AWARENESS AND KNOWLEDGE OF A GROUP OF LIBYAN SCHOOL TEACHERS IN EMERGENCY MANAGEMENT OF DENTAL TRAUMA

By

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This Thesis was submitted in Partial Fulfillment of the Requirements for Master's Degree of Pediatric Dentistry.

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Faculty of Dentistry

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DEDICATION

In the name of Allah the most merciful, and peace and blessing be upon our best prophet Mohammed (peace be upon him).

To who breeds me little and pray for me old, to my mother, may Allah have mercy on her.

To my husband for his continuous encouragement and support.

To my brothers and sisters, especially Elham, to their inspiring encouragement.

To the grace whom Allah gave me, Abdul-moniem and Aya Younis.

To all of them I Dedicate this thesis.

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I would like thank my loved ones, who have supported me throughout entire process, my husband, children, brothers and my sisters.

Also, I would to thank the participants in my survey, who have willingly shared their precious time during the process of the questionnaire. and to the experts who were involved in the statistical analysis of the data obtained.

The Researcher

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List of Abbreviations

PDL Periodontal Ligament.

TDI Traumatic Dental Injury.

TDIs Traumatic Dental Injuries.

IADT International Association for Dental Traumatology.

AAPD American Academy Pediatric Dentistry

ABSTRACT

Awareness and Knowledge a Group of Libyan School Teachers in Emergency Management of Dental Trauma

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Emergency management of dental trauma is one of the important subjects in the field of dentist. The problem of the study is to evaluate the knowledge and awareness of Libyan school teachers about emergency management of traumatic dental injury.

The study population consists of all of public primary and preparatory schools teachers in the district of Benghazi city. A total of (500) teachers from different schools constituted the sample of the study. A modified questionnaire consisted of three major parts was used to assess the perception of school teachers. A total of (435) questionnaire received, (406) of them (81%) were valid for statistical analysis.

Responses obtained from completed questionnaires were tabulated expressed as frequency distributions, and in percentages. Further, the responses were entered on computer, using SPSS. Chi-square test was used to compare the knowledge of teachers. The results of the study revealed that:

1. Knowledge regarding emergency management of dental trauma of primary and preparatory school teachers in Benghazi city is insufficient.

2. The specific area of weakness in teachers' knowledge of immediate dental trauma management needs to be emphasized. It has been noticed that management regarding dental trauma is not included in the teaching curriculum.
3. Based on the statistical analysis it was obvious that there no relation between awareness and knowledge of emergency management of dental trauma and the length of service as a teacher, training gained by teachers, and teachers who took first-aid course.

The study recommended that educational authorities are advised to direct their efforts toward well-established educational programs & campaigns for teachers about emergency management of dental trauma.

Chapter 1

INTRODUCTION

1.0 INTRODUCTION

Primary and permanent anterior teeth are important for esthetics, speech(phonetics), mastication, integrity of supporting tissues, psychological and mental wellbeing of children.[1] However, children are at high risk of losing anterior teeth because of traumatic injuries to the face and trauma to the teeth and surrounding structures, usually because of their continuous engagement in physical activities.[2] Dental trauma known as the effect of an accidental event that involves the hard and the support structures of a tooth.[1] This can vary from simple crack of the crown to more extensive injury involving the tooth and[3]. There is perhaps no single dental disturbance that has greater psychological impact on the parents and the child than the loss or fracture of child's anterior teeth.[3] In many countries, traumatic dental injuries are considered a public health problem due to the growing rates of violence, automobile accidents, contact sports and injuries in the school environment.[4] Some studies in western countries, indicate that the number of cases with dental trauma is on increase as compared to cases with dental caries or periodontal problems which are declining in these countries and hence much attention has been given to traumatic dental injuries [5].

Dental trauma can take place in infancy, childhood, adolescence and adulthood. However, children are particularly at increased risk for traumatic injuries[6], which can happen at home, nursing schools, primary and secondary schools, sport clubs, streets or any elsewhere. Researchers reported that home and school were the most common places where dental trauma occur. [3,7,8] For example, Anjum et al.[9] emphasized that school was one of the locations with greatest prevalence of dental trauma. As it is well known that, children spend about 40% of their awake time in school and are usually engaged in sports or playing

activities. Therefore, the emergency management of traumatic dental injuries is largely depended on school teachers as they are the first persons to take care of such incidents when the accidents occurred at the school. Anika et al.[10] asserted that it was not the responsibility of dentists alone but a great role could also be played by those who are surrounding children such as parent, school teachers, sport coaches and others who might be available at the site of the accident. So, knowledge and attitude of school teachers regarding emergency management of dental trauma are critical to ensure good prognosis of the clinical treatment of trauma incidents. Many international reports and studies had indicated that the lacking knowledge of adults likely to be present at the emergency site regarding immediate management of dental trauma. These studied included parents, sport coaches, primary school teachers, physical education teachers and medical staff including doctors. [11,12,13,14,15,16,17]

A review of the literature from 1995 to 2007 shows that the prevalence of traumatic dental injuries in primary and permanent teeth was high throughout the world.[18] Statistics from most countries showed that one fourth of all school children and almost one third of adults had suffered trauma to their permanent dentition, but there were variations among and within countries [18] In addition, dental trauma among young people can lead to significant economic consequences[19]. Considering total body injuries, dental traumatic injuries are not frequent and make up as little as 5% for all ages, but they are relatively common among children aging 0-6 years where it comprises about 17% [20]. Traumatic dental injuries are more prevalent in permanent (58.6%) than that in primary dentition where they constitute 36.8%. [21,22] Dental injuries mainly involve anterior teeth of the upper jaw. The most frequent causes of these injuries are falls, sport activities, bicycling, and traffic accidents.

