Submitted: 25 October, 2024 Accepted: 21 February, 2025 Published: 03 November, 2025 DOI:10.22514/jocpd.2025.125

ORIGINAL RESEARCH

Journal of Clinical Pediatric Dentistry

Parental knowledge of traumatic dental injuries explained by first aid training and education: a cross-sectional study

Hani T. Fadel[1,*], Sara K. Mousa[2], Manal I. Al-Malik[3], Emad A. Al-Badawi[4,†], Maisa O. Al-Sebaei[5,†], Taghreed Al-Harbi[3,†]

[1]Department of Preventive Dental Sciences, College of Dentistry, Taibah University, 42353 AlMadinah AlMunawwarah, Saudi Arabia
[2]Pediatric Dentistry, Dr. Sulaiman Al-Habib Hospital, 12214 Riyadh, Saudi Arabia
[3]Dental Department, King Fahd Armed Forces Hospital, 23311 Jeddah, Saudi Arabia
[4]Jeddah Dental Specialty Center, 23532 Jeddah, Saudi Arabia
[5]Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, King Abdulaziz University, 22252 Jeddah, Saudi Arabia

***Correspondence**
hfadel@taibahu.edu.sa
(Hani T. Fadel)

† These authors contributed equally.

Abstract

Background: Traumatic dental injuries (TDIs) are of high prevalence, especially among children at home. Parental knowledge regarding management of TDIs is detrimental for the prognosis of the affected teeth and child. The aims were to assess knowledge concerning TDIs and their management among parents of children attending selected dental centers in Western Saudi Arabia, and to determine the characteristics of the parents as related to their knowledge on TDIs. **Methods**: A cross-sectional study was conducted among 432 parents recruited from two major dental centers in Jeddah, Saudi Arabia. A self-administered questionnaire consisting of 13 questions about TDI-related knowledge, attitude and self-evaluation was used. A two-step cluster analysis was used to categorize the studied sample based on their characteristics. **Results**: Knowledge regarding TDIs was generally low. The two-step cluster analysis revealed that cluster #1 with parents who had no first aid training and low educational background had the lowest percentage of correct answers to questions related to management of avulsed teeth compared to those with first aid training and/or higher educational backgrounds ($p < 0.05$). The same cluster also included individuals with the lowest self-perceived knowledge related to TDIs and the least interest to learn about management of TDI in the future ($p < 0.05$). **Conclusions**: Within study limits, there was a lack of knowledge of traumatic dental injuries (TDIs) and their management among parents of children attending the two selected dental centers in Jeddah, Saudi Arabia. Clusters including parents with no first aid training and lower levels of education demonstrated lower TDI-related knowledge.

Keywords

Health knowledge; Attitude; Practice; Sociological factors; Tooth avulsion; Tooth injury

1. Introduction

Children and young adults are often susceptible to traumatic dental injuries (TDIs), with the majority of such injuries occurring before the age of 19 [1] or even 10 years [2]. The prevalence of dental trauma among school children is around 25% [1]. Maxillary incisors are the most commonly injured teeth [3–5], with luxation injuries more frequently reported in the primary dentition, while crown fractures occurring more often in the permanent dentition [1, 2]. Falls are recognized as the most common cause of TDIs in preschool children. In contrast, sports or hits by another person are reported more commonly among schoolchildren. Traffic accidents and assaults, on the other hand, usually occur among adolescents and young adults [6]. There are multiple risk factors for dental trauma, which include but are not limited to increased height, class II malocclusion, increased overjet, incompetent lips, higher socioeconomic status, poor psychosocial status and increased physical activity [7–9]. In addition, a number of studies from different countries have found that males are more prone to dental trauma than females [2, 5, 10–12]. Conversely, one study in Jordan reported no significant differences in TDIs between boys and girls [13].

Dental injuries may cause multiple negative impacts and impair the social functioning, emotional balance and well-being of the child. They may also lead to pediatric patients experiencing dental fear and anxiety during the emergency dental visit. Factors contributing to the association between TDIs and dental fear/anxiety include parental knowledge, female sex, degree of oral hygiene and recent pain symptoms [14]. Meanwhile, the nature of the trauma, type of injury, the action taken at the site of injury, and the area in which the injury occurred can all affect the long-term prognosis of an injured tooth. In addition, the immediate and appropriate management by those present at the site where the trauma took place is a critical factor in determining the prognosis [15]. It was reported that home was the most common place where TDIs occurred [10]. Therefore, parents are usually the

first to witness such accidents and take immediate action. It is crucial for parents to have adequate knowledge regarding dental trauma and its management in order to obtain a better prognosis.

It has been suggested that dental trauma was more costly to treat and time-consuming compared to other accidental injuries. This may be directly linked to the number of required follow up visits, since the average number of outpatient visits needed to treat an injured permanent tooth was 9.5 visits, *i.e.*, approximately 2 years [16], whereas other body injuries required only 1.5 visits [17]. It was also reported that the oral health-related quality of life (OHRQoL) was negatively affected by traumatic dental injuries [18–20].

