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Dental trauma management and it's awareness in school teachers: A survey in Burhanpur, Madhya Pradesh, India

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Abstract

Aim: To evaluate knowledge and awareness of school teachers in respect to manage the dental trauma, check the background of dental trauma education and to estimate the incidents during their teaching experience.

Introduction: The most commonly affected part of the body during accidents and sports injuries in kids are teeth and the surrounding structures. Traumatic dental injuries are a major pediatric concern for the dentist, parents and the society. School is one of the locations with the greatest prevalence of traumatic dental injuries. A significant number of school-aged children experience trauma of some sort to primary or permanent dentition.

Methodology: A two stage sampling procedure was followed in the section of the study participants during the first stage by applying simple random sampling procedure, 24 schools out of the total 471 schools from the entire district were selected. In the second stage by considering each selected school as a cluster/unit, the total number of school teachers in each cluster who were present on the day was 285 included as study participants; thus a total of 285 school teachers constituted the final sample.

Results: Out of the 285 teachers who participated in the study, 136 had less than 6 years teaching experience 68 had 6-10 years, 39 had 11-15 years 23 had 16-20 and 19 teachers had more than 20 years of experience.

Discussion: Majority of teachers responded that the upper front teeth are most commonly traumatized and female teachers were more knowledgeable compared to their male counterparts, regarding the growth pattern of child's dentition. This can be owed to the caring nature and closeness of female to children.

Keywords: dental trauma, school teachers, survey, burhanpur

Introduction

Children and mishaps are inseparable. Kids while playing are more prone to get hurt. The most commonly affected part of the body during accidents and sports injuries in kids are teeth and the surrounding structures. Traumatic dental injuries are a major pediatric concern for the dentist, parents and the society.

In the early 90s, Andreasen^[6] hypothesized that dental trauma, in the future, will probably exceed dental caries and periodontal diseases. Since that hypothesis was made, several studies have been conducted in different populations and reported 7%–50% of the child population has sustained an orodental injury by the age of 15 years.

Nirvan *et al* reported that boys are comparatively more affected by traumatic injuries than girls. It has also been noted that maxillary central incisors has highest incidents of getting fractured followed by mandibular central incisors, mandibular lateral incisors and maxillary lateral incisors.

School is one of the locations with the greatest prevalence of traumatic dental injuries^[2]. A significant number of school-aged children experience trauma of some sort to primary or permanent dentition where teachers are generally present at the time dental trauma occurs, as such accidents often take place during or after school activities^[1].

Furthermore, TDI could adversely affect the developing occlusion and esthetics. Cortes *et al*. reported that children with fractured teeth had a greater negative impact on eating and enjoying food, cleaning teeth, smiling, laughing than children without injury.

The development of the occlusion both functionally and esthetically during childhood is dependent on the satisfactory presence of teeth. When a trauma is inadequately treated, disastrous results can occur as malformed, malpositioned teeth, premature tooth loss, and pulpal death with abscess formation [4]. The prognosis of the injured tooth depends on the crucial hours following the accidents. Educational initiatives planned to inform teachers can positively influence their knowledge and attitudes towards emergency management of dental trauma, consequently leading to a more favorable prognosis [5]. Therefore, it is necessary that not just the parents but also teachers present at the site of the accidents should be well trained in dealing with such unwanted events.

In this study our aim was to evaluate knowledge and awareness of school teachers in respect to manage the dental trauma, check the background of dental trauma education and to estimate the incidents during their teaching experience.

Materials and Methods

The present descriptive cross sectional study was conducted among the various government and private schools located in Burhanpur District of Madhya Pradesh, India by the Department of Public Health Dentistry, Guru Gobind Singh College of Dental Sciences and Research Center. A two stage sampling procedure was followed in the section of the study participants during the first stage by applying simple random sampling procedure, 24 schools out of the total 471 schools from the entire district were selected. In the second stage by considering each selected school as a cluster/unit, the total number of school teachers in each cluster who were present on the day was 285 included as study participants; thus a total of 285 school teachers constituted the final sample. The permission for the study was taken from the District Education Officer. The schools were selected in order to represent the whole district by cluster random sampling technique. Written permission was obtained from the head of the selected schools, and the appointments were scheduled before proceeding for the survey in order to avoid the interruption of the regular classes. Schools teachers selected were teaching the students/children aged 3 to 15 years. Study was conducted from 15th June to 30th June 2018. The teachers were explained the nature and purpose of the study in local language i.e. Hindi. The printed questionnaire was prepared based on the needs of study after referring similar questionnaire used in the studies conducted in different parts of the world [7-9].

