Clinical Research

Evaluation of the Dental Avulsion Knowledge Levels of Physicians Working in the Emergency Departments of Hospitals

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ABSTRACT

Objective: The aim of this study is to determine the dental avulsion knowledge levels of physicians from all specialties working in the emergency departments of hospitals, to evaluate their attitudes and behaviors, and to increase their awareness of the subject of dental avulsion through the information brochure given at the end of the survey.

Material and Method: An online survey consisting of 21 questions and four sections was administered to physicians, asking questions about their personal information, their demographic information, their attitudes towards dental avulsion cases, and their knowledge of and experience with dental avulsion. The survey was administered to 152 volunteer physicians who worked in the emergency departments of 13 different hospitals in Diyarbakır city center and who had agreed to participate in the study. The Shapiro-Wilk test for conformity to normal distribution, the Kruskal-Wallis H test and the Mann-Whitney U test were used to examine differences between groups. The statistical significance level was taken as $p < 0,05$.

Results: The knowledge scores were found to be statistically significantly higher for emergency medicine specialists compared to interns, for physicians who were aware of the trauma guide compared to those who were not, and for physicians whose family members included a dentist compared to those whose family members did not include a dentist.

Conclusion: According to the results of this study, it was concluded that continuous training programs are necessary to increase the knowledge and awareness levels of physicians in all branches working in emergency services about traumatic dental injuries.

Keywords: *Traumatic Dental Injures, Dental Avulsion, Emergency Physicians.*

ÖZ

Hastanelerin Acil Servislerinde Çalışan Hekimlerin Diş Avülsiyonu Bilgi Düzeylerinin Değerlendirilmesi

Amaç: Bu çalışmanın amacı, hastanelerin acil servislerinde görev yapan tüm branşlardaki hekimlerin dental avülsiyon konusundaki bilgi düzeylerini belirlemek, tutum ve davranışlarını değerlendirmek ve anket sonunda verilen bilgilendirme broşürü ile dental avülsiyon konusundaki farkındalıklarını arttırmaktır.

Gereç ve Yöntem: Hekimlere kişisel bilgileri, demografik bilgileri, dental avülsiyon vakalarına yönelik tutumları, dental avulsiyon konusundaki bilgi ve deneyimleri hakkında 21 soru ve dört bölümden oluşan online bir anket uygulanmıştır. Anket, Diyarbakır il merkezindeki 13 farklı hastanenin acil servislerinde çalışan ve araştırmaya katılmayı kabul eden gönüllü 152 hekime uygulandı. Gruplar arasındaki farklılıkları incelemek için Shapiro-Wilk normal dağılıma uygunluk testi, Kruskal-Wallis H testi ve Mann-Whitney U testi kullanıldı. İstatistiksel anlamlılık düzeyi $p < 0,05$ olarak belirlenmiştir.

Bulgular: Bilgi puanları acil tıp uzmanlarının intörnlere göre, travma rehberinden haberdar olan hekimlerin olmayanlara göre ve ailesinde diş hekimi olan hekimlerin olmayanlara göre istatistiksel olarak anlamlı derecede yüksek bulunmuştur.

Sonuç: Bu çalışmanın sonuçlarına göre acil servislerde görev yapan tüm branşlardaki hekimlerin travmatik diş yaralanmaları konusunda bilgi ve farkındalık düzeylerinin arttırılması için sürekli eğitim programlarının gerekli olduğu sonucuna varılmıştır.

Anahtar Sözcükler: *Travmatik Dental Yaralanmalar, Dental Avülsiyon, Acil Servis Hekimleri.*

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Traumatic dental injuries (TDIs), which are frequently seen in childhood, are an important threat to oral and dental health. During this period, trauma may cause adverse effects to tooth development and ideal occlusion, depending on the severity of the injury; psychological problems caused by function, phonation and aesthetic problems can negatively affect the development of the child (1).

