




Emergency Management of Traumatic Dental Injuries: Knowledge of Dubai School Nurses

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Academic Editors: Alessandro Leite Cavalcanti and Wilton Wilney Nascimento Padilha

Received: 26 March 2019 / Accepted: 27 June 2019 / Published: 15 July 2019

Abstract

Objective: To assess the knowledge of school nurses in Dubai, United Arab Emirates, about the emergency management of Traumatic Dental Injuries (TDIs) at schools. **Material and Methods:** A cross-sectional questionnaire survey was conducted amongst 68 school nurses (SN) prior to inviting them to an educational workshop on the emergency management of TDIs. The educational workshop covered all the topics in the questionnaire and provided basic necessary information to the SN regarding the emergency management of TDIs. Descriptive statistics were used to describe the characteristics of the sample; the Kolmogorov-Smirnov test was used to test normality for the score of knowledge and Mann-Whitney U test to correlate score of knowledge with different demographical variables ($p < 0.05$). **Results:** An overall lack of knowledge about the emergency management of TDIs was observed. The overall average for the score of knowledge for all the participants was 10.75 out of a total of 16 correct answers. Female participants had significantly higher scores of knowledge compared to males ($p = 0.02$). None of the other demographic variables were significantly associated with the score of knowledge. **Conclusion:** More training programs are essential for school nurses to improve their knowledge and awareness for better future handling of traumatic dental injuries.

Keywords: Health Knowledge, Attitudes, Practice; Tooth Injuries; School Nursing.

Introduction

The oro-facial region is a common site for traumatic injuries in children [1] and according to the World Health Organization (WHO) is a global public health concern [2]. Across the world, 16-40% of children in the age range of 6 to 12 years old are affected by dental trauma due to unsafe playgrounds, unsafe schools, road accidents, or violence [2].

Traumatic dental injuries (TDIs) occur more in children and young adults and account for 5% of all traumatic injuries [3]. Twenty-five percent of all school children will experience dental trauma, and 33% of adults had experienced trauma to permanent dentition, especially before the age of 19 [3]. Regarding the United Arab Emirates (UAE), little published data exists on the prevalence of TDIs, although one study reported a prevalence of 25.9% [4]. Avulsion of permanent teeth is seen in 0.5–3% of all dental injuries [5,6]. Tooth avulsion occurs more frequently in children aged 7 to 9 years, especially boys [6-8] with upper central incisors being the most commonly affected teeth [6,7].

School nurses, as the first assistance available in trauma situations with school pupils, should have the proper knowledge of the emergency early management of traumatic dental injuries to ensure the best possible prognosis for the injured teeth. Studies from different countries around the world demonstrated that school nurses lack the proper knowledge of dental injury management and that a pressing need for training and education exists [9-17]. There are no published data regarding this topic in Dubai, a major city in the United Arab Emirates and the Middle East and North Africa (MENA) area.

The aim of the study was to assess the level and quality of the knowledge of school nurses in Dubai, UAE about the management of emergency dental trauma at schools.

Material and Methods

Study Design and Setting

A cross-sectional study was conducted in Dubai, UAE, among nurses, both in private and public schools.

Sampling

A census sampling methodology was utilized. We contacted all school nurses (204) in 159 schools and invited them by email and telephone follow-ups to partake in this study. The final sample size was 68 school nurses.

Data collection

Data were collected by means of a questionnaire, which was designed using modified versions of the questionnaires from several studies [10-17]. A pilot study was conducted to validate the questionnaire among ten school nurses, and minor modifications were made to improve wording and clarity. The English version of the questionnaire was translated into Arabic and then back-translated to English to verify the accuracy of the translation.

School nurses were invited to one of two educational workshops assigned at two separate dates, in the form of a one-hour presentation that included videos and a presentation on the emergency management of TDIs. The workshops discussed in detail all the questions of the questionnaire and the emergency management chart/steps of TDIs in the form of a large poster were given to the participants at the end of the workshop [Figure 1]. This poster was based on the community guidelines adopted by the International Association of Dental Traumatology (IADT) [18].

