

Importance of knowledge of the management of traumatic dental injuries in emergency departments

Acar Aren, M.D.,¹ Arzu Pinar Erdem, M.D.,² Gamze Aren, M.D.,² Zeynep Deniz Şahin, M.D.,¹ Ceren Güney Tolgay, M.D.,² Merve Çayırıcı, M.D.,² Elif Sepet, M.D.,² Recep Güloğlu, M.D.,³ Hakan Yanar, M.D.,³ Kaya Sarıbeyoğlu, M.D.⁴

¹Department of General Surgery, İstanbul Training and Research Hospital, İstanbul-Turkey

²Department of Pediatric Dentistry, İstanbul University Faculty of Dentistry, İstanbul-Turkey

³Department of General Surgery, İstanbul University İstanbul Faculty of Medicine, İstanbul-Turkey

⁴Department of of General Surgery, İstanbul University Cerrahpaşa Faculty of Medicine, İstanbul-Turkey

ABSTRACT

BACKGROUND: Hospital emergency departments (EDs) are confronted with managing dental emergencies of both traumatic and non-traumatic origin. However, the literature suggests inadequate knowledge of the management of traumatic dental injuries (TDIs) among medical professionals. The aim of this study was to investigate the knowledge and attitudes regarding management of TDIs among İstanbul ED physicians.

METHODS: Surveys were distributed to emergency departments (ED) directors and their physicians. The survey contained questions about their characteristics and tested their knowledge of managing dental trauma.

RESULTS: A total of 126 surveys (13 ED directors and 113 physicians) were returned and included in the analysis. ED physician's knowledge of the appropriate management of crown fractures and avulsion was generally good ($p=0.221$), but poor for luxation injuries ($p=0.0001$). Physicians were more likely to have a better knowledge about permanent teeth than about primary teeth ($p=0.027$).

CONCLUSION: Education, monitoring, improved availability of resources, and disciplinary measures in cases of poor compliance are necessary to improve TDI management in hospitals, especially among physicians.

Keywords: Dental trauma; orofacial injury; traumatic dental injuries.

INTRODUCTION

Several epidemiological studies continue to show significant levels of dental trauma in many countries.^[1-3] In industrialized countries, about one in five children experience a traumatic dental injury (TDI) to permanent teeth before leaving school. Prevalence of injured teeth reported in the literature varies from 10% to 51%.^[4,5] The nature and complexity of dental trauma in children vary widely.^[6] Prompt and appropriate management is necessary to significantly improve prognosis of many dentoalveolar injuries, especially in a young patient.^[7-9]

The emergency medical service doctors are frequently the first to provide the primary treatment.^[10] It has been well documented that the prognosis of traumatized teeth depends largely on both timely and appropriate emergency management.^[6] Tooth fracture affecting the pulp, luxation injuries, and, especially, avulsions require prompt evaluation and treatment to obtain the best possible outcomes. Delays in treatment may result in poor prognoses of a child's tooth/teeth that have sustained these time-sensitive dental injuries.^[11] To ensure appropriate treatment of children with dental trauma, it is essential that emergency medical professionals are adequately trained in the basic principles of dental trauma management.^[10]

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Address for correspondence: Acar Aren, M.D.

İstanbul Eğitim ve Araştırma Hastanesi, Genel Cerrahi Kliniği, İstanbul, Turkey

Tel: +90 212 - 588 44 00 / 1576 E-mail: acararen@gmail.com



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In our previous article about predominant causes and types of orofacial injury in children seen in the emergency department (ED),^[12] a total of 1296 children among 12055 patients with orofacial trauma were evaluated. Although there is a high probability of encountering orofacial trauma, our search of the literature revealed only one study from Turkey that evaluated the knowledge of medical professionals in the management of tooth avulsion injuries. Therefore, this study aimed to evaluate the first-aid knowledge of the emergency physicians on the management of common pediatric dental traumas such as complicated/uncomplicated crown fractures, luxation, and avulsion.

MATERIALS AND METHODS

The present study was a cross-sectional observational study. The project was approved by the Ethics Committee of Istanbul University, Faculty of Dentistry (2015/24). The nature and purpose of the study was explained to all participants, its voluntary nature emphasized. Informed consent to participate was subsequently obtained from each study participant. Strict confidentiality was assured as no names or phone numbers were required.

