

# Evaluation of knowledge among general dentists in treatment of traumatic injuries in primary teeth: A cross-sectional questionnaire study

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## ABSTRACT

**Objective:** The purpose of the present study was to assess the knowledge of General dentist regarding the management of dental traumatic injuries of primary teeth. **Materials and Methods:** A total of 100 general dentists were selected and a validated questionnaire was distributed among the dentist to assess their knowledge on treatment strategies regarding traumatized primary teeth. **Statistical Analysis:** Data were entered into SPSS version 20.0 for percentages. The correct answers were tested in relation to the dentists' years of experience using the Chi-square test. **Results:** Analyzing the questionnaire for knowledge, 49% of dentists answered accurately regarding avulsed primary teeth, 36% of dentists answered appropriately regarding crown and root fractures, and 55% of dentists gave appropriate answers regarding luxation injuries. Chi-square test showed a statistically significant difference only for 2 questions in relation to the dentist's years of experience ( $P < 0.05$ ). **Conclusion:** There is a lack of consistency in the knowledge among general dentist regarding traumatic dental injuries of primary teeth. There is a need to create awareness and education regarding traumatic injuries of primary teeth.

**Key words:** General dentist, knowledge, traumatic injuries

## INTRODUCTION

Trauma in primary dentition is a common occurrence between 2 and 4 years of age<sup>[1]</sup> and the incidence ranges from 4% to 30%.<sup>[2]</sup> Dental injuries can vary from simple concussion to a severe damage involving the surrounding structures of the tooth.<sup>[3]</sup> These traumatic injuries to the primary dentition present with a special challenge to the dentist, as it creates panic among the parents and the dentist and creates anxiety and fear in the young child.

The major hindrance in delivering appropriate dental care by the dentist during this situation and the dentist fear of any additional risk to a permanent

successor.<sup>[4]</sup> Primary teeth play an imperative role in the self-esteem of the preschool children and also plays a pivotal role in speech development, esthetics, and function.<sup>[5,6]</sup> The maintenance of the primary dentition is important to guide the eruption of permanent teeth and traumatic dental injuries may affect this balance, and hence, it is considered as an important oral health problem.<sup>[7]</sup> In addition, research carried out by Da Silva Assunção *et al.* had stated that trauma to primary teeth leads to alterations in the succedaneous dentition.<sup>[8]</sup> However, only a

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few sporadic case reports have been published on the management of traumatic injuries in primary teeth, and only a few suggests the positive treatment outcome in primary dentition.<sup>[9,10]</sup>

Several studies have assessed the knowledge of emergency management of traumatic injuries in permanent teeth, but not in primary teeth.<sup>[11,12]</sup> Most of these studies concluded the need for better communication between the dentist and the community to create awareness. Treatment of traumatic dental injuries in primary teeth is often more complex, and a precise diagnosis and meticulous follow-up examinations are always required. Hence, there may be a need for a specialized staff for a periodic follow-up depending on the degree of severity.<sup>[13]</sup> However, there is no consensus in the literature concerning the treatment options for treating traumatized primary teeth, and this may contribute to new studies focused on trauma in the primary dentition. There is a lack of well-supported studies to guide dentist in selecting appropriate treatment options for traumatized primary teeth.

Therefore, this study was aimed to assess the level of knowledge of general dentist in treating traumatized primary teeth and creating awareness.

## MATERIALS AND METHODS

### Ethical approval

The present cross-sectional study was carried out after obtaining Ethical approval from the Institutional review board (SRB/STPGe) of Saveetha Dental College.

### Study design

The survey was conducted in a single dental school in Chennai. This was one of the first studies to assess the knowledge of dentist in treating traumatic dental injuries in primary teeth, a nonprobability purposive sampling frame was designed. Since it was easy to recruit the study population from a single dental school, purposive sampling technique was chosen. A sample of 100 General Dentists working in a Single Dental School, Chennai, India was included in the study.

The study was undertaken in two stages stage 1 and Stage 2. Stage 1 comprised formulating, designing, and validating the questionnaire, whereas Stage 2 tested the validated questionnaire among 100 general dentists.

### Stage 1 (designing and validation of questionnaire)

A standardized self-constructed questionnaire was formulated using American Academy of Pediatric Dentistry (AAPD) guidelines by two investigators (DR, GJ).<sup>[11]</sup> Both the investigators (DR, GJ) independently formulated the questionnaire, and after a consensus, they arrived at a final list of 15 questions. The questionnaire was based on the clinical scenario, which includes questions regarding the treatment strategies for primary tooth crown fracture, crown-root fractures, root fractures, and avulsion to assess the clinical knowledge of General dentist along with their years of clinical experience.

