

Evaluation Of Knowledge And Attitude On Emergency Management Of Traumatic Dental Injury Among Teachers Of Puducherry School- A Questionnaire Study

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Abstract

Background:

Traumatic dental injuries (TDIs) are a significant public health concern among children and adolescents, with schools being a frequent setting for such incidents. Teachers, as first responders during school hours, play a crucial role in providing immediate care. However, evidence suggests that their knowledge of emergency dental trauma management is often limited, particularly in cases of tooth avulsion.

Aim:

To assess the knowledge and attitudes of high school teachers in Puducherry, India, regarding the emergency management of traumatic dental injuries.

Materials and Methods:

A cross-sectional questionnaire-based study was conducted from January to March 2025 among 280 high school teachers randomly selected from 30 government schools in urban and rural Puducherry. Data were collected using a validated, self-administered questionnaire consisting of 15 items assessing knowledge and attitudes on emergency management of dental trauma. Responses were recorded on a five-point Likert scale. Data were entered in Microsoft Excel and analyzed using SPSS version 20.0, with descriptive statistics presented as frequencies and percentages.

Results:

Of the 280 participants, 60.0% were female, and 35.0% belonged to the 30–39 year age group. While 83.5% agreed that dental trauma commonly occurs on school playgrounds and 87.5% recognized its psychological impact, only 43.9% were aware that an avulsed tooth could be reimplanted. A majority (90.4%) emphasized the need for teacher training in emergency dental trauma management, and 96.4% expressed willingness to learn more. Furthermore, 95.7% were ready to spread awareness among parents, and 93.9% indicated that they would refer children for prompt dental care in case of emergencies.

Conclusion:

High school teachers in Puducherry demonstrated a positive attitude toward emergency dental trauma management but lacked adequate knowledge regarding critical aspects such as avulsion and reimplantation. These findings underscore the urgent need for structured, context-specific training programs to strengthen first-response capacity in schools and improve treatment outcomes for children sustaining TDIs.

Keywords: traumatic dental injuries, avulsion, reimplantation, school teachers, emergency management, knowledge, attitudes

INTRODUCTION

Traumatic dental injuries (TDIs) remain a common and serious health issue affecting children and adolescents worldwide. The global prevalence of dental trauma in primary and permanent dentition is estimated to range between 15% and 30%, with the highest incidence occurring during school-age years due to increased physical activity, sports participation, and playground accidents.^[1,2] The anterior teeth are most commonly affected, and such injuries can significantly impact a child's functional, psychological, and aesthetic well-being.^[2]

Schools are among the most frequent settings for dental trauma, making teachers the primary responders during such emergencies. However, several studies have shown that even healthcare professionals, including emergency physicians, lack adequate knowledge in the management of TDIs, particularly in avulsion and luxation injuries, highlighting the critical need for structured training programs in this area.^[3] Proper and timely intervention, especially in cases of avulsion, can markedly improve the prognosis of the injured tooth. For instance, immediate replantation or appropriate storage of the avulsed tooth significantly enhances the chances of tooth survival.^[4]

Despite this, many teachers are unfamiliar with correct management protocols, including the ideal storage media, the urgency of treatment, or even the possibility of tooth reimplantation.^[5] This deficiency in knowledge has been attributed to the lack of structured training on dental emergencies in both pre-service teacher education and in-service training programs.^[6] Consequently, children with TDIs may experience avoidable delays in receiving care, leading to poor long-term outcomes.

Previous studies conducted in various international settings have highlighted the need for targeted educational interventions to empower teachers with basic knowledge of dental trauma response.^[7] However, data on this topic remain sparse in the Indian context, particularly in smaller administrative units like Puducherry, where schools may differ in infrastructure, training exposure, and access to emergency dental services.

This study aims to assess the knowledge and attitudes of high school teachers in Puducherry, India, regarding the emergency management of TDIs. Findings from this research may inform the development of evidence-based training materials and school health policies that equip teachers to respond promptly and effectively during dental trauma incidents.

