An Assessment of the Knowledge of Dentists on the Emergency Management of Avulsed Teeth

Betul Sen-Yavuz1, Sezgi Sadikoglu2, Berkant Sezer2, Jack Toumba3, Betul Kargul4

Objective: to investigate the knowledge and attitudes of general dental practitioners (GDPs) on the emergency management of avulsed teeth. The management of the avulsed teeth is well outlined in the latest trauma guideline. However, little information is available about the level of knowledge of the management of avulsed teeth among young dentists in Turkey. Material and Methods: A cross-sectional questionnaire was completed to assess the knowledge of GDPs on the emergency management of avulsed teeth. The questionnaire asked questions to 142 dental practitioners about whether they have received information about the emergency management of dental trauma, whether they have intervened in cases of avulsed teeth following a dental trauma, and, finally, whether they have given treatment of avulsed teeth. Results: The majority of GDPs had received training to treat avulsed teeth. The findings of the study showed that only 35% of GDPs recalled the critical time for treatment. The number of GDPs who had incorrect knowledge on this topic was higher and statistically significant (p < 0.001). The rates of the correct answers according to the relevant information fields were as follows: optimal storage medium (78%), type of splint (56%), splinting period (58.5%), and systemic medication after avulsion (32%). Conclusion: The results show that many GDPs had limited experience in treating avulsed teeth. However, in the study, it was stressed that the knowledge of GDPs related to the factors affecting the successful treatment of avulsion cases should be improved by using continuing education programs.
surrounding the root surface can be preserved (7). When the periodontal ligament cell injury is large, external root resorption begins, the hard tissue of the root is damaged, and the progression of the damage may lead to tooth loss (8). However, the replantation of avulsed primary teeth is not recommended because of the possible damage to the permanent tooth germ during the procedure, possible infection, and ankylosis (9,10).

If proper first aid procedures are not provided on time due to the lack of knowledge of general dental practitioners (GDPs), many avulsed permanent teeth can be lost, or many permanent successors can be damaged. Therefore, determining the lack of knowledge of GDPs on this issue can be very effective in reducing the poor prognosis of such injuries (7,11,12).

Regarding the trauma knowledge, the knowledge of the GDPs depends on some factors such as their undergraduate education, post-graduate seminars they have received and what they have read about the issue (12,13). The dental education program was reformed under the guidance of the "Profile and Competences for the Graduating European Dentist" and "ADEA Competencies for the New General Dentist" to train dentists under the requirements of the era in Turkey. It is stated that dental students should have the skills of pre-diagnosis, diagnosis and emergency management in avulsion cases (14). Nonetheless, there is limited information about the level of knowledge in emergency management of avulsed teeth for undergraduate students in Turkey (15,16), which is an issue pointing out the aim of this study. The aim of the present study was to evaluate the awareness and knowledge of GDPs for the treatment of traumatic tooth avulsion injuries in Turkey.

Material and Methods

Ethical approval was received for the study from the Marmara University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee (reference number 06.03.2017-97). The study was then commenced. The participation in the present study was voluntary, and verbal and written informed consents were obtained from all GDPs who were included in the study. In the context of the present study, a questionnaire was completed by GDPs who worked in Istanbul, Turkey.

A confidence interval of 90% was used for the sample size calculation, with an absolute precision of 0.05 and a power calculation was performed. The analysis suggested that a total sample size of 117 participants was required. In the study, a total of 167 dentists who worked in Istanbul were contacted; 151 (90%) of dentists replied to the questionnaire; and 142 (94%) dentists (female=85, male=57) who completed the survey were included in the study. A total of 103, out of 142 dentists, who participated in the present study, completed the questionnaire online.

To measure the knowledge of GDPs on the emergency management of avulsed teeth, a 32-item questionnaire was created by evaluating the studies that were conducted previously on the same topic (7, 11, 12, 17-19). The questionnaire covers the topics of the emergency management of avulsion injuries. The questionnaire helps to measure the knowledge and awareness of GDPs on the emergency management of avulsion injuries. The questionnaire helps to measure the knowledge and awareness of GDPs on the emergency management of avulsion injuries. The questionnaire helps to measure the knowledge and awareness of GDPs on the emergency management of avulsion injuries. The questionnaire helps to measure the knowledge and awareness of GDPs on the emergency management of avulsion injuries.

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posed questions about whether GDP’s attended a course on emergency treatment of dental traumas, whether they intervened in the treatment of avulsion cases, which factors they considered in the replantation of avulsed teeth, the critical time for the urgent replantation of avulsed teeth, the storage medium and the time of splinting for avulsed teeth.

