

An Assessment of the Knowledge and Experience of General Dentists Regarding the Management and treatment of Avulsed Teeth: A Descriptive Cross-Sectional Study

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Background and objectives: Dental injuries is one of the foremost imperative verbal wellbeing issues habitually happen in children from 8 to 12 a long time ancient and may shift from minor tooth break to broad dentoalveolar harm and tooth avulsion. Avulsion is characterized as a total relocation of a tooth from the hard attachment speaking to up to 16% of all dental wounds. Administration of the avulsed teeth is well clarified within the rules of Worldwide Affiliation of Dental Traumatology (IADT) and the American Foundation of Pediatric Dentistry (AAPD). Dental specialists are mindful for diagnosing and treatment dental wounds and they need to be well taught in this field. This research aims to assess knowledge of dentists of Guilan University of medical sciences in 2024 on avulsion teeth.

Materials and methods: A modification of the questionnaires used by Yuko Fujita and Dalia Abdullah was used to assess demographic data and knowledge of management of avulsed teeth in Iranian dental professionals.

Results: Dental practitioners of Rasht city have a generally great information and execution almost crisis activity of avulsed tooth but more can be accomplished within the zone of information.

Conclusion: The require for instructive programs for progressing the execution and information of dental specialists in a dental crisis is recommended.

Keywords: Tooth avulsion, Attitude, Knowledge, Dentists.

1. Introduction

Injuries happening to teeth are among the most common oral health problems in children between the ages of 8 and 12, and can range from minor tooth fractures to extensive alveolar damage and tooth avulsion (1,2).

Incisor's injury is common among children due to their incomplete coordination and judgment of their environment, causing them to fall when strolling, running and playing. Injuries to children's teeth can disable their speaking, chewing, aesthetic functions, and permanent teeth eruption (3). Dental injuries include traumatic dental injuries that can be classified into various categories (4). Traumatic dental injuries can vary widely in their severity. Dental traumas include these classifications:

enamel fractures, fractures that extend deeper into the pulp, avulsion, intrusions, extrusions and dental luxation (5). Avulsion is defined as the complete displacement of a tooth from its bony socket and accounts for up to 16% of all tooth injuries (6,7). It is 3 times more frequent in boys than \ girls and occurs most commonly between ages 7 and 9 years. The teeth that are most commonly prone to avulsion are maxillary central incisors (1, 6, 7). The treatment of avulsed teeth is well described in the guidelines of the International Association of Dental Traumatology (IADT) and the American Academy of Pediatric Dentistry (AAPD) (8). The best treatment for tooth evulsion is immediate replacement of the tooth in a tooth socket, with a success rate of 85-97% (9). However, this procedure can damage permanent replacement teeth and is not recommended for

primary teeth (1). One of the most important factors determining the prognosis of replanted teeth is the vitality of the remaining periodontal tissue in the root. The tooth should be preserved in a moist preservation solution such as milk to prevent the root surface from drying out (1, 10). When the tooth remains a long period outside of the socket (longer than 60 minutes), periodontal ligament may undergo necrosis and tooth loss may occur. Avulsed tooth must get replanted as soon as possible (11). General dentists are responsible for diagnosing and treating dental injuries and should be well-trained in this area (6). Patients suffering from dental trauma often should pursue a treatment sequence that encompasses the participation of both general dentists and many specialists. Optimal treatment procedure includes a broad spectrum of dental specialists such as oral and maxillofacial surgeons, paediatric dentists, endodontists, orthodontists, prosthodontists, and periodontists. Initially, urgent care in an emergency department is often administered by an oral and maxillofacial surgeon or a pediatric dentist. Following this, the patient may be referred to a general dentist or endodontist for secondary care, including endodontic and restorative treatment. Eventually, the orthodontist, prosthodontist, and periodontist may be recommended due to additional treatment (12).

However, treatment guidelines are often known only to specialist pediatric dentists.

The General Dental Council's 2005 booklet in the UK emphasizes the importance of continually developing and refreshing knowledge and skills over the course of one's career, staying current with best practices, and delivering high-quality care grounded in the best available evidence (13). Several studies have been conducted to determine general dentists' knowledge of the treatment of deciduous teeth, but their overall knowledge is reported to be limited and in need of improvement (1, 6, 7, 9, 14). It ranges from low to moderate based on the results of a study of Turkish pediatricians' knowledge of erupting teeth (15). Some educational lectures were necessary to increase graduate students' knowledge of emergency management of tooth evulsions, which could be achieved by adding basic first aid leaflets and posters (16). Another study from Italy showed that there is a need to improve the knowledge of Italian dentists on how to treat avulsion injuries (17). Hence there are few studies in this field in Iran in the literature, so the present study has been conducted to assess the knowledge of the emergency management of avulsed teeth by Iranian general dental practitioners.

