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“Dental Truma in Children”

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بِسْمِ الرَّحْمَنِ الرَّحِيمِ

"يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ"

In The Name Of Allah

*"Allah exalts those of you who believe and those who have been given knowledge
in degrees, and Allah is Acquainted with what you do."*

great truth of Allah.

Contents

- *Abstract*
- *Result*
- *conclusion*
- *purpose*
- *Introduction*
- *Review of the literature of dental trauma*
- *Materials and methods:*
- *Discussion*
- *conclusions*
- *Suggestions*
- *Recomendation*
- *References*

Abstract

Background and objective: dental trauma is an irreversible pathology that after occurrence is characterized by life-long debilitating effects. The objectives of this study were to measure the prevalence of anterior teeth fracture and their association with predisposing factors.

Results :

show according to answers of questions and diagnosis , number of male (117) and female (83) to the dental fracture the male more than the female . And accordin to school the pravite school (51%) and public school (49%) , in public school more exposure to dental tramua . And brushing teeth non affect during exposure to dental tramua . And visit of dental clinic there is a statistically significant relationship between children exposed to dental trauma and visit the doctors.

Conclusions:

based on the result of a experimented on children about dental trauma. We concluded that iraqi government should take the right procedure in pubilc schools by teachers and the educational media to guide them to protect themselves from dental trauma and try to decreasing the results in the future

Purpose:

To assess the prevalence of traumatic dental injuries (TDIs) among 6- to 15-year-old schoolchildren in Maysan city of Iraq .

INTRODUCTION

Traumatic dental injuries (TDIs) have become an important public health problem not only because their prevalence is relatively high but also because their treatment has been neglected resulting in a substantial impact on children's oral health-related quality of life. Dental injuries occurring due to sports can be prevented by the use of protective mouth guard or facemask but maximum injuries occur unexpectedly during daily life activities and mostly involve anterior teeth, thus, affecting their function. Treatment of dental trauma is not an ordinary situation in daily dental practice. Outcome of the treatment is highly related to the knowledge and skills of the dentist as well as to the emergency aid at the place of the injury. So, not only the dentist, but also parents, teachers and coaches must have basic knowledge in emergency management of dental trauma .

Dental trauma is also a source of distress for the parents but they are not aware of the consequences of dental trauma. A number of risk factors need to be considered when assessing traumatic dental injuries. Incompetent lips and increased incisal overjet are important predisposing factors. Childhood obesity has become a global epidemic. Unhealthy eating habits are one of the causes of obesity in children.

Literature shows that the relationship between TDIs and obesity has been investigated in various studies. Petti et al.² and Nicolau et al.³ have found that obese children are less active and lethargic and, thus, more prone to dental trauma. But some authors have the opinion that there is no significant association between obesity and TDIs.

The association of dental trauma with obesity is not yet clear. Other prevalence studies conducted in Indian children have not investigated the relationship of TDIs with obesity.

The present study was conducted to determine the prevalence of TDIs to anterior teeth schoolchildren of Maysan city and to investigate the relationship of dental trauma with various risk factors .

Traumatic dental injuries occur in preschool children, adolescents, and adults, and they affect about 20–30% of permanent dentition worldwide . Nearly 80% of dental trauma occurs under the age of 20 years making childhood and adolescence highly vulnerable periods for traumatic dental injuries . Depending upon the severity, type, and duration of dental trauma, various complications such as the fracture of the crown, discoloration of the tooth, necrosis of the pulp, apical periodontitis, root resorption, and fistulas can occur . Evidence shows that children who experienced trauma to their anterior teeth were more likely to avoid smiling, laughing, and were more concerned with their personality than children without dental trauma .

Similarly, children with untreated dental trauma face embarrassment and social isolation and known to have a poor oral health-related quality of life . It is documented that adolescents with fractured teeth have an impact on their daily living 20 times more than those without dental trauma . Likewise, untreated dental trauma in adolescents negatively impacts eating and smiling. Besides the functional, physical, and psychological impacts of dental trauma, treating dental trauma can be expensive. The maxillary central incisors are the most commonly affected teeth with dental trauma, and the fracture of tooth enamel is the most frequent type of dental injury followed by enamel dentine fracture .

Various factors such as age, socioeconomic status, and environmental influences play an important role in the etiology of dental trauma.

Researchers have shown that adolescents who experienced adverse life events such as low socioeconomic status and poor environmental conditions were more likely to experience dental trauma than those who had positive and economically favorable life experiences .

Review of the literature of dental trauma

Traumatic dental injuries (TDIs) occur frequently in children and young adults, comprising 5% of all injuries. Twenty-five percent of all school children experience dental trauma and 33% of adults have experienced trauma to the permanent dentition, with the majority of the injuries occurring before age .

Luxation injuries are the most common TDIs in the primary dentition, whereas crown fractures are more commonly reported for the permanent teeth. Proper diagnosis, treatment planning and follow-up are important to assure a favorable outcome. This update includes a review of the current dental literature using EMBASE, MEDLINE, PUBME and Scopes searches from 1996-2011, as well as a search of Dental Traumatology from 2000-2011.

The goal of these guidelines is to provide information for the immediate and urgent care of TDIs. It is understood that some of the subsequent treatment may require secondary and tertiary interventions involving specialists with experience in dental trauma The IADT published its first set of guidelines in 2001, and updated them in 2007.

As with previous guidelines, the working group included experienced investigators and clinicians from various dental specialties and general practice.

The current revision represents the best evidence based on the available literature and expert professional judgment.

In cases where the data did not appear conclusive, recommendations are based on the consensus opinion of the working group, followed by review by the members of the IADT Board of Directors. It is understood that guidelines are to be applied with evaluation of the specific clinical circumstances, clinicians' judgment and patients' characteristics, including but not limited to compliance, finances and understanding of the immediate and long-term outcomes of treatment alternatives versus non-treatment.

The IADT cannot and does not guarantee favorable outcomes from adherence to the Guidelines, but believe that their application can maximize the chances of a favorable outcome. These Guidelines offer recommendations for diagnosis and treatment of specific TDIs; however, they provide neither the comprehensive nor the detailed information found in textbooks, in the scientific literature, and most recently in the Dental Trauma Guide (DTG).

● General Recommendation

Special considerations for trauma to primary teeth A young child is often difficult to examine and treat due to lack of cooperation and because of fear. The situation is distressing for both the child and the parents. It is important to keep in mind that there is a close relationship between the apex of the root of the injured primary tooth, and the

underlying permanent tooth germ. Tooth malformation, impacted teeth, and eruption disturbances in the developing permanent dentition are some of the consequences that can occur following severe injuries to primary teeth and/or alveolar bone. A child's maturity and ability to cope with the emergency situation, the time for shedding of the injured tooth and the occlusion, are all important factors that influence treatment.