In Saudi Arabia, the prevalence of TDIs ranged between 12% and 44% in both primary and permanent dentitions [21–24]. Several studies have been carried out, spanning over different geographic locations with diverse cultural backgrounds; to evaluate the knowledge of TDIs and their management within Saudi Arabia. The studied samples included various populations such as schoolteachers [25, 26], parents [27, 28] and emergency room (ER) physicians [29]. Interestingly, all studies agreed that there was a lack of knowledge among the participants regarding TDIs. However, the available literature is yet to describe any specific characteristics or reasons behind such a lack of TDI-related knowledge among parents of the affected children.

The aims of this study were thus to assess the knowledge concerning traumatic dental injuries (TDIs) and their management among parents of children attending two major dental centers in Western Saudi Arabia-Jeddah, and to determine the characteristics of parents as related to their TDI-related knowledge.

2. Materials and methods

2.1 Study design and sample

This cross-sectional analytic study was conducted between February/March 2021 and September 2021. Ethical approval was obtained from both King Fahd Armed Forces Hospital Approval No. REC 416, Date: February 2021) and the Ministry of Health (Approval No. H-02-J-002, Date: March 2021). The study sample comprised participants with the inclusion criteria of being parents of children attending one of two major dental centers in Western Saudi Arabia: the dental center at King Fahd Armed Forces Hospital or the North Jeddah Specialty Dental Center. Parents who are dentists by profession were excluded.

King Fahd Armed Forces Hospital is a major governmental hospital in Makkah AlMukarramah region and is situated in the metropolitan city of Jeddah. Its dental center includes all dental specialties and accommodates a large number of dental patients each year (*i.e.*, around 137,332 patients per year). While the North Jeddah Specialty Dental Center is considered one of the main dental centers in Jeddah and is run by the Ministry of Health, with a recurring number of approximately 52,885 patients seen per year from various socio-economic backgrounds.

A convenience sampling strategy was conducted where participants were selected based on their availability at the time and their willingness to participate. The total sample size was calculated based on the outcome variable “Best management for a knocked-out tooth”, an alpha (α) level of significance of 0.05 and a power of 0.92, the required total sample size was at least 320. In addition, a post-hoc power calculation was performed following the comparison between the resulting clusters in terms of “Best medium for storing an avulsed tooth”, and the achieved study power was 0.77 (ClinCalc.com).

2.2 Interview and questionnaire

Data were collected through a self-administered questionnaire, which was modified and comprised sections from validated, reliable and pre-tested questionnaires from previous studies, in both English and Arabic languages [26, 28, 30]. The questionnaire consisted of 13 close-ended questions divided into three sections. The first section was related to demographic data. The second section included questions on knowledge of assessment of dental trauma and its management, and the third section assessed the attitude and self-evaluation. Content validation was performed for the modified questionnaire by deciding on the content for review, selecting the panel of reviewing experts, conducting the validation and reviewing the sections and items of the modified questionnaire [31]. New Arabic and back translations were also performed to ensure the accuracy of the translation in the modified questionnaire. Pre-testing and piloting were then conducted on 20 parents. This was done to determine whether the questionnaire collected all necessary information, addressed the overall topic and objectives of the study and was understandable to the participants. Either one of the parents filled the questionnaire by hand while sitting in the waiting area or after entering the clinic. It took approximately 10 minutes to complete the questionnaire. A member of the clinical staff was present in case any clarification was needed. Questionnaires which were not completely answered (18 questionnaires) were excluded from the study.

2.3 Data analysis

Descriptive statistics in the form of frequency distributions and percentages were used. Inferential statistics, *i.e.*, *t*-test, analysis of variance (ANOVA) and chi-square, were also performed to assess associations between individual demographic characteristics and TDI-related knowledge. The level of significance was set at 0.05. However, no specific patterns were observed that would answer the study questions (data not shown). Accordingly, a two-step cluster analysis was performed as an explorative strategy in an attempt to detect logical patterns for characteristics of participants with similar knowledge regarding TDIs. Two-step clustering is a hybrid type of analysis where continuous and categorical variables may be considered since its algorithms combine partitioning (1st step) and hierarchical (2nd step) methods of clustering. The analysis hypothesis was that there are distinct clusters within the dataset, and that each cluster exhibits unique characteristic features that would explain differences in TDI-related knowledge from other clusters. Different background and educational variables were tested in the current analysis. The model cohesion quality of Silhouette read “good” following

the entry of the variables "First Aid Training" and "Educational Level". The clusters resulting from the analysis were compared against each other using the aforementioned inferential statistical tests. Data were analyzed using the Statistical Package for Social Sciences-IBM SPSS software version 20.0 (IBM, Armonk, NY, USA).

3. Results

A total of 432 responses were collected from both King Fahd Armed Forces Hospital (n = 208) and North Jeddah Specialty Dental Center (n = 224). The demographic characteristics of the participants are presented in Table 1. Out of the total sample, 85% of the parents were between the ages of 30 and 49 years and 52% were females. Forty-two percent had only up to a high-school degree (Table 1).

Table 1 presents the background and general knowledge of the total sample regarding traumatic dental injuries (TDIs). Parents who received first-aid training constituted 32% of the total sample, while 61% of the parents have encountered a dental injury (Table 1). When parents were asked if TDIs can be prevented at home, 39% stated that such injuries are preventable only to a certain degree. Fifty-two percent of the sample had moderate to high self-perceived knowledge regarding TDIs, while 96% were interested to learn more about TDIs and their management in the future (Table 1).

