

## **Assessment of the Knowledge of Availability of Primary Dental Trauma Care and Its Awareness among Emergency Medical Specialists in the City of Chennai**

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## **Abstract**

**Background:**Dental trauma (traumatic dental injury) is an impact injury to the teeth and/or other hard and soft tissues within and around the mouth and oral cavity. Traumatic dental injuries (TDIs) are the most common injuries among the entire worldwide population. From a simple fall to sports injuries and road traffic accidents, children, adolescents, and adults risk experiencing TDIs. These Emergency dental situations are first brought to the notice of physicians, who do the initial line of management.

**Objectives:**The study aims to assess the extent of Emergency medical specialist knowledge regarding the diagnosis and primary management of traumatic dental injuries.

**Methods:**A questionnaire of 15 both open-ended and close-ended questions was designed. After validation and ethical clearance, the questionnaire study was conducted among 98 emergency medical specialists throughout the city of Chennai. The data collected were statistically analyzed.

**Results:**In this study, it was found that the frequency of hospitals having dental surgeons available was 52.0%, and the availability of proper dental imaging facilities was only 58.2%. The frequency of respondents knowing avulsion was 30.6.

**Conclusions:** Through this study, it has been found that the knowledge and awareness regarding managing primary dental traumatic injuries among emergency medical specialists in the city of Chennai are low, but the facilities in hospitals to manage traumatic dental injuries were satisfactory.

**Keywords:** Emergency medical specialists, Traumatic dental injuries, Primary dental trauma care.

## 1. Introduction

A road traffic accident (RTA) is any injury due to crashes originating from, terminating with, or involving a vehicle partially or fully on a public road. Every year the lives of approximately 1.35 million people are cut short due to a road traffic crash. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability due to their injury (1).

India, in particular, has about one percent of the global vehicle population, accounting for six percent of the world's road traffic accidents. Maxillofacial and dental injuries are often associated with road traffic accidents. Various studies have shown the association between Maxillofacial, dental injuries, and road traffic accidents (2),(3),(4),(5),(6),(7)&(8).

Trauma involving the dentoalveolar region is a common occurrence that can result in the fracture and displacement of teeth, fracturing of bone, and/or associated soft tissue injuries (9). Dental traumatic injuries are the fifth most common bodily injury (10). Traumatic dental injuries comprise as much as 85% of patients presenting with injuries to the oral region (11), of which 26-76% of injuries to the permanent dentition comprise crown fractures (12). Luxation injuries shall include 15-61% of all dental injuries (13), mainly involving the maxillary central incisor. Dental Avulsion accounts for approximately 0.5-1.6% of traumatic injuries in permanent dentition (14).

Most traumatic dental injuries (TDI) occur in children and teenagers, where tooth loss has long-term consequences. Management for these younger age groups may differ from adults, mainly due to developing teeth and pubertal facial growth. The incidence and pattern of traumatic injuries vary from country to country, depending on prevailing geographical, social, cultural, and environmental factors. Chennai is one of India's metro cities where multiple contributing factors contribute to the high incidence of traumatic injuries. Proper management of traumatic dental injuries is very important lack of which can affect the individual's facial esthetics and emotional well-being and can cause pain, difficulty in mastication, and malocclusion. Management of TDIs depends on each injury's type, location, and severity. Regardless of the extent of the injury, the tooth requires immediate management as the prognosis depends on the decisions taken in the "Golden Hour" after the injury.

Emergency department (ED) visits for dental issues are mostly related to traumatic injuries. The knowledge of ED physicians and emergency medical specialists about the diagnosis and primary management of dentofacial injuries is crucial for prognosis. The aim of correct primary management of TDIs to improve the prognosis and minimize poor outcomes due to inaccurate diagnosis and/or lack of knowledge in the immediate management of TDIs (15). Various studies have shown that most of the physicians in the emergency department in hospital settings have little or no formal training in clinical dentistry (16), (17) & (18). This study aims to assess the knowledge of emergency medical specialists towards the emergency management of dental trauma.

## 2. Objectives

This study aimed to assess the extent of Emergency medical specialist knowledge regarding the diagnosis and primary management of traumatic dental injuries, as well as the availability of proper facilities for the management of dental traumatic injuries in hospitals in the city of Chennai.

## 3. Methods

The study was approved by the Institutional Ethics Committee. The nature and purpose of the study were explained to all participants, and its voluntary nature was emphasized. Informed consent to participate was subsequently obtained from each study participant. Considering the ethical issues and confidentiality of respondents to the questionnaire, the participant's registration number, demographic details, and contact details were not recorded.

