

Awareness, Knowledge, and Attitude Regarding Dental Trauma in Children among Undergraduate and Postgraduate Dental Students and Dental Faculty

Sachin Parmar^{1*}, Ashish Saxena¹, Neha Verma², Shikhar Pratap Chauhan¹, Ajay Parihar³, Deepika Sharma¹

¹Department of Pedodontics and Preventive Dentistry, Government College of Dentistry, Indore, Madhya Pradesh, India.

²Department of Prosthodontics Crown and Bridge, Government College of Dentistry, Indore, Madhya Pradesh, India.

³Department of Oral Medicine and Radiology, Government College of Dentistry, Indore, Madhya Pradesh, India.

Abstract

Background: Traumatic dental injuries (TDIs) are very common; epidemiological studies revealed that one out of two children sustains a dental injury, most often between the age of 1½ and 2½ year. The prognosis of traumatized teeth depends on the prompt and appropriate treatment, which depends on the knowledge of the people managing the child, which often are school teachers and parents. Dental professionals are expected to identify and manage traumatic dental emergencies in the primary and permanent dentitions and referring severe cases to a specialized dental care provider. Hence, it is critical to assess the existing knowledge of dental traumatology among dental students and dental practitioners, as they play a key role in providing the necessary intervention in the near future. Hence, the purpose of this institutional study is to assess the knowledge, attitude, and awareness among dental students and dental faculty members regarding dental trauma in children. **Materials and Methods:** A cross-sectional, questionnaire-based, and institutional study has been conducted among 300 dental students and faculty members. Online questionnaire was designed which include questions on their educational qualification and their knowledge and attitudes, regarding TDIs. **Results:** Correct responses given by dental faculty members (87.78%) followed by postgraduate students (85.9%) and least correct responses were given by undergraduate students (71.2%). Hence, faculty members and postgraduate students had comparatively better knowledge and attitude as compared to undergraduate students toward management of TDIs. **Conclusion:** Dental students are expected to be competent before graduation in managing TDI in the primary and permanent dentitions. Within the limitations of this study, we conclude that awareness, knowledge, and attitude regarding the TDIs in children among undergraduates are comparatively low. The present findings provided baseline information on the existing knowledge and highlight the need to improve the knowledge of dental students regarding TDIs and their management by adding additional training courses covering TDI in undergraduate programs.

Keywords: Alternative storage media, Avulsion, Replantation, Sports dentistry, Traumatic dental injuries.

INTRODUCTION

Traumatic dental injuries (TDIs) are very common; epidemiological studies revealed that one out of two children sustains a dental injury, most often between the age of 1½ and 2½ year. Dental injuries can be due to a fall, injury from a variety of sports, road accidents, or even being struck by an object. Among them, fall is the most common cause of dental injuries. Crown fractures and luxation are the most commonly occurring dental injuries.^[1] Anterior teeth are most commonly involved in both the primary and permanent dentition in the majority of trauma cases. The prognosis of traumatized teeth depends on the prompt and appropriate treatment, which depends on the knowledge of the people managing the child, which often are school teachers and parents.^[2]

TDIs can range from simple chipping off of the enamel surface, crown fractures, root fractures, and luxation injuries to severe damage to supporting tooth structures. Significant damage to the developing permanent successor occurs when it is directly involved in the trauma causing developmental disturbances and malalignments that require a multidisciplinary team of skilled

Address for correspondence: Dr. Sachin Parmar,
Department of Pedodontics and Preventive Dentistry,
Government College of Dentistry, Indore, Madhya Pradesh, India.
Email: drsachinparmar96@gmail.com

Received: May. 02, 2023; **Accepted:** May. 28, 2023; **Published:** Jun. 08, 2023

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Parmar S, Saxena A, Verma N, Singh SP, Parihar A, Sharma D. Awareness, Knowledge, and Attitude Regarding Dental Trauma in Children among Undergraduate and Postgraduate Dental Students and Dental Faculty. J Res Adv Dent 2023;14(4):1-5.

