



Prevalence of Traumatic Dental Injuries in school going children of Parbhani city, Maharashtra

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ABSTRACT: Introduction: Dental trauma is relatively a significant problem in children which requires immediate attention. It can occur at any age, but mostly seen amongst children. It imposes physical and psychological discomfort, pain and other implications over child's health.

Aim: This study aimed to assess the prevalence of Traumatic Dental injuries (TDIs) among 4 to 12 years old school going children in Parbhani city, Maharashtra, India.

Method: A cross-sectional study was carried on 6510 school children (4 to 12 years) from various areas of city using multistage random sampling method. The data regarding the TDIs was recorded clinically using Ellis and Davey's classification. The data was analyzed using the SPSS (Version 20) statistical software program with level of significance at $P \leq 0.05$. The Chi – Square test was employed to evaluate the results for the prevalence of dental trauma in association with age, gender, number of teeth involved and type of injury

Results: Prevalence of traumatic injuries in 4 to 12 year old children in Parbhani city was found to be 3.34% (n=218). 60.55% (n=162) of males and 39.44% (n=86) of females had TDIs. 42.66% (n=93) of injuries were found in age group of 7 to 9 years. Single tooth trauma was observed in 90.82% (n=198) of children while enamel fractures were seen with the highest frequency in 63.30% (n=138) of children.

Conclusion: Children in the age group of 7-9 year were more commonly affected by TDIs and it was found to be more in males (60.55%) as compared to females (39.44%). Thus, awareness programs and community health activities should be carried out with various preventive measures to reduce the prevalence of TDI and thus the financial cost of the treatment.

I. INTRODUCTION

Quality of any individual's life mainly focuses on health care of a person which emphasizes on function, speech and appearance being the most important part now a days. It has strong influence over self-esteem, social interaction and psychology of a child. Therefore, it is not surprising that dental problems and appearance of the anterior teeth are linked to social, psychological and emotional well-being.¹

Today, TDIs have become a public health issue due to various reasons such as, firstly, it occurs frequently to the oral region and accounts for 5% of all injuries. Secondly, the younger age of the patients who are more prone to trauma. Third, TDIs are very complicated and expensive to treat, needs a multidisciplinary approach involving the participation of various specialists and lastly, unlike other injuries, dental traumas are irreversible to treat and thus their treatment will more likely to continue throughout the life.²

Most of the maxillofacial and dental injuries are due to falls, fights, assaults and during sports which are associated with physical or psychological discomfort, pain and other implications. Predisposing factors includes various facial anatomic features like proclined maxillary teeth, class II malocclusion and class III malocclusion, bimaxillary protrusion, skeletal maxillary prognathism, increased overjet, open bite and incompetent lips.³

Various epidemiological studies indicate that TDI being a significant problem presently and in near future, exceeding its incidence than that of caries and periodontal disease in younger age population. The prevalence for TDIs in primary dentition has been found to be ranging from 9.4% to 41.6% and in permanent dentition between 6.1% to 58.6%.⁴ Such a huge variation may be influenced by different factors including study size and population, geographical location, education and



lifestyle, differences in cultural behavior, type of study and involvement in sports and various outdoor activities.⁵

There have been various studies over prevalence of TDIs in India.^{6,7,8,9} There is no published literature reported on prevalence for dental trauma in Marathwada region, Maharashtra. So, the aim of the present study is to assess the prevalence of traumatic dental injuries (TDIs) to the anterior teeth among 4-12-year-old students in Parbhani city, Maharashtra, in association with age group, gender, type of dental injury and number of teeth traumatized (Single or Multiple teeth injury).

II. METHODOLOGY

This is the cross-sectional survey conducted over 6510 school students (3645 boys and 2865 girls) between 4 to 12 years of age in Parbhani city, Maharashtra, to evaluate the prevalence of traumatic dental injuries.

The study was conducted on the basis of multistage random sampling method. The schools were selected on the basis of location. The map of Parbhani city was adopted, studied and was divided into five zones namely, north, east, south, west and central zone. In the first stage, a list of all the schools across each zone including their address, phone numbers, number of sections and approximate number of children was obtained; in the second stage, schools were distributed by areas i.e. private and public schools taking the socio-economic status into consideration to avoid bias; in the third stage, equal number of schools were randomly selected from each area to have an equal distribution.

