



# Knowledge of general dentists, endodontists and pediatric dentists about the management on dental traumas: a survey in turkey

Conhecimento de dentistas clínicos-gerais, endodontistas e pediatras sobre o manejo de traumas dentários: uma pesquisa na Turquia

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## ABSTRACT

**Objective:** The purpose of this study was to determine endodontists, pedodontists and general dentists' knowledge of management of dental trauma. **Material and methods:** A web-based survey including 13 questions was prepared using Google forms, and a link to the survey was sent to the general dentists, endodontists and paediatric dentists via social media. The questionnaire asked for information regarding the age, gender, state of education, type of institution and knowledge levels about dental traumas. A total of 258 questionnaires were returned, and the One-Way Anova for practitioners' knowledge and the statistical analysis of the relationship between gender, vocational training and training by using Mann-Whitney U tests for participants. **Results:** As a result of statistical analysis, although there was no statistical difference between pedodontists and endodontists in their knowledge levels, it was found that both occupational groups had higher knowledge level than general dentists ( $p = 0,0001$ ). While there was a significant difference between practitioners at university and oral and dental health hospital ( $p = 0.0001$ ), there was no difference between practitioners in university hospital and private office ( $p = 0.065$ ). **Conclusions:** In conclusion, general dentists had knowledge of inadequate dental trauma management and the knowledge level of dentists working at oral and dental hospital was lower.

## KEYWORDS

Dental Trauma; Knowledge Level; General Dentist; Endodontists; Pediatric Dentistry.

## RESUMO

**Objetivo:** O objetivo deste estudo foi determinar o conhecimento de dentistas clínicos gerais endodontistas, odontopediatras sobre o tratamento de traumatismos dentários. **Material e métodos:** Uma pesquisa na Web, incluindo 13 perguntas, foi preparada utilizando os formulários do Google. Um link para a pesquisa foi enviado aos dentistas clínicos gerais, endodontistas e odontopediatras via mídia social. O questionário solicitou informações sobre idade, sexo, estado da educação, tipo de instituição e níveis de conhecimento sobre traumas dentários. Um total de 258 questionários foram devolvidos e o One-way ANOVA foi utilizado para avaliar o conhecimento dos profissionais e a análise estatística da relação entre gênero, treinamento vocacional e treinamento foi realizada utilizando o teste de Mann-Whitney. **Resultados:** como resultado da análise estatística, embora não tenha havido diferença estatística entre pediatra e endodontista em seus níveis de conhecimento, verificou-se que ambos os grupos ocupacionais apresentaram maior nível de conhecimento que os dentistas em geral ( $p = 0,0001$ ). Embora tenha havido uma diferença significativa entre os profissionais da universidade e o hospital de saúde bucal e odontológico ( $p = 0,0001$ ), não houve diferença entre os profissionais do hospital universitário e consultório particular ( $p = 0,065$ ). **Conclusões:** Em conclusão, os dentistas clínicos-gerais tinham conhecimento de tratamento inadequado do traumatismo dentário e o nível de conhecimento dos dentistas que trabalhavam nos hospitais odontológicos era menor.

## PALAVRAS-CHAVE

Traumatismo dentário; Nível de conhecimento; Dentista clínico-geral; Endodontistas; Odontopediatras.

## INTRODUCTION

Traumatic dental injuries (TDIs) are common in childhood, with a reported incidence of between 7% and 58% in children and 35% in adults [1,2]. TDIs can adverse consequences, as they can affect permanent and complex dentition, and their diagnosis and treatment can be complicated [3]. In both children and adults, anterior teeth are the most common type of TDI. Such TDIs have a negative effect on quality of life [4]. According to one study, most dental trauma patients present to the emergency clinic of the nearest state hospital, private polyclinic, or private practice clinic [5]. Therefore, general dentists and the knowledge of current approaches to TDI treatment, in addition to their level of expertise and education, play an important role in the treatment of TDIs.

Treatment options for TDIs are based on the extent and nature of the injury and can include; soft tissue interventions, restoration of the tooth, replacement of the coronal fragment, or replacement of an avulsed tooth. The abundance of possible trauma scenarios, combined with a wide range of treatment options for TDIs, makes it difficult for practitioners to provide evidence-based treatment and recommend the best treatment option to the patient [6]. The treatment of TDIs may involve more than one dental specialty, such as pedodontics or endodontics [7]. In treating TDIs it is important that general dentists are familiar with appropriate emergency approaches and evidence-based guidelines, such as those of the International Association of Dental Traumatology (IADT) [8]. In cases of inappropriate or no treatment after a dental trauma, tooth discoloration, tooth mobility, sensitivity, pulpal necrosis, root or bone resorption, and eventually tooth loss may occur [9]. Previous studies showed that general dental practitioners were ill prepared to deal with TDIs due to insufficient training and that their management of TDIs was inadequate [10,11]. In a literature review, we found that there were few studies on the knowledge levels of TDIs among general dental practitioners and specialists in Turkey. The aim of this study was to evaluate and compare the level of knowledge of TDIs among general dentists, pedodontists, and endodontists in Turkey.