Access this article online

Website:
www.jrad.co.in

DOI:
<https://doi.org/10.53064/jrad.2022.14.4.373>

specialists to support the conservative treatment in a growing child.^[3] Avulsion injuries, though occurring infrequently, are considered the most serious of all dental injuries. Avulsion injuries account for about 1–11% of all TDIs that commonly involve the primary dentition more than the permanent dentition.^[4]

Dental professionals are expected to identify and manage traumatic dental emergencies in primary and permanent dentitions and referring severe cases to a specialized dental care provider. Hence, it is critical to assess the existing knowledge of dental traumatology among dental students and dental practitioners, as they play a key role in providing the necessary intervention in the near future. Hence, the purpose of this institutional study is to assess the knowledge, attitude, and awareness among dental students and dental faculty members regarding dental trauma in children.

MATERIALS AND METHODS

This was a cross-sectional, questionnaire-based, an institutional study of undergraduate, postgraduate dental students, and dental faculty members at Government College of Dentistry, Indore. After taking the ethical clearance from the Institutional Ethics Committee (Ethical clearance no.162/IEC/SS/202), data for the study were obtained by means of a self-administered questionnaire. Sample size was calculated using the following formula $Z_{1-\alpha/2}^2 p(1-p)/d^2$, minimum required sample size was 288. Thus, it was proposed to include 300 participants in the study.

The data collection tool was a 12-item questionnaire which sought information on educational qualification of the participants, knowledge of injuries to primary and permanent tooth, tooth avulsion, and factors that influence success of replantation, storage media for storing an avulsed tooth, sports dentistry, and ideas on implementation of school educational program on management of dental trauma. The questionnaire was developed on basis of previous studies which used International Association of Dental Traumatology (IADT) Guidelines for management of TDIs. The questionnaire was pretested to check their reliability to garner the required information. The questions were presented in a Google form format to all the participants by sending them the link and the participants were instructed to choose the single best answer.

Data were collected and screened for completeness and entered into the excel sheet. The data were analyzed using the Statistical Package for the Social Sciences 21.0 version. Statistical tools employed in analysis were descriptive statistics which included frequency counts, percent, and cross tabulations. Associations between categorical variables were determined using Chi-square test and Fischer's exact test.

RESULTS

The study included 300 dentist participants. Majority of the respondents were undergraduate students (68.4%) followed

by postgraduate students (19.0%), followed by dental faculty members (12.7%). Distribution of study participants based on their responses to various questions is shown in Table 1.

Majority of the participants (77.7%) reported 1.5–2.5 year to be most common age for the injury to primary teeth. Crown fracture (61.7%) followed by luxation of tooth (36.0%) was the most common tooth injury noticed by the participants. The appropriate interpretation of avulsed tooth was done by 91.0% participants.

About 67.7% of the participants believed that on avulsion of tooth, dental treatment should be sought, whereas 19.7% participants believed that dental treatment is mandatory within 6 hours after avulsion and 12.7% participants believed that dental treatment can be sought till before elapse of 24 h.

Most of the participants (92.7%) would prefer to rinse the avulsed tooth gently for few seconds without scrubbing it under running water, whereas 7.3% would prefer to wipe it clean with a tissue paper. Replantation of permanent tooth, under the guidelines, was recommended by 89.3% participants, whereas 10.7% believed that it should not be replanted.

Milk to be the best storage media was reported by 66% of participants, whereas 26% said that saline is the best and according to 8% of participants, water is the best storage media (Figure 1). Among the participants considering saline and water to the best storage media, a significantly large proportion was constituted by undergraduate students.

Awareness regarding sports dentistry was seen in 74% participants, a significantly greater proportion of undergraduate students compared to postgraduate students and dental faculty members were unaware of sports dentistry ($P < 0.05$).

According to 97.7% participants, boxing/football/skating are more commonly associated with tooth trauma.

Maximum (46.3% participants) believed that school dental education related to tooth trauma should be provided at the primary school level. A significantly greater number of postgraduate students and faculty members advised incorporation of school educational program on management of dental trauma during primary school level (1st–5th standard), whereas significantly greater proportion of undergraduate students preferred middle school level (6th–8th standard) (Figure 2).

