

A Questionnaire-based Dental Survey for the Purpose of Evaluating the Knowledge Level, of School Teaching Staff on First-aid Management of Traumatic Dental Injuries in Bareilly Region

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ABSTRACT

Aim: Tooth trauma has been and continues to be the common occurrence that every school teacher and especially sports teacher must have sufficient knowledge which can improve the prognosis of traumatized teeth of school children through immediate on-site management or on time referral to healthcare providers. The aim of this particular study was evaluating the knowledge level of school teaching staff in Bareilly city and also their attitude with respect to emergency first-aid management of traumatic dental injuries (TDI) taking place in Bareilly schools. **Materials and Methods:** A cross-sectional, descriptive study among 348 school teaching staff was undertaken in Bareilly region. This was conducted through a questionnaire-based dental survey which included demographic characteristics, behavioral attitude, and knowledge regarding first-aid management of TDI. **Results:** A total of 348 school teachers responded to the questionnaire. Majority of them, that is, 75.9% had not received any first aid training. A total of 46.6% teachers were aware that the fractured tooth fragment can be used for the treatment. When inquired about the luxation injury, 15.5% were aware that the child should be referred to a dentist. In case of avulsion, 56.3% of the teachers were aware that the tooth can be used for replantation. And only 40.8% of the teachers would refer the child to a dentist and 24.1% would refer the child to pediatric dentist. **Conclusion:** The knowledge of the school teachers in Bareilly about first-aid management of TDI is limited. Programs and guidelines should be formulated to train the teachers regarding first aid and emergency management of dental trauma.

Key words: TDI, Dental Trauma, First aid management

INTRODUCTION

Traumatic dental injuries (TDI) are prevalent finding among the population and are known to be one of the serious public health problems among children that should be considered.^[1] TDIs are very common in childhood. Epidemiological studies have shown that the prevalence of TDI in primary dentition ranges between 11% and 30%, and in permanent dentition, it lies in the range of 5–29%.^[2] Recently, a study showed that approximately one billion of population suffered from dental injury, be it of any kind and the prevalence in permanent dentition is about 15% when observed worldwide. TDIs are very common in both the mixed and permanent dentition with an incidence rate between 1.25% and 4%.^[3]

TDIs possess significant consequences related to health of children, which can be functional, psychological, and social in nature. These consequences also have significant impact on parents, who are generally concerned with esthetic and economic aspects of this problem.^[2] The consequences of dental trauma

can vary from simple tooth fractures to the complicated tooth avulsion. According to Pakev and Radhte, tooth avulsion accounts for 0.5–16% of all cases of dental trauma.^[4] Therefore, appropriate emergency treatment for cases of dental trauma is critical for the success of replantation procedures. Furthermore, along with the pain and discomfort caused at the time of injury or later, pulpal, and periodontal destruction of any traumatized tooth may lead to its poor prognosis in long run^[4] whereas in severe cases it may even lead to complete tooth loss. Emergency management of the injuries become mandatory for the good prognosis of the treatment.^[3]

School is a place where children are more prone to get dental trauma. As children give maximum hours of the day to schools

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or day-care institutions; therefore, it is not even surprising that majority of the reported TDI occurs during the school time only. Falls, collisions followed by sports activities such as cycling and soccer are the most prevalent etiological factor.^[1]

School-aged children and school teachers are thought to be present at the site of an injury most of the times so making teacher aware of the emergency management fundamental to provide correct care to an injured child. The appropriate immediate treatment is not commonly performed due to a lack of proper knowledge among the teachers who usually provide the initial care before the child's approaches a dentist.^[1]

In a study by Panzarini *et al.* regarding the unawareness of physical education students and faculty of a college in Aracatuba SP Brazil highlighted the lack of knowledge among teachers regarding the emergency management of traumatic injuries.^[4] Therefore, the present study aimed to assess the knowledge and attitudes of school teachers regarding emergency management of TDI.

