



RESEARCH ARTICLE

KNOWLEDGE OF TEACHERS AND PARENTS ABOUT EMERGENCY MANAGEMENT OF DENTAL TRAUMA IN CHILDREN.

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Abstract

Introduction: Traumatic dental injuries (TDI) are frequent in children and adolescents, affecting teeth, supporting structures and adjacent soft tissues and contributing to the appearance of major psychosocial and economic problems. Tooth avulsion is a dental emergency where the prognosis of avulsed teeth significantly depends on prompt and efficient action at the site of the accident, thus requiring that parents or teachers to be knowledgeable about the correct management of this situation. **Objective:** the present study aimed to assess the level of knowledge of parents & teachers concerning the emergency management of tooth avulsion. **Subjects & methods:** 200 teachers (65.8% males) (34.2% females) and 200 parents (51.3% males) and (48.7% females) were interviewed from 6 major cities in Al-Qassim Province. The data were collected by questionnaire. The questions were focused on the teacher's and parent's background, knowledge and management of tooth fracture, avulsion. **Results:** A total of 200 teachers were interviewed, 170 agreed to respond with response rate 85%). A total of 200 parents were interviewed, 150 agreed to respond with response rate 75%) Majority of teachers and parents had little knowledge related to handling of traumatic dental injuries and emergency management of avulsed permanent teeth. **Conclusion:** This study revealed the lack of Knowledge of Teachers and Parents about Emergency Management of Dental Trauma in Qassim Province, Saudi Arabia. There is a need for awareness programs to improve teachers' and parent's knowledge and attitudes related to the emergency management of TDIs in children.

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Introduction:-

Dental trauma during childhood leads to present and future oral health problems, which can cause pain and distress. ⁽¹⁾ Dental trauma remains one of the important oral health problems in childhood occurring mostly between the ages of 7 and 12 years. ⁽²⁾ Several epidemiological studies show that the majority of traumatic dental injuries in school- aged children occur at home or school. ^(3, 4) Among dental traumatic injuries, avulsion results for major functional and esthetic disturbances for patients. The ultimate prognosis of an avulsed tooth occurring in a child may depend on the parents or the teacher's knowledge of appropriate emergency measures. ⁽⁵⁾ If possible, an avulsed

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permanent tooth should be re-implanted or kept in suitable storage media before proceeding to the dentist. However, the appropriate immediate treatment is often not performed due to a lack of knowledge.

In a study conducted in Asia, only 17.5% of investigated physical education teachers demonstrated the ability to indicate appropriate management for an avulsed tooth.⁽⁶⁾ In another study in South America, elementary school teachers answered questions regarding dental trauma and avulsion intuitively rather than on an informed basis.⁽⁷⁾ Another study showed the lack of knowledge of teachers on dental trauma and tooth avulsion.⁽⁸⁾ In Jordan, the school teacher's knowledge with regards to the emergency management of TDI cases was considered to be deficient.⁽⁹⁾

Similarly, children's parents have very little knowledge concerning what to do when the incident occurred at home. Certainly, few studies have addressed this question. In Singapore, a study showed that knowledge on some critical aspects of the handling of avulsed teeth by parents was poor.⁽¹⁰⁾ A study performed in Nigeria showed that 90% of parents would seek professional help urgently following dental trauma or tooth avulsion, and their knowledge of transport medium for the tooth was poor and the great majority had never received advice on what to do in the event of TDI.⁽¹¹⁾

Favorable healing after dental trauma or avulsion injury requires quick emergency intervention followed by evaluation and treatment at decisive times during the healing phase. Immediate and appropriate treatment, together with long-term follow-up, lead to a favorable prognosis for the traumatized tooth.⁽¹²⁾ Dental traumatic injuries which frequently occur school or at home, necessitates parents and teachers emergency knowledge for this procedure. So it is crucial to assess the level of knowledge of teachers and parents in Qassim Province, KSA

Subjects and Methods:-

Ethical considerations:-

The research was conducted after it was approved from Research and ethical Committee at college of dentistry-Qassim university.

