

Knowledge and attitude of dental trauma among mothers in Iraq

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Abstract

Aim To evaluate the knowledge and attitude of Iraqi mothers regarding dental trauma prevention and management.

Study design and methods Mothers ($n = 231$) that visited two professional dental centres in Mosul, Iraq, were interviewed and asked to answer a three-part questionnaire containing questions about demographic variables, attitudes and knowledge of dental trauma.

Statistics The relationships of the demographic variables with the total knowledge score of the correct responses were analysed using two-sample t tests. The number of correct responses regarding management of avulsed teeth compared to that of fractured teeth was evaluated using a paired t test. A 5 % level of statistical significance was applied for the analyses.

Results The mean knowledge score was 5.2 (on a scale of 0–10). No significant differences were found in knowledge score with respect to mothers' age, educational level, working status, personal experience with dental trauma or first aid training ($p > 0.05$). Mothers with either at least a high school education or previous experience with dental

trauma were more likely to recommend that their children wear mouth guards during sports ($p = 0.02$ and $p = 0.03$, respectively). Mothers who were 35 years of age and older were more likely to know how to correctly carry an avulsed tooth to a dentist. Mothers' knowledge regarding management of fractured teeth was significantly higher than that of avulsed teeth ($p < 0.0001$).

Conclusions Mothers in Mosul, Iraq, did not have sufficient knowledge about the prevention and management of traumatic dental injuries. Intervention programmes should be considered to increase mothers' awareness regarding dental injuries.

Keywords Trauma knowledge · Avulsed teeth · Fractured teeth · Dental trauma

Introduction

Dental trauma in children is a significant oral health issue worldwide. Traumatic dental injuries make up a considerable portion of dental emergencies, require multiple follow-up visits and can lead to long-term consequences for the developing dentition. Furthermore, dental trauma can lead to emotional, psychological, social and financial challenges for children, parents and health authorities (Glendor et al. 2000; Borum and Andreasen 2001; Lee and Divaris 2009).

The outcomes of some traumatic dental injuries like avulsion and complicated crown fracture would be greatly improved with prompt and correct management. However, early management often relies on the knowledge of lay people such as parents, coaches or teachers who are present at the scene of the accident. Previous studies from various countries have shown insufficient lay knowledge regarding emergency

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dental trauma management (Raphael and Gregory 1990; Blakytyn et al. 2001; Traebert et al. 2009; Vergotine and Koerber 2010). Since most dental injuries occur at home (O'Neil et al. 1989; Al-Jundi 2002), mothers may be the first people who are required to take immediate and correct action. A study among Jordanian mothers found inadequate knowledge regarding the immediate management of dental trauma, regardless of their socio-economic status, educational background or previous experience with dental trauma (Al-Jundi 2006). On the other hand, working mothers in India were found to have better knowledge and awareness regarding the use of mouth guards to prevent dental trauma compared to the non-working mothers (Hegde et al. 2010).

Iraq is a Middle Eastern country that has experienced a series of conflicts resulting in the deterioration of public health in general and paediatric health in particular. A recent retrospective study in Iraq found that 61 % of children with traumatic dental injuries were seen 1 month after the time of injury (Yassen et al. 2013), which is an indication of poor knowledge among parents regarding the advantages of immediate diagnosis and treatment of dental injuries. Additionally, a cross-sectional epidemiological study in Iraq proposed that 61 % of traumatic dental injuries occurred at home (Noori and Al-Obaidi 2009). However, no previous studies have been conducted in Iraq to explore the parental knowledge and attitude regarding traumatic dental injuries. The aims of this study were to evaluate the general knowledge and attitudes of Iraqi mothers regarding dental trauma management, and secondly to investigate which factors were associated with mothers' knowledge.

Materials and methods

The Ethical Committee of the Iraqi Ministry of Health, the Directorate of Nineveh Health in Mosul, Iraq, as well as the Indiana University Institutional Review Board in Indianapolis, Indiana, USA approved this study (IRB number 1204008384).

