



A Questionnaire Based Survey on Awareness of Emergency Management of Dental Trauma and Trauma Apps among Parents and Teachers

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ABSTRACT: This study was conducted to assess the knowledge regarding emergency management of dental trauma and awareness on the existence of dental trauma apps among parents and teachers. A Randomized study was conducted among 60 parents and 60 school teachers from North Bangalore. The data was collected by a self-administered questionnaire focusing on the parents and teachers previous dental traumatic experience in children and the awareness on existence of dental trauma apps. Among the 60 teachers, 68.3% had previous dental traumatic experience in children, and 23.3% had awareness on dental trauma apps. Among the 60 parents, 48.33% had previous dental traumatic experience in children and 16.7% had awareness on dental trauma apps. This study shows the need for awareness programs to improve teachers and parent's knowledge and attitudes related to the emergency management of Traumatic dental injuries (TDIs) in children and regarding the existence of various dental trauma apps.

KEYWORDS: tooth injuries; tooth fractures; tooth avulsion; smartphones; apps;

I. INTRODUCTION

Dental trauma results in injury not only to the teeth but also to other hard and soft tissues within the oral cavity. It is usually sudden, circumstantial, unexpected and accidental requiring emergency attention¹. It is one of the oral health problems in childhood that causes much discomfort leading to tooth loss. It varies from a minor enamel chip to extensive damage involving the supporting structures or avulsion of teeth, subsequently affecting the psychological well-being of the child.

Caregivers face challenge while managing dental trauma and the mode of treatment is never the same. The prognosis of it depends on appropriate emergency management and proper advice, which may frequently be the responsibility

of parents, teachers and other school staff making it necessary for proper knowledge on management of these injuries.² Prior assessment of the knowledge of the personnel who are possibly in close contact with children is mandatory.

According to studies conducted earlier, there is lack of knowledge in adults regarding immediate management of dental trauma. These survey include sport coaches, parents, teachers and even medical professionals.³⁻⁶

Therefore, providing information is the key to increase the knowledge on dental firstaid. The prognosis of dental traumatic injuries in children relies on the first action taken by parents and teachers.

This highlights on the need for a platform that can familiarize anyone on the emergency management of dental injuries in the most easy and acceptable way to be used whenever there is a traumatic injury as the first line of defense.²

Currently mobile apps are an inevitable tool for diagnosis in the field of medicine and dentistry. From being the traditional mobile phones used for calling and receiving phone calls to smartphones having wide range of apps, they provide information right at one's finger tips. These applications are fascinating due to its ease of portability and availability.⁷

II. MATERIALS AND METHODS

A Randomized study was conducted on the awareness of smartphone apps on dental trauma management among parents and teachers from North Bangalore. Prior to conducting the study, ethical approval was taken from the institutional authorities.

The estimation of sample size was done by the formula

$$n = \frac{Z^2 pq}{d^2} = 60$$

Where, Z = 1.96



$$p = 81\%$$

$$q = 1 - p = 0.19$$

$$f = 10\% = 0.1$$

The study sample was divided into two groups: 60 parents and 60 teachers

The social demographic data of all the participants were collected and a questionnaire was given which composed of two parts. The first part composed of questions about previous dental traumatic experiences and how they could manage, whether the participants received any formal training on dental trauma management and their attitude towards emergency management of dental traumatic injuries. These attitude questions included 3 situations and their various management as options.

Once the part 1 was completed, all the respondents were familiarized with various dental trauma Apps available in play store (All Dental Disorders[®], Dental First Aid[®], Dental Trauma[®] and Tooth SOS[®]). A Samsung A50 with Android version 10 was used to introduce the dental trauma App to the participants. Then the questionnaire was given again.

The second part consisted of questions on awareness on the existence of such Apps, whether the App was found to be helpful and their willingness to pay for such Apps in play store. Results were interpreted as a number and percentage for each question and were statistically analyzed using the SPSS software. Chi-square test was carried out and the level of significance was set at $P \leq 0.05$.