MATERIALS AND METHODS:

A cross-sectional questionnaire-based study was conducted from January to March 2025 among high school teachers in Puducherry, India, a Union Territory with a population of 1,247,953. Educational services in Puducherry are administered through government and aided institutions under the Directorate of School Education. Despite the inclusion of general health topics in teacher training, specific content on emergency dental trauma management remains limited.

The study was undertaken to assess the knowledge and attitudes of high school teachers regarding the emergency management of TDIs in children. A total of thirty government high schools were selected by simple random sampling, with an equal representation from urban and rural areas (15 each). All eligible high school teachers present during the survey day were approached, and those who consented were included in the study.

A pre-tested, structured, self-administered questionnaire was used to collect socio-demographic and professional details, including age, gender, teaching experience, location of the school (urban or rural), and educational qualifications. The questionnaire included 15 closed-ended questions assessing participants' knowledge and attitudes toward emergency management of dental trauma in school settings. Responses were recorded using a five-point Likert scale ranging from "Definitely Disagree" to "Definitely Agree." Questions covered common scenarios such as playground injuries, awareness of dental trauma, perception of urgency, training needs, and referral practices. The questionnaire was developed in English, translated into Tamil, and back-translated to ensure conceptual and linguistic clarity. Its face validity was established by a panel of public health dentistry experts. A pilot study was conducted among 30 school teachers (excluded from final analysis) to test the clarity and reliability of the questionnaire.

Teachers were recruited during regular working hours at their respective schools, as well as through routine school health camps conducted by the Department of Pediatric and Preventive Dentistry, Mahatma Gandhi Postgraduate Institute of Dental Sciences, Government of Puducherry Institution. Data collection was carried out within classrooms or staff rooms following a standardized briefing session provided to each group of participants. Anonymity of respondents was strictly maintained. Each participant was instructed to complete the self-

administered questionnaire independently and return it on the same day. The completed questionnaires were collected, compiled, and subsequently prepared for analysis.

The study protocol was reviewed and approved by the Institutional Ethics Committee of Mahatma Gandhi Postgraduate Institute of Dental Sciences, Govt. of Puducherry Institution, Puducherry. (IEC APPROVAL NUMBER: 43-2024). Written informed consent was implied through voluntary completion of the questionnaire. Administrative approval was obtained from the Directorate of School Education, and permission to conduct the study was secured from the headmasters of all selected schools.

The sample size was calculated using Open Epi version 3.01, assuming an expected knowledge adequacy of 81.7% among teachers regarding emergency management of dental trauma, based on findings from a previous study by Bhusari et al. (2023), with a 5% margin of error and 95% confidence interval.^[8] The calculated sample size was 230. To enhance representativeness and account for potential non-response or incomplete data, a total of 280 high school teachers were enrolled.

Data collected through paper-based questionnaires were entered in Microsoft Excel (Microsoft Corp., Redmond, WA, USA) and analyzed using IBM SPSS Statistics version 20.0 (IBM Corp., Armonk, NY, USA). Categorical variables were described using frequencies and percentages. The distribution of responses to each item was summarized in tables and figures.

RESULTS:

A total of 280 high school teachers from government schools in the Union Territory of Puducherry participated in the study. Among them, 168 (60.0%) were females and 112 (40.0%) were males. The majority of the participants (35.0%) were in the age group of 30–39 years, followed by 29.3% aged 40–49 years. Most respondents held a B.Ed. Qualification (68.6%), while 22.1% had completed postgraduate degrees. The demographic characteristics of the study population are summarized in **Table 1**.

Responses to the knowledge-related items are presented in **Table 2**. A high proportion of teachers agreed that dental trauma commonly occurs on the school playground (83.5%) and is one of the most frequent injuries in early childhood (81.8%). Additionally, 87.5% acknowledged the psychological impact of dental trauma on children, and 67.1% agreed that trauma to a primary tooth could affect the developing permanent tooth. Only 43.9% correctly believed that an avulsed tooth can be reimplanted. Figure 1 provides a graphical representation of teachers' responses to the statement regarding the possibility of reimplanting a knocked-out tooth. About 55.0% were aware that the emergency helpline number 108 should be contacted in the event of dental trauma.

