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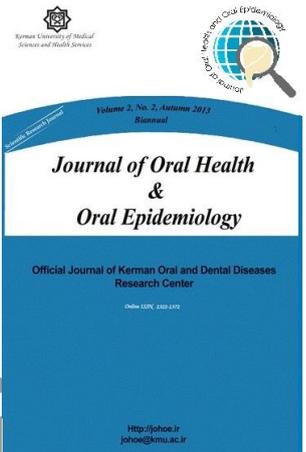
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Knowledge and Attitude of Dental Trauma Among Dental Students in Trace Region of Turkiye

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Abstract

Background: The study aimed to determine the level of knowledge of Trakya University Faculty of Dentistry 4th and 5th grade students about the diagnosis and clinical management of dental traumatic injuries and to evaluate the effects of factors such as the students' age, gender, and study period.

Methods: Total of 180 participants who were students in Trakya University Faculty of Dentistry were evaluated in 2022. The questionnaire comprised three chapters: the first chapter contained sociodemographic information, the second chapter contained general information such as trauma history, clinical experience, dental trauma education, and self-assessment of dental trauma knowledge, while the third chapter contained questions about the clinical management of dental trauma. Questionnaire reliability was assessed using Cronbach's alpha, which was found to be 0.717. This indicates acceptable internal consistency ($0.8 > \alpha \geq 0.7$). The survey data underwent analysis using the chi-square test, the Mann-Whitney U Test, and multiple regression analysis.

Results: A total 180 dentistry students in Trakya University participated in the survey. While 90.6% of the participants stated that they had not experienced any dental injury while continuing their education, 50.6% stated that they witnessed dental injury. 71.1% of the participants reported having a moderate level of knowledge regarding dental injuries. The results about clinical management of dental trauma showed that median level of case knowledge of the participants was 11. Considering that the highest score that can be obtained is 20, the participants are considered to have moderate case knowledge. When case knowledge level differed according to socio-demographic characteristics, it also differed significantly according to gender ($z=-3.811$; $p<.01$). The case knowledge score (med=12) of the female participants is higher than the score of the male participants (med=10).

Conclusion: The knowledge of dental students about the management of dental trauma was accepted but moderate.

Keywords: dental students, knowledge, dental education

Introduction

Traumatic dental injuries (TDIs) are most commonly observed in children and young adults, accounting for 5% of all injuries (1, 2). Approximately one in four school-age children suffer from dental injuries, while one in three adults experience trauma to their permanent teeth, typically before the age of 19 (3).

Dental trauma is painful, requires immediate and effective treatment. Also, dental trauma may negatively affect the occlusion, aesthetics and function of teeth and can have negative psychological and emotional effects in the traumatized individual, which brings aesthetic concerns to the forefront, especially in young adults. Patients expect the dentist to competently manage the condition so as to minimize the pain resulting from injury and enhance the prognosis of the traumatized teeth (4). In addition, deficient management can have serious consequences on the current conclusions and long-term diagnosis of the teeth and general and psychosocial health of patient. Therefore; diagnosis, treatment planning and follow-up are very important to achieve a successful prognosis after trauma (4, 5).

The dentist cannot provide the traumatized patient with the worst treatment options applicable without adequate knowledge of dental trauma. From this perspective, it can be assumed that the clinician's knowledge in dental trauma management may have a direct impact on the prognosis of the tooth or teeth. In one study, students reported that managing dental trauma was the area in which they felt least confident (6).

Dental students are expected to possess the necessary knowledge to diagnose and manage traumatic dental emergencies in both primary and permanent dentition upon graduation. Dentistry students have a crucial role in responding to trauma after graduation. Therefore, evaluation of the current dental traumatology knowledge of dental students is very important. According to many studies, dentists do not know how to help people who have experienced dental trauma because they do not have sufficient knowledge about emergency intervention (7-11). The aim of this study was to assess the knowledge of 4th and 5th year students of Trakya University Faculty of Dentistry regarding diagnosis and clinical management of dental trauma. Additionally, the study aimed to evaluate the impact of factors such as age, gender, and study period on the students' knowledge. This study is the only study conducted in this region.

Method

This research was evaluated and approved by the Scientific and Ethic Commissions of the Faculty of Dentistry of the Trakya University of Edirne, Turkiye (decision number : TUTF-GOBAEK 2022/163). The research was conducted in compliance with ethical principles, including the World Medical Association Declaration of Helsinki (version 2008).

Dental students at Trakya University were surveyed in a cross-sectional questionnaire-based study. The study aimed to assess the trauma knowledge and case management levels of students. The target of this study is the 4th and 5th year dentistry students in the 2021-2022 education period. A total of 180 participants were evaluated.