Statistical Analysis

The results of the questionnaire were expressed as percentages of frequency distributions. The calculations and statistical analyses of the data obtained were performed using MS-Excel 2010 and SPSS 19.0 for Windows (SPSS Inc., Chicago, IL, USA) package programs with a significance level of 0.05. The data were analyzed using the chi-square test.

Results

In the present study, 97 out of the 142 dentists, who participated in the study, were new graduates; 13 had 1-5 years of dental practice experience, and 32 had more than five years of experience. A total of 16 (11%) of these GDPs graduated from private universities, 122 (86%) from state universities and 4 (3%) from foundation universities. 80% of the GDPs stated that they had received training about avulsion injuries.

Figure 1 shows the source of the knowledge of the GDPs on avulsion. Only 40 (28%) of the GDPs who participated in the present study reported that they had a dental emergency unit in their clinics. Table 1 shows the approaches to GDPs if there is an avulsion case in the area.

When the GDPs were asked whether they would replant an avulsed tooth when a child who lived in their neighborhood had an avulsion, the percentage of the GDPs who would replant such teeth was 56%, and the rest of them answered that they would not replant such teeth. When the GDPs were asked about what to do when the avulsed tooth was dirty, 72 (57.5%) of the GDPs replied that they would rinse the tooth under running water, 21 (17%) said that they would gently wipe off any mud that was stuck to the tooth, 15 (12%) replied that they would scrub the tooth gently with a toothbrush, 16 (13%) would apply alcohol spray to the avulsed tooth and 1 (0.5%) they would replant the tooth without any pre-treatment.

In the present study, the GDPs were also asked about the factors which influenced the success of the replantation of ba, which is critical time for hit replantation of avulsed tooth, what do you think about the importance of replantation of avulsed tooth, what do you think about the importance of replantation of avulsed tooth, what do you think about the importance of replantation of avulsed tooth.
avulsed teeth. The distribution of the answers is shown in Table 2. Almost all (99.3%) of the GDPs stated that they would hold the avulsed tooth by the crown, and 0.7% of the GDPs stated that they did not notice the region of the tooth. A total of 113 (80%) of the GDPs who participated in the present study stated that they would carefully irrigate and aspirate it with physiological saline the blood clot in the tooth socket of an avulsed tooth; 20 (14%) stated that they would not remove the clot, 6 (4%) stated that they would remove the clot with curettage and 3 (2%) marked the “other” option.

The questions and their answers to the questions on the emergency management on avulsed teeth in the questionnaire are shown in Table 3. The correct responses of GDPs were statistically higher regarding the replantation of primary teeth (92%), optimal storage medium for avulsed teeth (78%) (p = 0.000, p = 0.000). On the other hand, GDPs who responded incorrectly about the critical time for the treatment of avulsed teeth (65%) were statistically more numerous (p = 0.000). There was no statistical difference in responses regarding systemic medications after avulsion (p = 0.332). The answers were analyzed according to the GDPs’ experience, additional education, and the source of their knowledge (Table 4 and Table 5).

When the GDPs were asked about the open or closed apices would affect the prognosis of the treatment in avulsed teeth, 10 (7%) of them stated that the prognosis would not be changed. A total of 111 (78%) of these GDPs stated that the apex of open (immature) teeth had a better prognosis, and 31 (22%) stated that the apex of the closed (mature) teeth had a better prognosis.

Finally, the participating GDPs were asked about the aspiration of avulsed teeth in the questionnaire. A total of 64 (45%) of them stated that lung radiography should be carried out, 28 (19.7%) stated that bronchoscopy should be carried out, 29 (20.4%) chose to make the patient vomit, 12 (8.4%) stated that lung control should be carried out with a stethoscope and 53 (37%) stated that they had no idea.

Table 1. The approaches of dentists to an avulsion case

| If you were at a site where someone had avulsed a tooth, would you? • | Dentists • Doktori dentalne medicine (%) |
| --- | --- |
| Be confident and replant the tooth • Bili biste suvereni i replantirali zub | 61 (43%) |
| Not be confident but you would replant the tooth anyway • Ne biste bili sigurni, ali bi svejedno nešto poduzeli | 57 (40%) |
| Not take action because you lack knowledge and training • Ne biste poduzeli ništa zbog manjka znanja i iskustva | 17 (12%) |
| Not take action because of the medico-legal consequences • Ne biste poduzeli ništa zbog medicinsko-pravnih posljedica | 7 (5%) |

Table 2. Which is the most critical factor that may influence the outcome of replantation?