## MATERIAL AND METHODS

This study was approved by the Ethics

Committee of the Institutional Review Board of Ankara Yıldırım Beyazıt University (Protocol No:2019-317). A 13-question survey (Table I) was formulated using Google forms, and the uniform resource locator link of the survey was sent via social media to general dentists, endodontists, and pediatric dentists in Turkey. No reminder message was sent, and only responses received within 4 wk were included in the analysis. Participation in the study was voluntary.

The survey comprised two parts:

Part I consisted of questions on demographic information and experience (age, sex, specialty, institution, trauma training, and dental trauma experience) Part II consisted of questions about dentoalveolar trauma. The questions were based on the management of dental trauma guidelines of the IADT [8].

The data obtained from Part I were analyzed using the Mann Whitney U test. Part II, which focused on the level of knowledge, was analyzed using a One Way analysis of variance. The tests were performed using IBM SPSS Statistics Version 21 software (IBM Corp., Armonk, NY, USA) and the level of significance was  $\alpha = 0.05$  in all the tests.

**Table I** - The demographic characteristics of the study population.

Demographic variables	N (%)	Mean score (SD)	p value
<b>Gender</b>			
Male	78(30)	7,72 (2,38)	0,007
Female*	180(70)	8,51(1,85)	
<b>Postgraduate course</b>			
Yes*	115(45)	9,04 (2,01)	0,0001
No	143(55)	7,64 (1,85)	
<b>Trauma Practice</b>			
Yes*	196(76)	8,64 (2,12)	0,0001
No	62(24)	7,08 (1,89)	
<b>Specialty</b>			
Pedodontist	81(31)	9,21 (1,69)	0,0001
Endodontist	62(24)	9,23 (1,71)	
General Dentist*	115(45)	7,09 (1,85)	
<b>Institution</b>			
Faculty of *Dentistry	120(47)	8,98 (1,90)	0,0001
ODHH	99(38)	7,44 (2,02)	
Private Practicer	39(15)	8,15 (1,82)	

\*: Statistically significant

## RESULTS

Among 602 surveyed general dentists and specialists, 258 participants completed the survey, giving 42.8% response rate. In terms of the respondents, 115 (45%) were general dentists, 81 (31%) were pedodontists, and 62 (24%) were endodontists. One hundred-twenty (44.4%) of the participants were working in the university hospital, 99 (33.2%) were working in oral and dental health centers and, 39 (10.8%) were working in private clinics.

When the results were examined, sex, duration of experience post-traumatic trauma training, and place of employment (i.e., private vs. public clinics) were associated with a statistically significant difference in knowledge levels (Table I). Females had a higher level of knowledge as compared with that of males. Those who had experience of the management of TDI cases and had received training on TDIs as part of their post-graduate education had a higher level of knowledge than those who had no experience of the management of TDI cases and no postgraduate training on TDIs.

When the results were analyzed based on the type of clinic or hospital (i.e., private or public) where the respondent worked, the level of knowledge of TDIs among participants working in university hospitals was higher than that of individuals, working in state hospitals or in private clinics. There was no significant difference in the level of knowledge of the participants working in state hospitals versus that of the participants working in private clinics ( $p = 0.065$ ). There was a statistically significant difference in the level of knowledge of TDIs based on the areas of expertise of the respondents (Table I), with general dentists having significantly lower scores than endodontists or pedodontists ( $p < 0.0001$ ). No significant difference was observed between the knowledge levels of endodontists and pedodontists ( $p > 0.05$ ) (Table-I).

A summary of the questions and the percentage of correct and incorrect answers are shown in Table II. Most of the respondents correctly answered the questions relating to the management of enamel dentin fractures (86%), treatment approaches to avulsion (73%), and types of anaesthetics used in avulsion (78.8%). The fewest correct answers were obtained for questions relating to the management of root fractures (27.8%).

