



TO EVALUATE KNOWLEDGE, AWARENESS, AND ATTITUDE REGARDING EMERGENCY MANAGEMENT OF DENTAL TRAUMA AMONG (ELEMENTARY) SCHOOL TEACHERS OF KHYBER PAKHTUNKHWA PROVINCE IN PAKISTAN

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ABSTRACT:

Objective: This study aimed to evaluate the knowledge, awareness, and attitudes of elementary school teachers in the Khyber Pakhtunkhwa (KPK) province of Pakistan regarding the emergency management of dental trauma.

Materials and methods: A total of 618 questionnaires were distributed among elementary school teachers across various districts of KPK, representing both private (34%) and public (66%) sectors. Data were collected through a survey utilizing a self-administered questionnaire, which was structured into three major sections comprising multiple-choice questions.

Results: Out of 618 teachers, 610 returned the completed questionnaire. Among them, 54% were male and 46% were female, with the majority (60%) having less than three years of teaching experience. The responses indicated a broad variation in knowledge and awareness levels. Notably, 79% of participants had never received any first aid training for trauma management, and 60% had never encountered a case of dental trauma requiring immediate emergency care.

When asked about their approach to managing dental trauma, 67% of respondents indicated they would stop the bleeding, contact the child's parents, and refer them to a dentist. In contrast, 20% suggested placing the avulsed tooth in a solution and guiding the child, while only 13% were aware of the correct first-aid procedure—reimplanting the tooth in its socket before referral.

Regarding the appropriate handling of an avulsed tooth, 80% of teachers stated they would wrap it in tissue paper, 13% preferred storing it in milk, and 7% opted for tap water for transportation.

Conclusion: The findings suggest that the majority of elementary school teachers in Khyber Pakhtunkhwa lack adequate knowledge of emergency dental trauma management. However, they demonstrated a positive attitude towards learning and adopting the appropriate practices for handling such situations.

Key words: Knowledge; Awareness; Attitude; Emergency Management; Dental Trauma

INTRODUCTION:

An injury to the mouth, including lips, teeth, periodontium, alveolar bone, associated soft tissues, and gums is referred to as dental trauma.^[1] Traumatic Dental Injuries (TDIs) are prevalent and found among children of growing age^[2], ranging from superficial tooth fracture to extensive trauma involving dentoalveolar damage to the supporting structure and displacement of a tooth or complete avulsion.^[3] It has the potential to produce both functional and aesthetic issues, as well as a negative influence on the patient's quality of life. Although dental trauma can occur anywhere at any age, the majority of such incidents are reported in school-aged children during school hours or while playing at home.^[4] Sixty percent of TDIs occur in sports, and schools are the often second most common location where TDIs occur.^[3] During school hours, a considerable number of school-aged children endure trauma to their primary or permanent dentition in the presence of school teachers.^[5] School teachers are considered an essential group because most dental injuries occur when a child is in the school environment.^[6] The period following a traumatic dental injury is critical in determining the prognosis, particularly in the case of an avulsed permanent tooth, because as long as the replantation takes place within 30 minutes after avulsion, the prognosis is usually good.^[7] According to Andreessen and Andreessen, Tooth avulsion refers to the complete displacement of a tooth from its socket due to an accident injury. Dental avulsion comprises 0.5%–16% of all traumatic dental injuries.^[1] The face of the child and anterior teeth, being the most exposed parts of the body, show a higher risk to face fracture. Also, maxillary central incisors are ranked the most frequently avulsed teeth.^[8] Boys show a three times higher incidence of dental trauma as compared to girls because of their active involvement in various sports and outdoor games.^[9] In an epidemiological study conducted on 862 Saudi schoolboys in 2011, the prevalence of dental trauma was as high as 34% among 12-14-year-old boys attending 20 schools in Riyadh.^[10] Therefore, dentists are not the only ones responsible for the emergency approach in managing dental trauma alone, school teachers can play an equally vital role as they are available at the site of the accident, and initial management is the prime deciding factor for a favorable prognosis.

