

The assessment of teachers' and medical professionals' knowledge on first aid in tooth injuries

¹Doctoral studies, Department of Paediatric Dentistry, Medical University of Łódź

Head of Department: Professor Joanna Szczepańska, MD, PhD

²Doctoral studies, Department of Dental Surgery, Medical University of Łódź

Head of Department: Professor Anna Janas-Naze, MD, PhD

³Department of Paediatric Dentistry, Medical University of Łódź

Head of Department: Professor Joanna Szczepańska, MD, PhD

KEYWORDS

tooth injury, teachers,
medical professionals, first aid

SUMMARY

Introduction. Tooth injuries constitute a serious clinical problem in contemporary paediatric dentistry. Immediately delivered and correct first aid is particularly important in the case of dental trauma.

Aim. The aim of the study was to assess the general knowledge of teachers and medical professionals on providing first aid to children in the case of dental trauma. Taking part in a first aid training course was also analysed.

Material and methods. An anonymous, voluntary questionnaire was administered to 727 people. It was conducted in January and February 2017 in three Polish provinces. The respondents were divided into groups depending on their age, sex, educational level, number of children and profession related to medicine or school education. Behavioural patterns were analysed in the event of a complete tooth dislocation or crown fracture.

Results. According to the study, 577 respondents (79.4%) have participated in a first aid training course at least once. Every third person: 223 (32%) has been a witness of a tooth injury. The most frequent type of encountered trauma was soft tissue injury and tooth crown fracture: 114 (35%) and 96 (29%) cases, respectively. The professionals who tried to provide first aid in dental trauma at a similar percentage were teachers: 56% of cases and people associated with medicine: 53%; the remaining professionals did so in 36% of cases.

Conclusions. The issue of first aid in dental trauma is rarely raised during first aid training courses. Despite this, every second person participating in the study has tried to provide first aid. However, their actions were incorrect in most cases.

INTRODUCTION

Dental trauma represents a serious and common medical and aesthetic problem; it is also a significant challenge for the dentist, particularly if the patient is a child. According to a study conducted in 2012-2013 at the Department

of Paediatric Dentistry of the Medical University of Łódź, Poland, 3.4% of the patients who reported to the facility had a history of oral trauma. School boys are at the highest risk for such injuries (1). Dental trauma accounts for 5% of traumatic body damage in all age groups (2).

The correct administration of first aid on the site of an accident is of vital importance for prognosis in mechanical dental trauma, particularly as serious one as tooth avulsion, for example. Securing the trauma area and the lost part of or whole tooth appropriately and starting professional treatment quickly dramatically improves the prognosis. Individuals who take care of children on a daily basis, parents and teachers, who are the most common witnesses to such accidents, should have a basic knowledge on first aid in dental trauma. Healthcare professionals should be aware of the proper trauma management protocol and know to which specialist they should refer the patient for treatment continuation, if necessary. These principles are necessary to ensure optimal conditions for healing and increase the chances of preserving the affected teeth in the oral cavity.

AIM

The aim of the study was to assess the knowledge of teachers and healthcare professionals: physicians, nurses, dental assistants and public health nurses on dental trauma first aid in children and the training that they have received on the matter.

MATERIAL AND METHODS

An anonymous, voluntary questionnaire was administered to 727 individuals. It was conducted in January and February 2017 in the Łódzkie, Lubelskie and Małopolskie provinces in Poland. The questionnaire was distributed at schools, in hospitals, clinics and on the Internet. The questionnaire was divided into three parts. The first one regarded demographic and social data. The respondents were divided into groups based on their education- or medicine-related profession as well as their age, gender, number of children and educational level. The second part of the questionnaire concerned the participation in first aid courses, the range of topics covered in those courses and the number of times the subjects had witnessed dental trauma. The third part of the questionnaire included questions on the management of complete tooth avulsion or tooth crown fracture cases.