Initially, content validation of the questionnaire was performed by circulating the questionnaire to 10 qualified Paediatric dentists. A panel discussion was conducted among 10 qualified Pediatric dentists, and they had rated the questionnaire using content validity ratio.<sup>[14-16]</sup> There was a good agreement between the investigators, with a rating of >0.7. Finally, the questionnaire was distributed to 10 random General dentists for face validation, and it was evaluated using 5-point Likert scale.

### Stage 2 (testing of validated questionnaire)

After the content and face validation, the questionnaire was distributed to 100 General dentists to complete the questionnaire. Distribution and collection of the questionnaire were done by one of the Pediatric dentists (DR).

### Statistical analysis

Data were collected and entered into SPSS software version (SPSS Inc., Chicago, IL, USA) 20.0 for percentages. The correct answers were tested in relation to the dentists' years of experience using the Chi-square test.

## RESULTS

A total of 100 questionnaire were distributed. All the questionnaire were filled with 100% response rate. Among the 100 respondents, 50 were male dentists and 50 were female dentists between the age group of 25 and 45 years.

Table 1 depicts the percentage of different answers given by the dentist. Analyzing the questions separately, question 10 (A 2.5-year-old child reports with an extrusion of an upper central incisor with <3 mm, what will be the ideal treatment) presented

**Table 1: Percentage of different answers given by the dentist**

Question number	Questionnaire	Percentage of different answers given by the dentist (%)			
Q1	Can an avulsed primary tooth be replanted	(a) Yes (65%)	(b) No (24%)	(c) Not sure (11%)	
Q2	Is there a recommended age for replantation of avulsed primary tooth	(a) 2-4 years (34%)	(b) >4 years (11%)	(c) No age difference (32%)	(d) Cannot be reimplanted (23%)
Q3	Common reason for avulsion of primary tooth	(a) Short roots (18%)	(b) Resilient alveolar bone and short roots (32%)	(c) Short crown (1%)	(d) All the above (49%)
Q4	Is there any difference in the management of avulsed primary and permanent teeth	(a) Yes (60%)	(b) No (15%)	(c) Not sure (25%)	
Q5	A 2.5-year-old child reports with a crown fracture involving pulp, what will be the ideal treatment?	(a) Pulpectomy and calcium hydroxide dressing (65%)	(b) Pulpectomy (28%)	(c) Extraction (2%)	(d) Not sure of treatment (5%)
Q6	A 2.5-year-old child reports with a crown fracture extending to only cervical region of the root, what will be the ideal treatment	(a) Pulpectomy (37%)	(b) Removal of fragment followed by pulpotomy (34%)	(c) Extraction (16%)	(d) Not sure of treatment (13%)
Q7	A 4-year-old child reports with root fracture with no coronal fragment displaced, what will be the treatment option	(a) No treatment required, wait and watch (42%)	(b) Extract the coronal fragment (14%)	(c) Extraction of coronal and apical fragment (22%)	(d) No treatment required (22%)
Q8	A 4-year-old child reports with root fracture with coronal fragment displaced, what will be the ideal treatment	(a) Repositioning and splinting the coronal fragment (32%)	(b) Extract the coronal fragment (17%)	(c) Extraction of coronal and apical fragment (31%)	(d) Not sure (20%)
Q9	A 4.5-year-old child report with mobile upper central incisor with bleeding from gingival crevice, what will be the ideal treatment	(a) No treatment required, wait and watch (53%)	(b) Pulpectomy (10%)	(c) Extraction (14%)	(d) Not sure (22%)
Q10	A 2.5-year-old child reports with an extrusion of upper central incisor with <3 mm, what will be the ideal treatment	(a) Pulpectomy (12%)	(b) Careful repositioning and wait and watch (72%)	(c) Extraction (4%)	(d) Not sure of treatment (12%)
Q11	A 5.5-year-old child reports with an extrusion of upper central incisors with more than 3 mm, what will be the ideal treatment	(a) Careful repositioning (36%)	(b) Pulpectomy (10%)	(c) Extraction (36%)	(d) Not sure of treatment (18%)
Q12	A 3-year-old child reports with a palatal luxation of tooth with no occlusal interference, what will be the ideal treatment	(a) Allow for spontaneous reposition of tooth (65%)	(b) Perform pulpectomy (14%)	(c) Extraction (4%)	(d) Not sure (17%)
Q13	A 3-year-old child reports with a palatal luxation of tooth with severe occlusal interference, what will be ideal treatment	(a) Gently reposition with combined labial and palatal pressure and splinting (63%)	(b) Pulpectomy (9%)	(c) Extraction (12%)	(d) Not sure (16%)
Q14	A 3-year-old child reports with intrusion of central incisor and the apex of the root not displaced with developing tooth germ, what will be ideal treatment	(a) Tooth left for spontaneous repositioning (53%)	(b) Surgical replacement and pulpectomy (20%)	(c) Extraction (7%)	(d) Not sure of treatment (20%)
Q15	A 3-year-old child reports with intrusion of central incisor and the apex of the root displaced with developing tooth germ, what will be the ideal treatment?	(a) Tooth left insitu for spontaneous repositioning (20%)	(b) Pulpectomy (15%)	(c) Extraction (43%)	(d) Not sure of treatment (22%)

the largest number of correct answers. On the other hand, question 1 (Can an avulsed primary tooth be replanted) yielded the largest number of incorrect answers [Table 1].

