demographic characteristics	Public		Private	
	n	%	n	%
Gender				
Male	76	46.3	46	28.0
Female	88	53.7	118	72.0
Age				
20-34	72	43.9	80	48.8
35-49	61	37.2	67	40.9
≥50	31	18.9	17	10.4
Length of teaching experience (year)				
<1	5	3.0	2	1.2
1-5	24	14.6	36	22.0
5-10	32	19.5	58	35.4
10-15	23	14.0	26	15.9
>15	80	48.8	42	25.6
Having children				
Yes	109	66.5	94	57.3
No	55	33.5	70	42.7
Received first aid training in own organization				
Yes	50	30.5	23	14.0
No	114	69.5	141	86.0
Received first aid training in another organization				
Yes	61	37.2	53	32.3
No	97	59.1	108	65.9
No answer	6		3	
Content of first aid training (including dental trauma)				
Yes	8	5	3	1.8
No	120	73.2	108	65.9
No answer	36		53	
Dental trauma experience (yourself/ your student)				
Yes	40	24.4	29	17.7
No	118	72.0	128	78.0
No answer	6		7	

the questionnaire were expressed

as frequency distributions. Statistical analysis was performed using chi-square test with a significance

level of .05 by version 20.0 of the SPSS statistics software.

Results

The results from part I on teachers' from public and private schools demographic information are shown in Table 2.

In part II, while 138 (84.5%) teachers in public school, 129 (79%) teachers in private school claimed they have poor knowledge of the subject; and 139 (85%) teachers in public school, 124 (76%) teachers in private school were low satisfied with their knowledge only 33 (20%) were interested to learn more in both school type. Teachers specified that the main source for information was a dentist.

Part III of the questionnaire was evaluated the knowledge of elementary school teachers about dental trauma management. The average score for all respondents was 4.96 (of 10). Two groups significantly improved the respondents' knowledge: being above 50 year old age group ($p=0.001$) and having teaching experience above 15 years ($p<0.001$).

Table 3 summarizes the following data: For question 1(a),

54.9% public school teachers, 69.5% private school teachers recognized that the upper incisor is a permanent tooth in an 8-year-old child. There was a significantly association between public and private schoolteachers knowledge ($p=0.003$). For case 1(b) 52.4% public school teachers, 39.6% private school teachers would urgently take her to the dentist. There was a significantly association between public and private schoolteachers knowledge ($p=0.01$). For case 2(a) 54,9% public schoolteachers and 51,8% private schoolteachers would find the tooth and put it in liquid and send the girl to the nearest dentist. For question 2(b) 79.3% public schoolteachers and 67.7% private schoolteachers knew that in case of dental trauma, first place of contact is a dentist. For question 2(c) only 5% public schoolteachers and 10.9% private schoolteachers were aware of getting early professional help. Private schoolteachers statistically had more correct answers on ideal replantation time than public schoolteachers ($p=0.02$). For question 3, 100% public schoolteachers and 93.3% private schoolteachers chose that replantation of primary tooth is not recommended. There was a significantly association between public and private schoolteachers knowledge ($p=0.001$).

Private schoolteachers had significantly more correct answers on trauma management of avulsed teeth than public schoolteachers ($p=0.01$).

Discussion

Table 3. Assessment of teachers' knowledge on dental trauma management in 15 randomly chosen elementary schools compared by school type.

Questions	Public School		Private School		P value
	n	%	n	%	
Recognizing that the upper incisor is a permanent tooth in an 8-year-old child	90	54.9	114	69.5	0.003
Suitable approach of a 8-year-old child with upper incisor tooth broken	86	52.4	65	39.6	0.01
Suitable direction of a 12-year-old child with avulsed teeth	90	54.9	85	51.8	>0.05
Suitable affiliation direction in case of dental avulsion	130	79.3	111	67.7	>0.05
Right answer about ideal replantation time	9	5	18	10.9	0.02
Suitable approach for replantation of primary tooth	164	100	153	93.3	0.001
Suitable approach for trauma management of avulsion	22	13.4	39	23.8	0.01
Remember to check tetanus vaccine control	76	46.3	90	54.9	>0.05

The level of knowledge of dental trauma management as found in this survey was low, average score being 4.96 of 10; Fux-Noy et al found similar results (4.59) [25]. In addition, only 20% were interested in additional training to dental trauma management. These results show the lack of awareness among teachers to the importance of immediate and optimum treatment of dental injuries.