Study design and sample:-

A cross-sectional study was conducted among primary school teachers from 6 major cities in Al-Qassim Province. A total of 200 teachers were interviewed, 170 agreed to respond with response rate 85%. The questionnaire surveyed teachers' background, knowledge and management of tooth fracture, avulsion, and also investigated teachers' attitudes and self-assessed knowledge (Fig. 1). Also, A total of 200 parents were interviewed, 150 agreed to respond with response rate 75%. The questionnaire surveyed parents' and teacher's background, knowledge and management of tooth fracture, avulsion (Fig. 2).

All questions in the questionnaire were close-ended. To help the respondents make quick decision, they were given alternative choices, which resemble real situation with dental trauma.⁽¹³⁾ All returned questionnaires were coded and analyzed.

Statistical Analysis:-

The analysis of data was carried out using Statistical Package for Social Sciences Computer Software (SPSS 21.0, Inc., Chicago, USA). Result were expressed as a number and percentage of respondents for each question and were analyzed using the SPSS software. The chi-square test was performed to test the influence of different variables, such as age, gender, teaching experience and first aid training, on knowledge of management of dental trauma, the level of significance was set at $P \leq 0.05$ (equivalent to 5%).

Results:-

A total of 200 teachers were interviewed, 170 agreed to respond with response rate 85%). The sample consisted of 112 males (65.8%) and 58 females (34.2%), The age group from 20-40 years represented 54.7% of the sample, followed by the 41- 60 age group with 45.3%.

When teachers have been asked if Dental trauma is part of the health education curriculum, 23.5% answered yes and 76.5% answered no, the awareness level was higher in the females than in the males. 46.9% of female answered yes but it was 26.6% in male. Experience of tooth avulsion at their school was reported by 32.4% of the teachers, with no significant difference between male and female. 50.0% of the teachers think that a tooth can be knocked out, 34.7% of them found that by Internet, with no significant difference between male and female. 8.8% think that a

primary tooth should be replanted and 91.2% answered no. Regarding permanent teeth 41.2% answered yes and 58.8% no. In case of an emergency 56.5% of the school teachers will clean the tooth and 43.5% don't. 78.8% of the participants will call parents, advise them to visit dentist. 58.2% think that a tooth can be out of a person's mouth for a longer than an hour. 37.1% will put the tooth in a container with water, 1.8% in a containers with patient's saliva, 19.4% in a container with milk, 19.4% responded in a container with solution, and 22.4% responded other, with no significant difference between male and female (**Figures 1,2**)

Figure 1:-Represents teacher's knowledge of avulsion

		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Awareness in schools	yes	31	26.6%	28	46.9%	59	23.5%
	No	86	73.4%	25	53.1%	111	76.5%
Fall in class	yes	54	48.2%	20	34.5%	74	43.5%
	No	58	51.8%	38	65.5%	96	56.5%
Times of fall	0	58	51.8%	37	63.8%	95	55.9%
	yes	45	40.2%	10	17.2%	55	32.4%
	No	6	5.4%	9	15.5%	15	8.8%
	3	3	2.7%	2	3.4%	5	2.9%
Protocol	yes	12	10.7%	7	12.1%	19	11.2%
	No	100	89.3%	51	87.9%	151	88.8%
Avulsion	yes	65	59.1%	40	61.7%	105	60.0%
	No	47	40.9%	18	38.3%	65	40.0%
How did u know avulsion	Internet	31	27.7%	28	48.3%	59	34.7%
	Schools	5	4.5%	1	1.7%	6	3.5%
	Research	4	3.6%	0	0.0%	4	2.4%
	Dentist	4	3.6%	2	3.4%	6	3.5%
	I don't know	68	60.7%	27	46.6%	95	55.9%
Re-implant deciduous	yes	8	7.1%	7	12.1%	15	8.8%
	No	104	92.9%	51	87.9%	155	91.2%
Re-implant permanent	yes	46	41.1%	24	41.4%	70	41.2%
	No	66	58.9%	34	58.6%	100	58.8%
After avulsion	Clean	59	52.7%	37	63.8%	96	56.5%
	Don't Clean	53	47.3%	21	36.2%	74	43.5%
Hold avulsed tooth	Crown	44	39.3%	20	34.5%	64	37.6%
	Root	19	17.0%	9	15.5%	28	16.5%
	any part	49	43.8%	29	50.0%	78	45.9%
Time to re-implant	immediate	50	44.6%	33	56.9%	83	48.8%
	within 1 h	30	26.8%	9	15.5%	39	22.9%
	within 6 h	32	28.6%	16	27.6%	48	28.2%
Immediate action	call parents, advise to visit dentist	89	79.5%	45	77.6%	134	78.8%
	return back to class after calm down	8	7.1%	4	6.9%	12	7.1%
	Don't know	15	13.4%	9	15.5%	24	14.1%
Dryness	yes	68	60.7%	31	53.4%	99	58.2%
	No	44	39.3%	27	46.6%	71	41.8%
Keep in place	in water	36	32.1%	27	46.6%	63	37.1%
	in saliva	0	0.0%	3	5.2%	3	1.8%
	Milk	23	20.5%	10	17.2%	33	19.4%
	saline	26	23.2%	7	12.1%	33	19.4%
	don't know	27	24.1%	11	19.0%	38	22.4%

