Evaluation of knowledge and attitude of school teachers about emergency management of traumatic dental injury

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Abstract

**Introduction:** Traumatic dental injuries (TDIs) are widespread in the population and are a serious dental public health problem among children. Dental trauma may cause both functional and esthetic problems, with possible impacts on the patient’s quality of life. **Aim:** To investigate teacher’s knowledge and attitudes of Mathura city about emergency management of TDIs in children. **Materials and Methods:** A total of 352 teachers from total 23 schools of Mathura city were included in the study. Data were collected through a survey, which included a self-administered questionnaire. The questionnaire consisted of three major parts containing multiple-choice questions. **Results:** Among the teachers 51.1% were males and 48.9% were females. Majority of the respondents, that is, 33.5% were between 31 and 40 years of age. Most respondents (34%) had more than 10 years of teaching experience. Majority of the teachers (39.2%) had educational qualification other than B.Ed. and M.Ed. degrees. Physical education teachers comprised the largest group of school teachers. Regarding knowledge and attitude, the teachers with 10–20 years of teaching experience, physical education teachers, and the teachers other than B.Ed. and M.Ed. qualifications had given more correct answers to the questions when compared with other groups. **Conclusion:** For the teachers having a low level of knowledge, there is a need for greater awareness to improve teachers’ knowledge and attitudes related to the emergency management of TDIs in children by organizing educative and motivational programs.

**Key words:** Attitude, dental trauma, knowledge

INTRODUCTION

Traumatic dental injuries (TDIs) are widespread in the population and are a serious dental public health problem among children.[1] It may cause both functional and esthetic problems, with possible impacts on the patient’s quality of life.[2] Primary and permanent anterior teeth are not only important for esthetics but also are essential for phonetics, mastication, integrity of supporting tissues, as well as psychological and mental wellbeing of children.[3] Sports account for 60% of TDIs, and schools are the place where one can find a noticeable risk of TDI.[3] A significant number of school-aged children experience trauma of some sort to primary or permanent dentition.[4]

The greatest incidence of trauma to the primary teeth occurs at 2–3 years of age, when motor coordination is developing. Most dental injuries occur to permanent teeth with incomplete root development in children in mixed dentition. Due to their immature motor coordination, these young children are predisposed to falls and hence are at a risk of sustaining TDIs.[1] When teeth and their supporting structures are subjected to impact trauma, the resultant injury manifests either as a separation or a crushing injury or a combination of both. Separation injuries are exemplified by displacement of teeth during which there is a cleavage of tissues, such as the periodontal ligament (PDL). This occurs during avulsions and extrusive luxations.[5] TDI
are usually a combination of trauma to the perioral soft tissues, teeth, and their supporting tissues. Dental injuries can be classified into: Enamel fracture, crown fracture without pulp involvement, crown fracture with pulp involvement, root fracture, crown–root fracture, luxation, avulsion, and fracture of the alveolar process.

Among the different types of dental trauma, avulsion results in the greatest functional and esthetic impairment due to its worse prognosis. Prompt and pertinent emergency management is not only the responsibility of the dentist but also of lay people, such as the parents and the school teachers available at the site of accident. School is one of the locations with the greatest prevalence of the occurrence of dental trauma in adolescents. Falls and collisions, followed by sports activities such as cycling and soccer, are the most prevalent etiological factors. There are various dental trauma that can be encountered during sports such as soft tissue injuries, fractures, TMJ injuries, tooth intrusion, tooth extrusion, crown and root fractures, and avulsion. Teachers are generally present at the time dental trauma occurs, as such accidents often take place during or after school activities. However, they have few/limited knowledge regarding the recommended course of action in such situations. It is therefore of fundamental importance for coaches, teachers, and undergraduate students in physical education to be duly informed with regard to the correct first-aid measures. So, school teachers should have knowledge of basic dental physiology and the treatment protocol for such injuries.

The questionnaire was pretested on 15 teachers, other than those who participated in the study, 2 weeks apart (test–retest). The questionnaire consisted of three major parts containing multiple-choice questions.

Part I comprised of information on the personal and professional profile of the respondents, including age, gender, length of service (teaching experience), topics they taught, and ultimately their level of education.

Part II of the questionnaire comprised questions assessing participants’ knowledge with regard to dental trauma. This part was further divided into the following sections:

- Basic knowledge on the growth patterns of children’s dentition
- General knowledge of dental trauma
- Knowledge of fractured teeth
- Knowledge of avulsed teeth

Part III of the questionnaire was aimed at evaluating the attitudes of the teachers and comprised of two questions: One regarding attitude toward referral of oral trauma and the other regarding teachers’ reaction to avulsion injuries.

All the data were entered in Microsoft excel and analyzed using SPSS package (version 22). The 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. The significance level was set at 0.05.

RESULTS

Our study comprised of 180 (51.1%) males. Majority of respondents, that is, 118 (33.5%) were in the age group of 31–40 years. Most respondents, that is, 120 (34%) had more than 10–20 years of teaching experience. Majority of the teachers, that is, 138 (39.2%) had educational qualification other than B.Ed./M.Ed., and physical education teachers 165 (46.9%) comprised the biggest group of school teachers [Table 1].