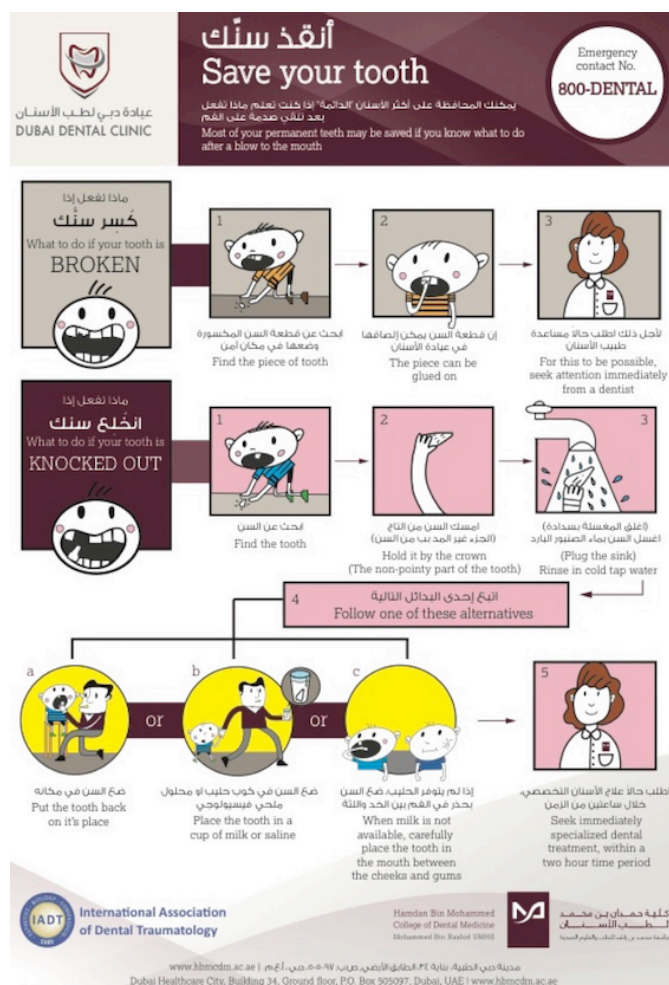


Figure 1. Instructional poster adopted from IADT.

The questionnaire included a total of 15 demographic questions and 16 questions about the knowledge and management of various types of TDIs. The knowledge questions were divided into two parts: part 1 tested the participants' knowledge about types of dental injuries and whether they could differentiate between primary and permanent tooth injuries and their management, while part 2 tested the knowledge about avulsed primary and permanent tooth management.

Statistical Analysis

Data were entered into a computer using SPSS for Windows version 20.0 (SPSS Inc., Chicago, IL). Statistical analysis was performed using descriptive statistics (P-value of less than 0.05

was considered significant in all statistical analyses). Kolmogorov-Smirnov test to (test normality for the score of knowledge) and Mann-Whitney U test to (compare the score of knowledge with different demographical variables) were used for statistical analysis.

Ethical Aspects

Ethical approval was obtained from the Research and Ethics Committee at Hamdan Bin Mohammad College of Dental Medicine (HBMCDM) at the Mohammad Bin Rashid University of Medicine and Health Sciences (MBRU).

Results

The response rate for the questionnaire was 68/203 (33.5%). The study participants included 10 (14.7%) males and 58 (85.3%) females. Participants coming from preschools were 3 (4.4%), primary 24 (35.3%), middle 8 (11.7%), secondary 9 (13.2%), and school of all grades were 24(35.3%). As for the participants' qualifications, the majority of the participants; 41 (60.3%), held a bachelor's degree. Moreover, 52 (76.5%) of the participants had children of their own, and 40 (58.8%) encountered children with TDIs. As for previously attended TDI education and training; only 23 (33.8%) did, 11(16.2%) felt adequately informed about TDIs, and 17 (25%) had first aid courses covering the management of TDIs. The mean age of the participants was 36.35 (+8.71), and the mean experience in years was 11.78 (+8.74). The mean duration in the current position was 7.88 (+7.56).

The participants were asked about their past experiences and encounters with different types of TDIs. The results of participants past experiences and encounters of TDIs are demonstrated in Figure 2.

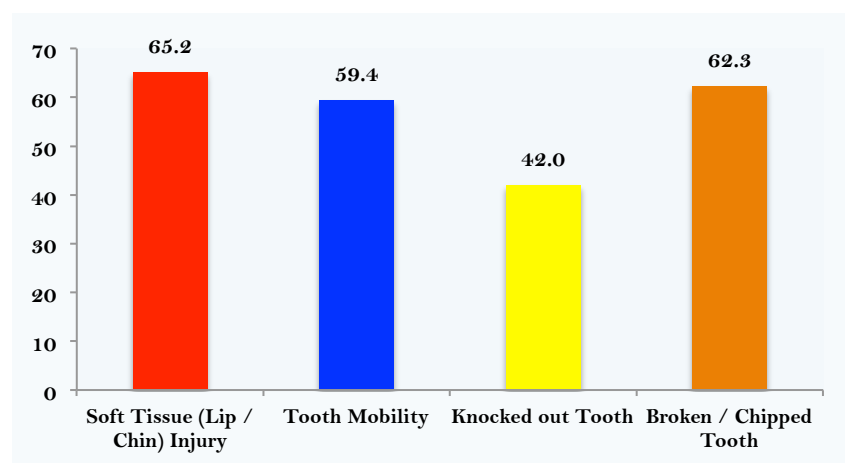


Figure 2. Participants' experience and encounters of TDIs.

