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Assessment of Knowledge of Primary School Teachers Regarding Emergency Management of Dental Trauma: A Cross-Sectional Study

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**Conflicts of Interest:** Nil

# Abstract

**Aim**: The aim of the present study was to assess the knowledge of primary school teachers regarding emergency management of dental trauma.

**Material and Methods:** The present study was conducted among 100 school teachers of Pune city schools using close ended questions. Which contain 24 questions to access their knowledge towards emergency management of dental trauma. Data was collected and analyzed by Statistical Product and Service Solution (SPSS).

**Result:** 61% Teachers agreed to have encountered such injuries in the past but only 23% of the school teachers

had received prior training in dental trauma management. Teachers were willing to acquire knowledge, and 77% answered they would like to attend training programs on dental trauma management.

**Conclusion:** The knowledge is average and teachers are will to attend training programs.

**Keywords:** emergency dental trauma, knowledge, teachers, school children.

# Introduction

Childhood is the most energetic period of life where a child try to learn and explore different things. In this hustle he/she is exposed to different traumatic injuries which can be bodily as well as dental traumas. Dental traumatic injuries comprises5% of all traumatic injuries seeking first aid and up to 17% of all bodily injuries among preschool children. These are injuries to the teeth, periodontium, and surrounding soft tissues .<sup>1</sup>

Dental trauma in children cause severe pain, stressful situations, and poor aesthetics which may cause low self-esteem.<sup>7</sup> In addition, children having untreated dental traumas may have malocclusion and chewing problems<sup>1</sup> The anterior teeth not only contribute to aesthetics but are vital for phonetics, mastication, the integrity of supporting tissues, as well as psychological and mental wellbeing of children<sup>-2</sup>

The three key predisposing factors in these kinds of injuries are as follows:1. Increased overjet of the teeth 2. Protrusion of the maxillary anterior teeth 3. Insufficient lip closure.<sup>3</sup>

The teeth that are most commonly involved are maxillary central incisor 37%, mandibular central incisor 18%, mandibular lateral incisor 6% and maxillary lateral incisor 3%.<sup>5</sup> Among these avulsion of permanent teeth is considered one of the most serious dental injuries requiring prompt and correct emergency management. The maxillary anterior are most commonly avulsed teeth in the primary and permanent dentition. Boys have about two to three times as more fractured teeth then girls.<sup>3</sup>

The traumatic displacement of the root of the primary tooth can affect the development of the permanent tooth germ, by altering the secretory phase of the ameloblast, leaving a defect known as circular enamel hypoplasia. Hypoplasia, including enamel discoloration and/or enamel defects, are the most frequent malformation sequelae of traumatic injuries to the primary dentition. In a long-term study of 255 traumatized primary teeth, 23% corresponding erupted permanent teeth showed developmental disturbances. The highest prevalence was found after intrusive injuries in primary teeth. <sup>4</sup>

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Epidemiological studies have shown that the prevalence of TDI in primary dentition ranges between 11% and 30%, and in permanent dentition, it lies in the range of 5%-29%. Most of TDIs are observed in children belonging to the age group of 8-11 years, and the majority have occurred at home followed by school.<sup>1</sup>Accidents in the school environment resulting from falls is very common and one of the main etiological factors of traumatic tooth injury at school. Such injuries are unscheduled for both the child and for teachers. Teachers are the first ones contacted when a child sustains such injuries.<sup>1</sup> Technical knowledge and clinical experience is essential to establish an accurate diagnosis and provide a rational treatment in such situations.<sup>5</sup> The role of school teachers in the prevention of traumatic dental injuries is a topic that has received a great deal of attention in the recent years.<sup>6</sup>

Present study was aimed to assess the knowledge, awareness, and attitude toward the emergency management of dental trauma among the school teachers of Pune, India. The other objectives were to correlate knowledge with demographic and professional characteristics and evaluate the need for oral health education programs for teachers.

# Material and methodology

The present study is a cross-sectional survey conducted among school teachers in Pune. It involved the completion of a self-administered, closed ended structured questionnaire by the teachers.

Inclusion criteria were primary school teachers, headmasters and principals of schools. All available primary school teachers of government, semi-aided and private schools were considered for the study.

Exclusion criteria were personnel who did not participate in the educational process.

The survey was voluntary in nature and strict confidentiality was assured. The respondents were asked to tick the most appropriate option from the alternative choices provided. The questionnaires thus filled were collected within one week. 24 questions were formulated on the knowledge and awareness regarding emergency management of dental trauma in children, all of which were of 'closed type'. The questionnaire was developed in English.

The questionnaire consisted of three parts. Part I included 6 questions on teachers demographic data. Part II consisted of 5 self-assessment regarding traumatic dental injury. Part III consisted of 13 questions based on different clinical dental trauma situations.

A Pilot study was conducted prior to the main study to assess the feasibility on a convenient sample of 20 teachers from primary schools in Pune city, Maharashtra, India. Based on the results of the pilot study, the reliability of questionnaire was determined by Table 1: Demographic characteristics of participants the Cronbach's alpha (0.8), the prevalence of knowledge among teachers was found to be 50%. The alpha error was 5% and power of the study was found to be 80%. Thus the sample size calculated for the study was 97.

