

Original article

Knowledge of Libyan Mothers in Tripoli about Emergency Management of Dental Avulsion

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ABSTRACT

Background and objectives. Traumatic dental injuries (TDIs) frequently occur in society and may occur at home. The ultimate prognosis of an avulsed tooth occurring in a child may depend on the parents' knowledge of appropriate emergency measures. Therefore, the purpose of this study was to evaluate aware-ness level of Libyan mothers regarding traumas & emergency management of dental avulsion. **Material and methods.** A cross-sectional study was carried out by means of questionnaire-based survey. 1397 mothers had participated in this study. The questionnaire was distributed in 11 elementary schools from different regions in Tripoli during four months in 2022. A questionnaire comprising 13 questions in simple Arabic language was used. The data was collected and analyzed. **Results.** A total of 1397 mothers were participated in the study, only 13.9% were aware of self-dental reimplanting permanent avulsed tooth. Their knowledge of transport medium for the avulsed tooth was poor, only 12.1% identified milk as an appropriate medium, and only 20.9% would clean the avulsed tooth with tap water. The increase in the percentage of who choose the right option was significantly associated to the increase in the mother's level of education. There were 47.7% of mothers who had a previous history of dental trauma for their children. **Conclusion.** This study showed an insufficient awareness regarding tooth avulsion among Libyan mothers. More efforts should be applied for conducting oral health educational campaigns aimed at improving parents' knowledge.

Keywords: Questionnaire, Dental Trauma, Re-Implantation, Parent Education, Storage Media.

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INTRODUCTION

Traumatic dental injury in children is a value oral health problem worldwide [1]. it can vary from minor enamel chipping to complex damage involving the supporting structures and displacement or avulsion of teeth. These injuries have a negative impact on the quality of life [2]. They are an emergency situation needs immediate care [3].

Avulsion of permanent teeth is a common injury and it represent about 16% of dental injuries [4,5]. The

most teeth susceptible to avulsion are Maxillary central incisors [4].

The prompt and appropriate treatment influence the prognosis of traumatized teeth, which often depends on the knowledge of nonprofessional people, who are available at the place of the injury [6]. As 41% of dental injuries occur at home [7]. Parents have a significant role to improve the prognosis of traumatic permanent teeth injuries of children if they had known the procedure taken at the time of accident. The proper prognosis of avulsed teeth depends on appropriate

management in the time of the trauma, according to the International Association of Dental Traumatology (IADT) guidelines, in order to ensure a standardization in the first aid procedures and a good long-term prognosis after replantation [4]. Previous studies from various countries have shown insufficient knowledge of lay person regarding emergency dental trauma management [1].

Despite the importance of this problem, there is no study available in the literature in Libya to assess the knowledge among mothers towards the emergency management of dental trauma. Hence, the aim of the present study was to assess mothers' awareness of the emergency management of traumatized primary and permanent teeth by means of a questionnaire in a sample of 1397 mothers with different education levels.

MATERIAL AND METHODS

The present study was questionnaire-based study. A questionnaire was designed and distributed to all mothers of children between 6 and 12 years of age who were attending 11 different elementary schools in Tripoli, Libya. Prior approval was taken from the managers of the schools. In addition, an educational talk was conducted with the school teachers and the students about the objects of this survey prior to the informed consent from the mothers. The duration of the study was 4 months (February–may 2022). A two-part questionnaire which is a modified form of that used by Raphael and Gregory was used in the current study [8]. The questionnaire was provided to the participating mothers in Arabic language which was translated from English. First part was consisting of questions on demographic information, including age and educational background. Second part consisted of 13 multiple-choice questions related to management and knowledge around the avulsed tooth. A total of 2000 questionnaires were distributed on a daily basis among the selected mothers. In order to assess their knowledge of appropriate emergency management of avulsed primary and permanent teeth, the respondents had to mark one option provided to them in multiple choice questions, which they found to be correct according to their knowledge.

A pilot study involving 10 children and their mothers had previously been carried out, which determined that no changes to the proposed methodology were needed and the questionnaire was understandable and clear to the participants.