Figure 2:- Pearson Chi-Square Tests.

		Gender
Awareness in schools	Chi-square	6.399
	df	1
	Sig.	.011*
Fall in class	Chi-square	2.931
	df	1
	Sig.	.087
Times of fall	Chi-square	11.747
	df	3
	Sig.	.008 ^{*b}
Protocol	Chi-square	.071
	df	1
	Sig.	.790
Avulsion	Chi-square	.105
	df	1
	Sig.	.746
How did u know avulsion	Chi-square	8.929
	df	4
	Sig.	.063 ^b
Re-implant deciduous	Chi-square	1.153
	df	1
	Sig.	.283
Re-implant permanent	Chi-square	.001
	df	1
	Sig.	.969
After avulsion	Chi-square	1.920
	df	1
	Sig.	.166
Hold avulsed tooth	Chi-square	.608
	df	2
	Sig.	.738
Time to re-implant	Chi-square	3.303
	df	2
	Sig.	.192
Immediate action	Chi-square	.143
	df	2
	Sig.	.931
Dryness	Chi-square	.829
	df	1
	Sig.	.362
Keep in place	Chi-square	11.045
	df	4
	Sig.	.026 ^{*b}

A total of 200 parents were interviewed, 150 agreed to respond with response rate 75%) The sample consisted of 77 males (51.3%) and 73 females (48.7%), The age group from 20- 40 years represented 68% of the sample, followed by the 41- 60 age group with 32%.

When asked if Dental trauma is part of the health education curriculum, 25.3% of answered yes and 74.7% answered no, with no significant difference between male and female. Experience of female was more than male of tooth avulsion reported by 54.8%. (78%) of the parents think that a tooth can be knocked out, 22% of them found that by Internet, with no significant difference between male and female. 18.7% think that a primary tooth should be replanted and 81.3% answered no. Regarding permanent teeth, re-implantation was chosen by female (59%) more

than male (27.3%) In case of an emergency 60.7% of the parents will clean the tooth and 39.3% don't. 85.3% of the participants will visit dentist immediately. 49.3% think that a tooth can be out of a person's mouth for a longer than an hour and 41.3% will put the tooth in a container with water, 4.0% in a containers with patient's saliva, 12.0% in a container with milk, 18.0% responded in a container with solution, and 24.7% responded other, with no significant difference between male and female (**Figures 3, 4**).

