

Knowledge, awareness, and attitude among the employees in emergency ambulance services towards traumatic dental injuries

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ABSTRACT

Introduction: Traumatic dental injuries are the most frequently encountered dental emergencies. Psychologically a missing tooth in the front tooth region can be a cause of social embarrassment for the child and may elevate the anxiety level in the parents. The prognosis of any road traffic accident (RTA) mainly depends on the employees in emergency ambulance services to prompt correct emergency measures. **Aim of the Study:** The purpose of this study was to evaluate the knowledge and the awareness level of the employees in emergency ambulance services regarding the management of dental trauma in patients who have sustained RTAs. **Materials and Methods:** In total, 100 healthcare workers in 108 emergency ambulance services were randomly evaluated using a self-structured questionnaire in and around Kancheepuram district of Tamil Nadu. **Results:** The overall knowledge of the personnel in 108 emergency ambulance services regarding management of traumatic injuries to the teeth was not satisfactory. Approximately, 86% of employees reported that no dental first aid is given for the patient who has sustained RTA. **Conclusion:** Dental trauma awareness program and first aid training will help in rebuilding the awareness and knowledge regarding the importance of management in a dental emergency.

Keywords: Ambulance services, dental traumatic injury, road traffic accident

Introduction

Traumatic injuries in childhood lead to present and future oral health problems, which causes pain and distress.^[1] Children encounter many accidents in their routine day to day life when they engage themselves in sports activities such as running, skating, and cycling. Thus, it becomes important to provide immediate emergency care to reduce the various possible outcomes.^[2,3]

Any kind of violence, accidents, falls, and sports related activities can cause tooth loss.^[4] Dental traumatic injuries mainly range

from minor enamel chipping to extensive maxillofacial damage involving the tooth supporting structures with displacement and avulsion of teeth.

Injuries in children have become an international public health problem. In 2011, WHO projected that more than 6,30,000 children under the age of 15 died because of road traffic accident (RTA). These injuries are associated with high rate of morbidity. For every person who dies, there are several thousand others who live on with various other disabilities.^[5]

The traumatic injuries such as tooth avulsion varies from 0.5% to 16% of injuries in the permanent dentition and from 7% to 13% in the primary dentition. Maxillary central incisor is most

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commonly involved tooth in avulsion in both primary and permanent dentition. Avulsion injuries are three times more common in boys than in girls because of their active participation in sports and games.^[6] Prior to graduation, approximately 50% of the school children experience some form of traumatic dental injury.^[7]

The loss of an anterior tooth can lead to an extreme psychological trauma, along with compromised aesthetics. Immediate emergency management can help in developing the prognosis of an injured tooth, which helps in preserving the smile.

The prognosis of an avulsed tooth is largely determined by the viability of the periodontal ligament. This in turn is determined by the storage media.^[8] Epidemiological studies on dental injuries show that most of the dental injuries occur on road (41%).^[9-11] Hence, the ultimate result of an avulsed tooth may depend on the knowledge of the correct emergency management by the employees in the 108 emergency ambulance services.

The aim of this study was to assess the attitude, awareness, and knowledge of the personnel employed in ambulance services towards the immediate emergency management of dental trauma because it is generally the ambulance which is called for whenever any accident occurs. Before planning educational campaigns, it is necessary to understand the awareness level of the employees in the emergency ambulance services.

The objective of this study was to enable the practitioner to formulate the instructions that can be given to the employees to improve their understanding that it is very necessary to check the intactness of the dental arch after the patient has sustained a trauma. It is mandatory to make them aware and to improve their knowledge and skill and to act immediately in case of any dental traumatic injury.

Materials and Methods

A questionnaire was designed, and one-to-one interview was performed among 100 employees working in 108 emergency ambulance services in the district of Kancheepuram, Tamil Nadu. The questionnaire contained 15 closed-ended questions for the assessment of knowledge and attitude of the employees towards dental trauma and its emergency management. The questionnaire was prepared both in English and vernacular language (Tamil). The questionnaire was checked for the content validity, and it was also checked for construct validity using test-retest method.