2. Materials and methods

This descriptive cross-sectional study was conducted at Dental faculty, Guilan University of Medical Sciences in 2024 from October till December. The study was approved by the committee of ethics of the university (code.1538). We used a modification of the questionnaires used by Fujita et al. (7) and Abdullah et al. (6). The questionnaire consisted of two parts: part

A: demographic data, and part B: Six multiple-choice questions about management of avulsed teeth. The questionnaire was validated and pre-tested in, Guilan University of Medical Sciences, School of Dentistry. The awareness and practice of dentists regarding avulsion were evaluated based on age, gender, work experience, and workplace.

2.1. Statistical analysis

Due to the evaluation of validity, the Content Validity Index (CVI) was 92%, and the reliability was estimated to be 0.90. The validity of questions got assessed by 10 expert specialist professors and questions getting CVR < 0.6 were deleted. Six questions were assigned one point for correct answer and zero point for wrong answer; thus, the maximum possible knowledge score was six points. An information sheet was prepared to outline the study's purpose and significance, along with a consent form for participation in the proposed research. Then the questionnaires were distributed web-based to 188 general dental practitioners in Rasht. At the beginning of the questionnaire, consent was obtained from them. All dentists working in private or public offices that completed the questionnaire included in study. 53 practitioners didn't complete the questionnaire. Eventually 135 general practitioners enrolled the study. Sample size was calculated based on a similar study (18). The data was recorded and analyzed using SPSS version 23, descriptive statistics, independent t-test and chi-square test. Statistically significant difference was assumed when $P < 0.05$ (Table1).

2.2. The questionnaire

Imagine a girl who has fallen down the road and anterior upper front tooth totally displaced from its socket is brought to your office immediately after the accident. Answer the questions below:

Questions

1) Would you replant the avulsed tooth?

- Yes, in all cases

- Yes, only for permanent teeth

- No, there is not any chance for successful treatment, so the tooth should put away

2) You have decided to replant the tooth, if the avulsed tooth is covered with dirt, how would you prepare the tooth before replantation?

- Handle from the crown and wash it in tap water then put it into the socket

- Scrub the tooth gently with a toothbrush then put it into the socket

- Wipe off the mud that is stuck to the tooth by hand then put it into the socket

- Spray alcohol on the tooth then put it into the socket

3) What would you do to prepare the socket prior to replantation?

- Gentle irrigation and aspiration with saline

- Removal of coagulum with curettes
- No treatment is needed

4) Which one is the correct type of splint and preferred splinting duration?

- Rigid / 5 days
- Semirigid / 6 to 8 weeks
- Rigid / 2 to 3 weeks
- Semirigid / 7 to 10 days

5) Would you prescribe an antibiotic for the patient?

- Yes
- No

6) If you were to carry out root canal therapy on a replanted tooth, when would you start the treatment?

- Immediately after replanting the tooth
- 7 to 10 days after splint removal
- 6 month after replantation
- Before removal the splint

The duration of the practice varied from 1 to over the 20 years, with a mean duration of 17.41 ± 8.87 years

3.2. Percentage distributions of the responses to questions on managing avulsed tooth

The overall mean score for knowledge of management about avulsed tooth was 4.85 ± 0.415 of 6 points.

The Chi-square test showed no significant association between knowledge score and age (P-value = 0.713), but there was a significant association with gender (P-value = 0.020) and practice duration (P-value = 0.522). Male dentists participating in this study gotten better mean score significantly (Table 1). According to the results of the present study, knowledge did not significantly relate to the age of dentists; however, the highest level of good knowledge was observed in the 36-45 age group (Table 2).

In total 19.1% of the subjects showed a good level 79.4% a moderate level and 1.5% a poor level of knowledge (Table 3).

The most correct response percentage was related to management for the duration of splinting tooth (99.3%) and the least one was for antibiotic therapy (94.1%) (Table 4).

The overall mean score for knowledge of management about avulsed tooth was 4.85 ± 0.415 of 6 points.