Attitudes of school teachers toward emergency dental trauma management are presented in **Table 3**. A majority (90.4%) strongly felt that teachers must be trained in the emergency management of dental trauma, and 95.0% believed that educating teachers would benefit children's health. Nearly 96.4% expressed willingness to learn more about dental trauma management, and 95.7% indicated readiness to spread awareness among parents. Furthermore, 93.9% reported they would follow appropriate referral practices during dental emergencies, and 91.1% expressed interest in gathering information on emergency service centers. Figure 2 provides a graphical representation of teachers' willingness in learning about the emergency management of dental trauma.

Table 1: Demographic characteristics of high school teachers (n = 280)

Characteristics	Number	Percentage
Age Groups (Years)		
< 30	64	22.9
30–39	98	35.0
40–49	82	29.3
≥ 50	36	12.9
Gender		
Male	112	40.0
Female	168	60.0
School Location		

Urban	140	50.0
Rural	140	50.0
Teaching Experience (Years)		
< 5	54	19.3
5-10	91	32.5
11-20	89	31.8
> 20	46	16.4
Educational Qualification		
B.Ed.	192	68.6
M.Ed.	62	22.1
Other	26	9.3

Table 2: Distribution of Responses to Knowledge-Based Questions on Emergency Management of Traumatic Dental Injuries Among High School Teachers in Puducherry
(n = 280)

Knowledge-Based Questions	Definitely Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Definitely Agree n (%)
Dental trauma occurs on school playground	6 (2.1)	12 (4.3)	28 (10.0)	144 (51.4)	90 (32.1)
Dental trauma is common in early childhood	3 (1.1)	14 (5.0)	34 (12.1)	137 (48.9)	92 (32.9)
Dental trauma has psychological impact	4 (1.4)	8 (2.9)	23 (8.2)	122 (43.6)	123 (43.9)
Trauma to primary tooth affects permanent tooth	10 (3.6)	25 (8.9)	57 (20.4)	123 (43.9)	65 (23.2)
Emergency management improves prognosis	6 (2.1)	12 (4.3)	41 (14.6)	139 (49.6)	82 (29.3)
Knocked-out tooth can be reimplanted	42 (15.0)	49 (17.5)	66 (23.6)	91 (32.5)	32 (11.4)
Emergency helpline (108) should be called	12 (4.3)	30 (10.7)	84 (30.0)	109 (38.9)	45 (16.1)

Table 3. Distribution of Responses to Attitude-Based Questions Regarding Emergency Management of Traumatic Dental Injuries Among High School Teachers in Puducherry (n = 280)

Attitude-Based Questions	Definitely Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Definitely Agree n (%)
Emergency dental trauma management requires special training	5 (1.8)	2 (0.7)	4 (1.4)	102 (36.4)	167 (59.6)
Teachers must be trained for dental trauma emergencies	8 (2.9)	5 (1.8)	14 (5.0)	99 (35.4)	154 (55.0)
Educating teachers benefits children's oral health	4 (1.4)	2 (0.7)	8 (2.9)	107 (38.2)	159 (56.8)
Willingness to know more about dental trauma emergencies	4 (1.4)	1 (0.4)	5 (1.8)	110 (39.3)	160 (57.1)
Willingness to spread awareness among parents	3 (1.1)	1 (0.4)	8 (2.9)	103 (36.8)	165 (58.9)
Referral to dental clinic in case of emergency	2 (0.7)	2 (0.7)	13 (4.6)	104 (37.1)	159 (56.8)
Attending training will help during emergencies	3 (1.1)	3 (1.1)	17 (6.1)	96 (34.3)	161 (57.5)
Want to know about dental trauma emergency service centers	5 (1.8)	7 (2.5)	13 (4.6)	117 (41.8)	138 (49.3)