MATERIALS AND METHODS

The present survey was conducted in schools located in the city of Bareilly, UP. Before conducting the survey, approval from the Principal of all the studied school was taken. Authorities of the school valued this particular study and informed verbal consent for participating in the questionnaire were also obtained from every single teacher participating in the study before itself. The questionnaire was filled by 348 school teachers. The questionnaire was prepared in English language. From all the available subjects, those who were willing to participate were included in the study and those who were not willing were excluded from the study.

The questionnaire was adapted from the previous studies.^[3] The questionnaire for the study comprises of only close-ended questions, along with that alternate choices were also given so as to help the participants be quick at their decision.

The questionnaire had these following parts:

- Included questions with regard to demographic characteristics of participants and their attitude toward dental trauma.
- Consisted of questions pertaining to three traumatic injuries with different severity level to assess the level of on-spot knowledge of teaching staff at the time of emergency TDI occurring at school. Injuries included crown-fracture, luxation injury, and avulsion.
- Included the question regarding the first choice of health-care provider at the time of an emergency TDI.

All the data were entered into MS Excel and later analyses were done in SPSS version 23 (Chicago, USA). After the questionnaires had been collected, the teachers were given information through a lecture and demonstration of few models. Chi-square test was used to investigate the effect of gender, length of service, educational background, and participants teaching topics on their knowledge and attitudes.

RESULTS

A total of 348 school teachers responded to the questionnaire [Table 1]. About 56.9% of them were females, 38.2% were above 45 years of age, and 67.8% had more than 10 years of teaching experience. Majority of them 75.9% had not received any first aid training and had not witnessed (71.6) any dental traumatic injury.

Table 2 shows the response of teachers to different clinical presentation of traumatic injuries. About 66.1% of the teachers

Table 1: School teachers' characteristics

| School teachers' characteristics | Number | Percentage |
|---|--------|------------|
| Gender | | |
| Female | 198 | 56.9 |
| Male | 150 | 43.1 |
| Age in years | | |
| ≤35 | 115 | 33.1 |
| 36–45 | 100 | 28.7 |
| >45 | 133 | 38.2 |
| Teaching experience in years | | |
| <10 | 112 | 32.2 |
| >10 | 236 | 67.8 |
| Teaching specialization | | |
| Physical education | 125 | 35.9 |
| Other | 223 | 64.1 |
| Have own children | | |
| Yes | 192 | 55.5 |
| No | 156 | 44.5 |
| Previous dental trauma training/information | | |
| None | 264 | 75.9 |
| During first aid course | 30 | 8.6 |
| Formal expert training/information | 24 | 6.9 |
| Informational leaflets | 16 | 4.6 |
| Internet sources | 14 | 4.0 |
| Incidences of dental trauma witnessed at school | | |
| None | 249 | 71.6 |
| 1–2 | 68 | 19.5 |
| 3–4 | 27 | 7.8 |
| ≥5 | 4 | 1.1 |
| Believe in their ability to help a child with dental trauma | | |
| Yes | 85 | 24.4 |
| No | 263 | 75.6 |
| Would like to be informed about dental trauma | | |
| Yes | 330 | 94.8 |
| No | 18 | 5.2 |