The questionnaire was divided into 3 scenarios, such as questions regarding avulsion of primary tooth, questions regarding crown and root fractures and questions based on luxation injuries.

Analyzing the questionnaire for knowledge regarding avulsed primary teeth (Question 1-4), 49% of dentists answered accurately and 51% of dentists answered irrelevantly. Analysis of the questionnaire regarding crown and root fractures, only 36% of dentists answered appropriately regarding crown and root fractures. Knowledge regarding luxation injuries (palatal, labial, intrusion, and extrusion), 55% of dentists gave appropriate answers. Figure 1 depicts the percentage of correct and incorrect answers given by the dentist under each domain.

Table 2 shows the years of experience and the correct answers provided by the dentist. Chi-square test showed a statistically significant difference only for 2 questions in relation to the dentist's years of experience ( $P < 0.05$ ). There was no statistically significant difference evident for other questions and the dentist's years of experience ( $P > 0.05$ ).

## DISCUSSION

This study set out to investigate the knowledge of general dentist in treating traumatized primary teeth. The present study was initiated as one of the preliminary studies to investigate the dentist knowledge using a self-applied questionnaire. The questionnaire used in this research had been validated by content and face validation at the beginning of the study, based on the validation technique explained previously. The aim of this validation process was to gain the experts opinion and to modify the questionnaire in ease of understanding.

The greatest incidence of trauma to the primary teeth occurs between 2 and 3 years of age<sup>[4]</sup> and the

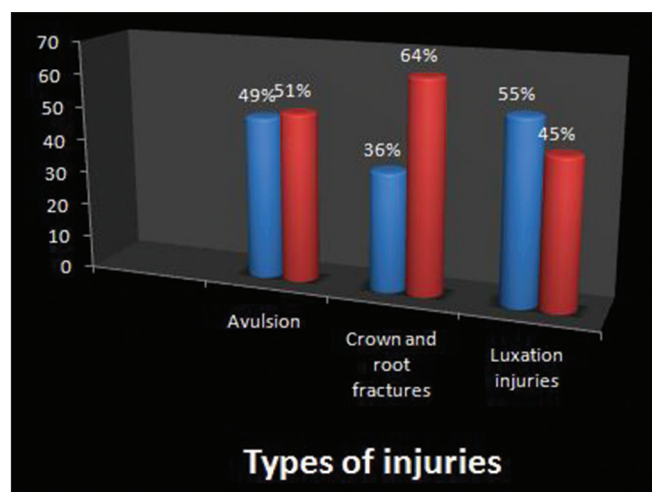


Figure 1: Percentage of correct and incorrect answers for each domain

treatment strategy should be dictated by the concern for the safety of the permanent dentition.<sup>[1,4]</sup> The result of the present study suggests that there was a lack of adequate knowledge about traumatized primary teeth among general dentist.

Avulsion is more common in primary teeth due to the resilient alveolar bone, and the prevalence has been reported to be 5.8%.<sup>[17]</sup> A few case reports have suggested the success and failure of replacement of avulsed tooth.<sup>[9,18]</sup> Forty-nine percentage of dentist answered accurately to the questions regarding the avulsion of primary teeth. A systematic review performed by Martins-Júnior *et al.* had stated that there are a lacunae and a lack of high-quality studies to guide clinicians regarding the best approach to treating primary tooth avulsion.<sup>[19]</sup> Replantation of an avulsed primary tooth is not yet accepted as a treatment option in the guidelines formulated by either AAPD or International Association of Dental Traumatology.<sup>[11,20]</sup>

The incidence of crown fractures in primary dentition accounts about 1%–3%.<sup>[17,21]</sup> Bhayya and Shyagali assessed the prevalence of traumatic injuries of primary dentition in Gulbarga city, India and reported that, crown fracture was the most prevalent type of fractures and the primary reason was due to fall.<sup>[12]</sup> Sixty-five percentage of dentist answered accurately for crown fracture with pulpal exposure. Although cvek's pulpotomy is one of the treatment modalities for partial pulp exposure, its application is rarely encountered in primary dentition.<sup>[13]</sup> Kupietzky and Holan suggested a conservative partial pulpotomy as a successful treatment protocol for primary teeth with crown fracture and pulp exposure.<sup>[22]</sup> According to AAPD guidelines, pulpotomy and calcium hydroxide dressing are the ideal treatment options.<sup>[11]</sup>

