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## Traumatic Dental Injuries: A Survey of Knowledge and Attitudes Among Family Physicians in Türkiye

**Objective:** Individuals exposed to trauma are most often brought or directed to the nearest healthcare facility by their relatives. In Türkiye, most widely available healthcare services are provided by family physicians at primary care family health centers. Patients expect to receive treatment for traumatic dental injury (TDI) from medical doctors when they do not have immediate access to a dentist. The aim of this study was to investigate the knowledge and attitude about traumatic dental injuries among family physicians working at family health centers in Turkey.

**Materials and Methods:** A total of 110 family physicians participated in the study. Participants were family physicians who attended a meeting organized by the Elazig Provincial Directorate of Health. A self-administered questionnaire consisting of 16 multiple choice questions assessing demographic data, knowledge, and attitude about traumatic dental injuries was distributed to family physicians.

**Results:** The results obtained from 86 fully responded questionnaire forms, 75% of family physicians didn't receive any education on TDI. Eighty six percent (86%) of family physicians feel that they don't have adequate knowledge about TDI. Fifty three and a half percent (53.5%) of the family physicians reported coming across patients with TDI at least once at their practice. Regarding physicians' attitudes, 75% think that medical schools should provide education about TDI.

**Conclusions:** This study revealed that the majority of family physicians lack the knowledge needed to manage avulsion and crown fracture cases. Hence, educational programs are necessary during and after medical training for family physicians to properly manage traumatic dental injuries.

**Key Words:** Traumatic dental injury, family physicians, dental trauma, knowledge, medical education

### Travmatik Diş Yaralanmaları: Türkiye'deki Aile Hekimlerinin Bilgi ve Tutumlarının Araştırılması

**Amaç:** Travmaya maruz kalan bireyler yakınları tarafından en yakın sağlık kuruluşuna getirilmekte veya yönlendirilmektedir. Türkiye'de en yaygın sağlık hizmetleri birinci basamak Aile Sağlığı Merkezlerinde aile hekimleri tarafından verilmektedir. Hastalar, bir diş hekimine hemen ulaşamadıkları zaman tıp doktorlarından travmatik diş yaralanmaları (TDY) tedavisi almayı beklemektedir. Bu çalışmanın amacı, Türkiye'de aile sağlığı merkezlerinde çalışan aile hekimlerinin travmatik diş yaralanmalarına ilişkin bilgi ve tutumlarını incelemektir.

**Gereç ve Yöntem:** Çalışmaya toplamda 110 aile hekimi katılmıştır. Anketler Elazığ İl Sağlık Müdürlüğü tarafından düzenlenen bir toplantıda aile hekimlerine demografik verilerini, travmatik diş yaralanmaları hakkındaki bilgilerini ve tutumlarını değerlendiren 16 adet çoktan seçmeli sorudan oluşan bir anket dağıtılmıştır. Toplantı sonunda katılımcılardan anketler toplanmıştır.

**Bulgular:** 86 anket formunun eksiksiz olarak yanıtlanmasından elde edilen sonuçlara göre, aile hekimlerinin %75'i TDY konusunda herhangi bir eğitim almamıştır. Aile hekimlerinin %86'sı TDY konusunda yeterli bilgiye sahip olmadıklarını düşünmektedir. Aile hekimlerinin %53,5'i muayenehanelerinde en az bir kez TDY hastası ile karşılaştığını bildirmiştir. Verilen yanıtlarda aile hekimlerinin %75'i tıp fakültelerinde TDY hakkında eğitim verilmesi gerektiğini düşünmektedir.

**Sonuç:** Bu çalışma, aile hekimlerinin çoğunluğunun avülsiyon ve kron kırığı gibi TDY vakalarını yönetmek için gerekli bilgiye sahip olmadığını ortaya koydu. Bu nedenle, aile hekimlerinin travmatik diş yaralanmalarını uygun şekilde yönetebilmeleri için tıp eğitimi sırasında ve sonrasında eğitim programları gereklidir.

