

Knowledge and Attitude of School Teachers with regard to Emergency Management of Dental Trauma in Bangalore City

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ABSTRACT

Introduction: Dental trauma in children is a significant oral health issue worldwide. School teachers are immediate seniors for children in school, and they are considered as the primary care takers for them. Hence, the purpose of the study is to assess the knowledge and attitude of school teachers with regard to emergency management of traumatic dental injuries and to evaluate the association between school environmental factors with teacher's knowledge and attitude towards management of dental trauma.

Material And Methods: A total of 160 teachers from the government schools were included in the study. Data were collected using a five part questionnaire including demographic data, knowledge, attitude, self-assessment, and possible strategies to change the scenario. Data obtained from 160 completed questionnaires were statistically analyzed using descriptive statistics, t-test and chi square test. **Results:** It was found that only 46.9% of the participant had adequate knowledge scores, and 60.6% of participant had a positive attitude towards emergency management of dental trauma in school. The knowledge and attitude categories of school teachers when compared with the length of service and those who witnessed traumatic dental injury in school using Pearson's chi square test statistically significant association ($p < 0.05$) was observed with attitude scores only, while knowledge scores were not significant. **Conclusion:** This study reveals a serious lack of knowledge and awareness among school teachers regarding emergency management of dental injuries. We suggest educational programs should be developed for the school teachers to improve their knowledge so that proper dental first-aid procedures can be achieved

KEYWORDS: Attitude, Emergency Treatment, First Aid, Knowledge, Schools

INTRODUCTION

Dental trauma in children is a significant oral health issue world wide.¹ The prevalence of traumatic dental injury among 5-16 year old school children in Bangalore city was 9.7%, and only 3.9% of children with traumatic dental injury had sought treatment. Children from public school had significantly higher traumatic dental injuries as compared to private schools.² The face and the teeth being the most exposed parts of the body have a higher tendency to fracture.³ Traumatic injuries to the primary and permanent dentition is probably the next to dental caries.^{4, 5} The development of the occlusion both functionally and esthetically during childhood depends upon the presence of healthy dentition. Studies have shown that main cause of traumatic dental injuries among school children is from falls and sports activities with the maxillary incisors being most commonly involved. In their study, Andreasen et al., suggest that the loosely structured periodontal ligament surrounding the erupting teeth and elasticity of alveolar bone favor complete avulsion.^{6,7}

A disastrous and unfortunate result occurs when the traumatic injury is inadequately treated leading to conditions like malformed or malpositioned teeth, premature tooth loss and pulp death with abscess

formation. The prognosis for success often depends on the rapidity with which the tooth is being treated followed by the injury, irrespective whether the procedure is involving protecting a large area of exposed dentin or treating a vital pulp exposure. Untreated trauma may leave deficit that affects the quality of life and self esteem of the patient. Improper intervention may lead to longstanding damage to the orofacial structures.⁷

The most common locations where a traumatic dental injury occurs are mostly in the school and home environment. Parents and teachers are usually the ones present in the vicinity when such accidents occur. Hence, their knowledge about the management of traumatic dental injuries is vital for the prognosis of injured teeth and in assisting the injured person to receive appropriate first-aid treatment as soon as possible.⁸

School teachers are immediate seniors for children in school, and they are considered as the primary care takers for them. They are frequently required to deal with trauma in schools.⁶ Hence the purpose of the study is to assess the knowledge and attitude of school teachers with regard to emergency management of traumatic dental injuries and to evaluate the association between school environmental factors with teacher's knowledge and attitude towards management of dental trauma.

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MATERIAL AND METHODS

Study subjects and data collection: This was a Cross-sectional study done over a period of three months from June to August 2014. The study was conducted among government school teachers in Bangalore city. Teachers present on the day of data collection were included in the study. List of school teachers under Bangalore city was obtained from deputy directorate of public instructions (DDPI), served as a sampling frame.

Sample size calculation: The sample size calculated with confidence level 95% was **160**.

Permission was obtained from the school authorities to administer the questionnaire to the teachers. The participants were explained about the objective of the study and also informed consent was obtained from all teachers. Ethical clearance was also obtained from the Institutional Review Board of M .R Ambedkar Dental College and Hospital, Bangalore.

Questionnaire: A questionnaire was developed to assess current knowledge and attitude of school teachers with regard to emergency management of dental trauma. The questionnaire was both in Kannada and English language to ensure comprehension by all school teachers. All the questions were given alternative choices to help the respondents and respondents were asked to tick the most appropriate answer from the options provided.