| The factors on which the treatment success of avulsed teeth depends • Čimbenici o kojima ovisi uspjeh liječenja avulziranih zuba | Dentists • Doktori dentalne medicine (%) |
| --- | --- |
| The damage of periodontal ligament cells • Oštećenje stanica parodontnog ligamenta | 0 (0%) |
| The storage conditions of avulsed teeth • Uvjeti pohranjivanja avulziranog zuba | 2 (1%) |
| The time that passes after the trauma • Vrijeme proteklo od traume | 4 (3%) |
| All • Sve | 136 (96%) |
### Table 3  The knowledge of emergency treatment of avulsed teeth

| Knowledge • Znanje          | GDPs • Doktor dentalne medicine | %   |
|-----------------------------|--------------------------------|-----|
| **1. Replantation of primary teeth • Replantacija mliječnog zuba** |                                |     |
| Yes • Da                    | 11                             | 8%  |
| No • Ne                     | 131                            | 92% |
| **2. Critical time for treatment • Kritično vrijeme za liječenje** |                                |     |
| Within 30 min • unutar 30 min. | 49                             | 35% |
| 30-60 min                   | 60                             | 42% |
| Within 2 h • unutar 2 sata  | 22                             | 15% |
| Not sure • Nisam siguran   | 11                             | 8%  |
| **3. Optimal storage medium • Optimalan medij za pohranjivanje** |                                |     |
| Milk • Mlijeko              | 140                            | 27% |
| Patient’s mouth (Saliva) • Pacijentova usta (slina) | 113                            | 22% |
| Physiologic saline solution • Fiziološka otopina | 108                            | 21% |
| Contact lens solution • Otopina za leće | 42                             | 8%  |
| Tap water • Voda iz slavine | 27                             | 5%  |
| Warm water • Topla voda     | 25                             | 5%  |
| Cold water • Hladna voda    | 16                             | 3%  |
| Wrap it with gauze • Umotavanje u gazu | 14                             | 3%  |
| Disinfectant solution • Dezinfekcijska otopina | 13                             | 3%  |
| Water with a pinch of salt • Voda s prstohvatom soli | 9                              | 2%  |
| Ice • Led                   | 4                              | 1%  |
| No need to store the tooth • Ne treba pohranjivati zub | 0                              | 0%  |
| **4. Type of splint • Vrsta splinta** |                                |     |
| Flexible splint • Fleksibilni splint | 80                             | 56% |
| Rigid splint • Rigidni splint | 41                             | 29% |
| Does not matter • Ne igra ulogu | 2                              | 1.5%|
| Not sure • Nisam siguran   | 19                             | 13.5%|
| **5. Splinting period • Trajanje splintiranja** |                                |     |
| 2 weeks • 2 tjedna          | 83                             | 58.5%|
| 4 weeks • 4 tjedna          | 34                             | 24% |
| 6 weeks • 6 tjedana         | 2                              | 1.5%|
| Not sure • Nisam siguran   | 23                             | 16% |
| **6. Intra-canal medication used for root canal treatment • Intrakanalni uložak** |                                |     |
| Calcium hydroxide paste • Pasta kalcijeva hidroksida | 123                            | 86.5%|
| Zinc oxide paste • Cinkova oksidna pasta | 7                              | 5%  |
| Not sure • Nisam siguran   | 12                             | 8.5%|
| **7. Systemic medication • Sistemska medikacija** |                                |     |
| Antib., anti-inf. , tetanus vaccine • Antib., antiinf., cjevipo protiv tetanusa | 46                             | 32% |
| Anti-inf.                   | 17                             | 12% |
| Antib.                      | 37                             | 26% |
| Antib. and tetanus vaccine • Antib. i cjevipo protiv tetanusa | 20                             | 14% |
| Antib. and anti-inf. • Antib. i antiinf.  | 10                             | 7%  |
| Tetanus vaccine • Cjevipo protiv tetanusa | 7                              | 5%  |
| Tetanus vaccine and anti-inf. • Cjevipo protiv tetanusa i antiinf. | 4                              | 3%  |
| Others • Ostalo             | 1                              | 0.7%|

*p < 0.05 †Antib.: Antibiotics • antibiotici, ‡Anti-inf.: Anti-inflammatory drugs • protuupalni lijekovi
Table 4. The answers according to the GDPs’ experience, additional education, and the source of their knowledge