A score of knowledge was calculated for every participant based on the number of correct answers she/he provided in the knowledge section of the questionnaire. The overall average for the score of knowledge for all the participants was 10.75 out of a total of 16 correct answers. The

association between the score of knowledge of TDIs with different demographical variables is demonstrated in Table 1. The only statistically significant difference was found between the knowledge score of female participants (10.9) compared to that of males (9.7) ($p = 0.02$).

Table 1. Association of the score of knowledge of TDIs with different demographical variables.

Variables	Score of Knowledge	p-value*
	Mean (\pm SD)	
Gender		
Male	9.7 (\pm 1.34)	0.02
Female	10.9 (\pm 2.0)	
Level of Education		
High School	11.3 (\pm 2.0)	0.501
Above High School	10.8 (\pm 2.0)	
Experience		
Less Than 5 Years	10.4 (\pm 2.2)	0.873
5 Years and More	10.8 (\pm 1.9)	
Have Own Children		
Yes	10.9 (\pm 1.8)	0.391
No	10.2 (\pm 2.2)	
Encountered Children with TDIs		
Yes	10.8 (\pm 2.3)	0.656
No	10.6 (\pm 1.3)	
Was Given Advice Regarding TDIs		
Yes	11.1 (\pm 2.3)	0.511
No	10.6 (\pm 1.8)	

*Mann-Whitney U Test.

The distribution of answers for each specific question regarding the participants' knowledge is demonstrated in Table 2.

Table 2. Distribution of answers to the questions covering aspects of knowledge.

Aspect of Knowledge	Yes	
	N	%
Is a knocked out tooth a dental injury?	53	77.9
Need for treatment of broken/chipped tooth	65	95.6
Need for knocked out primary tooth management	36	52.9
Need for treatment of knocked out permanent tooth	65	95.6
Need for verification of the status of tetanus toxoid injection	42	61.8
Would you look for a broken/chipped tooth?	46	67.6
Need for informing parents about broken/chipped tooth and advising them to contact their dentist	65	95.6
Need for finding knocked out permanent tooth	52	76.5
Need for informing parents regarding knocked out permanent tooth and advising them to contact their dentist	67	98.5

Regarding the source of knowledge for TDIs, the most common source as reported by the participants was from dental office receptions (47%) followed by dentists (34%) and family physicians (6%) (Figure 3).

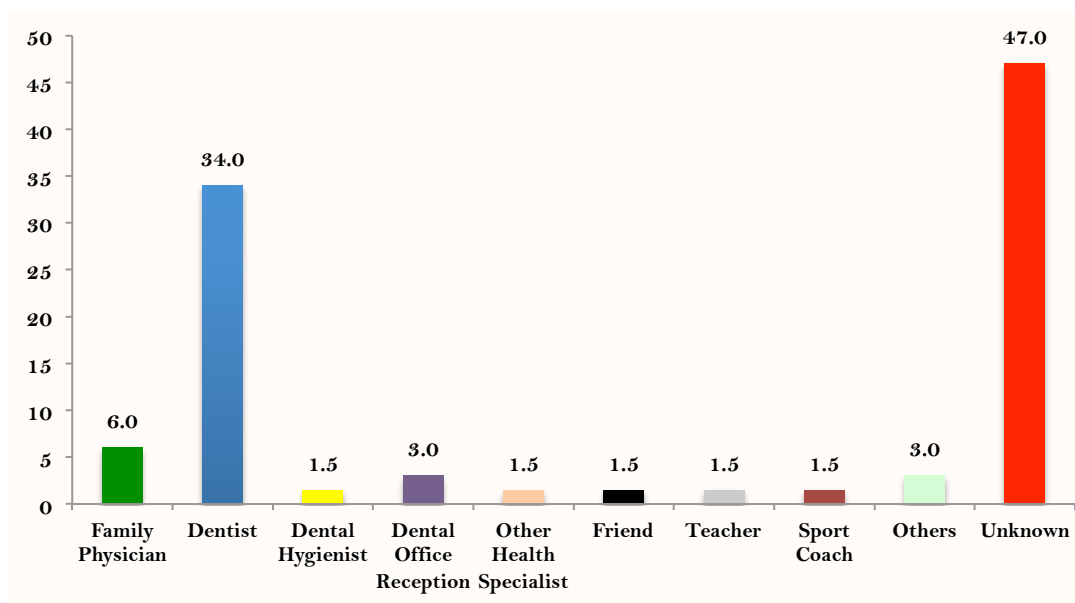


Figure 3. The source of knowledge of the participants.

