

Evaluation the Effects of Home Accidents to the Traumatic Dental Injuries of Primary Teeth

YILDIRIM ERDOĞAN¹, Z.ZAHİT ÇİFTÇİ², ÖZGE ERKEN GÜNGÖR³, HUSEYİN KARAYILMAZ⁴, ZUHAL KIRZIOĞLU⁵

¹Asst. Prof. Dr., Pamukkale University, Faculty of Dentistry, Department of Pediatric Dentistry, Denizli, Turkey-20160.

²Asst. Prof. Dr., Akdeniz University, Faculty of Dentistry, Department of Pediatric Dentistry, Antalya, Turkey-07070.

³Assoc. Prof. Dr., Akdeniz University, Faculty of Dentistry, Department of Pediatric Dentistry, Antalya, Turkey-07070.

⁴Prof. Dr., Akdeniz University, Faculty of Dentistry, Department of Pediatric Dentistry, Antalya, Turkey-07070.

⁵Prof. Dr., Süleyman Demirel University, Faculty of Dentistry, Department of Pediatric Dentistry, Isparta, Turkey-32000.

Corresponding Author: Hüseyin Karayılmaz, E-mail: dhkarayilmaz@yahoo.com.

ABSTRACT

Objective: The primary aim of this study was to retrospectively evaluate the effects of home accidents (HAs) on the traumatic dental injuries (TDIs) of primary teeth. Furthermore, the secondary aim was to bring attention to the importance of preventive measures for HAs, especially in this pandemic period where children all over the world spend most of their time in their homes due to coronavirus (COVID-19) disease.

Material and Methods: The records of the patients with TDIs of the primary teeth, aged 6 months-8 years, who applied to the Süleyman Demirel University, Faculty of Dentistry, Department of Pedodontics, between the years 2000-2010 and Akdeniz University, Faculty of Dentistry, Department of Pedodontics, between the years 2012-2019 were investigated.

Results: The sample consisted of 504 children that had TDIs to the primary teeth. The age range of the children was 1-8 years (3.5±1.8years old) and 37.3% (n=188) of the patients were girls and 62.7% (n=316) boys. The prevalence of the TDIs due to HAs was found to be 43.25% (n=218). A total of 380 teeth in the 218 patients who were found to have TDIs due to HAs were examined. The highest prevalence of traumatized children was in the age range 2-4 years (63.3%). Collisions with objects (45%) were found to be most common causes of dental trauma and the most common type of injury was found to be lateral luxation (35.8%).

Conclusions: Measures to prevent HAs should primarily target preschool children, the riskiest group. Accidents can be largely prevented by taking simple precautions such as providing a safe environment for children's healthy mental and physical development at home.

Key words: Home accidents, Dental trauma, Primary teeth,

INTRODUCTION

Injuries are the third leading cause of death after cardiovascular disease and cancer. In spite of their magnitude and preventability, injuries receive far less attention than other diseases. Injuries can be classified in two manners; by intent, such as unintentional or 'accidental' and intentional, and by place and activity, such as home or leisure accidents or occupational.¹

The term accident can be described as an unpredictable, unusual and unintended action which occurs in an unexpected time and place, with important effects. People only relate accidents to traffic accidents or accidents in outdoor activities. However, the place people regard as the safest, the home, hides many hazards especially for children. The main cause of accidents in the home is general negligence of safety.²⁻⁴

As home is the place where children spend most of their time, this is where most injuries occur, especially among preschool children. Home accidents are a very important matter and should be emphasized strongly in terms of them leading to injuries, morbidity and death. The incidence of home accidents is distinct for developed and developing countries.²⁻⁷ The World Health Organization (WHO) reports that injuries are the leading cause of death for children and adolescents under 20 years of age in the European Union (EU). "The Child Safety Report Card 2012 Summary for 31 Countries" revealed that, of the over 35,000 children and adolescents under 20 years of age who die each year in the EU, about 24% or roughly 9,100 deaths, are

due to injuries. Over two thirds of these are unintentional injuries.⁸

Head trauma constitutes as much as 40% of all body injuries in children.^{2, 9, 10} Gassner et. al¹¹ revealed that almost half of the facial traumas had traumatic dental injuries (TDIs). Preschool children showed a high prevalence of TDIs because the physical and emotional developmental level of the child is low.¹² Furthermore, parents' and babysitters' lack of knowledge about TDIs increases the prevalence of these injuries amongst preschool children.^{13, 14} In a meta-analysis study, it was shown that the overall prevalence of primary tooth injuries in this age range was 22.7% (highest: 27%, lowest: 14.2%).¹⁵ TDIs can influence the quality of life of children and their parents directly or indirectly by affecting appearance and speech of the child, and development and position of the teeth.¹⁶⁻¹⁸ This situation may cause physical, psychological and social problems for the patients and parents.^{13, 19, 20}