The institutional ethical committee clearance was obtained prior to the study, and those employees who were willing to participate in the study only were interviewed. The questionnaire evaluated the demographic details of the employees that included e.g., experience in the ambulance services, educational qualification, and the workplace where they are assigned by the government to carry out their emergency services. It contained the following

questions that were framed to determine their knowledge level about traumatic dental injuries;

1. Do you use the ambulance services for dental injury?
A) YES B) NO
2. How frequent do you come across dental injury in your services?
A) OFTEN B) RARE
3. Are you aware of dental injury during accidents?
A) YES B) NO
4. Have you learnt dental injury management during first aid training?
A) YES B) NO
5. Will you examine oral cavity in accident patient?
A) YES B) NO
6. Where will you go for treatment if the patient has “knocked out tooth”?
A) GENERAL HOSPITAL B) DENTAL HOSPITAL
7. What is the average time taken to seek the doctor in case of a “knocked out tooth”?
A) IMMEDIATELY B) WITHIN 30 MINUTES C) WITHIN FEW HOURS
8. What will you do with the “knocked out tooth”?
A) LEAVE THE TOOTH UNATTENDED B) TAKE THE TOOTH TO THE DENTIST
9. What is the material used to clean the “knocked out tooth”?
A) HANDKERCHIEF B) WATER
10. Would you replant the tooth into the socket?
A) YES B) NO
11. What is the medium used to transfer the “knocked out tooth”?
A) WATER B) SALINE C) MILK D) ANTISEPTIC SOLUTION E) MOUTH
12. What is the emergency management in case of hard tissue injury?
A) FIRST AID B) NOT AWARE
13. Do you think it is important to have education program regarding management of dental trauma?
A) YES B) NO
14. Would you like to attend an educational program on management of dental trauma?
A) YES B) NO
15. Are you satisfied with your knowledge of management of dental trauma?
A) YES B) NO.

Results

Table 1 shows the demographic details of the employees. Table 2 illustrates the distribution of positive and negative feedback of the employees for the questions. Table 3 depicts the distribution of preferred transport media. Table 4 shows the association between the experience of the employee and the positive and negative feedback of the employee. Table 5 brings out the association between the educational qualification and the positive and negative feedback of the employee. Table 6 emphasizes the association between the work place and the

positive and negative feedback of the employee. However, 72% of the employees reported that they use the ambulance services for dental injury, whereas 70% of the respondent staffs in the ambulance said that they rarely came across dental injury when they rendered emergency helpline services. In total, 68% of them were not aware of intra and extra oral injuries during accidents. Moreover, 90% of them reported that handling traumatized teeth and other oral structures were not included in their curriculum of first aid training. Approximately, 97% of the employees with experience of less than 3 years and 76% of them with experience of more than 3 years reported that they do not routinely examine the oral cavity in a traumatized patient which was found to be statistically significant. When asked, "What will you do with the avulsed tooth" about 76% of the employees said that they will discard the tooth. Only 12% reported that they will ask the patient to consult with the dentist regarding the "knocked out tooth." When asked about the transport media for the avulsed tooth, 42% of the employees preferred water, 24% preferred oral cavity, 14% preferred saline, and 10% preferred either milk or antiseptic solution. More than 80% of the employees in the 108 ambulance services responded that they were not satisfied with their knowledge regarding traumatic dental injuries, and they felt that attending a dental education program will be of much benefit when they handle patients.

Table 1: Table depicting the demographic details

	n%
Experience of the employee	
<1 year	63 (63%)
1-3 years	20 (20%)
>3 years	17 (17%)
Work place of the employee	
Urban	9 (9%)
Semi urban	24 (24%)
Rural	67 (67%)
Educational qualification of the employee	
Illiterate	0 (0%)
Primary education	8 (8%)
Middle school	6 (6%)
High and higher secondary	48 (48%)
Any degree	18 (18%)
Professional degree	20 (20%)

Table 2: Distribution of positive and negative feedback of the employees

Questions	Yes (%)	No (%)
Do you use the ambulance services for dental injury?	28 (28%)	72 (72%)
Are you aware of dental injury during accidents?	68 (68%)	32 (32%)
Have you learnt dental injury management during first aid training?	10 (10%)	90 (90%)
Will you examine oral cavity in accident patient?	24 (24%)	76 (76%)
Would you replant the tooth into the socket?	80 (80%)	20 (20%)
Do you think it is important to have education program regarding management of dental trauma?	66 (66%)	34 (34%)
Are you satisfied with your knowledge of management of dental trauma?	18 (18%)	82 (82%)
Would you like to attend an education program on management of dental trauma?	66 (66%)	34 (34%)
Frequently encountered patients who have sustained dental injury	30 (30%)	70 (70%)
Advised visit to dental hospital in case of knocked out tooth	24 (24%)	76 (76%)