The sample size was set at 231 subjects so the study would have at least 80 % power to detect an odds ratio of 2.25 using a binary demographic variable to predict a correct response, assuming the demographic variables were split no more extreme than 2:1 and the knowledge variable was correct for half of the respondents. The Department of Health in the city of Mosul officially divided the entire municipality into left and right banks. On each side there is one professional dental centre. Thus, 110 and 121 mothers who had visited the left and right bank centres for various dental reasons between January and March 2012 were selected for this study. To be included in the study, each mother had to review and sign an informed consent form.

A three-part questionnaire, modified from those used in previous studies (Raphael and Gregory 1990; Sae-Lim et al. 1999; Hegde et al. 2010; Fux-Noy et al. 2011), was used in the current study (Tables 1, 2, 3). The validity of the questionnaire was pilot tested independently by three paediatric dentists to double check the clarity of the questions and the accuracy of correct responses. Part I consisted of questions on demographic information, including age, educational background, working status, number of children, first-aid training experience and dental trauma experience. Part II consisted of self-assessment, multiple-choice questions about the attitude toward public education about dental trauma, as well as knowledge of availability of emergency services for dental trauma. Part III consisted of multiple-choice questions about mothers' general knowledge about prevention and management of dental trauma. A standard forward/backward translation protocol was used to convert the English questionnaire into Arabic. The forward translation was performed by two bilingual health professionals whose first language was Arabic. The Arabic version was back-translated into English by a bilingual paediatric dentist and double-checked by a native English speaking paediatric dentist. All mothers were interviewed by a trained dentist (one of the authors) and asked to answer the three-part questionnaire. In cases of illiteracy or failure to understand questionnaire, the investigators also orally explained the questions to the participants.

Each participant received a score from 1 to 10 according to her answers on Part III of the questionnaire. The relationships of the demographic variables (age, working status, number of children, personal experience with dental trauma and first aid training) with the total knowledge score of the correct responses were analysed using two-sample *t* tests. Furthermore, the relationships of the demographic variables with correct response(s) from each questions of Part III of the questionnaire were analysed using Chi-square tests. A Spearman correlation coefficient was calculated to evaluate the association between the number of correct responses and the mothers' self-assessed knowledge, satisfaction with self-assessed knowledge and enthusiasm for more education about dental trauma. The number of correct responses regarding management of avulsed teeth compared to that of fractured teeth was evaluated using a paired *t* test. A 5 % level of statistical significance was applied for the analyses.

Results

Demographic variables of the 231 mothers are shown in Table 1. The mean age of the mothers was 34.5 (± 9.4) years, the mean number of children per mother was 4.0

Table 1 Part I of the questionnaire: demographic characteristics of the 231 mothers

Variable	Characteristic	N (%)
Age (years)	<25	40 (17)
	25–34	81 (35)
	35–44	69 (30)
	≥45	41 (18)
Level of education	Less than high school	179 (77)
	High school	22 (10)
	College	30 (13)
How many children do you have?	≤3	105 (45)
	>3	126 (55)
Are you a working mum?	Yes	22 (10)
	No	209 (90)
Did you have personal experience (yourself/your child/) in dental trauma?	Yes	87 (38)
	No	144 (62)
If you did, how many previous dental traumas you had encountered?	0	144 (62)
	1	63 (27)
	2	21 (9)
	3	3 (2)
Have you had first aid training?	Yes	27 (12)
	No	204 (88)
Have you had dental trauma first aid training?	Yes	1 (<1)
	No	230 (99)

(±2.2). A total of 52 (23 %) mothers had a high school degree or higher. Only 22 (10 %) of the included mothers were working mothers. Eighty-seven (38 %) mothers had encountered previous dental trauma experience. Out of 27 (12 %) mothers that received first aid training, only one (<1 %) claimed that it included dental first aid. No significant difference was found in dental trauma knowledge score with respect to mothers' age, educational level, number of children, working status, personal experience with dental trauma or first aid training ($p > 0.05$).