The survey questionnaire was self-designed and framed to assess the knowledge in primary management of traumatic dental injuries and the availability of facilities for managing primary dental trauma. The questionnaire was validated, and a pilot study was conducted among 20 emergency medical specialists before starting the survey. The questionnaire contains 15 questions with both open-ended and close ended questions. The survey questionnaire was distributed to the emergency medical specialists of various hospitals across the city of Chennai under the authors' supervision. The questionnaire comprised questions regarding the availability of hospital beds, dental speciality imaging facilities, the availability of dental surgeons, knowledge about traumatic dental injuries, avulsion injuries of both primary and permanent teeth, and the emergent nature of each of these injuries. The following fields of knowledge were assessed: management of traumatic dental injuries, the importance of immediate management of an avulsed tooth for long-term success, the importance of replanting primary teeth, optimal storage media, proper handling of an avulsed tooth, and dental trauma experience.

The participants' responses were computed into a Microsoft Excel worksheet and evaluated with Statistical Package for the Social Sciences (SPSS), version 28.0 software (IBM SPSS, IBM Corporation 1, Armonk, New York, United States). Descriptive statistical analysis was performed and analyzed.

## 4. Results

The study was conducted among 98 emergency medical specialists regarding the availability of the facilities to manage dental trauma and their knowledge regarding the management of the same. The results of this cross-sectional study survey are then collected, tabulated, and statistically analyzed.

*Response to questions regarding the availability of facilities to manage traumatic dental injuries:*

The first six questions from the questionnaire assessed the availability of hospital facilities to manage traumatic dental injuries. The availability of hospital beds to accommodate patients with trauma was evaluated. (Table 1) The results of the number of hospitals accepting trauma cases, the number of trauma cases admitted per day by the hospital, and the number of dental trauma cases is summarised in( table 2). the availability of a dental surgeons in the hospital, their mode of availability, and the specialty they belong to was summarised in (table 3). (table 4) summarises the results of the availability of dental imaging facility available in the hospital.

*Response to questions that assessed Emergency medical doctor's knowledge about traumatic dental injuries:*

Questions 9-14 assessed the extent of Emergency medical specialists' knowledge regarding the diagnosis and primary management of dental traumatic injuries tooth which most commonly encounters dental trauma. Familiarity with the term avulsion among emergency medical specialists and their knowledge regarding the concept of reimplantation of the tooth and their willingness to splint the tooth has been summarised in (table 5)(table 6)(table 7)(table 8)(table 9) respectively.

**Table 1 Frequency of availability of beds in hospitals**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Number of beds in the hospital</b>	<25	27	27.6
	25-50	23	23.5
	51-100	15	15.3
	>100	33	33.7

**Table 1 Hospitals and frequency of trauma cases**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>	
<b>Does your hospital accept trauma cases?</b>	No	24	24.5	
	Yes	74	75.5	
<b>How many cases of trauma are admitted per day?</b>	-	23	23.5	
	0-5	44	44.9	
	1-5	2	2.0	
	6-10	29	29.6	
<b>How many dental trauma cases do you review a day</b>	0	34	34.7	
	1-3	63	64.3	
	4-6	1	1.0	

**Table 2 The availability of dental surgeon in the hospital**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Is there a dental surgeon available in your hospital?</b>	-	2	2.0
	No	45	45.9
	Yes	51	52.0

<b>If yes, which speciality does he / she belong to?</b>	-	45	45.9
	Mutlispeciality	22	22.4
	General dentist	8	8.2
	OMFS	23	23.5
<b>Is he/she available, (a) Full time (b) On call</b>	-	46	46.9
	Full time	26	26.5
	On call	26	26.5

**Table 3 Availability of dental imaging facility in hospitals**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Do you have dental specialty imaging?</b>	-	3	3.1
	No	38	38.8
	Yes	57	58.2

**Table 5**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Which tooth is most commonly involved in trauma?</b>	Maxillary central incisor	44	44.9
	Maxillary lateral incisor	23	23.5
	Mandibular central incisor	23	23.5
	Mandibular lateral incisor	8	8.2

**Table 6**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>Are you familiar with the term Avulsed teeth?</b>	Yes	30	30.6
	No	68	69.4

**Table 7**

	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
<b>If yes, have you encountered a patient with avulsed tooth/teeth?</b>	Yes	22	22.4
	No	76	77.6

**Table 8**

<b>Do you think avulsed tooth can be brought back to form?</b>	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
	No	9	9.2
	Yes	89	90.8

**Table 9**

<b>Is splinting necessary after reimplantation of avulsed tooth?</b>	<i>Options</i>	<i>Frequency</i>	<i>Percentage</i>
	No	26	26.5
	Yes	72	73.5

## 5. Discussion

Dental trauma can present as an isolated injury or with multiple other injuries. In either case, they are frequently attended by medical professionals in Emergency department services. Accurate assessment and immediate management of traumatic dental injuries significantly influence the prognosis. However, proper management is not always carried out due to a lack of knowledge of the diagnosis and primary management protocols.