Tablica 4. Odgovori s obzirom na iskustvo, dodatnu edukaciju i izvor znanja

| Answers • Odgovori | Experience • Izkustvo | Additional education • Dodatno obrazovanje | Source of knowledge • Izvor znanja |
|---------------------|------------------------|---------------------------------------------|-----------------------------------|
|                     | New graduates • Sveježi diplomirani (97) | Experienced • Iskusni (45) | Total (142) |
| Correct             | 83 (90.7)            | 45 (95.6)                                   | 128 (89.3) |
| Incorrect           | 9 (9.3)              | 2 (4.4)                                     | 11 (10.7) |
| Not sure            | 9 (9.3)              | 14 (28.6)                                   | 23 (16.2) |

| Replantation of primary teeth • Replantacija mliječnog zuba | n | % | P |
|-------------------------------------------------------------|---|---|---|
| Correct                                                     | 103 (90.4) | 28 (100) | 0.025* |
| Incorrect                                                   | 2 (9.6)   | 0 (0)   | 2 (33.3) |
| Not sure                                                    | 9 (9.6)   | 0 (0)   | 0 (0)   |

| Critical time for treatment • Vrijeme kritično za liječenje | n | % | P |
|------------------------------------------------------------|---|---|---|
| Correct                                                    | 70 (70.4) | 10 (100) | 0.007* |
| Incorrect                                                  | 3 (29.6) | 0 (0) | 1 (100) |
| Not sure                                                   | 1 (10)   | 0 (0) | 0 (0)   |

| Type of splint • Vrsta splinta                            | n | % | P |
|-----------------------------------------------------------|---|---|---|
| Correct                                                   | 37 (56.7) | 28.9 (100) | 0.011* |
| Incorrect                                                 | 13 (43.3) | 0 (0) | 29 (93.3) |
| Not sure                                                  | 18 (55.3) | 8 (28.6) | 7 (23.1) |

| Splinting period • Trajanje                                | n | % | P |
|-----------------------------------------------------------|---|---|---|
| Correct                                                   | 10 (10.3) | 13 (28.9) | 0.115 |
| Incorrect                                                 | 9 (9.3) | 8 (16.7) | 31 (64.9) |
| Not sure                                                  | 14 (27.8) | 12.3 (9) | 13 (22.2) |

| Intra-canal medication used for root canal treatment • Intrakanalni uložak za liječenje | n | % | P |
|-----------------------------------------------------------------------------------------|---|---|---|
| Correct                                                                                 | 4 (8.5) | 1 (2.2) | 27 (53.6) |
| Incorrect                                                                               | 9 (9.6) | 8 (16.7) | 0 (0) |
| Not sure                                                                                | 14 (27.8) | 9 (19.6) | 27 (53.6) |

| Systemic medication • Sistemska medicacija | n | % | P |
|-------------------------------------------|---|---|---|
| Correct                                   | 8 (11.3) | 4 (6.7) | 2 (10) |
| Incorrect                                 | 9 (13.6) | 5 (8.5) | 0 (0) |
| Not sure                                  | 25 (40.5) | 13 (22.2) | 0 (0) |

* p < 0.05
### Table 5: Knowledge of Optimal Storage Solution

| Source of Knowledge          | New Graduate (97) | Experienced (45) | P    | Additional education | Yes (114) | No (28) | P    | Source of knowledge | Course/seminar (6) | Book/article (30) | University (106) | P    |
|------------------------------|-------------------|------------------|------|----------------------|-----------|---------|------|---------------------|-------------------|------------------|------------------|------|
| Milk                         |                   |                  |      |                      | n        | %       |      | Contact lens solution |                   |                  |                  |      |
| Correct                      | 97                | 100              | 43   | 95.6                 |           |         |      | Correct              | 112               | 98.2            | 28               | 100  |
| Incorrect                    | 0                 | 0                | 2    | 4.4                  |           |         |      | Incorrect             | 2                 | 1.8             | 0                | 0    |
| Contact lens solution       |                   |                  |      |                      | n        | %       |      | Contact lens solution |                   |                  |                  |      |
| Correct                      | 32                | 33               | 10   | 22.2                 |           |         |      | Correct              | 34                | 29.8            | 8                | 28.6 |
| Incorrect                    | 65                | 67               | 35   | 77.8                 |           |         |      | Incorrect             | 80                | 70.2            | 20               | 71.4 |
| Physiologic saline solution |                   |                  |      |                      | n        | %       |      | Physiologic saline solution |                   |                  |                  |      |
| Correct                      | 84                | 86.6             | 28   | 62.2                 |           |         |      | Correct              | 93                | 81.6            | 19               | 67.9 |
| Incorrect                    | 13                | 13.4             | 17   | 37.8                 |           |         |      | Incorrect             | 21                | 18.4            | 9                | 32.1 |

*p < 0.05
Discussion

In the present survey, the participating GDPs were from private, state or foundation universities in Istanbul, Turkey. The dentists who participated in the study did not have any dental expertise. A questionnaire on emergency management after dental avulsion was given to GDPs, who had various levels of experience. The questionnaire included 32 questions and was prepared by examining similar studies in the literature (7, 11, 12, 17–19).