The Excel software was used for statistical analysis. The frequency of qualitative features was determined. The relationships between the frequencies of non-measurable features in the different groups were studied using the chi-square independence test. A significance level of $\alpha = 0.05$ was adopted. Cramer's V was used to investigate the strength of the association between two properties. Values of < 0.3 signified a weak association, those of $< 0.3-0.5 >$ a minor association and $(0.5-0.6 >)$ a moderate association. For the range of $(0.6-0.8 >)$ the association is relatively strong and for values higher than 0.8 the association is strong.

RESULTS

In the present study, 483 individuals (66.4%) were female and 244 (33.6%) were male. There were 141 individuals employed in education, who accounted for 19.4% of subjects, and 219 individuals were members of the medical community (30.1%). The remaining respondents (367; 50.5%) practised different professions than the ones mentioned. The age of the subjects was 18-30 years (68.2%), 31-40 (12.1%), 41-50 (10.2%) and 51-60 (9.5%). Among the respondents, 223 individuals (30.7%) had at least one child and 504 (69.3%) did not have any children at all.

There were 370 subjects with higher education (50.9%), 332 with secondary education (45.7%) and 25 with primary education (3.4%). The study group included 594 city dwellers (81.7%) and 133 rural inhabitants (18.3%).

According to the study, 577 respondents (79.4%) have participated at least once in a first aid training course (fig. 1). Only 94 individuals (16.3%) took part in first aid courses in which the subject of oral trauma was raised. A weak association between the profession and participation in a first aid course was observed ($\chi^2 = 25.1$, Cramer's V = 0.19), which was statistically significant ($p = 0.0000034$) (tab. 1). From among healthcare professionals 88% took part in a course; 86% of teachers and 72% of representatives of other professions did as well.

Nearly one third of respondents: 233 (32%) have witnessed dental trauma. Among medical professionals the figure was 38%, among teachers 34 and 28% of members

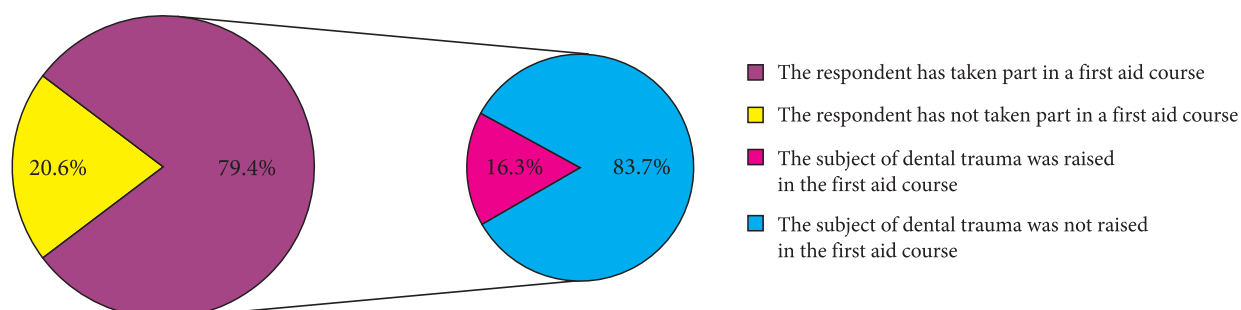


Fig. 1. Subjects' participation in a first aid course

Tab. 1. Analysed associations with regard to age, profession and educational level

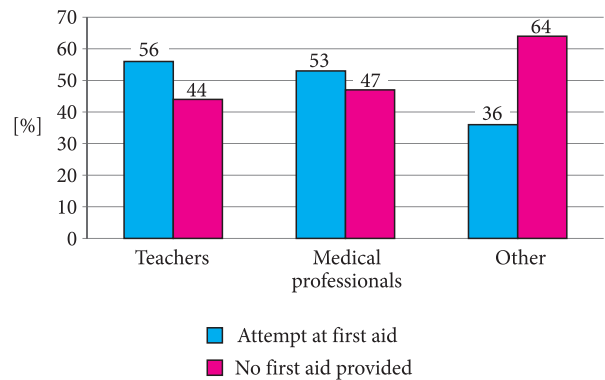
Studied association	p value	Chi-square independence test	Cramer's V
Age and participation in first aid course	0.00018659	19.8016	0.16504
Age and first aid provision	0.243315	4.17363	0.13298
Profession and first aid provision	0.020933	7.73283	0.18101
Profession and participation in first aid course	0.0000034	25.1831	0.18612
Educational level and participation in first aid course	0.017885	8.04758	0.10521

of other professions have witnessed such events. A first aid attempt was made by 109 subjects (46.8%) who witnessed an accident. Statistical analysis showed no relationship in the study group between prior participation in a course and the provision of first aid by accident witnesses.