Avulsion injuries are frequently seen in TDIs and have a poor prognosis. They are defined as the complete separation of the tooth from the alveolar socket (2). Avulsion of permanent teeth is seen in 0.5-16% of all TDIs (3, 4). Avulsion injuries often occur between the ages of 7 and 9, during the eruption of permanent inci-

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sors, and are more common in boys than girls (3). The most important factor affecting the prognosis in avulsion injuries is reimplantation of the tooth as soon as possible (5-9). However, reimplantation cannot always be performed immediately (9). In this case, it is necessary to transport the avulsed tooth to the dentist as soon as possible and with the most appropriate transportation method in order to preserve the vitality of the periodontal ligament cells (10).

Cases of avulsions are usually caused by traffic accidents, falls, sporting events at schools, and other physical effects. Traumas to the face can cause not only TDIs, but also maxillomandibular injuries. These injuries are often accompanied by injuries to other parts of the body (11). In these cases; parents, teachers or caregivers often go to a hospital's emergency department to have children treated. Dentofacial traumas constitute 0.3-4% of patients in the emergency department (12-14). It has been reported that 7.3% of these patients have injuries to the oral cavity structures (15). For this reason, the emergency departments of public and private hospitals providing 24-hour service frequently encounter emergency dentistry cases, including TDIs (16). Therefore, in order to provide the fastest and most ideal treatment for people who have suffered TDIs, healthcare professionals at emergency departments should be trained in TDI treatment protocols and their knowledge level on this subject should be sufficient (17).

The aim of this study is to determine the knowledge level of physicians working in the emergency departments of public and private hospitals about dental avulsion, to evaluate their attitudes and behaviors, and to increase their awareness of the subject through the information brochure given at the end of the survey.

MATERIAL AND METHOD

Approval for this study was obtained from the Local Ethics Committee of the Faculty of Dentistry (Protocol Number 2019-57, dated 25.12.2019). The study was aimed to achieve a minimum sample size of 152 observations for a population size of 416, considering a 5% significance level, a 95% confidence level, and a sampling error of 6%. The study was conducted with 152 volunteer physicians who were working in the emergency departments of 13 different hospitals in Diyarbakır city center between December 2021 and February 2022 and who had agreed to participate in the study.

An electronic survey was used as the data collection tool. The questionnaire was prepared for the computer environment via Google Forms and necessary permissions were obtained from official institutions. The questionnaire form, which was created for the data collection, consists of 21 questions and four parts, the validity and reliability of which were tested in similar studies published in the literature on the level of knowledge and awareness of physicians regarding the emergency treatment of avulsion injuries.

The first part of the questionnaire elicits personal information about the physicians, the second part the demographic information of the physicians, the third part the attitudes of the physicians to dental avulsion cases, and the fourth part the knowledge and experiences of the physicians about dental avulsion. A link to an educational brochure was added to the end of the questionnaire in order to increase the awareness of physicians working in the emergency department.

The data obtained in this study were analyzed using the licensed IBM SPSS Statistics Version 21 software program. The Shapiro–Wilk test was used because of the number of units to investigate the normal distribution of the variables. To examine the differences between the groups, the Kruskal-Wallis H and Mann-Whitney *U* tests were used in case the variables did not indicate a normal distribution. In case of a significant difference in comparisons among more than two groups, the groups with significant differences between them were determined with the help of post-hoc comparisons (using the Mann-Whitney U test with Bonferroni correction). To interpret the results, 0,05 was used as the significance level, with $p < 0,05$ indicating a significant difference, and $p > 0,05$ indicating no significant difference.

RESULTS

The data obtained from the first part of the questionnaire, which includes questions about the personal information of the participants, are present in table 1, the data obtained regarding participants' demographic information are presented in table 2, the data obtained regarding their attitudes towards dental avulsion cases are presented in table 3, and the data obtained regarding their knowledge of and experience with dental avulsion are presented in table 4.

