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Knowledge and Self-Reported Practice of Iranian Elementary School Students Towards Traumatic Dental Injuries

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ABSTRACT

Introduction: Traumatic dental injuries (TDIs) are common among school-aged children and often require immediate and appropriate first-aid management to improve treatment outcomes. However, evidence regarding children's knowledge and intended responses to TDIs in Iran remains limited. This study aimed to assess the knowledge and self-reported practice of Iranian elementary school students regarding the emergency management of TDIs and to identify associated factors.

Materials and Methods: A descriptive-analytical cross-sectional study was conducted among 487 students aged 10–13 years from four public elementary schools in Tehran, Iran. Participants completed a structured self-administered questionnaire comprising demographic characteristics, 10 knowledge items, and 5 scenario-based self-reported practice items related to TDI management. Knowledge and practice scores were converted to percentages, with higher scores indicating better performance. Data were analyzed using descriptive statistics, Pearson's correlation coefficient, and multiple linear regression analysis.

Results: The mean age of participants was 10.73 ± 0.85 years, and 57.1% were female. The mean knowledge score was 64.83 ± 9.54, while the mean self-reported practice score was 80.89 ± 16.30. Although most students recognized the importance of seeking immediate dental care after tooth mobility (82.1%), only 6.6% knew that an avulsed permanent tooth could be replanted. Knowledge regarding the critical extra-alveolar time and appropriate storage media for avulsed teeth was also low. Only 4.5% of participants selected immediate replantation as the correct management of an avulsed tooth, and 17.7% identified milk as an appropriate storage medium. Regression analysis showed that knowledge scores were positively associated with previous TDI training ($\beta = 0.15$, $p = 0.001$) and negatively associated with age ($\beta = -0.10$, $p = 0.03$). Self-reported practice scores were associated with gender ($\beta = 0.19$, $p < 0.001$), while an unexpected inverse association was observed with previous training ($\beta = -0.15$, $p = 0.001$).

Conclusion: Elementary school students demonstrated inadequate knowledge regarding the emergency management of TDIs, particularly tooth avulsion. School-based educational interventions are needed to improve emergency preparedness and evidence-based responses to dental trauma.

Keywords: Tooth injuries; Knowledge; Practice; Students; Child; Adolescent.

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Introduction

Traumatic dental injuries (TDIs) constitute a significant public oral health problem worldwide [1,2]. School-aged children and adolescents are particularly vulnerable to TDIs because of their increased participation in physical activities, sports, and outdoor play [3,4]. The prevalence of TDIs among children and adolescents varies substantially according to age, geographic location, case definitions, and study methodology. A global meta-analysis estimated that approximately 18.1% of children aged 11–13 years have experienced traumatic dental injuries, while some studies have reported higher lifetime prevalence estimates approaching one-quarter of school-aged populations [1,4,5]. In Iran, findings from a national oral health survey indicated considerably lower prevalence estimates of approximately 5% among 12-year-olds and 6% among 15-year-olds [6].

Traumatic dental injuries may result from a wide range of etiological factors, including falls, sports-related incidents, object-related trauma, interpersonal violence, and traffic accidents [7]. According to a meta-analysis by Hashim et al. [8], falls are the most common cause of orofacial injuries, followed by contact sports, interpersonal violence, and biting hard objects. Given that many of these injuries occur during school and recreational activities, children are often among the first individuals present at the scene of a dental emergency. The consequences of TDIs can be substantial. Injuries such as crown fractures, luxation injuries, and tooth avulsion may lead to functional limitations, esthetic concerns, speech difficulties, psychological distress, and reduced oral health-related quality of life among affected children and adolescents [9,10]. Importantly, the prognosis of many traumatic dental injuries depends heavily on immediate actions taken after the injury. Prompt and appropriate first-aid measures, particularly in cases of tooth avulsion, can significantly improve treatment outcomes and reduce the long-term physical, psychological, and financial consequences of dental trauma [11]. Despite the importance of timely emergency management, previous studies conducted in different countries have generally reported insufficient knowledge regarding the management of traumatic dental injuries among children, parents, teachers, and other community members [12-14]. Assessing the level of knowledge and intended response of schoolchildren is particularly important because they frequently witness injuries occurring during sports and play activities and may be directly involved in seeking help or initiating first-aid measures [13,14]. Limited information is available regarding Iranian elementary school students' awareness and self-reported practices concerning traumatic dental injuries. Therefore, this study aimed to assess the knowledge and self-reported practice of elementary school students in Tehran, Iran, regarding the emergency management of traumatic dental injuries and to identify factors associated with these outcomes.