The survey was developed by gathering the questions used in the articles of Needleman, Subhashraj, and Addo.^[11,13,14] In addition, physicians' experience in first-aid management of dental trauma was examined with new questions framed by the authors. The original questionnaire was developed and piloted to 10 volunteers and revised before being completed by the first group of participants. The survey was distributed to the emergency rooms departments of Istanbul University Faculty of Istanbul Medicine and Faculty of Cerrahpaşa Medicine and Health Science University Istanbul Training and Research Hospital.

The questionnaire was divided into three parts. The first part comprised questions on personal information. It included information about (age, gender, year of medical graduation, profession, academic title, level of experience in emergency medicine, if first-aid training included training on dental trauma and if the medical training involved any dental educational programs, whether the participants find their knowledge of dental trauma management sufficient or not, previous experience, and interest in learning dental trauma management). Parts II and III comprised questions regarding uncomplicated crown fracture, complicated crown fracture, luxation, and avulsion of both primary and permanent teeth as well as the emergent nature of each of these injuries. The multiple-choice or yes/no questions were used. The survey was given to the participants under the supervision of the authors.

The following fields of knowledge were assessed: importance of the emergent treatment of complicated crown fractures for pulpal healing, management of luxation, importance of immediate management of an avulsed permanent tooth for

the long-term success, importance of not replanting primary teeth, optimal storage media, critical extra-alveolar time of an avulsed tooth, proper handling of an avulsed tooth, proper cleaning technique for an avulsed tooth before replantation, first place to contact in seeking professional help, and dental trauma experience.

The guidelines for managing TDI as published at that time by the International Association of Dental Traumatology were used to determine the correct choice for each trauma question in the survey as defined by Needleman, Diaz, and co-workers.^[11,15]

Statistical Analyses

Data were analyzed using NCSS (Number Cruncher Statistical System) 2007 Statistical Software (Utah, USA). A descriptive analysis including average, standard deviations, medians, minimum, and maximum was performed. We performed one-way analysis of variance for different groups and Tukey's multiple comparison test for subgroups; Independent t-test was also performed. The results were considered to be significant for $p < 0.05$.

RESULTS

In total, 126 physicians participated in the study; 72.22% of the participants were male and 27.78% were female. The mean age of the participants was 36.67 ± 8.87 years.

The first part of the questionnaire included the personal data of the physicians. Personal data has been summarized in Table 1; 73.81% of the respondents were general surgeons and 89.68% were medical specialists.

In this study, the mean of professional experience duration was 10.73 ± 8.82 . The professional experience duration was calculated taking into account the time spent in this area after receiving the title of medical specialist. Experience level in emergency medicine was calculated as taking in consideration of the emergency service working time and it was 9.10 ± 7.98 years.

72.22% of the participants did not receive any training on oral and dental health and 97.62% did not attend any dental trauma management training. Three participants reported that they received education on dental trauma at a medical faculty. Of all the physicians, 84.92% stated that their knowledge of dental trauma management was insufficient and 80.80% were willing to attend training on this subject.

Knowledge of the appropriate emergent treatment for dental fractures, both uncomplicated and complicated, was satisfactory as indicated by physicians' correct response rates between 65.08%–92.86%. The questions regarding emergent treatment need of lateral luxation cases, where primary or

Table 1. (a) Personal data of the physicians (b) Knowledge of TDI management (c) Interest in TDI management (d) Experience in emergency medicine

(a) Personal data of the physicians	n	%			
Profession					
General Surgery	96	76.2			
Internal Medicine	11	8.7			
Pediatrics	10	8			
Emergency Medicine	9	7.1			
Academic Title					
Medical specialist	113	89.68			
Assistant professor	2	1.59			
Associate professor	8	6.35			
Professor	3	2.38			
Did you attend any oral health training during your educational/professional career?					
No	91	72.22			
Yes	35	27.78			
Did you attend any dental trauma management training during your educational/professional career?					
No	123	97.62			
Yes	3	2.38			
If the answer is yes, when did you attend?					
No answer given	123	97.62			
5 th grade of medical faculty	3	2.38			
(b) Knowledge of traumatic dental injuries management	n	%			
Do you think you have sufficient knowledge of dental trauma?					
Yes, my knowledge is sufficient	1	0.79			
My knowledge is almost sufficient	10	7.94			
No, not sufficient	107	84.92			
I have no idea	8	6.35			
(c) Interest in traumatic dental injuries management	n	%			
If a dental trauma management training was given, would you attend?					
Yes, I am interested	101	80.80			
No, I am not interested	20	16.00			
I have no idea	4	3.20			
(d) Experience in emergency medicine	n	Mean	Standar deviation	Minimum	Maximum
Years of experience	126	10.73	8.82	1	35
Years of experience in emergency medicine	124	9.10	7.98	0	35

permanent teeth are displaced by 1–2 mm without traumatic occlusion, were correctly responded to in the range of 65.08%–76.19%. However, the correct response ratio for questions regarding the emergent nature of avulsion injuries was low (26.19%–53.97%). Table 2 presents the percentage of physicians' correct responses to each of the questions regarding emergent nature of treatment of dental fractures and luxation of primary/permanent teeth.