The frequency of TDIs affecting the primary dentition of children has been reported from many studies.^{18, 21-25} Although there is numerous data about TDIs of the primary dentition, there is limited information about the effects of home accidents on the TDIs of the primary teeth and the importance of preventive measures.

Therefore, the primary aim of this study was to retrospectively evaluate the effects of home accidents on the TDIs of primary teeth by using the records of the patients that were referred to the pediatric dentistry clinics of two different universities in the West-Mediterranean

region of Turkey. Furthermore, the secondary aim was to bring attention to the importance of preventive measures for home accidents, especially in this pandemic period where children all over the world spend most of their time in their homes due to coronavirus (COVID-19) disease.

MATERIALS AND METHODS

The records of the patients with TDIs of the primary teeth, aged 6 months to 8 years, who applied to the Süleyman Demirel University, Faculty of Dentistry, Department of Pedodontics, between the years 2000–2010 and Akdeniz University, Faculty of Dentistry, Department of Pedodontics, between the years 2012–2019 were investigated. No ethic approval was required for this retrospective report.

The data obtained from the patients' records, such as age and gender of patients, cause, type, time and scene of the TDI and applied treatment to the patients, was analyzed carefully. Also, clinical photographs and radiographs of the patients were evaluated for the TDIs according to Andreasen's criteria.²⁶ The teeth that were lost because of succession, and structural losses in anterior teeth as a result of caries were not included in the study.

RESULTS

The sample consisted of 504 children that had TDIs to the primary teeth. The age range of the children was 1–8 years (3.5±1.8 years old) and 37.3% (n=188) of the patients were girls and 62.7% (n=316) boys. The prevalence of the TDIs due to home accidents was found to be 43.25% (n=218).

The results given from this point are related to the 218 children who had TDIs at home. The highest prevalence of traumatized children was in the age range 2–4 years (63.3%) and the lowest was in the age range 7–8 years (7.4%) (Figure 1a).

Figure 1a: Age distribution of traumatized children, 1b: Causes of dental trauma.

It has been determined that TDIs due to home accidents are more common in the spring season (32.5%) (Figure 2a).

Collisions with objects (45%) were found to be most common causes of dental trauma, followed by falls (42.2%), and stair accidents (5.5%) (Figure 1b). It was observed that there was a statistically significant difference between the genders and age groups in terms of causes of trauma ($p_{gender}=0.008$, $p_{age}=0.006$).

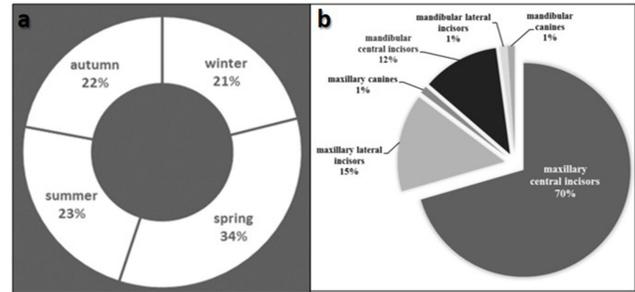


Figure 2a: Seasonal distribution of home accidents, 2b: Distribution of traumatized teeth.

A total of 380 teeth in the 218 patients who were found to have TDIs due to home accidents were examined. The average number of traumatized teeth per child was 1.78 and approximately 50% of the children were found to have one affected tooth, while 34% presented with two affected teeth. The maxillary primary central incisors were found to be most affected by dental trauma followed by maxillary primary lateral incisors and mandibular central incisors (Figure 2b). There was no statistical difference in terms of right and left sides ($p>0.05$).