III. RESULTS

A total of 60 teachers and 60 parents were interviewed. When asked about any previous dental traumatic experience 68.3% of teachers and 48.3% of parents answered yes (Table 1.1) and among them 45% of teachers and 30% of parents had experience on management of dental trauma among the children (Table 1.2). 40% of the teachers and 21.7% of parents had been educated/trained through various platforms (Table 1.3).

Regarding broken tooth, 56.7% of teachers and 70% of parents responded by picking up the tooth and wrapping with handkerchief, 11.7% of teachers and 8.3% of parents thought it should be put in milk (Table 1.5).

Regarding luxation, 48.3% of teachers and 16.7% of parents responded that they would make the child rinse with water, 8.3% of teachers and 6.7% of parents thought they should make the child bite on cotton (Table 1.7)

Regarding avulsion, 26.7% of teachers and 35% of parents responded by picking the tooth and

wrapping in handkerchief, 10% of teachers and 5% of parents thought that they should pick and put in milk and 1.7% of teachers and 3.3% of parents responded that they would try placing the teeth back in the child's mouth (Table 1.8).

23.3% of the teachers and 16.7% of parents were aware about dental trauma Apps in play store (Table 1.8). When asked about the various Apps, 60% of teachers and 50% of parents found TOOTH SOS[®] App most helpful (Table 1.9). 30% of teachers and 16.7% of parents were ready to pay for dental trauma apps in play store (Table 1.13).

IV. DISCUSSION

Traumatic dental injuries remain one of the major issues of concern in the primary dentition causing physical, aesthetic and psychological impact affecting not only the child but also his/her parents.⁸ The future course of an injured tooth would depend on a sufficient administration of emergency management. The majority of traumatic dental injuries in school-aged children occur at home or school¹ which is the main reason for selecting parents and teachers for this study. Therefore, the prognosis of a dental traumatic injury occurring in a child would solely rely on the parents or the teacher's knowledge on suitable emergency measures.⁹ In a study conducted in Asia, only 17.5% of investigated physical education teachers had appropriate knowledge on managing an avulsed tooth.⁵ In another study conducted in Jordan, the school teacher's knowledge on the emergency management of TDI cases was found to be inadequate.¹⁰

One of the studies conducted in Nigeria, it revealed that 90% of the parents would attempt to seek professional help immediately following dental trauma and their knowledge on various transport medium for the tooth was insufficient and the greater majority had never been informed on how to manage an event of TDI.¹¹

These days, smartphones and apps are reachable to most of the people, due to their fast popularization and lower costs, building a society connected to each other.

However, this society could take more advantage through the utilization of the oral health apps if they are aware about it. The development of various apps for smartphones represents an interesting and effective way to provide a new technological tool and reach the desired target audience.

Possessing a Dental App in ones smartphone that enables to deal with a dentoalveolar emergency efficaciously, could be



very demanding and thoughtful. Moreover, if the App guides a person step by step during the event, the likely course of the tooth could dramatically improve.¹²

Based on the results of the present study, 41.3% of the parents had come across previously to various dental traumatic injuries in their children (Table 1.1) which was comparable to a study conducted by Hazim et al 2018¹³, where 42.7% of parents had previous TDIs in their children, 68.3% of the teachers had experienced dental traumatic injuries at school (Table 1.1) indicating more number of injuries at school than at home ($p \leq 0.05$) in the region present study was conducted (Figure 1). This result is comparable to the study conducted by Obied et al 2018¹⁴, where the self-reported trauma during the teaching experience was found to be 56%.

Among the parents and teachers 21.7% and 40% respectively were educated or trained previously ($p \leq 0.05$), through various platforms of which majority of them gained information through the internet (Table 1.3 and 1.4) (Figure 2) indicating the wide usage of smartphones which was similar to a study conducted by Al Sane et al¹⁵, where the Internet was regarded as the best way of transmitting the information across all ages, especially among young adults.

Among the various dental traumatic injuries, avulsive injuries accounts for the most amount of psychological and physical trauma¹. In the present study regarding avulsion, 3.3% of parents and 1.7% of teachers felt that the tooth should be placed back in the child's mouth immediately, whereas, majority of them thought that the tooth should be washed before wrapping in paper or putting in milk (Table 1.7) clearly indicating a lack of knowledge among both the parents and teachers.