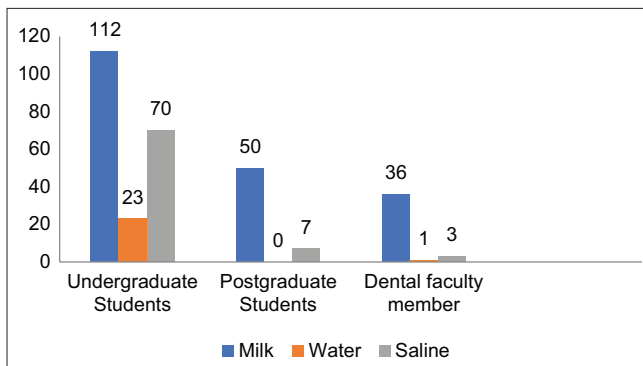
A great majority (99.3%) believed that there is a need to educate sports teacher about dental trauma in school. Thus, almost all the participants agreed to the need to educate sports teacher about dental trauma in school, and thus, there was no significant difference in the responses between the participants belonging to different categories ($P > 0.05$).

DISCUSSION

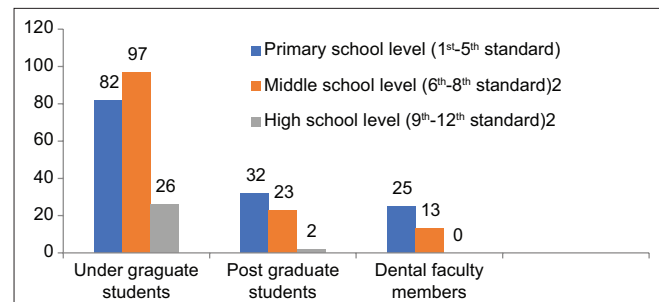
Dental trauma is defined as traumatic injuries to the oral tissues such as the tooth, gums, alveolar bone, and others. This type

Table 1: Distribution of study participants based on their responses to various questions

Question	Response	Frequency (Total 300 participants)	Percentage (100%)
Injuries to primary teeth occur most commonly at which age?	6–12 month	59	19.7
	1.5–2.5 year	233	77.7
	More than 2.5 year	8	2.7
Most common injury in child is	Root fracture	7	2.3
	Luxation	108	36.0
	Crown fracture	185	61.7
What is an avulsed tooth?	A tooth that has a segment fractured	9	3.0
	A tooth that has been completely dislodged from its socket in the alveolar bone	273	91.0
	A tooth that has been mal-positioned	18	6.0
How soon do you think it is to seek dental treatment for an avulsed tooth?	Immediately	203	67.7
	Within a 6 h	59	19.7
	Before 24 h elapse	38	12.7
If you found the avulsed tooth and it is dirty, what would you recommend?	Wipe the tooth with a tissue paper	22	7.3
	Rinse gently for few seconds without scrubbing it under running water	278	92.7
Should an avulsed permanent tooth be replanted in its socket?	Yes, if under the guidelines	268	89.3
	No	32	10.7
Best alternative storage medium for avulsed teeth in case culture medium is not available	Milk	198	66.0
	Water	24	8.0
	Saline	78	26.0
Are you aware about sports dentistry?	Yes	222	74.0
	No	78	26.0
Which sport do you think have higher chances of dental trauma?	Boxing/football/skating	293	97.7
	Table tennis/cricket/badminton	7	2.3
What do you think, implementation of school educational program on management of dental trauma should be done at which level?	Primary school level (1 st –5 th standard)	139	46.3
	Middle school level (6 th –8 th standard)	133	44.3
	High school level (9 th –12 th standard)	28	9.3
Do you think there is need to educate sports teacher about dental trauma in school?	Yes	298	99.3
	No	2	0.7


Figure 1: Comparison of response regarding storage media among different groups based on educational qualification

of trauma usually occurs during sports, road traffic accident, or rigorous activities, and they commonly affect the younger age groups specially children.^[5] The cause of dental trauma is unpredictable and can occur anytime, anywhere and to anyone and the most common tooth involved in dental trauma is the upper anterior, which can lead to negative effects to a person life such as loss of confidence, defective function, speech-related problems, and esthetic loss which may cause


Figure 2: Comparison of response regarding school educational program on management of dental trauma among different groups based on educational qualification

psychologic imbalance. It is important for the public to know more about the management of the traumatic events and preventive measures that can be taken so that the incidence of dental trauma can be reduced.^[6]

Dental trauma is part of the undergraduate and postgraduate curriculum in Pediatric Dentistry and Endodontics as per the Dental Council of India. The response of the participants belonging to different categories (in terms of educational

qualification) did not differ significantly with respect to the common age of injury to primary dentition.