The data was collected using self-administered questionnaire having eleven questions. The questions consisted of one open ended and ten closed ended questions. The questionnaire consisted of two major parts. Part 1 comprised of information on the personal and professional profile of the respondents, typically covering age, gender and length of service and their qualification. Part 2 of the questionnaire comprised of questions assessing participants' knowledge with regard to dentition and dental trauma and evaluating the attitudes of teachers towards dental trauma, their experience and management.

The data obtained from studies was used investigate the effect of age, gender, length of service, qualification on their knowledge and attitudes towards dental trauma. Statistical analysis was performed using Windows SPSS 23.0 version. Discrete groups were compared by Chi-square (χ^2) test. A two-tailed ($\alpha = 2$) $P < 0.05$ was set as statistical significance.

Results

Out of the 285 teachers who participated in the study, 136 had less than 6 years teaching experience 68 had 6-10 years, 39 had 11-15 years 23 had 16-20 and 19 teachers had more than 20 years of experience.

Among 24 schools the formal training of first aid the teachers below 6 years of training had the lack of training (96.3%) in the urban areas. The young teachers were found to be more trained than the senior ones with female ratio is equal to male ratio with the difference of 0.99%. A point to be noted here is that 3.8% of private teachers received formal training compared to government teachers with only 1%.

We also found that 85% of teachers with teaching experience of 6-10 years were aware about the most frequently affected teeth by traumatic accidents with the observation of awareness, percentage decreases with increased teaching experience. Graduated teachers with B.Ed. degree (86.8%) also showed a good knowledge of most commonly affected teeth in traumatic injury. School teachers in the middle age group are the most known group with female domination of 84%.

The senior most qualified and experienced teachers have witnessed the highest number of dental trauma injuries with 36.8% and 56% respectively whereas young teachers have witnessed the least. In a nutshell, with increasing age and experience the observation of traumatic injuries also increases. Females teachers have observed more cases compared to males 38%. Government school teachers outnumbering the private ones (52.6%) with graduated teachers (66.4%) has never witnessed any case of traumatic dental injury in school and 33% has witnessed. Among the teachers holding B.Ed. degrees 37.7% observed dental injuries while 63.2% have not. The significant difference in their qualification ($p > 0.040$).

Teachers in the age group of 51-60 years have the least experience of seeing any dental injury (69.6%) while 46.7% of the age group of 41-50 years have observed highest number of cases.

Teachers when asked about the kind of trauma they observed in dental injury answered with other than broken or avulsed tooth with bleeding 63.9%. Teachers of rural areas observed traumatic incidents of broken tooth without bleeding with highest number of times i.e. 100% whereas the urban area teachers had no idea of dental trauma. (63.4%) giving us the conclusion that majority of teachers haven't witnessed any dental trauma giving significant value of $p > 0.001$. The post graduate and graduate teachers with B.Ed. degree (24.5% and 27.5 %) noticed broken tooth with bleeding. the teachers in the age group 51-60 years has least knowledge of the kind of trauma among kids 69.6%. Avulsion is the least common traumatic accident (23%) by the school teachers.

The choice of teachers for management of trauma in the children is to inform their parents and take them to dentist especially by the most experienced teachers (63%) and the least being reassurance to the child in the opinion of teachers. Rural areas teachers have opted for searching of tooth pieces and taking the child to the dentist. Females have selected the option for contacting parents with highest number of times giving us the significant value of ($p < 0.029$)

The teachers believe that broken tooth pieces cannot be reattached in the least experienced groups. (47%) and, urban areas (47.2%). the young age groups (64.3%) and 64.4% females thinking that it can be attached.

