

ORIGINAL ARTICLE

Frequency of Traumatic Dental Injuries to Anterior Teeth Among 7 to 14 Year-Old School Children

QURAT-UL-AIN¹, ALI SHAHID², MUHAMMAD AFZAL³, SHEHNOOR AZHAR⁴, HAMNA KHAWAJA⁵, MUHAMMAD SHAIRAZ SADIQ⁶

¹Assistant Professor Dentistry Department, Abbottabad International Medical Institute, Abbottabad

²Demonstrator, Oral & Maxillofacial Surgery, Institute of Dentistry, CMH Lahore Medical College Lahore, National University of Medical Sciences

³Associate Professor, Prosthodontics department, Institute of Dentistry, CMH Lahore Medical College Lahore, National University of Medical Sciences

⁴Assistant Professor Public Health University of Health Sciences Lahore

⁵Assistant Professor Prosthodontics Sharif Medical and Dental College, Lahore

⁶Associate Professor, Oral Medicine, Institute of Dentistry CMH, Lahore Medical College, National University of Medical Sciences, Rawalpindi, Pakistan

Correspondence to: Muhammad Afzal; Email: m.afzal.74@gmail.com, Cell: +92-32-14692278

ABSTRACT

Objective: To determine the prevalence of traumatic injuries to the anterior teeth among 7 to 14 year-old school children.

Design: It was a cross-sectional study.

Study Settings: This study was done in 10 Government & Private High Schools of Lahore, Pakistan from November 2021 to April 2022.

Material and Methods: There were a total of 2230 students between the ages of 7 and 14 participated in the study. Oral examinations and structured questionnaires were used to gather data, which included socioeconomic factors.

Results: Total 11.3 percent of the permanent anterior teeth in the current study had TDI. It was found that there is a considerable gender difference in the incidence of dental trauma, with more boys than girls experiencing it. Fall-related injuries accounted for the majority of TDI cases (68.5 percent), then sports (11.2 percent). The permanent maxillary central incisors were frequently broken, with enamel-related fractures being the most frequently reported. The most frequent injury noted was an enamel fracture.

Conclusion: Children of school age had a moderate prevalence of TDI, and it was advised that regular oral health education programmes about the causes and techniques of avoiding TDI be implemented.

Keywords: Traumatic Dental Injuries, Prevalence, School Children, Anterior Teeth

INTRODUCTION

Traumatic dental injuries (TDIs) have become the leading cause of mortality and disability among human beings, and they are especially prevalent in young children. This has led to the recognition of childhood injuries as a global public health issue. ¹ It is estimated that in the year 2000, injuries were responsible for 12 percent of the global burden of disease and 9 percent of deaths across the globe. ²

The incidence of (TDIs) to the front teeth of children around the world has been studied extensively by a number of researchers. ³ People of all ages are affected by TDI's negative impact on the neighbourhood. Front tooth trauma is now a serious public health issue because to its widespread frequency and the tremendous impact it has on a child's day-to-day existence. ⁴

All of the tooth's structural components, including enamel, dentin, and pulp, can be affected, and so can the supporting structures, such as the periodontium and alveolar process. Necrosis of the sick tooth or sinus canal might occur as a result of trauma to the tooth. Children's daily lives are affected by TDI in many ways, including their appearance, functionality, comfort, self-confidence, and more. ^{5,6} Slurred speech, limited biting, and an unattractive appearance can all result from these alterations, which are more noticeable in the child's higher front teeth than his or her lower incisors. The loss of proximal and incisal connections might cause malocclusion in a short period of time. ⁷

The general public has little knowledge of the dangers of dental injuries, which increases the likelihood of an accident occurring. The incidence of tooth injuries is underestimated by several healthcare practitioners, including dentists. ^{8,9} Study type, methodological discrepancies, trauma classification, limited jobs and age groups, behavioral/geographic variations between nations" were among the TDI study variations. ^{10,11}

A survey of the literature reveals that there are very few research on the incidence and causation of dental trauma in school-age children between the ages of 7 and 14. The study's goal was to raise awareness of prevalent oral traumatic injuries and related risk factors in the population in order to lower the frequency of dental traumatic injuries.

MATERIAL AND METHODS

It was a cross sectional study done in 10 Government & Private High Schools of Lahore, Pakistan from November 2021 to April 2022. Total 2230 students of both genders between 7-14 years were included in the study. The Area Education Officer (DEO) of Lahore, who oversaw surveys at several schools in the district, gave his official approval for the study. The parents of the youngsters and the school administration gave their written consent, respectively.

The estimated sample size of 2230 school children were calculated based on the prevalence of traumatic dental injury in previous studies at 15%, with 95% confidence interval and 10% margin of error. School going children who were special children, not cooperative, TDIs to the deciduous teeth, subjects having clinical indication of trauma, orthodontic therapy, loss of teeth except TDIs, teeth having developmental defects, but with jumbled history were excluded.

The dental checkup took place in a room with plenty of natural light. Autoclavable dental mouth mirrors and a dental explorer were used to evaluate the children while they sat in chairs. The investigation was conducted using a questionnaire form that had been specifically prepared. Parts of the form were split into two sections. The first portion contained information about the patient's personal characteristics, such as age and gender, while the second part contained information gleaned from the clinical examination and other data.