Table 1. *Frequency distribution table of personal information.*

		n	%
Gender	Female	59	38,82
	Male	93	61,18
	Total	152	100
Age	20–30	93	61,18
	30–40	41	26,97
	40 and older	18	11,84
	Total	152	100
Branch	Intern doctor	61	40,13
	General practitioner	40	26,32
	Assistant doctor	24	15,79
	Emergency medicine specialist	12	7,89
	Child health and diseases specialist	15	9,87
	Total	152	100
Length of service in the profession	1–5 years	95	62,5
	6–10 years	33	21,71
	11 and above	24	15,79
	Total	152	100

Table 2. *Frequency distribution table of demographic information.*

		n	%
Have you previously received TDI education?	Yes	12	7,89
	No	140	92,11
	Total	152	100
Do you have a TDI management protocol in your clinic?	Yes	14	9,21
	No	138	90,79
	Total	152	100
Are you aware of the trauma guide of the IADT?	Yes	19	12,5
	No	133	87,5
	Total	152	100
Do you have a dentist among your family members?	Yes	29	19,08
	No	123	80,92
	Total	152	100

Table 3. *Frequency distribution table of physicians' attitudes towards dental avulsion cases.*

		n	%
What is your level of knowledge about TDI?	Sufficient	9	5,92
	Insufficient	82	53,95
	No idea	61	40,13
	Total	152	100
What do you think about the importance of learning about TDI?	Very important	45	29,61
	Important	99	65,13
	Insignificant	8	5,26
	Total	152	100
Would you like to learn about the emergency management of a dental avulsion tooth?	Yes	135	88,82
	No	17	11,18
	Total	152	100
Have you ever encountered dental avulsion before?	Yes	49	32,24
	No	103	67,76
	Total	152	100

Table 4. *Frequency distribution table of physicians' knowledge of and experience with dental avulsion.*

	False		True		Total	
	n	%	n	%	n	%
What is dental avulsion?	36	23,68	116	76,32	152	100
What do you do if you encounter dental avulsion? (You can tick more than one option.)	50	32,89	102	67,11	152	100
Do you think an avulsed tooth can be replaced (reimplantation)?	45	29,61	107	70,39	152	100
If you had decided to replace the avulsed tooth, but the tooth was dirty, what would you do? (You can tick more than one option.)	37	24,34	115	75,66	152	100
How is an avulsed tooth retained?	88	57,89	64	42,11	152	100
Do you think the duration of the avulsed tooth outside the mouth is important?	12	7,89	140	92,11	152	100
If you were not going to reimplant the tooth, what kind of environment would you store it in? (You can tick more than one option.)	48	31,58	104	68,43	152	100
Can you distinguish between primary and permanent teeth?	80	52,63	72	47,37	152	100
Can you replace the primary tooth when it avulses?	16	10,53	136	89,47	152	100

In order to evaluate participants' knowledge of and experience with dental avulsion, they were asked nine questions in the fourth part of the questionnaire. A score average was determined by giving 2 points for ideal answers, 1 point for acceptable answers, and 0 points for incorrect answers. While the highest score physicians participating in this study could get for these nine questions was 25, the average score for all participants in our study is 12,11 (Table 5).

Table 5. *Physicians' Knowledge and experience scoreboard on dental avulsion.*

	n	Median	Min	Max
Physicians' Knowledge and Experience Score on Dental Avulsion	152	12	3	25

The personal and demographic information of the participants and their average scores on dental avulsion knowledge were compared. There are no statistically significant differences between physicians' dental avulsion knowledge and experience scores in terms of gender, age groups, length of service in the profession, previous TDI training and having a TDI management protocol (p >0.05).

There is a statistically significant difference between participants' dental avulsion knowledge and experience scores when considering their fields (p <0,05). The dental avulsion knowledge and experience scores of intern doctors were found to be significantly lower than those of emergency medicine specialists (Table 6 and Figure 1).