**Anahtar Kelimeler:** Travmatik diş yaralanması, aile hekimleri, diş travması, bilgi, tıp eğitimi

### Introduction

Currently, traumatic dental injury (TDI) is a significant public dental health problem. Dental traumas are highly prevalent in preschool age, school age children and adolescents (1). One in five children and one in every four adults are exposed to TDI (2, 3). Traumatic dental injuries account for 17% of injuries in preschool age children and 5% of injuries that require treatment in children and adolescents (1, 4). Treatment of TDI is often complex and expensive. It also requires a multidisciplinary approach (5). Traumatic dental injuries may affect patient's life and quality of life. Permanent damage may occur in afflicted individuals (6, 7).

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Individuals exposed to trauma are most often brought or directed to the nearest healthcare facility by their relatives (8, 9). In Turkey, widely available healthcare services are provided by family physicians at primary care family health centers (10). As defined by law, family physicians are physicians who take a personalized approach to healthcare, offering preventive health services and primary diagnostic, treatment and rehabilitative healthcare services to individuals. Their roles and responsibilities include diagnosis, treatment and referral of patients presenting to the family health centers in an appropriate manner (11).

By providing primary healthcare providers, family physicians play a crucial role in populations with limited access to dentists and in patients of low socioeconomic status (12). Specifically, the elapsed time after the trauma occurred and tooth storage medium are very important for the prognosis in cases of TDI. Therefore, emergency management or referral of the patient by the physician at the first point of care is of utmost importance (13). Patients expect to receive treatment for TDI from medical doctors when they do not have immediate access to a dentist (14).

Studies are available in literature reporting approaches to TDI taken by emergency medicine physicians, pediatricians, general practitioners, emergency nurses and emergency medical technicians (12, 15-18). However, to the best of our knowledge there is no published study about examining family physicians' approach to TDI. The aim of the present study was to investigate the knowledge and attitude about traumatic dental injuries among family physicians working at family health centers.

## Materials and Methods

**Research and Publication Ethics:** This cross-sectional, questionnaire-based study was conducted with participation of family physicians working at family health centers in Elazığ. Ethics approval for the study was granted by Firat University Ethics Committee for Non-Interventional Research Studies (Decision No: 2019-16/02).

## Study Design, Participants, and Data

**Collection:** The questionnaire was carried out at a family physicians meeting organized by the Elazığ Provincial Directorate of Health in November 2019. The questionnaire forms were handed out by researchers and, as stated at the beginning of the form, voluntary family physicians were asked to fill out the forms completely. An informed consent form was obtained from the physicians who voluntarily participated in the study. Of 110 questionnaires, 86 were completed fully and 24 questionnaire forms with missing responses were excluded from the study.

The questionnaire was created by the researchers based on similar studies as shown in Table 1 (19-22). The questionnaire consisted of 3 sections and 16 questions. The first section was included four questions on demographics, including age, sex, work setting and professional experience. The second section was comprised of five questions which intended to find out the education and opinions of family physicians on TDI. The third section was consisted of seven multiple choice questions that assessed knowledge and management of TDI among family physicians.

**Statistical Analysis:** The study data were collected and analyzed using the SPSS 22.0 (SPSS Inc., Chicago, US). Results were expressed as a frequency and percentage of respondents for each question.

## Results

The results obtained from 86 fully responded questionnaire forms are presented in Table 1. Data on the responses to the questions were summarized as number and percentage. Part (a) of Table 1 shows the demographic data of family physicians. Part (b) of Table 1 presents their education, opinions and experience about TDI. The knowledge level of family physicians on avulsed teeth and crown fracture is shown in part (c) of Table 1.

Among the family physicians surveyed, 60.5% were male, 48.8% of the physicians were in their 20s, 46.5% had more than five years of experience and 57% worked in Elazığ city center.