Correct response ratios between crown fracture, luxation, and avulsion question groups were significantly different ($p=0.0001$) (Table 3). Luxation question group had less correct responses than crown fracture and avulsion groups ($p=0.0001$). No significant differences were observed between crown fracture and avulsion question groups ($p=0.221$). Correct responses to permanent teeth questions were higher than those to primary teeth questions ($p=0.027$).

Table 2. Correct responses regarding the emergent management of TDI as a function of the type of injury (crown fracture, luxation, and avulsion) (a) and tooth type (primary vs permanent) (b)

(a)	Mean±SD correct response to survey questions	Median	Minimum	Maximum	p
Crown fracture	1.04±0.76	1	0	3	0.0001
Luxation	0.59±0.75	0	0	2	
Avulsion	1.2±0.77	1	0	2	
(b)	Mean±SD correct of survey questions	Median	Minimum	Maximum	p
Primary teeth	1.31±0.70	1	0	3	0.027
Permanent teeth	1.52±0.78	2	0	3	

Table 3. Comparison of correct responses among different question groups

	p
Crown fracture / Luxation	0.0001
Crown fracture / Avulsion	0.221
Luxation / Avulsion	0.0001

Last part of the questionnaire included detailed questions regarding the management of avulsion (if treatment is needed in cases of permanent tooth avulsion, proper management of the avulsed tooth, proper cleaning technique of an avulsed tooth before replantation, proper handling of an avulsed tooth, optimal storage media, and prescription of antibiotics). Responses were grouped as “correct,” “incorrect,” and “no comment”; Table 4 presents the percentages of the responses.

While the incorrect response ratio for the question “Should avulsed permanent tooth be replaced?” was 30.95%, 56.35% of the participants declared that they have no idea; 10.32% of the physicians were aware of the appropriate treatment of an avulsed tooth. The correct response ratio for questions “If the tooth looks dirty, what would you do?” and “From which part would you hold the tooth?” was 50.79% and 48.41%, respectively. The correct response ratio for the question re-

garding appropriate storage media was very high (94.54%). Table 5 presents the distribution of responses to questions regarding appropriate storage media. The majority of respondents (80.96%) stated they would prescribe antibiotic and anti-inflammatory medications following avulsion, which was considered the correct response regarding treatment.

Critical extra-alveolar time of the avulsed tooth and first place to contact in seeking professional help were also questioned. Responses to these questions were distributed as the best response getting the highest score and the worse getting the lowest score [Table 6 (a, b)]. When we evaluated the duration between avulsion and seeking professional help, the response of 26.19% of the participants was immediately, that of 5.87% was in a couple of hours, and that of 19.05% was within 24 h; 7.14% participants responded that there was no need for urgent professional help and 19.05% had no idea about situation. For professional help, only 7.94% participants preferred a dentist and 1.59% preferred a pediatric dentist, which is very low.

Physicians’ dental trauma experiences were also examined in the last part of the questionnaire.

Participants’ previous experiences of dental trauma, with type and reason, were evaluated. Their knowledge about clinics in Istanbul that can manage emergency dental trauma cases and working hours of such clinics was also asked.

Table 4. Distribution of the responses to questions regarding avulsion injury

	Correct responses		Incorrect responses		No comment	
	n	%	n	%	n	%
Should avulsed permanent tooth be replaced?	16	12.7	39	30.95	71	56.35
What is the appropriate treatment of avulsed tooth?	13	10.32	89	70.63	24	19.05
If the tooth looks dirty, what would you do?	64	50.79	26	20.64	36	28.57
From which part would you hold the tooth?	61	48.41	3	2.38	62	49.21
Which storage media are appropriate for the avulsed tooth?	119	94.54	80	63.48	20	15.87
Would you prescribe antibiotics after avulsion?	102	80.96	24	19.05	0	0

