

Traumatic dental injury incidence of unseen children

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Abstract

Background/Aims: There is a lack of information about the incidence of dental trauma in Turkish children with disabilities and those in detention centers. The aim of this study was to investigate the occurrence of dental trauma in two groups estimated to have high-potential risk, young prisoners and disabled children, compared with healthy peers.

Materials and methods: A total of 530 children were included in the study. The participants were divided into three groups: Disability Group (n=238), Imprisoned Children Group (n=231) and school children (n=61) as the Control Group. The occurrence of dental trauma was evaluated according to age and gender. Statistical evaluations were done by using SPSS statistics-22 programme.

Results: The mean age of all participants was 14.85 ± 3.43 years. Males predominated (75.8%). In the Imprisoned Children Group, not only maxillary and mandibular incisors but also canines had dental trauma. Time of imprisonment and education level did not have any significant effect on dental trauma occurrence among children in detention centers. In the Disability Group, the disability type did not have any significant effect. In the Control Group, maxillary central incisors were the most traumatized teeth. The incidence of dental trauma was 11.3% in the Imprisoned Children Group, 4.6% in the Disability Group, and 9.8% in the Control Group. There was a significant difference among the three groups ($p:0.027$; $p<0.05$).

Conclusion: Dental trauma incidence may differ among disabled, imprisoned, and healthy children. Hence, children from different parts of the community should be included in epidemiological studies to provide a more accurate incidence of dental trauma.

KEYWORDS

children, dental trauma, disability, prison, prisoner, rehabilitation center

1 | INTRODUCTION

While economic growth shows the welfare level of a country, the indicator of the social welfare of a country may refer to the accessibility to health care services provided to all citizens including individuals with disabilities, refugees, orphans, and prisoners, who may be regarded as the “unseen, neglected or disregarded” part of the community.

In 1997, Martens et al reported a controversy involving the improvement of the oral health status of individuals in Western countries, as the age-matched individuals with disabilities did not demonstrate the same progress. Twenty years have passed but the problem still exists. Not only children with disabilities but also children in detention centers or prisons struggle with unmet healthcare and dental treatment needs.^{1,2}

Prisoners generally come from low socioeconomic and socio-cultural backgrounds with low education levels. In addition, these

TABLE 1 Type of disabilities of participants

Type of disability	Frequency (n)	%
Mental retardation	140	58.8
Autistic spectrum disorder	31	13.0
Physical disabilities	24	10.1
Trisomy 21	7	2.9
Cerebral palsy	18	7.6
Other	18	7.6
Total	238	100.0

individuals present with poor health status due to their nutritional and living conditions. Moreover, while the health status of prisoners is not routinely included in national health reports, their health status is reported to worsen during imprisonment.³

There are many reports on the oral health status of healthy individuals, including the prevalence of dental trauma. Only a few researchers have reported on the prevalence of dental trauma in children with disabilities and in children in detention centers.⁴ Therefore, this special community of children can be considered “unseen,” as they are not included in the national health reports of many countries.

The frequency of dental trauma has been reported to vary in different periods of life. The frequency of traumatic dental injuries is the highest between 2-4 years and 8-10 years of age in both genders.^{5,6} There is a difference in the overall gender relationship in accidents associated with work and acts of violence, with male: female ratios of 10:1 and 8:1. Males are reported to be subjected to dental trauma injuries more frequently.⁷

Traumatic injuries have a substantial impact on children's daily life. In countries where there is a high frequency of traffic accidents and street violence, and where the participation of children in sports is also higher, traumatic dental injuries have transformed into not only a social problem but also a public health problem.⁸

Depending on the type of injuries and different treatment methods, the prognosis of the teeth cannot be correctly estimated.^{9,10} Additionally, in the case of acute traumatic dental injuries, appropriate early intervention is essential to prevent poor prognoses such as tooth loss, unfavorable healing or other complications.¹¹ The literature has expressed that general dentists, unfortunately, have insufficient knowledge regarding the management of acute dental trauma.¹¹⁻¹³ This situation may derive from inadequate traditional curricula of dental schools on the management of acute dental traumatic injuries. On the other hand, dentists who work in government-supported dental clinics have limited resources. Dentists who work in prison hospitals or clinics for patients with special needs are obliged to treat only emergency cases and thus cannot solve all treatment needs of these patients.¹⁴ The situation is also similar for Turkey.

According to the year 2013 governmental database, 29.4% of the population in Turkey is below 18 years old. Additionally, 12.29% of

the population is individuals with disabilities, and one-fourth of this figure is children.¹⁵ Considering imprisoned individuals, the percentage of child prisoners is 3.4%.