The trauma usually involved soft tissue injury and tooth crown fracture: 114 (35%) and 96 cases (29%), respectively. The lowest number of trauma cases were associated with temporomandibular joint damage and maxillary fracture (fig. 2). First aid was provided most commonly in soft tissue trauma: 68 cases (61%) and tooth crown fracture: 31 cases (32%).

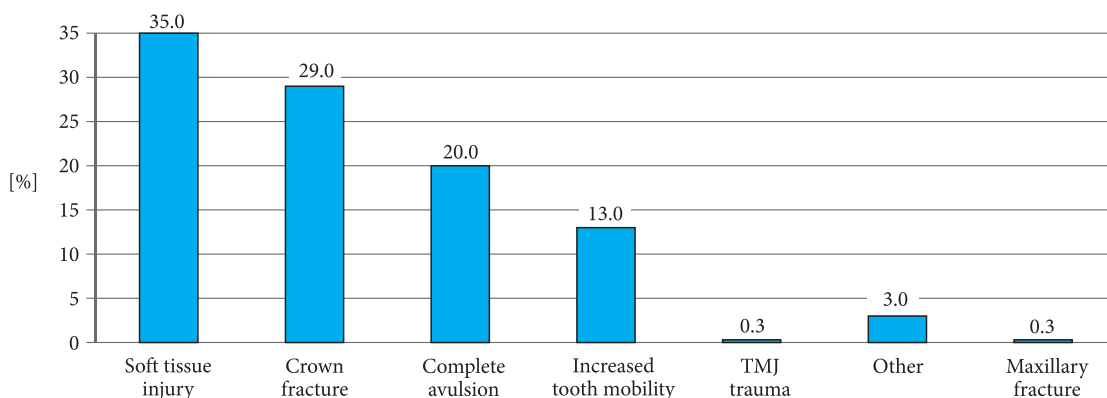
In the study group, a relationship between the profession and first aid provision was observed ($\chi^2 = 7.7$; $p = 0.02$) and the strength of this relationship expressed by Cramer's V was 0.18 (tab. 1). The professionals who attempted to provide first aid in tooth injury at a similar rate were teachers (56% of cases) and individuals working in medicine (53%). The members of the remaining professions made a first aid attempt in 36% of cases (fig. 3).

In the case of tooth crown fracture, more than half of the respondents (416; 57.2%) believed that finding the broken part of the tooth and reporting to the dentist immediately with it was the right action to take. However, as many as 257 respondents (35.3%) did not consider finding the broken fragment necessary. Among medical


Fig. 3. Behaviour of different professional groups witnessing dental trauma

professionals, 68% selected the answer that they would go to the dentist immediately with the tooth fragment found and 26% would not take the broken part of the tooth with them for the visit. As for teachers, 49% would report to the dentist immediately with the tooth fragment found and 36% would report to the dentist immediately without the broken part of the tooth (fig. 4).

The prognosis following complete permanent tooth avulsion depends primarily on correct first aid provision within the first hour after the accident. Moreover,


Fig. 2. Rate of occurrence and types of trauma witnessed by the subjects

appropriate behaviour of the patient, compliance with doctor's instructions, maintaining appropriate oral hygiene, avoiding putting pressure on the teeth and reporting for follow-up visits also have a significant impact on the outcome. Among the respondents, only 75 individuals (10.3%) were aware of the fact that permanent tooth replantation on the site of the accident is the right action to take. The medical community accounted for 67%, other professions for 23% and teachers for 10% of this group. As for the distribution of answers to a question on first aid in complete permanent tooth avulsion, 23% of healthcare professionals declared that they would perform immediate replantation, 64% would report immediately to the dentist with the tooth fragment found, while 11% responded that a tooth which has fallen out cannot

be used. Six percent of teachers responded to this question that immediate replantation is essential, 57% answered that a visit at a dentist with the lost tooth is necessary and 30% believe that a lost tooth cannot be used for treatment (fig. 5).