**Table 1.** Traumatic dental injury questionnaire form and distribution of answers given by the family physicians

<i>(a) Demographic Data of Family Physicians (1-4)</i>			n	%
1-Gender				
	o	Female	34	39.5
	o	Male	52	60.5
2-Age			n	%
	o	21-30	42	48.8
	o	31-40	32	37.2
	o	41 and older	12	14
3-Professional experience			n	%
	o	1-5	46	53.5
	o	6-10	24	27.9
	o	11-15	4	4.7
	o	16-20	4	4.7
	o	21 and more	8	9.3
4-Working at			n	%
	o	City center	49	57
	o	District	32	37.2
	o	Rural	5	5.8

**Table 1. continued**

<b>(b) Education, Experience and Opinions of Family Physicians about TDI's (5-9)</b>		
	<b>n</b>	<b>%</b>
5-Have you received any education on TDI?		
○ No	64	74.4
○ Yes, at the medical school	18	20.9
○ Yes, at a congress/ seminar	4	4.7
6-Do you feel that you have adequate knowledge about TDI? (n=86)	<b>n</b>	<b>%</b>
○ No	74	86
○ Yes	12	14
7-Do you think TDI is an emergency? (n=86)	<b>n</b>	<b>%</b>
○ No	12	14
○ Yes	66	76.7
○ No idea	8	9.3
8-Do you think that education should be provided in medical schools about TDI? (n=86)	<b>n</b>	<b>%</b>
○ No	14	16.3
○ Yes	64	74.4
○ No idea	8	9.3
9-Have you ever come across a patient with TDI? (n=86)	<b>n</b>	<b>%</b>
○ No	40	46.5
○ Yes, once	2	2.3
○ Yes, more than once	44	51.2
<b>(c) Knowledge of Family Physicians About Tooth Avulsion and Crown Fracture (10-16)</b>		
10-Have you heard about the term tooth avulsion?	<b>n</b>	<b>%</b>
○ Yes	40	46.5
○ No	38	44.2
○ No idea	8	9.3
11-Would you replant the permanent tooth that was knocked out after a trauma? (n=86)	<b>n</b>	<b>%</b>
○ Yes	14	16.3
○ No	38	44.2
○ I don't know what to do in that case	34	39.5
12-A 11-year-old child the upper front tooth was knocked out (Figure 1) (n=86)	<b>n</b>	<b>%</b>
○ Looks like a primary tooth	8	9.3
○ Looks like a permanent tooth	58	67.4
○ I don't know	20	23.3
13-What would you do for the tooth in Question 12/Figure 1? (You may choose multiple answers) (n=106)	<b>n</b>	<b>%</b>
○ There is not anything that can be done for an avulsed tooth	10	6.4
○ I would refer the child to a dentist immediately	32	30.2
○ I would replant the tooth and refer the child to a dentist immediately	6	5.7
○ I would store the tooth in appropriate conditions and advise consultation to a dentist	50	47.2
○ I don't know what to do	8	7.5
14-In your opinion, how long after an avulsed tooth be replanted into its socket? (n=86)	<b>n</b>	<b>%</b>
○ *Immediately	12	14
○ *15 min	4	4.7
○ *30 min	4	4.7
○ *One hour	18	20.9
○ 24 hours	8	9.3
○ Should never be replanted	6	7
○ Don't know	34	39.5
15- Which do you think is the best storage medium for an avulsed tooth as a result of trauma like the one in Question 12? (You may choose multiple answers) (n=106)	<b>n</b>	<b>%</b>
○ *Milk	11	10.4
○ *Saline	20	18.9
○ *Child's saliva	16	15.1
○ An avulsed tooth should not be stored, but discarded	6	5.7
○ Sterile Sponge	24	22.6
○ Ice	10	9.4
○ Disinfectant	2	1.9
○ None of the above	4	3.8
○ Don't know	13	12.3
16- Would you tell the patient that they should keep the fractured fragments shown in the Figure 2 and take them to a dentist? (n=86)	<b>n</b>	<b>%</b>
○ Yes	68	79.1
○ No	8	9.3
○ Don't know	10	11.6

\*Recommended options (13)