Discussion

The first line health care in any emergency situation is provided by the physicians and nurses employed in ambulance services. The decisive factor in the survival and prognosis of the tooth belonging to a person who has sustained RTA depends on the prompt action by the employee.^[12] Whenever a patient has encountered a RTA, medical professionals are the first to treat the patient. The results of the study showed insufficient knowledge regarding dental trauma and its management among the health care workers employed in 108 emergency ambulance services. More than three-fourth of them did not know about the tooth replantation procedures. This is very shocking because most patients who have sustained RTA have some part of their oral and maxillofacial region injured. The prevalence rate of injuries to permanent teeth varies between 6.1% and 58.6%.^[13] At least half of the children going to school especially boys face the possibility of some fall during play.^[14-18] Andersson and Bodin^[19] stated that the prognosis of an avulsed tooth is mainly determined by its reimplantation time. Early the tooth is reimplanted into the socket, better the prognosis. In a study done by Yunus *et al.* in 2015 among nursing students, 30% responded that the critical time for replantation to be within 20 min.^[20]

In our present study, only 24% of the employees said that they will seek the dentist when a tooth is avulsed in RTA patients.

In a questionnaire study done by Loo *et al.*^[21,22] among the parents, most of them stated that they would visit the dentist whenever their child sustained any trauma. According to the International Association of Dental Traumatology^[23] and American Association of Pediatric Dentistry,^[24] milk has been widely recommended for dentist and general population as the ideal storage medium for an avulsed tooth. Milk contains epithelial growth factor, has neutral pH, little or no bacterial content that are all favorable characteristics.^[25-27]

Andreasen and Hjørtting-Hansen stated that if an avulsed tooth was replanted into the socket within 30 min the success rate was 90%. This is in accordance with the present study wherein 80% of the employees conveyed that they would replant the tooth into the socket if they come across any case of avulsion.^[28] Most general population are not satisfied with their knowledge level about dental traumatic injuries, and there are reports that

show that even professionals who deal with trauma show a lack of comprehension in this field.^[29-35] This scenario indicates that

educational program that provides information and improves the awareness level pertaining to traumatic dental injuries is highly necessary to impart knowledge among the employees in the 108 emergency ambulance services. Education plays a very important role in improving the knowledge of the employees thus reducing the burden imposed by dental injuries caused by RTA.^[36]

Table 3: Distribution of preferred transport media

Medium of transport for the knocked out tooth	n (%)
Water	21 (42%)
Saline	7 (14%)
Milk	5 (10%)
Antiseptic solution	10 (10%)
Oral cavity	24 (24%)

Limitations of present study

It is a short study that evaluated the knowledge level only among 100 health care workers in and around Kancheepuram district of

Table 4: Association between the experience of the employee and the positive and negative feedback of the employee

Questions	Experience of the employee	Yes (%)	No (%)	Chi-square	P
Do you use the ambulance services for dental injury?	<3 years	23 (28%)	60 (72%)	Fisher exact probability - 0.02	0.549
	>3 years	5 (29%)	12 (71%)		
Are you aware of dental injury during accidents?	<3 years	56 (67%)	27 (33%)	0.06	0.801
	>3 years	12 (71%)	5 (29%)		
Have you learnt dental injury management during first aid training?	<3 years	8 (10%)	75 (90%)	Fisher exact probability -0.07	0.537
	>3 years	2 (12%)	15 (88%)		
Will you examine oral cavity in accident patient?	<3 years	2 (3%)	63 (97%)	Fisher exact probability - 8.31	0.015
	>3 years	4 (24%)	13 (76%)		
Would you replant the tooth into the socket?	<3 years	66 (80%)	17 (20%)	Fisher exact probability - 0.07	0.544
	>3 years	14 (82%)	3 (18%)		
Do you think it is important to have education program regarding management of dental trauma?	<3 years	58 (70%)	25 (30%)	3.27	0.07
	>3 years	8 (47%)	9 (53%)		
Are you satisfied with your knowledge of management of dental trauma?	<3 years	15 (18%)	68 (82%)	Fisher exact probability - 0.00	0.636
	>3 years	3 (18%)	14 (82%)		
Would you like to attend an education program on management of dental trauma?	<3 years	55 (66%)	28 (34%)	13.69	0.0002
	>3 years	3 (18%)	14 (82%)		
Frequently encountered patients who have sustained dental injury	<3 years	25 (30%)	58 (70%)	0.00	0.954
	>3 years	5 (29%)	12 (71%)		
Advised visit to dental hospital in case of knocked out tooth	<3 years	20 (24%)	63 (76%)	Fisher exact probability - 0.00	0.616
	>3 years	4 (24%)	13 (76%)		

Table 5: Association between the educational qualification and the positive and negative feedback of the employee