Table 5. Distribution of responses to questions regarding appropriate storage media

	n	%
Correct responses		
Saline solution	79	62.70
Salt water	19	15.08
Patient's mouth	11	8.73
Contact lens solution	5	3.97
Milk	5	3.97
Incorrect responses		
Cold water	30	23.81
Paper towel/gauze	11	8.73
Disinfectant solution	10	7.94
Plastic bag	9	7.14
There's no need to keep the tooth	6	4.76
Ice	5	3.94
Tap water	4	3.17
Coke	4	3.17
Hot water	1	0.79
No idea	20	15.87

Their opinions on interfering with dental trauma cases were estimated [Table 7 (a, b)]; 55.56% of the physicians had experienced a dental trauma and 50.79% had witnessed tooth fracture. Reasons for the trauma were traffic accident (32.54%), fall (35.71%), sports accident (10.32%), and stroke (28.57%). Of all, 88.89% of the physicians were not aware of the emergency clinics managing dental trauma in Istanbul and their working hours. While witnessing a dental trauma, 44.44% and 27.78% of the physicians do not interfere with the patient because of lack of knowledge and because of legal obligations, respectively.

No significant differences were found between the demographic features of physicians and correct response ratios (Table 8).

DISCUSSION

This study aimed to evaluate the first-aid knowledge of the medical hospital ED physicians about the management of the common pediatric dental traumas. In our previous article, we reported that a high number of children visited EDs with orofacial injury complaints.^[12] Although high probability of orofacial trauma exists, our search of the literature revealed only one study from Turkey that evaluated the knowledge of medical professionals in the management of tooth avulsion injuries.^[16] Because an emergency dental practitioner is rarely present in public or university hospitals in Turkey, it is inevitable that physicians will sometimes be required to provide emergency dental treatment before professional dental contact.

Table 6. Extra-alveolar time of the avulsed tooth (a) the preference of professional help (b)

(a) Extra-alveolar time of the avulsed tooth	All groups	
	n	%
In case of avulsion, when should the patient seek professional help?		
Immediately (score: 5)	33	26.19
Within first 24 h (score: 2)	24	19.05
I have no idea	24	19.05
Within 30-60 minutes (score: 4)	20	15.87
Within a few hours (score: 3)	16	12.70
There is no need for professional help (score: 1)	9	7.14
(b) Preference for professional help	All groups	
	n	%
Which one would you communicate with for the treatment?		
Medical doctor (score: 3)	103	81.75
Dentist (score: 4)	10	7.94
There is no need for treatment (score: 1)	5	3.97
I would treat by myself (score: 6)	4	3.17
Pediatric dentist (score: 5)	2	1.59
Plastic surgeon (score: 2)	1	0.79
I have no idea	1	0.79

Unlike most of the previously cited studies,^[10,14-20] which primarily queried physicians about avulsions, our study examines the management of the common pediatric dental traumas such as complicated/uncomplicated crown fractures, luxation, and avulsion.

Díaz et al.^[15] interviewed 82 medical staff in hospital emergency rooms in Chile; 90% of them had not received formal training, and it was concluded that the overall TDI knowledge was relatively poor. In 2011, Trivedy et al.^[20] found that the majority (88%) of the physicians in the United Kingdom did not receive any formal training in TDI, and they were not confident in managing dentofacial emergencies. Ulusoy et al.^[16] reported that 41% of the respondents assessed their knowledge as insufficient, and the majority (78%) stated that they would like further education. All of these studies reveal that physicians have an inadequate understanding of providing appropriate first-aid when confronted with TDI. In this study, the professional experience duration and experience level of the study group in emergency medicine were approximately 10 years. During this period, the majority of the physicians did not get any education about oral health or dental trauma management.

Table 7. (a) Previous experience of dental trauma, (b) behavior of the physician facing dental trauma

(a) Previous experience of dental trauma		n	%	
Have you ever witnessed a dental trauma incident?		No	56	44.44
		Yes	70	55.56
Type of trauma	Avulsion	No	103	81.75
		Yes	23	18.25
	Tooth fracture	No	62	49.21
		Yes	64	50.79
	Luxation	No	112	88.89
		Yes	14	11.11
Reason of trauma				
	Traffic accident	No	85	67.46
		Yes	41	32.54
	Fall	No	81	64.29
		Yes	45	35.71
	Sports accident	No	113	89.68
		Yes	13	10.32
	Stroke	No	90	71.43
		Yes	36	28.57
	Others	No	124	98.41
		Yes	2	1.59
(b) Behavior of the physician witnessing dental trauma		n	%	
If you are present at the scene of dental trauma accident, and the tooth is avulsed				
I would not do anything because I do not know what to do		56	44.44	
I would not do anything because of legal issues		35	27.78	
I would confidently replant the tooth		2	1.59	
I would try to replant the tooth, without surety		1	0.79	
I have no idea		32	25.40	
Are you familiar with dental clinics and their workings hours in Istanbul that can manage emergency dental trauma cases?		No	112	88.89
		Yes	14	11.11

Only three participants had attended a lecture on TDI in medical faculty. Furthermore, 84.92% of the physicians found their knowledge of TDI to be insufficient and were willing to get educated on this subject. The results of this study are similar to those of other studies, revealing the inefficient knowledge of dental trauma management among ED physicians.