The total number of completed questionnaires was 1397. The data of the 1397 questionnaires showed the number of people who responded to each question and the nature of the response. Responses obtained were tabulated and expressed as frequency distributions, and then computed in percentages. The mothers were categorized into two groups according their educational level. Group A was under bachelor degree, while group B was bachelor degree and above. Statistical analysis was done using SPSS, release 25 for Windows Inc., 2010. The Chi-square test was performed to test the influence of educational background on the knowledge of respondents and the level of significance was set at $p \leq 0.05$.

RESULTS

Sample characteristics

Out of 2000 participants to whom the questionnaire was sent, 1397 filled were analyzed and included in this study. The rest were excluded based on being partially filled and irrelevance. Majority of the respondents had attained bachelor degree and above 614 (56.9%) while 466 (43.1 %) had education level under bachelor degree as shown in table (1).

Table (1): Demographic information

Variables	n	%
Age		
< 30	527	56.9
> 30	400	43.1
Level of education		
Below Bachelor	466	43.1
Bachelor & above	614	56.9

Distribution of responses for the whole sample

Table (2) & (3) shows the distribution of responses for the whole sample. About knowledge regarding Dental trauma: When asked about their children experiencing any past dental trauma, slightly above half of mothers said "No 722 (52%). The result of this

study revealed that 57.7% of the mothers had previous information about dental traumatic injuries, 56% gained the information from dentist and 25% from media.

Table 2. Mother attitudes regarding traumatic dental injury

Question	n	%
1. Has any of your children have dental trauma?		
Yes, had trauma other than tooth avulsion.	288	20.9
Yes, had avulsed primary tooth	333	24.1
Yes, had avulsed permanent tooth	38	2.7
No, had not	722	52.3
2. Do you have any previous information about dental traumatic injuries?		
Yes	759	57.7
No	583	42.3
3. If you had such information, what is the source of that information:		
Dentist	561	56.0
Physician	63	6.3
Media	250	25.0
Friends	128	12.8
4. Do you think that primary teeth are important?		
Yes, important	784	56.9
Not important as they will be replaced	594	43.1
5. If your child has an avulsed primary tooth, what will you do?		
Searching to find the tooth	525	38.4
Not searching for it	842	61.6
6. If you would find the tooth, what will you do?		
Replant the tooth	135	10.1
Not replanting it	1203	89.9
7. Do you think that permanent teeth are important?		
Yes, important	1341	96.5
Not important as fixed appliances are available	48	3.5

Table 3. Knowledge about the immediate emergency management of avulsed permanent teeth

Question	n	%
1.If your child has an avulsed permanent tooth, you will:		
Search to find the tooth.	700	52.4
Not searching for the tooth.	637	47.6
2. If you found the tooth covered with dirt, what will you do?		
Clean the tooth then save it	772	65.6
Save the tooth only	241	20.5
Replant the tooth	17	1.4
Clean the tooth then replant it	147	12.5
3. If you would clean the tooth, you will use:		
Tooth brush	704	55.8
Tap water	264	20.9
Antiseptics	119	9.4
Not known	175	13.9
4. If you would replant the tooth, you will do that:		
Immediately	587	65.0
Within half an hour	71	7.9
At any time	245	27.1
5. You will handle the avulsed tooth from:		
Crown	1036	91.7
Root	94	8.3
6. If you will transport the avulsed tooth to the dentist, you will use:		
paper tissue	535	43.4
Cotton	362	29.4
Tap water	187	15.2
Milk	149	12.1

When mothers have been asked if they think that primary teeth are important, 56.9% answered yes, and 43.1% answered no. About 38.4% of the mothers answered they will search for primary teeth if avulsion occurred, 10.1% of them answered they will replant primary teeth. Regarding permanent teeth, 96.5% of mothers answered they are important. If avulsion of permanent teeth occurred, 52.4% of the mothers answered they will look for them and 47.6% answered no. When asked if they will find the permanent tooth covered with dirt, 65.65% said they would clean the tooth then save it, 20.5% of the mothers reported they will save it only but 1.4% said they will replant the avulsed tooth, and 12.5% answered they will clean the tooth then replant it.

When mothers were asked about the method for cleaning the tooth if there is a dirt on it, 55.8% replied that they would use a brush. Antiseptics were chosen by 9.4%.