While 208 (90 %) mothers claimed that they had a little or no knowledge of dental trauma management, 122 (53 %) mothers were satisfied with their knowledge (Table 2). However, 191 (83 %) mothers were enthusiastic to learn more about the topic. Two-hundred and seventeen mothers (94 %) were aware of the availability the emergency dental services during working hours. However, only 140 (61 %) mothers were aware of the availability of after-hours emergency services. There was no significant correlation between mothers' knowledge score and their self-assessed knowledge or their satisfaction with self-assessed knowledge ($p > 0.05$). There was a significant correlation between enthusiasm for more education in dental trauma and knowledge score (correlation = 0.15, $p = 0.026$).

Table 2 Part II of the questionnaire: attitude, self-assessment, and availability of emergency services for dental trauma

Question	Answer	N (%)
Self-assess your knowledge in dental trauma management	None	165 (71)
	Little	43 (19)
	Moderate	22 (10)
	Good	1 (<1)
Satisfaction with self-assessed knowledge	Very unsatisfied	38 (16)
	Not satisfied	71 (31)
	Satisfied	121 (52)
Enthusiasm for more education in the subject	Highly satisfied	1 (<1)
	Not interested	40 (17)
	Very interested	191 (83)
Availability of during working hours emergency service	Yes	217 (94)
	No	14 (6)
Availability of after working hour emergency service	Yes	140 (61)
	No	91 (39)

Part III of the questionnaire (Table 3) assessed general knowledge of mothers regarding prevention and management of dental trauma. The average knowledge score for all mothers was 5.2 (±1.5) out of 10. For the first question, 113 (49 %) mothers knew that in the case of dental trauma, the first place of contact is a dentist or dental school. For question two, only 20 (9 %) mothers recommended that their children wear mouth guards while playing sports. For question three, only 66 (29 %) mothers would replace avulsed permanent teeth or carry the tooth in a solution to the dentist immediately. For question four, only 10 (4 %) mothers would use cold milk to carry an avulsed tooth to dentist. For question five, 177 (77 %) mothers did not think that a knocked out primary tooth should be replanted. For question six, only 132 (57 %) mothers were aware of the urgent need for professional management of avulsed permanent teeth within 30 min. For question seven, 163 (71 %) mothers answered that a broken front tooth of a 9-year-old child is a permanent tooth. For question eight, 188 (81 %) mothers would immediately send a child with broken tooth to a dentist. For question nine, only 32 % would try to find the fractured piece of broken tooth. For question ten, 218 (94 %) mothers would seek professional help for a broken tooth within the same day or next day.

Mothers with at least high school education or previous dental trauma experience were more likely to recommend that their children wear mouth guards while playing sports ($p = 0.02$ and $p = 0.03$, respectively). Furthermore, mothers who were 35 years of age or older were more

Table 3 Part III of the questionnaire: knowledge regarding prevention and management of dental trauma

Question	Answer	N (%)
In case of dental trauma, which would be the first place you would contact?	Physician	8 (3)
	Hospital	110 (48)
	Dentist	104 (45)
	Dental school	9 (4)
Do you recommend your child/children to wear mouth guards while playing sports?	Yes	20 (9)
	No	211 (91)
If a 12-year-old child fell and the tooth is completely out of the mouth what do you do?	Replace it back or carry the tooth in a solution to the dentist immediately	66 (29)
	Arrest the bleeding and discard the avulsed tooth	111 (48)
	Not sure what to do	54 (23)
In case you decided to carry the tooth to a dentist, how would you do it?	Handkerchief	162 (70)
	Cold milk	10 (4)
	Tap water	42 (18)
	Saline (salt water)	17 (7)
Do you think that a baby tooth that has been knocked out should be replanted?	Yes	53 (23)
	No	177 (77)
	Not sure	1 (<1)
How urgent do you think it is to seek professional help if a permanent tooth has been knocked out?	Within 30 min	132 (57)
	Within a few hours	19 (8)
	Within the first day	51 (22)
	Next day	16 (7)
	Within month	2 (1)
	No care needed	11 (5)
A 9-year-old child fell and broke their upper front tooth, the broken tooth is likely to be	Permanent tooth	163 (71)
	Baby tooth	32 (14)
	Not sure	36 (15)
Your immediate emergency management in this condition is	Send child to the dentist immediately	188 (81)
	Reassure the child and put her to rest	32 (14)
	Not sure what to do	11 (5)
Would you try to find the fractured piece?	Yes	74 (32)
	No	157 (68)
How urgent do you think it is to seek professional help if a permanent tooth has broken?	Within 30 min	119 (52)
	Within a few hours	21 (9)
	Within the first day	58 (25)
	Next day	20 (9)
	Within month	6 (3)
	No care needed	7 (3)