It was reported that there was a relation between the place of injury and gender, where the most frequent location of injury for boys was school followed by home, while for girls it was vice versa. [23,24]

Dental trauma emergency care is very important issue, and it is crucial for the prognosis especially in cases of teeth avulsions. For children and adolescents, parents and school teachers are usually nearby when the accidents occur. Therefore, their knowledge about the management of dental trauma is vitally important for the prognosis of injured teeth and in helping the injured person to receive appropriate first-aid treatment as soon as possible.[25] Proper intervention can play an important role to improve the prognosis of a traumatized tooth. [1,17,26]

Young et al[27] showed in their study that immediate management of traumatic dental injury did not require special skill but only knowledge; it can be performed by a lay person if one knows the procedures. They concluded that the ideal situation was that such knowledge became everyone's basic practical knowledge. The earlier the one learns the best appropriate management procedure, the higher chance they can save more traumatized teeth.

In most cases, the child is referred to a dentist without any emergency management at the accident site, resulting in unfavourablecomplications and consequences.[28] Therefore, school teachers can play a critical role in the primary management of dental trauma and hence improve the prognosis of traumatized teeth.[9,29,30] Many studies in different countries had reported inadequate knowledge and awareness of school teachers regarding emergency management of dental trauma injuries.[2,9,25,31,32,33]

Pooja et al.[34] carried out a study to evaluate knowledge and attitudes of school teachers regarding the emergency management of an avulsed tooth in the district of Patiala, Punjab, which revealed that

overall knowledge regarding the emergency management of avulsed tooth low in teachers and suggested that there was a need of first aid training to all teachers along with emergency management of dental trauma.

In Libya, according to the researcher best knowledge, there have been no studies reported so far to evaluate the knowledge, attitude and practice of school teachers regarding emergency management of dental injuries. Therefore, this study has been designed to assess the knowledge, awareness, attitude and practice of school teachers of Libyan primary and preparatory schools regarding emergency management of dental trauma.

Chapter 2

REVIEW

OF

LITERATURE

2.1 Definition of Dental Trauma:

Dental trauma can be defined as an impact injury to the teeth and/or other hard and soft tissues within and around the vicinity of the mouth and oral cavity. It is usually sudden, circumstantial, unexpected, and accidental and often requires emergency attention. It is not a disease but a consequence of several unavoidable risk factors in life[35]. When teeth and their supporting structures are subjected to impact trauma, the resultant injury manifests either as a separation or a crushing injury or a combination of both. Separation injuries are exemplified by displacement of teeth during which there is a cleavage of tissues, such as the periodontal ligament (PDL), this occurs during avulsions and extrusive luxation.[36] Traumatic dental injuries are usually a combination of trauma to the per oral soft tissues, teeth, and their supporting tissues.

2.1.2 Classification of Dental Trauma:

In the 1950, Pediatric dentist G. E. Ellis was the first to promote universal classification of dental injuries. Dental injuries have been classified according to a variety of factors, such as etiology, anatomy, pathology, or therapeutic considerations.[37]

Feliciano and Caldas [38] conducted a systematic review of studies between 1936 and 2003. They identified the most used systems were Andreasen (32%), Ellis (14%) and Garcia - Godoy (6%).

Andreasen, Ellis and Garcia - Godoy classification are discussed below.

2.1.2.1 Classification by Andreasen:[37,39]

A. Injuries to the hard-dental tissues and pulp.

1. Crown infarction N873.60. An incomplete fracture (crack) of the enamel without loss of the tooth substance.

2. Uncomplicated crown fracture. A fracture contained to the enamel (N 873) or involving enamel and dentin, but not exposing the pulp (N 873.61).
3. Complicated crown fracture N873.62. A fracture involving enamel and dentin and exposing the pulp.
4. Uncomplicated crown root fracture. N873.64. A fracture involving enamel, dentin and cementum but not involving the pulp.
5. Complicated crown root fracture N873.64. A fracture involving enamel, dentin and cementum and exposing pulp.
6. Root fracture N873. A fracture involving dentin, cementum and the pulp.

B. Injuries to the periodontal tissues.

1. Concussion N873.66. An injury to the tooth supporting structures without abnormal loosening or displacement of the tooth, but with marked reaction to percussion.
2. Subluxation N873.66. An injury to the tooth supporting structures with abnormal loosening but without displacement of the teeth.
3. Intrusive Luxation (central dislocation) N873.66. Displacement of the tooth into the alveolar bone. This injury is accompanied by comminution or fracture of the alveolar socket.
4. Extrusive luxation (peripheral dislocation partial avulsion) N873.66. Partial displacement of the tooth out of its socket.
5. Lateral Luxation N873.66. Displacement of the tooth in a direction other than axially. This is accompanied by commin ution or fracture of the alveolar socket.
6. Exarticulation (complete avulsion) N873.68 Complete displacement of the tooth out of its socket.

C. Injuries of the supporting bone.

1. Comminution of alveolar socket (Mandible N802.20, Maxilla 802.40) Crushing and compression of the alveolar socket. This condition is found together with intrusive and lateral luxation.
2. Fracture of the alveolar socket wall (Mandible N802.20, Maxilla N802.40).

   A fracture contained to the facial or lingual socket wall.
3. Fracture of the alveolar process (Mandible N802.20, Maxilla N802.40).

   A fracture of the alveolar process, which may or may not involve the alveolar socket.
4. Fracture of the Mandible and Maxilla (Mandible N802.21). Maxilla N802.42).

   A fracture involving the base of the mandible or maxilla and often the alveolar process (jaw fracture). The fracture may or may not involve the alveolar socket.