The physicians' knowledge of the appropriate emergency treatment for dental fractures, both uncomplicated and complicated, was satisfactory as indicated by their correct response rates between 65.08% and 92.86%. The questions regarding lateral luxation injuries, which cause 1–2 mm displacement of the permanent/primary teeth without traumatic occlusion, were mostly correctly responded to (between 65.08% and 76.19%). However, questions regarding avulsion

injuries had a low correct response ratio (26.19%–53.97%). Questions regarding luxation had a lower correct response ratio than those regarding crown fractures and avulsion ($p=0.0001$); no significant difference was found between correct responses to questions regarding crown fractures and avulsion ($p=0.221$). Questions regarding permanent teeth had a significantly higher correct response ratio than those regarding primary teeth ($p=0.027$).

Needleman^[11] and coworkers stated contrary results when comparing emergency physicians in Turkey. They reported poor knowledge about dental fractures, both uncomplicated and complicated, and good responses to luxation and avulsions, especially avulsions. Similar to Needleman et al., physicians' knowledge of TDI to permanent teeth was found to be better than that to primary teeth.

Table 8. Analyses of association between the characteristics of various emergency department physicians and their knowledge of emergency management of dental trauma as determined by the mean number of correct responses to eight survey questions regarding complicated/uncomplicated crown fractures, luxation, and avulsion

Physician/Institution characteristics	No. of physicians	% of physicians	Mean±SD correct responses to eight survey questions	Median	Min.	Max.	p
Age							
20–39 years of age	91	72.80	9.84±2.41	10	4	18	0.272
40–49 years of age	20	16.00	8.95±1.79	8	6	13	
50–69 years of age	14	11.20	9.36±2.34	9.8	5	14	
Sex							
Men	91	72.80	9.55±2.39	9	5	18	0.478
Women	34	27.20	9.88±2.17	10	4	13	
Specialty							
General surgery	96	76.2	9.58±2.41	9	5	18	0.664
Pediatrics	10	8.00	10.5±1.58	10.5	8	13	
Internal medicine	11	8.7	9.67±1.94	10	7	13	
Emergency Medicine	9	7.1	9.33±2.45	10	4	13	
Professional experience							
0–5 years	46	36.80	9.8±2.17	10	4	14	0.731
6–10 years	31	24.80	9.87±2.43	10	6	16	
11–15 years	18	14.40	9.61±2.87	8	7	18	
16–20 years	7	5.60	9.57±2.76	9	6	13	
>20 years	23	18.40	9.04±1.94	9	5	14	
Academic position							
Medical specialist	112	89.60	9.71±2.31	10	4	18	0.226
Assistant professor	2	1.60	7±2.83	7	5	9	
Associate professor	8	6.40	10±2.51	9.5	7	14	
Professor	3	2.40	8±1	8	7	9	

In the present study, it was found that the age, gender, medical specialization, academic title, and experience level in emergency medicine of the respondents had no significant effect on emergency physicians' correct responses regarding emergency treatment for complicated/uncomplicated crown fractures, luxation, and avulsion ($p>0.05$). Needleman^[11] and coworkers also reported the same results about the effect of ED physicians' characteristics on the knowledge of TDI. In previously cited studies, the correct answers about appropriate knowledge of avulsion management stated in a very wide range 3% to 50%.^[10,18]

A favorable prognosis for avulsed and replanted teeth significantly depends upon the combination of minimal time spent outside the socket, appropriate storage and transportation media, and minimal aggression to the root surface and periodontal ligament.^[21] In this study, regarding the question if an avulsed permanent tooth should be replanted when the patient doesn't have any systemic disorder, only 12.70% of the participants agreed to put the tooth back in its socket; 3.92% of the physicians stated that an avulsed permanent incisor

should be replanted in any event, while 24.6% of them would not replant an avulsed tooth under any circumstances, and 56.35% of respondents did not have any idea. In a study by Holan and Shmueli^[10] at Israel, 4% of the physicians stated that an avulsed permanent incisor should be replanted in any event, while McIntyre et al.^[22] reported that approximately 72% of the respondents would not immediately replant an avulsed tooth. The data of Hamilton et al.^[2] showed that 36.4% of respondents did not know a tooth could be replanted. In the study of Abu-Dawoud et al.,^[17] the majority of physicians surveyed (83.3%) reported that they did not receive any information concerning when tooth avulsion occurred.