Materials And Methods:

Data for this cross-sectional study were collected over four months, from September 2024 to December 2024. The study was conducted among public and private elementary school teachers in Khyber Pakhtunkhwa. Ethical approval was obtained from the heads of institutions and school principals. Participation in the survey was voluntary, and only teachers who provided informed consent were included. Before participation, teachers were informed about the study's objectives, and consent was obtained accordingly. A structured, close-ended questionnaire comprising three sections was used for data collection [Proforma 1]. To facilitate prompt decision-making, participants were provided with multiple-choice options. The questionnaire was pretested in a pilot study involving ten teachers, who were subsequently excluded from the final analysis.

Part 1: Personal Record			
Gender: Male	<input type="checkbox"/>	Female	<input type="checkbox"/>
Age: 20-29 Years	<input type="checkbox"/>	30-39 Years	<input type="checkbox"/>
		40-49 Years	<input type="checkbox"/>
		>50 Years	<input type="checkbox"/>
Educational Level: Diploma	<input type="checkbox"/>	University	<input type="checkbox"/>
		Higher Education	<input type="checkbox"/>
School Type: Public Sector	<input type="checkbox"/>	Private Sector	<input type="checkbox"/>
Service Period: Less than 3 Years	<input type="checkbox"/>	3-6 Years	<input type="checkbox"/>
		More than 6 Years	<input type="checkbox"/>
Have you received first-aid training?	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
If yes, did it involve the management of a dental emergency?	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
Did you witness any cases of dental trauma in your students?	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
If yes, how many cases did you witness? 1-2	<input type="checkbox"/>	3-4	<input type="checkbox"/>
		>5	<input type="checkbox"/>

Part 2: Scenario Based (You can tick multiple options)	
Scenario 1: A 9-year-old student got hit by a cricket ball and broke his upper front tooth.	
1) The broken tooth is most likely going to be?	
Milk Tooth	<input type="checkbox"/>
Permanent Tooth	<input type="checkbox"/>
Not Sure	<input type="checkbox"/>
2) The immediate emergency management, in this case, should be?	
Reassure the student and send him back to class	<input type="checkbox"/>
Send the child to the school nurse if available.	<input type="checkbox"/>
Contact the child's parents and advise them to quickly take the child to a dentist.	<input type="checkbox"/>
Not sure what to do	<input type="checkbox"/>
Scenario 2: An 11-year-old girl fell from the school stairs, and her upper front tooth fell out on the floor.	
• The immediate emergency management, in this case, should be?	
Stop bleeding and send the child back home.	<input type="checkbox"/>
Put the tooth in any solution and send the child back home with it.	<input type="checkbox"/>
Put the tooth back in its place in the mouth and send the child to a dentist immediately.	<input type="checkbox"/>
Not sure what to do	<input type="checkbox"/>
What would you do if you decided to place the tooth back but it fell on the floor?	
You would put the tooth straight back in its place without any pretreatment.	<input type="checkbox"/>
You would rinse the tooth under tap water.	<input type="checkbox"/>
You would scrub the tooth gently with a toothbrush or cloth.	<input type="checkbox"/>
• How urgently do you think you should seek professional help if a permanent tooth is knocked out?	
Within 30 Minutes	<input type="checkbox"/>
Within a few hours	<input type="checkbox"/>
Before next day	<input type="checkbox"/>
Not Sure	<input type="checkbox"/>
• If you do not reimplant the tooth, how would you ideally transport it to the dentist?	
Tap Water	<input type="checkbox"/>
Milk	<input type="checkbox"/>
Child's Mouth	<input type="checkbox"/>
Tissue Paper	<input type="checkbox"/>
Part 3: Awareness And Attitude	
• Do you think it is essential to seek emergency management for dental trauma?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Do you think that your knowledge of emergency management is satisfactory?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Would you like to receive short training in emergency management of DTIs	
Yes <input type="checkbox"/>	NO <input type="checkbox"/>

RESULTS:

Out of 618 school teachers from both public (34%) and private (66%) sectors, 610 returned the questionnaire. Among the respondents, 54% were male and 46% were female. The majority (60%) had less than three years of service. Notably, 79% had not received any first aid training, and 60% had never witnessed a case of dental trauma.