D. Injuries to gingiva or oral mucosa.

1. Laceration of gingiva or oral mucosa N873.69. A shallow or deep wound in the mucosa resulting from a tear and usually produced by a sharp object.
2. Contusion of gingiva or oral mucosa N902.00: A bruise usually produced by an impact from a blunt object and not accompanied by a break of the continuity in the mucosa, causing submucosal hemorrhage.
3. Abrasion of gingiva or oral mucosa N910.00: A superficial wound produced by rubbing or scrapping of the mucosa leaving a raw bleeding surface.

2.1.2.2 Classification by Ellis and Davey:[40]

- This classification is based on numeric system. It is modification of the WHO system, though it is simple, is only applicable to the permanent dentition.
- All the primary teeth have been grouped but detailed description has not been given (Grouped as class 9) injuries to the alveolar socket and fractures of the mandible and maxilla are not classified here.
- It is one of the most widely accepted methods of classification.

– Class I - Simple fracture of the crown involving little (or) no dentin.
– Class II - Extensive fracture of the crown involving considerable dentin, but not the dental pulp.
– Class III - Extensive fracture of the crown involving considerable dentin, and exposing the dental pulp.
– Class IV - The traumatized teeth that becomes non vital with (or) without loss of crown structure.
– Class V - Teeth lost as a result of trauma.
– Class VI - Fracture of the root with or without a loss of crown structure.
– Class VII - Displacement of a tooth without fracture of crown (or) root.
– Class VIII - Fracture of crown en masse and its replacement.
– Class IX - Injuries to primary dentition

2.1.2.3 Classification by Garcia - Godoy:[41]

Enamel crack; Enamel fracture; Enamel Dentine fracture without pulp exposures; Enamel Dentine fracture with pulp exposure; Enamel - Dentine - cementum fracture without pulp exposure; Enamel - Dentine - cementum fracture with pulp exposure; Root fracture;

Concussion; Luxation; Lateral displacement; Intrusion; Extrusion; and Avulsion.

2.1.3 Prevalence:

According to epidemiological studies traumatic dental injury (TDI) affects 8%[42] to 62.1%[43] of children between 2 and 5 years of age. Andreasen, and Andreasen[44] recognized that these young children were predisposed to falls due to immature motors coordination and hence were potentially at risk of sustaining dental trauma. Most dental injuries occur to permanent dentition with incomplete root development in children with mixed dentition. Jacobsen & Andreasen[45] confirmed that dental injuries happened in children between ages of 8 and 11 years ,when the periodontal structure surrounding the erupting teeth was weaker and provided minimal resistance to an extrusive force.[46]

A significant number of school aged children experience trauma of some sort to primary or permanent dentition. Studies had shown that the main cause of traumatic dental injuries among school children was from falls and sports activities.[47,48] The teeth most commonly involved were maxillary central incisor (37%), mandibular central incisor (18%), mandibular lateral incisor (6%) and maxillary lateral incisor (3%). Crown fracture is the most frequent types of injury comprising 26-76% of injuries to the permanent dentition [49] luxation injuries comprise 30-44% of all dental injuries. [50]The most serious dental injury was avulsion of tooth. It comprised 0.5 - 3% of dento - facial injuries in the permanent dentition and 7-13% in the primary dentition[51].

Studies by Marwah,[52]& Abdellatif, Hegazy.[3]had shown that most dental accidents in children occurred at home, followed by school.

According to Elisa et, al[53], males experienced significantly more dental trauma to the permanent dentition than females in most

international studies which indicated the male: female ratio ranged from 1.3-2.3:1.

The difference in gender distribution among children in the primary dentition was not so obvious[53].

2.1.4 Etiology of Dental Trauma:

Traumatic dental injuries can result from either direct or indirect impact. The extent of the damage is related to factors such as energy of impact, resilience and shape of the impacting object, direction of the impact and the reaction of the tooth surrounding tissues[54].

Studies showed that dependency of type and causes of the traumatic dental injuries to permanent and primary dentition existed[45]. This phenomenon might be related to the features of the underlying bone structure which in primary dentition is less mineralized than that in permanent. Therefore, trauma in primary dentition is more likely to result in a tooth displacement.

According to Hecova et al.[55] and Faus - Damia et al.[4] falls were the main common cause of traumatic dental injuries (from 31.7 to 64.2%) followed by sport activities(up to 40.2%), bicycling accidents (up to 19.5%), traffic accidents (up to 7.8%), physical violence (up to 6.6%). Bicycling accidents were common cause of dental trauma in schoolchildren group.

Andreasen et al. [56] summarized etiology of trauma in various age groups as follows:

In pre - school children (0 -6years) the injuries mainly result from falling and usually occur in the home environment during day time.

In school children (7-15 years) the injuries mainly result from being pushed and hit, and from falling; these occur mainly in school or sports areas during day time.

In adolescents and adults, the injuries mainly result from push/ hit injuries which predominantly occur during leisure hours

2.1.4.1 Predisposing Factors:

1. Increased over jet with protrusion of upper incisors and insufficient lip closure.

   Burden [57] observed that subjects with an over jet greater than normal range (0-3.5mm) were significantly more likely to have received an injury to the maxillary incisors, and also observed that children with inadequate lip coverage were at greater risk of dental trauma, regardless of their over jet size.

2. Previous dental trauma.

   According to Onetto et al.[58] a high percentage of patients receiving injuries had suffered previous dental trauma.

3. Mental distress such as epilepsy, cerebral palsy, attention-deficit hyperactivity and history of previous injuries were shown to increase the risk for dental injuries.

4. Overweight children.

   Petti and Tearstain[59] showed that obese school children were significantly more prone to dental trauma than none obese children.