Teachers when asked about replantation of teeth had no clue whether it is possible or not. The post graduated teachers

(51.4%) had the opinion that a broken piece cannot be reattached. 10% males have agreed that the broken tooth can be reattached.

60.7% Teachers have no idea about management of the tooth affected by traumatic accidents. Teachers having experience between (16-20 years) have opted for the choice that replantation of teeth should be done within 30 minutes of the accident. Highly qualified teachers (10%) believed that best treatment would be done within few hours of accidents. Under experienced (11%) and post graduated teachers of private schools (10%) believed that treatment can be done at any time. The washing medium of choice by 52.6% teachers is tap water/antiseptic/alcohol rinse. Teachers in rural areas believe that scrubbing the tooth thoroughly will be the ideal choice. 38% Elder group teachers (51-60years) suggested of putting the tooth back into its position.

Best storage media according to the 56.1% teachers is tap water especially those having experience of above 20 yrs. Storage in child's mouth is the least chosen option (1.8%). Majority of post graduates (47.1%) think that saline would be a better storage media. 7.5% Highest degree holders gave priority to milk for storage.

When enquired about confidence levels among teachers for managing such incidences, 74.65% were found to be under confident, 26.1% teachers were confident highest being from the age group of 16-20 years. Newbies are found to be less confident.

Discussion

The present study was conducted over 285 school teachers of Burhanpur, Madhya Pradesh to assess the knowledge, awareness, and attitude towards the emergency management of dental trauma in school children. In the present study, only 3.7% of school teachers had received first aid training and only 37.7% of teachers had ever witnessed a case of dental trauma. In the present study majority of teachers responded that the upper front teeth are most commonly traumatized. This is because there is increased risk of traumatic dental injuries to the upper front teeth if the patient has a pronounced over jet with protrusion in combination with inadequate lip coverage [10]. Similar results were obtained in studies conducted by Feldens EG *et al.*, Baginska J *et al.*, but a higher response rate was observed in a similar study conducted by Nikam AP *et al.* [12-14]. It was also noteworthy that female teachers were more knowledgeable compared to their male counterparts, regarding the growth pattern of child's dentition. This can be owed to the caring nature and closeness of female to children [15]. Similar results were obtained in a study conducted by de Lima Ludgero *et al.* [16] at Brazil (60.4%) and Hashim [17] at the UAE (44.1%). Contrary to this, only a few schoolteachers could correctly identify the tooth in the study conducted by Mohandas and Chandan [8] at Bengaluru, India, and Nirwan *et al.* [18] at Jaipur, India (24.4% and 33.2%, respectively).

Avulsion is more common in children as the bone is in the formation stage and is not completely mineralized and more resilient, thus any injury or trauma to tooth at this stage causes the tooth to avulse instead of getting fractured [19].

In the present study, majority i.e. 63% would contact the parents and advise them to take the child to a clinic. Similar results were found in the study conducted by Mohandas and Chandan [8]. Contrary to this, the study conducted by Kaul *et al.* [15], resulted that despite the anxiety involved in seeking emergency care for an injured child, majority of the school teachers (60.99%) stated that they would ask the child to

keep the tooth safely in his mouth and take him to nearest dental clinic or dentist.

In the present study regarding the knowledge and management of avulsed tooth the response rate was poor [Table 1]. Lower awareness was reported in study conducted by Vergotine RJ *et al.*, in which only 12% of the academic teacher and 7% of the physical education teachers responded correctly to immediate management of avulsed tooth [25]. However, studies conducted by Mesgarzadeh AH *et al.*, and Caglar E *et al.*, Sae-Lim V *et al.*, reported more awareness of 50%, 43% and 74% respectively [7, 21, 22]. Regarding the promptness of replantation of an avulsed tooth, most of the school teachers responded correctly that tooth should be replanted as early as possible whereas lower awareness was reported in studies conducted by Mesgarzadeh AH *et al.*, Chan AW *et al.*, and Al-Jundi SH *et al.* [7, 23, 24]. Since the ideal treatment for avulsed teeth is immediate replantation, the promptness in providing such treatment will have a direct bearing on the outcome [24].