Materials and Methods

Sampling and data collection

This descriptive-analytical cross-sectional study was conducted among elementary school students aged 10–13 years in Tehran, Iran. The minimum sample size was estimated to be 280 participants using the multiple regression assumptions in PASS software, with a significance level of 0.05, statistical power of 80%, and an anticipated coefficient of determination (R2) of 0.05. Following coordination with the Department of Community Oral Health at Tehran University of Medical Sciences, four public elementary schools (two girls' schools and two boys' schools) were selected from schools affiliated with Tehran University of Medical Sciences. These schools are located in districts characterized by relatively lower socioeconomic conditions compared with the city average, including lower household income levels and greater reliance on public educational services. Because school participation required administrative approval and willingness to cooperate with the study, the sampling approach was not intended to provide a representative sample of all elementary school students in Tehran. Students enrolled in grades 4–6, corresponding to the target age range, were invited to participate by census.

Data collection was conducted over one week using a self-administered questionnaire. Before questionnaire administration, students and their parents received information regarding the study objectives and the voluntary nature of participation. Completion of the questionnaire was considered indicative of willingness to participate. The inclusion criteria were: **(1)** age 10-13 years, **(2)** enrollment in grades 4–6, and **(3)** provision of parental and student consent. Students who were unable to understand the questionnaire items or who declined participation were excluded.

Questionnaire

Data were collected using a structured self-administered questionnaire adapted from previously published studies [15-17]. The questionnaire was translated into

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Persian through a forward-backward translation process performed by a bilingual professional to ensure linguistic accuracy and conceptual equivalence. Content validity was assessed by an expert panel comprising six community oral health specialists, one pediatric dentist, one endodontist, one oral and maxillofacial surgeon, and one epidemiologist. A pilot study involving 10 students assessed reliability through a 10-day test-retest interval; these participants were excluded from the final analysis. The internal consistency was acceptable (Cronbach's alpha > 0.70).

The final questionnaire consisted of three sections:

- Background characteristics: age, gender, history of TDIs, participation in professional sports, type of the sport, use of mouthguards during sports, and previous training related to the prevention and management of TDIs.

- Knowledge (10 items): assessing knowledge of the emergency management of TDIs using multiple-choice and Yes/No/I do not know formats. Correct responses were scored as 1, whereas incorrect and "I do not know" responses as 0. The total knowledge score was calculated by summing the scores of all items. Scores were subsequently converted to percentages, with higher scores indicating greater knowledge. For multiple-response items, each correct option was scored individually, and total item scores were summed to generate an overall knowledge score.

- Self-reported practice (5 scenarios): assessing intended responses to common TDI situations. Responses were dichotomized as favorable (1) or unfavorable (0) based on adherence to evidence-based guidelines. The total self-reported practice score was obtained by summing the item scores and converting them to percentages, with higher scores reflecting more appropriate intended management of TDIs. For multiple-response items, each correct option was scored individually, and total item scores were summed to generate an overall self-reported practice score.

Ethics

The study protocol was approved by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.DENTISTRY.REC.1401.030). Participation was entirely voluntary. Information regarding the study objectives, confidentiality of responses, and participants' rights was provided in the introductory section of the questionnaire. Informed consent was obtained from parents prior to participation.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participant characteristics and questionnaire responses. Multiple linear regression analyses were performed separately for knowledge and self-reported practice scores. The initial models included age, gender, history of traumatic dental injuries, participation in sports activities, type of sport, mouthguard use during sports activities, and previous training regarding the prevention and management of TDIs. Backward elimination was subsequently applied to obtain the final parsimonious models. Multicollinearity and model assumptions were assessed before model interpretation. Pearson's correlation coefficient was used to assess the relationship between knowledge and self-reported practice scores. Statistical significance was set at $p < 0.05$.

Results

Demographic and sport-related characteristics

A total of 487 completed questionnaires were collected and included in the analysis. The mean age of the participants was 10.73 ± 0.85 years. Females constituted 57.1% (n = 278) of the study population. A history of TDIs was reported by 12.1% (n = 59) of the participants. Based on the classification proposed by Rice et al. [18], 25.6% (n = 125) of the students participated in contact or limited-contact sports. Only 5.3% (n = 26) reported using mouth guards during sport activities, and 3.5% (n = 17) had previously received training regarding the prevention and management of TDIs. The demographic and sport-related characteristics of the participants are presented in Table 1.