A questionnaire was developed for the study to measure students' knowledge and clinical management of dental trauma. The questionnaire consisted of 21 questions and was reviewed by dentists to evaluate its validity. The final version of the survey, along with the dentists' comments, was presented to the students.

Then, the last 21 questions were tested by ten general practitioners to see whether the questions are understandable and related to each other. Finally, a Turkish language specialist evaluated the questionnaire for language validity, and it was finalized.

The final online questionnaire contained three chapters. The questionnaire contained three parts: sociodemographic status was in the first chapter, general information (trauma history, clinical experience, dental trauma education and self-assessment of dental trauma knowledge) was in the second chapter, questions about clinical management of dental trauma were in the third chapter. The photographs of the case questions asked in the third chapter were taken from the book of Andreasen et al.(1). Respondents' responses to questions in third chapter were marked as either correct or incorrect. The second chapter includes six questions and the third chapter includes fifteen questions, seven of which are with photographs. Out of the 15 questions, 14 were multiple-choice questions with only one correct answer, each worth 1 point. One question was a multiple-choice question with six correct answers, and each six correct choices was worth 1 point.

The data were analysed using IBM SPSS V22 (SPSS Inc.). The modified questionnaire's reliability was measured using Cronbach's alpha and test-retest. For the questionnaire, Cronbach's alpha was 0.717 ($0.8 > \alpha \geq 0.7$ was considered acceptable). The study assessed test-retest reliability using the kappa coefficient. Categorical data was compared using the Chi-Square test. The effect of sociodemographic status on each correct answer score was determined using the Mann-Whitney-U Test. Furthermore, a multiple regression analysis was conducted to ascertain the impact of socio-demographic variables on the level of case knowledge, with a significance level of $P < 0.05$.

Results

180 dentistry students in Trakya University participated in the survey. Table 1 shows the sociodemographic distribution of the study respondents.

The analysis results of the second chapter are presented in Table 2. A chi-square test was conducted to assess the correlation between the level of knowledge on the case and the questions in the second chapter. Of the total respondents, 90.6% stated that they had not experienced any dental injury while continuing their education, 50.6% of the participants reported witnessing dental injuries, while 71.1% believed they had a moderate level of knowledge about such injuries. In terms of sources of information about dental traumas, 39.9% stated that they benefited from lecture notes, 28.6% from intern clinics and 18.4% from articles/books on the internet. The least used information sources by the participants were mobile applications and IADT guidelines. 48.8% of the participants found it moderately important, 43.9% important, and 93.3% stated that they wanted to receive training on postgraduate dental trauma management.

The results of the third chapter about clinical management show that the median level of case knowledge of the participants was 11 (mean 11.14 ± 3.45). Considering that the highest score that can be obtained is 20, the participants are considered to have moderate case knowledge. In addition, case knowledge scores were categorized as follows 1-7 points as low, 8-14 points as moderate, and 15-20 points as high. 12.8% of the participants had low case knowledge, 69.4% had moderate case knowledge, and 17.8% had high case knowledge.

The correct responses from 4th and 5th year students to each question were as follows: 81.7% of the students answered the questions regarding extrusive luxation correctly, 71.1% answered correctly for complicated/non-complicated enamel-dentin fracture, and 70.0% answered correctly for subluxation/lateral luxation in primary dentition. Over half of the students answered the questions about critical time for avulsion (69.4%), replanted immature teeth (64.4%), replanted teeth (62.2%), complicated crown fractures (56.7%), and replanted dirty teeth (52.8%) correctly. However, the students answered other questions correctly, with the following percentages: 46.7% for avulsion (replanted mature teeth), 38.9% for avulsion (stored in dairy for less than 30 minutes), 36.1% for intrusive luxation in primary dentition, and 32.8% for avulsion in primary dentition.

The study employed the Mann-Whitney U test to examine differences based on socio-demographic characteristics. When case knowledge level differed according to socio-demographic characteristics, it also differed according to gender ($z = -3.811$; $P < 0.01$). The case knowledge score (med=10) of the male participants was lower than the score of the female participants (med=12). The distribution of case knowledge level categorical scoring by gender is shown in Graph 1.

Case knowledge score does not differ significantly by class ($z = -0.368$; $P > 0.05$). The case knowledge scores of 4th year (med=11) and 5th year (med=11) were found to be the same. The multiple linear regression analysis was conducted to assess the impact of socio-demographic variables on the total score obtained from the third chapter of the questionnaire. Gender had a significant effect on the level of case knowledge ($B = -2.091$, $P < 0.01$), while class did not show any significant effect.

Discussion

Preventing, diagnosing, and clinically managing dental trauma is a crucial aspect of dental education. Dental trauma is a common occurrence for dentistry students in clinical practice after graduation, requiring immediate intervention. When the results of our study were evaluated, the knowledge level of Trakya University students about dental trauma was acceptable, but it was determined that this knowledge needed to be developed and supported.