Correct answers are highlighted in bold text

likely to know how to correctly carry permanent avulsed teeth to a dentist ($p = 0.03$). No other associations were observed between the correct answer of any dental trauma management question and variables reported in Part I of the questionnaire. When the answers of the four questions regarding management of avulsed teeth were compared to the answers of the four questions regarding management of fractured teeth, mothers' knowledge regarding management of fractured teeth was significantly higher compared to their knowledge regarding management of avulsed teeth ($p < 0.0001$).

Discussion

This study was designed to be able to directly interview mothers instead of sending the questionnaire to them via their children as was done in previous studies (Al-Jundi 2006; Oliveira et al. 2007). Advantages of this approach are the following: to assure that the mothers did not receive assistance in filling out the questionnaire from their relatives or friends, to assure that mothers did not use any external resources to answer the questions (e.g. the Internet), and to make sure that the informed consent and the

questionnaire were fully explained to mothers who were unable to read or understand the questions.

In this study, 179 (77 %) mothers had less than a high school level of education. Conversely, 82–100 % of mothers that participated in previous studies that estimated dental trauma management awareness had a high school degree or a higher education level (Al-Jundi 2006; Hegde et al. 2010; Hashim 2012). However, no significant difference in total knowledge score was found in relation to mothers' educational level or age, which is consistent with previous studies (Sae-Lim et al. 1999; Santos et al. 2009; Hashim 2012). Only 27 (12 %) mothers had received first aid training, the majority of which did not include any dental trauma first aid. This indicates that dental injuries are not part of general first-aid information. This lack of dental first aid information is not limited to Iraq, but has been also reported in other countries (Hamilton et al. 1997; Holan and Shmueli 2003; Al-Jame et al. 2007).

More than two-thirds of mothers (71 %) stated that they had no knowledge in dental trauma management, which was comparable to self-assessed knowledge among mothers or parents reported in previous studies (Sae-Lim et al. 1999; Al-Jundi 2006). However, 122 (52 %) mothers were satisfied with their knowledge. This indicates that some of the mothers did not comprehend that basic knowledge in dental trauma management might improve the prognosis of some cases of dental trauma. The majority of the mothers (94 %) were aware of availability of dental emergency services during working hours. However, after-hours dental emergency services were only known by 140 (61 %) mothers. In Iraq, all after-hours dental emergencies are treated by oral and maxilla-facial residents at general hospitals, who have good experience in dental traumatology. Therefore, it is crucial to educate the mothers of the availability of after-hours dental emergency services to avoid any delay in seeking professional help in cases of dental trauma.

The average score of dental trauma knowledge and management for all mothers was 5.2 out of 10. This indicates the lack of awareness among mothers about the importance of optimal and early management of dental injuries. This study found that 104 (45 %) mothers would contact a dentist in case of dental trauma. This percentage was lower than that reported among mothers in India (Hegde et al. 2010) and Brazil (Oliveira et al. 2007), which were 68 and 93 %, respectively. In the Iraqi health system, there is a dental unit at each hospital; this could explain the relative high percentage of mothers (48 %) who would contact a hospital regarding dental trauma. However, hospital dental units may not be the best option, considering the limited resources available in these public dental units and the urgent nature of some dental injuries. Of particular concern was that only 20 (9 %) mothers recommended that their children wear mouth guards while playing sports.