Knowledge

The mean knowledge score regarding the emergency management of TDIs was 64.83 ± 9.54. The highest correct response rate was observed for the item regarding immediate dental consultation after tooth mobility (82.1%, n = 400). The lowest level of knowledge was observed for avulsion management: only 6.6% (n = 32) correctly identified that an avulsed permanent tooth can be replanted. Similarly, only 10.9% correctly identified the critical extra-alveolar time window for an avulsed tooth, and 16.4% correctly recognized milk as an appropriate storage medium. Detailed responses to the knowledge items are presented in Table 2. Self-reported practice. The mean self-reported practice score was 80.89 ± 16.30. Most participants (94.9%, n = 462)

indicated that they would seek dental care following a dental injury. However, correct management of tooth avulsion was very low (4.5%, n = 22), including immediate replantation. Only 17.7% (n = 86) correctly identified milk as an appropriate storage medium when replantation was not possible. Detailed responses to the self-reported practice items are presented in Table 3.

Analytical findings

Multiple linear regression analysis showed that knowledge scores were significantly associated with age (β = −0.10, p = 0.03) and previous training on the prevention and management of traumatic dental injuries (TDIs) (β = 0.15, p = 0.001). Specifically, increasing age was associated with a slight decrease in knowledge scores, whereas prior training was associated with higher knowledge scores. Self-reported practice scores were significantly associated with gender (β = 0.19, p < 0.001) and previous training (β = −0.15, p = 0.001). Boys demonstrated higher scenario-based practice scores compared with girls. In contrast, students with prior training showed lower self-reported practice scores than those without prior training. No statistically significant correlation was observed between knowledge and self-reported practice scores (p = 0.26) (Table 4). All variables considered clinically relevant were entered into the initial regression models. History of TDIs, participation in sports activities, sport type, and mouthguard use were not significantly associated with either outcome and were excluded during the backward elimination procedure.

Table 1. Characteristics of study participants (n = 487).

	n (%)
Gender	
Female	*278 (57.1)*
Male	*209 (42.9)*
History of TDIs	
Yes	*59 (12.1)*
No	*428 (87.9)*
Professional sports activity	
Yes	*138 (28.3)*
No	*349 (71.7)*
Sport type	
Contact/Limited-contact	*125 (25.6)*
Noncontact	*14 (2.9)*
None	*348 (71.5)*
Use of mouth guards during sports	
Yes	*26 (5.3)*
No	*461 (94.7)*
Previous training on prevention and management of TDIs	
Yes	*17 (3.5)*
No	*470 (96.5)*

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Table 2. Participants' answers to questions on knowledge of emergency management of TDIs (n = 487).

Item	Total
n (%)	
Which of the following activities can cause damage to permanent teeth? You can choose more than one option.	
Sleeping	8 (1.6)
Fighting*	387 (79.5)
Car, motorcycle, on bicycle accidents*	395 (81.1)
Eating	81 (16.6)
Physical activity*	88 (18.1)
Walking	5 (1.0)
Falling*	388 (79.7)
Running*	88 (18.1)
None of the above	30 (6.2)
If part of a permanent tooth breaks due to an impact, the dentist can reattach the broken piece to the tooth.	
Yes*	52 (10.7)
No	318 (65.3)
I don't know	117 (24.0)
If part of a permanent tooth breaks due to an impact, the broken piece should be kept in a tissue until you get to the dentist.	
Yes	142 (29.2)
No*	181 (37.2)
I don't know	164 (33.7)
If a permanent tooth becomes loose due to an impact, you should see a dentist immediately.	
Yes*	400 (82.1)
No	50 (10.3)
I don't know	37 (7.6)
If a permanent tooth falls completely out of the mouth due to an impact, it can be put back in its place in the mouth.	
Yes*	32 (6.6)
No	336 (69.0)
I don't know	119 (24.4)
If a permanent tooth falls completely out of the mouth due to an impact, the first thing to do is to find the tooth.	
Yes*	140 (28.7)
No	235 (48.3)
I don't know	112 (23.0)
If a permanent tooth falls completely out of the mouth due to an impact, it must be held by the root of the tooth.	
Yes	99 (20.3)
No*	192 (39.4)
I don't know	196 (40.2)
If a permanent tooth is completely knocked out of place due to an impact and its surface becomes dirty, it should be washed with alcohol.	
Yes	84 (17.2)
No*	238 (48.9)
I don't know	165 (33.9)
If a permanent tooth is completely knocked out of the mouth due to an impact, the maximum time for it can remain outside the mouth before being put back in its place is 30 minutes.	