Table 2: Crown fracture

| Question | Response | Number | Percentage |
|---------------------------------------|------------------------|--------|------------|
| Crown fracture | | | |
| 1. Dentition knowledge | Primary teeth | 38 | 10.9 |
| | Permanent teeth | 230 | 66.1 |
| | Don't know | 80 | 23.0 |
| 2. Use of fractured parts | Yes | 162 | 46.6 |
| | No | 48 | 13.8 |
| | Don't know | 138 | 39.7 |
| 3. Storage environment | Dry | 10 | 2.9 |
| | Moist | 123 | 35.3 |
| | Don't know | 215 | 61.8 |
| Luxation injury | | | |
| 4. Emergency management | Bleeding control | 242 | 69.5 |
| | Refer to dentist | 54 | 15.5 |
| | Don't know | 52 | 14.9 |
| Avulsion | | | |
| 5. Replantation | Yes | 196 | 56.3 |
| | No | 152 | 43.7 |
| 6. Time to replantation | 0-30 min | 70 | 20.1 |
| | Within 1-5 h | 48 | 13.8 |
| | Within 48 h | 24 | 6.9 |
| | Not important | 5 | 1.4 |
| | Don't know | 201 | 57.8 |
| 7. Storage medium | Water | 22 | 6.3 |
| | Saline | 54 | 15.5 |
| | Cold milk | 72 | 20.7 |
| | Child's mouth | 4 | 1.1 |
| | Antimicrobial solution | 48 | 13.8 |
| | Clean napkin | 32 | 9.2 |
| 8. Cleaning tooth before replantation | Yes | 206 | 59.2 |
| | No | 142 | 40.8 |
| 9. If yes, how | Cold water | 98 | 28.2 |
| | Soft toothbrush | 8 | 2.3 |
| | Antimicrobial solution | 57 | 16.4 |
| | Oral mouthwash | 4 | 1.1 |
| | Don't know | 39 | 11.2 |

were able to differentiate between deciduous and permanent teeth. In case of fractured tooth, 46.6% of the teachers were aware

that the fractured tooth fragment can be used for the treatment and 35.3% were aware that the fragment should be kept moist. Whereas, 61.8% were not aware of the use of fractured fragment for treatment.

When inquired about the luxation injury 15.5% of the teachers preferred to control the bleeding. Moreover, 69.5% were aware that the child should be referred to a dentist.

In case of avulsion 56.3% of the teachers were aware that the tooth can be used for replantation. Regarding the time of replantation, 20.1% of the teachers reported that it should be <30 min, while 57.8% of the teachers had no knowledge regarding the time. A large number of teachers (33.3%) were unaware of the storage media the preferred choices were 20.7% cold milk, water, 6.3% saline, 15.5% antimicrobial solution, and 13.8% as a storage media for avulsed tooth.

A total of 59.2% teachers were aware of the cleaning procedure. Out of which 28.2% preferred cold water, 16.4% antimicrobial solution for cleaning of the avulsed tooth.

In the present study, 40.8% of the teachers would refer the child to a dentist and 24.1% would refer the child to pediatric dentist [Table 3 and Figure 1].

DISCUSSION

Dental traumatic injuries (TDIs) have now become a very relevant issue in public health, not only because of their relatively higher prevalence but also because of their very strong influence on children's day-to-day deeds, such as running, sport practicing, and bicycle riding.^[5]

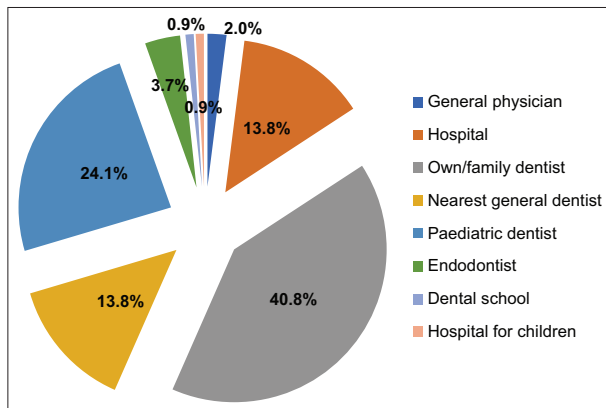
Approximately 50% of children had already experienced TDIs before finishing off their school. Based on this data of TDIs, it must be emphasized that school environment itself plays an important and crescent role in promoting health, prevention of numerous diseases, and accidents commonly occurring among children as well as teenagers.^[5]

Loss of any permanent tooth is a painful as well as a regretful experience for any pediatric patient. Various studies performed earlier highlighted the significance of well trained staff at school, who are most often supposed to respond to dental traumatic incident at the very first stage. The school system and teachers in schools, along with teaching, are becoming well aware and are actively participating in the proper healthcare of any child. We must use this for our benefit by taking needed measures to train school teachers to increase their awareness in field of dental trauma and their emergency management. Educational programs and dental camps might prove to be beneficial in this regard.^[1]