Figure 1: Teachers' awareness regarding the possibility of reimplantation of an avulsed (knocked-out) tooth

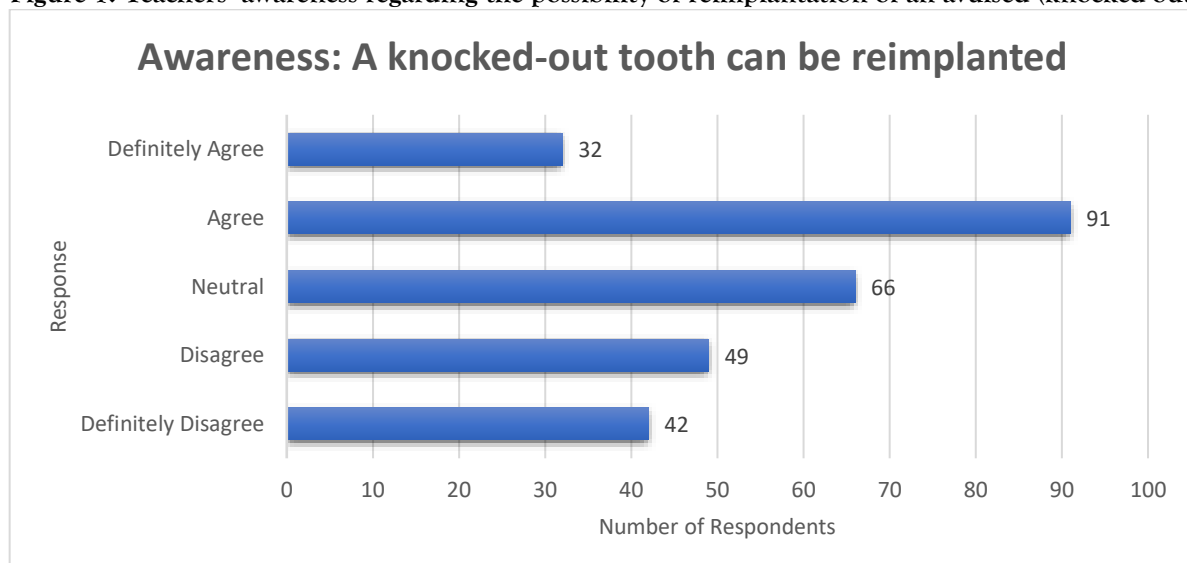
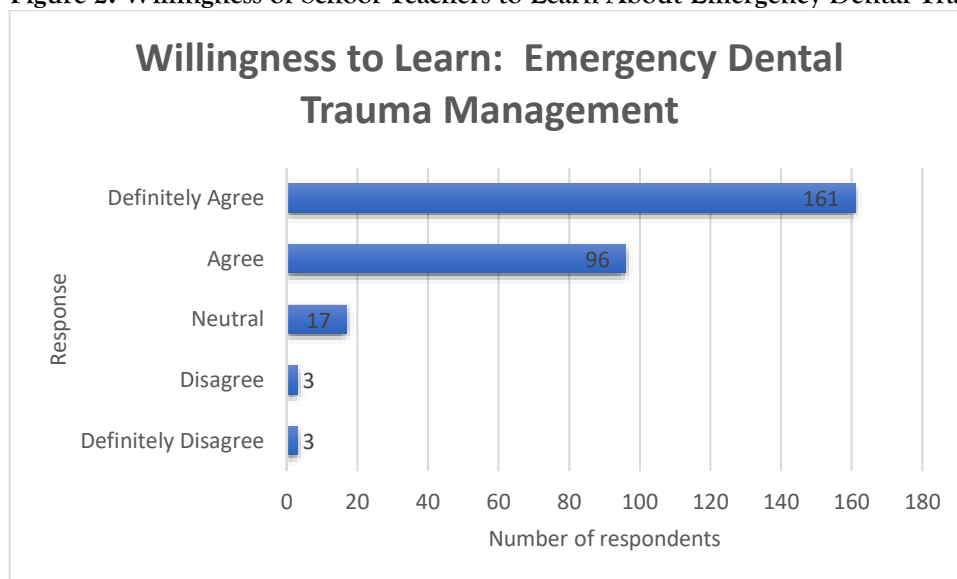