Although the knowledge levels of most of the GDPs on the critical treatment period after an avulsion, avulsion of primary teeth, and the storage medium of the teeth were correct, their level of knowledge on intra-canal medication and splinting techniques need to be higher for clinical success. In the present study, more than half of GDPs told that the ideal splint type was a flexible splint. This rate was reported as much higher than the study of Vasconcellos et al. (20). Besides, 58% of the GDPs are recorded as correct in this study, which is more than the study by Cinar et al. (21).

A study published in Turkey in 2020, showed that the knowledge level of more experienced dentists was lower (16). Similarly, in this study, more new graduates knew the answers to most of the questions. Also, there was a statistical difference in responses regarding the type of splint, splitting period, and optimal storage medium since GDPs may have forgotten to update their knowledge. Unlike these studies, Kariya et al. (10) stated that the experience of GDPs increased the level of knowledge regarding the critical time for treatment of avulsed teeth.

Al-Zubair (12) conducted a study in 2015 and found that approximately half of the dentists in Yemen (46%) received their knowledge on the avulsion treatment of dental avulsion from the books and scientific articles they had read. Kenny et al. (22) reported that 40% of the dentists in Yorkshire received postgraduate training in dental trauma. In this respect, most dentists who participated in the current study, 75% of them, stated that the source of their knowledge on the treatment of avulsion was the university education they received. In a study that was conducted by Zhao and Gong (17) in China, a total of 56% of the dentists stated that they did not receive any education on this topic at the university. The study of Upadhyay et al. (18) reported that 93% of the dentists in Nepal did not receive any training. In the current study, GDPs who received additional education, were familiar with the splint type, the splinting period, and milk for storage solutions in a statistically better manner. But GDPs who did not receive additional education knew that the avulsed primary tooth should not be replanted. It was determined that 80% of the GDPs in Istanbul received training in this field at the University. The impact of the knowledge source differed depending on the questions.

In the studies conducted in two different regions of Nepal, the dentists were asked the following question: “Should the avulsed teeth be replanted?” to which 86%, and 31% of the participating dentists replied: “No” (11, 18). In similar studies conducted in China and Saudi Arabia, the rates of the “No” answer were 87% and 85% respectively (17, 23).

Rasprava

Doktori dentalne medicine koji su sudjelovali u ovom istraživanju bili su iz privatnih, državnih ili sveučilišnih klinika u Istanbu. Upitnik o zbrinjavanju hitnih slučajeva nakon zubne avulzije ispunjavali su liječnici s različitim razinama iskustva. Upitnik je sadržavao 32 pitanja, a pripremljen je prema uzorku za slična istraživanja (7, 11, 12, 17–19).

Iako su razine znanja većine doktora dentalne medicine o kritičnom razdoblju liječenja nakon avulzije, avulziji mliječnih zuba i sredstvima za pohranjivanje avulziranog zuba bile točne, za klinički uspjeh trebala bi biti veća razina njihova znanja o intrakanalnim lijekovima i tehnikama splintiranja. U ovom istraživanju više od polovine doktora reklo je da je idealan tip splinta fleksibilan. Ta stopa bila je mnogo veća nego što je u istraživanju Cinara i suradnika (20). Osim toga, u ovom je istraživanju 58% odgovora bilo točno, što je više nego u istraživanju Cinara i suradnika (21).

Studija objavljena u Turskoj 2020. pokazala je da je razina znanja iskusnijih doktora niža (16). Slično tomu, u ovom je istraživanju više novih diplomiranih znalo odgovore na većinu pitanja. Zabilježena je i kasniji statistički značajni razliki u odgovorima koji se odnose na vrstu splinta, trajanje splintiranja i optimalni medij za pohranjivanje zuba, jer su doktori možda zaboravili obnoviti svoje znanje. Za razliku od ovih studija, Kariya i suradnici (10) naveli su da je iskustvo doktora povećavalo razinu znanja o kritičnom vremenu liječenja avulziranih zuba.