Teeth with crown-root fractures and root fractures always present with a higher frequency of premature loss due to poor prognosis and left untreated due to anticipated risk for permanent teeth. Costa *et al.* looked into the clinical and radiographic sequelae of traumatized primary teeth and concluded that the crown-root fracture was the common type of fracture and presented with higher clinical sequelae.<sup>[10]</sup> Only 36% of dentists answered correctly, indicating that, the knowledge regarding the crown and root fractures remains unsatisfactory.

AAPD had dictated treatment protocol for crown-root fracture and root fractures depending on the extent of the fracture.<sup>[11]</sup>

**Table 2: Years of experience and the correct answers provided by the dentist**

Question number	Questions	Pearson's Chi-square value based on years of experience (<5 years, 5-10 years, >10 years) and the correct answers provided	P
Q1	Can an avulsed primary tooth be replanted	14.786	0.02*
Q2	Is there a recommended age for replantation of avulsed primary tooth	7.182	0.30
Q3	Common reason for avulsion of primary tooth	11.598	0.07
Q4	Is there any difference in the management of avulsed primary and permanent teeth	7.735	0.25
Q5	A 2.5-year-old child reports with a crown fracture involving pulp, what will be the ideal treatment?	8.440	0.20
Q6	A 2.5-year-old child reports with a crown fracture extending to only cervical region of the root, what will be the ideal treatment	9.819	0.13
Q7	A 4-year-old child reports with root fracture with no coronal fragment displaced, what will be the treatment option	0.965	0.98
Q8	A 4-year-old child reports with root fracture with coronal fragment displaced, what will be the ideal treatment	9.153	0.16
Q9	A 4.5-year-old child report with mobile upper central incisor with bleeding from gingival crevice, what will be the ideal treatment	4.562	0.21
Q10	A 2.5-year-old child reports with a extrusion of upper central incisor with <3 mm, what will be the ideal treatment	15.962	0.04*
Q11	A 5.5-year-old child reports with a extrusion of upper central incisors with >3 mm, what will be the ideal treatment	6.028	0.42
Q12	A 3-year-old child reports with a palatal luxation of tooth with no occlusal interference, what will be the ideal treatment	10.966	0.08
Q13	A 3-year-old child reports with a palatal luxation of tooth with severe occlusal interference, what will be ideal treatment	4.978	0.54
Q14	A 3-year-old child reports with intrusion of central incisor and the apex of the root not displaced with developing tooth germ, what will be ideal treatment	1.471	0.96
Q15	A 3-year-old child reports with intrusion of central incisor and the apex of the root displaced with developing tooth germ, what will be the ideal treatment?	8.038	0.23

Chi-square test: \* $P < 0.05$  (statistically significant)

Studies had suggested that luxation injury was the most common type in primary dentition<sup>[18,23]</sup> and Costa *et al.* had reported that subluxation was one of the common types of luxation injuries from his series of case reports.<sup>[10]</sup> AAPD suggested different treatment options depending on the degree of displacement.<sup>[11]</sup> Assunção *et al.* suggested 'Monitoring only' as the most common treatment protocol.<sup>[23]</sup>

Years of dentist experience and the correct answers provided by them was found statistically significant only to 2 question [Table 2]. The statistically significant answers provided were the questions regarding avulsion and extrusion of primary teeth ( $P < 0.05$ ). The reasons for this statistically significant answers may be due to the dentist's years of experience and luxation injuries (33%) and avulsed tooth (5.8%) were the most common type of traumatic injuries encountered as stated previously.<sup>[17,18,23]</sup> As there was no statistically significant difference encountered between the

years of experience and the correct answers for most of the questions, the present study suggests that years of experience has no influential role in the treatment modalities and more awareness and knowledge is required for general dentist in treating traumatized primary teeth.

It is important to emphasize that the present was a cross-sectional study, which evaluated the knowledge in only one dental school. Hence, further longitudinal investigations involving other dental schools as a multi-centric approach are recommended to provide more information for discussion on knowledge on the management of traumatic injuries in primary teeth.

Based on the results of the present study and with the available evidence in the literature, it is clearly evident, that, knowledge and the information regarding the predicted risk, treatment options, and complications are not available for primary dentition.

## CONCLUSION

With the light of available evidence, this study concludes that there is a need to create awareness and education regarding treatment protocols and the risk of developing complications. This may help the clinician to determine an appropriate treatment protocol and prognosis of traumatized primary teeth.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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