33.7% of the hospitals had more than 100 beds. The frequency of hospitals accepting trauma cases was 75.5%. On average, 44.9% of hospitals responded that 0-5 trauma cases were admitted daily. 64.3% of the hospitals reviewed 1-3 dental trauma cases daily. 52% of the hospitals had dental surgeons available either on call or the full time of which 23.5% were oral and maxillofacial surgeons and 8.2% were general dentists, which highlights the lacunae in providing primary dental trauma or maxillofacial trauma care. 22.4% of hospitals had dental surgeons from all specialties available. 58.2% of the hospitals had dental imaging facilities readily available, which warrants the quality of diagnosis made by hospitals without a dental imaging facility. From the above data, we can say that hospitals that provide trauma care do not have appropriate imaging facilities or qualified specialists to manage dental trauma. Maxillary central incisor is commonly involved tooth in dental trauma; in our study, 44.9% of them claimed that maxillary central incisor was most commonly involved tooth in dental trauma, Which was according to the findings of Caliskan and Turku et al., Kowash et al. avulsion of teeth is a condition which requires immediate reimplantation followed by splinting of the avulsed tooth. The success of avulsed tooth treatment is entirely time-bound. 30.6% of the medical specialists were familiar with the term avulsion of teeth, which according to the findings of Bahammam et al., 90.8% of the participants thought avulsed tooth could be brought back to form. This result agrees with the study by Subhashraj K et al., and 73.5% of participants thought splinting was necessary after reimplanting an avulsed tooth, which according to the findings of Hamilton et al., 73.5% of the respondents agreed with the thought of reimplanting primary teeth.

The present study was under the findings of a survey done in Pondicherry, India, by Krishnaraj subhasraj et al. 2009 with 200 emergency service doctors. He stated that 90% did not know traumatic dental injury management. It was also according to the previous studies all over the world summarized by Yeng 2019, who claimed that medical doctors' knowledge of dental trauma is inadequate and warrants intervention from medical educators to close this gap. Under the findings

of these studies, the present study findings showed that ED medical specialists had insufficient training and knowledge regarding the primary management of traumatic dental injuries. It was also found that the participants' institutions do not provide sufficient preparation. Studies by Trivedy et al. and Ulusoy et al. (18)&(19) reported that there was no education about clinical dentistry in medical schools or postgraduate programs in the United Kingdom and Turkey. Also, Trivedy et al. said that ED physicians displayed a minor confidence level for managing dental avulsion injuries (20.4%), followed by major facial trauma (39.8%) among four groups of dentofacial emergencies.

Based on the present findings, it is evident that there is incomplete training of emergency physicians regarding dentofacial injuries. There is a need for dentofacial trauma education for ED physicians during and after medical training. If the medical education curriculum provided medical doctors with more information and skills regarding the early management of traumatic dental injuries, the treatment outcome of these injuries would improve. Holan & Shmueli et al. found that doctors who were the most successful in managing avulsed teeth were those who were married to a dentist. This shows dental specialists' significance in managing traumatic dental injuries.

However, the contribution of Dental professionals skilled in managing traumatic dental injuries can significantly improve the standard of care provided. Furthermore, local dental organizations should communicate more closely with the EDs to share the list of doctors who want to offer consultation services and plan joint training sessions. Educational programs and conferences regarding the management of Traumatic dental injuries should be conducted periodically for Emergency medical specialists to improve their knowledge and awareness. The plan of action suggested above aims to enhance the level of care that can be provided to patients and ultimately achieve better treatment outcomes.

### **Conclusion:**

From the results of this study, overall emergency medical specialist knowledge of management of dental trauma is inadequate and warrants intervention. This can be achieved by either consultation services provided by Dental specialists who are well versed in the management of traumatic dental injuries or by providing adequate training regarding the management of traumatic dental injuries during or after medical school training.

### **FINANCIAL SUPPORT AND SPONSORSHIP:**

Nil.

### **LIMITATIONS:**

Nil.

### **RECOMMENDATIONS:**

We recommend that more comparative studies be done in different geographical areas to assess the extent of Emergency medical specialist knowledge regarding the diagnosis and primary management of traumatic dental injuries to enhance the level of care that can be provided to patients. Furthermore, we recommend services provided by Dental specialists who are well versed in managing traumatic dental injuries to be appointed full-time in the Emergency departments of medical facilities to achieve better treatment outcomes.



**CONFLICT OF INTERESTS:**

The authors confirm that no potential conflict of interest relevant to this article was reported.

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