

Knowledge about emergency management of dental trauma among school teachers of Bhaktapur Nepal

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Abstract

Background: Injury to a young child's teeth and face is a traumatic experience for the child and parents. Prompt and effective action on traumatized teeth significantly increases the likelihood of a positive treatment outcome. Adequate knowledge of school teachers in emergency situation arising during school hours can prove to be a boon for the child's oral health.

Objectives: To assess the knowledge of school teachers of Bhaktapur about emergency management of dental trauma and also to measure the relationship between socio demographic characteristic of teachers and knowledge about dental emergencies.

Methods: The cross sectional study was conducted among 424 schools teachers of Bhaktapur district from September 2014 to March 2015. Simple random sampling was done to select the schools. Questionnaire was distributed among the teachers after taking their informed written consent. Data was collected and sent for statistical evaluation. Frequencies and percentage were calculated. Chi-square and Fisher's Exact test were applied.

Results: Nearly one third (32.2%) teachers who had information on dental trauma knew the proper management of displaced teeth ($p=0.01$). Statistically significant difference was found among those who had first aid training and proper management of displaced teeth ($p=0.04$). Teachers who had experienced dental trauma in their students were only confident of managing displacement of traumatized teeth ($p=0.02$).

Conclusion: Knowledge of the school teachers in Bhaktapur was seen to be inadequate for emergency management of fracture and avulsed tooth.

Key words: Emergency management, School teachers, Teaching experience, Traumatic dental injuries.

INTRODUCTION

Injury to both, primary and the permanent dentitions and their supporting structures is one of the most common dental problems seen in children. Dental trauma may exceed dental caries and periodontal disease as the most significant threat to dental health among young people, and is accompanied by significant economic consequences¹. Child being in a dynamic state of growth both mentally and physically is more susceptible to fall and injury due to his lack of muscle

coordination². Injury to a young child's teeth and face is a traumatic experience for child and parents. In most cases of dental trauma a rapid and appropriate treatment can lessen its impact from both an oral and esthetic standpoint³.

Dental trauma can vary from a minor enamel chip to extensive maxillofacial damage involving the supporting structures and displacement or avulsion of teeth⁴. Epidemiological studies of dental trauma have shown that most dental accidents in children occur at home followed by school⁵⁻⁹. It was reported that sport and school injuries accounted for 60% of dental trauma⁸. In the age group 0-6 years, oral injuries are ranked as second most common injury covering 18% of all somatic injuries. Among the oral injuries, dental injuries are most frequent¹⁰⁻¹².

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At present there are 31,555 primary, 11,341 lower secondary, 6,298 secondary and 2,512 higher secondary schools which illustrates the uprising education system in Nepal¹³. As provided by the Department of Education, Bhaktapur district consists of 428 schools¹⁴. Teachers are responsible for maintaining the quality of the school progress. Their effectiveness is the basic component and an important predictor of school effectiveness¹⁵. Studies have shown that irrespective of first aid training, the knowledge of school teachers towards management of traumatic dental injuries was inadequate^{4,16-24}. The prognosis of traumatized teeth depends upon the correct and prompt treatment which often relies on common people like teachers and parents present at the site of accident⁴.

Data on dental injuries in Nepal is scanty. Knowledge of school teachers in emergency situation arising during school hours can prove to be a boon for the child's oral health. Bhaktapur is one of the densely populated areas with large number of educational institutions. As study evaluating the knowledge of school teachers in Bhaktapur district is not done previously, this study was formatted to assess the knowledge of school teachers of Bhaktapur about emergency management of dental trauma and also to measure the relationship between socio-demographic characteristic of teachers and knowledge about emergency management of dental trauma.

METHODS

This cross sectional study was conducted among the schools teachers of Bhaktapur district from September 2014 to March 2015. Minimum sample size of 385 respondents was calculated based on unknown prevalence of knowledge about emergency management of school teachers of Bhaktapur. Fifty percent assumed for conservative sample size determination, about precision five percent, 95% confidence limits. Assuming 10% non response rate and incomplete questionnaires²⁵, we decided to include 424 school teachers as our sample size.

