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Knowledge and attitude among schoolteachers regarding traumatic dental injuries in children: A descriptive study

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Abstract

Background/Objectives: Traumatic dental injuries (TDIs) in children are a prevalent issue worldwide, often leading to significant immediate and long-term consequences. This study aimed to shed light on the current state of knowledge and attitudes among schoolteachers, paving the way for targeted interventions that can make a significant difference in the management of traumatic dental injuries in the school environment.

Methods: The cross-sectional study was conducted on teachers in the selected schools using Self-administered questionnaires. The questionnaire included baseline characteristics including type of school the teachers work at (Government/Private), demographics. The second part included questions on the attitude of the teachers about TDI, and the knowledge of the participants about TDI. Statistical analysis was performed using SPSS, with statistical significance set at $p < 0.05$.

Results: Out of 90 school teachers 50 (55.5%) were male, 55 (61.1%) were >30 years of age. Only 25 (27.8%) of the teachers received advice on what to do at the time of any kind of dental trauma. Majority of the participants [48 (53.3%)] wanted to attend an educational program on management of dental trauma. Poor knowledge was the most seen among the teacher's ages more than 30 years, which was statistically significant. Good knowledge was the most seen among the teachers with a master's degree.

Conclusions: In conclusion, school teachers' knowledge and attitudes toward traumatic dental injuries are crucial for effective emergency management. Addressing knowledge gaps and psychological aspects can empower teachers to respond appropriately, improving outcomes for affected children.

Keywords: Traumatic dental injuries, dentoalveolar injuries, avulsion, knowledge

Introduction

Traumatic dental injuries (TDIs) in children are a prevalent issue worldwide, often leading to significant immediate and long-term consequences^[1]. The prevalence of dental trauma ranges from 4.9% to 37% in different countries, and half of the children experience dental trauma^[2]. From childhood until puberty, dental trauma appears to happen often, with boys being more susceptible than girls because of their hyperactivity. When it comes to dental trauma, boys often experience it between the age groups 2-4 and 9-10, whereas girls typically experience it between the ages of 2 and 3^[3]. These injuries, which can range from minor chips to severe dislocations or avulsions of teeth, not only affect the physical health of children but also their psychological well-being, self-esteem, and quality of life. The maxillary central incisor (37%), mandibular central incisor (18%), mandibular lateral incisor (6%), and maxillary lateral incisor (3%) are the teeth that are most often affected^[4]. Given the high incidence of TDIs, particularly in active and playful environments such as schools, the role of schoolteachers in managing these injuries becomes paramount, and hence their thorough knowledge regarding this matter can improve the prognosis^[5].

The most frequent causes of dentoalveolar injuries include motor vehicle accidents, falls, physical activity, and blows from hard objects^[6]. The most common consequences of TDIs are crown or root fracture, luxation injuries, avulsion, and damage to the alveolar bone, soft tissue, gingiva, and tooth pulp.

Schoolteachers, due to their close daily interactions with children, are often the first responders in the event of a dental injury. Their immediate actions can critically influence the prognosis of the injury. For instance, appropriate management of a knocked-out tooth within the first few minutes can significantly increase the chances of successful reimplantation and long-term viability. Despite this, studies indicate that there is a considerable variation in the level of knowledge and preparedness among teachers regarding the handling of such emergencies. This knowledge gap can lead to suboptimal management of TDIs, potentially exacerbating the injury and its associated outcomes.

Previous research has shown that while some teachers possess basic knowledge about dental injuries, many lack specific details about the immediate steps to take following an injury. For example, a significant number of teachers are unaware of the importance of preserving a knocked-out tooth in a suitable medium, such as milk or saline, before reimplantation. Additionally, there are often misconceptions about the urgency of seeking professional dental care following a TDI. Such gaps in knowledge can lead to delayed or inappropriate responses, ultimately affecting the child's recovery and long-term oral health [7, 8].

To address these issues, comprehensive training programs for school teachers are essential. These programs should cover a range of topics, including the types of TDIs, their immediate and long-term management, and the critical importance of timely intervention. Practical demonstrations, scenario-based training, and regular refresher courses can significantly enhance teachers' confidence and competence. Moreover, collaboration with dental professionals to provide hands-on training and create a supportive network for teachers can further improve outcomes.