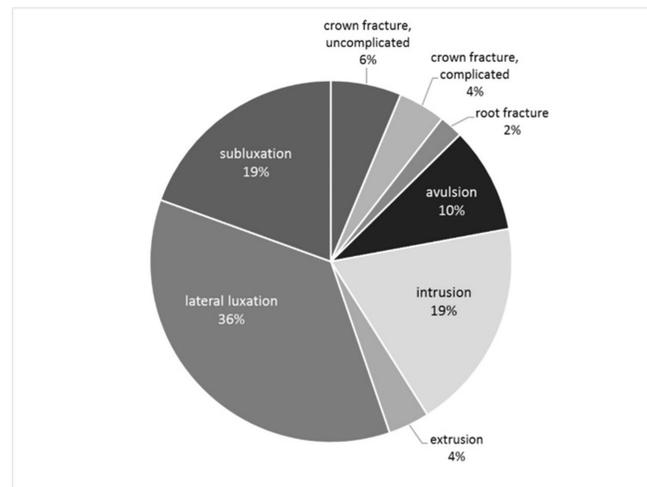
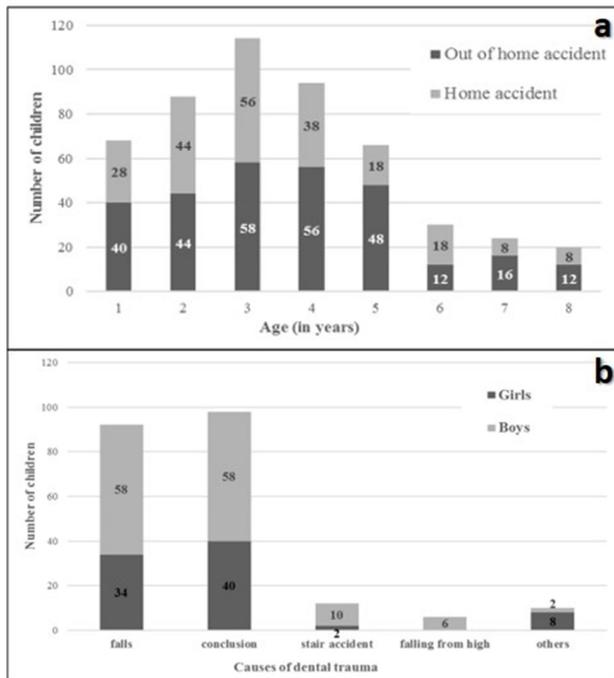


Figure 3: Type of injuries.

The most common type of injury was found to be lateral luxation (35.8%), followed by subluxation (19.5%) and intrusion (18.9%) (Figure 3). The distribution of fracture types according to teeth was statistically different ($p<0.001$).

More than half of the traumatized teeth did not require any treatment or follow up. Only 65 teeth (15%) received treatment, and some of them were extracted (27%) (Figure 4).

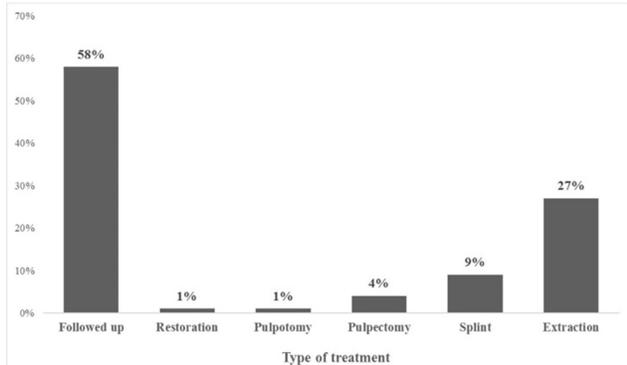


Figure 4: Treatment of traumatized teeth.

DISCUSSION

Unintentional TDIs are a major public health problem, resulting in irreversible dental sequelae for children during growth and development.^{18, 27} Many studies investigated the prevalence of TDIs in primary dentition up to today's date.^{18, 21-24} The relationship between variables, such as age and gender of the patient, the etiology, type and treatment of the trauma, were shown in these studies. However, information about the scene that directly affects the severity of the injury was not mentioned as much. In our study the scene where a TDI occurred was evaluated in two categories: in the house and outside the house. Preschool children spend more time at home and this place is full of dangerous surprises. Consequently, home accidents are inevitable. The distribution of the children's home injuries according to the injured part of the body was as follows: upper extremities 51.34%, lower extremities: 30.63%, head and neck 11.51%, body (chest, abdomen, and pelvis) 2.56%, multiple 0.51%, unknown 3.45%. Most injuries occurred when children were at home alone.¹