According to the year 2015 governmental report, based on a survey including 2367 children, the main reasons for child death in Turkey were reported to be trauma and poisoning.¹⁶ Gender, age, and trauma history are important predisposing factors that increase the risk of dental trauma.^{8,17}

There is a lack of information about the prevalence of dental trauma in Turkish children with disabilities and children in detention centers. Hence, there is a need for further research regarding dental trauma to establish a baseline for future preventive and management plans.¹⁰ This is the first article providing information about the incidence of dental trauma among this community of “unseen” children. Thus, the aim of this study was to investigate the occurrence of dental trauma in two groups estimated to have high potential risk, young prisoners and disabled children, compared with healthy peers.

2 | MATERIALS AND METHODS

Ethical approval was obtained from the Istanbul Aydin University Faculty of Dentistry Research Ethics Committee (B.30.2.AYD.0.00.00-480.2/102).

Prior to carrying out the study, a power analysis was performed to identify the participant number required to accurately detect significant effects. Based on the power analysis, a total number of 530 individuals were included in the study. They were divided into three groups: 238 individuals had different types of disabilities (Disability group), 231 were child prisoners (Imprisoned children group) and 61 schoolchildren were included in the study as the Control group.

Individuals with disabilities were attending full-time rehabilitation centers which were providing physical rehabilitation services sponsored by the government in Istanbul, Turkey. These centers offer one-to-one rehabilitation for children with either physical or mental disabilities. Patients who attend these centers had been previously examined and diagnosed medically as disabled.

The Disability group was classified into six sub-groups based on clinical diagnosis. These groups were the (a) Mental retardation group, (b) Autistic spectrum disorder (ASD) Group, (c) Cerebral Palsy (CP) group, (d) Physical disabilities group, (e) Trisomy 21 group, and (f) Other conditions group, including genetic diseases and unclassified disabilities (Table 1).

The Imprisoned Children group consisted of 231 children and male adolescents. The Control group contained 61 schoolchildren (Table 2).

All participants and their legal guardians were informed about the objectives of the study and informed consent was obtained from the legal guardians. All the participants who gave consent were included in the study.

TABLE 2 Distribution of groups according to number, gender, and age

	Imprisoned-children group	Disability group	Control group	Total
Number	231	238	61	530
Gender				
Male (%)	231 (100%)	140 (58.8%)	31 (50.8%)	402 (75.8%)
Female (%)	–	98 (41.2%)	30 (49.2%)	128 (24.2%)
Mean age	16.65 ± 0.91	13.13 ± 4.33	14.77 ± 1.49	14.85 ± 3.43

Following a complete medical history, all subjects were examined by one examiner. Oral and dental examinations were carried out for all the participants using a disposable dental mirror and an available efficient natural light source. The standardized criteria of the World Health Organization (WHO) were used for the intraoral examination. Age, gender and any trauma history were recorded and any traumatized teeth were assessed. The criteria for the diagnosis of anterior dental trauma were assessed according to the method used by Andreasen et al.¹⁸ The number of injured teeth, type of trauma, type of tooth, and location in the upper or lower jaw were recorded. Dental trauma was recorded only for the teeth present during the oral examination.

The data were subjected to simple descriptive analysis, and statistical analysis was performed by IBM SPSS version 22 program (SPSS Inc., Chicago, IL, USA). Statistical significance for the association between the occurrence of dental trauma and the distribution of dental injuries by age and gender among the different groups of participants was determined using the chi-square test with the level of statistical significance set at $P < 0.05$.

3 | RESULTS

The study comprised 530 children; 402 boys and 128 girls, representing 238 children with disabilities, 231 child prisoners and 61 schoolchildren (control). The mean age of all participants was 14.85 ± 3.43 years. Frequency of participants, gender, and mean ages of all groups are summarized in Table 2.

In the Imprisoned Children group, the duration of stay in the detention center was between 1 to 48 months, and the average stay duration was 6.54 ± 8.38 months. The education levels of the Imprisoned Children group were as follows: 9.1% illiterate, 29.9% graduated from elementary school and the rest were attending ninth or 10th grade of high school.

Among the 231 Imprisoned children, 26 had traumatic dental injuries. It was observed that not only maxillary and mandibular incisors but also canines had dental trauma. Time of imprisonment did not have any significant effect on dental trauma occurrence among the Imprisoned children.

In the Disability group ($n = 238$), four girls and seven boys had dental trauma. In the Control group, six children had a history and evidence of dental trauma and only one of them was a girl. The maxillary right and left central incisors were the most traumatized teeth of the Control group (Table 3).

There was a significant difference between unseen children and the Control group regarding the presence of dental trauma ($P = 0.027$; $P < 0.05$). The incidence of dental trauma was 11.3% in the Imprisoned children group, 4.6% in the Disability group, and 9.8% in the Control group of schoolchildren (Table 4).