The participants were presented with different scenarios to test their knowledge as follows: *Scenario 1:* Regarding the ability of the participants to distinguish between primary and permanent incisor in a 9-year-old-boy (64.2%) answered correctly “*permanent tooth*”. *Scenario 2:* Regarding the urgency of seeking professional help if a permanent tooth was knocked out (56.7%) answered correctly “*within 30 minutes*”. *Scenario 3:* Regarding the ideal manner of holding the knocked out permanent tooth (47.8%) answered correctly “*By the crown*”. *Scenario 4:* Regarding the first course of action when encountering a knocked out permanent tooth (11.9%) answered correctly by “*putting the tooth back in its place*”. *Scenario 5:* Regarding the action taken when a knocked out permanent tooth falls to the ground and is covered with dirt (26.9%) answered correctly by ± “*rinse the tooth under tap water*”.

Discussion

A review of the literature revealed that many studies were conducted worldwide assessing school nurses’ and school teachers’ knowledge about the management of dental trauma and these studies revealed inadequate knowledge on the part of school teachers and nurses regarding the emergency management of dental trauma [10-17]. The knowledge of school nurses in the UAE has yet to be adequately studied.

A previous study developed in Sharjah, UAE in 2010 suggested that interventions such as educating parents, caretakers, and older siblings on how to reduce and prevent dental injuries were needed [4]. Another study conducted in Ajman, UAE, recommended educational campaigns about the importance of managing emergency dental injuries [19]. This underlined the importance of educating the public in general and school nurses in particular about dental injury management. [3]

The overall average for the score of knowledge for all the participants in our study was 10.75 out of a total of 16 correct answers. The only statistically significant difference found was between

the knowledge score of female participants compared to that of males. The most common source of knowledge of TDIs, as reported by study participants was from dental clinic receptionists. The participants demonstrated poor knowledge when encountering an avulsion and the first proper course of actions needed, a true emergency significantly affected by proper immediate management. This highlights the importance of education and training for this group. A recent Dubai study of the effect of dental trauma management education for school nurses confirmed that education increased the level of knowledge of this particular group [20].

Regarding the previous experience with traumatic injuries; when the participants in our study were asked whether they had observed children with TDIs, the majority (58.8%) responded positively. Some authors reported a lower proportion (24%) [13], and very few participants (8.2%) with previous experience of TDIs [14]. Our study participants demonstrated a higher incidence of encounter with TDIs than the aforementioned. This finding highlighted the importance of past education in this group of caregivers in Dubai as they have reported encountering a higher number of TDIs compared to previous studies. So we looked at this aspect in further detail by assessing the attendance of previous training about TDIs; we found that only one third (33.8%) of our participants indicated they had and 25% reported having first aid courses covering the management of TDIs. A much lower percentage (7.6%) of participants reported having prior education in a 2012 study in Turkey [15]. In contrast to that, a study in India (2012) reported that more than two-thirds (76%) of their study participants had received dental trauma education [10]. Furthermore, in our study, the majority of the participants (64.7%) recognized correctly the type of incisor (permanent) tooth in a nine-year-old. These results were very close to those reported by other authors with a recognition rate of 62.4% [14].

Additionally, in the present study, 95.6% indicated that they would inform parents about a traumatic incident and advise them to contact their dentist immediately in cases of a broken /chipped tooth, a much higher response rate than the one observed in Iranian participants [12].

When we assessed avulsed (knocked out) tooth management, 76.5% of the participants reported they would attempt to save a knocked out permanent tooth (by putting it back in the socket). This percentage was much higher than that obtained by other studies [12,15]. Another important aspect we enquired about was keeping an avulsed primary tooth in a safe place for proper verification and obtaining a professional consultation, due to the potential risk of damaging the permanent successor. In the present study, 52.9% responded in favor of saving a knocked out primary tooth. Previous authors reported a response rate of 8% to the same question [16].