The results of the present study demonstrated that the knowledge of teachers regarding dental trauma is limited. About 75.9% of teachers did not have any training on management of traumatic injuries. About 71.6% of the teachers had never encountered any dental traumatic injuries which suggest they have a limited knowledge. A study conducted by Kaul *et al.* also showed similar findings, only 29.77% teachers had received first aid

Table 3: Health-care provider

| Healthcare provider | Number | Percentage |
|-------------------------|--------|------------|
| General physician | 7 | 2.0 |
| Hospital | 48 | 13.8 |
| Own/family dentist | 142 | 40.8 |
| Nearest general dentist | 48 | 13.8 |
| Pediatric dentist | 84 | 24.1 |
| Endodontist | 13 | 3.7 |
| Dental school | 3 | 0.9 |
| Hospital for children | 3 | 0.9 |

**Figure 1:** Health-care provider

training, and only 26.6% of teachers had ever witnessed a case of dental trauma.^[2]

When the teachers were asked to identify the affected tooth in case of tooth fracture. About 66.1% of the teachers were able to correctly identify the tooth. And 46.6% of the teachers were aware that the fractured fragment can be reused for treatment. This is similar to a study conducted by Nirwan *et al.*^[6] and Bhandary *et al.*^[7] where 74.6% and 72.4% of teachers were confident to distinguish between deciduous and permanent teeth. Arifan and Sonmez *et al.*^[8] reported that 7.6% respondents said that they would look for the broke tooth piece and only 45.3% teachers realized the importance of the broken part of the tooth.

In case of Luxation injuries, 69.5% of the teachers would try to control the bleeding and 15.5% of the teachers would refer the child to the dentist. This would be the most common reaction of any layman where the sight of blood would lead to focus on controlling the bleeding first. But only 15.5% of the teachers would refer the child to a dentist. This could lead to delayed management of the luxation injuries which could affect the long-term prognosis of the affected tooth. Similar findings were seen in studies conducted by Mohandas and Chandan^[9] would also reported that 57.5% of teachers would ask the child to bite on a handkerchief, and also similar to findings by Chan *et al.*^[10]

In the present study, when questions were asked regarding a case of avulsion, 66.1% of the teachers were able to correctly identify

the tooth. A total of 56.3% teachers were aware of replantation in case of avulsion, contrary to Chandukutty *et al.*^[11] (83.8%) and Taranath *et al.*^[12] (99%). Whereas Aluwalia *et al.*^[13] and Hashim *et al.*^[14] found that a lower percentage of teachers (36.8% and 19%) were aware of replantation as a choice of treatment in case of avulsion[®].

In the present study, 57.8% did not have any knowledge regarding the importance of extra-oral time on the prognosis of the concerned tooth. Whereas the study conducted by Singh *et al.*^[15] 41.8% of teachers were aware of the extra-oral time and its affect on the prognosis. When inquired about the storage medium for the avulsed tooth, the responses were 20.7% cold milk, saline 15.5%, and antimicrobial solution 13.8%. de Lima Ludgero *et al.*^[16] and Hashim *et al.*^[14] reported that only 5% and 4.3% of teachers were aware of correct storage media. Whereas Chandan *et al.*^[9] (49.6) and Ahluwalia *et al.*^[13] (47.4%) found that large number of teachers was aware of the correct storage media.

When the teachers were enquired about the method of cleaning the tooth before transporting it to the dentist, only 59.25% of teachers were aware of the cleaning process. Out of which 28.0% of the teachers preferred cold water for washing, which is contrary to Shamarao *et al.*^[17] Taranath *et al.*^[12] where 62.5%, 54.2% teachers were aware of the correct solution of cleaning a dirty avulsed tooth.