Regarding the urgency of replantation, a significant high number 65% revealed that they would replant the avulsed tooth immediately, while 27.1% did not consider the time factor and choose the answer 'at any time'. For handling the avulsed permanent teeth, a high number 91.7% of mothers choose to hold the crown. The majority of avulsed teeth will be stored and transported in an inadequate storing medium, paper tissue was chosen by 43.4% of mothers followed by cotton by 29.4% of mothers and unfortunately, milk was chosen by only 12.1%.

Comparison of the mothers' responses according to the education level.

The tabulated data for both groups were analyzed statistically by using the Chi-square test as shown in table (4&5). Under bachelor degree (Group A), 53.5% of mothers had received previous information about dental trauma and 60.6% in the university graduated (Group B). Permanent teeth are important, as agreed by nearly all of the mothers in both groups but about the importance of primary teeth only 243(52.5%) in group A and 369 (60.9%) in group B answered yes, they are important. A small number of mothers in both groups, 33(7.3%) in group A and 44 (7.5%) in group B replied that they would replant the primary teeth if avulsion occurred.

When mothers were asked how to deal with the avulsed permanent tooth till reaching to the dentist's office, a few in both groups had shown the tendency in reimplanting the avulsed tooth in the socket by themselves, (10.9%) (15.3%) in groups A and B respectively (Fig. 1).

A significantly higher number of mothers in both groups replied that they would use a brush to clean the tooth. Antiseptics were chosen by (9.7%) in group A and (9.4%) in group B. However, a considerable number of mothers 155 (27.5%) in group B chose to wash the avulsed tooth with tap water while only 62 (15.1) of mothers in group A chose it.

Table 4. Mother attitudes regarding TDI according to the education level

Question	Under Bachelor Group A		Bachelor & above Group B		P value
	n	%	n	%	
Has any of your children have dental trauma?					
Yes, had trauma other than tooth avulsion.	78	16.9	126	20.8	.274
Yes, had avulsed primary tooth	107	23.2	144	23.8	
Yes, had avulsed permanent tooth	13	2.8	11	1.8	
No, had not	264	57.1	325	53.6	
Do you have any previous information about dental traumatic injuries?					
Yes	247	53.5	366	60.6	.020
No	215	46.5	238	39.4	
If you had such information, what is the source of that information:					
Dentist	172	56.8	263	57.9	.831
Physician	10	3.3	16	3.5	
Media	78	25.7	121	26.7	
Friends	43	14.2	54	11.9	
Do you think that primary teeth are important?					
Yes, important	243	52.5	369	60.9	.006
Not important as they will be replaced	220	47.5	237	39.1	
If your child has an avulsed primary tooth, what will you do?					
Searching to find the tooth	145	31.9	242	39.9	.007
Not searching for it	309	68.1	364	60.1	
If you would find the tooth, what will you do?					
Replant the tooth	33	7.3	44	7.5	.919
Not replanting it	418	92.7	544	92.5	
Do you think that permanent teeth are important?					
Yes, important	445	95.9	596	97.2	.232
Not important as fixed appliances are available	19	4.1	17	2.8	

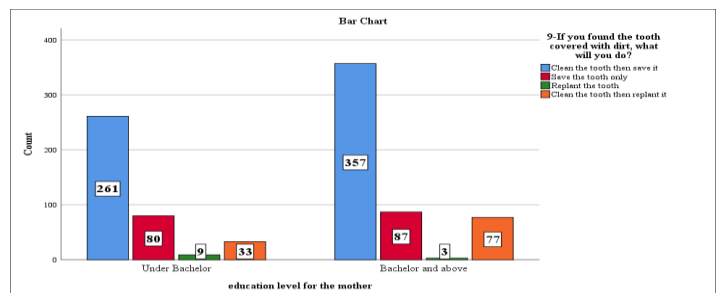


Figure 1. Dealing with avulsed permanent tooth

Table 5. Mother knowledge about the immediate emergency management of avulsed permanent teeth according to the education level