Among undergraduate students significantly greater proportion reported crown fracture to be the most common form of tooth trauma, whereas among postgraduate students and faculty members a significantly greater proportion reported luxation to be the most common form of tooth trauma. Luxation is more common in children as the bone is in the formation stage and is not completely mineralized and more resilient, thus any injury or trauma to tooth at this stage causes the tooth to luxate instead of getting fractured.^[7] This variation in the responses among participants could be due to much more clinical experience, in dental faculties and postgraduate students have than the undergraduate and interns having.

Compared to postgraduates and dental faculty, a significantly greater number of under graduate students were found to have wrong notion of avulsed tooth ($P < 0.05$), that an avulsed tooth is a tooth that has been completely dislodged from its socket in the alveolar bone.

Dental avulsion treatment is complex, due to the fact that it is influenced by many different factors. The most influential factor is the condition of periodontal ligament cells at the moment of the replantation, which in many cases are non-viable and are not expected to heal.^[8] Hence, immediately one should seek the dental treatment. There was no significant difference in the response of participants belonging to different categories with respect to urgency of seeking treatment on avulsion of tooth ($P > 0.05$).

Handling of avulsed tooth play important role in replantation. The freshly avulsed tooth will have viable periodontal ligament cells which are having high regenerative property; hence, this cells must be present on tooth surface which has to be replanted.^[9] Wiping or roughly handling of avulsed tooth will reduce success rate of replantation. Among all the four categories of participants, significantly greater number of undergraduate students, recommended wiping of avulsed tooth with tissue paper. None of the postgraduate student or dental faculty advised the same. Distribution of responses regarding handling of avulsed tooth is given in Table 2.

The IADT guidelines recommend that immediate re-implantation of an avulsed permanent tooth be done but not in all cases.^[10] Replantation is not recommended in severe caries, periodontal disease, non-cooperative patient, unconscious patient, and patients with severe underlying medical conditions (cardiac diseases or immunosuppression). In this study, replantation of permanent tooth, under the guidelines, was recommended by 89.3% participants, whereas 10.7% believed that it should not be replanted. Among the participants not recommending replantation of avulsed tooth, a significantly proportion was constituted by undergraduate students.

Various conventional media that can be used to transport an avulsed tooth were documented by the respondents. About 66% of participants reported milk to be the best storage media, whereas 26% said that saline is the best, and according to 8% of participants, water is the best storage media. Among the participants considering saline and water to the best storage media, a significantly large proportion was constituted undergraduate students. The IADT guidelines recommended fresh milk or patient's mouth/saliva at the site of injury and if access to a suitable media, HBSS or isotonic saline should be used.

Dental injuries are the most common type of orofacial injury sustained during participation in sports with the increased popularity of contact sports and encouragement to participate at an early age, the role of the dental profession in relation to prevention of dental and other orofacial sporting injuries has become more important in view of this.^[11] The common orofacial sports related injuries include soft-tissue injury and hard tissue injury includes those to the teeth and facial bones, such as tooth intrusion, luxation, crown and/or root fractures, complete avulsion, and dental-facial fractures. In outdoor sports such as boxing/football/skating, there are higher chances of dental trauma. In our institutional study, a significantly greater proportion of undergraduate students as compared to postgraduate students and dental faculty members were unaware of sports dentistry.