Teachers who were willing to participate with their informed written consent were included in the study. Teachers who were unwilling to participate or on leave were excluded from the study.

Simple random sampling was done to select the schools. Ethical consent was taken from the institutional review committee along with permission from the principal of the respective schools prior to conducting the study.

The questionnaire distributed among the teachers comprised of eight questions assessing their socio-demographic profile and sixteen questions to evaluate their knowledge on emergency management. The pretested semi-structured questionnaire in the previous study⁴ was modified and translated from English to Nepali language by an expert and both the language were incorporated for the ease of the participant. Data from the questionnaire was entered in SPSS version 11 and statistical analysis was done. Frequency and percentage were calculated to assess the level of awareness towards traumatic dental injuries. Chi-square test and Fisher's Exact test were applied to measure relationship between socio-demographic characteristic of teachers and knowledge about emergency dental trauma.

RESULTS

Among the 424 teachers, one hundred and seventeen (27.6%) were male and three hundred and seven (72.4%) were female. Majority of the teachers 325 (76.7%) were from private schools, with only 99 (23.3%) from public schools. Three hundred and forty four teachers (81.1%) worked in those schools providing secondary level of education. Playgrounds were present in the schools where four hundred and twelve teachers (97.2%) worked. Majority of the teachers 204 (48%) belonged to 21-30 years of age group and were mostly graduated 271 (63.9%). The professional profile indicated that only 134 (31.6 %) of the teachers had undergone first aid training while 151 (35.8%) had received information on dental trauma. Information on dental trauma was mostly received from lectures with the dentist by ninety nine teachers (23.4%).

About 223 (52.6%) of teachers had confidence on identifying between primary and permanent teeth. With regards to management of tooth avulsion, fourteen teachers (3.53 %) knew the proper management by locating the tooth and attempting to replant it. Majority of the teachers 277 (65.3%) were worried about stopping the bleeding with pressure as loss of blood is perceived to be life threatening. In context of replantation of deciduous tooth, two hundred and seventeen teachers (51.4%) gave the correct answer while one hundred and ninety-eight (46.7%) were incorrect in context of replanting permanent teeth. On questioning them about where they would take if there is any dental emergency, nearly half (50.5%) of teachers preferred nearest hospital on foot or by any transport while only 32.3% would like to take to a dentist. It was reassuring to know that three hundred and sixty seven (86.6%) of teachers would send the child immediately in case of emergency.

Sixty nine (16.3%) of the participants thought avulsed teeth were useless to save. While thirty (7.3%) of them preferred disinfection solution, thirty nine (9.2%) preferred gauze as their storage media. Distilled water was favored by twenty one (5%) teachers while still two hundred and twenty five teachers (53.1%) had no idea about storage media. Thirty four teachers (8.25%) knew the proper management of fracture teeth by putting the fractured part on liquid medium and taking to the dentist. Eighty nine (21%) teachers knew about the correct management of displaced teeth.

Two hundred and forty eight (58.7%) teachers had never heard of mouth guard while 159 (37.7%) thought it could prevent injury to the tooth. Replantation of avulsed permanent tooth is the ideal mode of treatment .In contrast, three hundred and fifty one teachers (83%) in our study believed that they didn't think about it as a treatment option. One hundred and eight (25.5%) of the teachers had the experience of coming across dental trauma in their students and among them, three

hundred and twenty six (77.1%) had in range of (1-5).

Statistically significant difference (p=0.04) was found among those who had first aid training and proper management of displaced teeth (Table 1)

Nearly one third (32.2%) of teachers who had information on dental trauma knew the proper management of displaced teeth which was statistically significant (p=0.01) as shown in (Table 2).

Among the 108 teachers who had experienced dental trauma in their students for the past one year, thirty one (28.7%) knew the correct management for displaced teeth where significant association (p =0.02) could be found (Table 3).