**Table II** - Questions about treatment of dental trauma.

Questions	Case	Correct N (%)	Incorrect N (%)
Q1-a	Enamel-dentin-pulp fracture	136(52,5)	122 (47,5)
Q1-b	Enamel-dentin-pulp fracture (restoration material)	170 (65,6)	88(34,4)
Q2-a	Enamel/Enamel-dentin fracture	223(86,1)	35 (13,9)
Q2-b	Enamel/Enamel-dentin fracture (restoration material)	159 (61,9)	98(38,1)
Q3-a	Solution in avulsion	130(49,8)	128(49,2)
Q3-b	Avulsion open apex	189(73)	69(27)
Q3-c	Type of anesthetic	204 (78,8)	54(21,2)
Q3-d	Type of splint	117(46,2)	136(53,8)
Q4	Lateral luxation	79(30,5)	179(69,5)
Q5	Root fracture	70(27,8)	188(72,2)
Q6	Crown fracture-open apex with priapical lesion	165(63,7)	93(36,3)
Q7	Avulsion closed apex	77 (29,7)	181(70,3)

## DISCUSSION

Appropriate and prompt treatment for TDIs are crucial for the prognosis of TDIs and prevention of further complications [12]. Appropriate treatment of TDIs reduces the stress and anxiety among patients. Previous studies showed that prompt treatment of TDIs by experienced dental practitioners led to decreased patient anxiety and improved patient outcomes [13,14]. The aim of this study was to evaluate the level of knowledge of TDI treatment among general dentists, endodontists and pedodontists.

According to the results of this study, the following factors were associated with a significantly higher level of knowledge of TDIs: a specialist background (i.e., endodontics or pedodontics), experience of the management of TDIs, and attending postgraduate courses on TDIs. In addition, there was a proportional relationship between the number of TDI cases treated in the past and the respondents' knowledge levels [15].

In our study, we also observed that specialists had a higher level of knowledge of the management of TDIs as compared with that of general dentists. However, we found no significant difference in knowledge levels among endodontists and pedodontists. These results support those of some other studies [15,16]. In contrast Hartman et al. [15] stated that endodontists had higher knowledge than did pediatric dentists about particular types of TDIs, and Duruk and Erel [17] reported that pediatric dentists were more informed than other specialists were about the treatment of avulsion. General dental practitioners considered that coverage of maxillofacial trauma in the general curriculum was limited and that their training did not equip them to deal with dental traumas. Dental postgraduate curriculum in pediatric dentistry, endodontics, and maxillofacial surgery include dental trauma courses. The level of knowledge of general dentists was also lower than that, as more cases were seen and more supplied during endodontics and pedodontics postgraduate education. The knowledge of specialists of the management of TDIs may be better than that of general dental practitioners due to continual education on recent developments in the field, including new dental materials. On the other hand, the infrequent exposure of general dental practitioners to patients with TDIs may mean they can not recall aspects of their training as undergraduate relating to TDIs.

Buldur and Kapdan [11] reported that dentists working in university hospitals had a higher level of knowledge of TDIs as compared

with that of dentists working in other institutions. The findings of our study are in agreement with those of Buldur and Kapdan[11]. As noted in the previous study [11], the findings can be attributed to dentists in university hospitals gaining more experience and training due to higher numbers of TDI cases presenting to these hospitals.

In our study, the number of female participants (70%) was higher than that of male participants (30%). In Turkey, the number of female dentists has surpassed that of male dentists since the 1990s, the numbers of female dentists in the country continue to exceed those of male practitioners. A similar trend has been also observed in other countries [8,15,18]. Our study showed that female dentists had a higher level of knowledge of TDIs than did male dentists. This finding can be attributed to the number of female dentists in this study far outweighing the number of male dentists.

In this study, the highest level of knowledge among all the participants was of uncomplicated crown fractures (86.10%). Buldur and Kapdan [11] also reported a high level of knowledge of crown fractures as compared to knowledge of other TDIs. As reported in clinical studies, uncomplicated crown fractures showed a small amount of pulpal response, and pulpal inflammation was resolved following restorative treatment, which eliminated the inflammation [19,20]. Considering the high number of uncomplicated crown fractures cases and relatively simple treatment procedure, it can be expected that the level of knowledge of crown fractures would be higher than that of knowledge of other TDIs. In this study, 52.5% (n = 136) of the participants responded correctly to the questions on complicated crown fractures. In contrast, in studies by Buldur and Kapdan [11] and Alyasi et al. [16], only 30.9% and 33.1% of the participants, respectively answered questions on complicated crown fractures, correctly. In the present study, the high level of knowledge

among the participants of complicated crown fractures may be because such fractures are more common in Turkey.

In our study, 72.2% (n = 188) of the participants responded correctly to questions on root fracture treatment. Based on the literature on the treatment of root fractures, the prognosis can be developed by rapid treatment and close adaptation of root segments [21]. Similarly, Krastl et al. [22] and Alyasi et al. [16] reported that 88.5% and >50% of participants responded correctly to questions on the same topic. Krastl et al. [22] In Germany, in most cases, only a tooth with a fractured root needs to be splinted. In the present study, correct answer was root canal treatment and a semirigid splint. Although there is some evidence to support short-term splinting of root-fractured teeth, the majority of studies concluded that short-term splinting did not improve the outcome [8].