Dentistry education in Türkiye is 5 years long, in the first 3 years of which, theoretical and preclinical education is given. In the 4th and 5th years, alongside the theoretical lectures, clinical training to enable dentistry students to effectively diagnose and treat patients is also provided.

Dental trauma is not a separate specialty in dentistry. Dental trauma education is usually included in the pedodontic, surgical and endodontic perspective in the curriculum. With the first Covid-19 case seen in March 2020, all undergraduate education switched from face-to-face to online. However, the question of how online lectures affected the trauma knowledge and clinical management of the dental students remains to be answered. Studies have reported a decrease in knowledge about TDI over time (12-14). Various studies, including our own, have assessed the dental students' knowledge levels and found that different teaching methods increased the dental students' knowledge levels. There have also been reports that repetition of lectures has a positive effect on the retention of knowledge (15, 16). Therefore, the aim of this study was to evaluate the level of knowledge and clinical management of dental trauma among dental students in the Thrace region.

The result showed that trauma education was inadequate, as also reflected in the results of previous studies (12, 15, 17, 18). Most participants had a moderate level of knowledge in this study. At the beginning of dentistry education, students have serious lack of knowledge about dental trauma, but lectures and continuing education are effective in improving the knowledge of dentistry undergraduate students about dental trauma and in maintaining the knowledge (15).

Fractures of crowns are common in anterior teeth, accounting for 18 to 22% of all TDI, 22 to 44% of uncomplicated fractures and 11 to 15% of complicated crown

fractures. (12). Dental trauma can cause different types of injuries depending on the size, direction and location of the impact. Crown fractures may cause cracks of enamel and/or dentin or fractures with loss of tooth substance and exposing pulp tissue (19). Two questions in the questionnaire were related to the diagnosis of crown fractures. More than half of the participants gave correct answers to both questions.

The participants answered the question about the treatment of the tooth after intrusive luxation with a high percentage of correct answers (53.9%), which is similar to another study (12). In the case of intrusion, the correct intervention is splinting for 2 weeks following the surgical replantation of the tooth (1).

The study showed that students' knowledge about the clinical management of horizontal root fracture is insufficient, the correct response rate is very low (35%), unlike other studies (12, 20).

Avulsion are serious injuries. The developmental status of the avulsed tooth, the time until the replantation of the tooth, the storage conditions (saline, saliva, dairy, etc.), the splinting time affect the prognosis of the tooth. Replantation of avulsed teeth is different in primary and permanent dentition. According to the current IADT guidelines, deciduous teeth should not be replanted if they avulse (21, 22) because replantation of primary tooth can damage the permanent tooth germ (23). However, 67.2% of the participants in the study answered that the primary tooth should be replanted; similar results were obtained with the previous study (24).

In the study, 41.7% of dentistry students preferred washing the teeth with sterile saline in case the avulsed tooth was dirty, while the study of Vasconcellos et al (25)., the preference rate was 89.8%, and in the study of Al-Zubair (26), the rate was 26% in dentists. In the study of Hashim et al (24), 68.2% selected holding the tooth by the crown and washing it with sterile saline to clean contaminated avulsed teeth.

The time until the replantation of avulsed teeth and the storage conditions are very critical (27). According to the guidelines (1, 27), avulsed teeth must be kept in a moist environment in order to maintain of periodontal ligament vitality and reduce the risk of ankylosis if it cannot be placed in the socket immediately. Many different physiological environments in which the avulsed tooth can be transported are recommended including Hank's balanced salt solution (HBS), sterile saline, dairy, (27) patient's mouth and saliva (28). The most practical media for storing avulsed teeth are dairy and physiological saline. Their pH and osmolality resemble the extracellular fluid (17). Tap water, which causes rapid cell death and increased inflammation of the periodontal ligament due to hypotonicity, is the least preferred storage condition (23). In this study, 92.2% of students chose dairy, 81.7% HBS, 80.6% sterile saline, 73.3% saliva, 72.8% patient's mouth and 9.4% tap water. In some studies, the most preferred storage medium was found to be dairy, similar to this study (23, 24, 29). Stokes et

al. (31) found that professionals were equally divided between tap water and dairy, and Fujita et al. (17) physiological saline (43%) and found dairy (43.8%) as the preferred to storage medium. Storing the avulsed tooth in the patient's saliva was also preferred by general dentists. (40%) rather than in dairy (24%) (26) .

The limitation of the study is that only students who received clinical training at Trakya University were included.