Family physicians 74.4% did not receive training on TDI in medical school or postgraduate programs. Only 14% of the respondents believed that they had adequate knowledge of TDI and 76.7% considered TDI as a medical emergency. According to 74.4% of the participants, undergraduate education on TDI should be provided in medical faculties. Among family physicians, 53.5% reported that they had at least once encountered a TDI patient in their practice. Of all respondents, 46% reported that they previously heard about the term dental avulsion. Among family physicians, 16.3% stated that they thought about replacing the broken tooth, while 39.5% did not know what to do. The avulsed tooth of an 11-year-old child depicted in Figure 1 was identified as primary tooth by 9.3% of the family physicians and 23.3% had no idea. In the case of an avulsed tooth, 5.7% of the respondents would consider replanting the tooth in its socket and referring the patient to a dentist and 6.4% believed that nothing could be done for an avulsed tooth. For an avulsed tooth, only 44.3% of the family physicians would replant the tooth within the recommended time period and only 44.4% of the responses were in line with recommended storage media. Of all respondents, 79.1% specified that they would advise bringing fragments of a broken tooth to a dentist.



**Figure 1.** A case of tooth avulsion



**Figure 2.** A Case of Crown Fracture

## Discussion

This study intended to evaluate the attitude and knowledge on traumatic dental injuries among family physicians who provide the most far-reaching and rapidly accessible healthcare services to the Turkish population. Since it is not possible for people residing in the rural parts of our country to have access to dental care services in emergency situations, medical doctors are expected to take action in the event of a TDI (19).

It has been previously reported that education provided in medical schools in Turkey does not specifically cover TDI (17). Based on our findings, 20.9% of the family physicians received education on TDI in medical schools but 86% stated that their knowledge of TDI was insufficient. The percentage of family physicians

who received education on TDI is higher than those reported in literature but low in terms of overall education level (3.4-9.8%) (21, 23). The low rates of education and personal competence regarding TDI may be related to insufficient coverage of dental practices in medical education and the belief that dentists are totally responsible for dental problems.

Outside the working hours of dental professionals or when access to dental care is not possible, individuals experiencing a TDI present to family health centers which are the healthcare facilities that can be accessed quickly. Some investigators have stated that hospitals and emergency departments do not have a written protocol for TDI or attend to specific cases only (14, 24). As mentioned earlier, the low level of education on TDI coupled with the absence of treatment and referral protocols in place in medical facilities poses problems in terms of TDI treatment and management.

In the present study, family physicians were shown photos of 2 cases (Figure 1, 2) involving an avulsed tooth and an enamel-dentin fracture which are among the most prevalent TDIs occurring in our region and their responses were reviewed (25). Among physicians, 53.5% stated that they had at least once encountered a TDI patient in their practice. While Kumar et al. and Subhashraj reported that 37.2% and 24% of physicians had come across avulsion cases respectively (18, 26). Bahammam et al. and Aren et al. reported that 59% and 55.6% of emergency care physicians had seen patients with TDI (19, 20). Nikolić et al. and Chanchala et al. found that 95% and 65% of pediatricians had come across a case of TDI at least once in their practices (15, 22). Emergency departments are the first places to go in the case of a trauma or an accident. This may explain why emergency care physicians encounter TDI patients more frequently than family physicians. The reason behind the higher rate of encounters with TDI among pediatricians than in surveyed family physicians might be that pediatricians take care of children only and come across with a larger number of cases.

Several studies published in the literature reported that a vast majority of physicians (86%-100%) thought that undergraduate or postgraduate courses about TDI should be provided in medical schools and were willing to receive training in the management of TDI (15, 18, 22). In line with these data, 74.4% of surveyed family physicians considered that medical schools should provide educational courses on TDI.

In our study, 46.5% of the family physicians have previously heard about the term avulsion and its management. The corresponding figures were 88% among pediatricians (Nikolic et al., 2018), 43.2% in medical doctors (Kumar et al., 2017) and 52.5% among emergency care physicians (Bahammam, 2018) (20, 22, 26). The findings that 53.5% of the family physicians encountered with at least one patient presenting with a traumatic dental injury and only 46% of them have previously heard about the term avulsion suggest that TDI patients may be exposed to incorrect treatment or instructions.