Item	Total n (%)
Yes*	53 (10.9)
No	114 (23.4)
I don't know	320 (65.7)
If a permanent tooth falls completely out of the mouth due to an impact, and is not immediately put in its place, it should be kept in milk until you can see a dentist.	
Yes*	80 (16.4)
No	158 (32.4)
I don't know	249 (51.1)

*Correct answers.

Table 3. Participants' answers to the questions on self-reported practice regarding TDIs (n = 487).

Item	Total n (%)
What would you do if you fell while playing and broke part of your front tooth?	
If there was no pain or bleeding, I wouldn't do anything.	43 (8.8)
I find the broken piece of tooth, put it in milk, and go to the dentist with my parents.*	72 (14.8)
I find the broken piece of tooth, put it in a tissue, and go to the dentist with my parents.	119 (24.4)
I won't look for the broken piece and will go to the dentist with my parents.	161 (33.1)
I don't know.	92 (18.9)
If you bump into another student while playing and one of your upper front teeth is displaced inward, what would you do?	
I put the tooth back in place with my finger and immediately go to the dentist with my parents.*	59 (12.1)
I won't touch the tooth and will go to the dentist with my parents immediately.*	334 (68.6)
I won't do anything, but if I had pain later, I would go to the dentist with my parents.	34 (7.0)
I don't know.	63 (12.9)
Imagine falling during a soccer game, hitting your mouth, and bleeding. Then you realize your upper front tooth is missing. What do you do? (More than one answer may be correct.)	
I press firmly on the wound with a paper tissue to stop the bleeding and rest for a while.	194 (39.8)
I immediately look for the tooth, find it, wash it with water, put it back in its place in the bone, and go to the dentist with my parents.*	22 (4.5)
I immediately look for the tooth, find it, put it in milk, and go to the dentist with my parents.*	81 (16.6)
I immediately look for the tooth, find it, put it in a tissue, and go to the dentist with my parents.	145 (29.8)
I throw the tooth away because it is useless.	93 (19.1)
I don't know.	96 (19.7)
If your tooth was completely knocked out of place due to an impact and you couldn't put it back in, where would you put the tooth?	
Water	18 (3.7)
Milk*	86 (17.7)
Paper tissue	194 (39.8)
Nothing	91 (18.7)
I don't know	98 (20.1)
Where is the first place you go after a tooth injury?	
To the doctor	25 (5.1)
To the dentist*	462 (94.9)

*Favorable answers.

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Table 4. Final multiple linear regression models for factors associated with knowledge and self-reported practice scores regarding TDIs (n = 487).

	Unstandardized coefficients (B)	*Standardized coefficients (β)*	*P value*
	Knowledge		
Age	*−1.10*	*−0.10*	*0.03*
Previous training on the prevention and management of TDIs	*7.79*	*0.15*	*0.001*
Self-reported practice			
Gender	*6.35*	*0.19*	*<0.001*
Previous training on the prevention and management of TDIs	*−13.38*	*−0.15*	*0.001*

Discussion

This study assessed the knowledge and self-reported practices of elementary school students in Tehran regarding the emergency management of traumatic dental injuries (TDIs) and identified factors associated with these outcomes. Overall, the findings revealed inadequate knowledge of key emergency procedures, particularly in relation to avulsed tooth management, despite generally positive attitudes toward seeking dental care. The present study demonstrated substantial gaps in students' knowledge regarding critical aspects of TDI management. Although a relatively high proportion of students recognized the importance of seeking immediate dental care following trauma, knowledge related to evidence-based first-aid procedures was poor.