Repeated trauma episodes are frequent in children.

Immature versus Mature Permanent Teeth Every effort should be made to preserve pulpal vitality in the immature permanent tooth to ensure continuous root development. The vast majority of TDIs occur in children and teenagers where loss of a tooth has lifetime consequences. The immature permanent tooth has considerable capacity for healing after traumatic pulp exposure, luxation injury and root fractures.

Avulsion of Permanent Teeth The prognosis for avulsed permanent teeth is very much dependent on the actions taken at the place of accident. Promotion of public awareness of first-aid treatment for the avulsed tooth is strongly encouraged. Treatment choices and prognosis for the avulsed tooth are largely dependent on the vitality of the periodontal ligament (PDL), and the maturity of the root.

● Patient/Parent Instructions

Patient compliance with follow-up visits and home care contributes to better healing following a TDI. Both the patients and the parents of young patients should be advised regarding care of the injured tooth/teeth for optimal healing, prevention of further injury by avoidance of participation in contact

sports, meticulous oral hygiene, and rinsing with an antibacterial such as Chlorhexidine Gluconate 0.1% alcohol free for 1-2 weeks. Alternatively, with a young child, it is desirable to apply Chlorhexidine Gluconate to the affected area with a cotton swab. The use of pacifiers should be restricted.

● Classification of dental injuries

Comparing and accumulating data from different studies is extremely difficult due to the differences in the definitions and classifications used. Andreasen's classification¹¹ contains 19 groups and includes injuries to the teeth, supporting structures, gingiva and oral mucosa.

Whilst this classification a modification of the World Health Organization's (WHO) classification,¹² it is a more comprehensive system which allows for minimal subjective interpretations.

The WHO classification of oral trauma describes injuries to the internal structures of the mouth. Luxation injuries are grouped as one and not divided into intrusive, extrusive and lateral luxations as is the case with the Andreasen classification. Injuries to the alveolar socket and fractures of the mandible or maxilla are not grouped under oral injuries with the WHO standards, but rather are classified separately as fractures of face bones. There is a broad group incorporated with the WHO standards which allows for 'other injuries including laceration of oral soft tissues. These types of open ended groupings may lend themselves to misinterpretation by investigators. Garcia-Godoy's classification¹³ differs somewhat but is also a modification of the WHO system.

This classification differs from others mainly by separating dental fractures into those involving cementum or not. Broad terms such as 'complicated' or 'uncomplicated' fractures are not used with the 10-Garcia-Godoy classification, however, there are no groupings for subluxation or alveolar injuries and mandible or maxilla fractures.

The Ellis classification¹⁴ is another modification of the WHO system which has been used by various authors for recording dental trauma.

This system is a simplified classification which groups many injuries and allows for subjective interpretation by including broad terms such as 'simple' or 'extensive' fractures. Injuries to the alveolar socket and fractures of the mandible and maxilla are not classified here. Whilst there are numerous classification systems currently available, some investigators have opted to record only specific injuries, hence creating their own classification and augmenting the difficulties when comparing studies. Tables 2a and 2b illustrate some of the different specifications of dental and oral trauma reported in the literature.

● Predisposing and risk factors

An important predisposing factor reported for dental trauma was a large maxillary overjet and incomplete lip closure. Galea observed that the severity of injuries appeared to increase when there was an associated injury to the lower lip, while a third of the accidents occurred in subjects with some form of malocclusion. Female subjects with prominent maxillary incisors and incompetent lip closure often had multiple injuries to the supporting structures of the teeth. Burden observed that subjects with an overjet greater than the normal range (0-3.5 mm) were significantly more likely to have received an injury to the maxillary incisors.

It also appeared that the prevalence of dental trauma in females increased as overjet increased. Dearing and Hunter et al. also observed a significant difference in the frequency of fractured incisors between patients with an increased overjet. Increased overjet, however, may not play an important role when trauma is sustained via contact or collision sports, as was demonstrated in a case-control study by Stokes et al.

It should be noted, however, that there were only 36 cases and controls in this study.

Competent lip coverage was also an important predictor of dental trauma. Burden observed that children with inadequate lip coverage were at greater risk of dental trauma, regardless of their overjet size. However, did not observe an increased frequency of dental trauma with incompetent lip closure, particularly in females. Hamilton observed that significantly more children in the lower socio-economic groups received injuries compared with the higher socio-economic brackets, while Onetto observed that a high percentage of patients receiving injuries had suffered previous dental trauma. Another important factor found to increase the risk of dental trauma while playing sports was the lack of a properly fitted mouthguard and/or faceguard. 42-45 The value of mouthguards may be demonstrated by Lee-Knight who reported that none of the athletes who sustained dental injuries in the Canada Games was wearing a mouthguard. Johnsen and Winters suggest that many dental injuries can be avoided by informing the population of the importance of these protective devices whilst playing sport. Jollyetal observed that when a mouthguard was not worn during football games, the likelihood of a fractured or avulsed tooth was at least twice that of when a mouthguard was worn.

● Assessment of the dental injury

A relevant history should be taken after the primary survey has been completed and other injuries managed. Tetanus status should be elicited and the vaccine administered if indicated. The dental history should include missing teeth, history of trauma, previous orthodontics, root canal therapy and fillings. Reported dental pain or sensitivity can guide the examination. The practitioner should ask the patient to bite down and assess any occlusal disturbances, and enquire if these changes are new.

An altered occlusion can be a sign of maxillofacial injuries (eg mandibular or midface fractures). This must be followed by appropriate imaging (eg orthopantomogram and computed tomograph) if indicated. The oral cavity should be examined using a light source to look for any abnormalities of the lips and intraoral structures. It is not uncommon for teeth, or fragments of teeth, to be imbedded in the lips and cheeks. Lacerations of the vestibule (eg degloving injuries) may contain gravel or dirt.

A complete tooth-by-tooth examination should be conducted using FDI notation and the findings documented. These may be important for follow-up care, medico-legal or insurance purposes. Clinical photographs should also be taken for the medical record as they offer a precise documentation of the extent of the injury. These can also be used later for planning treatment, legal claims and transfer of care purposes. This must be done with the patient's consent following relevant privacy procedures .

● Classification and treatment of dental injuries

A common descriptive language to describe dental injuries is important as management often extends to several specialties.

General practitioners (GPs), emergency physicians, oral and maxillofacial surgeons, and dentists may all be involved in the management of a single patient. Each member of the treating team should therefore be able to communicate the nature and extent of the dental injuries.

It is also important to understand what the expected management and likely outcome of treatment would be. This ensures continuity and consistency across all aspects of the patient's management plan.