There were discrepancies regarding the manner of storing the tooth on the way to the dentist. The respondents provided the following answers to a multiple choice question on how to store an avulsed tooth: transport in sodium chloride solution 0.9% – 30%; transport in dry gauze – 28%; water, milk and contact lens solution – 12% each; hydrogen peroxide solution 3% – 5%; alcohol – 2% (fig. 6).

For deciduous tooth avulsion the respondents provided different answers than for permanent tooth avulsion. More than 492 respondents (67.7%) do not consider it

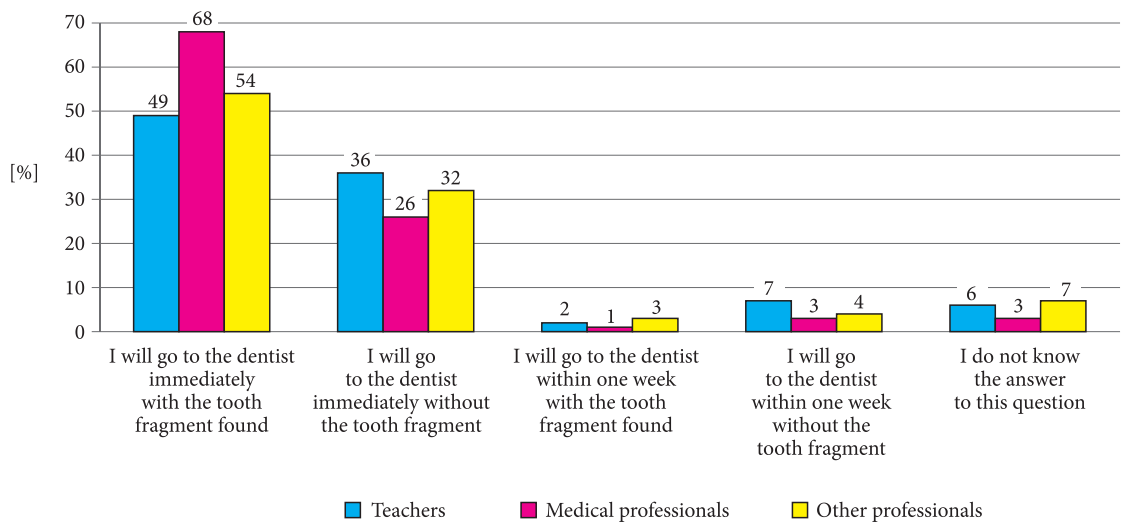


Fig. 4. Behaviour of different professional groups in the event of tooth crown fracture