Statistically significant relation was only found between the teachers' teaching experience and proper management of displaced teeth rather than fracture and avulsion (p =0.04) (Table 4)

Table 1: Relationship seen between management of dental traumatic injuries and first aid training done

Type of injury		First aid training done		Total	p value*
		Yes (n=134)	No (n=290)		
Avulsion	Yes	5 (3.7%)	10 (3.4%)	15 (3.6%)	p=0.88
	No	129 (96.3%)	280 (96.6%)	409 (96.4%)	
Fracture	Yes	9 (6.7%)	26 (9%)	32 (8.3%)	p=0.43
	No	125 (93.3%)	264 (91%)	389 (91.7%)	
Displacement	Yes	37 (27.6%)	52 (17.9%)	89 (21%)	p=0.02
	No	97 (72.4%)	238(82.1%)	335 (79%)	

*Fisher's exact test applied

Table 2: Relationship seen between management of dental traumatic injuries and information the teachers have got on dental trauma

Type of injury		Information on dental trauma		Total	p value*
		Yes	No		
Avulsion	Yes	8 (5.3%)	7 (2.6%)	152(35.8%)	p= 0.15
	No	144 (94.7%)	265 (97.4%)	272 (64.2%)	
Fracture	Yes	13 (8.6%)	22 (8.1%)	35 (8.3%)	p= 0.868
	No	139 (91.4%)	250 (91.9%)	389 (91.7%)	
Displacement	Yes	49(32.2%)	40 (14.7%)	89 (21%)	p = 0.01
	No	103 (67.8%)	232 (85.3%)	335 (79%)	

*Fisher's exact test applied

Table 3: Relationship seen between management of dental traumatic injuries and experience of trauma in their students

Type of injury		Experienced dental trauma in past one year			p value*
		Yes (%)	No (%)	Total	
Displacement	Yes	31 (28.7)	58 (18.4%)	89 (21%)	p= 0.02
	No	77 (71.3)	258 (81.6%)	335 (79%)	
Fracture	Yes	6 (5.6)	29 (9.2%)	35 (8.3%)	p= 0.23
	No	102 (94.4)	287 (90.8%)	389 (91.7%)	
Avulsion	Yes	4 (3.7)	11 (3.5%)	15 (3.6%)	p= 0.9
	No	104 (96.3)	305 (96.5%)	409 (96.4%)	

*Fisher's exact test applied

Table 4: Relation between teaching experience and the proper management of dental traumatic injuries

Age groups (years)	Avulsion		Fracture		Displacement	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
1-10	6 (40.0)	273 (66.7)	19 (54.3%)	260 (66.8%)	63 (70.8%)	216 (64.5%)
>10-20	6 (40.0)	79 (19.3)	11 (31.4%)	74 (19.0%)	10 (11.2%)	75 (22.4%)
>20-30	2 (13.3)	50 (12.2)	5 (14.3%)	47 (12.1%)	13 (14.6%)	39 (11.6%)
>31-40	1 (6.7)	6 (1.5)	0 (.0%)	7 (1.8%)	2 (2.2%)	5 (1.5%)
>40	0(0)	1 (0.2)	0 (0%)	1 (.3%)	1 (1.1%)	0 (0 %)
Fisher's Exact	p = 0.07		p = 0.36		p = 0.04	

DISCUSSION

Stage of dentition development is an important factor in determining the correct emergency management. When questioned on whether they were able to identify between primary and permanent tooth, 52.6% of the school teachers were confident they could. Similar findings were seen for permanent teeth by Al-Jundi et al¹⁶ and by Chan et al⁴ which were 40% and 47% respectively.

Among the three dental injuries addressed in the study, the teachers were found to be very much confident on managing displaced than avulsed and fractured teeth. Inadequate knowledge of tooth fracture and avulsion management was also seen in study done by Feldens et al²⁶. While Sae-lim et al¹⁹, Mohandas U et al²¹ and Mesgarzadeh et al²⁷ found good knowledge among teachers in managing fracture and avulsion.

Nearly one third (32.2%) of teachers who had information on dental trauma knew the proper management of displaced teeth which was statistically significant ($p=0.01$), while the management on fracture and avulsion were insignificant. This gives an assumption that they had received proper knowledge only on managing displaced teeth by their interaction with the dentist.