Andreasen developed a classification system in 1972 that encompassed primary and permanent dentition.

A comprehensive, easy-to-use website was also created by the Rigshospitalet, Denmark and the International Association of Dental Trauma (www.dentaltraumaguide.org). The injuries are divided into the following categories, and have been summarised by the authors to make them relevant to the general practice setting.

tissues and pulp Dental hard tissues include the enamel, dentine and cementum .Fractures limited to the crown and root can be difficult to view without transilluminating light or special equipment. These may not be available to GPs. It is therefore best to assess these injuries based on the following clinical features:

- pain
- mobility of the fractured tooth segments

the presence of infection in advanced cases. Fractures that involve the pulp may result in red soft tissue being visible in the area of the fracture. These injuries require referral to a general dentist who will take intra-oral radiographs to visualise the fracture.

Treatment may require root canal therapy and restoration of the tooth. The role of the medical practitioner is to manage the patient's pain and ensure attendance at a dental practice as early as possible.

● Injuries to periodontal tissues:

Concussion

History of trauma that is tooth or area specific.

Clinical features – Pain to percussion in both horizontal and vertical directions. There may be no signs of tooth movement, which includes no bleeding, mobility or displacement.

Treatment – Refer to the general dentist as no further treatment is required from the GP. Simple analgesia may be prescribed depending on the severity of the injury. Advise a soft diet until review by the dental officer.

Subluxation

Abnormally mobile tooth within the socket.

Clinical features – Pain and mobility.

Treatment – Stabilise the tooth if required, then urgently refer to a general dentist (as early as possible). Apply a splint if materials are available (discussed later in the article). Simple analgesia may be prescribed depending on the severity of the injury. Advise a soft diet until review by the dental officer.

Intrusion

Partial or complete displacement of tooth inside the socket.

Clinical features – Pain and displacement of the tooth into the socket. It is more commonly seen in the maxilla because of the thinner bone surrounding the tooth root. The intruded tooth may injure the underlying developing tooth bud in primary dentition, causing abnormalities in tooth eruption and possible defects affecting the enamel or other vital structures of permanent teeth.

Treatment – Urgently refer to a general dentist (as early as possible) as no further treatment is required from the GP. Simple analgesia may be prescribed depending on the severity of the injury. Advise a soft diet until review by the dental officer.

Extrusion

Partial tooth displacement out of the socket.

Clinical features – Pain. The tooth is displaced towards the occlusion (away from the socket) but remains within the tooth socket.

Treatment – Administer a local anaesthetic nerve block if the GP is appropriately trained, and reposition the tooth. Apply a splint if materials are available and urgently refer to a general dentist (as early as possible). Simple analgesia may be prescribed depending on the severity of the injury. Advise a soft diet until review by the dental officer.

Lateral luxation

Lateral luxation is defined as a traumatic displacement of a tooth in any direction other than axially.

Clinical features – Pain. This type of injury is often associated with alveolar bone fracture of the bone that surrounds the tooth root. It has been shown to be the most frequent injury affecting primary dentition. These can be unstable and may affect the bone at different levels depending on the nature of the injury.

Treatment – Administer a local anaesthetic nerve block if the GP is appropriately trained and reposition the tooth. Apply a splint if materials are available and urgently refer to a general dentist (as early as possible). Simple analgesia may be prescribed depending on the severity of the injury.⁸ Advise a soft diet until review by the dental officer.

Avulsion

Complete disarticulation of the tooth from its bone socket.

Clinical features – Pain. The tooth is completely displaced out of the socket but may occasionally still be in the mouth. There may be bleeding on presentation, and depending on the time passed, there may be a clot in the tooth socket. The most frequently avulsed tooth in the permanent dentition is the maxillary central incisor, which predominantly presents in the 7–10 years age group.¹⁰ It is essential to assess if the patient has inhaled the tooth if it appears to be missing and has not been found at the site of the accident. This requires chest imaging. The patient will need to visit a dentist to discuss possible restorative options for the space created by the missing tooth if no tooth is found.

Treatment – Success of replanting avulsed teeth depends on:

Time since injury: less than two hours is ideal as replantation success is limited after this time

Storage material: Storage of the avulsed tooth in a compatible solution will prevent the periodontal ligament from drying out and increases the possibility of successful replantation.

In order of preference, the tooth should be placed in a commercial dental storage medium (Hank's solution), contact lens saline (available at pharmacies), milk, or held inside the patient's cheek respectively. This is critical and should be done upon presentation to the GP's office or at the emergency department triage desk. The tooth should not be dried or exposed to the air, and should be gently rinsed with saline. Water should be avoided as its osmotic effect causes cell death in the periodontal ligament.

Whether the permanent tooth has an open or closed apex: Children with immature, developing adult teeth with an open apex have a greater chance of re-establishing the blood and nerve supply to the teeth than adult teeth with closed apices.

Tooth type: Primary teeth should not be replanted or repositioned as this may damage the adult tooth that is developing in the bone.

and ask the patient to spit some saliva (which may contain some blood, which is desirable) into the plastic before wrapping the tooth if it is not safe for the patient to hold the avulsed tooth inside their cheek (eg risk of aspiration). Replantation can be attempted if it does not delay presentation to a general dentist. The medical practitioner can administer a local anaesthetic nerve block if they are appropriately trained.

Gently irrigate the tooth and socket before inserting the tooth. Ensure that the correct tooth is in the correct socket and it is in the correct orientation. Apply a splint if materials are available.

Prescribe an appropriate antibiotic such as amoxicillin 500 mg orally every 8 hours for 7 days and chlorhexidine 0.2% mouthwash 10 ml rinsed for 1 minute every 8 hours for 14 days. Urgently refer to a general dentist (as early as possible).

Immobilising teeth in their correct anatomical position as soon as possible provides the best chance of replantation and prevents further damage from occurring. Advise a soft diet until review by the dental officer.

Injuries to supporting bone

Clinical features – Pain. The supporting bone is visible on the avulsed tooth or in the tooth socket. Segment mobility and dislocation are also common findings.¹³

Treatment – Fractures involving the alveolar bone are managed with an urgent referral to a general dentist or maxillofacial surgeon (as early as possible). Fractures involving the maxilla or mandible require referral to an emergency department, or directly to an oral and maxillofacial surgeon. Advise a soft diet until review by the dental officer.

Injuries to gingival or oral mucosal areas

Clinical features – Visible breach of the oral mucosal areas with varying degrees of bleeding. The oral mucosa is well vascularised and bleeding may be brisk from a small laceration.

Treatment – Haemostasis can be achieved with digital pressure, with or without adrenaline-soaked gauze, to the injury site. The laceration will heal without further intervention if it is small and not gaping, while a larger laceration may require sutures. Referral to an emergency department, or directly to an oral and maxillofacial surgeon, is also appropriate.