This research aims to shed light on the current state of knowledge and attitudes among schoolteachers, paving the way for targeted interventions that can make a significant difference in the management of traumatic dental injuries in the school environment.

Materials and Methods

Study Design and Participants

This cross sectional study was conducted at different schools in south and north 24 paraganas, West Bengal between March 2024 and April 2024.

The sample size was calculated using *G*Power* software. Considering the effect size 0.45, α err 0.05 and Power 0.80, and 10% non-response rate, the total sample size was 90.

Study Tool

Self-administered questionnaires were distributed by the author to the teachers in the selected schools. The questionnaire was formed based on previous studies.

The questionnaire included a total of 15 questions. The first part included baseline characteristics including type of school the teachers work at (Government/Private), age, sex, and education.

The second part included questions on the attitude of the teachers about TDI - "Do you know what an avulsed tooth is?"; "Have you experienced an accident where the tooth of a child was avulsed?"; "Have you received any advice on what to do at the time of any kind of dental trauma?"; "Do you think it is important to have an educational program on management of dental trauma?"; "Would you like to attend an educational program on management of dental trauma?"

The third part included questions on the knowledge of the

participants about TDI - "What will you do immediately after a traumatic dental injury of a child?"; "How would you hold the tooth?"; "Knowledge regarding the time for the dentist's opinion needed after trauma"; "How will you clean the avulsed teeth?"; "How will you store and carry the avulsed tooth to dentist?"

Each correct answer was scored 1 and incorrect answer was scored 0. A total score was given to each questionnaire as a percentage of total correct answers. A score of $\geq 80\%$ was considered good knowledge, a score 50%-79% was considered as acceptable knowledge, and a score $< 50\%$ was considered poor knowledge. In our study case the highest score was 5.

Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of Guru Nanak Institute of Dental Science and Research. All participants signed terms of an informed written consent. In addition, the purpose and the methodology of the survey was explained to each participant, they were assured of data confidentiality, and were informed that participation was voluntary. The study was conducted following the Declaration of Helsinki.

Statistical Analysis

The tabulation of the data, generation of graphs and tables were done in Microsoft Excel. The statistical analysis was done using IBM SPSS statistics 27.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics including frequency and percentage were calculated for socio-demographic characteristics of participants. Chi-square test was used for measuring the association and correlation between the variables. The level of significance was fixed at $p=0.05$ and any value less than or equal to 0.05 was considered to be statistically significant.

Results

The questionnaire was distributed to a total of 90 school teachers. Of these, 50 (55.5%) were male, 55 (61.1%) were >30 years of age. Government school teachers were 50 (55.5%). Of the teachers, 30 (33.3%) had bachelors' degree and 60 (66.7%) had Masters' degree [Table 1].

Regarding the attitude of the teachers about TDIs, 57 (63.3%) of them knew what an avulsed tooth is; 30 (33.3%) experienced an accident where the tooth of a child was avulsed. Only 25 (27.8%) of the teachers received advice on what to do at the time of any kind of dental trauma. Thirty-six (40%) teachers thought it is important to have an educational program on management of dental trauma. Majority of the participants [48 (53.3%)] wanted to attend an educational program on management of dental trauma. [Table 2]

Table 3 presented the knowledge of the participants about TDIs. Thirty-four (37.8%) participants said that they will Refer the child immediately to dentist with the broken tooth immediately after a traumatic dental injury of a child, 16 (17.8%) responded that will put back the tooth into the socket and rush to the dentist, 40 (44.2%) of them would wash the child's mouth with tap water and take the tooth in a wet cloth, and 10 (11.1%) would not be concerned about the broken tooth. Regarding the question on how to hold the avulsed tooth, majority of the participants [50 (55.6%)] would hold it anywhere. Regarding the time for the dentist's opinion needed after trauma, 39 (43.3%) of the participants had no idea, 23 (25.5%) responded that opinion was needed immediately within 30 minutes, 17 (19%) responded within few hours, and the rest responded that opinion is needed within 24 hours.

Regarding cleaning the avulsed teeth, 20 (22.2%) responded that they would Scrub the tooth to remove the dirt, 28 (31.1%) said they would rinse with tap water, 14 (15.5%) responded that they would Wash the avulsed tooth with sterile saline, 11 (12.2%) would wipe the tooth with tissue paper, and 17 (19%) responded that there was nothing to do. Regarding storing and carrying the avulsed tooth to dentist, 8 (8.9%), 15 (16.7%), 13 (14.4%), 10 (11.1%), 15 (16.7%), 9 (10%), 4 (4.4%), and 9 (10%) participants responded ice, tap water, wet tissue, sterile saline, cotton pad, child’s mouth, any aseptic solution, and milk, respectively.