Furthermore, our study showed that mothers with previous experience in dental trauma or at least a high school education were more likely to recommend that their children wear mouth guards during sports. Previous studies from India found that 52 % of mothers would recommend the use of mouth guards (Hegde et al. 2010).

Only 66 (29 %) mothers knew that avulsed teeth should be replaced or carried in a solution to a dentist immediately. This percentage is higher than that reported among mothers in Jordan (1 %) (Al-Jundi 2006) and the United Arab Emirates (17 %) (Hashim 2012), but substantially lower than that reported among mothers in India (67 %) (Hegde et al. 2010). In this study, 132 (57 %) mothers stated that they would seek professional help within 30 min, which was less than that reported in previous studies among parents (Raphael and Gregory 1990; Stokes et al. 1992) and teachers (Chan et al. 2001; Fux-Noy et al. 2011). It is crucial to seek professional help for avulsed teeth as soon as possible to facilitate the best long-term outcome. However, seeking urgent professional help for an avulsed tooth without storing that tooth in a desirable storage medium would negatively affect the periodontal cells viability and lower the prognosis of an ideal outcome (Moazami et al. 2012). Only 10 (4 %) mothers mentioned that they would use cold milk to carry the tooth to the dentist. This percentage was comparable to that reported in some previous studies (Raphael and Gregory 1990; Sae-Lim et al. 1999), but lower than that reported in other studies (Hegde et al. 2010; Oliveira et al. 2007; Santos et al. 2009; Vergotine and Koerber 2010). Storage media such as Viaspa or Hank's balanced salt solution were not included as options to carry avulsed teeth in the current study because they are not available in Iraq.

In the current study, mothers' knowledge regarding management of fractured teeth was significantly higher than their knowledge regarding management of avulsed teeth. This could be explained by the general belief among lay people in Iraq that avulsed teeth cannot be saved, and that the only treatment that should be provided in case of tooth avulsion is to stop bleeding. Furthermore, management of avulsed teeth is more urgent and challenging for lay people as compared to management of fractured teeth. A recent 4-year retrospective study regarding treatment provided for children with dental trauma in Iraq did not report any re-implanted teeth among all cases with tooth avulsion (Yassen et al. 2013). Previous studies among mothers have also reported better knowledge in fractured teeth compared to avulsed teeth (Al-Jundi 2006; Hashim 2012). However, no statistical comparison regarding knowledge of management of avulsed versus fractured teeth in the above-mentioned studies was performed.

The most promising aspect of this study was the observation that 191 (83 %) mothers expressed enthusiasm

to have more education regarding dental trauma management. Clear and simplified informational campaigns through newspapers, television, brochures, posters and hand-outs should be considered to raise parents' awareness regarding the prevention and management of dental trauma (Bourguignon and Sigurdsson 2009). A recent study found substantial improvement in the level of knowledge among parents who received leaflets with basic information regarding tooth avulsion (Al-Asfour and Andersson 2008). Another study suggested the use of routine dental visits as an educational vehicle to convey information regarding the management of dental trauma (Vergotine and Koerber 2010). Further studies are required to introduce and validate suitable educational programmes regarding early management of traumatic dental injuries among parents, teachers, sport leaders, coaches, nurses and receptionists in emergency centres. It is noteworthy to mention that all mothers included in our study were attending public dental facilities. Mothers attending private dental clinics might have been under-represented in this study.

Conclusions

Mothers' knowledge regarding prevention and management of traumatic dental injuries in Mosul, Iraq, is inadequate regardless of their age, educational level, number of children, working status, personal experience with dental trauma or first aid training. Mothers with at least a high school education or previous dental trauma experience were more likely to recommend that their children wear mouth guards while playing sports. Mothers who were 35 years of age and older were more likely to know how to correctly carry an avulsed tooth to a dentist. The knowledge of participants regarding management of fractured teeth was significantly higher than that regarding management of avulsed teeth. Public health oriented intervention programmes should be considered to increase awareness of mothers regarding emergency management of traumatic dental injuries.

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