Home accident risk factors are related to children's cognitive immaturity and ignorance of danger, parenteral behavior and the home environment. Child age and gender, family's socio-economic level, parents age, educational and professional background, as well as home arrangements have been repeatedly reported as influencing children's home accident incidence. Parents' behavior, including supervision and application of home safety measures, and children's training in safety practices are equally considered as basic factors in home accident prevention.²⁸

Among all the TDIs to the primary teeth, our study showed that most TDIs occurred at home (43.25%). Amorim et al.¹⁸ revealed that almost half of TDIs occurred at home for preschool children. It was determined that TDIs occurred at home most frequently (60.9%), and then in the street (18.9%), followed by at school (17.7%).²⁹ The same rate of home accidents for preschool children was stated by Robson et al.³⁰ who also showed that falls (79.1%) were the principal cause of dental trauma. In our study, collisions with objects were the most frequent etiological factor,

followed by falls on a flat floor. This result was in agreement with other studies.^{13, 18}

Boys were more significantly affected by dental trauma compared with girls ($b/g=1.7$). This result was corroborated by other studies.^{15, 23, 29, 30} This is may be due to the fact that boys were not as calm as girls and preferred action games. However, some of the studies revealed that no significant difference was found in the distribution of dental trauma between genders.^{18, 31}

This investigation found that the most affected age group was 2–4 year old, and this is consistent with other studies.^{18, 25, 32, 33} The children of this age group have started to walk but have little motor coordination and are prone to fall, which results in dental trauma. We stated that one of the predominant causes of trauma were falls. This is also stated in previous studies.^{27, 30, 34, 35} School age children spend more time outside the home, such as at school and in the playground. However, generally children aged 2–4 years spent most of their time at home, so the risk of home accidents may arise. It is important that protective measures at home are taken against home accidents and that parents/ babysitters are informed about dental trauma.

Our finding, that the most frequent injuries were luxation, can be explained by immature supporting tissues and short roots of primary teeth. The most commonly affected teeth are maxillary primary central incisors and then lateral incisors. These results are generally supported by other researchers.^{23, 33, 34, 36} The reason for this may be that these teeth are located at the front of the dental arch. Also, because the maxilla is rigid and the mandible is movable, the possibility of protecting the mandible is increased. It was shown that trauma to primary teeth involved a single tooth in almost half of the patients. This is in agreement with Kırzioğlu et al.³⁴ The most preferred treatment option for the primary tooth injury was examination-follow up and this opinion was supported by some other researchers.^{25, 34, 37}

Generally, the incidence of dental trauma tends to increase towards the warmer seasons. Choi et al.¹³ stated that most dental injuries had occurred in late spring. Our research did not show any statistical difference between seasons. There were also not any variables between seasons shown by Chan et al.³⁸

The prevalence of TDIs in primary teeth has increased during the past few years. It was demonstrated that the majority of TDIs occurred at home especially among preschool children. The situation is more serious with lack of adequate safety measures at home and with TDIs of primary teeth seen as less significant than TDIs of permanent teeth by parents. Some parents may lack information about primary tooth trauma. They may think that as primary teeth are replaced by permanent teeth the traumatic injuries of these teeth are not as important. It was shown that 55% of parents think so.³⁰

CONCLUSION

A home seems like such a nice safe place until a child starts to live there. Children want to explore their everyday environments, so it is crucial for parents to check things out from their perspective to make sure the home is safe.

Accidents cannot be completely avoided. However, their occurrence and that of major accidents could be prevented by taking simple measures such as ensuring a safe environment for children's healthy mental and physical development at home.^{28, 39} Parents should pay more attention to home safety and should clear any hidden "hazards" at home. For example, keeping toys and other objects off the floor, fixing rugs with anti-skid rubbers, installing safety gates to the stairs and using safety devices for windows, doors and drawers could be useful.

Caregivers and parents should supervise their children constantly, they must set rules for the prevention of home accidents and teach children about safety. It could be a preventive action that both parents and caregivers attend an educational program about home accidents and the importance of emergency treatments (medical, dental etc.).

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