[Table 2] Sociodemographic features of the study model.

Gender	
Male	54%
Female	46%
Age	
20-29	68%
30-39	14%
40-49	7%
>50	11%
Educational Level	
Graduate	54%
Postgraduate	40%
Ph.D. scholar	6%
School Type	
Public Sector	34%
Private Sector	66%
Service Period	
Less than 03 years	60%
3-6 Years	14%
More than 06	20%
No Response	6%
Have you received first-aid training?	
Yes	20%
No	79%
No Response	1%
If yes, did it involve the management of a dental emergency?	
Yes	20%
No	79%
No response	1%
Did you witness any cases of dental trauma in your students?	
Yes	40%
No	60%
If yes, how many cases did you witness?	
1-2 Case	74%
3-4 Case	20%
>5	6%

The survey revealed that 73% of school teachers were unable to correctly identify a damaged front tooth in a nine-year-old child as permanent. When asked about immediate emergency management, 67% of participants believed the appropriate response was to contact the child's parents and advise them to seek dental care promptly.

Regarding the management of an avulsed tooth that had fallen to the ground, 67% of teachers stated they would look for the lost tooth. Among them, 80% indicated they would gently clean it with water or another liquid, while 20% stated they would attempt to reinsert the tooth immediately without any pretreatment.

In terms of seeking professional help, 67% of school teachers recognized the importance of receiving dental care within 30 minutes, whereas 7% believed treatment within a few hours was sufficient, and 13% were uncertain.

A significant proportion of participants (87%) were unaware of the appropriate storage medium for an avulsed tooth until reaching the dentist. Most respondents (80%) indicated they would store the

tooth in tissue paper, while 7% suggested tap water, and only 13% correctly identified milk as a suitable storage medium. A significant number of school teachers (73%) were not satisfied with their knowledge regarding emergency dental trauma but considered it important to seek emergency management for dental trauma. [Table 3], [Table 4], [Table 5],

Table 3

Scenario 1	
Part A: A nine-year-old student got hit by a cricket ball and broke his upper front tooth.	
The broken tooth is most likely going to be?	
Milk Tooth	73%
Permanent Tooth	13%
Not sure	14%

Part B

The immediate emergency management, in this case, should be?	
Rescue the student and send him home	0%
contact the children's parents and ask them to visit the dentist	67%
send the child to the school nurse	26%
not sure what to do	7%

Table:4

Scenario 2	
Part A: The eleven-year-old girl fell from the school stairs, and her upper front tooth fell out on the floor.	
The immediate emergency management, in this case, should be?	
a) Stop bleeding and send the child back home.	67%
b) Put the tooth in any solution and send the child back home with-it	20%
c) Put the tooth back in its place in the mouth and send the child to a dentist immediately	13%
d) Not sure what to do	0%

Part B

What would you do if you decided to place the tooth back, but it had fallen on the floor?	
a) You would put the tooth straight back in its place without any pretreatment	20%
b) You would rinse the tooth under tap water	80%
c) You would scrub the tooth gently with a toothbrush or cloth	0%

Part C

"How quickly should you seek professional help if a permanent tooth is knocked out?"	
a) within 30 minutes	67%
b) within a few hours	13%
c) before next day	7%
d) not sure	13%

Part D

If you do not re-implant the tooth, how would you ideally transport it to the dentist?	
a) Tap water	7%
b) Milk	13%
c) Tissue paper	80%
d) Child mouth	0%

Table 5

Q1	
Do you think it is essential to seek emergency management of DTIs?	
Yes	87%
No	13%
Q2	
Do you think that your knowledge of emergency management of TDIs is satisfactory?	
Yes	27%
No	73%
Q3	
Would you like to receive short training in emergency management of DTIs?	
Yes	73%
No	27%

DISCUSSION:

Proper management is crucial for the long-term prognosis of teeth affected by traumatic dental injuries (TDIs), particularly in young children. Since school-aged children are most commonly affected, and teachers are often the first responders in such situations, their knowledge of TDI emergency management is essential for ensuring appropriate and timely care.⁽¹⁾

This study assessed the knowledge, awareness, and attitudes of elementary school teachers in Khyber Pakhtunkhwa, Pakistan, regarding the emergency management of traumatic dental injuries in children. Findings revealed that only 20% of teachers had received first aid training, and just 40% had ever encountered a dental trauma emergency.