5. Socio-economic state.

   Children in the lower socio-economic groups received more injuries compared with the higher socio-economic groups.[60]

6. Intentional injuries include child abuse and assault:

   Dental injury might be an important indicator of child abuse since approximately 50% of cases involved oro - facial injury.[47]

7. The lack of a properly fitted mouth guard and/or faceguard.

2.1.4.2 Reaction of the Tooth to Trauma:

Mcdonald & Averys.[61] summarized reaction of the tooth to trauma as follows:

Pulp hyperemia, internal hemorrhage, calcific metamorphosis of the dental pulp (progressive canal calcification or dystrophic calcification), internal resorption, peripheral (external) root resorption, pulp necrosis and ankylosis.

2.1.5 Avulsion Tooth:

Avulsion is defined as the complete displacement of a tooth from its socket in alveolar bone owing to trauma.[62] When a tooth has been displaced from its socket which is in fact the serving of periodontal ligament fiber and the neurovascular bundle, there may be associated injuries to the alveolus and adjacent teeth. Usually avulsion involves a single tooth, but multiple avulsions are occasionally encountered. [63]

Avulsion of a permanent tooth is estimated to represent 0.5% to 16% of all dental injuries. [64] Tooth avulsion is three times more frequent in boys than girls because of their active participation in sports and games and occurs most frequently between the ages of 7 to 14 years, affecting the maxillary central incisors in primary as well as permanent dentition.[65] The lower jaw is seldom affected. In their study, Andreasen et al.[66]suggested that the loosely structured periodontal ligament surrounding the erupting teeth and elasticity of alveolar bone favor complete avulsion.

The health of the pulp and periodontal ligament (PDL) are the key issues that affect the prognosis of the avulsed tooth. [62] PDL cells are critical in allowing the tooth to reattach back into the socket. When there is too much damage to the ligament, healing occurs by bony replacement, and the tooth is replaced by bone and lost over a few years.

Immediately after avulsion, both pulpal and PDL cells begin to suffer ischemic injury, which can be worsened by drying, bacteria, and chemical irritants. These factors cause the loss of vitality to these PDL

cells and dehydration to the pulpal cells, which are invaluable for tooth survival. [61,62,67]

2.1.5.1 First Aid of Avulsed Teeth:

Prognosis of certain dental traumatic injuries like avulsion depends on the actions taken at the place of accident, immediately after the avulsion. [68,69]According to International Association for Dental Traumatology (IADT) and the American Academy of Pediatric Dentistry (AAPD) [70], there are two ways for the immediate management of avulsion injuries:

1. Immediate replantation of the tooth. In such cases, the tooth should be washed with cold running water for a maximum of 10 seconds before replantation.
2. If the tooth cannot be replanted within 5 minutes, storage of the tooth in a suitable storage medium to maintain the vitality of the periodontal ligament.

2.1.5.2 Replantation:

Andreasen, et al. [66] demonstrated in a clinical study that immediate replantation (within 5 minutes) was one of the most critical factors necessary for periodontal ligament PDL regeneration and return to normal function. Andersson and Bodine [71] discovered that teeth replanted within 15 minutes had a favorable long-term prognosis, and most teeth replanted within 10 minutes experienced no resorption. An extra oral dry time of 60 minutes was considered the point where survival of the root periodontal cells was unlikely. [72]

More recently, it was found that dry environment of greater than 15 minutes caused precursor cells on the root side of the PDL to fail to reproduce and differentiate into fibroblasts.[73] Even if the avulsed tooth was then placed in a liquid medium prior to replantation, this resulted in

the unfavorable "repair" as opposed to the favorable "regeneration" and lead to ankylosis, root resorption, and eventual tooth loss.[74]

Avulsed primary tooth should not be re - implanted as it can damage developing permanent tooth bud. There are also individual situations when replantation is not indicated (e. g., severe caries or periodontal disease, root fracture, non-cooperating patient, severe medical conditions (e.g., immunosuppression and severe cardiac conditions) which must be dealt with individually. Functional healing was observed in teeth re-implanted within one hour after the injury.[75] Numerous studies by Andreasen, et al.[66]Karayilmaz et al.[76] had shown that the success of replantation in permanent tooth was depended on various factors like extra-alveolar time, storage medium, type of retention employed, time of endodontic intervention, type of drug prescribed, oral hygiene status as well as general health of the individual .

Replantation of an avulsed tooth is preferably done at the injury site to minimize extra-alveolar time. The tooth is rinsed with cold tap water for ten seconds to remove any gross contamination and then immediately replanted in its socket. Then the patient is referred to the dental care facility for stabilization and antibiotic prophylaxis. When immediate re-implantation is not possible, the avulsed tooth must be stored in a humid storage media until the re-implant can be done.[74]

2.1.5.3 The Storage Media:

According to Raoof et al.[17]to replant a clean tooth with undamaged root surface the avulsed tooth should be stored in an appropriate medium till patient is brought to the dental office. The storage medium is the media in which the tooth has been stored prior to re - implantation. The storage medium should be capable of preserving the viability periodontal ligament cells, so that the cells can be capable of undergoing mitosis and

form clones of the damaged fibroblasts of the periodontal ligament and its generating cells.

The storage mediums in order of preference are Hank's balanced salt solution, Viaspan, milk, saliva, vestibule of the mouth or container with the patient' s spit, normal saline or water.[77] Out of the above mentioned storage mediums the least desirable medium is water. The reason being that its hypotonicity causes rapid lysis of the cells and increases the inflammation on replantation. [72] A more specialized medium that can be used to store the avulsed tooth is the Hanks balanced salt solution. This solution has superior ability to maintain viability of the PDL cells, however this solution is not easily accessible. [78]

According to Andreasen et al.[66] milk considered an excellent medium due to its composition and its osmolarity similar to the human blood. Furthermore, milk is a storage medium of relatively easy access at the location of trauma. In milk, the storage may last as long as 6 hours.