Table 6. *The results of the analysis on the difference between the branches in terms of the knowledge and experience scores of the physicians on dental avulsion.*

		Physicians' Knowledge and Experience Score on Dental Avulsion				
		n	Median	Min	Max	p
Branch	Intern doctor	61	11	3	21	**0,022**
	General practitioner	40	13	6	20	
	Assistant doctor	24	12,5	7	22	
	Emergency medicine specialist	12	13,5	8	19	
	Child health and diseases specialist	15	11	5	25	
	Total	152	12	3	25	

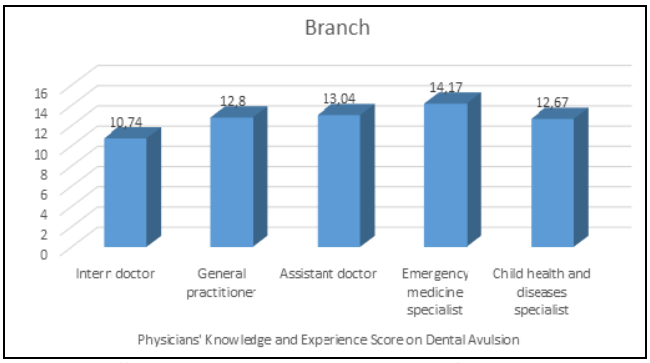

Figure 1. *Differences Between Branches in terms of Knowledge and Experience Scores of Physicians on Dental Avulsion.*

Additionally, the pairwise comparison results between the groups are presented in table 7.

Table 7. *The pairwise comparison results between the groups.*

		p
Intern doctor	Child health and diseases specialist	0,999
Intern doctor	General practitioner	0,137
Intern doctor	Assistant doctor	0,318
Intern doctor	Emergency medicine specialist	**0,049**
Child health and diseases specialist	General practitioner	0,999
Child health and diseases specialist	Assistant doctor	0,999
Child health and diseases specialist	Emergency medicine specialist	0,999
General practitioner	Assistant doctor	0,999
General practitioner	Emergency medicine specialist	0,999
Assistant doctor	Emergency medicine specialist	0,999

There is a statistically significant difference between participants' dental avulsion knowledge and experience scores in relation to their awareness of the trauma guide of the International Society of Dental Traumatology (IADT) (p <0,05). The knowledge and experience scores of the physicians who were not aware of the IADT trauma guide were found to be significantly lower than those of the physicians who were aware of the IADT trauma guide (Table 8 and Figure 2).

Table 8. *Analysis Result of the Difference Between IADT Awareness in terms of Knowledge and Experience Scores of Physicians on Dental Avulsion.*

		Physicians' Knowledge and Experience Score on Dental Avulsion				
		n	**Median**	**Min**	**Max**	**p**
Are you aware of the IADT trauma guide?	Yes	19	15	6	21	**0,05**
	No	133	12	3	25	
	Total	152	12	3	25	

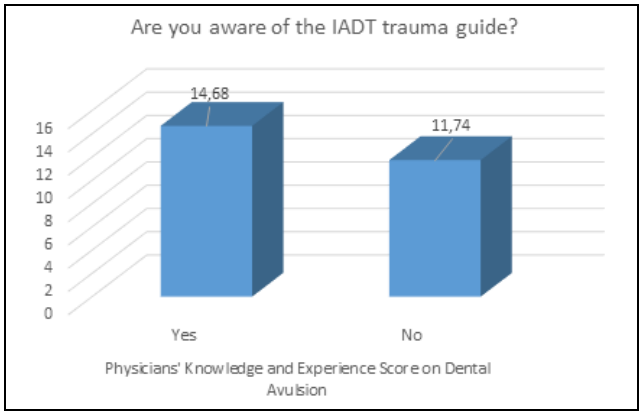

Figure 2. *Differences between Physicians' Awareness of the IADT Guidelines in terms of their Knowledge and Experience Scores on Dental Avulsion.*

There is a statistically significant difference between participants' dental avulsion knowledge and experience scores in relation to having a dentist among participants' family members (p <0,05). If participants did not have a dentist among family members, their dental avulsion knowledge and experience scores were found to be significantly lower than those of participants who had a dentist among family members (Table 9 and Figure 3).