When the parents and teachers were asked about awareness on dental trauma apps, majority of them were unaware (Table 1.8) (Figure 3) about their existence indicating the importance for a widespread awareness on the different dental trauma apps available on Google Play store. When the parents and teachers were shown the various dental trauma apps, both felt these apps very useful in an emergency situation and were eager to learn more about it. 50% of the parents and 60% of the teachers found the TOOTH SOS® to be most helpful and informative (Table 1.9) (Figure 4), as it gives step wise information on each dental injury and its emergency management in a way easy to perceive.

Over the past decade, the Internet has become a powerful communication channel. Those

days are gone when mobile phones were considered as a luxury thing to have with. This wonderful gadget now, has become a necessity in today's world. Owing to the COVID-19 pandemic, telemedicine and teledentistry has gained immense awareness for health-related information and other queries. This further raises the importance of the smartphones and the various apps to provide information in any situation of emergency, medical or dental. This could possibly avoid the complications later and help in better management of these injuries. Hence the parents and teachers must be made aware of these apps in Google Play store through every channel possible.

V. CONCLUSION

This study concludes a lack of knowledge among parents and teachers on emergency management of dental trauma and the existence of dental trauma Apps.

Thus, different ways for improving the public knowledge about dental trauma must be initiated. Starting from the dental authorities by organizing various camps in schools and hospitals, topics on various dental trauma and dental trauma first aid and their management to be included in the school curriculum.

The public can be educated through engaging platforms that can also enable the incorporation of various audio-visual aids. These educational programs will instill a positive attitude among the parents and teachers and boost their confidence at the time of managing a dental traumatic injury.

VI. RECOMMENDATIONS

Basis on these findings, the following can be recommended:

- Community based programs to create awareness on dental trauma and their management through dental trauma apps.
- Improving the delivery of dental first aid training through various courses and workshops.
- The use of feasible methods, such as posters, flyers and social media to increase awareness about dental trauma.
- Events on World Trauma Day (October 17th) should focus more on dental injuries and the accessibility of various dental trauma Apps and reach out to the lay person in every way possible.

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TABLES AND GRAPHS

Chi-Square Test						
Have you encountered any dental trauma case among students in your teaching experience?	NO	Count	GROUP PARENTS	TEACHERS	p	
		%	31	51.7%		19
	YES	Count	29	41		
		%	48.3%	68.3%		

Table 1.1- Previous traumatic experience of parents and teachers

Chi-Square Test						
Have you managed any dental trauma case among students at school?	NO	Count	GROUP PARENTS	TEACHERS	p	
		%	42	70.0%		33
	YES	Count	18	27		
		%	30.0%	45.0%		

Table 1.2- Previous experience of managing dental trauma among parents and teachers



Chi-Square Test					
			GROUP		P
			PARENTS	TEACHERS	
Have you been educated/trained about dental trauma management in children through any platform?	NO	Count	47	36	0.030
		%	78.3%	60.0%	
	YES	Count	13	24	
		%	21.7%	40.0%	

Table 1.3- Previous training regarding management of dental trauma among parents and teachers

Chi-Square Test					
			GROUP		P
			PARENTS	TEACHERS	
Have you been educated/trained about dental trauma management in children through any platform?	Internet	Count	10	21	0.405
		%	76.9%	87.5%	
	Friends/	Count	3	3	
		%	23.1%	12.5%	
	Colleagues	Count			
		%			

Table 1.4- Source of information regarding management of dental trauma among parents and teachers

Chi-Square Test					
			GROUP		P
			PARENTS	TEACHERS	
If a child (aged 10 years old) experiences a dental trauma in the school campus and her upper two front teeth are broken, the child is conscious and is not associated with any other general symptoms, How would you manage?	Nothing	Count	13	19	0.317
		%	21.7%	31.7%	
	Pick up the broken piece and wrap it in Handkerchief/Paper.	Count	42	34	
		%	70.0%	56.7%	
	Pick up the broken piece and put it in milk	Count	5	7	
		%	8.3%	11.7%	