4 | DISCUSSION

There is a wide range of research on the oral health status of children. However, only a few studies have focused on traumatic dental injuries in healthy children and the prevalence of dental trauma in children with disabilities and/or child prisoners.^{4,19}

The most common risk factors related to dental trauma are falls, collisions, traffic accidents, violence, seizures, tooth grinding, dental caries, marked overjet and lack of lip seal.^{6,7,20}

Dental injuries showed a greater prevalence among patients with disabilities compared with healthy persons, even though these children do not participate in contact sports or radical physical activities.^{20–22} Generally, for individuals with disabilities, dental trauma may occur because of inadequate motor coordination, uncontrolled movements of the head, seizures, or delayed response to surrounding obstacles.⁸

According to the results of this study, children with disabilities had a lower dental trauma incidence than healthy peers when compared with other studies in the dental literature. This result may be caused by the traditional Turkish family style, in which the disabled person is not allowed to go outside or do any physical activities by himself without the supervision of a family member. Moreover, as the urban environment in Istanbul is not disable-friendly with insufficient accessibility options, this supervision for individuals with

TABLE 3 Prevalence of dental trauma according to gender

Gender	Female (n)	Male (n)
Participants with disabilities		
Mental retardation	4	5
Physical disabilities		1
Autistic spectrum disorder		1
Imprisoned participants		26
Control group	1	5

Dental trauma	Imprisoned children group, n (%)	Disability group, n (%)	Control group, n (%)	P
Non-traumatized	205 (88.7%)	227 (95.4%)	55 (90.2%)	0.027*
Traumatized	26 (11.3%)	11 (4.6%)	6 (9.8%)	

Chi-square test, * $P < 0.05$.

disabilities is a must, and eventually it is a decreasing factor for traumatic injuries of any type.

In contrast to the findings of the present study, Miamoto et al and Bagattoni et al demonstrated that dental trauma prevalence was higher in persons with CP, and Dieguez-Perez et al reported that physically disabled individuals had experienced more dental trauma when compared with healthy peers.^{20,22,23}

Acharya et al determined that healthy children had experienced traumatic dental injuries more often than children with disabilities, but the difference was not significant.²⁴ According to Santos et al the prevalence of traumatic dental injuries in individuals with CP was similar to that in healthy individuals, but individuals with CP were receiving less dental treatment than healthy individuals.²⁵

In the present study, it was interesting to see the difference in dental trauma incidence among the disabled and healthy children groups. The healthy group presented with an almost two times greater incidence of dental trauma at 9.8%, whereas the incidence of dental trauma for the disability group was 4.6%. This disparity may result from the predominant component of the disability group being mentally retarded children. In the traditional Turkish family structure, children with mental retardation, unfortunately, have very limited access to daily life activities.

The results of this study, regarding the gender comparison, showed similar findings as Ferreira et al.¹⁹

According to the year 2009 data, 1478 children aged between 12-17 years were in prisons or detention centers in Turkey. This means that 1.3% of all prisoners in Turkey were children and most of the child prisoners were male.^{26,27} Most of the children who were claimed to have committed a crime were aged 14 years.²⁶ In the present study, the average participant ages were similar to Turkish child-prisoner ages.

According to the Dental Health Report of the UK in 2003, untreated dental disease among prisoners was four times greater than that of the whole population from a similar social background.^{14,28} In the present study, the rate of dental trauma in the child-prisoner group was higher than the disability and schoolchildren groups, but it was less than four times. This result may have been related to the mean age and the amount of time in prison. Contrary to expectations, the rate of dental trauma in children with disabilities was less than that in schoolchildren. This result may have been caused by the high percentage of patients who are mentally retarded among the disabled participant group in the present study.

As shown in most of the studies, boys were injured more frequently than girls in all age groups.^{10,21,29} In the present study, boys were also injured more than girls in all groups.

TABLE 4 Distribution of dentally traumatized teeth in participants

In the disability group, maxillary incisors were the most frequently^{22,30} traumatized teeth followed by maxillary canines.³⁰ Canine teeth were found to be more traumatized in the Imprisoned children group when compared to the Disability and Control groups.

Due to the emotional fragility of the two study groups, time and formation patterns of dental trauma were not asked. Dental trauma in these particular groups of children may not be prevented. If dental treatment planning in these particular children was done by a multidisciplinary dental team comprising dental specialists, the effectiveness of treatments may be increased. Effective health planning should be available without questioning individuals from all levels.

In conclusion, dental health care planning should include all groups of children, even if some of them are unseen in statistics. As recognized in the Universal Declaration of Human Rights, Declaration on the Rights of Disabled Persons and the Body of Principles for the Protection of All Persons under Any Form of Detention or Imprisonment, every patient shall have the right to be treated in the least restrictive environment and with the least restrictive or intrusive treatment appropriate to the patient's health needs and the need to protect the physical safety of others.³¹

This statement emphasizes the rights of this special community of individuals. With the help of more epidemiological studies such as the present study, these unseen children may be noticeable, and more detailed health policies covering all citizens in society may be developed.

CONFLICT OF INTEREST

The authors confirm that they have no conflict of interest.

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