The two-step cluster analysis resulted in 3 clusters, with clusters #1 and 2 comprising parents who haven't received any form of first aid training (0%) (Fig. 1). In addition, parents in clusters #2 and 3 held a bachelor or higher education degree, while those from cluster #1 did not obtain such a degree (Fig. 1). Collectively, cluster #3 included individuals who received first aid training (100%) and who were mainly holders of a higher educational degree (71%) (Fig. 1).

Table 2 compares between the 3 clusters with regards to the TDI knowledge related questions. The percentage of correct answers to the question on management of avulsed permanent teeth was generally low, with no statistically significant differences between the clusters (p = 0.2167) (Table 2). Between 31% and 70% of the participants across clusters answered correctly to the questions related to management of avulsed primary teeth and fractured upper front teeth, with no significant differences observed between the clusters (p = 0.051 and 0.200, respectively) (Table 2). Cluster #1 demonstrated the lowest percentage (12%) of individuals who answered correctly to the question on the best medium for storing an avulsed tooth compared to the other clusters (p = 0.020) (Table 2). When looking collectively at all 4 TDI knowledge related questions, cluster #1 achieved a composite knowledge score of only 27 ± 20, compared to 36 ± 21 and 35 ± 26 for clusters #2 and 3, respectively (p = 0.001).

Fig. 2 illustrates that more individuals in cluster #1 perceive their personal knowledge regarding TDIs as low (60%), compared to those observed in clusters #2 and 3 (49% and 35%, respectively) (p = 0.001). Fig. 3 demonstrates that the majority of parents are interested in learning about management of TDI in the future across all three clusters. However, cluster #1 included a higher percentage of participants who are not interested compared to the other two clusters (p = 0.027).

4. Discussion

The purpose of this study was to assess the level of knowledge of dental trauma and its management among parents of children attending two major dental centers in Western Saudi Arabia. The results of the current investigation are consistent with the findings from other national studies that generally indicate a lack of knowledge concerning traumatic dental injuries (TDIs) and their management [25–29, 32]. Moreover, a recent systematic review confirmed that there is a global lack in TDI-related knowledge among parents [33].

Only 10% of the participating parents would try to replant the avulsed permanent tooth before going to the dentist. Interestingly, around the same percentage has been reported in previous studies conducted in Makkah [34] and AlQassim [27]. These findings indicate that parents are essentially unaware of the appropriate management of an avulsed tooth. It could also be due to their fear of doing such a procedure incorrectly or hurting the child in the process [17, 25].

In addition, around two-thirds of the parents stated that there is no benefit in keeping an avulsed primary tooth, which was comparable to another study conducted among primary school teachers in Riyadh [26]. This can be owed to their anticipation that a permanent tooth will erupt in place of the avulsed primary tooth, deeming the primary tooth as unimportant [35]. Moreover, some parents are not able to distinguish between a primary and a permanent tooth, let alone the importance of each one [36].

The current results, along with those from two previous studies; demonstrated that most parents prefer using tissue over other media for storing an avulsed tooth [28, 34], whereas a study in Riyadh reported that the majority of mothers chose saline as the most suitable storage medium [37]. Interestingly, most parents in another study in western Saudi Arabia picked milk, *i.e.*, the correct answer [32]. The storage medium is an essential factor that impacts the long-term prognosis of an avulsed tooth. Despite its importance, most of the published data points to a confusion among the general public when it comes to the best medium of storage. A possible explanation for this variation could be the natural differences in educational and/or training backgrounds, which are not always reported or linked to TDI-related knowledge.

With regards to the management of fractured teeth, the present study found that just over one third of the parents would "look for the broken part of the tooth" before going to the dentist. A similar percentage was reported in studies in AlQassim [27] and Abha [28], while only 9% of the parents in a study in Riyadh considered looking for the broken piece [37]. These findings indicate the general lack of understanding of the importance of saving broken tooth fragments for future bonding, and the benefit this may have on the overall prognosis of the tooth [26].

According to the two-step cluster analysis, the lowest TDI-related knowledge was observed among parents who haven't received any first aid training. This is in line with the study conducted among mothers in AlQassim [27], and highlights the importance of professionally provided information and its potential improvement of the oral and overall prognosis. Simple means such as information leaflets have already demonstrated

TABLE 1. Demographics and general knowledge regarding traumatic dental injuries in the total sample (N = 432).

Variable	n	%
Age (yr)		
<30	33	7.6
30–39	211	48.8
40–49	158	36.6
≥50	30	6.9
Sex		
Female	226	52.3
Male	206	47.7
Education		
Middle School or lower	40	9.3
High School	143	33.1
Bachelor's degree or higher	249	57.6
First Aid Training		
No	295	68.3
Yes	137	31.7
Have you, your family member or your friend ever encountered a dental injury?		
No	168	38.9
Yes	264	61.1
Can dental injuries at home be prevented?		
No, they occur during normal/natural activities	263	60.9
Yes, all dental injuries can be prevented	106	24.5
Yes, major dental injuries can be prevented	63	14.6
What is the best management in case of a knocked-out permanent tooth?		
These is not benefit in keeping the tooth since it fell out	137	31.7
Put it in tissue or gauze and go immediately to the dentist	152	35.2
Try to put it back in place before going to the dentist*	45	10.4
I don't know	98	22.7
What is the best management in case of a knocked-out milk (primary) tooth?		
These is no benefit in keeping the tooth since it fell out*	278	64.4
Put it in tissue or gauze and go immediately to the dentist	54	12.5
Try to put it back in place before going to the dentist	24	5.6
I don't know	76	17.6
What is the best medium for storing a knocked-out tooth before going to the dentist?		
Tissue or gauze	208	48.1
Empty container	76	17.6
Milk*	84	19.4
Tap water	64	14.8
What is the best management in case of a broken upper front tooth?		
There is no benefit in finding the broken tooth part	154	35.6
Find the broken tooth part and go immediately to the dentist*	155	35.9
I don't know	123	28.5
How would you rate your knowledge regarding dental injuries and their management?		
Low	209	48.4
Moderate	205	47.5
High	18	4.2
Are you interested in learning more about dental injuries and their management?		
No	17	3.9
Yes	415	96.1