Before the questionnaire was definitely established, the questions were pretested in a pilot study on 20 school teachers. The questionnaire was translated into Kannada language and was also translated back to English to ensure correct translation. The questionnaire was easy to understand and was finalized with no modification. Its respective psychometric properties were assessed as follows. Content validity was assessed by ten experts, to depict items with a high degree of agreement among experts Aiken's V index was used to quantify the concordance between experts for each item and the values higher than 0.85 were always obtained. Cronbach alpha was 0.74 indicating good reliability.

Questionnaire had five parts:

Section 1: contained questions on personal data that recorded name, age, gender, the length of service, first aid training background, the source of information regarding traumatic dental injuries and experience of witnessing tooth injury in school children.

Section 2: consisted of multiple choice questions about school teacher's general knowledge about prevention and management of dental trauma. It consisted of case studies with two imaginary cases of dental trauma in a school environment.

Case 1: consisted of questions regarding mild trauma involving uncomplicated crown fracture.

Case 2: comprises of questions regarding permanent tooth avulsion.

Section 3: consisted of questions regarding attitude of school teachers in the management of dental trauma.

Section 4: self-assessment of school teachers regarding emergency management of dental trauma in school.

Section 5: consisted questions of possible strategies to change the scenario.

Statistical analysis: For further statistical analysis, responses to the questions were recorded as correct or incorrect, and each of the correct answer was given a score of 1 and the wrong answer score of 0 for the knowledge questions, similarly responses to the questions of attitude part ,score 1 was assigned for positive attitude and 0 for negative attitude. Based on the sum of the scores of the questions on knowledge and attitude, two categories were defined for each of them adequate (>5 score) and inadequate (<5 score) knowledge, positive (>5score) and negative (<5 score) attitude. Data from the returned 160 questionnaires were encoded, and statistical analysis was performed using the software statistical package for social sciences (SPSS).Descriptive statistics, included percentages, frequencies, and t test and chi square were used to find out significant differences $p<0.05$.

RESULTS

Data was collected from July to September 2014 over a period of 3 months. A total of 160 school teachers participated in the study.

Section 1: About 34.4 % of the school teachers were from the age group of more than 50 years. Among the participants, 57 (35.6%) were male, and 103 (64.4%) were females. About 78.7% of school teachers had teaching experience of more than 5 years. In all, 43.8% had received previous first aid training, but only 5.7% stated that emergency management of traumatic dental injuries was covered in their training curriculum. About 58 (36.3%) school teachers stated that they have received information about traumatic dental injury through the source of TV/ radio, and 43 (26.9%) reported that they acquired the information through their friends/relatives/colleague. About 10.5% of school teachers have never received any information about dental injury management. Almost 71.3% teachers reported that they had witnessed a case of dental trauma during their teaching career.

Section 2:

Case 1 (mild dental trauma): With regard to imaginary case presented in Table 1, Among 160 school teachers 102 (63.8%) correctly answered that the fractured incisor in a 9 year old is most likely to be a permanent, 31 (19.4%) answered primary teeth, while 27 (16.9%) were not sure which teeth it was. As an immediate action, 132 (82.5%) of school teachers correctly answered that they would contact his parents and advise them to send the child to the dentist immediately, 13.1% said that they would calm the child and send him back to class, while 4.4% school teachers did not know what to do.

The damaged front teeth likely to be	N (%)
Permanent teeth	102 (63.8)
Primary (milk teeth)	31 (19.4)
Don't know	27 (16.9)
Which of the following would you consider to be the most appropriate?	132 (82.5)
Contact his parents and advise them to send the child to dentist immediately	21 (13.1)
Calm down the child and send him back to class	7 (4.4)
Don't know what to do	

Table 1: Responses of school teachers regarding knowledge of mild traumatic dental injury (case scenario 1)

Case 2 (avulsed teeth): With regard to the imaginary case of tooth avulsion, shown in table 2. Of all those surveyed, only 70 (43.7%) responded that they would try to find the fractured teeth. When questioned regarding which immediate action they would take, only 84(52.5%) correctly responded that they would put the tooth in a solution and send the child to the dentist immediately. Unfortunately, 33.8% wrongly believed that they should concentrate on stopping the oral bleeding by compressing a cloth or handkerchief over the injury while 17 (10.6%) did not know what to do. When questioned regarding the type of health service they would seek, 42 (26.3%) would prefer a general physician, 4 (2.5%) pediatrician, 56 (35%) would take the child to general dentist and 58 (36.3%) would go to a pediatric dentist. When asked about suitable time to seek professional help only 44.3% knew the suitable time for treatment. In case of storing the fallen teeth, respondent would store the tooth in tap water 17 (10.6%), child's mouth 10 (6.3%), saline solution 43 (26.9%), milk 14 (8.8%), disinfecting solution 42 (26.3%), wrap the tooth in handkerchief or paper tissue 17 (10.6%) and 10.6% school teachers responded that they did not know where to store to the fallen tooth.