Notably, only a very small proportion of participants correctly identified that an avulsed permanent tooth can be replanted, and similarly low awareness was observed regarding appropriate storage media, such as milk, and the critical time window for successful replantation. In contrast to higher rates documented in prior studies [19-22], only 6.6% of the students recognized that an avulsed permanent tooth can be replanted. Regarding storage media, the most selected option was paper tissue by 39.8%. As well as in some previous studies, dry storage media such as gauze, cotton, tissue, and handkerchief were mainly preferred [19,23]. A total of 17.7% of respondents indicated that they would choose milk as a storage medium which is in accordance with a study by Young et al. (18.7%) [23]. However, some studies found lower rates of selecting milk; for instance, 3.6% in Brazilian students [17], 2.8% and 5.4% in Nigerian school children [15,24]. In our study, only 10.9% of the students were aware of ideal extra-alveolar time frame and this is in agreement with results of Goswami et al. [20] and Adekoya-Sofowora et al. [1]. Conversely, Eigbobo and Etim revealed that 53.3% of children would pursue expert treatment within 30-minute window post-injury [24]. Given that tooth avulsion is one of the most time-sensitive dental emergencies, the observed low level of correct responses indicates a critical gap in emergency preparedness. Delayed or inappropriate action can result in irreversible periodontal ligament damage and significantly reduce the prognosis of the avulsed tooth. The low level of knowledge observed in this study suggests that most students are unlikely to perform correct first-aid measures in real-life trauma situations, which may result in preventable tooth loss and long-term functional and esthetic consequences.

Hence, improving students' preparedness may enhance immediate response behaviors and potentially improve clinical outcomes. The level of knowledge observed in this study is consistent with reports from several countries indicating insufficient awareness of TDI management among schoolchildren. Previous studies conducted among children and adolescents in different settings have similarly demonstrated poor understanding of avulsion management, particularly regarding replantation and storage media selection. Andersson et al. [25] demonstrated that the knowledge of Kuwaiti students regarding emergency management of dental avulsion, tooth replantation and storage solutions is significantly deficient. Adekoya-Sofowora et al. [15] also showed the lack of knowledge about proper evidence-based management of dental avulsion in Nigerian school children.Castilho et al. [17] in Brazil, Young

et al. [23] in Hong Kong, Dhindsa et al. [19] in India, Eigbobo and Etim [24] in Nigeria and Spodzieja et al. [22] in Poland observed similar results in their studies. This consistency across populations suggests that inadequate TDI-related knowledge among children is a widespread public health issue rather than a context-specific problem. In contrast, the relatively high proportion of students who reported that they would seek dental care immediately after injury is comparable to findings from some previous studies in which children demonstrated better awareness of care-seeking behavior than of specific first-aid procedures. In our study, approximately 94.9% of respondents reported seeing a dentist following dental trauma, implying adequate comprehension regarding the role of dentists in the management and treatment of TDIs which were similar to results in previous studies [17,19,21,24]. This finding is more favorable compared to prior research by Adekoya-Sofowora et al. [15], which noted a strong children preference for consulting with medical physicians. This discrepancy indicates that while general awareness of dental urgency may exist, it does not translate into adequate procedural knowledge.

Self-reported practice results demonstrated only few students perform immediate replantation of avulsed tooth in case of incidence (4.5%) which are in consistent with the findings of the studies by Dhindsa et al. (4.8%) [19], and Eigbobo and Etim (3.9%) [24]. Not only about avulsion, but also lack of knowledge and correct management of other types of dental injuries was seen among the students. Only 10.7% of the respondents knew that the broken part of the fractured tooth can be reattached by dentist. Spodzieja et al. also realized more than half of students (55%) aged 14–19 years were unaware that fractured tooth segment has clinical value and must be taken to a dentist [22]. Furthermore, the proportion of evidence-based responses regarding management of a displaced tooth (12.1%) and fractured tooth (14.8%) was low in the present study, whereas Young et al. documented a slightly higher rates of correct responses [23]. Age was significantly associated with knowledge, although the direction and magnitude of the association suggest a modest effect. The inverse relationship between age and knowledge may reflect limited exposure to structured oral health education in older students or variability in recall and engagement with prior educational content. Previous training on traumatic dental injuries was positively associated with knowledge, supporting the effectiveness of targeted educational interventions in improving cognitive understanding of emergency management procedures. However, this association did not translate into improved self-reported practice, indicating a potential gap between knowledge acquisition and applied decision-making. Gender was significantly associated with self-reported practice scores, with boys demonstrating higher scenario-based practice scores than girls. This finding may reflect differences in exposure to physical activities, sports participation, or risk-taking behavior patterns, which could influence familiarity with injury scenarios. However, this interpretation should be made cautiously, as self-reported measures may also be influenced by response bias. Interestingly, previous training was inversely associated with self-reported practice scores. Although this finding appears counterintuitive, it should be interpreted cautiously because only 17 students (3.5%) reported having received previous training.