**Correct answer.*

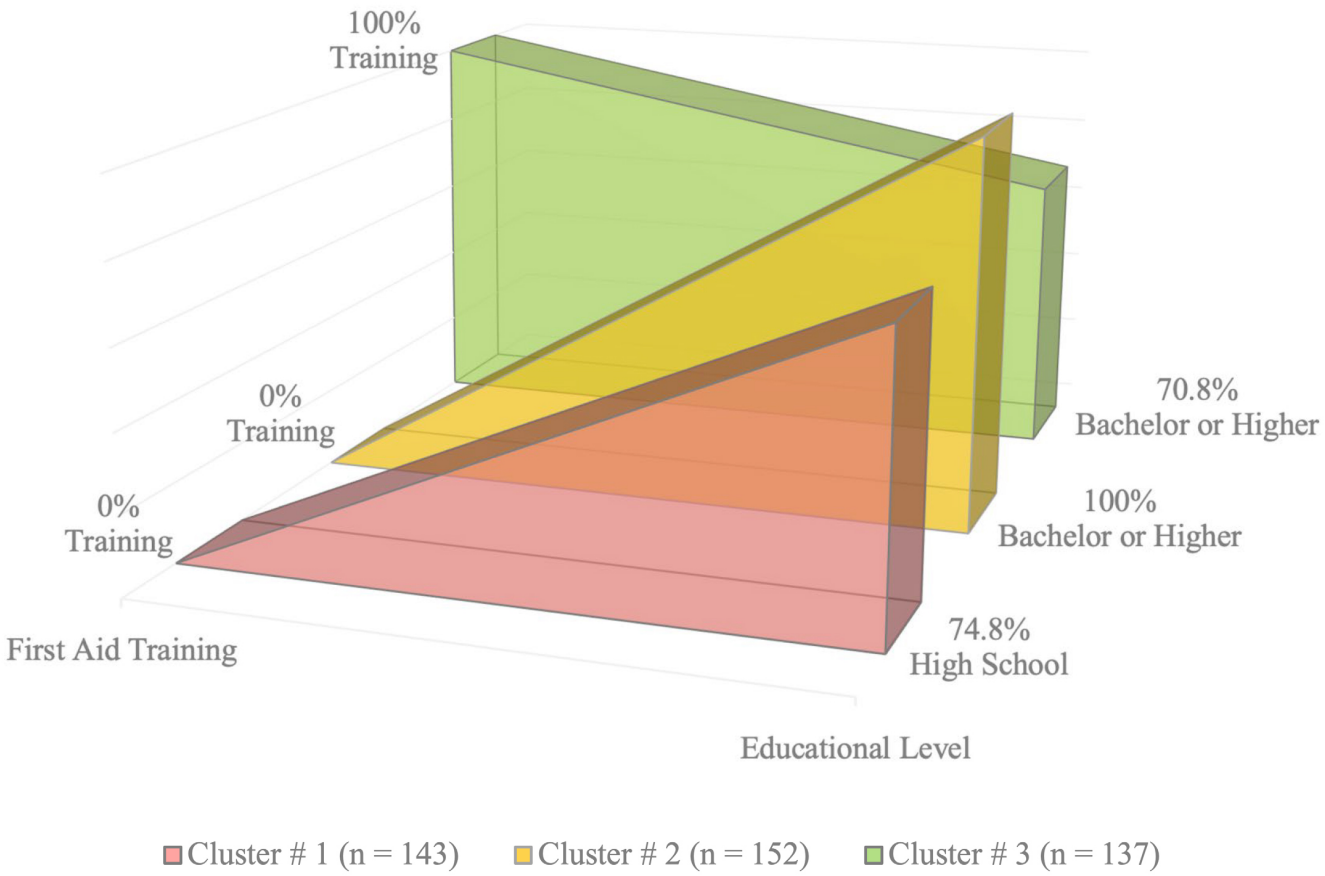

FIGURE 1. Area chart showing the results of the 2-step cluster analysis based on the input variables "First Aid Training" and "Education Level" of the parents.

TABLE 2. Comparisons between the three clusters with regards to number (percentage) of correct answers to the traumatic dental injuries (TDI) knowledge questions.