School is one of the locations with the greatest prevalence of TDIs. A significant number of school-aged children experience

Table 2: Comparison of response regarding handling of avulsed teeth among different groups based on educational qualification

If you found the avulsed tooth and it is dirty, what would you recommend?	Undergraduate students	Postgraduate students	Dental faculty members	Total
Wipe the tooth with a tissue paper				
Count	22	0	0	22
Percentage	10.7	0.0	0.0	7.3
Rinse gently for few seconds without scrubbing it under running water				
Count	183	57	38	278
Percentage	89.2	100.0	100.0	92.7
Total				
Count	205	57	38	300
Percentage	100.0	100.0	100.0	100.0

Chi-square value=14.231, df=3, $P=0.003$

trauma of some sort to primary or permanent dentition where teachers are generally present at the time dental trauma occurs, as such accidents often take place during or after school activities. In the study, majority of participants believed that school dental education related to tooth trauma should be provided at the primary school level. A significantly greater number of postgraduate students and faculty members advised incorporation of school educational program on management of dental trauma during primary school level (1st–5th standard), whereas significantly greater proportion of undergraduate students preferred middle school level (6th–8th standard).

Athletes, coaches, athletic directors, sports teacher, parents, and members of the dental community should be aware of how individuals who participate in sporting activities are at risk for dental trauma.^[12] Almost all the participants agreed to the need to educate sports teacher about dental trauma in school, and thus, there was no significant difference in the responses between the participants belonging to different categories.

CONCLUSION

TDIs are an inevitable clinical situation that requires a thorough knowledge to support the correct diagnosis and treatment. Dental students are expected to be competent before graduation in identifying and managing traumatic dental emergencies in the primary and permanent dentitions and referring severe cases to a specialized dental care provide within the limitations of this study, we conclude that undergraduate dental students awareness, knowledge, and attitude regarding the TDIs in children are significantly low. The present findings provided baseline information on the existing knowledge and highlight the need to improve the knowledge of dental students regarding

TDIs and their management by adding additional courses covering dental trauma in dental undergraduate programs.

REFERENCES

1. Diangels AJ, Andreasen JO, Ebeleseder KA, Kenny DJ, Trope M, Sigurdsson A, *et al.* International association of dental traumatology guidelines for the management of traumatic dental injuries: 1. Fractures and luxations of permanent teeth. *Dent Traumatol* 2012;28:2-12.
2. Mohandas U, Chandan GD. Knowledge, attitude and practice in emergency management of dental injury among physical education teachers: A survey in Bangalore urban schools. *J Indian Soc Endod Prev Dent* 2009;27:242-8.
3. Lenzi MM, Alexandria AK, Ferreira DM, Maia LC. Does trauma in the primary dentition cause sequelae in permanent successors? A systematic review. *Dent Traumatol* 2015;31:79-88.
4. Heithersay GS. Replantation of avulsed teeth. A review. *Aust Dent J* 1975;63-72.
5. Pohl Y, Filippi A, Kirschner H. Results after replantation of avulsed permanent teeth. II. Periodontal healing and the role of physiologic storage and antiresorptive-regenerative therapy. *Dent Traumatol* 2005;21:93-101.
6. Trope M. Clinical management of the avulsed tooth: Present strategies and future directions. *Dent Traumatol* 2002;18:1-11.
7. Singh B, Sinha N, Solanki G, Langaliya A. Knowledge and attitudes of urban and rural school teachers towards the emergency dental condition management in school students. *UJMDS* 2014;2:29-32.
8. Bakarcic D, Hrvatin S, Maroevic M, Jokic NI. First aid management in emergency care of dental injuries-knowledge among teachers in Rijeka, Croatia. *Acta Clin Croat* 2017;56:110-6.
9. Blomlof L, Lindskog S, Andersson L, Hedstrom KG, Hammarstrom L. Storage of experimentally avulsed teeth in milk prior to replantation. *J Dent Res* 1983;62:912-6.
10. Day PF, Flores MT, O'Connell A, Abbott PV, Tsilingaridis G, Fouad AF, *et al.* International association of dental traumatology guidelines for the management of traumatic dental injuries. 3. Injuries in the primary dentition. *Dent Traumatol* 2020;36:343-59.
11. Kumamoto DP, Maeda Y. A literature review of sports-related orofacial trauma. *Gen Dent* 2004;52:270-80, quiz 281.
12. Elliott MA. Professional responsibility in sports dentistry. *Dent Clin North Am* 1991;35:831-40.