Question	Under Bachelor Group A		Bachelor & above Group B		P value
	n	%	n	%	
14- If your child has an avulsed permanent tooth, you will:					
Search to find the tooth.	192	43.2	337	56.6	.000
Not searching for the tooth.	252	56.8	258	43.4	
15- If you found the tooth covered with dirt, what will you do?					
Clean the tooth then save it	261	68.1	357	68.1	.003
Save the tooth only	80	20.9	87	16.6	
Replant the tooth	9	2.3	3	0.6	
Clean the tooth then replant it	33	8.6	77	14.7	
16- If you would clean the tooth, you will use:					
Tooth brush	256	62.3	269	47.7	.000
Tap water	62	15.1	155	27.5	
Antiseptics	40	9.7	53	9.4	
Not known	53	12.9	87	15.4	
17-If you would replant the tooth, you will do that:					
Immediately	178	63.1	259	67.3	.003
Within half an hour	15	5.3	41	10.6	
At any time	89	31.6	85	22.1	
18-You will handle the avulsed tooth from:					
Crown	330	89.4	468	92.7	.093
Root	39	10.6	37	7.3	
19-If you will transport the avulsed tooth to the dentist, you will use:					
paper tissue	184	46.1	245	44.5	.001
Cotton	138	34.6	150	27.2	
Tap water	45	11.3	69	12.5	
Milk	32	8.0	87	15.8	

Regarding the time of replantation, a significant high number of mothers in group B, 259 (67.3%) compared with group A, 178 (63.1%) revealed that they would replant the avulsed teeth immediately. On the other hand, a significantly higher number of mothers in group B, 41(10.6%) chose to replant the teeth within 30 min, while only 15 (5.3%) was in the group A who chose this time.

For handling the avulsed permanent teeth, a high number of mothers in both groups chose to hold the crown of the tooth. The majority of avulsed teeth will be stored and transported in an unsuitable storing

medium, and milk was shown only by 32(8%) in group A and by 87 (15.8%) in group B as shown in (Fig 2).

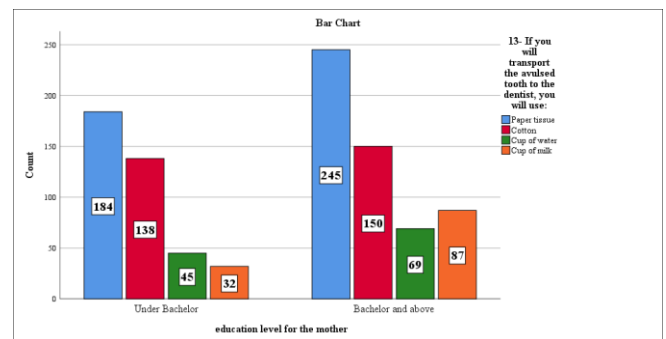


Figure 2. Transporting media

DISCUSSION

The questionnaire used in the present study was short, with simple, direct, and closed-ended questions. Similar studies in the literature have surveyed the knowledge of mothers and teachers concerning the management of avulsed teeth, Stokes et al., 1992 [9]; Al-Jundi et al.2006 [10]; Hedge et al., 2010 [11]; and Skeie et al., 2010 [12]. In this study the incidence of traumatic injuries and avulsions mentioned by mothers is comparable to that reported in other studies [13] [14], while this finding is higher than other study conducted in Egypt [5].

Mothers who had previous information regarding traumatic dental injuries were high in both groups. However, they were higher than those reported by studies in Egypt and Al-Madinah Al-Munawwarah by A. M. Abdellatif et al [15], and Nourwali et al [16] respectively. Most of this information was derived from dentists, which may be due to the availability of dentists for people in Tripoli. Fewer mothers in both groups received information from physicians. The second source of information for both groups was media, this may indicate that educational programs will be successful through media programs to educate people about correct first aid measures for managing avulsed permanent teeth. Despite the high number of mothers who answered yes about having information, it is apparent that correct answers for most of the questionnaire was less, this may indicate misunderstanding from the source of this information. About one third of respondents in both groups were

willing to look for the avulsed primary tooth. Despite the reason is not clarified, encouragement of this action should be done as it helps to judge that the tooth is not inhaled or swallowed by the child.