When asked about the solution, they will use to clean the avulsed tooth with; maximum teachers opted for an antiseptic solution to clean the tooth. This might be due to their intention to kill germs on the dirty tooth; however, they did not realize that doing this might hamper viability of cells of periodontal ligament at the same time. Similar results were observed in the study conducted by Mohandas and Chandan [8] and Kaul *et al.* [15] where only a few school teachers were aware of the correct solution to clean dirt avulsed tooth with.

A major factor which influences the prognosis of reimplantation is that the storage medium in which the tooth is kept should have pH and osmolarity compatible for maintaining the vitality of Periodontal Ligament (PL) cells. Currently milk is considered as one of the best storage medium because of ideal physiological properties which helps in maintaining the vitality of PL cells for upto six hours. Moreover milk is easily available at the time of accident [26, 27]. Storage in tap water should be the last resort because of its hypotonicity, which would lead to necrosis of PL cells [31]. While storing in saliva at the buccal vestibule may lead to infection of the periodontal membrane and the risk of swallowing in young children [32]. Hypotonic medium such as saliva and water can cause rapid cell lysis and increased inflammation on replantation [33, 31]. According to Trope M, the appropriate biological medium for the storage of an avulsed tooth until replantation should keep the vitality of periodontal ligament cells, reduce inflammatory response and prevent sequelae such as ankylosis and root resorption [32]. Regarding the storage media for avulsed tooth in the present study only 7.5% of the school teachers chose milk [Table 2]. The awareness regarding storage media for avulsed tooth was low in our study which was similar to studies conducted by Mesgarzaden AH *et al.*, and by Pithon MM *et al.*, [7, 33]. Majority of teachers in our study have opted for tap water or bottle of normal saline or antiseptic solution as storage media for the avulsed tooth. The low awareness rate regarding the appropriate storage medium might be mainly due to the fact that teachers were not aware that maintaining the viability of periodontal ligament cells is more important than making the tooth germs free. The response rate was higher in studies conducted by Namdev R *et al.*, and Young C *et al.*, [37, 34], whereas, it was found to be lower in studies conducted by Nikam AP *et al.*, Chan AW *et al.*, and Al-Asfour A *et al.*, [14, 23, 38].

The loss of a permanent tooth is a painful and regretful experience for any patient. Studies have indicated that the

majority of TDI's occur at school [24, 39, 40] and highlight the importance of trained/experienced school staff, who are most often required to respond initially to the traumatic incident. The school system and teachers in India, besides imparting education, are becoming increasingly aware and are taking an active part in the proper health care of a child. We can use this to our advantage by taking necessary measures to help teachers increase their knowledge regarding emergency management of dental trauma. The identification of causal factors and high-risk group patients proves beneficial for design of appropriate preventive measures. Educational programs and dental camps can prove to be beneficial in this regard. Mounting posters, leaflets, and media campaigns to educate teachers can prove to be of vital importance. Programs to update teachers' knowledge about dental trauma management in addition to first aid training need to be included in basic teacher training programs. Further studies to assess and compare the knowledge and attitude regarding emergency management of dental trauma would give a broader perspective.

Recommendations

1. Planned teachers training programme for physical education teachers to give knowledge in emergency and first aid management in every school.
2. Timely CDE programmes to be conducted for upgrading dental professional's knowledge about managing traumatic dental injuries.
3. Hank's Balanced Salt Solution (HBSS) to be included in the first aid kit in every government and private school.
4. Interaction between teachers and dentists through parent teacher meetings: can be a good way for bringing awareness on this subject.

Conclusion

Through this survey, we have drawn this conclusion that school teachers especially handling the middle and primary school should receive formal training in first aid. With increase in experience and age group teachers had a better response towards management of traumatic dental injuries. Extreme minimal knowledge about replantation of avulsed teeth was observed among the teachers. It is suggested that the awareness regarding management of avulsed teeth should reach common people through the mass media i.e. advertisements and newspapers.

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