Teachers who were above 50 year old had better knowledge about the subject. It is a fact that this age group had more experience than the younger age groups. Having teaching experience above 15 years was also found to be a

related factor to better knowledge on the subject (Table 2).

Private school teachers aren't good at referring an 8-year-old child with broken upper incisor tooth get suitable health service. Possible reason – we concluded subjectively due to oral discussions - for this difference can be the fact that private schools have their own school doctors and they choose to take the child to the school doctor in case of dental trauma.

Primary teeth may also be avulsed, but they should not be replanted because this manipulation may result in injury to the underlying permanent teeth germ [1].

In this survey, only 5.1% teachers replant the tooth themselves. While Chan et al. [26] and Fux-Noy et al. [25] found similar results; Hamilton et al. [27] and Pacheco et al. [28] found higher percentage. More than 94% of teachers did not feel the capable of performing tooth replantation. Other studies have reported 70% to 80% respondents wouldn't replant the tooth or wouldn't be comfortable to do so [29-31].

An avulsed tooth should be replanted in its socket as soon as possible to avoid further damage to the periodontal membrane [32-35]. Before replantation, the tooth should be cleaned with saline solution if the tooth would be observed dirty [28,34]. The replantation procedure of the avulsed

teeth has been recommended to be performed immediately - within 30 minutes after trauma [26,30,36]. If the tooth can't be replanted, until replantation time, the teeth must be kept in a proper media [30]. Hank's Balanced Salt Solution (HBSS) has been especially developed for cell maintenance and thus, theoretically, it allows a better conservation of tissues for long time periods. It has been widely employed as a reference solution in studies on dental avulsion as it has the ideal osmolality and pH for preserving the vitality of cells [37].

Milk has a favorable osmolality and composition for the viability of periodontal ligament cells and has therefore been widely recommended to dentists and general population for keeping avulsed teeth to be replanted, being the second or third best transportation media for avulsed teeth include (in order of preference), after Viaspan® and/or Hank's Balanced Salt Solution®, according to the International Association of Dental Traumatology [19], and the American Academy of Pediatric Dentistry [38] due to its beneficial effects and characteristics, and its ease of access at the moment of trauma [37].

While 53.3% teachers choose to put the avulsed tooth in liquid, only 14.9% teachers knew that the proper media is milk. Similar results were found in other studies among teachers [25-27,36]. The popular wrong answers are paper tissue, ice and tap water respectively. Private school

teachers gave better answers about 'suitable approach for trauma management of avulsion' than the public school teachers.

In case of dental trauma especially intra-oral wounds tetanus vaccine is necessary to be checked out [39]. Half of both public and private school teachers knew the importance of tetanus vaccine control in dental trauma.

Conclusion

The level of knowledge of dental trauma management both public and private school teachers from Istanbul, Turkey, as found in this study was unsatisfying. It appears that additional education programs are critical to improve teachers' awareness of the importance of dental trauma management in both types of schools. First aid training should involve 'dental trauma management' courses given in elementary schools.