Al-Zubair (12) proveo je istraživanje 2015. i ustanovio da je otprilike polovina doktora dentalne medicine u Jemenu (46%) svoje znanje o liječenju avulziranih zuba stekla iz knjiga i znanstvenih članaka. Kenny i suradnici (22) izvijestili su da je 40% doktora dentalne medicine u Yorkshireu završilo postdiplomsku izobrazbu o dentalnim traumaima. U tom kontekstu, većina ispitanika koji su sudjelovali u ovom istraživanju – njih 75%, navela je da je izvorni njihova znanja o liječenju avulziranog zuba stekla iz knjiga i znanstvenih članaka. Da ništa naučili o toj temi. U istraživanju Al-Zubah i suradnika (18) navodio se da je 93% doktora dentalne medicine u Nepalu nije sudjelovalo ni u kakvoj dodatnoj izobrazbi. U ovom istraživanju su doktori koji su se dodatno educirali bili statistički značajno bolje obavijesteni o vrstama splintova, razdoblju splintiranja i mliječku kao rješenju za pohranjivanje zuba. U ovom istraživanju više od polovine doktora reklo je da idealan tip splinta fleksibilan. Ta stopa bila je mnogo veća nego što je u istraživanju Cinara i suradnika (20). Osim toga, u ovom je istraživanju 58% odgovora bilo točno, što je više nego u istraživanju Cinara i suradnika (21).

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U istraživanjima koja su provedena u dvjema različitim pokrajinama Nepala, doktorima je postavljeno sljedeće pitanje: Treba li avulzirane zube replantirati?, na što je 86% i 31% stomatologa koji su sudjelovali odgovorilo negativno (11, 18). U sličnim istraživanjima provedenima u Kini i Saudijskoj Arabiji stope negativnih odgovora bile su 87%, odnosno 85% (17, 23), a u ovom istraživanju njih 92% odgovorilo je negativno. Holan i Shmueli (19) pokazali su 2003.
whereas in the present study, 92% answered “No”. Holan and Shmueli (19) in 2003, reported that 50% of the dentists in Israel told that avulsed permanent teeth should not be replanted, and 8% said that they had no idea. In the present study; however, no dentists selected the option that such teeth should not be replanted and only 0.7% stated that they did not have any idea.

Similar to the current study, Al-Zubair (12) conducted a study in Yemen and asked the dentists about the necessary factors for the success of the replantation of avulsed teeth. A total of 53% of dentists stated that all the factors including the time elapsed after the trauma, the storage conditions of avulsed teeth, and the periodontal ligament damage affect the success, while 47% selected only one factor among the three abovementioned factors. In the present study, on the other hand, 96% of the dentists stated that all the factors influence a successful outcome.

The responses of dentists in several studies on the storage conditions of avulsed teeth stated that the most suitable storage condition was saliva (11, 12, 17). However, Abu-Dawoud et al. (7) and Al-Haj Ali et al. (23) reported that dentists stated that milk was the best storage medium for avulsed teeth. In the study by Upadhyay et al. (18), 59.8% of the participating dentists stated that Hank’s balanced salt solution was the ideal storage medium. Fujita et al. (24) reported that sixth-year dental students in Japan were familiar with the fact that milk and physiological saline solution were the most practical transport media for the storage of avulsed teeth because their pH and osmolality were similar to those of extracellular fluid.

In the present study, the GDPs stated that they would prefer calcium hydroxide as an intra-canal medicament for root canal treatment of avulsed teeth, at a higher rate than other studies (17, 18). The reason why calcium hydroxide is by far the most widely used intra-canal medication is due to its inhibition of bacterial enzymes, producing an antimicrobial effect, which activates some tissue enzymes, producing a mineralizing effect (25).

When the responses of the GDPs in the current study were examined, it was determined that many participants did not attend any courses or seminars on the emergency management of avulsed teeth; and most of them did not treat the patients with avulsed teeth due to dental trauma. Nevertheless, when the responses to the questions regarding the knowledge of the treatment of avulsed teeth were evaluated, it was observed that the response to the emergency knowledge of the participating GDPs was close to the rates reported in previous studies in the literature. Some responses were even better. However, in the present study, it was emphasized that the knowledge of the GDPs about this topic needs to be improved.

Conclusion

In the present study, the following conclusions can be drawn: The overall knowledge of GDPs about the emergency management of avulsed teeth was found to be moderate. However, the answers of most GDPs were correct regarding the replantation of primary teeth; The fact that experienced GDPs had less information points to the importance of up-

dat is 50% stomatologa u Izraelu navelo da se avulzirani trajni zubi ne smiju replantrirati, a 8% reklo je da nema pojma. U ovoj studiji nijedan ispitanik nije odabrao opciju da se takvi zubi ne trebaju vratiti u alveolu, a samo 0,7% izjavilo je da nema pojma.

Slično kao u ovom istraživanju, Al-Zubair (12) proveo je istraživanje u Jemenu i pitao doktore dentalne medicine o potrebnim čimbenicima za uspjeh replantacije avulziranih zuba. Ukupno 53 % ispitanika izjavilo je da svi čimbenici, uključujući vrijeme proteklo od traume, uvjete pohranjivanja avulziranog zuba i oštećenje parodontnog ligamenta, utječu na uspjeh, a 47 % odabralo je samo jedan čimbenik između triju gore navedenih. Istodobno, u ovom je istraživanju 96 % ispitanika izjavilo da svi čimbenici utječu na uspješan ishod.