	Cluster #1 (n = 143)		Cluster #2 (n = 152)		Cluster #3 (n = 137)		*p*-Value
	n	%	n	%	n	%	
What is the best management in case of a knocked-out permanent tooth?	10	(7.0%)	20	(13.2%)	15	(10.9%)	0.216
What is the best management in case of a knocked-out milk (primary) tooth?	81	(56.6%)	101	(66.4%)	96	(70.1%)	0.051
What is the best medium for storing a knocked-out tooth before going to the dentist?	17	(11.9%)	36	(23.7%)	31	(22.6%)	0.020*
What is the best management in case of a broken upper front tooth?	44	(30.8%)	62	(40.8%)	49	(35.8%)	0.200

**Statistically significant at $p < 0.05$ using chi-square test.*

their usefulness in educating the public regarding management of TDIs [38] and calls for revisiting by the concerned regulatory bodies in the rapidly evolving digital era.

The cluster analysis also pointed to an association between TDI-related knowledge and parents' level of education, as participants with a higher university degree were noticed to have superior knowledge concerning TDIs. This supports the findings of multiple studies [32, 34] and may be understood as education progression is presumably accompanied with advancement in information extraction and analytical skills, including the handling of daily emergencies, and necessitates public actions such as spreading educational information via social media and other more accessible means.

Most of the participants acknowledged that their level of knowledge regarding TDIs was inadequate, and that they were genuinely interested in learning more about dental trauma and its management. This was in agreement with the findings of other recent studies [27, 29, 34], and reflects the parents' level of self-consciousness and sense of responsibility towards their families, and how this issue may impact their children's

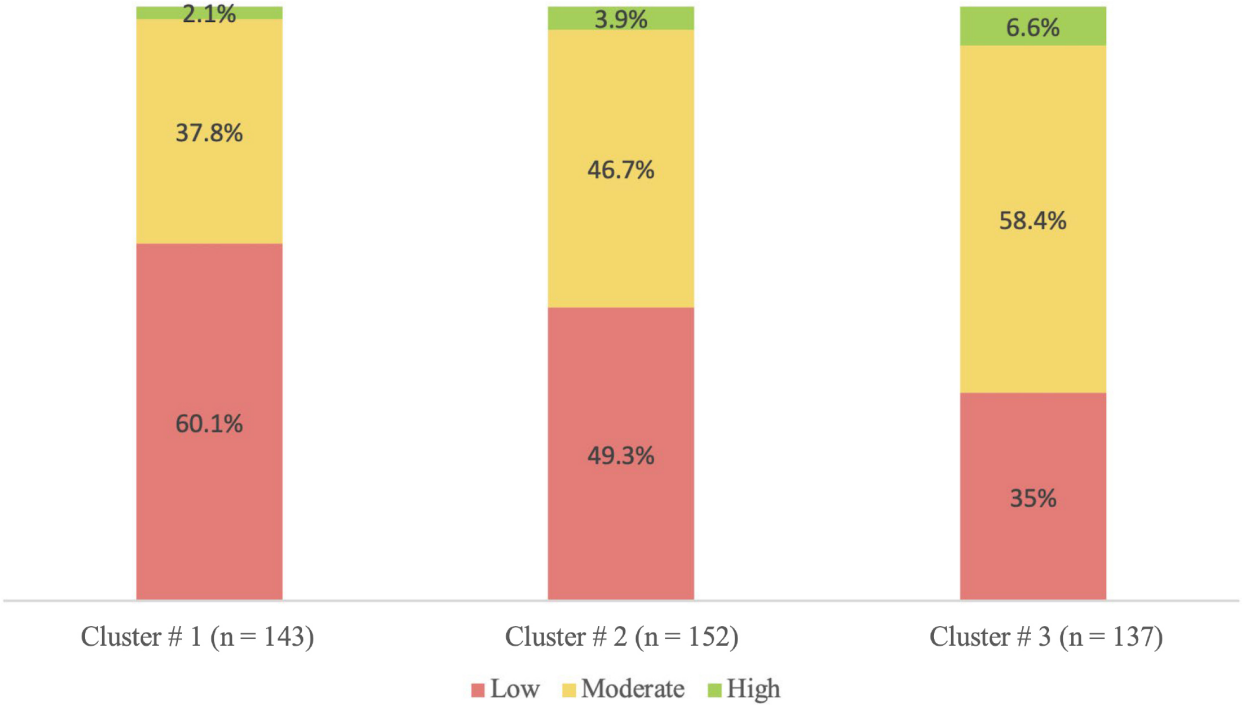

FIGURE 2. Stacked bar charts for the self-perceived knowledge regarding traumatic dental injuries (TDI) within the three clusters. Differences between the clusters were statistically significant using chi-square test ($p = 0.001$).