Table 1.5- Knowledge of broken tooth management among parents and teachers

Chi-Square Test					
			GROUP		P
			PARENTS	TEACHERS	
If a child gets hit with a ball and his upper front teeth is moved to the side with some bleeding on the gums, How would	Nothing	Count	10	26	0.004
		%	16.7%	43.3%	
	Calm the boy, clean the area and ask the child to rinse with	Count	46	29	
		%	76.7%	48.3%	



you manage?	water.			
	Calm the boy, clean the area and ask the child to bite on cotton	Count	4	5
		%	6.7%	8.3%

Table 1.6- Knowledge of luxated tooth management among parents and teachers

Chi-Square Test		GROUP			P
			PARENTS	TEACHERS	
A child falls down from the stairs of school, as a result her two upper, front teeth have fallen on the ground, the child has bleeding all over her gums, How would you manage?	Nothing	Count	0	5	0.060
		%	0.0%	8.3%	
	Pick up the teeth and wrap in Handkerchief/paper	Count	21	16	
		%	35.0%	26.7%	
	Pick up the teeth and store it in milk	Count	3	6	
		%	5.0%	10.0%	
	Wash the teeth before putting in milk or wrapping with paper	Count	34	32	
		%	56.7%	53.3%	
Pick up the teeth and try placing it in the child mouth	Count	2	1		
	%	3.3%	1.7%		

Table 1.7- Knowledge of avulsed tooth management among parents and teachers

Chi-Square Test		GROUP			P
			PARENTS	TEACHERS	
Did you know that dental trauma apps existed?	NO	Count	50	46	0.361
		%	83.3%	76.7%	
	YES	Count	10	14	
		%	16.7%	23.3%	

Table 1.8- Awareness of dental trauma Apps among parents and teachers

Chi-Square Test		GROUP			P
			PARENTS	TEACHERS	
Which App did you find most helpful?	Tooth SOS	Count	30	36	0.213
		%	50.0%	60.0%	
	All Dental Disorders	Count	15	7	
		%	25.0%	11.7%	
	Dental First Aid	Count	0	1	
		%	0.0%	1.7%	
	Dental Trauma	Count	15	16	
		%			



		%	25.0%	26.7%	
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Table 1.9- Comparison regarding the various Apps available in Google Play Store

Chi-Square Test

			GROUP		p
			PARENTS	TEACHERS	
Will you use the app in the management of trauma if such a situation arises?	NO	Count	11	6	0.191
		%	18.3%	10.0%	
	YES	Count	49	54	
		%	81.7%	90.0%	

Table 1.10- Acceptability of the various Dental Trauma apps among parents and teachers

Table 1.11- Acceptability of the apps among parents and teachers

Crosstab

			GROUP		Total
			PARENTS	TEACHERS	
Will you suggest these apps to your colleagues and friends	YES	Count	60	60	120
		%	100.0%	100.0%	100.0%

Chi-Square Test

			GROUP		p
			PARENTS	TEACHERS	
Are you willing to pay for such Apps in Play Store.	NO	Count	50	42	0.084
		%	83.3%	70.0%	
	YES	Count	10	18	
		%	16.7%	30.0%	