SPSS version 17 was used to enter all of the data that was collected. The data was analysed using descriptive statistics. Using percentages and proportions for qualitative/categorical characteristics, such as gender, traumatic injury, and age for quantitative/continuous variables, the demographic data was presented. We used a chi-square test to see how these variables affected the outcome. The significance of a P-value 0.05 was determined.

RESULTS

The distribution of children in the two age groups is given in Table 1. The number of children in the 7-10 years age group were 1199 (53.8%) and 1031 children (46.2%) in the 11- 14 years age group. There were 1192 (53.5%) males and 1038 (46.5%) females in the

selected population. Out of 2230 school children examined and interviewed, The overall prevalence of TDI was 11.3% (251 children). The majority of TDI occurred at home (40.6%), and in school (25.1%) followed by road (21.9%) and playground (10.4%). The occurrence of TDI was maximum at home followed by school premises as shown in Table 2. It was observed that out of 251 children affected with TDI, 303 teeth were involved with TDI. Single tooth injuries were seen in 210 (83.7%) children, evidence of trauma to 2 teeth were seen in 32 (12.7%) children, 3 teeth were affected in 7 (2.8%) children and 4 teeth were affected in 2 (0.8%) children as shown in Table 3. A total of 251 children in the study population were affected with TDI and 303 teeth were affected with TDI. Enamel fracture was the most common type of fracture affecting 72.6% of the teeth, followed by enamel dentine fracture affecting 19.14%. Pulpal involvement was seen in 4.62% and avulsion in 3.63% of the cases. Enamel fracture was seen maximum in the maxillary central incisors (52.8%) followed by maxillary lateral incisors (17.16%). Similarly enamel dentine fracture was seen maximum in the maxillary central incisors (14.19%) followed by maxillary lateral incisor (3.96%). Pulpal involvement and avulsion were seen more in maxillary central incisors at 3.63% and 3.3% respectively as shown in Table 4.

Table 1: Demographic data of Participants of the study

Parameters	Characteristics	No. of Patients	%age
Age	7-10 years	1199	53.8
	11-14 years	1031	46.2
Gender	Male	1192	53.5
	Female	1038	46.5
Traumatic Dental Injury (TDI)	TDI Absent	1979	88.7%
	TDI Present	251	11.3%
TDI age wise	Present 7-10 y	91	7.6%
	Present 11-14 y	160	15.5%
TDI gender wise	Present in Male	157	13.2%
	Present in Female	94	9.1%

Table 2: Etiology related distribution of affected children

Causes of Traumatic Dental Injury	No. of Patients	%age
Fall	172	68.5%
Collision	19	7.6%
Traffic	6	2.4%
Sports	28	11.2%
Violence	8	3.2%
Biting on hard object	17	6.8%
Miscellaneous	1	0.4%
Total	251	100%

Table 3: Number of Teeth Affected

No of Teeth effected	Frequency	%	Total No. of teeth effected
1	210	83.7%	210
2	32	12.7%	64
3	7	2.8%	21
4	2	0.8%	8
Total	251	100.0%	303

Table 4: Type of fracture in enrolled children

Type of TDI	Number of teeth	%age
Enamel fracture	220	(72.60%)
Enamel and dentine fracture	58	(19.14%)
Pulp involvement	14	(4.62%)
Missing due to trauma	11	(3.63%)
Total	303	100%

DISCUSSION

The discomfort, loss of function, and poor aesthetics that can result from dental injuries can have a negative influence on children's quality of life. Traumatized children suffer not just physically but also emotionally. 11.4 percent of permanent anterior teeth were found to have TDIs in this investigation. Traumatic damage to the permanent teeth were observed in previous investigations ranging from 6.1 percent to 58.6 percent. Similarly, the prevalence reported

by Ingle et al. (11.5%), and Marcenes et al. (11.5%), was similar to that reported in this study 12 (11.7 percent).¹⁵

The 11- to 14-year-old age group comprised the majority of those who suffered dental damage (15.5 percent). With ageing comes a greater risk of injury because of the compounding effect of previous injuries over time. According to Traebert et al., boys are more affected by trauma than girls, and this study confirms their findings.¹⁶ This may be attributed to the fact that boys are more likely to participate in violent or risky recreational activities or sports than girls, and they mature at a slower rate. As girls grow up in traditional Pakistani society, they may be less exposed to trauma-causing variables including contact sports, falls, and automobile accidents, which could explain why the prevalence of TBIs among them is lower. Boy children tend to become increasingly involved in outdoor activities as they mature.

Enamel fractures (72.60 percent) and those involving both enamel and dentin (19.14 percent) were the most common types of dental injuries reported in this investigation, which is consistent with previous studies by Gupta et al,¹⁷ and Bhat et al,¹⁸. Traumatic injuries resulting from falls (68.5%), sports activities (11.2%), road traffic accidents (2.4%), collisions (7.6%) and violence were the next most common causes of injuries in this study (3.2 percent). This discovery is in line with prior research by Marcenes et al.¹⁹, Sudeshni et al.²⁰ and other researchers.

Preventive measures include childproofing your home, getting teeth that stick out straightened, and educating people on how to care for luxated/exfoliated teeth and where to get help if they are hurt.

CONCLUSION

Total 16.3% of school children have TDI to their anterior teeth. The most frequent cause of trauma was falling, followed by sports, collisions, and auto accidents. To promote awareness of the causes and strategies for avoiding TDI among school-age children, oral health education programmes should be regularly implemented.

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