● Creating a dental splint

General practices and emergency departments generally have access to simple materials to fashion a splint. The simplest splints can be made with moulding blu-tack (Figure 4) or aluminium foil (Figure 5) to bridge the loose teeth. A more stable splint can be made by drying the teeth and applying a pre-moulded piece of malleable metal from a Hudson mask with skin glue.

Materials and methods:

Epidemiological cross-sectional study was carried out among 200 schoolchildren aged 6 to 15 years in Maysan city. The sample size was derived using the stratified random sampling method; we picked two schools from the region. These schools had more students in the acceptable age group of the study which constituted our final sample size. Children were examined for traumatic dental injuries, and the children with positive findings were further examined for lip competence, Angle's molar relationship, and overjet. The results were statistically analyzed using cross-tabulation and Chi-square test. We went on two shapes to a government school and a private school to get a number of children to know the break in children. We have been examined on their clinically we have been dedicated after the comfort of children and was examined by mirrors and gloves and focused on the examination on where the children to add their teeth or not there are dental trauma in anterior teeth of children in the ratio of their exclusion.

Statistics

1. Introduction

This topic will cover:

Study methodology.

The relative distribution of the sample.

Hypothesis testing.

2. Relative distribution of the sample

Table No.1 shows the relative distribution of the children included in the study, depending on the study variables:

Table1. Relative distribution of the children.

Variables (N)	Frequency		<u>Percentage (N %)</u>
Age	6	1	0.5%
	8	7	3.5%
	9	23	11.5%
	10	50	25.0%
	11	26	13.0%
	12	26	13.0%
	13	36	18.0%
	14	15	7.5%
	15	16	8.0%
	Total	200	100.0%

Gender	Female	83	41.5%
	Male	117	58.5%
	Total	200	100.0%
Type of school	Public school	98	49.0%
	Private school	102	51.0%
	Total	200	100.0%
Brushing	No brushing	82	41.0%
	Brushing	118	59.0%
	Total	200	100.0%
Visit the doctor	No visit	139	69.5%
	Visit	61	30.5%
	Total	200	100.0%
Number of affected teeth	0	144	72.0%
	1	16	8.0%
	2	40	20.0%
	Total	200	100.0%

Source: Prepared by the researcher according to statistical analysis outputs using SPSS

Age

The mean age of the children was 11.42 years, with a standard deviation of 1.95. The highest percentage was for children aged 10 years 50 (25%), followed by children aged 13 years 36 (18%), then 26 (13%) for children aged 10 and 11 years, then children aged 15, 16, 8, 6 years with a percentage 16 (8%), 15 (7.5%), 7 (3.5%) and 1 (0.5%), respectively (Table 1, Figure 1).

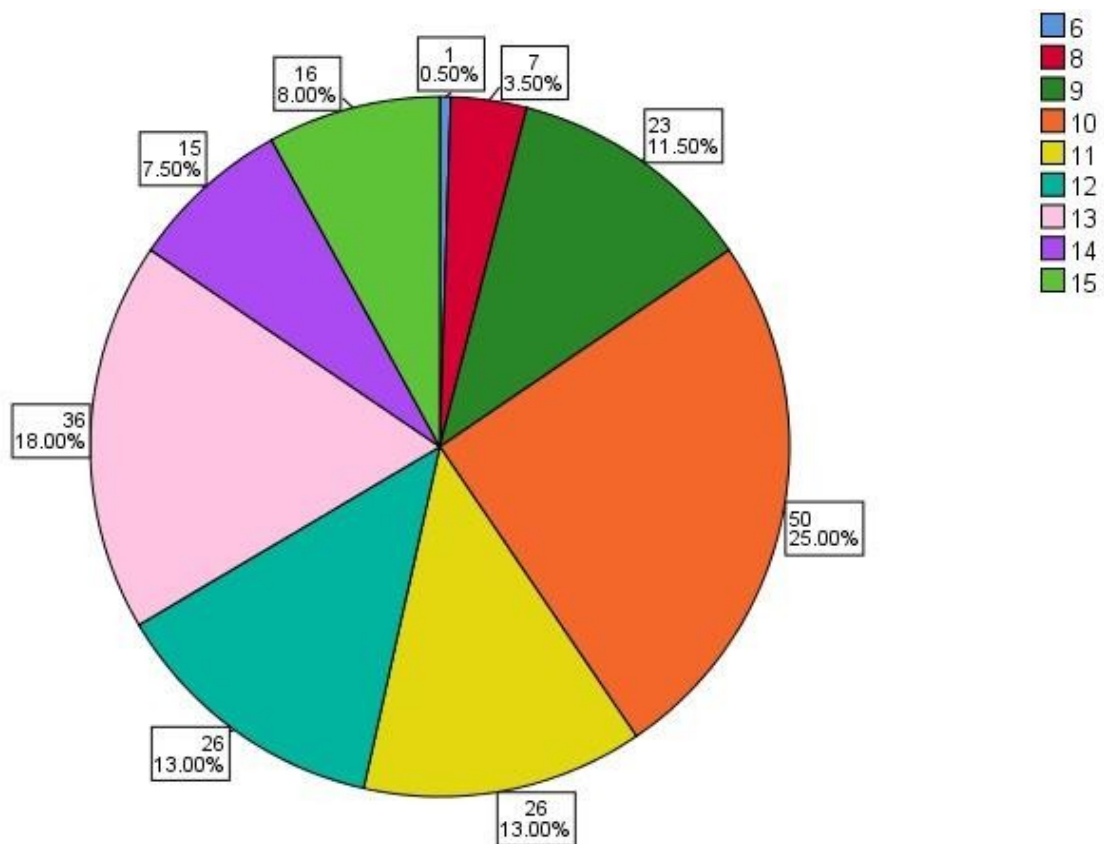


Figure 1. Distribution of children by age.

Gender

The number of males reached 117 (58.5%), while the number of females was 83 (41.5%) (Table 1, Figure 2).