Thus, ideally, replantation at the site of the injury leads to the best long-term prognosis. Hence, education or information of dental trauma care among teachers, coaches, caregivers, parents, medical personnel and, above all, dentists, is essential. A study conducted in 2001 by Blakytny et al.[79] showed the reasons for reluctance in replantation among teachers, coaches, and caregivers were the following:

1. Inadequate training.
2. Reluctant to induce pain/fear in child.
3. Fear of blood-borne infection.
4. Fear of incorrect replacement.
5. Fear of legal consequences.

2.1.5.4 Complications of Tooth Avulsion:

- In primary teeth

– Infection

- Complicated problems to the underlying permanent teeth, such as, hypoplasia, discoloration, delay in eruption time, and tooth malformation.(80)
- Dilacerations (bend) in the permanent teeth root.

- In permanent teeth
- Discoloration as a result of loss of vitality of the avulsed tooth.
- Ankylosis of the alveolar ridge, leading to functional and aesthetic changes.
- Replacement resorption occurs when the replanted tooth is slowly replaced with bone.
- External inflammatory resorption is a progressive loss of tooth associated with destruction of adjacent alveolar bone.
- Infection.
- Aspiration of an inadequately secured replanted tooth.

2.1.6 Resources on the web of Guidelines for Management of Dental Injuries:

Vaida et al.[54]pointed out that management of dental trauma demanded precise diagnosis, adequate emergency management and correct treatment with follow - ups . All treatment procedures in case of dental trauma were directed to minimize undesired consequences which might lead not only the loss of the tooth, but also to the loss of the alveolar bone.

- The international Association of Dental Traumatology published guidelines in 2011 with recommendations for the management of dental injuries based on a review of the literature and consensus opinions[70]. these guidelines provide views on care based on the

published evidence and the opinions of professionals who practiced in this field.

– An internet-based set of guidelines has also been developed and sponsored by the International Association for Dental Traumatology (WWW.dentaltraumaguide.org). This is a free website that practitioners can use to quickly and easily access information about how to manage dental injuries, the prognosis of the teeth and many other issues.

2.1.7 Prevention of Dental Trauma:

An effort should be made to reduce the prevalence of traumatic injuries by taking consideration the following:

A. Education:

Karande et al.[2] Loo et al.[51] and Mala Singh et al. [81] recommended steps that could be considered to improve the knowledge level among school teachers and parents:

- Identification of the target group in the teachers 'community, it comprises of class teachers, physical education teachers, life sciences teachers, and the principal as they directly come in contact with school children.
- School teachers should ensure a safe environment during physical education lessons to identify the causal factors for the design of appropriate preventive measures to reduce incidents such as collisions, fights, and falls.

- Educational programs such as incorporation of emergency management of dental injuries in the curriculum of physical education teachers should be considered.
- For teachers and parents, dental and medical institutional authorities in coordination with the school authorities should plan such educative programs so that they can educate the children.
- First-aid management of dental trauma should be included in the teacher training curriculum, would help the teachers act in a better way when faced with such situations
- Dental camps should be held for school children every year, implementing such awareness lectures highlighting emergency management of dental traumatic injuries occurring in children for teachers and parents on a regular basis, would help in reinforcing their knowledge.
- Dental checkup camps should be organized to identify high-risk group, such as children with proclined teeth, and informing their parents about prevention and possible treatment options.
- Intervention program should be developed to target the parents to avoid unnecessary loss of permanent tooth due to avulsion injury, so the tooth can be retained in function for life.
- Television and the Internet can be the source of information regarding TDIs for parents.

B. Mouth Protection:

Many dentoalveolar injuries can be prevented by the use of well-fitted, properly constructed mouth guards, face cages, helmets in any sport in which there is a risk of sudden impact to the face. So, it is the responsibility of physical education teachers and sports coaches to

identify potentially dangerous sports in their area and recommend the use of safety equipment[13].

2.2 Review of Previous Studies:

For the importance and significance of emergency management in dental trauma, a various studies all over the world have been conducted. Below are some of the studies which directly related to this study listed according to its recent publication.

Divya et al.[82] conducted a study aimed to evaluate the knowledge of school teachers about dental trauma and its management in Kannur district in India. The study results showed a statistically significant association was found between the teacher's knowledge regarding trauma and their teaching experience, 90.1% of the participants responded correctly that the teeth most frequently affected by traumatic accidents were the upper front teeth, 23.4% responded correctly regarding management of traumatic tooth fracture, 46.5% had a correct knowledge regarding the implantation of avulsed permanent teeth, and only 14.2% responded correctly to the proper storage medium for avulsed teeth. It was concluded that among the teachers surveyed there was significantly very low knowledge of emergency management of dental trauma.

Amina and Hekmat [83]carried out a study regarding primary school teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor among children**.** in Assuit City Egypt. Their conclusion was that the level of teachers' knowledge in study group was improved after teaching first aid measures as compared to the control group. Before teaching first aid measures the majority of teachers their level of knowledge was unsatisfactory, after teaching first aid measures, the majority was satisfactory knowledge.

Anika et al.[10] studied Knowledge, Attitude and Practice (KAP) of Teachers Regarding Dental Traumatic Injuries among School Children of Shimla City. The study targeted a total of 381 participants from 21 schools of Shimla city were included in the study. The study concluded that variables like age, longer career span, better educational level and undergone first aid training did not provide more knowledge and the better attitude towards management of Traumatic Dental Injuries. Teachers had the least knowledge of whether to replant tooth back or not, liquid for rinsing the avulsed tooth, and transport media for the avulsed tooth and fair knowledge on when and where to refer child.

Rohan et al.[84]carry out a study to assess the knowledge of Australian (Sydney) school teachers in their initial management of TDIs and to investigate any differences in knowledge between primary school teachers working in public versus private metropolitan school teachers. The study concluded that knowledge gaps were demonstrated among Sydney primary school teachers in the initial management of TDIs and found to be consistent with the previously published literature. In addition, knowledge was similar for teachers employed in public and private schools. School teachers would benefit from education regarding TDI management which might improve the prognosis of these injuries when they occurred.