The data collected was coded and statically analysed using Statistical Product and Service Solution (SPSS) version 21 for Windows (SPSSInc, Chicago, IL). level of significance was set up at P = 0.05.

## Results

A total of 100 school teachers completed the questionnaire. Table 1 shows the demographic characteristics of the participating teachers. According to the results, 80% of school teachers were females, and 20% were males. 46% of them were less than 30 years of age and the rest 54% were more than 30 years of age. Furthermore, 45% of them had a teaching experience of more than 10 years while 55% had an experience of less than 5 years.

Characteristics	Frequency (n)	Percentage (%)
Age group		
< 30 years	46	46
< 40 years	31	31
< 50 years	17	17
> 50 years	6	6
Gender distribution		
Male	20	20
Female	80	80
Qualification		
Graduation	59	59
Post Graduation	28	28
Diploma Course	13	13
Years of experience		
<10 years	55	55

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10-20 years	30	30
20-30 years	12	12
>30 years	3	3
Teaching section		
Pre-primary	15	15
Primary	85	85

In our study, 76% teachers always supervise the children during sports activities. When questioned about previous experience in the management of dental trauma 61 % agreed to have encountered such injuries in the past (p=0.021).

23% of the school teachers had received prior training in dental trauma management (p=0.013\*). When asked about teeth most frequently affected, 76 % of teachers correctly answered the upper front teeth are the ones most commonly traumatized.

Table 2:

Question	Always N (%)	Sometime N (%)	Rarely N (%)	Never N (%)	P value
Do you supervise the children during sport activities	76 (76%)	22 (22%)	1 (1%)	1 (1%)	P=0.006*

\*p<0.05 – significant difference

Table 3:

Question	Yes N (%)	No N (%)	Not sure N (%)	P value
Have you ever encountered a dental trauma in a child	61 (61%)	24 (24%)	15 (15%)	p=0.021*
Did you have first-aid training of dental trauma	23 (23%)	72 (72%)	5 (5%)	p=0.013*

 $p{>}0.05-no\ significant\ difference \qquad *p{<}0.05-significant\ difference$ 

Table 4: Which tooth are frequently affected by traumatic accidents

Questions	Frequency (n)	Percentage (%)
Upper front teeth	76	76
Lower front teeth	8	8
Upper back teeth	4	4
Lower back teeth	12	12

Chi = 12.65, p = 0.016\*

When asked about immediate emergency management in case the 3rd standard child's upper front tooth broke, 66% teachers answered that they will contact the parents and advise them to send the child to the dentist immediately. When enquired about immediate action to be taken if a tooth is completely out of its socket, 42% of teachers agreed they would save the tooth and look for

professional help. Furthermore, 30% of teachers answered they would replace the tooth back in the socket and meet the dentist immediately and 40% of teachers reported that they would discard the tooth. When asked about holding the avulsed tooth 37% teachers answered they would use the upper part of the tooth. When enquired about the media to carry the tooth, 35% preferred water as the medium followed 33% who preferred a disinfecting solution to transport the tooth to Table 5: the dentist. Only 11% agreed to carry the tooth in fresh milk while 9% answered saliva as the medium for the transport of tooth to dentist. Regarding the urgency of reimplantation of the avulsed tooth, 32% of teachers agreed the tooth should be put back immediately or within 30 minutes of avulsion. Lastly, teachers were willing to acquire knowledge, and 77% answered they would like to attend training programs on dental trauma management.

Questions	Answers	n(%)
Your immediate emergency management in case of 3rd standard child's upper front tooth broke	Calm down the child and send him back to the class	24
	Contact parents and advise them to send the child to the dentist immediately Look for the broken tooth piece and send the child with it	66
	Not sure what to do	10
The immediate emergency action	Stop the bleeding by compressing a cloth over the injury	43
avulsion is	Look for the tooth, wash it and put it back in its place	9
	Save the tooth in child's mouth and look for professional help Place the tooth in a paper and send the child to dentist after the school time	42
	Not sure what to do	6
What type of health service would	General Dentist	55
	Paediatric Dentist	31
	Physician	12
	Emergency ward	2

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If the tooth has fallen on the dirty	Rub the tooth under tap water and put it back into its socket	30
ground what would you do	Rub away the dirt by a sponge and soap and put it back in its place	15
	Put it back into the socket immediately without cleaning	2
	Discard the tooth	40
	Not sure what to do	13
Which part of the tooth you will	Upper part of tooth	37
hold of the knocked out tooth	Middle part of tooth	17
	Lowest part of tooth	10
	Not sure	36
How would you transport the tooth on the way to the dentist if	Put tooth in ice	11
tooth on the way to the dentist if you cannot put the tooth back into	Put tooth in liquid	39
Its socket	Put tooth in child's mouth	4
	Put tooth in child's hand	5
	Wrap the tooth in a handkerchief or paper tissue	30
	Not sure	11