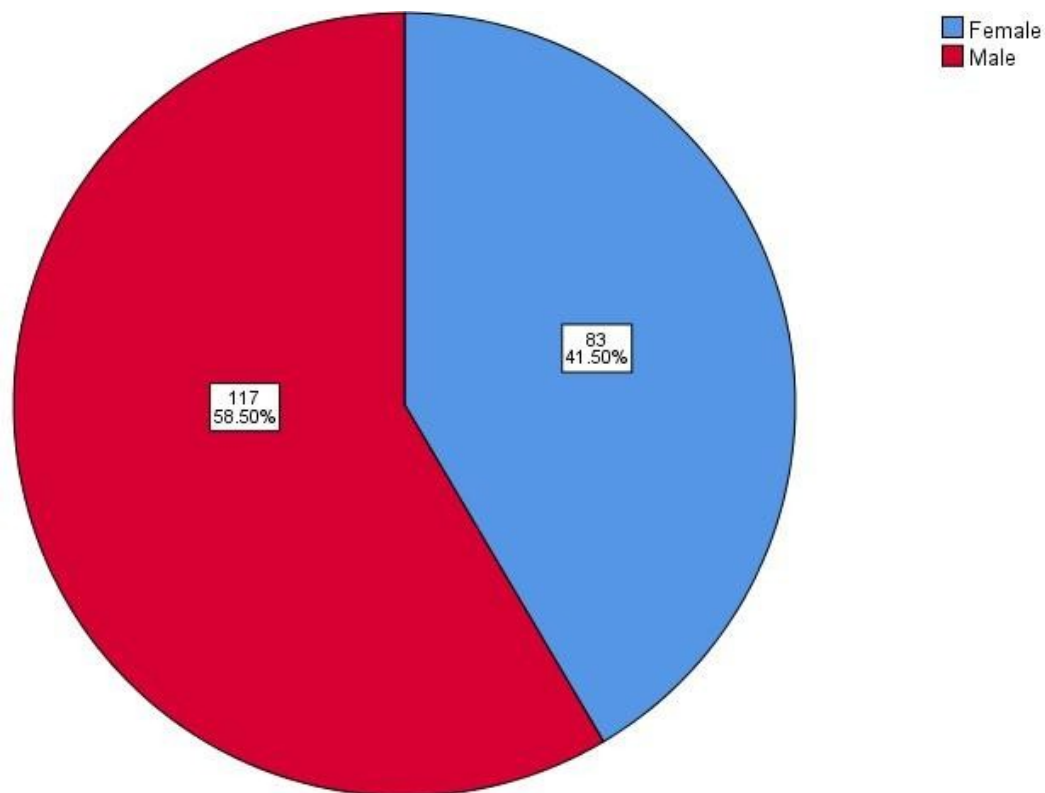


Figure 2. Distribution of children by gender.

Type of school

The number of children in private schools was 102 (51%), while the number of children in public schools was 98 (49%). (Table 1, Figure 3).

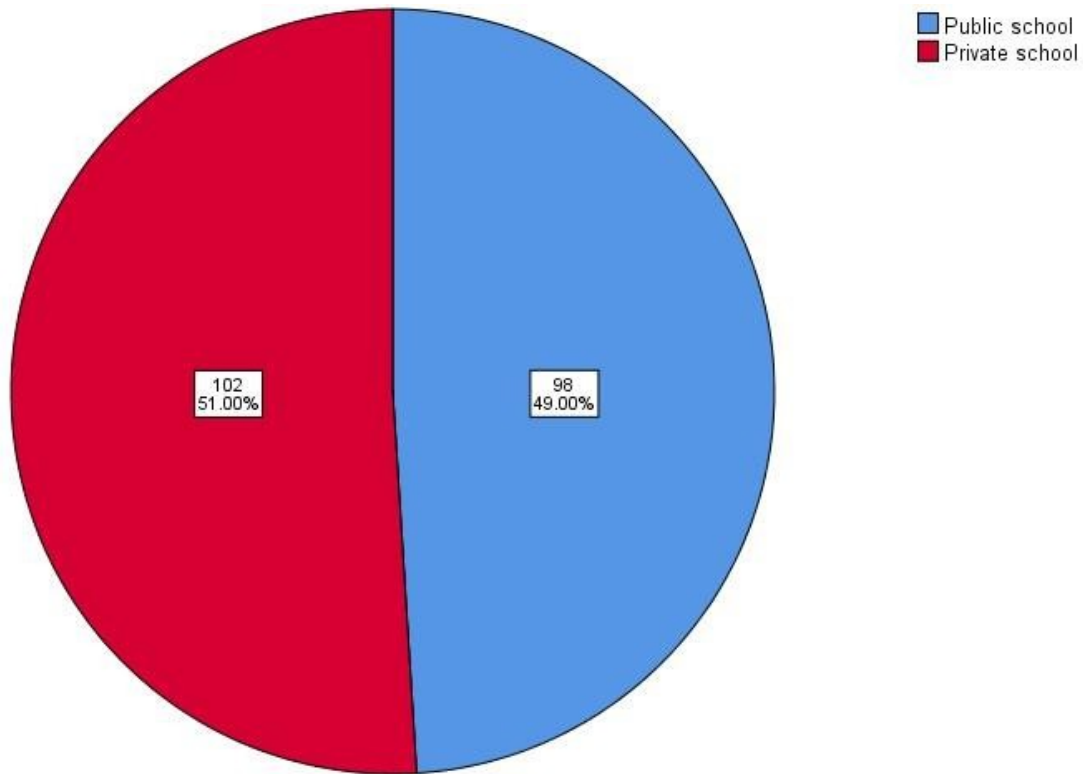


Figure 3. Distribution of children by type of school.

Brushing

The number of children who brush their teeth was 118 (59%), while the number of children who did not brush their teeth was 82 (41%). (Table 1, Figure 4)..