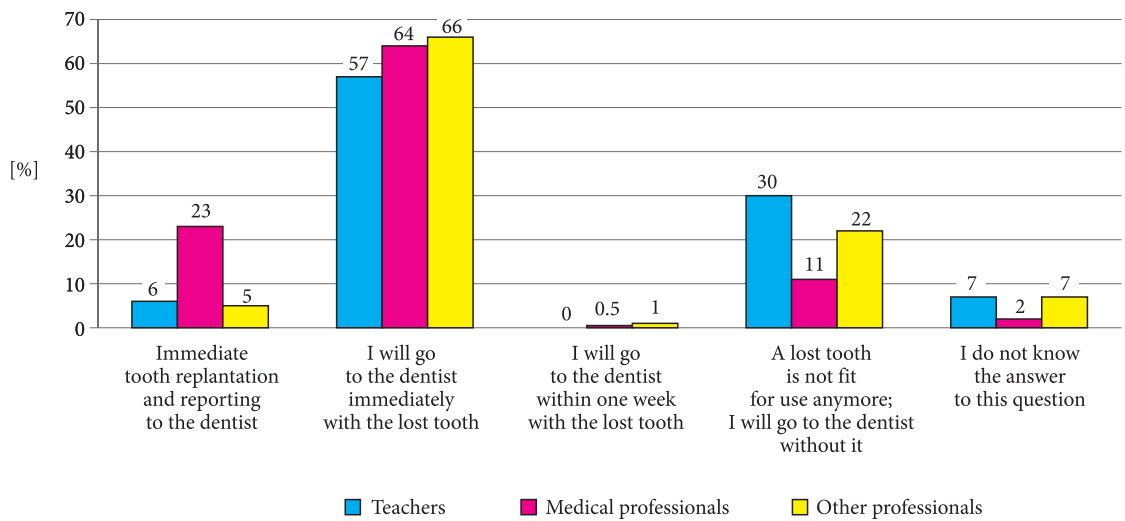


Fig. 5. Behaviour of different professional groups in the event of complete permanent tooth avulsion

necessary to report to the dentist after a deciduous tooth is lost due to trauma. This group included 60% of healthcare professionals, 69% of teachers and 72% of members of other professions. The option of reporting immediately to the dentist with the lost tooth was selected by 156 subjects (21.4%). This group included 29% of medical professionals, 20% of teachers and 18% of members of other professions.

Eleven percent of teachers do not know how to act in deciduous tooth trauma and 9% of healthcare professionals believe that a deciduous tooth should be replanted (fig. 7).

DISCUSSION

The data regarding the most common types of dental trauma have been comparable in different countries over the years. In an analysis performed by Hilt et al. (3) in 2000-2003 the most common type of tooth injury was enamel and dentine fracture (55% of cases). Researchers from the city of Łódź, Poland, also report that in 2012-2013

the most common type of dental trauma was Ellis Class II fracture (23.8%). Partial avulsion or tooth root fracture occurred in only 3.96% of cases (1). According to Ain et al. (4) the most common type of trauma in Indian schools is crown fracture involving the enamel (68.45%). Likewise, German researchers report crown fracture (63.8%) and tooth avulsion (36.2%) to be the most common types of trauma in 2004-2008 (5).

In their studies, many authors raise the subject of participation in dental trauma first aid training sessions among individuals employed in medicine and education. It is school employees and children's guardians in particular that should know the principles of first aid. In the present study, 68% of the respondents have been a witness to oral trauma. According to Baginska et al. (6) 70.1% of school nurses have come across dental trauma, 45.7% of which took place at school. In Brazil, 23.9% of teachers have taken part in a first aid course. Only in 4.1% of cases was the subject of dental trauma raised during the course (7). Among teachers in Indian schools 31.8% have