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Mark desirable liquids for storing	Tap water	35
a tooth that has been knocked out		
while you are on your way to the	Fresh milk	11
dentist		
	Child's saliva	9
	Spirit	6
	Saline	6
	Disinfecting solution	33
Which is the best time for placing	Immediately after accident	32
the tooth back if it is knocked out		
of the mouth?	Within 30 minutes after bleeding has stop	32
	Within same day	11
	This is not a crucial factor	6
	Not sure what to do	19
How urgent do you think that you should visit a dentist if a	Immediately within 30 minutes	40
permanent tooth is knocked out	Within a few hours	28
	Within a few days	14
	Any time	12
	Not sure	6

Your student bumped into a chair	I would relocate the tooth with my finger and send him/her immediately	14
and hurt his/her upper front tooth	to the dentist.	
which is moved towards the palate		
however intact. The patient is	I would not touch the tooth and send him/her immediately to dentist	51
otherwise conscious and unhurt.		
What will you do?	I would do nothing but tell him/her to go to a dentist if he/she has pain in	20
	the future	
	Not sure	15

# Discussion

This survey investigated the knowledge and awareness of school teachers regarding emergency management of dental trauma in school children of Pune city. In the present study, only 23% of school teachers had received prior first-aid training in dental trauma management. In a similar study by Maher Alsulami in Saudi Arabia we found low levels of knowledge of first aid training among school teachers.<sup>16</sup>

Furthermore, in a study by Newman *et al.* 67% of teachers in England had been specifically trained regarding dental trauma and 91% had been trained in first aid, which is significantly higher than that obtained in our study.<sup>8</sup>

In case of trauma to a child in school, 66% of teachers in our study answered they would call the child's parents. This represents an attitude of dental neglect and the dearth of knowledge regarding action to be taken in the event of dental injuries in school. This is similar to a study by Syed Yawar Ali Abidi *et al.* in which the majority of 55% of teachers in Karachi answered they would call the students parents at the time of avulsion injury.<sup>6</sup> In the present study, 76% of teachers correctly answered the upper front teeth as the ones most frequently affected by trauma. Regarding the immediate action to be taken in case of avulsion, 42% correctly answered they would replace the tooth back in the socket and immediately look for professional help. The poor response of teachers in this study highlights the lack of knowledge about avulsion injuries and possibility of reimplantation of avulsed teeth.<sup>6</sup> Similarly, low awareness was reported in the study conducted by Vergotine RJ *et al.* in which only 12% of school teachers and 7% of physical education teachers correctly answered the immediate management of avulsed teeth.<sup>9</sup> In contrast to the higher awareness of 74% reported by Sae-Lim V, *et al.*<sup>10</sup>

In the present study, 40% teachers responded that they would discard the tooth. Similar studies showed that 20% of participants would discard an avulsed tooth.<sup>15</sup>

Many factors during first-aid management are important and can decide future good or bad prognosis. One of the most significant points for a good avulsed tooth prognosis is the storage media.<sup>17</sup> According to Tzigkounakis V and Merglova V, storage medium and extra alveolar time are critical factors that may impact the outcome of the treatment of an avulsion injury.<sup>11</sup> Storage media must possess an osmolarity and pH compatible for preserving the vitality of the periodontal ligament cells. Milk has been currently considered as an appropriate storage medium due its ideal physiological

properties that maintain the vitality of the periodontal ligament cells for nearly up to six hours. Storage in tap water is inappropriate as its hypotonicity causes the death of the cells. Storing in saliva in the buccal vestibule carries the risk of swallowing in children. Thus, an ideal biological medium for the storage of avulsed tooth until reimplantation must preserve the vitality of the cells, reduce the inflammatory response and prevent associated adverse consequences of analysis and root resorption.<sup>12</sup> In the present study, barely 11% teachers responded correctly as milk the storage medium for the avulsed tooth. This reveals lack of awareness regarding the need to carry an avulsed tooth to the dentist and its appropriate storage media. These findings of poor awareness of storage media were in accordance with other studies by Mesgarzadeh AH, et al. and Pithon MM et al. 13,14

In the current study, majority of the respondents are not satisfied with the knowledge of emergency management of dental trauma and 77% of them would like to attend an educational program on management of dental trauma.

The limited number of study participants can be considered as a drawback of the study. Hence, further studies must be conducted to evaluate the knowledge of teachers over a larger area and the impact of training programs on their attitude in management of dental trauma. Various projects for educating school teachers about trauma management must be undertaken. Developing interactions between pedodontists and the school teachers through seminars and demonstrations for teachers will create a paradigm shift in improving the prognosis of traumatized teeth.<sup>6</sup>

### Conclusion

The conclusions drawn from the present study are the knowledge and attitude concerning the immediate

management of dental trauma in children among school teachers in Pune City is average. Furthermore, their knowledge about storage medium for avulsed tooth is poor. They were unaware of the urgency of reimplantation of avulsed tooth. Lastly, teachers are willing to attend training programs for the management of dental injuries and had a favorable attitude towards the same.

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