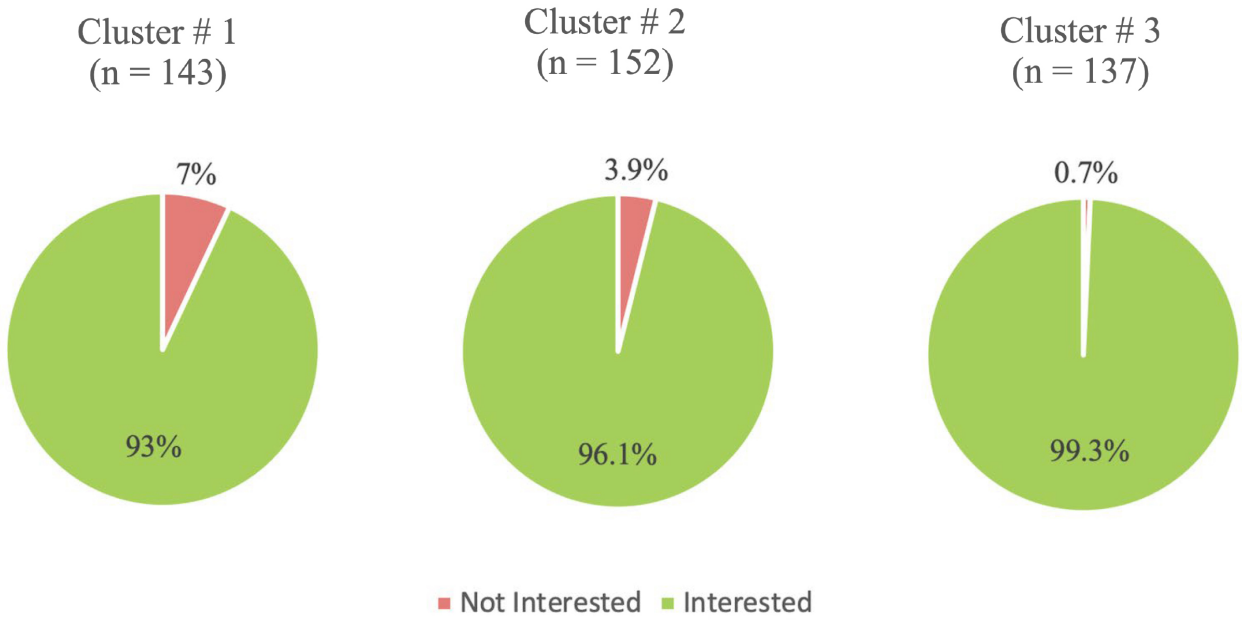

FIGURE 3. Pie charts showing interest in learning about traumatic dental injuries (TDI) and their management within the three clusters. Differences between the clusters were statistically significant using chi-square test ($p = 0.027$).

oral health-related quality of life (OHRQoL) [18–20]. Interestingly, declaration of low TDI-related knowledge and the lack of interest in further learning about TDI was particularly observed in the cluster with no first aid training and lower educational background. This may be explained either by the lack of confidence some parents may experience in the absence of relevant knowledge and skills as first responders in case of emergencies, or by the ignorance towards the importance of such vital issues as a results of lower levels of education.

There are a few noteworthy limitations in this study. First, the study was conducted in two selected hospitals in Jeddah that do not represent the total population of Western Saudi Arabia or Saudi Arabia in general. In addition, and despite achieving a study power of 0.77, the relatively small sample size may have led to an underestimation when evaluating the study findings. Future studies should preferably enroll a larger sample that is systematically spread over multiple regions and cities to provide more extrapolative results. Nevertheless, the

current sample involved two major dental centers, from two diverse governmental sectors and from a main metropolitan city, which provides useful indications for how TDI-related knowledge is spread among parents within a specified population. Another limitation is the cross-sectional nature of the current study, which limits the conclusion of causative relationships and necessitates looking upon the findings with caution. However, the current design was aligned with the purpose of the study that was meant to serve as an initial step for future follow up investigations.

5. Conclusions

Within the limitations of this study, it can be concluded that there is a lack of knowledge regarding traumatic dental injuries (TDIs) such as knocked-out teeth and their management among parents of children attending the two selected dental centers in Jeddah, Saudi Arabia. Moreover, clusters including parents with no first aid training and lower levels of education demonstrated lower TDI-related knowledge, particularly the storage and transportation of avulsed teeth. Further largescale studies are required to thoroughly investigate the factors contributing to the lack of knowledge regarding TDIs in the community.

Based on the findings of this study, a national program that motivates non-professional members of the society to undertake essential first aid training can be recommended, and in many cases may prove to be lifesaving. The lack of knowledge related to traumatic dental injuries (TDIs) that was found in the current and previous studies highlights the importance of both prevention and appropriate management of dental trauma. Although abiding by global standards and evidence [39], dental administrations should work with health authorities on incorporating management of TDIs in first aid training after recognizing its importance, and must be taught to all key individuals close to the injured child such as parents, siblings, teachers, school nurses, coaches and health care professionals. Additionally, dental professionals have the responsibility of educating and raising awareness among laypeople regarding management of TDIs. This can take place during regular dental visits, oral health promotion campaigns and dental educational programs discussing the prompt management of dental accidents. In addition, making use of the media such as the internet, smartphone applications and educational material may facilitate the education of people with various backgrounds, and in different geographic locations. Another recommendation is to integrate the topic of dental trauma management in medical education programs and curricula for healthcare providers to ensure the acquisition of necessary knowledge in managing such cases. Finally, it is of utmost importance that dentists help prevent TDIs by providing patients with mouthguards when needed, such as those who are involved in sports activities, and to provide early treatment for children with excessively proclined incisors.

ABBREVIATIONS

TDI, traumatic dental injuries; OHRQoL, oral health-related quality of life; ER, emergency room; ANOVA, analysis of variance.

AVAILABILITY OF DATA AND MATERIALS

All relevant data are contained within the article. Identifiable data related to part of the participants cannot be shared and are classified as they are related to military personnel and/or their dependents.