Appropriate replantation of an avulsed permanent tooth within 30 min has a 90% chance of success. After 2 h, there is negligible (5%) chance of long-term retention of the tooth.^[23] An attempt should, thus, be made to immediately replant the avulsed tooth. Last part of the questionnaire in this survey includes questions related to the topics considered very important for the prognosis of avulsed permanent teeth. We evaluated the duration between trauma occurrences and re-

ferring the patient for professional help after avulsion; 26.19% physicians replied immediately, 15.87% replied within 30–60 min, 12.70% replied within a few hours, and 19.05% replied within 24 h. Furthermore, 7.14% physicians stated that there is no need for professional help and 19.05% did not have any idea.

In this study, only 10.32% physicians chose the appropriate management technique for an avulsed tooth. Ulusoy et al.^[16] stated that approximately half of the respondents were not aware of the appropriate procedures regarding replantation of avulsed permanent (42.0%) or primary (47.8%) teeth. Furthermore, approximately half of the respondents identified appropriate clinical procedures prior to replantation, such as proper cleaning (wash briefly under cold running water for a few seconds without touching the tooth) and handling techniques (from crown area) of an avulsed tooth before replantation.

Hamilton et al.^[24] obtained worse results in a study on root surface preparation when compared with this study. They stated that 28.5% respondents would scrub the tooth prior to replantation, 8.5% would wash and scrub the tooth with cotton, and 43.9% would wash the tooth with an antiseptic solution.

The significance of the media is to preserve the vitality of the periodontal ligament. The type of storage media required for avulsed permanent teeth were mainly responded to correctly. In this study, 62.7% physicians chose saline solution; 35% of the participants considered sterile saline as the best medium for storage and transportation in the study of Subhashraj et al.^[14] In our study, 8.73% participants recognized that an avulsed tooth should be intraorally transported, while in the studies by Lin et al.^[18] and Díaz et al.,^[15] 13.2% and 9.8% of the participants, respectively, responded that the best transport medium for an avulsed tooth is saliva. In the study of Subhashraj et al.,^[14] none of the participants was aware that patient's mouth (saliva) may also function well as a storage medium. In this study, 3.97% (a low percentage) of the physicians described "milk" as an alternative storage medium. In the study of Díaz et al.,^[15] 40% of the respondents stated milk as a storage medium.

A majority (80.96%) of respondents in this study, while 72.4% Turkish ED physicians in another study,^[16] stated that they would prescribe antibiotics and anti-inflammatory medications following avulsion, which was considered the correct response regarding treatment.

Most (81.75%) of the emergency physicians would refer the patient to a medical doctor after avulsion; 7.94% would choose a medical doctor. Only 1.59% (n=2) would refer the patient to a pediatric dentist, which was very low. In the study of Ulusoy et al.,^[16] it is stated that only 13 (18.8%) participants would refer the patient to a pediatric dentist. Hamilton et al.^[2] and Addo et al.^[13] highlighted that the physicians

are frightened of hurting the child and of the possible legal implications of incorrectly replanting the tooth. In our study, 27.78% of the participants refused to treat the child because of legal issues and 44.44% found their knowledge about dental trauma to be inefficient.

Physicians' previous experience of dental trauma ratio was found to be 55.56% in this study; 88.89% of the participants were unaware of the dental emergency clinics and their working hours in Istanbul. Published studies have revealed that physicians have an inadequate understanding of how to provide appropriate first-aid when confronted with TDI.^[10,14–20] One study from Turkey^[16] stated that most (66.7%) participants were unaware of the urgency of seeking professional care following TTAI. In this study, 84.92% of the physicians found their knowledge about dental trauma to be insufficient and 80.80% volunteered to get educated.