Questions	Educational qualification of the employee	Yes (%)	No (%)	Chi-square	P
Do you use the ambulance services for dental injury?	Higher secondary and above	24 (28%)	62 (72%)	Fisher exact probability - 0.00	0.593
	Below higher secondary	4 (29%)	10 (71%)		
Are you aware of dental injury during accidents?	Higher secondary and above	58 (67%)	28 (33%)	Fisher exact probability - 0.09	0.516
	Below higher secondary	10 (71%)	4 (29%)		
Have you learnt dental injury management during first aid training?	Higher secondary and above	9 (10%)	77 (90%)	Fisher exact probability - 0.15	0.576
	Below higher secondary	1 (7%)	13 (93%)		
Will you examine oral cavity in accident patient?	Higher secondary and above	21 (24%)	65 (76%)	Fisher exact probability - 0.06	0.555
	Below higher secondary	3 (21%)	11 (79%)		
Would you replant the tooth into the socket?	Higher secondary and above	69 (80%)	17 (20%)	Fisher exact probability - 0.02	0.564
	Below higher secondary	11 (79%)	3 (21%)		
Do you think it is important to have education program regarding management of dental trauma?	Higher secondary and above	57 (66%)	29 (34%)	Fisher exact probability - 0.02	0.553
	Below higher secondary	9 (64%)	5 (36%)		
Are you satisfied with your knowledge of management of dental trauma?	Higher secondary and above	15 (17%)	71 (83%)	Fisher exact probability - 0.13	0.482
	Below higher secondary	3 (21.4%)	11 (79%)		
Would you like to attend an education program on management of dental trauma?	Higher secondary and above	57 (66%)	29 (34%)	0.22	0.637
	Below higher secondary	9 (64%)	6 (36%)		
Frequently encountered patients who have sustained dental injury	Higher secondary and above	26 (30%)	60 (70%)	Fisher exact probability - 0.02	0.586
	Below higher secondary	4 (29%)	10 (71%)		
Advised visit to dental hospital in case of knocked out tooth	Higher secondary and above	21 (24%)	65 (76%)	Fisher exact probability - 0.06	0.555
	Below higher secondary	3 (21%)	11 (79%)		

Table 6: Association between the work place and the positive and negative feedback of the employee

Questions	Work place of the employee	Yes (%)	No (%)	Chi-square	P
Do you use the ambulance services for dental injury?	Urban	3 (33%)	6 (67%)	Fisher exact probability - 0.14	0.486
	Non urban	25 (27%)	66 (73%)		
Are you aware of dental injury during accidents?	Urban	6 (67%)	3 (33%)	Fisher exact probability - 0.01	0.597
	Non urban	62 (68%)	29 (32%)		
Have you learnt dental injury management during first aid training?	Urban	1 (11%)	8 (89%)	Fisher exact probability - 0.01	0.629
	Non urban	9 (10%)	82 (90%)		
Will you examine oral cavity in accident patient?	Urban	2 (22%)	7 (78%)	Fisher exact probability - 0.02	0.630
	Non urban	22 (24%)	69 (76%)		
Would you replant the tooth into the socket?	Urban	7 (78%)	2 (22%)	Fisher exact probability - 0.03	0.573
	Non urban	73 (80%)	18 (20%)		
Do you think it is important to have education program regarding management of dental trauma?	Urban	6 (67%)	3 (33%)	Fisher exact probability - 0.00	0.638
	Non urban	60 (66%)	31 (34%)		
Are you satisfied with your knowledge of management of dental trauma?	Urban	2 (22%)	7 (78%)	Fisher exact probability - 0.12	0.509
	Non urban	16 (18%)	75 (82%)		
Would you like to attend an education program on management of dental trauma?	Urban	6 (66%)	3 (33%)	Fisher exact probability - 0.00	0.638
	Non urban	60 (66%)	31 (34%)		
Frequently encountered patients who have sustained dental injury	Urban	3 (33%)	6 (67%)	Fisher exact probability - 0.05	0.543
	Non urban	27 (30%)	64 (70%)		
Advised visit to dental hospital in case of knocked out tooth	Urban	2 (22%)	7 (78%)	Fisher exact probability - 0.02	0.630
	Non urban	22 (24%)	69 (76%)		

Tamil Nadu. A field study that involves a more broader spectrum probably covering the entire state will help us throw more light on the importance of educational program in the emergency management of dental trauma.

Conclusion

Within the limitations of the present study, it can be concluded that, although there is lack of proper knowledge on emergency management of dental trauma among the employees, there was willingness among them to gain knowledge as they are the first people who are approached whenever there is any emergency. As there is light at the end of the tunnel, although the present day knowledge on the awareness of dental trauma is quite dark, conducting an educational program will illuminate the minds of those who are hiding in the light.

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Conflicts of interest

There are no conflicts of interest.

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