References

1. Andreasen JO, Andreasen FM, Andersson L. (2007) Textbook and color atlas of traumatic injuries to the teeth, 4th edition. Copenhagen: Munksgaard. 217-54 p, 444-88 p, 516-41 p.
2. Traumatic dental injuries in children presenting for treatment at the Department of Pediatric Dentistry, Faculty of Dentistry, University of Jordan, 1997-2000. Rajab LD. Dent Traumatol 2003; Feb;19(1):6-11. PMID: 12656848
3. A retrospective study of dento-alveolar injuries of children in Ankara, Turkey. Altay N, Güngör HC. Dent Traumatol. 2001; Oct;17(5): 201-4. PMID: 11678537
4. Traumatic injuries to permanent teeth in Turkish children, Ankara. Dent Traumatol. Altun C, Ozen B, Esenlik E, Guven G, Gürbüz T, Acikel C, Basak F, Akbulut E. 2009; Jun;25(3): 309-13. PMID: 19583580
5. Prevalence of traumatic injuries to the permanent incisors in candidates for orthodontic treatment. Dent Traumatol. Bauss O, Röhling J, Schwestka-Polly R. 2004; Apr 20(2): 61-6. PMID:15025687
6. Prevalence and handedness correlates of traumatic injuries to the permanent incisors in 13-17-year-old adolescents in Erzurum, Turkey. Canakci V, Akgül HM, Akgül N, Canakci CF. Dent Traumatol. 2003; Oct 19(5): 248-54. PMID:14708648
7. Factors associated with traumatic dental injuries among 12-year-old schoolchildren in South India. David J, Astrøm AN, Wang NJ. Dent Traumatol. 2009; Oct 25(5): 500-5. PMID:19614932
8. Fractured permanent incisors among Nigerian school children. Falomo B. ASDC J Dent Child. 1986; Mar-Apr 53(2): 119-21. PMID:3457032
9. Traumatic dental injuries in schoolchildren from Santo Domingo. Garcia-Godoy F, Morbán-Laucer F, Corominas LR, Franjul RA, Noyola M. Community Dent Oral Epidemiol. 1985; Jun 13(3): 177-9. PMID:3860343
10. Dental trauma in children and young adults visiting a University Dental Clinic. Ivancic Jokic N, Bakarcic D, Fugosic V, Majstorovic M, Skrinjaric I. Dent Traumatol. 2009; Feb 25(1): 84-7. PMID:19208016
11. Epidemiologic survey of traumatic dental injuries in children seen at the Federal University of Rio de Janeiro, Brazil. Jesus MA, Antunes LA, Risso Pde A, Freire MV, Maia LC. Braz Oral Res. 2010; Jan-Mar 24 (1): 89-94. PMID:20339720
12. Dental trauma in Turkish children, Istanbul. Kargul B, Çağlar E, Tanboga I. Dent Traumatol. 2003; Apr 19(2): 72-5. PMID:12656836
13. Prevalence of traumatic injuries to maxillary permanent teeth in 9- to 14-year-old school children in Yazd, Iran. Navabazam A, Farahani SS. Dent Traumatol. 2010; Apr 26(2): 154-7. PMID:20089070