In the present study, 40.8% of the teachers would refer the child to a dentist and 24.1% would refer the child to pediatric dentist. The response is almost similar to the study conducted by Singh *et al.*^[15] where 43% of teachers preferred contacting the parents to take the child to a dentist. Whereas in a study conducted by Chan *et al.*^[10] showed that 66.7% of the teachers would refer the child to a dentist.

CONCLUSION

The results of this study point to the limited knowledge of school teachers about the emergency management of traumatic injuries of the teeth. Necessary measures needed to be undertaken to educate teachers and increase their knowledge. The time period following traumatic injuries is critical with regard to the prognosis of the tooth. For this, it is required that the first ones contacted by the child after the accident, have proper knowledge and awareness, which will help them to carry out expedite procedures in a timely fashion. Programs and guidelines should be formulated to train the teachers regarding first aid and emergency management of dental trauma.

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QUESTIONNAIRE

Demographic data/personel information

1. Gender
 - Female
 - Male
 - Other
2. Teaching experience(years)
 - <10
 - >10
3. Teaching specialization
 - Physical education
 - other
4. Do you have children?
 - Yes
 - No
5. Have you ever been trained or were informed about dental injuries?
 - Yes
 - No
6. If yes how?
 - During first aid course
 - Formal expert training/information
 - Information leaflets
 - Internet sources
 - Other
7. Would you like to be more informed on dental trauma injuries?
 - Yes
 - No
 - Maybe
8. Have you ever helped a child after a dental trauma injury at school?
 - Yes
 - No
9. If yes, how many dental trauma cases have you seen during school hours:
 - 1-2
 - 3-4
 - >5
10. Do you believe in your ability to help a child with dental trauma injury?
 - Yes
 - No

General question

After a dental trauma injury which type of health service would you seek first?

- General physician
- Hospital
- Your own/family general dentist
- Nearest general dentist

- Dental school
- Pediatric dentist
- Endodontist (Specialists in root canal treatment)

Dental trauma knowledge

CASE1-CROWN FRACTURE: During school hours a 10-year old girl falls in the school yard. Two upper front teeth are broken; otherwise, the girl is conscious healthy & unhurt in the rest of the body.

- I. The broken teeth are likely to be:
 - Temporary (Primary) teeth
 - Permanent teeth
 - Do not know
- II. You find the broken pieces on the ground. The piece:
 - Can be used again
 - Can't be used anymore
 - You don't know whether they can be used or not
- III. If broken piece can be used this should be stored in:
 - Dry environment
 - Moist environment
 - Do not know

CASE 2-LUXATION INJURY: A 13-year old boy is hit in the face during the break. As a result, 2 upper front teeth are moved laterally. Some bleeding is visible on the gingiva, otherwise the child is conscious, healthy and feels relatively well despite the trauma

- IV. What would you do?
 - Calm down the child, rinse the area with plenty of water & advise the child to bite on gauze for bleeding control before contacting the parents and referring to the dentist
 - Calm down the child, contact the parents & advise them to go with the child to the dentist
 - Do not know

CASE 3- AVULSION: During school hours a 15-year old boy got hit in his face. As a result, 2 upper front teeth are missing & is blood in his mouth. Otherwise the child is conscious & healthy. you find both teeth dirty in ground near the injured child.

- V. Can the teeth be repositioned?
 - Yes
 - No
- VI. If yes within which time limit can this be performed:
 - Immediately, within the first 30 min from the injury
 - Within the 1–5 h after the injury
 - There are no time limit restrictions
 - Do not know
- VII. How would you store the teeth until the child visit the dentist?
 - Inside water
 - Inside saline
 - Inside cold milk
 - In child's mouth

- Inside antimicrobial solution
- Inside clean handkerchief/napkin
- Do not know

VIII. Before you store them, would you clean them

- Yes
- No

IX. If yes, how would you do this?

- Rinse with plenty of cold water
- Gently brush the outer surface with a soft toothbrush
- Rinse with antimicrobial solution
- Rinse with an oral mouthwash
- Do not know