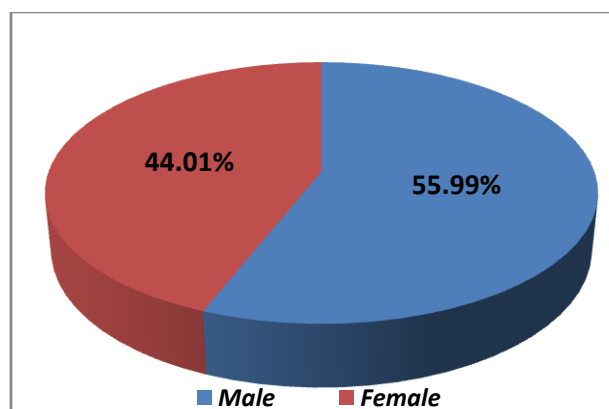
Before proceeding with the study, ethical clearance was obtained from the Institutional Ethical Committee of Saraswati Dhanwantari Dental College and Hospital, Parbhani. Formal letters were sent to the respective schools to get the prior permission for conducting the examination. Aim, characteristics and importance of the study were explained properly to all the staff, parents or local guardians.

Children were divided in three age groups of 4 to 6 years, 7 to 9 years and 10 to 12 years to assess the age-wise prevalence of trauma. Maxillary anterior teeth were included in the study. The examination was done with mouth mirror and probe in natural light by direct vision. Daily around 1200 students were examined in around 2-3 schools.

Dental trauma was recorded on the basis of Ellis and Davey's classification (1960). It only included Ellis and Davey's class I, class II, class III, class IV, class V and class IX as vitality tests and radiographs were not used to assess the extent of the teeth fracture in the school premises. All the information regarding age, gender, number of injured teeth, extent of tooth structure involved and cause of injury was carefully recorded.

The data was subsequently processed and analysis was done by descriptive statistics (frequency distribution and cross-tabulation). The data was analyzed using the SPSS (version 20) statistical Software program. The Chi – Square test was employed to evaluate the results for the prevalence of dental trauma in association with age, gender, number of teeth involved and type of injury.

Figure 1: Demographic characteristics of the study participants (N=6510)



A. Gender

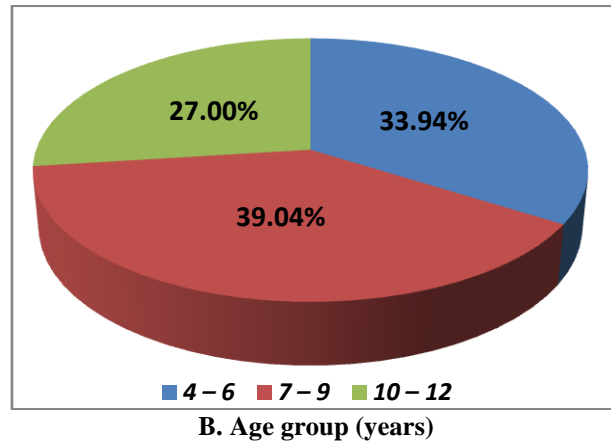


Figure 2: Prevalence of traumatic dental injuries among study participants (N=6510)

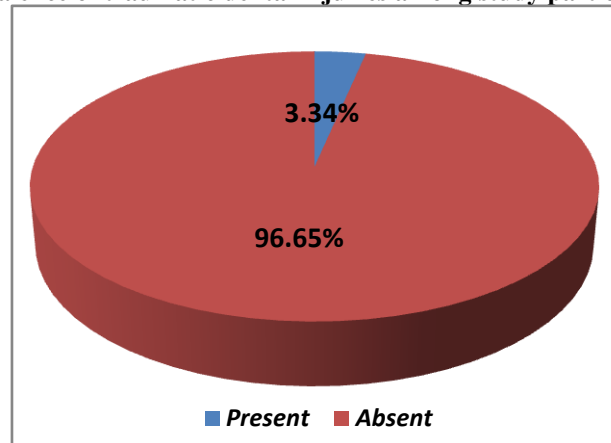
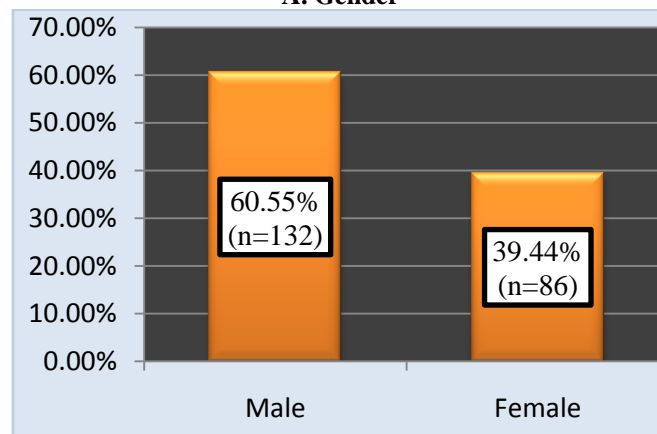
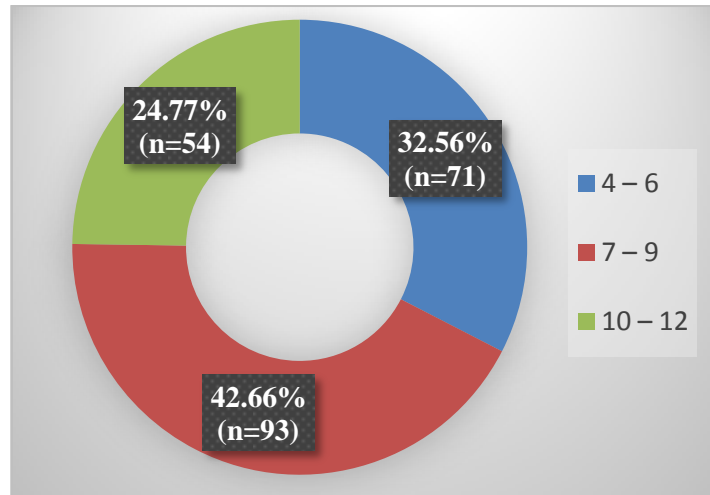