Regarding the question asked about frequently traumatized teeth, 148 teachers provided the correct response, which included 54 (36.2%) teachers who had worked for a period of 10–20 years, 117 (78.5%) were physical education teachers, and 50 (33.6%) teachers had B.Ed. educational qualification. Chi-square analysis indicated that physical education teachers and the teachers with education qualification other than B.Ed. and M.Ed. had given more correct answers.
to the questions when compared with other groups (P < 0.05).

When asked about child age most affected by dental trauma, 106 teachers provided the correct answer. Teachers in the second decade of service, 44 (41.5%); physical education teachers, 72 (67.9%); and the teachers having educational qualification other than B.Ed. and M.Ed., 71 (67%), gave more correct answers to the questions when compared with other groups (P < 0.05).

A total of 151 teachers gave the correct response when asked about the trauma management. Teachers in the second decade of service 60 (40%), physical education teachers 118 (78.7%), and the teachers with educational qualification other than B.Ed. and M.Ed. 69 (46%) gave more correct answers to the questions when compared with other groups (P < 0.05).

When enquired about the type of frequently affected teeth, 164 respondents provided the correct answer, of whom 49 (29.9%) had worked for 10–20 years, 119 (72.6%) were physical education teachers, and 70 (42.7%) teachers had educational qualification other than B.Ed. and M.Ed. degree. Chi-square analysis indicated that physical education teachers and the teachers with educational qualification other than B.Ed. and M.Ed. had more correct answers to the questions when compared with other groups (P < 0.05).

Regarding the extra-alveolar time limit, 147 teachers gave the correct answers. Chi-square analysis indicated that 111 (75.5%) physical education teachers and 62 (42%) teachers with educational qualification other than B.Ed. and M.Ed. gave more correct answers to the questions when compared with other groups (P < 0.05).

A total of 256 teachers gave the correct response when asked about the storage medium for the avulsed teeth. It was found that 136 (53%) physical education teachers gave more correct answers to the question when compared with other groups (P < 0.05) [Table 2].

Regarding trauma referral, 48 (14%) thought that it was crucial to refer the child to a clinician in the case of any trauma. It was found that 16 (33.3%) literature teachers gave more correct answers to the question when compared with other groups (P < 0.05) [Table 3].

**DISCUSSION**

Appropriate management is very much important for the future prognosis of teeth affected by TDIs, especially in young children. Those most likely to be involved at the site of a TDI are school-aged children and school teachers, making teacher knowledge of TDI emergency management fundamental to the provision of correct care to an injured child.\[^1\]

The sample population comprised of 51.1% males. Similarly, a study done by Hossein et al.\[^8\] comprised of 52% males. In terms of age, the majority of the respondents (33.5%) were between 31 and 40 years of age, which is in accordance to the study conducted by Bayrak et al.\[^1\] in which 36.7% were between 31 and 40 years of age. In contrast, Hossein et al.\[^4\] showed that majority of respondents were between 41 and 50 years of age. In this study, most respondents (34.1%) had 10–20 years of teaching experience, which is similar to the study conducted by Hossein et al.\[^4\] In contrast, majority of the respondents had 0–10 years of teaching experience in the study done by Chan et al.\[^9\]. In this study, 39.2% teachers held degrees other than the B.Ed. and M.Ed. degrees as their educational qualification, which is in contrast to Hossein et al.’s\[^8\] study. Physical education teachers (46.9%) comprised the biggest group of school teachers in this study, whereas physical education teachers (3.8%) comprised the smallest group of school teachers in the study done by Bayrak et al.\[^1\].
In this study, 30.1% correctly told the child age most affected by dental trauma, which is in accordance to the prolonged interaction with school children.

Regarding the frequently traumatized teeth, 42% teachers gave the correct answer, that is, anterior teeth of the maxilla, in the present study. However, Hossein et al.\textsuperscript{[8]} concluded that 66.2% provided the correct response. They found that physical education teachers were more familiar with the type of tooth that is frequently affected by traumatic accidents. These positive traits are believed to have originated from their prolonged interaction with school children.
study conducted by Hossein et al.\(^8\) in which 37.5% teachers gave the correct answer. Due to their immature motor coordination, these young children are predisposed to falls and hence are at risk of sustaining TDIs.

In this study, when the teachers were asked about the trauma management, 43% teachers correctly preferred to immediately contact the parents to take the child to a dentist, similar to the study done by Hossein et al.\(^8\) However, in contrast Chan et al.\(^9\) concluded that 66.7% gave the correct response.

Regarding frequently affected avulsed teeth in the present study, 46.6% gave the correct answer, that is, anterior teeth, which is in accordance with the study conducted by Caglar et al.\(^10\) (50%). In contrast, Hossein et al.\(^8\) found that 61.9% teachers gave the correct response.