Conclusion

Turkish dental students' overall knowledge of the IADT trauma treatment guidelines was moderate. The need for additional dento-alveolar trauma education is emphasised by the current findings. The number of cases seen by dental students in the clinic is decreasing due to the increase in the number of dental faculties. This causes students to graduate with insufficient knowledge level. In order to increase the knowledge level of students for future studies, mobile applications that can show different clinical cases, game-based teaching tools and patient simulators can be used.

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Authors' contribution:

All authors have contributed equally.

Competing Interests

The writers of this work have clearly stated that they have no conflicts of interest.

Data Availability Statement

Nil.

Ethical Approval

This research was evaluated and approved by the Scientific and Ethic Commissions of the Faculty of Dentistry of the Trakya University of Edirne, Turkiye (decision number : TUTF-GOBAEK 2022/163).

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Tables

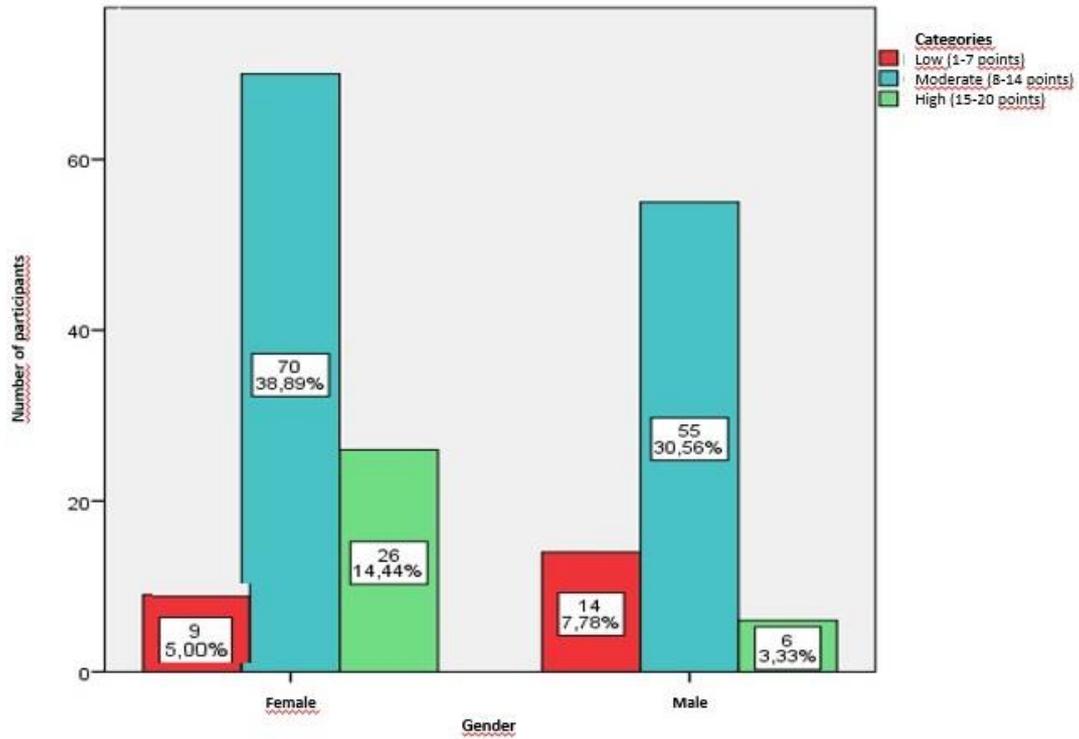
Table 1: Sociodemographic characteristics of study respondents.

Sociodemographic characteristics	Groups	Number of respondents	percentage
Gender	Female	105	58.3
	Male	75	41.7
Level of training	4 th grade	83	46.1

Table 2: General information about trauma history, clinical experience, dental trauma education and self-assessment of dental trauma knowledge (6 questions).

Questions	Answers	n	%
1. Did you experience any dental injuries while continuing your education?	Yes	17	9.4
	No	163	90.6
2. Have you witnessed any dental injuries while continuing your education?	Yes	91	50.6
	No	89	49.4
3. What is your level of knowledge about dental injuries?	Very weak	2	1.1
	Weak	17	9.4
	Moderate	128	71.1
	Good	30	16.7
4. What are the sources you learned about dental trauma during your education?	Very Good	3	1.7
	Lecture Notes	176	39.9
	IADT Guideline	36	8.2
	Article/Book on the Internet	81	18.4
	Intern Clinic	126	28.6
5. What do you think about having knowledge about dental trauma management after graduation?	Mobile Apps	22	5.0
	I don't find it important	2	1.1
	I find it less important	13	7.2
	Moderately Important	86	47.8
6. Would you like to learn about post-graduation dental trauma??	I find it important	79	43.9
	Yes	168	93.3
	No	12	6.7

Figures



Graph 1: The distribution of case knowledge level categorical scoring by gender.