Figure 3:-Represent Parent's knowledge of avulsion

		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Awareness	yes	16	20.8%	22	30.1%	38	25.3%
	No	61	79.2%	51	69.9%	112	74.7%
Fall in house	yes	26	33.8%	38	52.1%	64	42.7%
	No	51	66.2%	35	47.9%	86	57.3%
Times of fall	0	51	66.2%	33	45.2%	84	56.0%
	1- 2 times	22	28.6%	36	49.3%	58	38.7%
	3-4 times	3	3.9%	4	5.5%	7	4.7%
	5 or more times	1	1.3%	0	0.0%	1	0.7%
Avulsion	yes	52	67.5%	65	89.0%	117	78.0%
	No	25	32.5%	8	11.0%	33	22.0%
How did u know avulsion	Internet	14	18.2%	19	26.0%	33	22.0%
	Schools	6	7.8%	6	8.2%	12	8.0%
	Research	5	6.5%	0	0.0%	5	3.3%
	Dentist	6	7.8%	15	20.5%	21	14.0%
	I don't know	46	59.7%	33	45.2%	79	52.7%
Re-implant perm	yes	12	15.6%	16	21.9%	28	18.7%
	No	65	84.4%	57	78.1%	122	81.3%
After avulsion	Clean	42	54.5%	49	67.1%	91	60.7%
	Don't Clean	35	45.5%	24	32.9%	59	39.3%
Hold avulsed tooth	Crown	34	44.2%	34	46.6%	68	45.3%
	Root	14	18.2%	14	19.2%	28	18.7%
	any part	29	37.7%	25	34.2%	54	36.0%
Time to re-implant	immediate	47	61.0%	39	53.4%	86	57.3%
	within 1 h	14	18.2%	15	20.5%	29	19.3%
	within 6 h	16	20.8%	19	26.0%	35	23.3%
Immediate action	to dentist now	63	81.8%	65	89.0%	128	85.3%
	to dentist later	11	14.3%	6	8.2%	17	11.3%
	I don't know	3	3.9%	2	2.7%	5	3.3%
Dryness	yes	33	42.9%	41	56.2%	74	49.3%
	No	44	57.1%	32	43.8%	76	50.7%
Keep in place	in water	30	39.0%	32	43.8%	62	41.3%
	in saliva	1	1.3%	5	6.8%	6	4.0%
	Milk	7	9.1%	11	15.1%	18	12.0%
	saline	19	24.7%	8	11.0%	27	18.0%
	don't know	20	26.0%	17	23.3%	37	24.7%

Figure 4:- Pearson Chi-Square Tests

		Gender
Awareness	Chi-square	1.735
	df	1
	Sig.	0.188
Fall in house*	Chi-square	5.124
	df	1
	Sig.	.024*
Times of fall*	Chi-square	8.279
	df	3
	Sig.	.041 ^{a,b,c}
Avulsion*	Chi-square	10.103
	df	1
	Sig.	.001*
How did u know avulsion*	Chi-square	11.656
	df	4
	Sig.	.020 ^{a,b}
Re-implant permanent	Chi-square	.990
	df	1
	Sig.	.320
After avulsion	Chi-square	2.484
	df	1
	Sig.	.115
Hold avulsed tooth	Chi-square	.190
	df	2
	Sig.	.909
Time to re-implant	Chi-square	.930
	df	2
	Sig.	.628
Immediate action	Chi-square	1.596
	df	2
	Sig.	.450 ^b
Dryness	Chi-square	2.655
	df	1
	Sig.	.103
Keep in place	Chi-square	8.244
	df	4
	Sig.	.083 ^b

Discussion:-

According to the results of this study, 25.3% of parents showed knowledge about emergency management of avulsed tooth and this result was similar to study conducted by Oliveira et al.,⁽¹⁴⁾ where 32% of parents lacked awareness. In the present study, only 18.7% of the parents were aware of the immediate re-implantation of an avulsed tooth, similar to a study reported by Al-Jundi,⁽¹⁵⁾ In contrast, to that reported by Oliveira et al.,⁽¹⁴⁾ (39%) and (66.6%), by Hegde et al.,⁽¹⁶⁾ which clearly indicates the insufficiency in the knowledge about the immediate management of avulsed tooth. Therefore, the parents need to be educated more in this aspect.

Cleaning of avulsed permanent teeth must be performed with saline solution just when visible dirt is observed. Unfortunately, about 39.3% of the parents in the present study answered that they will not clean the avulsed tooth before going to the dentist and it was found to be slightly more (31%) when compared with the study by Oliveira et al.⁽¹⁴⁾ When the immediate re-implantation is not performed, storage mediums that can aid in pulpal and periodontal healing are milk, sterile saline solution, saliva. But in the present study, most of the parents responded that they would immerse the avulsed tooth in tap water (41.3%), which was found to be different when compared to the studies reported by Hegde et al.⁽¹⁶⁾ The lack of experience and knowledge expressed by the parents answering the questionnaire concerning dental trauma reflects the need for more effective communication between dental

professionals and parents to enable them to act correctly when facing a case of dental avulsion. Additionally, educational campaigns and preventive programs on dental trauma must be organized to improve caregivers' knowledge on emergency management of dental avulsion.