If teeth that are knocked out become contaminated with soil, there is a risk of tetanus infection. When questioned about the serious infection of tetanus and the importance of tetanus prophylaxis after certain TDIs; 61.8% of the participants in the present study acknowledged this risk and agreed to the prophylaxis. These results were similar to the previous findings, where the majority of the urban teachers (50.4%) showed a positive response to the need for tetanus prophylaxis after TDIs [11].

Regarding the issue of contacting a dentist for a consultation about a knocked out permanent tooth, 98.5% of our participants responded by yes. This was much higher than other studies, for example, which reported that 65% of the participants had existing knowledge about this aspect. The IADT [18] suggests that a dentist opinion should be sought immediately in case of a knocked out permanent tooth. In the present study, 57.3% of our participants chose seeking help within 30 minutes of an avulsion. Comparing this with the study developed in Kuwait [16], the knowledge level on the importance of “extra-alveolar time” before replantation was 1%, which is much less than the present study.

For the question regarding proper handling of an avulsed tooth, 48.5% of our participants chose the correct answer to handle the tooth from its crown. These results were low compared to other studies [10,15].

Ideally, in the case of permanent tooth avulsion, the more the tooth stays outside of its socket (extra-alveolar time), the worse the prognosis. Therefore, according to the IADT guidelines, the tooth should be replanted within the “golden hour” [20]. In the present study, a very low proportion of 9 (13.2%) of the participants chose “putting the tooth back in its place” as the first action in response to a knocked out permanent tooth. Similarly, other authors observed that replantation was chosen by 7.2% of the participants [17]. In comparison; there was a more positive response in previous studies [10,12] where exactly half of the surveyed participants declared that they would perform tooth replantation immediately. In our study, the answer chosen most frequently by participants (45.6%) was “calling patients’ parents and advising them to take the child to the dentist”. These results are very similar to the previous study; where 34% of the respondents said they would call the parents first to inform them [10].

Regarding cleaning the dirty knocked out tooth. The IADT guidelines recommend rinsing the avulsed tooth for about 10 seconds under running water [21]. In the present study, 52.9% of the participants chose “rinse the tooth with normal saline” followed by 26.5% choosing “rinse the tooth under tap water”. Several other studies had similar results when it came to knowledge about this specific issue [11,16,22].

An interesting finding of our study was in the significantly higher score of knowledge of the female participants compared to the male participants. This could be genuinely the fact or it might be due to the fact that the female number of participants was higher than the males.

Some of the limitations of the study included the following: The study questions did not include any regarding the appropriate transport medium for the avulsed tooth. This information and knowledge are crucial in the proper emergency management of avulsed teeth. In addition, the questionnaire might have been too long. This might have contributed to some of the participants skipping questions. Possible limitations to this study shared by all questionnaire survey studies might have been: variation in participants’ ability to understand and interpret questions, the inability to tell how truthful a respondent is being and how much a respondent thought was put in answering the questions.

Conclusion

Although the female participants in the study demonstrated a significantly higher overall score of knowledge compared to males; the study demonstrated the lack of adequate knowledge about the emergency management of TDIs. A particular aspect of vitally needed improvement is in the knowledge of emergency management of avulsed permanent teeth. School Nurses should have proper knowledge of emergency early management of traumatic dental injuries in order to ensure the best prognosis possible for the injured teeth.

The authors recommend the incorporation of TDI prevention and emergency management to the curricula of school nurses as well as regular courses and updates for them about the subject. The establishment of a trauma telephone “hotline” could be helpful to provide nurses and other school personnel with needed appropriate information in case of a TDI emergency. Furthermore, an emergency trauma management poster similar to the one given for the study participants should be distributed and kept for reference in school nurses’ clinics. Additionally, a “Toothsaver” kit should be regularly stocked in all school clinics inventory, and the school nurses should be trained on how to use it to preserve avulsed teeth.

Future research is recommended on the topic. A systematic review of all the available published data can and should be done to shed a clearer light on the overall knowledge in the subject. The investigation of knowledge of school nurses in the other Emirates of the UAE will also give a more comprehensive view, and a comparison between knowledge of school nurses in urban and rural areas of the UAE can be helpful.

Authors’ Contributions: SA contributed to the conception and data design, data acquisition, analysis, and interpretation, drafted and critically revised the manuscript. MA contributed to the conception and data design, data acquisition, analysis, and interpretation, drafted and critically revised the manuscript. MK contributed to the conception and data design, data analysis, and interpretation, drafted and critically revised the manuscript. IH contributed to the conception and data design, data analysis, and interpretation, drafted and critically revised the manuscript.

Financial Support: None.

Conflict of Interest: The authors declare no conflicts of interest.

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