Jayachandra et al.[85] investigated the perception of teachers toward traumatic tooth avulsion and its management among school children in Durg, Chhattisgarh. They found that, the knowledge of school teachers toward the emergency management of traumatic dental injuries (TDIs) was insufficient, particularly regarding immediate management of avulsed tooth and medium for storage and transport of avulsed tooth. Therefore, a teacher's orientation program toward the management of TDI was highly suggested.

Lívia et al.[86] released a study aimed to assess the knowledge and actions of a group of Brazilian school teachers relative to dental trauma in permanent teeth. The results of the study showed that91.2% of the teachers had no knowledge about dental trauma and only 16.6% had seen cases of acute dental trauma. 23.9% of the participants had received first-aid training and 4.1% had been educated in dental trauma. However, the study concluded that the knowledge and actions of Brazilian schoolteachers in relation to the care of acute injuries in permanent teeth were inconsistent and were based on unfounded concepts, beliefs and intuition, and lack of training. They recommended a continuing education program in oral care due to a dental trauma should be a good plan of action.

Malaz and Amal. [87]carried an across-sectional study to assess knowledge of primary school teachers regarding emergency management of dental trauma, in Khartoum State. The conclusion of the study stated that most of the teachers had neither received first aid training nor dental trauma emergency management training. Yet they had a reasonable knowledge that they had received from reading or hearing about dental trauma management. They advocated that training dental program and educational campaigns should be established by the concerned authorities.

Pradhan et al.[88]conducted a study aimed to assess the knowledge of school teachers of Bhaktapur about emergency management of dental trauma and also to measure the relationship between socio-demographic characteristic of teachers and knowledge about dental emergencies. One of the findings of the study was teachers who had experienced dental trauma in their students were only confident of managing displacement of traumatized teeth. The study concluded that knowledge of the school

teachers in Bhaktapur was seen to be inadequate for emergency management of fracture and avulsed tooth.

Kaur et al.[89]prepared a study which aimed to assess the knowledge and attitude regarding tooth avulsion and dental first aid among school teachers in urban and rural areas. The study was performed on a sample of 50 school teachers of urban and 50 school teachers of rural. Results showed poor knowledge in the management of avulsed teeth among the school teachers of both areas. The study concluded that School teachers, being one of the child managers, needed to have the basic knowledge to recognize and manage oral emergencies avulsed teeth to prevent its consequences in the child's development.

Francisco et al.[90]designed a study to evaluate elementary education teachers' knowledge on avulsion and tooth replantation, the aim of the study was to assess the knowledge of 89 teachers about dental trauma. The study concluded that the knowledge of teachers should be improved by educational and preventive campaigns on management of traumatized teeth.

Pujita et al.[1]investigated a prospective intervention study conducted with 1000 teachers (500 urban, 500 rural) randomly selected from the entire government and private, primary (elementary) as well as secondary (high) schools of Nellore district of Andhra Pradesh, India. They concluded that the teachers' overall knowledge with respect to the emergency management of the traumatic injuries was deficient and significant differences were found in the knowledge of teachers before and after the informative promotion.

Basir et al.[91]carried a study which aimed to evaluate the primary school teachers' knowledge about emergency management of avulsed teeth in Ahvaz, Iran. The study was conducted in twenty randomly selected primary schools. The results of the study indicated that 15.2% of

the teachers had an experience of the avulsed tooth at school, all of them knew the importance of emergency management and 36.4% would look for a dentist for treatment of the cases. Only 6.3% reimplanted the tooth themselves. Regarding the storage media, 6.7% would keep the avulsed tooth in milk. There was no significant difference between gender and education level. The conclusion showed that school teachers' lacked knowledge regarding dental trauma and especially tooth avulsion.

Olatosi et al.[92] investigated in their study the Knowledge and Attitude of Some Nigerian School Teachers on the Emergency Management of Avulsed Permanent Incisor. A total of 320 teachers answered the questionnaires. 63% of the respondents were female. The study concluded that the school teachers had insufficient knowledge about the emergency management of avulsed permanent teeth. School oral health campaigns with regards to emergency management of avulsed teeth will help improve teachers' knowledge and modify their behavior.

Young et al.[93] investigated the level of knowledge about emergency management of dental trauma among Hong Kong primary and secondary school teachers. The conclusions of the study were the knowledge on the emergency management of dental trauma among primary and secondary school teachers in Hong Kong was insufficient, particularly on the handling of permanent tooth avulsion and the appropriate storage medium for avulsed teeth. Receipt of first-aid training with dental contents and acquisition of dental injury information from other sources were positively correlated with knowledge in managing dental trauma.

Kaur et al. [94]aimed to evaluate school teachers' knowledge and attitudes regarding immediate management of avulsed teeth in children. A total of 177 teachers from seven schools of Garhshankar town,

Hoshiarpur District, Punjab, India, formed the sample of the study. The study concluded that knowledge regarding emergency management of dental trauma was poor amongst school teachers. Therefore, suggested that orientation to the management of avulsed tooth should be a part of the teacher training education.

Sharifi et al.[95] conducted a descriptive cross-sectional study to determine knowledge and effect of demographic factors of primary school teachers in Kermanshah on the management of dental trauma. Samples of 145 randomly selected primary school teachers were investigated. The study found that knowledge of the primary school teachers about the management of dental trauma was insufficient and no significant relationship was observed between gender, experience, academic rank, the number of exposures to dental trauma and the teachers' knowledge regarding the management of the avulsed or fractures teeth ($P > 0.05$). The study recommended in-service training courses and updating the teachers' information for the management of dental trauma.