AUTHOR CONTRIBUTIONS

SKM and MIAM—designed the research study. SKM, EAAB, MOAS and TAH—performed the research/collected the data. HTF—analyzed and interpreted the data. HTF and SKM—wrote the manuscript. All authors contributed to editorial changes in the manuscript. Similarly, all authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from both King Fahd Armed Forces Hospital (Approval No. REC 416, Date: February 2021) and the Ministry of Health (Approval No. H-02-J-002, Date: March 2021). Participation in the study was voluntary, with no negative repercussions affecting the regularly provided service would result from participation refusal. Informed consent was obtained after explaining the nature of the study to the participants. In addition, confidentiality of personal information was ensured, as no names or contact numbers were required. The ethical principles outlined in the Declaration of Helsinki were respected.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

[1] Levin L, Day PF, Hicks L, O'Connell A, Fouad AF, Bourguignon C, *et al*. International association of dental traumatology guidelines for the management of traumatic dental injuries: general introduction. Dental Traumatology. 2020; 36: 309–313.

[2] Parvini P, Lermen Y, Sader R, Schwarz F, Obreja K. Traumatic dental injuries over an 8-year period at a German dental center: a retrospective overview and cross-sectional analysis. International Journal of Implant Dentistry. 2023; 9: 40.

[3] Lembacher S, Schneider S, Lettner S, Bekes K. Prevalence and patterns of traumatic dental injuries in primary teeth: a 3-year retrospective overview study in Vienna. Clinical Oral Investigations. 2022; 26: 2085–2093.

[4] Borkar RR, Barretto ES, Swamy DF, Fijardo EV. Prevalence of traumatic dental injuries and associated risk factors among preschool children in Goa: a cross-sectional study. Cureus. 2024; 16: e73894.

[5] Sælen FD, Virtanen JI, Skeie MS, Sulo G, Thelen DS. Traumatic dental injuries among children attending the public after-hours emergency dental