U nekoliko istraživanja o uvjetima pohranjivanja avulziranih zuba doktori dentalne medicine naveli su da je najprikladnija slina (11, 12, 17). No Abu-Dawoud and suradnici (7) te Al-Haj Ali i suradnici (23) izvijestili su da su doktori dentalne medicine smatrali da je mlijeko najbolji medij za pohranjivanje avulziranih zuba. U istraživanju Upadhyaya i suradnika (18) 59,8 % doktora koji su sudjelovali izjavilo je da je Hankova izbalansirana slana otopina idealan medij za pohranjivanje. Fujita i suradnici (24) istaknuli su da studenti šeste godine dentalne medicine u Japanu znaju da su mlijeko i fiziološka otopina najprikladniji transportni medij za pohranjivanje avulziranih zuba jer su njihov pH i osmolalnost slični onima u izvanstaničnoj tekućini.

U ovom istraživanju ispitanici su izjavili da prednost daju kalcijevu hidroksidu kao intrakanalnom ulošku za liječenje korijenskih kanala avulziranih zuba, više negoli u drugim istraživanjima (17, 18). Razlog da je kalcijev hidroksid najčešće korišten intrakanalni lijek jest inhibicija bakterijskih enzima koji stvaraju antimikrobni učink, a on pak aktivira neke tkivne enzime potičući mineralizaciju (25).

Kad su analizirani odgovori doktora dentalne medicine u ovom istraživanju, utvrđeno je da mnogi nisu pohađali nikakve tečajeve ili seminare o hitnom zbrinjavanju avulziranih zuba, a većina nije niti liječila pacijente s avulzijama nakon dentalne traume. Ipak, kad su analizirani odgovori na pitanja koja se odnose na znanje o liječenju avulziranih zuba, uočeno je da su odgovori vezani za znanje o hitnom zbrinjavanju bili slični onima iz prethodnih istraživanja. Neki su odgovori bili još bolji. No u ovom je istraživanju istaknuto da je potrebno poboljšati znanje općih stomatologa o toj temi.

Zaključak

U ovom istraživanju zaključci su sljedeći: Otkriveno je da je sveukupno znanje općih stomatologa o hitnom zbrinjavanju avulziranih zuba umjereno. No odgovori većine ispitanika u vezi s replantacijom mliječnih zuba bili su točni; Činjenica da su iskusni doktori imali manje informacije upućuje na važnost obnavljanja znanja; Manjkavost istraživanja jest u
Zbrinjavanje avulzije zuba

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Conflict of Interest

The authors have no conflicts of interest to declare.

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References

1. Toprak ME, Tuna EB, Seymen F, Gençay KA. Traumatic dental injuries in Turkish children, Istanbul. Dent Traumatol. 2014 Aug;30(4):280-4.
2. Ferres-Amat E, Diaz-Martinez C, Herrera-Martinez S, Maura-Solivellas I, Ferres-Padre E. Unusual transalveolar and transmuco-gingival root avulsion of a fractured primary central incisor: a case with an 8-year follow-up. Case Rep Dent. 2015;2015:914846.
3. Andersson L, Adreasan JO, Day P, Heithersay G, Trope M, Daingelis A. The correct management of the avulsion case by GDP is concluded that as GDPs form a vital link to the patient, hence, they need to be educated on the emergency management of avulsed teeth by providing postgraduate continuing education programs to improve their awareness and knowledge. The correct management of the avulsion case by GDP will result in an increased success of the treatment. Furthermore, the awareness of GDPs should be raised to the availability of the IADT guideline with online tools such as the IADT website (www.iadt-dentaltrauma.org/) and phone application (Tooth SOS, Official App of IADT).
4. Panzarini SR, Trevisan CL, Brandini DA, Poi WR, Sonoda CK, Luvisotto ER, et al. Intracanal dressing and root canal filling materials in tooth replantation: a literature review. Dent Traumatol. 2012 Feb;28(1):42-8.
5. Trope M, Moshonov J, Nissan R, Buxt P, Yesilsoy C. Short vs. Long-term calcium hydroxide treatment of established inflammatory root resorption in replanted dog teeth. Endod Dent Traumatol. 1995 Jun;11(3):124-6.
6. Dominguez Reyes A, Muñoz Muñoz L, Aznar Martín T. Study of calcium hydroxide apexification in 26 young permanent incisors. Dent Traumatol. 2005 Jun;21(3):141-5.
7. Abu-Dawoud M, Al-Enezi B, Andersson L. Knowledge of emergency management of avulsed teeth among young physicians and dentists. Dent Traumatol. 2007 Dec;23(6):348-55.
8. Lima TFR, Silva EJNLD, Gomes BPFA, Almeida JFA, Zaia AA, Soares AJ. Relationship between initial attendance after dental trauma and development of external inflammatory root resorption. Braz Dent J. 2017;28(2):201-5.
9. Firelander LT, Chandler NP, Drummond BK. Avulsion and re-plantation of a primary incisor tooth. Dent Traumatol. 2013 Dec;29(6):494-7.
10. Kariya PB, Singh S, Bargale S, Shah S, Kulkarni N, Dave BH. Evaluation of knowledge regarding emergency management of avulsed traumatic dental injuries in children among general dental practitioners in India. Indian J Dent Res. 2019;30(1):21-6.
11. Limbu S, Dikshit P, Bhagat T, Mehata S. Knowledge of dental emergency management of avulsed tooth in dental colleges in Nepal. J Nepal Health Res Counc. 2014 Jan;12(26):1-7.
12. Al-Zubair NM. General dentists’ knowledge about the emergency management of dental avulsion in Yemen. J Oral Sci. 2015;21(1):25-9.
13. Karapinar- Kazandag M, Tanalp J, Ayhan T, Kaptan RF, Ersev H. Evaluation of retention of dental students’ trauma knowledge following a reminder lecture. Biomed Res. 2018;29(9):1756-63.
14. MeSH Browser [database on the Internet]. Diş Hekimliği Dekanları Konseyi. Mezuniyet Oncesi Diş Hekimliği Eğitimi Ulusal Çekirdek Eğitim Programı. 2016. Available online: http://ddk.org.tr/wp-content/uploads/2018/03/ddk2016decep2016.pdf. (accessed on 4 April 2020).