Figure 1 demonstrates distribution of knowledge among the study samples. Good knowledge was observed among 14% of the participants, Acceptable knowledge was seen among 28%, and poor knowledge was observed among 58%.

Table 4 and figure 2 presents the comparison of age of the teachers with knowledge about dental traumatic injury. Poor knowledge is the most seen among the teacher’s ages more than 30 years. Chi-square analysis shows a statistically significant result. Table 5 and figure 3 presents the comparison of gender of the teachers with knowledge about dental traumatic injury. Poor knowledge is the most seen among the male teachers. Chi-square analysis does not show a statistically significant result. Table 6 and figure 4 presents the comparison of educational qualification of the teachers with knowledge about dental traumatic injury. Good knowledge is the most seen among the teachers with a master’s degree. Chi-square analysis shows a positive association between educational qualification and knowledge which is not statistically significant.

Table 1: Demographic details of the study population

Variables		Frequency (%) (n=90)
Age	≤30	35 (38.9%)
	>30	55 (61.1%)
Gender	Male	50 (55.5%)
	Female	40 (44.5%)
Education	Bachelors	30 (33.3%)
	Masters	60 (66.7%)
Type of School	Government	50 (55.5%)
	Private	40 (44.5%)

Table 2: Attitude of the study population about traumatic dental injuries

Sl no	Questions	Answers	Frequency (%) (n=90)
1	Do you know what an avulsed tooth is?	Yes	57 (63.3%)
		No	33 (36.7%)
2	Have you experienced an accident where the tooth of a child was avulsed?	Yes	30 (33.3%)
		No	60 (66.7%)
3	Have you received any advice on what to do at the time of any kind of dental trauma?	Yes	25 (27.8%)
		No	65 (72.2%)
4	Do you think it is important to have an educational program on management of dental trauma?	Yes	36 (40%)
		No	54 (60%)
5	Would you like to attend an educational program on management of dental trauma?	Yes	48 (53.3%)
		No	42 (46.7%)

Table 3: Knowledge of the participants about traumatic dental injuries

Sl no	Questions	Answers	Frequency (%) (n=90)
6	What will you do immediately after a traumatic dental injury of a child?	Refer the child immediately to dentist with the broken tooth	34 (37.8%)
		Put back the tooth into the socket and rush to the dentist	16 (17.8%)
		Wash the child’s mouth with tap water and take the tooth in a wet cloth	40 (44.2%)
		Would not be concerned about the broken tooth	10 (11.1%)
7	How would you hold the tooth?	From the crown	28 (31.1%)
		From the root	12 (13.3%)
		Anywhere	50 (55.6%)
8	Knowledge regarding the time for the dentist’s opinion needed after trauma	Immediately within 30 minutes	23 (25.5%)
		Within few hours	17 (19%)
		Within 24 hours	11 (12.2%)
		Don’t know	39 (43.3%)
9	How will you clean the avulsed teeth?	Scrub the tooth to remove the dirt	20 (22.2%)
		Rinse with tap water	28 (31.1%)
		Wash with sterile saline	14 (15.5%)
		Wash with hydrogen peroxide	0
		Wipe the tooth with tissue paper	11 (12.2%)
10	How will you store and carry the avulsed tooth to dentist?	Nothing to do	17 (19%)
		Ice	8 (8.9%)
		Tap water	15 (16.7%)
		Wet tissue	13 (14.4%)
		Sterile saline	10 (11.1%)
		Cotton pad	15 (16.7%)
		Child’s mouth	9 (10%)
		Any aseptic solution	4 (4.4%)
Milk	9 (10%)		
Don’t know	7 (7.8%)		

Table 4: Association of age with knowledge

Age group (in years)	Knowledge			Chi-square p-value
	Good	Acceptable	Poor	
≤30	6 (46.2%)	11 (44%)	18 (34.6%)	0.026*
>30	7 (53.8)	14 (56%)	34 (65.4%)	

*Statistically significant (p-value <0.05)