3. Results

3.1. Demographic characteristics

A total of 135 General Dental practitioners participated in this study. The respondents comprised of 77.8% men (n = 105) and 22.2% female (n = 30) with the mean age of 45.35 ± 8.81 years.

Table 1. Dentist Knowledge mean score based on gender.

	Percentage	Mean Age	Mean score	P-value
Male	72%	45.8	4/90	0.020
Female	18%	43.7	4/67	

Table 2. Dentist knowledge mean score based on age.

Age	26 - 35	36 - 45	46 - 55	P-value
No. of participants	45	45	45	0.713
Mean score	4.83	4.88	4.84	

Table 3. Dentist Knowledge mean score based on gender.

	Poor 1-3 correct questions	Moderate 4-5 correct questions	Good 6 correct questions	P-value
1-10 years	0%	89.7%	10.3%	0.522
11-20 years	1.7%	79.3%	19%	
+20 years	2.3%	72.7%	25%	
Total	1.5%	79.4%	19.1%	

Table 4. Percentage of correct answers to each question.

Number of questions	Percentage of correct answer
1	97.8%
2	96.3%
3	98.5%
4	99.3%
5	94.1%
6	96.3%

4. Discussion

This was a cross-sectional descriptive study that was concluded in 2024 in Guilan University Medical Sciences by using a questionnaire distributed web-based. 188 general dentists; 135 general dental practitioners enrolled in the study. This survey aimed to evaluate general practitioners' knowledge regarding the management of avulsed teeth. The IADT recommends initiating root canal treatment 7–10 days after replanting an avulsed tooth with a closed apex and mature root to prevent inflammatory resorption and achieve a favorable long-term prognosis. (16). A similar study of Chitwan surgeons in 2020 in Nepal noted that dental surgeons had knowledge of first aid for tooth extractions. This study was cross-sectional and used a questionnaire containing 12 questions. 105 dentists participated in this study. Most of dentists (71.4%) were familiar with the correct management of the avulsed tooth. Data were entered into the Statistical Package of Social Science (SPSS) version 16. Results were relatively similar to the current article (19). Quite the opposite, another study of Turkish pediatricians in 2021 found that their knowledge of broken teeth ranged from low to moderate. A pediatrician completed a self-administered questionnaire that included 19 questions. Only 6.64% of the 256 subjects received information about tooth damage. Data for this survey from 256 respondents were analyzed using SPSS 22 (15). also in another study in turkey in 2024 between 84 students, the majority of students expressed interest in participating in an educational program on this topic. This cross-sectional study used a validated questionnaire with 10 questions. Only 7.1% of students reported they would reimplant an avulsed tooth. data were analyzed using the SPSS v23 (20). Both of these studies were cross-sectional in Turkey. This could be due to insufficient training during academic education and their studies could be Similar to the current study’s result, in a cross-sectional study of hospitals in Jeddah from August to December 2015, most participants (63.1%) considered insufficient information on dental trauma. A self-administered questionnaire consisting of 31 multiple-choice questions was used for evaluation. The data showed that his 45.9% of respondents had no prior knowledge

of her Avulsion (21). Also another study in Kingdom of Saudi Arabia In 2023 based on a 14-question questioner through 152 participants, The vast majority (71%) of interns responding to the questionnaire were aware of the initial management of avulsed teeth dental (22).

5. Limitations

This article has investigated the knowledge about tooth avulsion among dentists in a short period of time and only in a geographical area with a small statistical population. It would be beneficial to expand this study to assess the practical skills of dentists, including both specialists and students, in managing avulsed tooth emergencies across a broader geographical region.

6. Conclusion

General dentists of Rasht city have a relatively good knowledge and performance about emergency action of avulsed tooth but more can be achieved in the area of knowledge. The need for educational programs for improving the performance and knowledge of dentists in a dental emergency is suggested. Also, evaluate knowledge and performance of dental student and physicians to confront with similar case can be a good program to improve treatment and current survey showed that General dentist of Rasht city has a relatively good knowledge about managing tooth that is avulsed.

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Authors’ contribution

Parisa Rahimirad: Writing – Original draft, Writing – Review & editing
Mahsa Koochaki: Supervision, Software

Nazanin Bashardoust: Formal analysis, Methodology, Project administration
 Seyedeh Porousha Mahjoub Khatibi: Resource, Validation, Visualization
 Amir Haji Vosooghi: Conceptualization, Data curation, Investigation

Conflict of Interest

The authors declare no conflict of interest.

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