The questionnaire included two hypothetical cases designed to assess participants' general knowledge and awareness regarding tooth identification, dentition type, and common dental injuries. These scenarios depicted children within the most active age group (11–14 years), which is at the highest risk for sports-related dental trauma. (11,12,13,14)

In this study, the majority of respondents (73%) were unable to correctly identify the type of dentition to which the affected tooth belonged. When faced with a dental injury, most school teachers (67%) indicated they would contact the child's parents and advise them to seek prompt dental care. Similar findings were reported by Mohandas and Chandan (15), who found that most teachers preferred referring the child to a dentist via the parents. However, contrasting results were observed in a study by Hashim (16), where 85.8% of teachers opted to refer the child directly to a dentist. In Case 2, which involved an 11-year-old child with an avulsed tooth, the optimal treatment would be the immediate reimplantation of the tooth into its socket. However, the majority of school teachers were not in favor of reimplantation, likely due to a lack of knowledge or confidence in managing such emergencies.

If reimplantation is not performed, it is crucial to store the tooth in an appropriate medium to preserve the viability of periodontal ligament cells until professional dental care is available. Ideally,

the maximum dry time for an avulsed tooth should not exceed 20–30 minutes, as prolonged drying can disrupt normal physiological metabolism and compromise the integrity of periodontal ligament cells.⁽¹⁷⁾ But this is not the case in primary dentition, where it is not recommended to reimplant the tooth⁽¹⁸⁾. In the present study, only 13% of teachers expressed willingness to independently reimplant an avulsed tooth. These findings align with studies conducted by Mohandas and Chandan⁽¹⁵⁾ and Hashim⁽¹⁶⁾ where only a small proportion of school teachers reported searching for the lost tooth 1.5% and 19%, respectively.

In contrast, studies conducted by Chandukutty et al.⁽⁰⁷⁾ in Kerala, Taranath et al.⁽¹⁹⁾ in Madurai, and Ahluwalia et al.⁽²⁴⁾ in Patiala, India, reported significantly higher awareness among school teachers regarding the need for reimplantation 83.8%, 99%, and 36.8%, respectively.

Additionally, it was observed that the majority of teachers (67%) prioritized stopping the bleeding over searching for the avulsed tooth. This preference may stem from the perception that bleeding poses a more immediate and serious threat than tooth avulsion. However, this approach may not be in the best interest of the child, as delaying the retrieval and reimplantation of the tooth can negatively impact its long-term prognosis.

An ideal storage or transport medium should help preserve the cell vitality, adherence, and clonogenic capacity of the avulsed tooth. It should also be readily available at the accident site or easily accessible.⁽²⁰⁾

For the transportation of an avulsed tooth, the majority of school teachers (80%) preferred tissue paper as the storage medium, rather than more suitable alternatives. Unfortunately, only a small percentage opted for milk (13%) or tap water (7%).

Similar findings were reported in the study conducted by Mohandas and Chandan⁽¹⁶⁾, where only a small number of school teachers were aware of the correct solution for cleaning a contaminated avulsed tooth. In contrast, studies by Shamarao et al.⁽²³⁾ in Karnataka, Taranath et al.⁽¹⁹⁾, and Chandukutty et al.⁽⁷⁾ demonstrated higher awareness, with a majority of school teachers (62.5%, 54.2%, and 36.6%, respectively) correctly identifying the appropriate cleaning solution. It was encouraging to note that school teachers in Khyber Pakhtunkhwa (KPK) recognized the critical role of timely intervention in dental trauma management. This was evident from their responses regarding the urgency of seeking professional help, where the majority (67%) believed that immediate dental care was essential. Similar findings were reported in studies by Chandukutty et al.⁽⁷⁾ and Taranath et al.⁽²³⁾, where 45.9% and 33.6% of school teachers, respectively, acknowledged the importance of prompt intervention.