Table 1.12- Willingness to pay for Apps among parents and teachers

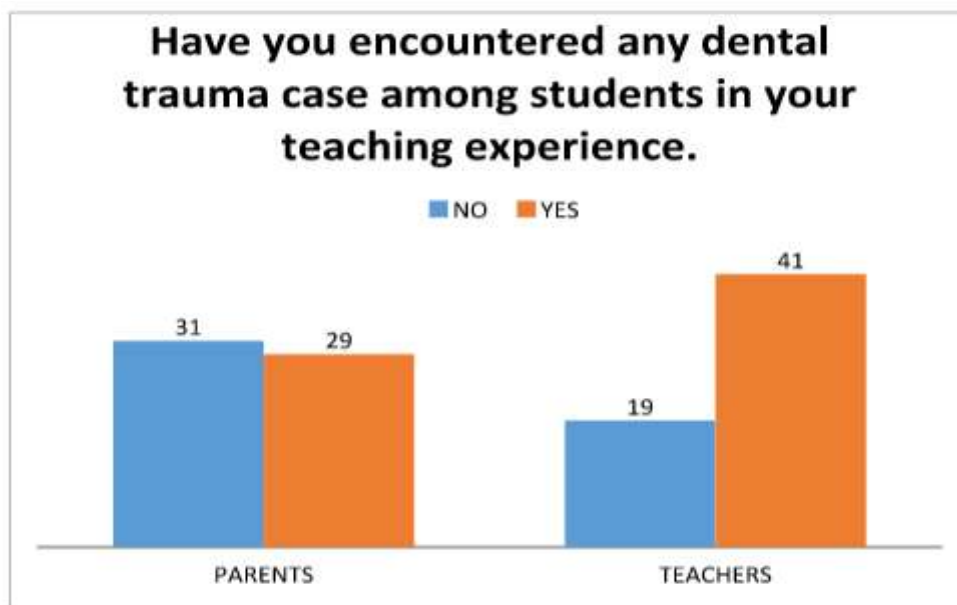


Figure 1 showing the previous dental traumatic experience of parents and teachers

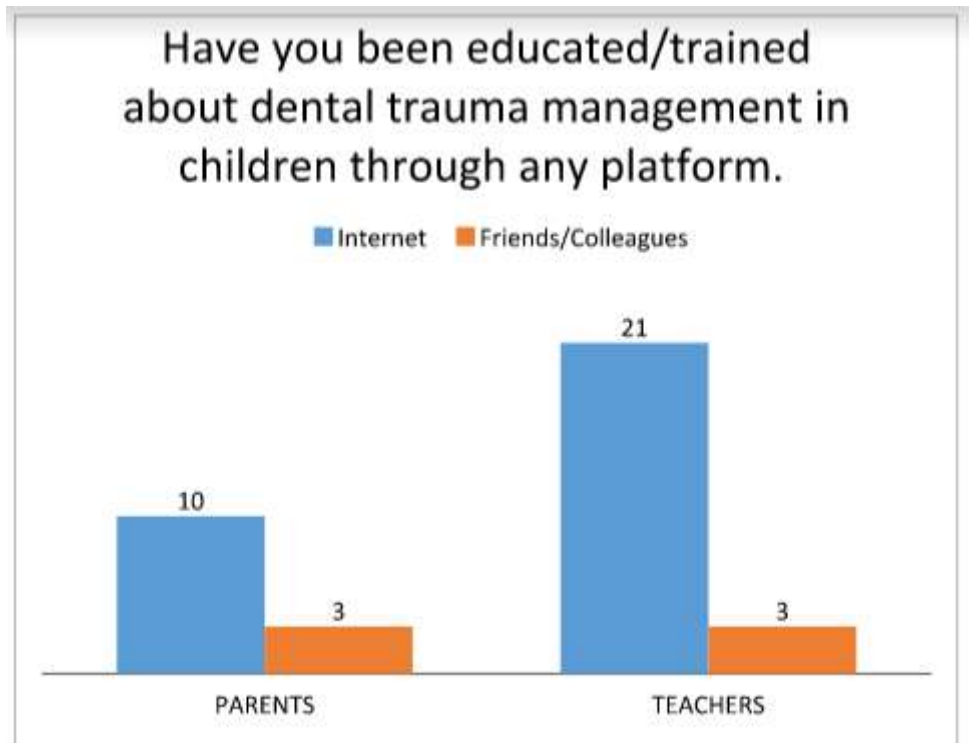


Figure 2 showing the source of information regarding dental trauma management among parents and teachers