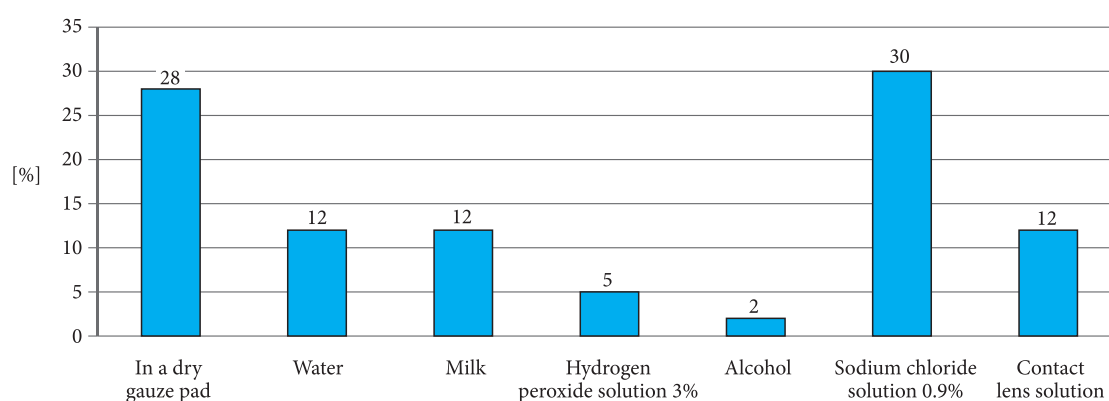


Fig. 6. Manner of storing an avulsed tooth on the way to the dentist

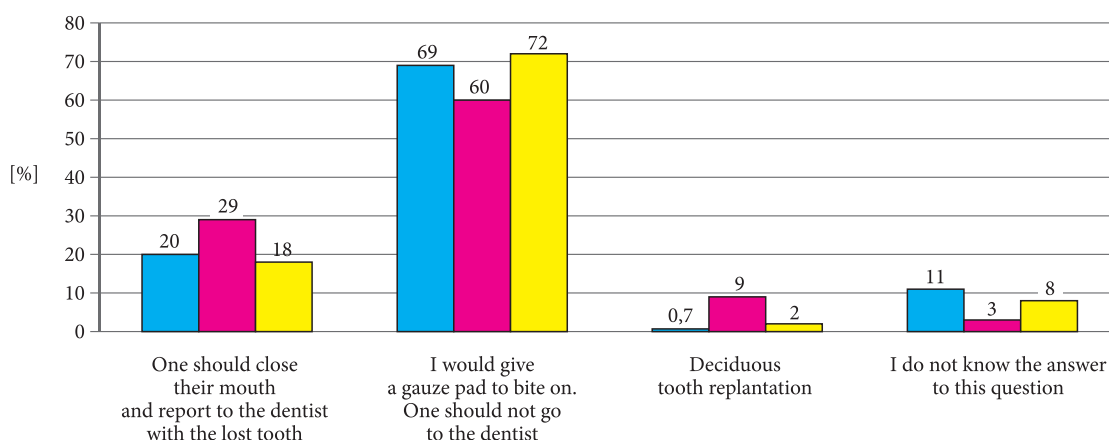


Fig. 7. Behaviour of different professional groups in the event of complete deciduous tooth avulsion

witnessed tooth injury, while 12.5% took part in appropriate training (8). In Iran, 52.3% of teachers have never taken part in a first aid course and nearly half of the respondents (47.2%) have witnessed dental trauma (9). According to Yigit et al. (10) 7.7% of physicians in Turkey have been properly trained in dental trauma first aid.

In the case of complete permanent tooth avulsion the most important factor for the prognosis is the correct provision of first aid within the first hour after the accident. In the case of complete permanent tooth avulsion 50% of school nurses in the city of Białystok, Poland, would replant the tooth and 34% would call the child's parents for them to collect the child from school and take it to the dentist (11). In British hospitals, only 6.3% of junior doctors declare that they know the correct management of complete tooth avulsion (12).

According to a study by Costa Hidalgo et al. (13), as many as 96.8% of teachers in Brazilian schools declare a lack of knowledge of first aid in complete tooth avulsion. According to research by Prasanna et al. (14) 264 teachers (88%) in Davangere City schools have never been informed on the right management of tooth avulsion cases. In Saudi Arabia, 78.7% of teachers believe that a deciduous tooth cannot be replanted. At the same time, one third of the respondents support the option of permanent tooth replantation (15). This result is significantly different from the present study, in which only 6% of teachers were

aware of the need for immediate replantation of a permanent tooth.

Bakarčić et al. (16) in their survey raise the subject of securing an avulsed tooth correctly on the way to the dentist. According to their analysis, 76.38% of teachers in Croatia would wrap an avulsed tooth in a dry gauze pad or tissue and 3.47% would put it in saline. This result is significantly different in favour of the current study, in which 28% of respondents would wrap an avulsed tooth in dry gauze, although only 24% of the subjects of the present study would put the avulsed tooth in milk or a contact lens solution.

CONCLUSIONS

First aid courses very rarely raise the subject of oral trauma. Despite this, almost half of individuals taking part in the study have tried to provide first aid as a witness to an accident; however, their actions were often incorrect. The knowledge on first aid in dental trauma should be widely disseminated, particularly among individuals employed in education and medicine. The dissemination of the relevant information among the members of these professions is very important since the success of further treatment is largely dependent on their quick and correct action. It would also be useful to display instructions on the management of oral trauma cases at schools, sports centres and in places attended by children and adolescents.