B. Touré1 et al [96], carried out a study to evaluate primary school teachers' knowledge regarding emergency management of avulsed permanent incisors. The study was conducted in fifty randomly chosen primary schools from Casablanca, Morocco. All teachers of the selected schools were included in the study. The data were collected by self-administered questionnaires. The study concluded that school teachers' lack of knowledge regarding dental trauma and especially tooth avulsion. Therefore, the results indicated that educational programs were necessary for improvement in their level of knowledge.

Jyothsna .[97] designed a study to examine the knowledge and attitude of primary school teachers with regard to the emergency management of avulsed permanent incisors. A total of 480 teachers from

25 randomly selected primary schools in Bangalore city participated in the study. Teachers who were willing to participate in the study were asked to fill the questionnaire and to immediately submit to the author. The study concluded that, the research clearly implicated that the primary school teachers in Bangalore city at best had the rudimentary knowledge of emergency management of dental avulsion. Teachers and other individuals, who were involved with the supervision of children in schools, should compulsorily receive simple instructions in dental first-aid as children spended the considerable duration of the active daytime at school.

Hashim.[25] investigated dental trauma management awareness among primary school teachers in the Emirate of Ajman,(United Arab Emirates). The objective of the study was to assess the level of knowledge of primary schools teachers in Ajman with regards to the immediate emergency management of dental trauma. A total of 161 teachers responded (response rate 84.4%).The study concluded that the level of knowledge of management of dental trauma (especially tooth avulsion) among school teachers in Ajman was inadequate, and education campaigns were necessary to improve their emergency management of dental injuries.

Chapter 3

AIMS OF THE STUDY

3.0 AIMS OF THE STUDY

Since school injuries account for a higher proportion of dental trauma, it would be desirable for teachers to be capable of emergency management of such injuries when they occur.

Reviews of literature have revealed no studies have been conducted in Libya to assess the knowledge of school teachers about the emergency management of dental injuries.

Therefore the aims of the study were to:

1. Assess the awareness and knowledge of Libyan school teachers in regard to immediate emergency management of dental trauma.
2. Compare their awareness and knowledge to the length of their service as school teachers.
3. Compare their awareness and knowledge to the presence or absence of the first-aid course as a component of their teacher training programs.
4. Provide scientific information for authority that could help in planning an emergency Program for school teachers to deal with dental trauma.
5. Provide baseline data for any further study.

Chapter 4

MATERIALS AND METHODS

MATERIALS AND METHODS

4.1 Material:

4.1.1 Study Design:

This cross-sectional study was conducted among government primary and secondary school teachers in Benghazi city to assess their knowledge regarding emergency management of dental trauma. The study was conducted during March until May year of 2012.

4.1.2 The Population:

The main purpose of the study was to measure the awareness and knowledge of Libyan school teachers in emergency management of dental trauma, therefore, the population of the study was the teachers work in Libyan public schools (elementary and preparatory) where children aged between 6 to 15 years having their education.

As the environment of any schools in Libya is almost the same regardless of its location, therefore, this study geographically was limited to the public primary and preparatory schools in the city of Benghazi. This limitation was due to some reasons such as:

1. Benghazi, as a second largest city in Libya, has a number of regions such as: Al - Berks, Seidy Hsean, Al - Sabry, Allaithy, Buhdiema, Al-fouihat,….etc. However, Benghazi head quarter of education had divided the city into three main regions: Central of Benghazi (Benghazi Al - Markaz), Al - Berka and Asslawy. This study was conducted in the region of Bengazi Al - Markaz because it was the largest region in the city. About 140 public (government) schools (elementary and preparatory) are allocated in Benghazi where a number of teachers work in each school. According to the statistical data was given by Benghazi head quarter of education, the number of teachers working in public primary and secondary schools were

2360 teachers at the time of the empirical study was conducted. (March - May 2012)

2. Enough schools were available to conduct the study.
3. The findings of the study can be generalized.
4. Researcher's limited resources available did not help to cover many cities, especially for those which were far away from Benghazi city.
5. The ability to move easily within the schools inside Benghazi city.

4.1.3 The Sample:

4.1.3.1 Determination of Sample Size:

To apply any empirical study, a sample size has to be determined. Therefore the sample size of this study was determined by using Steven Thimpson Equation as follows: (At 95% confidence power of the study).

$$n = \frac{N \times P(1-P)}{\left(N-1 \times (d^2 - z^2)\right) + P(1-P)}$$

Where:

n = Sample size

N = The population size

P = percentage of availability of character and objectivity = (0.5)

d = Error percentage = (0.05)

Z = The corresponding standard class of significance 95% = (1.96)

Hence:

n = 2360 x (0.5 x 0.5) / 2359 x 0.05 / 1.96 + (0.5 x 0.5)

n = 2360 x 0.25 / 2359 x 0.002 / 3.84 + 0.25

n = 590 / 1.478 = 399.188 Almost 400

4.1.3.2 Research Sample:

As the sample size has been determined at 400 which means that the participants must be not less than 400. Taking into consideration any

drop out or uncompleted questionnaires, the sample size for the purpose of this study was 500 primary and preparatory school teachers.

Five hundred teachers of both genders working in forty public schools (elementary and preparatory) were randomly selected to participate in this study.

Because of the number of teachers differed from school to school, an equal number was stated to select the participants from each school. Hence, 15 questionnaires were distributed to the teachers work in large schools (20 schools), while 10 questionnaires were distributed to those worked in less (smaller) size of schools (another 20 schools). (Appendix 1 represents the name of participated schools)

4.2 The Method:

4.2.1 The Tool of the Study:

To obtain the data needed to fulfill the aims of this study, a questionnaire (Appendix 2) which was modified form of questionnaire used by Raphael SL. and Gregory PJ (1990). For the purpose of this study the questionnaire was prepared in Arabic (local language). The questionnaire was divided into three parts: (Appendix 2 presents English copy of the questionnaire).