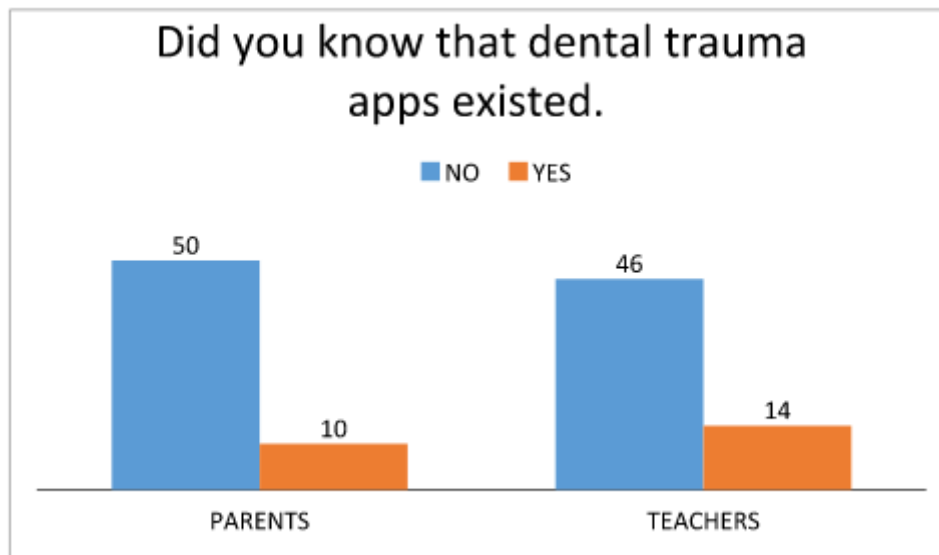


Figure 3 showing the awareness among parents and teachers regarding dental trauma apps

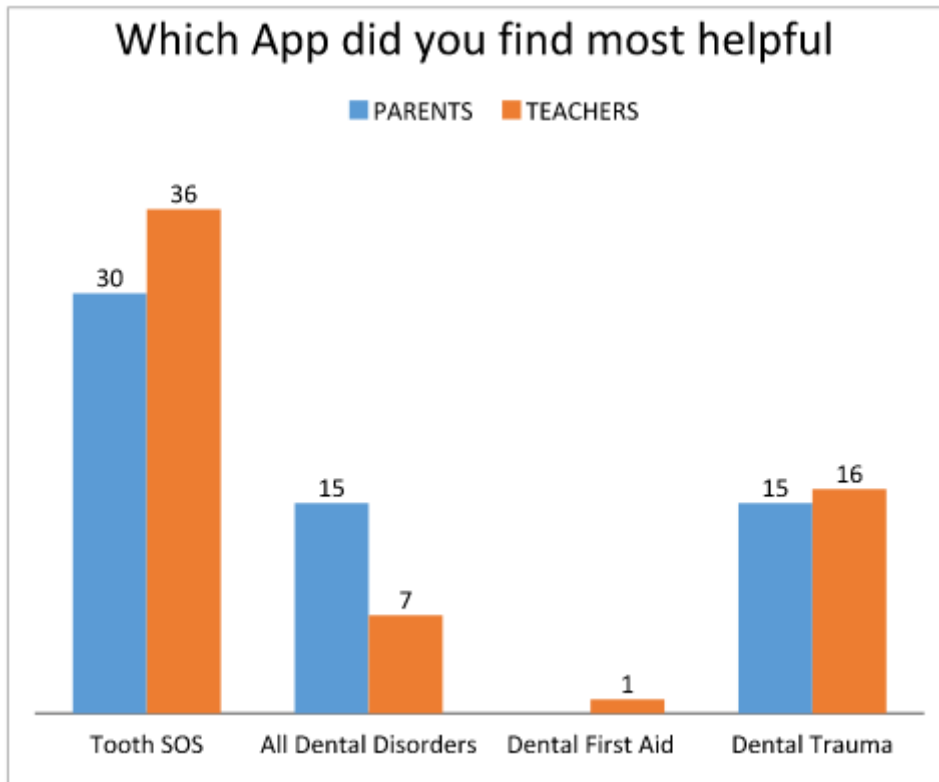


Figure 4 showing the most accepted dental trauma app when showed to parents and teachers