Additionally, it was reassuring that most teachers (87%) considered dental trauma an emergency requiring urgent treatment, highlighting their awareness of the significance of timely management in preserving dental health.

Regarding the management of a contaminated avulsed tooth, it was promising to find that most school teachers preferred rinsing the tooth under tap water rather than using a tool such as a toothbrush or attempting to reimplant it without any pretreatment. However, when asked about the most appropriate solution for cleaning an avulsed tooth, the majority incorrectly believed that an antiseptic solution would be the best choice. This preference likely stemmed from their intention to eliminate germs, but they were unaware that antiseptics could damage the periodontal ligament cells, potentially compromising the tooth's viability.

It was encouraging to note that school teachers in Khyber Pakhtunkhwa (KPK) recognized the critical role of timely intervention in dental trauma management. This was evident from their responses regarding the urgency of seeking professional help, where the majority (67%) believed that immediate dental care was essential. Similar findings were reported in studies by Chandukutty et al.⁽⁷⁾ and Taranath et al.²³, where 45.9% and 33.6% of school teachers, respectively, acknowledged the importance of prompt intervention.

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preserving dental health Regarding the management of a contaminated avulsed tooth, it was promising to find that most school teachers preferred rinsing the tooth under tap water rather than using a tool such as a toothbrush or attempting to reimplant it without any pretreatment. However, when asked about the most appropriate solution for cleaning an avulsed tooth, the majority incorrectly believed that an antiseptic solution would be the best choice. This preference likely stemmed from their intention to eliminate germs, but they were unaware that antiseptics could damage the periodontal ligament cells, potentially compromising the tooth's viability. The results from Part 3 of the questionnaire were particularly encouraging, as the majority of school teachers (73%) expressed dissatisfaction with their current knowledge of emergency dental trauma management. Furthermore, most showed interest in receiving short training sessions on how to manage dental trauma cases and provide appropriate first aid at the site and time of injury. This is especially important since the loss of a permanent tooth can be a distressing experience for a child. Several studies have indicated that the majority of traumatic dental injuries (TDIs) occur at school^(24,25,26), emphasizing the crucial role trained school staff can play in such emergencies. Schools not only serve as educational institutions but also as platforms for promoting health awareness. This presents an opportunity to enhance teachers' knowledge of emergency dental trauma management through targeted initiatives. To achieve this, teachers should receive proper guidance on risk factors, preventive measures, and appropriate emergency responses. Conducting awareness campaigns and seminars in schools can be an effective strategy for improving knowledge in this area. Multimedia presentations, informative posters, and small booklets containing guidelines on dental trauma management can serve as valuable educational tools. Such initiatives would benefit not only children but also society as a whole. Integrating dental trauma management training into basic teacher training programs, alongside first aid training, should be considered essential. Further studies assessing and comparing teachers' knowledge and attitudes toward emergency dental trauma management could provide valuable insights and contribute to community-wide improvements in dental health awareness and response preparedness.

CONCLUSION:

The study found that elementary school teachers in both public and private sectors have relatively poor knowledge regarding the management of dental trauma. However, their attitude toward acquiring the necessary skills is highly positive. The majority recognize the importance of proper emergency response and are willing to undergo first aid training. This highlights a crucial opportunity for targeted educational programs to enhance their preparedness in managing dental emergencies. Providing structured training and awareness campaigns can significantly improve their ability to handle dental trauma effectively, ensuring better outcomes for children and fostering a more informed and responsive school environment.

Authors' Contribution

1. Dr. Usman Nazir (Principal Author)
 - Conceptualization
 - Methodology
 - Writing – Original Draft
 - Project Administration
2. Dr. Halima Sadia Qazi (Corresponding Author)
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 - Investigation
 - Writing – Review & Editing
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- Writing – Review & Editing
- 6. Dr. Maryam Farrukh Rashid
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- Validation
- Visualization

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