Conclusion

Dental trauma may occur as an isolated injury or as a component of a severe maxillofacial injury. Physicians sometimes perform emergency dental treatment because emergency dental practitioners are rarely present in either public or university hospitals in Turkey. This study indicates a lack of adequate knowledge about TDI among physicians, similar to reports published over the last decade. Most of the physicians did not attend any training on dental trauma management or oral health during their educational or professional career. Regarding their unsatisfactory knowledge about dental trauma and enthusiasm for education, a dental trauma management training should be organized with the guidance of dental faculties. Continuing education, postgraduate programs, interdisciplinary seminars, case discussions, clinical posters, and flow charts with clinical guidelines for TDI management in emergency rooms should be provided to emergency physicians to help improve their level of knowledge on the emergency management of dentoalveolar tooth injuries. In addition, efforts by local dental organizations should provide emergency doctors with lists of dentists who are knowledgeable and willing to be available 24 h a day for consultation and, if necessary, provide timely management to the individuals sustaining TDI. These efforts would enhance the long-term outcomes for patients experiencing dental trauma who require emergency management.

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REFERENCES

1. Hamdan MA, Rajab LD. Traumatic injuries to permanent anterior teeth among 12-year-old schoolchildren in Jordan. *Community Dent Health* 2003;20:89–93.
2. Hamilton FA, Hill FJ, Mackie IC. Investigation of lay knowledge of the management of avulsed permanent incisors. *Endod Dent Traumatol* 1997;13:19–23. [CrossRef]
3. Kramer PF, Zembruksi C, Ferreira SH, Feldens CA. Traumatic dental

- injuries in Brazilian preschool children. *Dent Traumatol* 2003;19:299–303. [CrossRef]
4. Gassner R, Bösch R, Tuli T, Emshoff R. Prevalence of dental trauma in 6000 patients with facial injuries: implications for prevention. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;87:27–33. [CrossRef]
 5. Soriano EP, Caldas Ade F Jr, De Carvalho MV, Caldas KU. Relationship between traumatic dental injuries and obesity in Brazilian schoolchildren. *Dent Traumatol* 2009;25:506–9. [CrossRef]
 6. Andreasen JO, Andreasen FM, Skeic A, Hjørtting-Hansen E, Schwartz O. Effect of treatment delay upon pulp and periodontal healing of traumatic dental injuries—a review article. *Dent Traumatol* 2002;18:116–28.
 7. Levin L, Ashkenazi M, Schwartz-Arad D. Preservation of alveolar bone of un-restorable traumatized maxillary incisors for future implantation. *J Israel Dent Assoc* 2004;21:54–9.
 8. Schwartz-Arad D, Levin L, Ashkenazi M. Treatment options of untreatable traumatized anterior maxillary teeth for future use of dental implantation. *Implant Dent* 2004;13:120–8. [CrossRef]
 9. Schwartz-Arad D, Levin L. Post-traumatic use of dental implants to rehabilitate anterior maxillary teeth. *Dent Traumatol* 2004;20:344–7.
 10. Holan G, Shmueli Y. Knowledge of physicians in hospital emergency rooms in Israel on their role in cases of avulsion of permanent incisors. *Int J Paediatr Dent* 2003;13:13–9. [CrossRef]
 11. Needleman HL, Stucenski K, Forbes PW, Chen Q, Stack AM. Massachusetts emergency departments' resources and physicians' knowledge of management of traumatic dental injuries. *Dent Traumatol* 2013;29:272–9. [CrossRef]
 12. Aren G, Sepet E, Pınar Erdem A, Tolgay CG, Kuru S, Ertekin C, et al. Predominant causes and types of orofacial injury in children seen in the emergency department. *Ulus Travma Acil Cerrahi Derg* 2013;19:246–50. [CrossRef]
 13. Addo ME, Parekh S, Moles DR, Roberts GJ. Knowledge of dental trauma first aid (DTFA): the example of avulsed incisors in casualty departments and schools in London. *Br Dent J* 2007;202:E27. [CrossRef]
 14. Subhashraj K. Awareness of management of dental trauma among medical professionals in Pondicherry, India. *Dent Traumatol* 2009;25:92–4.
 15. Díaz J, Bustos L, Herrera S, Sepulveda J. Knowledge of the management of paediatric dental traumas by non-dental professionals in emergency rooms in South Araucanía, Temuco, Chile. *Dent Traumatol* 2009;25:611–9. [CrossRef]
 16. Ulusoy AT, Onder H, Cetin B, Kaya S. Knowledge of medical hospital emergency physicians about the first-aid management of traumatic tooth avulsion. *Int J Paediatr Dent* 2012;22:211–6. [CrossRef]
 17. Abu-Dawoud M, Al-Enezi B, Andersson L. Knowledge of emergency management of avulsed teeth among young physicians and dentists. *Dent Traumatol* 2007;23:348–55. [CrossRef]
 18. Lin S, Levin L, Emodi O, Fuss Z, Peled M. Physician and emergency medical technicians' knowledge and experience regarding dental trauma. *Dent Traumatol* 2006;22:124–6. [CrossRef]
 19. Qazi SR, Nasir KS. First-aid knowledge about tooth avulsion among dentists, doctors and lay people. *Dent Traumatol* 2009;25:295–9.
 20. Trivedy C, Kodate N, Ross A, Al-Rawi H, Jaiganesh T, Harris T, et al. The attitudes and awareness of emergency department (ED) physicians towards the management of common dentofacial emergencies. *Dent Traumatol* 2012;28:121–6. [CrossRef]
 21. Boyd DH, Kinirons MJ, Gregg TA. A prospective study of factors affecting survival of replanted permanent incisors in children. *Int J Paediatr Dent* 2000;10:200–5. [CrossRef]
 22. McIntyre JD, Lee JY, Trope M, Vann WF Jr. Elementary school staff knowledge about dental injuries. *Dent Traumatol* 2008;24:289–98.
 23. Andreasen JO, Hjørtting-Hansen E. Replantation of teeth. I. Radiographic and clinical study of 110 human teeth replanted after accidental loss. *Acta Odontol Scand* 1966;24:263–86. [CrossRef]
 24. Hamilton FA, Hill FJ, Holloway PJ. An investigation of dento-alveolar trauma and its treatment in an adolescent population. Part 1: The prevalence and incidence of injuries and the extent and adequacy of treatment received. *Br Dent J* 1997;182:91–5. [CrossRef]