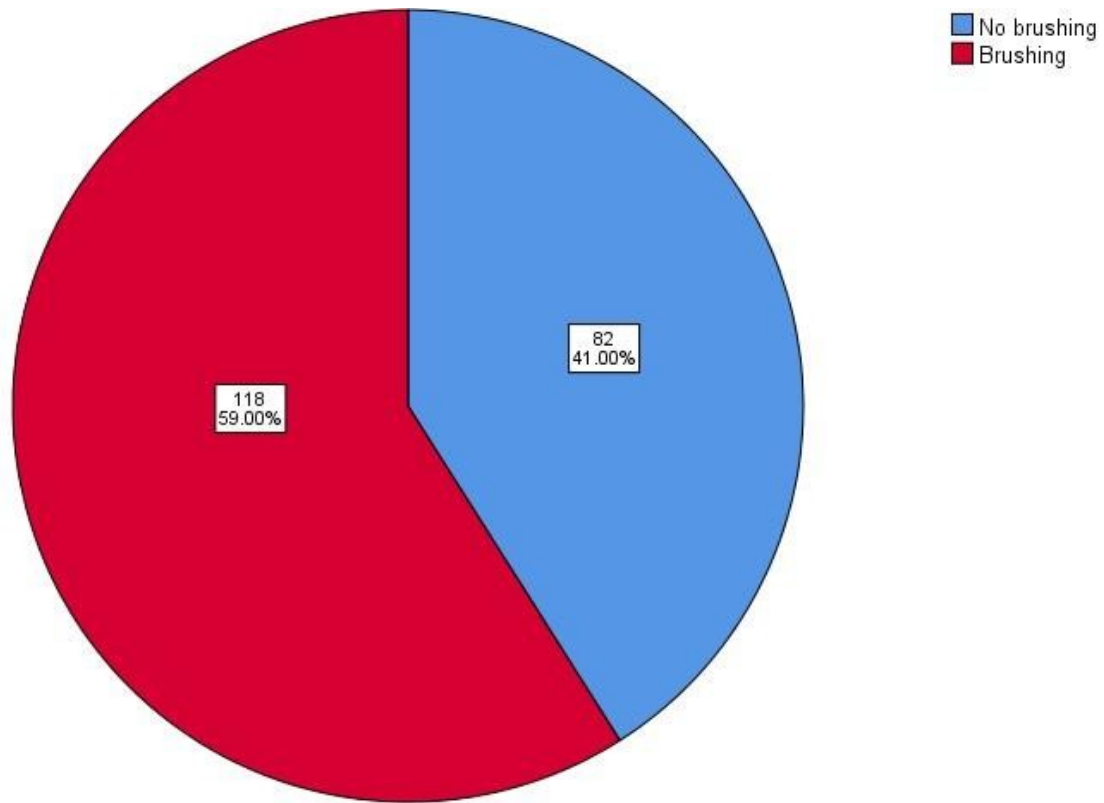


Figure 4. Distribution of children by brushing.

Visit the doctor

The number of children who visit the doctor was 61 (30.5%), while the number of children who did not visit the doctor was 139 (69.5%). (Table 1, Figure 5).

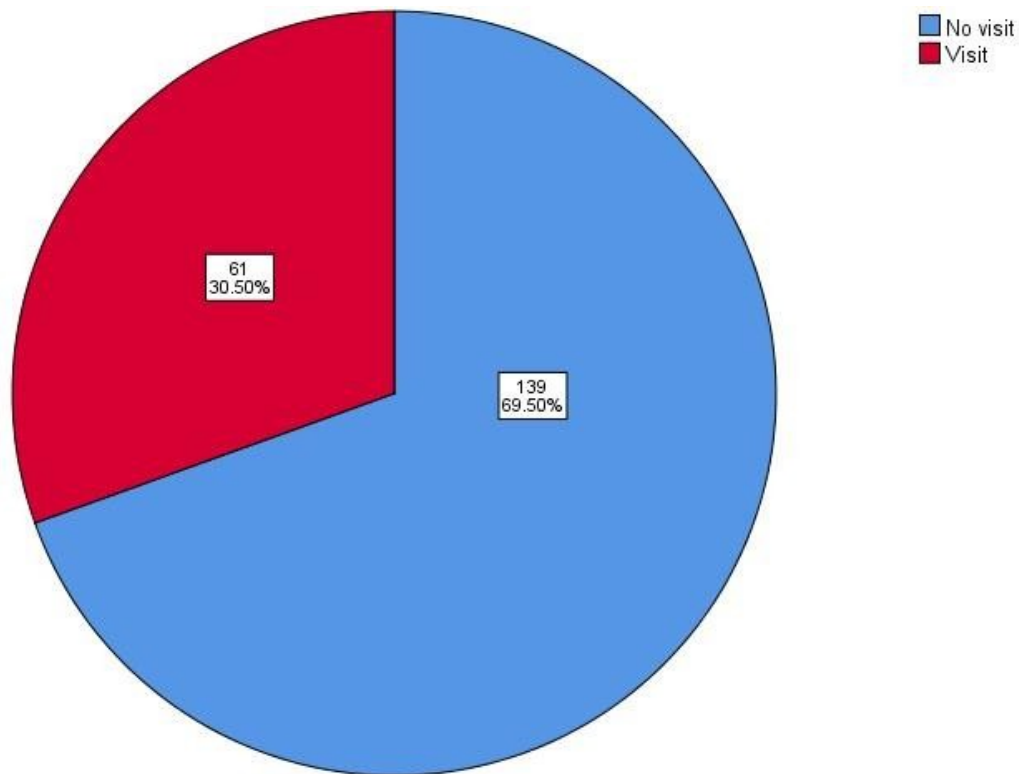


Figure 5. Distribution of children by visit the doctor.

Number of affected teeth

The mean of the affected teeth in the children was 0.48 with a standard deviation of 0.81.

The percentage of children with healthy teeth was 144 (72%), then children with infected teeth number (2) 40 (20%), then children with one tooth 16 (8%). (Table 1, Figure 6).

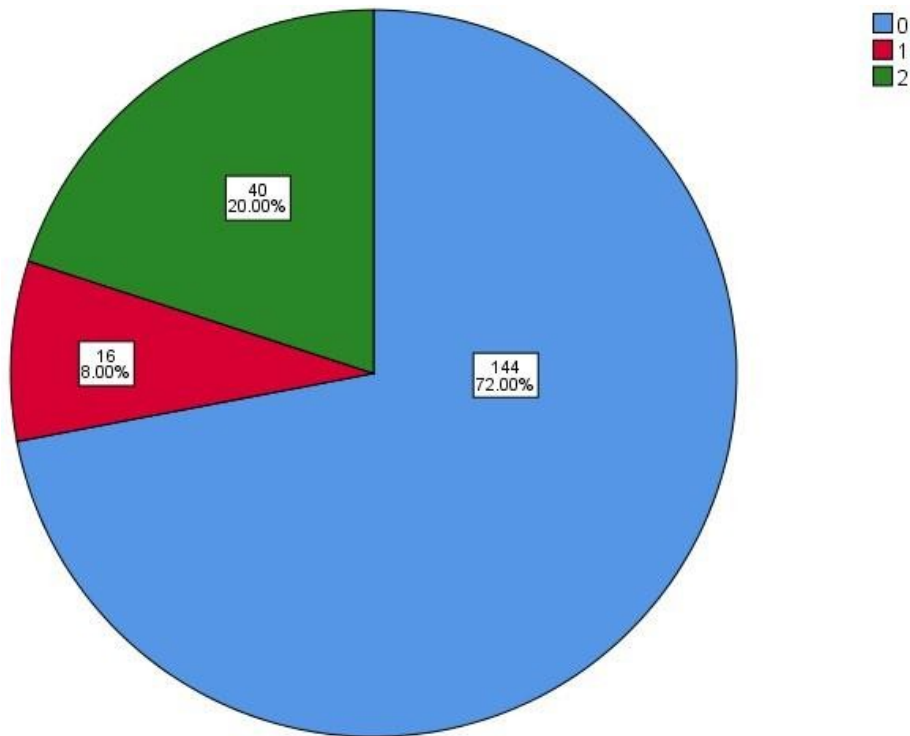


Figure 6. Distribution of children by number of affected teeth.