Figure 2: Willingness of School Teachers to Learn About Emergency Dental Trauma Management



DISCUSSION

Our study aimed to evaluate the knowledge and attitudes of school teachers regarding the emergency management of traumatic dental injuries (TDIs) in children. The findings revealed that while the majority of teachers demonstrated a favorable attitude towards emergency dental trauma management, significant gaps in knowledge remain, particularly concerning the reimplantation of avulsed teeth and appropriate emergency procedures.

These findings are consistent with previous studies conducted in India and elsewhere. In a study by Mala Singh et al. (2015), teachers with more years of experience and those from non-B.Ed./M.Ed. Backgrounds exhibited higher awareness of dental emergencies.^[9] Similarly, Krishnamoorthy et al. (2021) found that although teachers in Chennai showed a positive attitude towards TDI education, their knowledge and practical preparedness were inadequate.^[10] This aligns with our study's results, where despite high willingness to attend training (96.4%) and refer children (93.9%), only 43.9% were aware that an avulsed tooth could be reimplanted.

Abhishek Kumar et al. (2017) also highlighted a low level of awareness among teachers in Himachal Pradesh, urging the need for structured educational programs to improve knowledge and response to dental trauma.^[11] Similarly, a more recent study by Bhusari et al. (2023) conducted among school teachers echoed these gaps in knowledge and emphasized the importance of integrating dental trauma management into teacher training modules.^[8]

Our study underscores this need, especially given that dental trauma is highly prevalent among school-age children, particularly during sports or playtime. Studies by Petti et al. (2018) and Glendor (2009) have estimated that about 30% of school children suffer dental trauma during their academic years.^[12,13] The importance of immediate and correct response cannot be overstated, as the prognosis of dental trauma, particularly tooth avulsion, depends significantly on the time and method of management.^[14]

The willingness of teachers in our study to receive training and spread awareness further reinforces the findings by Al-Asfour et al. (2018), who noted that positive attitudes could be leveraged through capacity-building interventions in school environments.^[15] However, as observed in our study and previous research by Pacheco et al. (2003), a lack of knowledge about specific emergency steps, such as the correct storage media for avulsed teeth, remains a major barrier to effective first response.^[16]

While the study included a diverse sample from both urban and rural government schools and employed a validated questionnaire, certain limitations must be considered. The cross-sectional design does not allow for causal interpretations. Additionally, the reliance on self-reported data introduces the possibility of social desirability bias. Factors such as access to healthcare infrastructure, prior exposure to dental emergencies, and school-specific health policies were not measured but may have influenced the findings.

Further research should focus on evaluating the effectiveness of targeted school-based training interventions, including simulations and interactive workshops. Qualitative studies could provide deeper insight into barriers faced by teachers, including logistical, cultural, or attitudinal factors, that prevent effective emergency response. These findings could inform the development of tailored, sustainable training modules as part of teacher induction or continuing education programs.

CONCLUSION:

The findings of this study highlight that while school teachers in Puducherry demonstrate a positive attitude toward the emergency management of traumatic dental injuries, critical knowledge gaps remain, particularly in areas such as avulsion and its immediate management. These deficiencies underscore the importance of implementing structured, practical training programs within the school system to equip teachers with the necessary skills to respond effectively to dental emergencies. Teachers' awareness campaigns conducted by the Department of Pediatric and Preventive Dentistry, Mahatma Gandhi Postgraduate Institute of Dental Sciences, Government of Puducherry Institution, during routine school health camps should be further strengthened to provide comprehensive training in emergency dental management. Strengthening first-response capacity at the school level has the potential to improve treatment outcomes for injured children and foster a proactive culture of oral health awareness in the community.

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