A few mothers in both groups showed their interest in primary tooth replantation. The absence of knowledge about the hazards of replanting the primary teeth may be the cause, as indicated by Andreassen et al. [17,18]. Similar results were obtained from studies conducted by A.M. Abdellatif et al. [15] and by Hazim Mohamed Rizk [19]. A small number of mothers of the two groups showed interest in permanent tooth replantation by themselves, similar to a studies reported by Santos et al. [24], Al-Jundi [10], Kruthika, et al. [20], Hazim Mohamed Rizk [19] and Ningthoujam, et al. [13] and disagrees with the results of Raphael and Gregory [8] and Oliveira et al., [21] and Hegde et al [9]. The reluctance to replant avulsed teeth could be related to the insufficiency in the knowledge about the immediate management of avulsed tooth. Therefore, the mothers need to be educated more in this aspect.

On the other hand, a considerable number of mothers exhibited their preference to clean and/or save the avulsed permanent tooth to be replanted by a dentist. However, the knowledge of both groups regarding tooth cleaning methods before replantation or saving was poor. The use of brushing and antiseptics were preferred by mothers in both groups. These findings are similar to those of Raphael and Gregory [8] and A. M. Abdellatif et al [15]. Tap water which is the ideal cleaning method was chosen by a relatively few numbers of mothers in both groups but a considerably higher number was clearly detected among the university graduated mothers.

Despite a small number of mothers showed interest in replanting the avulsed permanent tooth by themselves in both groups, a considerably higher level of awareness was clearly noted among the bachelor degree graduated mothers about the importance of the time factor. They showed their interest in immediate replantation more than the second group. A large number of mothers in both groups preferred holding the avulsed tooth from the crown, and a relatively small number chose the root. However, a lot of mothers did not give any answer. Consequently, it

is expected that a large number of mothers will hold the tooth from the root and disturb the periodontal ligaments. They are not aware that one of the most important factors for the success of tooth replantation is the integrity and viability of the periodontal ligaments of the avulsed tooth.

Storing the avulsed tooth in a solution compatible with cell viability until replantation is an important point; however, selection of dry storage was prevalent among mothers of both groups. Paper tissue was the most commonly chosen medium by a considerable number of them and this was similar to the result obtained by Namdev, et al. [6]. Cotton was the second choice as this was selected by a number of mothers in both groups in agreement with the results of other studies [15] [22]. This concept of 'dry storage' among mothers indicates that there is lack of knowledge in both groups on how to handle avulsed teeth after an accident. They are not aware that dry storage during transport would harm normal healing, and the prognosis is related to the injury of the periodontal membrane during the time the tooth is out of its socket [23].

Milk was the next chosen transport medium by both groups (8% and 15.8%) for the avulsed permanent teeth as recommended in different studies [23]. This may be related to previous information gathered by the mothers from dentists and physicians or via the internet. This differs from the results of Raphael and Gregory [8], who showed that only 5% of respondents knew that milk was the medium of choice for both washing and transporting avulsed teeth. Fewer respondents, 3%, knew the same in the study performed by Santos et al. [24]. Shashikiran et al. [22], reported that only 1.8% chose milk in their study. Jabarifar et al., [14] reported that 19% of mothers chose milk as transport media for an avulsed tooth.

This is followed by the tap water; however, it is not recommended as it is of low osmolality hypotonic solution and causes swelling and rupture of PDL cells. Dry storage of the avulsed tooth or storing it in water are not the appropriate media as this will lead to injury to the periodontal membrane with the result that the replanted tooth will be lost at the end [23].

Our results also showed that mothers with higher education had significantly more knowledge and this

is in accordance with other studies [20,25,14]. This contradicts some previous studies' [10,26, 27] finding that educational levels have no significant impact on the level of knowledge. This might be due to differences in culture and the typical variation in parental roles from country to country.

Many studies [10, 20,25,14] indicate that there is a lack of mother's knowledge regarding the immediate management of dental trauma, which was a similar finding in this study also. The reason for this may be that no information is given about dental trauma through the educational system in Libya.

CONCLUSION

The general knowledge of mothers in Libya with regard to the emergency management of dental trauma was lacking regardless of their education level. The lack of knowledge expressed by the mothers reflects the need of more effective communication between dental professionals and mothers in order to enable them to act correctly when facing a case of dental trauma.

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Disclaimer

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Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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