Only 23.5% of teachers had previous experience about dealing with DTI. It is an unexpected finding that the majority of school teachers not received formal teaching training. In a similar study in England ⁽¹⁷⁾, only 67% of the teachers had been specifically trained in teaching and 91% had been trained in first aid. When enquired about any information received on tooth avulsion or any informative material available at school on managing TDI. 55.9% of teachers disappointingly said that they had not received any advice regarding emergency management of avulsed tooth. 41.2% were felt comfortable in replanting the avulsed tooth back in to the socket, but this figure was much higher when compared to that obtained in Hong Kong, where it was 17.5%. ⁽¹⁸⁾ These findings emphasize that additional TDI education would be exceedingly beneficial for school staff.

Compared with other studies: 75% ⁽¹⁹⁾, 50% ⁽²⁰⁾, in our study 58.8 % of teachers reported that they would 'not replant' an avulsed tooth due to lack of knowledge, but it is also reported that teachers may be worried about how to stop the bleeding and may fear the legal consequences of incorrect management. ⁽²¹⁾ Naturally, they choose to send the child immediately to professional care.

In our study, 19.4% of teachers choose milk as best storage media, majority of them 37.1% choose that they would immerse in tap water as storage media. Storage in tap water should be the last resort because of its hypotonicity, which would lead to necrosis of periodontal membrane cells ⁽²²⁾, while storing in saliva at the buccal vestibule may lead to infection of the periodontal membrane and the risk of swallowing in young children. ⁽²³⁾ In our research, only 11% of the participants recognized that an avulsed tooth should be intraorally transported, while in the study of Lim et al., 13.2% of the participants answered that the best transport medium for an avulsed tooth is saliva. ⁽²⁴⁾

According to Trope ⁽²⁵⁾, the appropriate biological media for storage of an avulsed tooth until replantation keep the vitality of periodontal ligament cells, reduce the inflammatory response, and prevent sequelae as ankylosis and root resorption. One of the most important factors is the time elapsed between the avulsion and replantation; the replantation should be performed as soon as possible in order to increase the likelihood of success. A shorter extra-alveolar time reduces the areas of root resorption following replantation, thereby favoring a better prognosis. Immediate replantation is the best measure in a case of avulsion of a permanent tooth. However, if this is not possible at the moment of occurrence of the dental trauma, the maximum possible time a tooth (in dry storage) can remain outside the alveolus is 120 min, for a better prognosis. ⁽²⁶⁾ Most of the teachers were aware of the desirability of replanting avulsed teeth 'immediately'. 48.8 % of teachers said that tooth should be replanted immediately. This contradicts results described by Chan et al ⁽¹³⁾, who found that just 5.4% of the physical education teachers surveyed reported being capable of performing an immediate replantation. But in a study done by Raphael and Gregory ⁽²⁷⁾ and Hamilton et al., ⁽²⁸⁾ showed that 92% and 38.6% respondents indicated it was 'very urgent' to seek professional assistance if a permanent tooth has been avulsed. However, the survey showed their knowledge of the subsequent emergency procedures was very limited.

Bhat and Li, reported that avulsions were found to be the most common type of dental injuries recorded for children less than 15 years of age seeking treatment in hospital emergency rooms. ⁽²⁹⁾ Over 90% of our participants expressed an interest in receiving more information on TDI management; this overwhelming interest among participants has also been shown in other studies. ⁽³⁰⁾ It is possible that by offering training programs, mainly by means of workshops, there will be an improvement of the approach of dental trauma and other related outcomes.

Conclusion:-

This study indicates a lack of knowledge of teachers and parents about emergency management of dental trauma and especially in tooth avulsion. Therefore, educational programs focused on teachers and parents must be undertaken in order to improve their level of knowledge and their attitude.

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