2.3.Hypothesis Test

2.4. First main hypothesis

Null hypothesis H0: There is not a statistically significant relationship between children exposed to dental trauma and age.

Alternative Hypothesis H1: There is a statistically significant relationship between children exposed to dental trauma and age.

To prove the validity of this hypothesis, a Chi-square test was used to reveal a significant relationship between children exposed to dental trauma and age.

The results show (Table 2) that there is not an association between **children exposed to dental trauma** and **age**. The p-value > 0.05 so that indicates they children exposed to dental trauma is not independent of age, So there is not a statistically significant relationship between children exposed to dental trauma and age.

Table 2. The association between between children exposed to dental trauma and age.

children exposed to dental trauma	Age										Total
	6	8	9	10	11	12	13	14	15		
No affected tooth	N 1 0.5% N	6 3.0%	17 8.5%	41 20.5%	18 9.0%	16 8.0%	27 13.5%	9 4.5%	9 4.5%	144 72.0%	
1 tooth is traumatized	N 0 0.0% N	1 0.5%	3 1.5%	3 1.5%	2 1.0%	1 0.5%	3 1.5%	3 1.5%	0 0.0%	16 8.0%	
2 teeth are traumatized	N 0 0.0% N	0 0.0%	3 1.5%	6 3.0%	6 3.0%	9 4.5%	6 3.0%	3 1.5%	7 3.5%	40 20.0%	
Total	N	1	7	23	50	26	26	36	15	16	200
% Total	N	0.5	3.5	11.5%	25.0	13.0%	13.0	18.0	7.5	8.0	100.0
		%	%		%		%	%	%	%	

2.5. Second main hypothesis

Null hypothesis H0:

children exposed to dental trauma and gender.

Alternative Hypothesis H1: There is a statistically significant relationship between children exposed to dental trauma and gender.

To prove the validity of this hypothesis, a Chi-square test was used to reveal a significant relationship between children exposed to dental trauma and gender.

The results show (Table 3) that the p-value < 0.05 so that indicates the children exposed to dental trauma is independent of gender, 6.5% and 13.5% of male had a one tooth trauma and two teeth trauma, respectively. Whereas 1.5% and 6.5% of female had a one tooth trauma and two teeth trauma, respectively.

So, there is a statistically significant relationship between children exposed to dental trauma and gender.

Table 3. The association between between children exposed to dental trauma

children exposed to dental trauma		Gender		Total	Chisquare	Pvalue
		Male	Female			
No affected tooth	N	77	67	144	6.245	0.044*
	%	38.5%	33.5%			
	N					
1 tooth is traumatized	N	13	3	16		
	%	6.5%	1.5%			
	N					
2 teeth are traumatized	N	27	13	40		
	%	13.5%	6.5%			
	N		83			
Total	N	117				
% Total	N	58.5%	41.5%	100.0%		

and gender.

* Significant level $\alpha = 0.05$

Source: Statistical analysis outputs using SPSS program by the researcher.

2.3.Third main hypothesis

Null hypothesis H0:

children exposed to dental trauma and type of school.

Alternative Hypothesis H1: There is a statistically significant relationship between children exposed to dental trauma and type of school.

To prove the validity of this hypothesis, a Chi-square test was used to reveal a significant relationship between children exposed to dental trauma and type of school.

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The results show (Table 4) that the p-value < 0.05 so that indicates the children exposed to dental trauma is independent of type of school, 6.5% and 13% of public school child had a one tooth trauma and two teeth trauma, respectively. Whereas 1.5% and 7% of private-school child had a one tooth trauma and two teeth trauma, respectively.

So, there is a statistically significant relationship between children exposed to dental trauma and type of school.

Table 4. The association between children exposed to dental trauma and type of school.

Children exposed dental trauma		Type of school			Total	Chisquare	Pvalue
		Public	Private				
No affected tooth	N	59	85	144			
	% N	60.2%	83.3%	72.0%			
1 tooth is traumatized	N	13	3	16			
	% N	6.5%	1.5%	8.0%			
2 teeth are traumatized	N	26	14	40	14.47	0.001*	
	% N	13%	7%	20.0%			
Total N		117	83	200			
% Total N		58.5%	41.5%	100.0%			

* Significant level $\alpha = 0.05$

Source: Statistical analysis outputs using SPSS program by the researcher.

2.4.Fourth main hypothesis

Null hypothesis

H0children exposed to dental trauma and brushing.

Alternative Hypothesis H1: There is a statistically significant relationship between children exposed to dental trauma and brushing.

To prove the validity of this hypothesis, a Chi-square test was used to reveal a significant relationship between children exposed to dental trauma and brushing.

The results show (Table 5) $p\text{-value} < 0.05$ such that it indicates that children exposed dental trauma independent of tooth brushing. The percentage of dental trauma for one and two teeth, if children did not brush their teeth, was 5% and 11.5% respectively, and decreased to 3% and 8.5% when the children brush their teeth..

So, there is a statistically significant relationship between children exposed to dental trauma and brushing.

Table 5. The association between between children exposed to dental trauma and brushing.

Children exposed dental trauma		Brushing		Total	Chisquare	Pvalue
		No	Yes			
No affected tooth	N	49	95	144	10.453	0.005*
	% N	24.5%	47.5%	72.0%		
1 tooth is traumatized	N	10	6	16		
	% N	5.0%	3.0%	8.0%		
2 teeth are traumatized	N	23	17	40		
	% N	11.5%	8.5%	20.0%		
Total N		82	118	200		
% Total N		41.0%	59.0%	100.0%		

* Significant level $\alpha = 0.05$

Source: Statistical analysis outputs using SPSS program by the researcher.

2.5.Fivth main hypothesis

Null hypothesis H0:

children exposed to dental trauma and visit the doctors.

Alternative Hypothesis H1: There is a statistically significant relationship between children exposed to dental trauma and visit the doctors.

To prove the validity of this hypothesis, a Chi-square test was used to reveal a significant relationship between children exposed to dental trauma and visit the doctors.

The results show (Table 6) p-value < 0.05 such that it indicates that children exposed dental trauma independent of visit the doctors. The percent of dental trauma for one tooth and two teeth was highest 23.5% among children who did not visit the doctor, compared to 4.5% among children who visited the doctor.

So, there is a statistically significant relationship between children exposed to dental trauma and visit the doctors.

Table 6. The association between between children exposed to dental trauma and visit the doctors.