Thirty five (8.25%) teachers knew the proper management of fracture teeth by putting the fractured part on liquid medium and taking to the dentist which highlights their inadequate knowledge in this aspect. Similar findings (22.5%) were noted by Feldens et al²⁶ in their study. While Sae-lim et al¹⁹, Mohandas et al²¹, Mesgarzadeh et al²⁷ found a better management of fractured teeth among their participants.

With regards to the emergency management of tooth avulsion, majority of the teachers (65.3%) were worried about stopping the bleeding with pressure as loss of blood is perceived to be life threatening by most people which was also seen in study by Chan et al⁴ and Mohandas et al²¹. The awareness about the proper management of "locating the avulsed tooth and attempting to replant it" was seen only in 3.53%. Similarly grossly deficient knowledge about tooth avulsion was seen by Mohandas et al²¹, Al Jundi et al¹⁶, to be 1.5% and 1% respectively. In contrast to our study, adequate knowledge in management of tooth avulsion were reported by Chan et al (17.5%)⁴, Sae-lim et al (71%)¹⁹ and Mesgarzadeh et al²⁷ (50.6%) although the latter mentioned that teachers were not informed of correct procedures. Replantation of avulsed permanent tooth is the ideal mode of treatment. In contrast, majority of teachers (83%) in our study believed that they didn't think about it as a

treatment option. Studies done by C Blakty et al²⁸ and McIntyre et al²⁸ showed similar findings as 74.5% and 44% respectively. Replanting of avulsed primary teeth has the potential risk of damaging the permanent successor³⁰. More than half of the teachers (51.4%) did not think of replantation which was reassuring.

The prognosis is related to the injury of the periodontal membrane during the time the tooth is out of its socket. Dry storage of the tooth will result in an irreversible injury to the periodontal membrane, with the result that the replanted tooth will be lost over time. Storage media like saline, milk, balanced salt solution with osmolality similar to the tissue fluid do not destroy the periodontal ligament cells³¹. Majority (53.1%) didn't have any idea on medium required for storage/transportation of knocked out teeth similar to study done by Mohandas et al²¹ whose finding was 58.3%. Extra oral time less than 20 minutes is considered ideal for replantation of teeth. It was reassuring to know 86.6% of teachers would send the child immediately in case of dental emergency.

Among the 108 teachers who had experienced dental trauma in their students for the past one year, thirtyone (28.7%) knew the correct management for displacement where significant association could be found. Similarly, Sea-Lim et al¹⁹ stated that 24% of their study population had previous experience of Traumatic Dental Injury (TDI) which had affected positively their knowledge of TDI management. In contrast, Chan et al⁴, Mohandas et al²¹ and C. Blakty et al²⁸ have not found any correlation between previous TDI experience and TDI management knowledge.

Mouthguards are designed to protect teeth and intraoral soft tissues from injuries. The American Dental Association recommends properly fitted mouth guards for a variety of sports and recreational activities which predispose the participants to oral injuries³². In our study, two hundred and forty eight (58.7%) had never heard of mouth guard while only 37.7% thought it could prevent injury to the tooth. In a study done by Karande N et al, only 23% of participants knew about mouth guard even after lectures given to them³³. On questioning them about where they would take on any dental emergency, 50.5% of teachers preferred nearest hospital on foot or by any transport while only 32.3% would like to take to a dentist. This shows an immediate need for awareness among the teachers. This study also had some limitations. The teachers had to recall their first aid training and also the number of students suffering from dental trauma, so possibilities of recall bias can be there as the exact number becomes difficult to remember. As study is focused on Bhaktapur, the findings cannot be generalized to other places of Nepal.

CONCLUSION

Knowledge of the school teachers in Bhaktapur was seen to be inadequate for emergency management of fracture and avulsed tooth. Their educational background, first aid training, previous information on dental trauma and previous TDI experience in their students was only seen effective for managing displacement of tooth. As Nepal is a developing country, education system is needed to be improvised by including special training on emergency management of dental injuries for school teachers. This significantly increases the likelihood of a positive treatment outcome.

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