dating the information; One limitation of the study was that its results are limited to restricted sample size. The larger sample size would be a better measure to dentifier the results; It is concluded that as GDPs form a vital link to the patient, hence, they need to be educated on the emergency management of avulsed teeth by providing postgraduate continuing education programs to improve their awareness and knowledge. The correct management of the avulsion case by GDP will result in an increased success of the treatment. Furthermore, the awareness of GDPs should be raised to the availability of the IADT guideline with online tools such as the IADT website (www.iadt-dentaltrauma.org/) and phone application (Tooth SOS, Official App of IADT).

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15. Buldur B, Kapdan A. Factors associated with knowledge and attitude of management of traumatic dental injuries: a cross-sectional study among Turkish dentists. Pesq bras odontoped Clin Integr. 2018;18(1):e3948.

16. Duruk G, Erel ZB. Assessment of Turkish dentists’ knowledge about managing avulsed teeth. Dent Traumatol. 2020 Jan 10.

17. Zhao Y, Gong Y. Knowledge of emergency management of avulsed teeth: a survey of dentists in Beijing, China. Dent Traumatol. 2010 Jun;26(3):281-4.

18. Upadhyay S, Rokaya D, Upadhyaya C. Knowledge of emergency management of avulsed teeth among general dentists in Kathmandu, Kathmandu Univ Med J (KUM). 2012 Apr-Jun;10(38):37-40.

19. 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 Jan;13(1):13-9.

20. De Vasconcellos LG, Brentel AS, Vanderlei AD, De Vasconcellos LM, Valera MC, De Araujo MA. Knowledge of general dentists in the current guidelines for emergency treatment of avulsed teeth and dental trauma prevention. Dent Traumatol. 2009 Dec;25(6):578-83.

21. Cinar C, Atabek D, Alacam A. Knowledge of dentists in the management of traumatic dental injuries in Ankara, Turkey. Oral Health Prev Dent. 2013;11(1):23-30.

22. Kenny KP, Day PF, Douglas GVA, Chadwick BL. Primary care dentists’ experience of treating avulsed permanent teeth. Br Dent J. 2015 Sep 11;219(5):E4.

23. Al-Haj Ali SN, Algarawi SA, Alrubaian AM, Alasgah AL. Knowledge of general dental practitioners and specialists about emergency management of traumatic dental injuries in Qassim, Saudi Arabia. Int J Pediatr. 2020 Feb 19;2020:6059346.

24. Fujita Y, Shiono Y, Maki K. Knowledge of emergency management of avulsed tooth among Japanese dental students. BMC Oral Health. 2014 Apr 8;14:34.

25. Panzarini SR, Trevisan CL, Brandini DA, Poi WR, Sonoda CK, Luvisotto ER, et al. Intracanal dressing and root canal filling materials in tooth replantation: a literature review. Dent Traumatol. 2012 Feb;28(1):42-8.