Children exposed to dental trauma		Visit the doctors		Total	Chisquare	Pvalue
		No	Yes			
No affected tooth	N	92	52	144	10.368	0.006*
	%	46.0%	26.0%			
1 tooth is traumatized	N	16	0	16		
	%	8.0%	0.0%			
2 teeth are traumatized	N	31	9	40		
	%	15.5%	4.5%			
	N		61	200		
	Total N	139				
	% Total N	69.5%	30.5%	100.0%		

* Significant level $\alpha = 0.05$

Source: Statistical analysis outputs using SPSS program by the researcher.

Results

The hypothesis testing and statistical study reached a number of results, which summarize as follows:

1. The first hypothesis showed there was a statistically significant relationship between children exposed to dental trauma and age at the level of significance 0.05. These results are in agreement with
2. The second hypothesis showed there was a statistically significant relationship between children exposed to dental trauma and gender at the level of significance 0.05. These results are in agreement with
3. The third hypothesis showed that there was a statistically significant relationship between children exposed to dental trauma and type of school at the level of significance 0.05. These results are in agreement with
4. The fourth hypothesis showed that there was a statistically significant relationship between children exposed to dental trauma and brushing at the level of significance 0.05. These results are in agreement with
5. The fifth hypothesis showed that there was a statistically significant relationship between children exposed to dental trauma and visit the doctors at the level of significance 0.05.

Discussion

In recent years, traumatic dental injuries have been the focus of extensive research. Preventative measures and accurate treatment were broadly discussed topics among dental professionals. The present study comprised data from patients seeking emergency care at the Department of Emergency Dental Care .

According to the collected data, males suffered more TDIs than females (male: n = 117 , female: n = 83). This correlates with previous findings of published literature and agrees with studies that attribute a higher risk of TDIs to gender and age. Authors have postulated that males have a greater propensity towards contact sports and risky behavior than girls . Recent studies, however, have argued a decline in gender disparities as females have developed similar athletic interests and are exposed to the same risk factors as boys in western society . This is confirmed by Glendor et al., who argue that the frequency of TDIs increases due to types of activity and behavioral factors rather than gender . It aligns with the fact that in both genders, TDIs were most frequently caused by falling . Many other studies have previously identified falling as the main cause of dental trauma . With falling being the predominant cause of TDIs, the frequency of TDI occurrence on weekdays and weekends is expected to be similar. The presented data confirm this

assumption, as the frequencies of TDI occurrence only show minimal variations in regard to the day of the week. TDI occurrence was higher on Fridays and Saturdays. As other recent studies have shown similar results, the relative likelihood of a TDI occurrence being higher from April to November may be linked to the fact that outdoor activities entailing higher risks of falling accidents increase in spring and summer .

. As TDIs fairly evenly occur on weekdays as well as on weekends, the opening hours of these support units should be extended to weekends.

Evaluating the pattern of affected teeth, the results show that upper central incisors were the most frequently injured teeth (63.5%, n = 719). This is coherent with international data . Due to their anterior position, upper incisors are more prone to be affected in traumatic incidents [. Additional risk factors include insufficient lip closure, an overjet over 3 mm and protrusion of upper anterior teeth . In contrast, lower incisors are more likely to be protected from TDI by the lower lip and upper incisors. In this study only 6.7% of TDIs occurred in lower teeth.

Based on the analysis of the presented data, fractures were the most common injury type (53%), being the most prevalent subtype (64.9%,). This confirms international trends [1,24]. However, the presented result is higher than the average observed by Faus-Matoses et al. (43.2%). On the other hand, Bilder et al. observed very high values in uncomplicated crown fractures with respect to enamel fractures in 91.3% of cases . The wide range of incidence rates reflects that the grounds for their comparison in reference to different injury types and their subgroups are often not satisfactory as varying classification systems are applied in different studies . Compared to the results of Yeng. et al. (1.9%).

conclusions

This study presents the first research on permanent dental injuries in Maysan Governorate, Iraq. To a large extent, the results confirm previously published international trends. The high rate of dental injuries leads to their frequent occurrence in schools all over the world. Because dentists are often challenged with their accurate diagnosis and treatment, further education and training in dental trauma medicine is vital in promoting beneficial treatment outcomes in the future.

children exposed to dental trauma and type of school high rate of trauma teeth among children in government schools more than in private schools . children exposed to dental trauma and gender . There is a statistically significant relationship between children exposed to dental trauma and gender. indicates the children exposed to dental trauma is independent of gender, 6.5% and 13.5% of male had a one tooth trauma and two teeth trauma, respectively. Whereas 1.5% and 6.5% of female had a one tooth trauma and two teeth trauma, . children exposed to dental trauma and brushing , exposed dental trauma independent of tooth brushing. The percentage of dental trauma for one and two teeth, if children did not brush their teeth, was 5% and 11.5% respectively, and decreased to 3% and 8.5% when the children brush their teeth . children exposed to dental trauma and visit the doctors , There is a statistically significant relationship between children exposed to dental trauma and visit the doctors, exposed dental trauma independent of visit the doctors. The percent of dental trauma for one tooth and two teeth was highest 23.5% among children who did not visit the doctor, compared to 4.5% among children who visited the doctor.

percentage of children with healthy teeth was 144 (72%), then children with infected teeth number (2) 40 (20%), then children with one tooth 16 (8%).

(Table 1, Figure 6).

number of children who visit the doctor was 61 (30.5%), while the number of children who did not visit the doctor was 139 (69.5%). (Table 1, Figure 5).

statistically significant relationship between children exposed to dental trauma and age. children exposed to dental trauma and age. The p-value > 0.05 so that indicates they children exposed to dental trauma is not independent of age, So there is not a statistically significant relationship between children exposed to dental trauma and age.

Suggestions

1. Preferring parents to record their children in private schools in children in private schools less likely to danger to their teeth, but because of a high cost, agencies all the government and teachers urged them to protect the child
2. cooperation between the Ministry of Health and the Ministry of Education is essential for formulating educational and training programmes to increase teachers' knowledge concerning the management of traumatic dental injuries in schools.
3. a direct collaboration between a local dentist or a dental clinic and the schools for proper and immediate management of dental emergencies is suggested.
4. Providing teachers with educational leaflets regarding proper ways to manage dental trauma could also be effective because a study conducted in Turkey found that educational leaflets were a successful and appropriate means of providing teachers with information regarding the management of dental injuries.

Recomendation

In light of the findings of the study, the following suggestions can be made:

1. Cooperation and coordination between the authorities responsible for providing first aid, such as the Iraqi Red Crescent and the Ministry of Health, and the Iraqi Ministry of Education.
2. Work must be done to raise awareness and knowledge about the importance of dental damage for Iraqi teachers.
3. Holding educational seminars and lectures about dental damage and how to deal with it for Iraqi teachers.
4. Organizing and publishing educational posters in schools on how to deal with dental damage, and what are the appropriate ways to treat it.

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