Table 5: Association of gender with knowledge

Gender	Knowledge			Chi-square p-value
	Good	Acceptable	Poor	
Male	5 (38.5%)	13 (52%)	32 (61.5%)	0.489
Female	8 (61.5%)	12 (48%)	20 (38.5%)	

Table 6: Association of education with knowledge

Gender	Knowledge			Chi-square p-value
	Good	Acceptable	Poor	
Bachelors	3 (23%)	7 (28%)	20 (38.5%)	0.049*
Masters	10 (77%)	18 (72%)	32 (61.5%)	

*Statistically significant (p-value <0.05)



Fig 1: Distribution of knowledge among the study sample

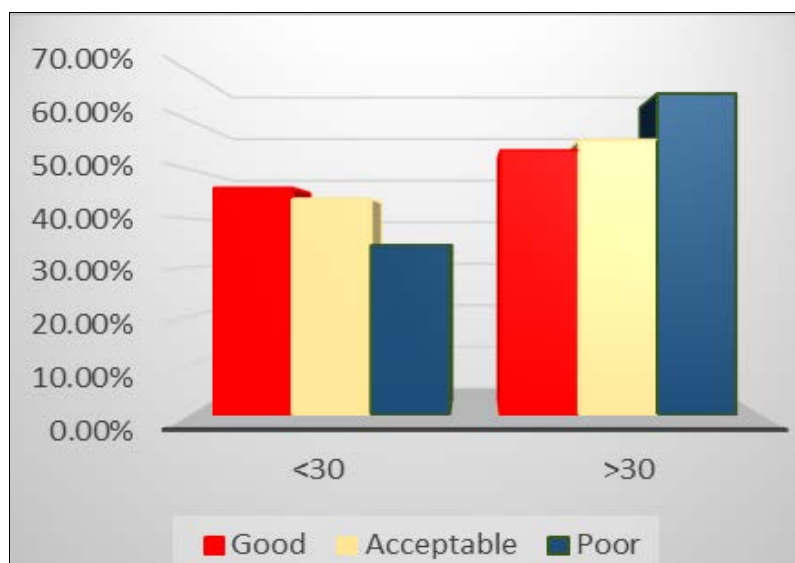


Fig 2: comparison of age with knowledge

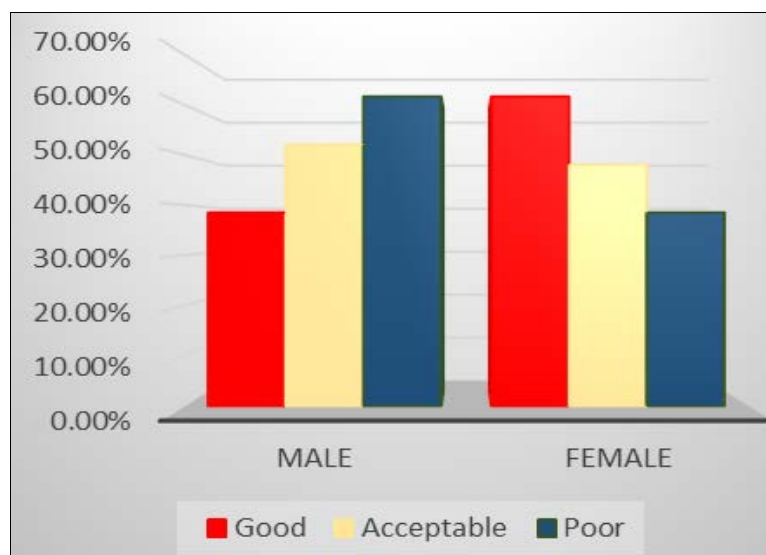


Fig 3. Comparison of gender with knowledge



Fig 4: Comparison between education and knowledge

Discussion

This study focused on the current state of knowledge and attitudes among schoolteachers, paving the way for targeted interventions that can make a significant difference in the management of traumatic dental injuries in the school environment. Understanding the current knowledge and attitudes of schoolteachers towards TDIs is crucial for several reasons. First, it helps identify the existing gaps in their understanding and the common misconceptions that might hinder effective management. Second, it highlights the need for targeted educational interventions and training programs aimed at improving their competency in dealing with dental emergencies. Finally, it underscores the importance of integrating dental emergency management into broader school health policies and emergency response protocols.