Would you try to find the fractured teeth?	
Yes	70 (43.7)
No	90 (56.3)
Which immediate action would you take?	
Would you look for the tooth, wash it and put it back in its place.	5 (3.1)
Stop the bleeding by compressing a cloth or handkerchief over the injury.	54 (33.8)
Put the tooth in a solution and send the child to dentist.	84 (52.5)
Don't know what to do.	17 (10.6)
What type of health service would you seek first?	
General physician	42 (26.3)
Pediatrician	4 (2.5)
General dentist	56 (35)
Pediatric dentist	58 (36.3)
Don't know	0 (0)
How urgent you think it is good to seek professional help if a tooth has been fallen out?	
Within 30 minutes	71 (44.3)
Within few hours	69 (43.1)
Within the first day	9 (5.6)
Next day	3 (1.9)
Within month	3 (1.9)
No care needed	5 (3.1)
Before you take the child to the dentist/ doctor, where would you store the fallen teeth?	
Tap water	17 (10.6)
Childs mouth	10 (6.3)
Saline solution	43 (26.9)
Milk	14 (8.8)
Disinfecting solution	42 (26.3)
Wrap the tooth in a handkerchief or paper tissue	17 (10.6)
Don't know	17 (10.6)

Table 2: responses of school teachers regarding knowledge of tooth avulsion (case scenario 2)

The knowledge section was composed of 7 questions, average knowledge score for all the school teachers was 4.17 (± 1.46) out of 7.

Section 3: Table 3 summarizes the response towards attitude questions. About 32.5% of school teachers had a positive response that it's the moral responsibility of school teachers to take care of the traumatic dental injuries that occur during the school hours. Regarding the importance of time for saving a tooth, 47.5% believed that time is not an important factor in saving a tooth. Only 37.5% positively agreed that if a tooth is lost in an injury requires prompt treatment to save the tooth. About 31.25% believed that dental emergency management must be included during the training of teachers. Only 35% agreed that dental trauma management is an emergency situation. Approximately 69.4% had a negative attitude towards wearing a mouth guard in outdoor/ contact sports. 25.6% had a negative attitude towards their involvement due to fear of legal consideration. About 30.6% felt that providing training in the management of dental trauma will be helpful for them in handling such situations.

Questions	Disagree N(%)	Can't say N(%)	Agree N(%)
It is moral responsibility of teachers to take care of the tooth injuries that happened in school hours.	62 (38.75)	46(28.75)	52(32.5)
Time plays an important role for saving a tooth.	76(47.5)	28(17.5)	56(35)
When a tooth is lost in injury, it can be saved, so there is an utmost need for treatment.	68(42.5)	32(20)	60(37.5)
Management of tooth injuries must be included during the training of teachers.	56(35)	54(33.75)	50(31.25)
Dental trauma management is an emergency situation.	34 (21.75)	70(43.75)	56(35)
Teacher's intervention in school dental injuries plays an important role in saving a tooth.	48(30)	67(41.9)	45(28.1)
Even though, emergency management of tooth injuries is thoroughly taken care by professionals but there is a need for teacher's involvement to timely save the tooth.	60(37.5)	55(34.4)	45(28.1)
Wearing a mouth guard should be made compulsory in all outdoor sports.	111(69.4)	20(12.5)	29(18.1)
In case of such emergency situations, there are no legal considerations that will put teachers in trouble.	41(25.6)	54(33.8)	65(40.6)
You feel providing training in management of dental trauma will be helpful to you in handling such situations.	35(21.9)	76(47.5)	49(30.6)

Case 2: Table 3, Distribution of responses regarding attitude for management of traumatic dental injury

The attitude section was comprised of 10 questions with three possible answers for each one. In this study, the mean score for attitude was 3.30 (± 1.77) out of 10.

Section 4: Self –assessment of school teachers with regard to management of dental trauma in schools: 65.6% claimed that they have little or no knowledge of dental trauma management. 93.1% of school teachers believed they need future education in this regard. Only

49.4% stated that they were able to take proper action in cases of trauma.