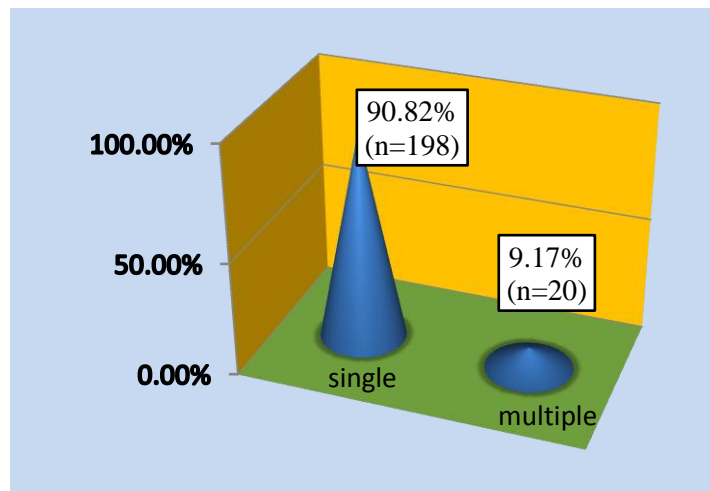
Figure 3: Frequency distribution of 4 to 12-year-old school children with traumatic dental injuries (N=218) according to different variables

A. Gender

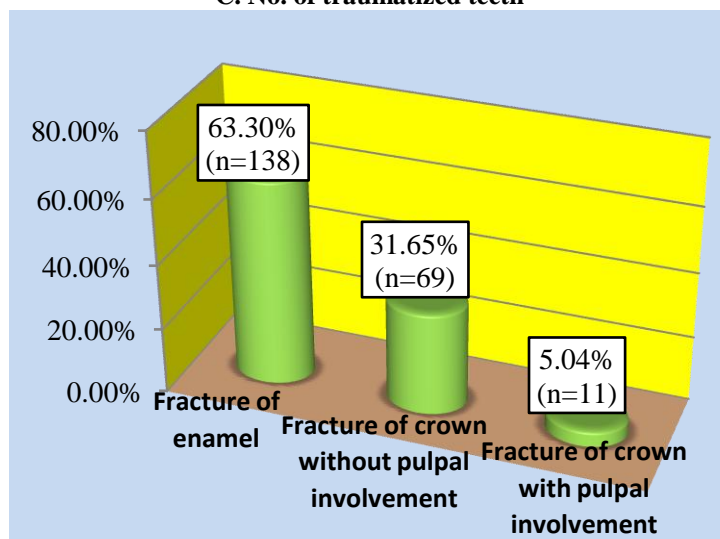




B. Age group (years)



C. No. of traumatized teeth



D. Type of injury



Table 1: Distribution of study participants with traumatic dental injuries (N=6510) according to gender

			Trauma		Total
			Present	Absent	
Gender	Male	Count	132	3513	3645
		% within Group	3.62%	96.38%	100.0%
	Female	Count	86	2779	2865
		% within Group	3.01%	96.99%	100.0%
Total		Count	218	6292	6510
		% within Group	3.34%	96.66%	100.0%

Chi square value: 1.903 P value: 0.1677

Table 2: Distribution of study participants with traumatic dental injuries (N=6510) according to age groups

			Trauma		Total
			Present	Absent	
Age group	4 – 6	Count	71	2139	2210
		% within Group	3.21%	96.79%	100.0%
	7 – 9	Count	93	2449	2542
		% within Group	3.66%	96.34%	100.0%
	10 – 12	Count	54	1704	1758
		% within Group	3.08%	96.92%	100.0%
Total		Count	218	6292	6510
		% within Group	3.34%	96.66%	100.0%