In this study, 41.8% teachers gave correct answer regarding the extra-alveolar dry time, that is, 30 min, otherwise it causes loss of normal physiological metabolism and morphology of periodontal ligament cells. The study conducted by Zakirullah et al.\(^11\) also revealed the similar results. On the contrary, the study conducted by Sankar et al.\(^12\) concluded that only 1% gave the correct response.

In this study, 87% teachers gave the correct answer regarding storage medium. In contrast, the study conducted by Hossein et al.\(^8\) and Chan et al.\(^9\) only 34.9% and 27.6% teachers, respectively, gave the correct response. The suitable storage media to allow periodontal and pulpal healing are milk, physiological saline, and saliva. Cold milk serves as an appropriate medium for avulsed teeth for up to 3 h, because of its optimum osmolarity and pH composition, whereas physiological saline remains effective for only 30 min. Storage in tap water should be considered the last option as its hypotency may result in necrosis of the cells in the periodontal membrane, whereas storage in saliva may cause infection of the periodontal membrane and also risk of swallowing in young children. At the site of the accident, however, only saliva is always available for storage purposes.\(^8\)

When asked for trauma referral, only 14% gave the correct response in our study, which is in accordance with Arikan et al.\(^5\)\(^1\) study. On the contrary, the study conducted by Hossein et al.\(^8\) showed that nearly 51.1% teachers gave the correct response.

Thus, there are some steps that can be considered to improve the knowledge level among school teachers and parents:

- Identification of the target group in the teacher’s community. It comprises of class teachers, physical education teachers, life sciences teachers, and the principal as they directly come in contact with school children\(^11\)
- School teachers should ensure a safe environment during physical education lessons to identify the causal factors for the design of appropriate preventive measures to reduce incidents such as collisions, fights, and falls
- Educational programs such as incorporation of emergency management of dental injuries in the curriculum of physical education teachers should be considered
- For teachers and parents, dental and medical institutional authorities in coordination with the school authorities should plan such educative programs so that they can educate the children
- First-aid management of dental trauma should include in the teacher training curriculum, would help the teachers act in a better way when faced with such situations
- Dental camps should be held for school children every year, implementing such awareness lectures highlighting emergency management of dental traumatic injuries occurring in children for teachers and parents on a regular basis, would help in reinforcing their knowledge
- Dental checkup camps should be organized to identify high-risk group, such as children with proclined teeth, and informing their parents about prevention and possible treatment options\(^13\)
- Intervention program should be developed to target the parents to avoid unnecessary loss of permanent tooth due to avulsion injury so the tooth can be retained in function for life
- Television and the Internet can be the source of information regarding TDIs for parents.\(^14\)

Many dentoalveolar injuries can be prevented by the use of well-fitted, properly constructed mouthguards, face cages, helmets in any sport in which there is a risk of sudden impact to the face. So it is the responsibility of physical education teachers and sports coaches to identify potentially dangerous sports in their area and recommend the use of safety equipment.\(^9\)

Dentists play a role in educating the public in the use of protective equipment for the prevention of oro-facial injuries during sporting and recreational activities and to provide knowledge to parents and patients regarding prevention of orofacial injuries and can prescribe, fabricate, or provide referral for mouthguard protection for patients at increased risk for orofacial trauma.\(^15\)
Jackson et al. in their study have compared the impact of pressure-laminated (LM), custom-made, properly fitted MGs to over-the-counter (OTC) MGs on the mild traumatic brain injuries (MTBI). Twenty-four MTBI/concussion injuries (5.8%) were recorded and there was a significant difference (=0.0423) with incidence rates of 3.6% and 8.3% in the LM MG and OTC MG groups, respectively. It was concluded that wearing custom-made LM MGs reduced the incidence of MTBI when compared with OTC MGs.[16]

Yamada et al., in their study, found that the incidence of oral injuries was 32.3% for soccer athletes and 56.5% for rugby athletes, with 0.8% and 24.1% of the respective groups having mouthguards. They found that many soccer athletes had insufficient knowledge about mouthguards and were not concerned about preventing oral injury. It was concluded that athletes as well as coaches must be made aware of the high risk of oral injury when playing sports.[17]

CONCLUSION

There is an increased awareness in the teachers having 10–20 years of teaching experience, physical education teachers, and the teachers with educational qualification other than B.Ed. and M.Ed. degrees compared with other groups.

For the teachers having a low level of knowledge, there is a need for greater awareness to improve teachers’ knowledge and attitudes related to the emergency management of TDIs in children.

Various methods may be used to improve knowledge of school teachers, including educational brochures and posters, lectures, courses, seminars, and regular visits to the school dentists. Furthermore, to achieve adequate awareness, further educative and motivational programs can be planned, developed, and organized in the schools. Based on this, the use of seminars and lectures during formal and continuing education may be recommended. With the many sports that children play, such as soccer, basketball, football, baseball, and all kinds of skating, it is recommended that dentists fabricate mouthguards for all, especially children who participate in organized and unorganized sports.

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