14. Traumatic injuries to the anterior teeth among South Kanara school children--a prevalence study. Rai SB, Munshi AK. *J Indian Soc Pedod Prev Dent*. 1998; Jun 16(2): 44-51. PMID:11813754
15. Prevalence and risk factors related to traumatic dental injuries in Brazilian schoolchildren. Soriano EP, Caldas Ade F Jr, Diniz De Carvalho MV, Amorim Filho Hde A. *Dent Traumatol*. 2007; Aug 23 (4): 232-40. PMID:17635357
16. Dental trauma in school-children six to twelve years of age. Zaragoza AA, Catalá M, Colmena ML, Valdemoro C. *ASDC J Dent Child*. 1998; Nov-Dec 65 (6): 492-4, 439. PMID:9883326
17. The caries decline: a review of reviews. Petersson GH, Bratthall D. *Eur J Oral Sci*. 1996; Aug 104 (4): 436-43. PMID:8930595
18. Andreasen JO, Andreasen FM, Andersson L. (2007) Socio-psychological aspects of traumatic dental injuries. In: Textbook and color atlas of traumatic injuries to the teeth. 4th edition. Copenhagen: Munksgaard pp 201.
19. Guidelines for the management of traumatic dental injuries. II. Avulsion of permanent teeth. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F, Bourguignon C, DiAngelis A, Hicks L, Sigurdsson A, Trope M, Tsukiboshi M, von Arx T. *Dent Traumatol* 2007; Jun 23(3): 130-6. PMID:17511833
20. Tooth avulsion and re-plantation – a review. Hammarström L, Pierce A, Blomlöf L, Feiglin B, Lindskog S. *Endod Dent Traumatol* 1986; Feb 2(1): 1-8. PMID:3516666
21. Treatment of the avulsed tooth. Trope M. *Pediatr Dent* 2000; Mar-Apr 22(2): 145-7. PMID:10769860
22. Oral trauma in children: a hospital survey. O'Neil DW, Clark MV, Lowe JW, Harrington MS. *Oral Surg Oral Med Oral Pathol* 1989; Dec 68 (6): 691-6. PMID:2574434
23. The prevalence of traumatic injuries treated in the pedodontic clinic of Ankara University, Turkey, during 18 months. Saroğlu I, Sönmez H. *Dent Traumatol* 2002; Dec 18 (6): 299-303. PMID:12656862
24. Knowledge and attitude of mothers with regards to emergency management of dental avulsion. Oliveira TM, Sakai VT, Moretti ABS, Thiago CS, Santos CF, Machado MA. *J Dent Child* 2007 Sep-Dec; 74 (3): 200-2. PMID:18482514
25. Knowledge of elementary school teachers in Tel-Aviv, Isreal, regarding emergency care of dental injuries. Fux-Noy A, Sarnat H, Amir E. *Dent Traumatol*. 2011; Aug 27(4): 252-6. PMID:21535404
26. Lay knowledge of physical education teachers about the emergency management of dental trauma in Hong Kong. Chan AWK, Wong TKS, Cheung GSP. *Dent Traumatol* 2001; Apr 17(2):77-85. PMID:11475950
27. Investigation of lay knowledge of the management of avulsed permanent incisors. Hamilton FA, Hill FJ, Mackie IC. *Endod Dent Traumatol* 1997; Feb. 13(1):19-23. PMID:9206384
28. Evaluation of the knowledge of the treatment of avulsion in elementary school teachers in Rio de Janeiro, Brazil. Pacheco LF, Filho PFG, Letra A, Menezes R, Villoria GEM, Ferreira SM. *Dent Traumatol* 2003; Apr 19(2): 76-8. PMID:12656837
29. Avulsed permanent incisors: knowledge and attitudes of primary school teachers with regard to emergency management. Blakytyn C, Surbutts C, Thomas A, Hunter ML. *Int J Paediatr Dent* 2001; Sep 11(5): 327-32. PMID:11572262

30. Tooth reimplantation after traumatic avulsion: A report of 10 cases. Kinoshita S, Kojima R, Taguchi Y, Noda T. *Dent Traumatol* 2002; Jun 18(3): 153-6. PMID:12154771
31. Elementary school staff knowledge about dental injury. McIntyre JD, Lee JY, Trope M, Vann WF. *Dent Traumatol* 2008; Jun 24(3): 189-98. PMID:18410391
32. American Association of Endodontists. Treatment of the avulsed permanent tooth. Recommended guidelines of the American Association of Endodontists. *Dent Clin North Am* 1995; Jan 39(1): 221-5. PMID:7890106
33. Effects of treatment delay upon pulp and periodontal healing of traumatic dental injuries- a review article. Andreasen JO, Andreasen FM, Skeie A, Hjörting-Hansen E, Schwartz O. *Dent Traumatol* 2002; Jun 18(3): 116-28. PMID:12110104
34. Replantation of 400 avulsed permanent incisors. Part 1. Diagnosis of healing complications. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. *Endod Dent Traumatol* 1995; Apr 11 (2): 51-8. PMID:7641619
35. Avulsed permanent teeth: a review of literature and treatment guidelines. Barrett EJ, Kenny DJ. *Endod Dent Traumatol* 1997; Aug 13(4): 153-63. PMID:9550040
36. Dental trauma management awareness of Singapore pre-school teachers. Sae-Lim V, Lim LP. *Dent Traumatol* 2001; Apr 17(2): 71-6. PMID:11475949
37. Storage media for avulsed teeth: a literature review. Poi WR, Sonoda CK, Martins CM, Melo ME, Pellizzer EP, de Mendonça MR, Panzarini SR. *Braz Dent J* 2013; Sep-Oct 24(5): 437-45. PMID:24474282
38. Guideline on Management of Acute Dental Trauma. *Pediatr Dent*. 2008-2009; 30(7): 175-83. PMID:19216418
39. Tetanus prophylaxis in injuries. Guidelines for the dental practice. Becking AG. *Ned Tijdschr Tandheelkd* 1995; Jul 102 (7): 266-8. PMID:11837111