Chi square value: 1.297 P value: 0.522

III. RESULTS

Total of 218 students (3.14%) aged between 4 to 12years were found to have TDI among 6510 students screened.[Fig2]

Highest frequency was found among boys (60.55%, n=32) than in girls(39.44%, n=86), which was not significant(P=0.1677) [Table 1][Fig3-A]. Mainly, 7 to 9year old students were affected most (42.66%, n=93), which was not significantly high(P=0.522) [Table 2] and least prevalence was

observed in 10 to 12years old students (24.77%, n=54).[Fig3-B]

More of the students had trauma to the single tooth i.e. in 198 students (90.82%) and only 20 students had trauma to the multiple teeth (9.17%). [Fig3- C]

In reference to the extent of fracture, highest frequency was found among the students having fracture limited to enamel (63.30%, n=138) while



only 11 students had crown fractures with the pulpal involvement (5.04%). [Fig3- D]

IV. DISCUSSION

Traumatic dental injury is not just mere a result of disease but the consequence of several demographic factors or risk factors such as overjet, overbite that will accumulate throughout the patient's life if not properly treated.

School-going children have been focused in the present study because of the ease of accessibility and their routine oral examination can be conducted as a part of survey which carries concern towards them in this age and allay fear. This study includes the age group of 4 to 12 years old children as this age is more prone to trauma, where 4-6 years old children began to schooling with various outdoor activities and 7-12 years old children tend to show often involvement in sports. Also, children during middle childhood are in formative period facing new challenges with gradual growth and development of dentition and mid-facial structures.

Present study states that the prevalence of TDIs to maxillary anterior teeth was found to be 3.34% which came to be lower as compared to the earlier studies done by Rahul Hegde & Geet Agrawal in 2017, in which it was 7.3% (Kharghar-Belapur, Navi Mumbai) and another study by Sharva V. in 2017, where they found prevalence of TDI to be 12.8% (Bhopal District).^{10,11}

In this study, 132 out of 218 participants were boys who had dental trauma which shows higher frequency of prevalence towards boys than girls which may contribute to the reason being behavioral factors that boys tending to be more energetic and attracted towards vigorous outdoor activities, contact sports and violence as compared to girls. The fact that boys are found to be suffered more trauma than girls can also be explained by cultural factors and social capital.^{12,13} Some of the previous studies also support present findings and reported higher frequency of trauma in boys.^{14,15,16}

The age group in which more frequency of trauma observed was 7 to 9 years in the present study, which corroborates to the fact that children in this age group are more tackled in sports and road learning activities. Various previous studies have also been reported with similar finding conducted in 2010 by Diaz et al, where 7- 9 and 10- 12 years old children were having highest frequency of dental trauma.¹⁷ Other studies in favour with the same, were done by Altun et al. and Eyuboglu et al. in 2009 showing highest prevalence of dental trauma in 8 - 10 years old children.^{18,19}

Dental trauma may be limited to single tooth or multiple teeth along with the soft tissue involvement. Here in this study, 90.82% of the children showed single tooth trauma while only 9.17% students had trauma to the multiple teeth (not more than two teeth). Similarly, the study done by Dua R. et al. in 2012 showed the similar results where single tooth trauma was observed in 84.4% of the patients.²⁰

In the present study, 63.60% children showed fracture extending upto the enamel while least frequency was observed in 5.04% children who had crown fracture with pulpal involvement. There are various studies supporting this finding which were conducted by Gupta K, Tandon S, Prabhu D in 2002 and similar studies done by Bastone EB et al. and Sharva V et al. in 2000 and 2017 respectively.^{21,22,23}

However, there are also some studies which showed fracture of the enamel & dentin without pulpal involvement being the most common type of injury in permanent dentition by Wilson S et al. in 1997.²⁴

As some of the limitations of present study is the inaccuracy of a patient's history in the absence of parents or guardian in school, which is particularly true in case of children and unequal distribution across age groups & among the two genders, so further Cross-sectional studies with more sample size and equal distribution is required.

V. CONCLUSION

Dental trauma is not a disease, rather an unfortunate impact injury, that can arise from any daily activity. It's the dentist's prime concern to have an epidemiological aspect of TDIs and thus, creating the awareness among the parents regarding the etiological factors and the various preventive treatment modalities.

In the present study, 3.34% of TDIs was observed, which was higher in males being non-significant, mostly affecting the single tooth in 7-9-year-old children and enamel fracture was found to be the commonest type of injury.

Therefore, the age at which children are more prone to traumatic injuries should be identified so that preventive measures should be directed to protect the risk population to a considerable extent.

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