In the current study, regarding the attitude of the teachers about TDIs, 57 (63.3%) of them knew what an avulsed tooth is; 30 (33.3%) experienced an accident where the tooth of a child was avulsed. Only 25 (27.8%) of the teachers received advice on what to do at the time of any kind of dental trauma. This number is very less compared to a previous study where 70.6% of teachers had received first aid training on dental trauma.⁹ Another study conducted by Pithon *et al.*^[10] reported that few of the participants were given some training on how to deal with emergency situations during their undergraduate course (13.5%) or after it (38.3%). In another study on awareness in primary school teachers regarding traumatic

dental injuries in children and their emergency management, most of the teachers (85.7%) did not receive any first-aid training for management of dental trauma^[3].

Significant number of respondents (44.2%) were not conscious about what to do immediately after a traumatic dental injury of a child. Teachers were also not aware about the critical role of time for the dentist's opinion needed after trauma (43.3%). These findings were in line with the writings of Prasanna *et al.*^[11], who concluded that as little as 23% of teachers knew the management of severe tooth injuries, such as tooth avulsion. Most of the earlier studies also showed that the teachers advocated transferring the dentally injured patients with avulsed tooth to a dentist. They, however, did not agree in taking any active role in managing avulsed tooth trauma.

In this study, 16 (17.8%) teachers had the knowledge of replacement of knocked-out tooth back to the socket. This might be due to unawareness of the teachers regarding replantation of avulsed tooth. In a study conducted by Hamilton *et al.*^[12] only 10.7% of the respondents knew that the knocked-out tooth can be replaced back into its socket but they feared being sued for replanting the tooth incorrectly. A study by Prasanna *et al.*^[11] in their study, reported that, 24% teachers had the knowledge of replacement of knocked-out tooth back to the socket while the 76% did not.

The appropriate storage media to permit periodontal and pulpal healing are milk, saline water and saliva.¹³ However,

most of time, saliva is the only quick media that is available. In our study, only 9 (10%) and 10 (11.1%) teachers, respectively, had the knowledge to store the avulsed tooth in appropriate media such as milk and saline water. These results are consistent with a previous study where only 12% teachers had the knowledge to store the avulsed tooth in appropriate media such as milk and saline water and a total of 39% responded that they will put the avulsed tooth in cotton rolls as the avulsed tooth obviously will get contaminated with blood.¹¹ On the other hand, in another study conducted on teachers of Porto Rico statistically had more correct answer for transportation media for avulsed tooth^[13]. In a study by Raphael and Gregory, only 5% respondents knew that 'milk' was medium of choice for both washing and transporting avulsed tooth. The concepts of 'dry storage' among rural parents also indicate that there is lack of knowledge in this group on how avulsed tooth should be handled after accident. The current study found that majority of the teachers lacked knowledge about TDIs as well as the proper emergency management in the case of TDI. According to our study poor knowledge was seen among 58% of the participants. This finding is similar to that of some other studies reporting knowledge deficiency about dental trauma among teachers^[5]. Majority of the participants (53.3%) wanted to attend an educational program on management of dental trauma. Thirty-six (40%) teachers thought it is important to have an educational program on management of dental trauma. In a previous study by Prasanna *et al.*^[11] similar trend were seen where a vast majority (85%) of teachers showed keen interest in knowing about the emergency management of knocked-out tooth compared with few others who did not.

We also compared the differences in the responses of participants in relation to age, gender, and the education of the teachers. Statistically significant associations were found between poor knowledge and age more than 30 years, and good knowledge and a teacher having a Masters' degree.

Our study had some limitations. First, the sample size was small. Future studies should be conducted with a larger sample size. Second, the present study did not comprehensively pursue information regarding teachers' educational experiences. A study in the future should be conducted to expand on aspects related to these experiences and reasons for lack of uniformity among school teachers, the type of dental trauma courses attended, whether courses were mandated or voluntary as well as the institutional source of these courses and their knowledge reference. Finally, the possibility of reverse causality cannot be excluded due to the cross-sectional nature of the study.

In conclusion, the knowledge and attitudes of schoolteachers regarding traumatic dental injuries in children play a vital role in the effective management of these emergencies. By identifying the gaps in knowledge and addressing the psychological aspects of emergency response, we can empower teachers to act decisively and appropriately, thereby improving the prognosis for affected children.

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