Table 9. *The Results of the Analysis on the Difference between the Dentist Status of the Family Members in terms of the Knowledge and Experience Scores of the Physicians on Dental Avulsion.*

		Physicians' Knowledge and Experience Score on Dental Avulsion				
		n	**Median**	**Min**	**Max**	**p**
Family members included a dentist?	Yes	29	15	6	22	**0,001**
	No	123	11	3	25	
	Total	152	12	3	25	

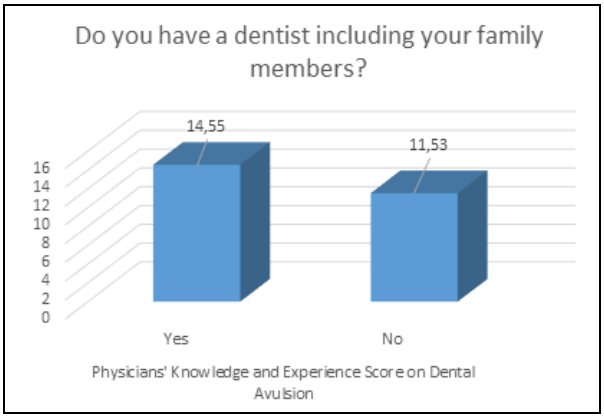

Figure 3. *Differences in the Status of Being a Dentist including Family Members in terms of Knowledge and Experience Scores of the Physicians on Dental Avulsion.*

DISCUSSION

Oral and dental health problems constitute one of the most common health problems in the world and generally do not receive sufficient importance in medical education programs. Numerous studies have reported that doctors can make a significant contribution to improving the level of oral and dental health in the community (9-11). TDIs represent one of the important oral and dental health problems of childhood, which can cause pain and anxiety in children, and can cause negative consequences such as psychosocial and aesthetic problems if mistakes are made during the emergency treatment and referral phase. Given that prompt and accurate treatment management in TDI cases can improve both short-term and long-term outcomes, it is important to raise awareness of this issue among emergency health professionals. It is expected that physicians working in emergency departments have sufficient knowledge about the emergency treatment of TDIs not only to increase treatment success rates, but also to reduce anxiety levels in children and their parents.

This study has revealed data that can provide information about the diagnosis, treatment and awareness of TDIs to physicians in all branches working in the emergency departments of hospitals in Diyarbakır city center. In our study, the average knowledge scores and the personal and demographic information of the participants were compared, and the attitudes and behaviors of the participants were evaluated. In this study, unlike other studies (18-21), an educational brochure link was added to the end of the electronic questionnaire. By placing the brochure link at the end of the

questionnaire, it was aimed to increase the awareness of physicians of this issue. Brochures were used in this study because of their advantages, such as being a method for personal information transfer and remembering the information by re-accessing it when necessary.

In this study, 53.95% of the physicians stated that their level of knowledge about TDIs was insufficient, 65.13% stated that it was important to learn about TDIs, 88.82% stated that they wanted to receive information about the emergency management of a tooth that had a dental avulsion, and 67.76% answered "no" to the question as to whether they had ever encountered dental avulsion before. In the light of all these findings, we think that physicians need more training on TDI diagnosis, treatment and the referral of these cases. For this reason, a short, colorful and catchy educational brochure link was added to the end of the questionnaire, explaining what physicians should do in such a situation. In addition, this subject should be included more in the medical education curriculum, and awareness of this issue should be increased through postgraduate training.

In the fourth part of the questionnaire, the participants were asked questions in order to evaluate their knowledge of and experience with dental avulsion. The highest score that the participating physicians could achieve was 25, while the average score in our study was 12,11 (48.44%, see Table 5). We believe that it is necessary to increase awareness of this issue with trainings, seminars and conferences on this subject, aimed at physicians.