The small number of trained participants may have produced unstable estimates and increased the likelihood of chance findings. In addition, the content, quality, duration, and timing of previous training were not assessed in this study. It is therefore possible that some training experiences were limited to general awareness messages and did not adequately address practical decision-making in emergency situations. Another explanation is that students who had received training may have become more aware of the complexity of dental trauma management and therefore responded more conservatively to scenario-based questions. Future studies should evaluate the characteristics and effectiveness of educational programs using prospective designs and objective assessments of practical skills.

The lack of a significant correlation between knowledge and self-reported practice further supports the notion that cognitive understanding alone does not necessarily translate into appropriate behavioral responses in emergency situations. This disconnect highlights the importance of incorporating skill-based, simulation-oriented, or repeated reinforcement strategies into educational programs on traumatic dental injuries. Overall, these findings suggest that while educational exposure improves knowledge, its impact on practical decision-making remains limited, emphasizing the need for more applied, behavior-focused training approaches in school-based oral health education programs. The findings of this study have important implications for school-based oral health promotion programs. The very low level of knowledge regarding avulsion management underscores the need for structured educational interventions targeting elementary school students. Given the high incidence of dental

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injuries during school activities, these environments represent a suitable and receptive environment for implementing such programs. The socioeconomic context of the participating schools should also be considered when interpreting the findings. All schools were public schools located in relatively disadvantaged districts of Tehran. Socioeconomic factors may influence access to oral health information, preventive services, and educational opportunities related to dental trauma. Therefore, the levels of knowledge and self-reported practice observed in this study may not fully reflect those of students attending schools in more affluent areas. Future studies should include schools from a broader range of socioeconomic settings to provide a more representative assessment of TDI-related knowledge among Iranian schoolchildren.

Evidence from previous studies suggests that brief, structured educational interventions can significantly improve children's knowledge and intended behavior regarding TDIs. Prior research states that organized school-based educational interventions targeting avulsion detection, prompt replantation, and appropriate preservation media enhances both the theoretical understanding and practical emergency skills of students regarding TDIs [3]. Incorporating TDI management into school health curricula, supplemented with visual materials and practical demonstrations, may be particularly effective. In addition, improving awareness among teachers and school staff may further enhance emergency response capacity, as adults are often responsible for supervising children during injuries.

Strengths and limitations

To the best of our knowledge, this is the first study to assess Iranian schoolchildren's knowledge and self-reported practice regarding TDIs. This study has several strengths, including a relatively large sample size and the use of a structured questionnaire based on previously published instruments with expert validation. However, several limitations should be acknowledged. First, the participating schools were selected from public schools affiliated with Tehran University of Medical Sciences and were located in relatively socioeconomically disadvantaged districts of Tehran. Consequently, the study sample may not be representative of all schoolchildren in Tehran or other regions of Iran. Differences in socioeconomic status, educational resources, and access to oral health information may influence knowledge and intended responses to traumatic dental injuries. Therefore, caution is warranted when generalizing these findings beyond similar school settings. Second, both knowledge and practice were assessed using self-administered questionnaires. The self-reported practice scenarios measured intended behavior rather than actual behavior during a real traumatic dental emergency. Participants may have selected answers they perceived to be socially desirable or may have overestimated their ability to respond appropriately. Consequently, the observed practice scores should not be interpreted as direct indicators of real-world performance. Future studies should incorporate observational assessments, simulations, or intervention-based evaluations to better assess practical competencies. Third, the cross-sectional design precludes causal inference between knowledge, training, and behavioral outcomes. Furthermore, only a small proportion of participants reported previous training, which may have reduced the precision of regression estimates involving this variable. Finally, the relatively small number of students with previous training limits the stability of related statistical estimates.

Conclusion

Elementary school students in Tehran demonstrated insufficient knowledge regarding the emergency management of traumatic dental injuries, particularly avulsion-related first aid procedures, despite generally positive attitudes toward seeking dental care and strong interest in receiving further education. These findings highlight the need for structured, school-based educational interventions to improve emergency preparedness and potentially reduce the adverse outcomes of traumatic dental injuries.

Conflict of Interest

There is no conflict of interest to declare.

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