clinic in Bergen, Norway. Acta Odontologica Scandinavica. 2024; 83: 290–295.
[6] Andersson L. Epidemiology of traumatic dental injuries. Journal of Endodontics. 2013; 39: S2–S5.
[7] Dosdoğru EY, Görken FN, Erdem AP, Öztaş E, Marşan G, Sepet E, *et al*. Maxillary incisor trauma in patients with class II division 1 dental malocclusion: associated factors. Journal of Istanbul University Faculty of Dentistry. 2017; 51: 34–41.
[8] Pereira TS, Freire-Maia J, Clementino LC, Martins-Júnior PA. The role of psychological status in the incidence of traumatic dental injuries in schoolchildren. Evidence-Based Dentistry. 2024; 25: 146–147.
[9] Challa R, S G Nirmala SV, Alahari S, Nuvvula S. Assessing the risk factors for injuries to maxillary permanent incisors and soft tissues among school children—a cross-sectional study. Indian Journal of Dental Research. 2021; 32: 416–422.
[10] Kaul R, Saha S, Koul R, Saha N, Mukhopadyay S, Sengupta AV, *et al*. Prevalence and attributes of traumatic dental injuries to anterior teeth among school going children of Kolkata, India. Medical Journal, Armed Forces India. 2023; 79: 572–579.
[11] Hashim R, Luke AM, Salah A, Mathew S. Traumatic dental injuries in permanent teeth among Arab children: prevalence, and associated risk factors-a systematic review and meta-analysis. PeerJ. 2024; 12: e18366.
[12] López MDR, Cademartori MG, Goettems ML, Demarco FF, Hallal PC, da Costa VPP. Analysis of the prevalence of traumatic dental injuries in the primary dentition: findings from a cohort study involving 4-year-old children from South Brazil. Dental Traumatology. 2025; 41: 143–151.
[13] Elkarmi RF, Hamdan MA, Rajab LD, Abu-Ghazaleh SB, Sonbol HN. Prevalence of traumatic dental injuries and associated factors among preschool children in Amman, Jordan. Dental Traumatology. 2015; 31: 487–492.
[14] Kvesić AJ, Hrelja M, Lovrić Ž, Šimunović L, Špiljak B, Supina N, *et al*. Possible risk factors for dental fear and anxiety in children who suffered traumatic dental injury. Dentistry Journal. 2023; 11: 190.
[15] Fouad AF, Abbott PV, Tsilingaridis G, Cohenca N, Lauridsen E, Bourguignon C, *et al*. International association of dental traumatology guidelines for the management of traumatic dental injuries: 2. avulsion of permanent teeth. Dental Traumatology. 2020; 36: 331–342.
[16] DiPaolo M, Townsend J, Peng J, McTigue DJ, Azadani EN. Characteristics, treatment outcomes and direct costs of tooth avulsion in children treated at a major hospital. Dental Traumatology. 2023; 39: 240–247.
[17] Glendor U, Halling A, Andersson L. Type of treatment and estimation of time spent on dental trauma. A longitudinal and retrospective study. Swedish Dental Journal. 1998; 22: 47–60.
[18] Celikel P, Ozturk N, Bas A, Sengul F. Evaluation of pediatric oral health-related quality of life score in children with traumatic dental avulsion injury: a questionnaire-based cross-sectional survey. Dental Traumatology. 2024; 40: 567–572.
[19] Odersjö ML, Johansson L, Robertson A, Sabel N. Self-reported oral health-related quality of life and orofacial esthetics among young adults with treated dental trauma. Clinical and Experimental Dental Research. 2025; 11: e70068.
[20] Leo G, Nyamuryekung'e K, Kahabuka FK. Impact of traumatic dental injuries on oral health-related quality of life among primary school children in Dar es Salaam. Clinical and Experimental Dental Research. 2025; 11: e70105.
[21] Al-Ansari A, Nazir M. Prevalence of dental trauma and receipt of its treatment among male school children in the eastern province of Saudi Arabia. The Scientific World Journal. 2020; 2020: 7321873.
[22] Shehri SZA, Ababtain RA, Fotawi RA, Alkindi M, Premnath S, Alhindi M, *et al*. Pediatric maxillofacial and dental trauma: a retrospective review of pediatric emergency management in Riyadh, Kingdom of Saudi Arabia. The Saudi Dental Journal. 2021; 33: 328–333.
[23] Alshammary F, Alhur T, Alshammari KN, Siddiqui AA, Abideen MZU, Alghaythi KS, *et al*. Prevalence and risk factors of dental trauma in Ha'il, Saudi Arabia. The Journal of Contemporary Dental Practice. 2022; 23: 628–633.
[24] Madiraju GS. Pattern of traumatic dental injuries and treatment receipt among children attending the university dental hospital in Saudi Arabia. Journal of Pharmacy & Bioallied Sciences. 2024; 16: S1771–S1775.
[25] Alluqmani FA, Omar OM. Assessment of schoolteachers' knowledge about management of traumatic dental injuries in Al-Madinah city, Saudi Arabia. European Journal of Dentistry. 2018; 12: 171–175.
[26] Alsadhan SA, Alsayari NF, Abuabat MF. Teachers' knowledge concerning dental trauma and its management in primary schools in Riyadh, Saudi Arabia. International Dental Journal. 2018; 68: 306–313.
[27] Al-Haj ASN. Awareness of emergency management of dental trauma among mothers in Al-Qassim, Saudi Arabia. International Journal of Stomatology & Occlusion Medicine. 2016; 8: 25–29.
[28] AlGhamdi NMS, Alothman S, Assiri A, Bijle MA, Togoo R. Knowledge of Saudi parents toward the emergency management of avulsed permanent teeth: a cross-sectional survey. Journal of Dental Research and Review. 2016; 3: 85–87.
[29] Bahammam LA. Knowledge and attitude of emergency physician about the emergency management of tooth avulsion. BMC Oral Health. 2018; 18: 57.
[30] Young C, Wong KY, Cheung LK. Emergency management of dental trauma: knowledge of Hong Kong primary and secondary school teachers. Hong Kong Medical Journal. 2012; 18: 362–370.
[31] Yussof MSB. ABC of content validation and content validity index calculation. Education in Medicine Journal. 2019; 11: 49–54.
[32] Alharbi R, Aboalshamat K, Alrabghi K, Alassiri A, Bashammakh A, Alghamdi A, *et al.* Assessment of parents' knowledge and attitudes on emergency management of permanent avulsed teeth in Western Saudi Arabia. The Open Dentistry Journal. 2020; 14: 396–402.
[33] Tewari N, Goel S, Srivastav S, Mathur VP, Rahul M, Haldar P, *et al.* Global status of knowledge of parents for emergency management of traumatic dental injuries: a systematic review and meta-analysis. Evidence-Based Dentistry. 2023; 24: 91.
[34] Alansari F, Alkhuzea N, Alzahrani M, Alqurashi M, Fouad W, Bukhari O, *et al.* Parental knowledge and attitude about the emergency management of traumatic dental injuries and the predictive factors affecting their knowledge—a cross sectional study in Makkah, Saudi Arabia. Journal of Umm Al-Qura University for Medical Sciences. 2020; 6: 18–23.
[35] Ansari SH, Alanazi AQ, Alqahtani M, Alharbi AO, Hodan FM, Alshaye RA. Perception of Saudi parents towards the problems related to primary dentition of their children residing in Riyadh city. Journal of Family Medicine and Primary Care. 2020; 9: 5559–5563.
[36] Duruk G, Gümüşboğa ZŞ. Parents' ability to distinguish between primary and permanent teeth. Journal of Dentistry for Children. 2020; 87: 159–165.
[37] Al-Sehaibany FS, Alajlan R, Almubarak D, Almaflehi N, Aljabaa A, Albarakati SF. Knowledge on management of traumatic dental injuries among saudi mothers. Clinical, Cosmetic and Investigational Dentistry. 2018; 10: 123–128.
[38] Al-Asfour A, Andersson L. The effect of a leaflet given to parents for first aid measures after tooth avulsion. Dental Traumatology. 2008; 24: 515–521.
[39] Aldossary MS. Dental governance and the Saudi vision 2030: a narrative review. Saudi Journal of Health Systems Research. 2022; 3: 35–41.

How to cite this article: Hani T. Fadel, Sara K. Mousa, Manal I. Al-Malik, Emad A. Al-Badawi, Maisa O. Al-Sebaei, Taghreed Al-Harbi. Parental knowledge of traumatic dental injuries explained by first aid training and education: a cross-sectional study. Journal of Clinical Pediatric Dentistry. 2025; 49(6): 40-47. doi: 10.22514/jocpd.2025.125.