Section 5: Table 4 summarizes the response of school teachers with regard to strategies suggested to improve their knowledge. The most frequently answered strategies suggested by teachers was workshop 34.4%, followed by the regular visit of the dentist to school 31.3%, visual information 16.3%, educational campaigns to be included in first aid program 15.6%, written information 1.3%, whereas 1.3% of school teachers believes that they do not need to have this type of knowledge.

Question	N%
According to you in which way can we improve the teachers knowledge about management of dental trauma?	
Written information	2 (1.3)
Visual information	26 (16.3)
Workshops	34.4 (55)
Regular visit of the dentist to the school.	31.3 (50)
Educational campaigns to be included in first aid program.	25 (15.6)
Teachers do not need to have this type of knowledge.	2 (1.3)

Table 4, Distribution of responses regarding question of possible strategies to change the scenario

When participant were categorized according to the sum of their scores of the answers, it was found that adequate knowledge (score ≥ 5) was reported by only 46.9% of the participant and 60.6% of participant had a positive attitude (score > 5) towards emergency management of dental trauma in school.

The association between mean knowledge and attitude scores was analyzed using t-test which showed a high statistical significance $p (< 0.001)$. The knowledge and attitude categories of school teachers were compared with the length of service and those who witnessed traumatic dental injury in school using Pearson' chi square test. The statistically significant association was observed between length of service of the participant, and the participant those witnessed traumatic dental injury in school across attitude scores only while knowledge scores were not significant (table 5).

Cat.	Inadequate knowledge	adequate knowledge	P value#	Positive attitude	Negative attitude	P value#
(Years of service)						
0-5 years	16 (47.1%)	18 (52.9%)	0.8	12 (35.3%)	22 (64.7%)	0.006*
6-10 years	23 (57.5%)	17 (42.5%)		17 (42.5%)	23 (57.5%)	
11-15 years	15 (51.7%)	14 (48.3%)		4 (13.8%)	25 (86.2%)	
>15 years	31 (54.4%)	26 (45.6%)		30 (52.6%)	27 (47.4%)	
Witnessed			0.06			0.03*
Yes	55 (47.5%)	61 (52.6%)		53 (45.6%)	63 (54.4%)	
No	30 (68.2%)	14 (25%)		11 (25%)	33 (75%)	

Table 5, comparison of length of service and those who witnessed traumatic dental injuries during school hours with knowledge and attitude scores. $P < 0.05$, denotes statistical significance # denotes chi square.

DISCUSSION

The incidence of dental injuries in children is extremely high. The prevalence of TDI among 5-16 year-old school children in Bangalore city was 9.7%. Children's in public school had 2.4 times higher TDIs as compared to private schoolchildren.⁹ Prompt and suitable emergency management is extremely important for the future

prognosis of teeth affected by traumatic injuries especially in young children. Those most likely to be involved at the site of a trauma are school aged children and teachers, making teachers knowledge of traumatic dental injury emergency management fundamental to the provision of correct care at an injured child.¹⁰ This present study evaluated knowledge and attitude of public school teachers towards the emergency management of dental trauma.

In the present study, 56.3% of teachers did not receive any first aid training, for those who had received first aid training; only 5.7% stated that emergency management of traumatic dental injuries was covered in their training programme. This finding was similar to the study done by Al-Jundi SH et al 2005.¹¹ First aid training programme should also include dental injury treatment and management in their curriculum. It is worth noting that 71.3% teachers reported having witnessed a case of dental trauma in school children, and it may be because of the unsafe physical environment in the playgrounds and indeed throughout the school especially in public schools.

In case 1, it was found that 63.4% school teachers knew that the fractured teeth would be permanent in a 9-year old student. This finding is in contrast with the study done by Raof M et al.¹² Replantation is contraindicated in the deciduous dentition, because such a procedure may damage the permanent successor. Therefore, it is necessary that teachers should have a primary knowledge of type of dentition.¹³

Tooth avulsion is common in school and sports environments and requires immediate action, delay in replantation of avulsed tooth will dramatically reduce the prognosis and will lead to loss of the tooth. For this reason, it is important to educate the teachers that witness the accident of how to handle emergency procedures in such scenarios.¹² School teachers who are present or nearby when an injury have a potential to shorten the time interval between the avulsion and replantation.¹⁰ Only 52.5% responded correctly that would put the tooth in a solution and send the child to the dentist immediately. Approximately 33.8% were more concerned about stopping the bleeding or controlling the bleeding first. Probably they opted this answer because this is the most common instinctive reaction of most of the lay people in such cases, even the sight of blood sets off a panicky response focusing on controlling the bleeding first. Similar results were observed in study done by Raof M.¹² Sadly, the child would not benefit from this because undue delay in replanting the tooth would jeopardize its prognosis.¹⁴