ORIJİNAL ÇALIŞMA - ÖZET

Acil servislerde travmatik dental yaralanmaların tedavisi konusunda bilginin önemi

Dr. Acar Aren,¹ Dr. Arzu Pınar Erdem,² Dr. Gamze Aren,² Dr. Zeynep Deniz Şahin,¹ Dr. Ceren Güney Tolgay,² Dr. Merve Çayırıcı,² Dr. Elif Sepet,² Dr. Recep Güloğlu,³ Dr. Hakan Yanar,³ Dr. Kaya Sarıbeyoğlu⁴

¹İstanbul Eğitim ve Araştırma Hastanesi, Genel Cerrahi Kliniği, İstanbul

²İstanbul Üniversitesi Dişhekimliği Fakültesi, Pedodonti Anabilim Dalı, İstanbul

³İstanbul Üniversitesi İstanbul Tıp Fakültesi, Genel Cerrahi Anabilim Dalı, İstanbul

⁴İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi, Genel Cerrahi Anabilim Dalı, İstanbul

AMAÇ: Hastane acil servisleri hem travmatik hem de travmatik kökenli olmayan acil dental durumlarla karşı karşıya gelirler. Öte yandan literatür, tıp uzmanları arasında travmatik dental yaralanmalarının (TDY) yönetimi konusunda bilgi eksiklikleri bulunduğunu ileri sürmektedir. Bu çalışmanın amacı, İstanbul acil cerrahi doktorlarının TDY'nin tedavisine yönelik bilgi ve tutumlarını araştırmaktır.

GEREÇ VE YÖNTEM: Anketler acil servis yöneticilerine ve doktorlara dağıtıldı. Anket, özellikleri ve dental travma yönetimi konusundaki bilgilerinin değerlendirilen soruları içermektedir.

BULGULAR: Toplamda 126 anketin (13'ü acil servis yöneticisi, 113 doktor) geri dönüşü olmuş ve değerlendirme kapsamına alınmıştır. Acil çalışanlarının kron kırıkları ve avülsiyon konusundaki uygun tedavi bilgi düzeyleri genelde iyi düzeyde olmasına karşın ($p=0.221$), lüksasyon yaralanmalarında konusundaki bilgileri yetersizdi ($p=0.0001$). Doktorlar kalıcı dişler konusunda süt dişlerine oranla daha iyi bir bilgi düzeyine sahiptiler ($p=0.027$).

TARTIŞMA: Bu çalışmadan elde edilen bulgulara dayanarak, hastanelerde özellikle doktorlar arasında TDY yönetimini iyileştirmek için eğitim, izleme, kaynakların daha iyi kullanılabilirliği ve disiplinler arası uyum eksikliğinin değerlendirilmesi gereklidir.

Anahtar sözcükler: Acil girişim; dental avülsiyon; travmatik diş yaralanmaları.

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