CONFLICT OF INTEREST

None

CORRESPONDENCE

*Anna Szufnara
Zakład Stomatologii Wieków Rozwojowego
Uniwersytet Medyczny w Łodzi
ul. Pomorska 251, 92-216 Łódź
tel./fax: +48 (42) 675-75-16
szufnara.ania@gmail.com

REFERENCES

1. Burczyński B, Przybylska A, Orlińska B et al.: Częstość występowania urazów zębów wśród dzieci zgłaszających się do Zakładu Stomatologii Wieków Rozwojowego Uniwersytetu Medycznego w Łodzi. *Nowa Stomatol* 2015; 20(3): 98-104.
2. Olczak-Kowalczyk D, Szczepańska J, Kaczmarek U et al.: Współczesna stomatologia wieku rozwojowego. Wyd. I. Med. Tour Press International, Otwock 2017.
3. Hilt A, Rybarczyk-Townsend E, Filipińska-Skapska R et al.: Urazowe uszkodzenia zębów u pacjentów zgłaszających się do Zakładu Stomatologii Wieków Rozwojowego UM w Łodzi w latach 2000-2003. *Nowa Stomatol* 2006; 1: 15-18.
4. Ain TS, Telgi LR, Sultan S et al.: Prevalence of Traumatic Dental Injuries to Anterior Teeth of 12-Year-Old School Children in Kashmir, India. *Arch Trauma Res* 2016; 5(1): e24596.
5. Bucher K, Neumann C, Hickel R et al.: Traumatic dental injuries at a German university clinic 2004-2008. *Dent Traumatol* 2013; 29: 127-133.
6. Baginska J, Rodakowska E, Milewski R et al.: Polish school nurses' knowledge of the first-aid in tooth avulsion of permanent teeth. *BMC Oral Health* 2016; 16: 30.
7. Antunes LA, Rodrigues AS, Martins AM et al.: Traumatic dental injury in permanent teeth: knowledge and management in a group of Brazilian school teachers. *Dent Traumatol* 2016; 32(4): 269-273.
8. Nirwan M, Syed A, Chaturvedi S et al.: Awareness in Primary School Teachers regarding Traumatic Dental Injuries in Children and Their Emergency Management: A Survey in South Jaipur. *Int J Clin Pediatr Dent* 2016; 9(1): 62-66.
9. Raoof M, Zaherara F, Shokouhinejad N: Elementary school staff knowledge and attitude with regard to first-aid management of dental trauma in Iran: a basic premise for developing future intervention. *Dent Traumatol* 2012; 28(6): 441-447.

10. Yigit Y, Helvacioğlu-Yigit D, Kan B et al.: Dentofacial traumatic injuries: A survey of knowledge and attitudes among emergency medicine physicians in Turkey. *Dent Traumatol* 2018 Sep 15. DOI: 10.1111/edt.12440.
11. Baginska J, Wilczynska-Borawska M: Knowledge of nurses working at schools in Białystok, Poland, of tooth avulsion and its management. *Dent Traumatol* 2012; 28(4): 314-319.
12. Trivedy C, Kodate N, Ross A et al.: The attitudes and awareness of emergency department (ED) physicians towards the management of common dentofacial emergencies. *Dent Traumatol* 2012; 28(2): 121-126.
13. Costa Hidalgo L, Souza Pesci H, Costa Hidalgo L et al.: Knowledge and attitudes of early school teachers regardless of alveolar-dental trauma first aid management. *J Orofac Invest* 2017; 4(2): 15-20.
14. Prasanna S, Giriraju A, Narayan NL: Knowledge and Attitude of Primary School Teachers toward Tooth Avulsion and Dental First Aid in Davangere City: A Cross-sectional Survey. *Int J Clin Pediatr Dent* 2011; 4(3): 203-206.
15. Alluqmani FA, Omar OM: Assessment of schoolteachers' knowledge about management of traumatic dental injuries in Al-Madinah city, Saudi Arabia. *Eur J Dent* 2018; 12(2): 171-175.
16. Bakarčić D, Hrvatin S, Maroević M et al.: First Aid Management in Emergency Care of Dental Injuries – Knowledge among Teachers in Rijeka, Croatia. *Acta Clin Croat* 2017; 56(1): 110-116.

submitted:

4.10.2018

accepted:

25.10.2018