In the present study, only a small number of the participants (30.5%, n = 79) responded correctly to the questions on lateral luxation. The participants experienced instability in splint times. In cases of luxation injuries involving orthodontic or surgical repositioning of teeth, Andreassen et al. [23] reported that semirigid splint for 4 wk resulted in effective dental healing. IADT guidelines recommend immediate repositioning and splinting [8]. The duration of splint treatment varies according to the severity of the trauma, compliance of the patient with the treatment, and the patient's growth and development status. The fact that the splint period requires advanced clinical knowledge and experience about the correct management of the splint period may explain why a large number of the participants answered the question incorrectly.

Immediate reimplantation of an avulsed tooth is very important for the prognosis and maximum recovery of the tooth [19]. In the present study, 73% (n = 189) of the participants responded to avulsion cases in an open apex

immature teeth. Conversely, 29.7% (n = 71) of the participants responded to avulsion cases in a closed apex mature teeth. This shows a lack of knowledge about the management of an avulsed tooth in adult patients. The findings could be due to misinterpretation of the questions. Likewise, they may point to inadequate knowledge about the duration of in a patient with an avulsed tooth. Similar to our study, Duruk and Erel [17] reported that 96.5% of their participants selected immediate replantation. Cohence et al. [24] reported that < 25% of respondents answered questions on the management of avulsed mature teeth correctly (i.e., immediate reimplantation), and Alyasi et al. [16] reported that 31.4% of participants in their study responded correctly to similar questions. If immediate replantation is not possible, the tooth should be stored in Hank's balanced salt solution, milk, saline, saliva, or water and immediately taken to a dentist for replantation and splinting [25,26]. Although Hank's balanced salt solution is the ideal solution according to the IADT, it may not be available in every hospital due to its high cost [25]. In a previous study, although the majority of dentists reported that they favored saliva and saline over milk to store avulsed teeth, the study showed that cold milk was superior to both saliva and saline for this purpose [27]. In our study, 49.8% (n = 130) of the participants selected milk as the optimum storage solution for an avulsed tooth, whereas 49.2% (n = 128) of the participants said they used other solutions. Based on the results, there seems to be no established consensus on the best medium to store avulsed teeth.

Splinting should allow physiological movement of an avulsed tooth in the socket and should ideally be for a maximum of 2 wk to reduce the risk of ankylosis [28]. Duruk and Erel [17] reported that 67.8% of participants stated that avulsed teeth should be splinted for between 2 and 4 wk. In this study, 46.2% (n = 117) of the respondents answered the question on the duration of splinting of an avulsed tooth

correctly (i.e., splinted for 2–4 wk), and 53.8% (n = 136) of the respondents answered this question incorrectly. According to these results may be attributed to the higher number of general dental practitioners in our study as compared with the numbers of specialist endodontists and pedodontists. In a survey of 400 dentists (general dental practitioners, n = 155; pediatric dentists, n = 80; endodontists, n = 34; prosthodontists, n = 25; restorative dentists, n = 20; periodontists, n = 28; orthodontists, n = 18; maxillofacial surgeons, n = 30; and maxillofacial radiologists, n = 10), Duruk and Erel [17] reported that all the respondents performed well in terms of knowledge of the treatment approach to avulsion.

Buldur and Kapdan [11] reported a moderate level of knowledge about the treatment of various TDIs among 136 dentists (general dentists, n = 93; pediatric dentists, n = 16; endodontists, n = 15; and restorative dentists, n = 12) in Sivas, Turkey. In another study, Çınar et al. [29], has found a low level of knowledge about the management of TDIs among 154 dentists (general dental practitioners, n = 133; and specialists, n = 21) in Ankara, Turkey. In the current study Turkish dentists had moderate knowledge about different TDIs. Given the low number of participants in our study, the findings may not reflect the knowledge of dental practitioners overall in Turkey. However, the power of the study and nature of the study population (i.e., general and dental practitioners from a range of specialties working in various settings in cities in Turkey) are strengths of the study.

The results revealed different levels of knowledge of TDIs among dentists in Turkey. This finding is in accordance with that of other research, which found a lack of knowledge among dental practitioners worldwide in terms of the management of dental trauma [30]. It should be noted that a comparison between the findings of various studies may be hard due to differences in their methodologies. However, the

results of such studies can be combined to better understand the current status of knowledge among dental practitioners of the management TDIs. Therefore, standardized study designs or international survey research should be considered in the future.

## CONCLUSION

In this study, the knowledge level of general dentists in Turkey on TDIs was lower than that of endodontists and pedodontists. The level of knowledge of dentists working in government hospitals was lower than that of those working in university hospitals or private clinics. In light of the findings of previous studies and the results of this study, we conclude that there is a need for more postgraduate education and hands on experience on TDIs for general dentists and dentists working in government hospitals.

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Selen İnce Yusufoğlu, made study design, analysed and wrote and critised.

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