According to the data obtained in this study, no significant difference was found between the dental avulsion knowledge and experience scores of the physicians based on their gender. Bahammam (18), Aren et al. (19), Kızıltan et al. (20) reported in their studies, similar to our study, that there was no statistically significant difference between the genders.

According to the data of Aren et al.'s study (19), no significant difference was found between the dental avulsion knowledge and experience scores of physicians in terms of their age. There was no significant difference between the ages of the physicians and their correct answer rates. In the Bahammam study (18), there was a statistically significant difference between all age groups, except between the (30-40) and (40-50) and between the (40-50) and (≥ 50) age groups. Yiğit et al. (21) found that the age of physicians was significantly related to the level of knowledge, and Kızıltan et al.(20) (20-30) found that the knowledge scores of the age group were lower than the other groups. Although our study concluded that the age of the physicians did not affect their knowledge and experience scores, we believe that, with increasing age, experience and exposure to avulsion cases will increase physicians' knowledge about the treatment of these cases.

According to the data of this study, a statistically significant difference was found between the dental avulsion knowledge and experience scores of the physicians in terms of their branches ($p < 0,05$). Intern doctors' dental avulsion knowledge and experience scores were found to be significantly lower than those of emergency medicine specialists. Although there is no statistically significant difference between other branches and intern doctors, the mean knowledge scores of intern doctors were found to be lower than those of doctors from all other branches. Bahammam's study (18) indicated that there was a statistically significant difference between different specialties, where emergency department physicians had the highest average knowledge scores, followed by pediatricians. Kızıltan et al. (20), as a result of comparing the knowledge scores of the participants with their demographic characteristics, found that the total scores of general practitioners and emergency medicine assistants were lower than those of emergency medicine specialists. We believe that the many and frequent encounters of emergency medicine specialists with TDI cases, compared to other branches, positively affect their level of knowledge.

According to the data of the study, no significant difference was found between the dental avulsion knowledge and experience scores of the physicians and their length of service in the profession. Aren et al. (19) found that there was no significant difference between the length of service of physicians in the profession and their correct response rates, while Ulusoy et al. (22) found that the length of experience as an emergency physician did not have a statistically significant effect on physicians' knowledge of the emergency treatment of dental avulsion. The study of Kızıltan et al. (20), contrary to our study, found that the knowledge scores of physicians with 0-5 years of professional experience were lower than those of the other groups. Although our study indicates that the length of service in the profession does not affect the knowledge and experience scores, it should not be ignored that working in the profession for many years will add a great deal of experience, both in terms of theory and in practice.

According to the data of the study, no significant difference was found between the dental avulsion knowledge and experience scores of the physicians in terms of their previous TDI training and the presence of a TDI management protocol in their clinics. However, there is a statistically significant difference between physicians' dental avulsion knowledge and experience scores and their awareness of the IADT trauma guide. The knowledge and experience scores of the physicians who were not aware of the IADT trauma guide were found to be significantly lower than those of the physicians who were aware of the IADT trauma guide. This finding demonstrates the importance of having knowledge about current literature and guidelines.

According to the data of the study, there is a statistically significant difference between the dental avulsion knowledge and experience scores of physicians who have a dentist among family members and those who do not. Among physicians with no dentist among family members, the dental avulsion knowledge and experi-

ence scores were found to be significantly lower than among physicians with a dentist among family members. Similarly, Yigit et al. (21) found that having a dentist among family members was significantly related to doctors' level of knowledge. Holan and Shmueli (23) found in their study that the doctors most successful in treating avulsed teeth were those married to a dentist. The reason for this result may be the easy consultation opportunity provided by a family member who is a dentist or a previous awareness.

Conclusion

Up-to-date and continuous training programs on the subject of TDIs should be organized for physicians working in emergency departments, and education programs on TDIs should be added to the undergraduate and graduate medical education curriculum to increase the level of knowledge and awareness about the subject.

Conflicts of Interest statement

No conflicts of interest.

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