Nikoliç et al. found that 81% of the pediatricians surveyed would replant avulsed permanent teeth (22). When emergency care physicians were asked whether it is possible to replant permanent teeth, correct response rates varied between 12.7% and 79.5% (19, 20). In our study, 16.3% of the family physicians stated that they would replant avulsed teeth into their sockets. Higher rates of reimplantation as reported among pediatricians and emergency care physicians may be related to the fact that they are more likely to attend to such cases due to aforementioned reasons and thus, they may have greater experience in managing traumatic dental injuries.

For the case of avulsed permanent tooth in an 11-year-old child presented in Figure 1, 67.4% of the physicians correctly identified it as a permanent tooth. However, 9.3% of the physicians thought that the avulsed tooth was a primary tooth and 23.3% had no idea. In Turkey, tooth anatomy is covered in medical school curriculum. The finding that 32.6% of the physicians failed to give the correct answer suggests that the issues of tooth development and anatomy in medical school are not considered sufficiently.

The use of a correct transport medium for the transfer process is important to preserve viability of the tooth and periodontal tissues if immediate reimplantation of the tooth is not possible (27, 28). In the question where we asked the family physicians about the storage medium of avulsed tooth before referral to a dentist, 44.4% of the responses were among recommended storage media (milk, saline solution and child's saliva) (13). This percentage is similar to those reported by Bahammam et al. and Subhashraj from their studies involving medical doctors (52.4% and 40%, respectively) but lower than that reported by Nikoliç et al. (74%) (18, 20, 22).

Another critical factor for the treatment and prognosis in avulsion cases is the extra-oral dry time (27, 29). Bahammam et al. reported that 48.4% of the physicians were not aware of the importance of extra-oral time. Similarly, 55.8% of the physicians did not have correct information about extra-oral dry time. Periodontal ligament cells cannot survive if avulsed teeth are not replanted within the first 60 minutes after injury and the prognosis will be poor even if they had been replanted (13). Therefore, avulsed teeth should be replanted as soon as possible to maintain the viability of the periodontal cells and for a better prognosis. If the tooth cannot be replanted immediately, it should be placed in a suitable transport medium and replanted without further delay (20, 23).

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When encountered with an avulsed permanent tooth such as the one shown in Figure 1, 7.5% of the physicians reported that they did not know what to do in that case. Only 5.7% of them stated that they would replant the tooth into its socket and refer the patient to a dental professional immediately. Our findings are consistent with those in former studies where most of the physicians said they would refer the patient to a dentist without any immediate intervention (20, 30). The low rate of correct responses suggest that physicians have a poor knowledge of reimplantation and thus, low self-confidence in this area.

In our study, 79.1% of the family physicians said informed that they would advise the patient to bring fragments of fractured tooth to a dentist (Figure 2). Today's adhesives and composite materials can be used successfully in the treatment of crown fractures caused by trauma. Preservation of fragments both facilitates dentist's work and provides improved aesthetic outcomes after treatment (31-33).

Our cross-sectional questionnaire study was conducted with family physicians graduated from different medical faculties in Turkey working in one of the 81 cities in Turkey. Although our findings give us general information about the knowledge and attitudes of family physicians, they provide limited information about family physicians all over Turkey. Further studies involving a larger sample of physicians from various districts can improve comprehensiveness of the research.

Based on the findings of our study, family physicians do not have sufficient information about TDI and treatments. The medical curriculum should include educational courses on emergency dental treatment and management of traumatic dental injuries which can be provided by dental professionals and awareness of TDI should be raised among medical doctors. By increasing physicians' knowledge and confidence level, prognosis of patients exposed to a TDI can be improved with correct initial intervention. Also, the knowledge level of currently working medical doctors should be improved by incorporating these topics in postgraduate training programs.

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