When asked about the type of health service they would seek when faced with a case of the knocked out tooth, the majority of the respondents informed that they would first seek the help of a general dentist or pediatric dentist (71.3%) and about 28.7% would take the patient to a physician or pediatrician. This is a positive finding of the present study, and it shows that school teachers believe

that dentist can provide appropriate and prompt action in case of tooth avulsion when compared with other health professionals. The results were in the accordance to the study done by Kaur H and Pagliarin CL etal.¹⁵

In the current study, the majority of the teachers assessed (55.7%) were not aware of the optimum extra oral time an avulsed tooth can stay out of the patient's mouth without serious consequences or damage to the avulsed tooth. Similar findings were observed in the study done by Pagliarin CL etal.¹⁵

When immediate replantation is not possible, the tooth should be stored in an adequate transport medium to circumvent the damage to the periodontal ligament cells.¹⁵ The most common choice of the storage medium for the avulsed teeth was an antiseptic solution (26.3%), similar findings were observed in the study conducted on the school teachers in Punjab, only 8.8% of the school teachers opted correctly for milk as a storage medium.¹³ Milk has been recommended for temporary storage solution of avulsed teeth before replantation as it has a favorable osmolarity and composition for maintaining the viability of periodontal ligament cells and it preserves the cell viability for up to 3 hours.¹³

An antiseptic solution is not recommended as a storage medium as it will compromise the periodontal ligament cells, and adversely affect the prognosis of the replanted tooth. About 10.6% of the school teacher's wrongly opted tap water as the storage medium, tap water is not recommended as a storage medium because of its low osmolarity, and this hypotonic solution would cause the periodontal ligament cells to swell and rupture and should only be considered as a last resort when no other option is available.¹³

The knowledge section was composed of 7 questions, average knowledge score for all the school teachers was 4.17 (± 1.46) out of 7. A similar finding was observed in a study done by Kaur H etal.¹⁰ Chi square test showed that the difference in their responses to the knowledge part of the questionnaire was not statistically significant with regard to gender, first aid training, the length of service and those who have witnessed trauma in school. This result were in accordance to the study done by Al-Jundi SHetal.¹¹

The attitude of teachers regarding emergency management of avulsed teeth was overall 60.6%.approximately. This result is comparatively lesser than the other study done by Kaur H etal.¹³ In the current study, it was observed that the past dental trauma experience had no effect on dental trauma management; however, it did have a positive effect on their attitude.

The risk of children getting dental injuries during sports activities can be minimized by using a mouth guard and other oro-facial protective devices. Prevention of these oro-facial traumatic injuries is a very vital step because the patient does not have to suffer from the disfigurement, accompanying pain and mental anguish. An advantage of wearing mouth guards during contact

sports are of prime importance.¹⁶ In the present study, 69.4 % had a negative attitude towards wearing a mouth guard in outdoor sports. In India, there are no rigid enforcement for the usage of oro-facial protective devices during contact sports in schools and gymnasiums.¹⁷ About 40.6% of school teachers believed that there could be a legal consideration that will put them in trouble in case of such emergency. Probably the reason behind this might be that school teachers feel, they will be responsible for the outcome if something goes wrong while managing such situations. Chi square test showed that the difference in their responses to the attitude part of the questionnaire was statistically significant with regard to the length of service and those who have witnessed trauma in school.

Over 93.1% of our participants expressed an interest in receiving further education on traumatic dental injuries (TDIs) management, a similar finding was observed in a study done by Al-Jundi SH etal.¹¹ When school teachers were asked to suggest in which way can we improve their knowledge, 34.4% suggested workshops followed by 31.3% regular visit of the dentist to the school. Educational handouts or brochures are a usual and effective means of communication to provide information about health. Improvement of knowledge, as well as its retention during a long period of time, may be achieved if addition to the educational brochure, there are also lectures or workshops taught by the especially trained professionals.¹⁸

Prevention and management of traumatic dental injury should be considered as a major public health issue, and adequate resources should be allocated for the research, and the development of prevention programmes for the same.

CONCLUSION

This study reveals a lack of awareness and knowledge among school teachers about emergency management of dental injuries. This issue should be seriously addressed on a large scale. We suggest educational programs should be developed, for teachers to improve their knowledge so that proper dental first-aid procedures can be achieved. These programs should be properly designed to assure that proper information is retained with a positive effect on attitude, and self-assessed competence.

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