Part I: Consisted of the name of school, school address, and six questions regarding the socio-demographic characteristics of the teachers on personal and professional data that recorded the following:

1. Three questions regarding gender, education level (qualification) and years of experience as school teacher.
2. Four questions related to previous training in both teaching and first-aid which including dental trauma.

Part II: Consisted of case study with mild dental trauma involving uncomplicated crown fracture. Two main questions followed the case.

Part III: Consisted of case study that involved avulsed permanent tooth and its management. Twelve questions followed the case. This part allows to investigate general knowledge and awareness of school teachers regarding emergency management of dental trauma, emphasizing avulsion tooth.

Both cases introduced in the questionnaire emphasizing only two types of dental trauma: First was uncomplicated crown fracture and the second was avulsed permanent tooth.

Before the questionnaires were distributed, and to assure understanding of the questions, a simple illustration and a brief idea were given to the participants (school teachers) regarding the questions emphasizing the two cases brought in the questionnaire. The illustration was delivered using simple language with emphasis on the issue of trauma dental injuries (TDI). After the illustration a short time was allotted for discussions and clarification of doubts encouraging interaction and participation

4.2.2 Pilot Study:

The pilot study allows the researcher to finalize and to asses applicability and clarity of the tool of study, and estimate the time needed to complete all parts of the questionnaire. Therefore, pilot study was carried out on 20 of public primary and preparatory schools teachers. According to the results of Pilot study some necessary modifications, additions and/or omissions were taken into consideration. However, to assure the stability of the result, the pilot study sample was excluded from the total sample.

4.2.3 Distribution of the Tool:

A total of five hundred questionnaires were delivered directly by hand to the respondents at their respective schools. In order to assess

their knowledge of appropriate emergency management of avulsed primary and permanent teeth the respondents were asked to tick the most appropriate answer from a list. Each answer list included correct and incorrect information.

Four hundred and thirty - five questionnaires (87.0%) were collected from the participated teachers, and they were then given the opportunity to make inquiries or comments about the questions. After the received questionnaires reviewed twenty-nine of them (5.8%) were found uncompleted, thus, were excluded from the analysis. The total number of teachers who have responded to each question and the nature of the response was four hundred and six (81.2%). Table 1 shows the number and percentage of questionnaires distributed, received, and completed responses.

Table 1: The questionnaires distributed and received

Category	**Frequency**	**Percent**
Questionnaires Distributed	500	100 %
Unreturned Questionnaires	65	13.0%
Questionnaires Received	435	87.0%
Questionnaires Uncompleted	29	5.8 %
Completed Questionnaires	406	81.2%

4.3 Ethical Aspects:

To assure the issue in this study, the following aspects have been considered:

1. To conduct the study formal permission was obtained from the head quarter of education for Benghazi region and from the school administration.
2. The purpose of the study was explained to the participants in Arabic language.
3. The voluntary nature was expressed for data collection.
4. Strict confidentiality of the obtained data was assured during brief illustrations before distribution of the questionnaire.
5. The methodology of the study (questionnaire) was explained to the teachers in Arabic language.
6. The right to not participate or to draw from the study was expressed to the teachers.

4.4 Statistical Methods:

Responses obtained from completed questionnaires were tabulated and expressed as frequency distributions, and then computed in percentages. Further, the responses were coded and entered on computer, using SPSS (Statistical Package for Social Sciences) software, Version 14.0 (SPSS Inc., Chicago, IL, USA). Chi-square test was used to compare the knowledge of teachers. The level of significance was set at $P \leq 0.05$ (equivalent to 5%).

4.5 Hypothesis:

Considering the aim of the study and having reviewed the previous related studies, three hypotheses were stated as follows:

1. The awareness and knowledge of Libyan primary and preparatory school teachers regarding the management of dental trauma injuries is sufficient.
2. There is relation between awareness and knowledge of primary and preparatory school teachers and the length of their service.
3. There is relation between awareness and knowledge of primary and preparatory school teachers and the presence or absence of first-aid course as a components of their teacher training programs.

Chapter 5

RESULTS

RESULTS:

Data obtained from the three parts of the completed questionnaires were tabulated. Tables (1) to (21) indicate both the frequency and the percent of each response to each question. In addition, tables (22) to (29) indicate correlation between the experience, training, first-aid and the Knowledge of Libyan school teachers regarding the management of dental trauma.

5.1 Socio - Demographic Data:

The data obtained from the participants of this study regarding part I of the questioner which "consisted of questions on personal and professional data that recorded gender, education level, teaching experience and first-aid training background" are presenting in tables (1) to (7) below:

Table (1) indicates the gender of the teachers participated in this study. 358 teachers (88.2%) were female while the rest 48 teachers (11.8%) were males.

Regarding the education level (qualification) of participated teachers, table (2) indicates that most of the respondents 84.5% had diploma while the remaining 15.5% were graduated from university college, hence they hold a bachelor's degree.

Considering the respondent's experience in teaching, table (4) shows that three hundred and fifty-three teachers 86.9% had an experience (years in service) more than ten years while only 13.1% of them had served in teaching for a period ranged between five to ten years.

Table 1: The responses of teachers for "Gender"

Category	Frequency	Percent
Male	48	11.8 %
Female	358	88.2 %
Total	406	100.0 %

Table 2: The responses of teachers for "Qualification"

Category	Frequency	Percent
Diploma	343	84.5 %
University	63	15.5 %
Total	406	100.0 %

Table 3: The responses of teachers for "Experience"

Category	Frequency	Percent
5-10 yrs	53	13.1 %
More than 10 yrs	353	86.9 %
Total	406	100.0 %

Training is important factor to increase the knowledge of the trainees, one question was addressed to the participants; table (4) represents the responses. Most of the teachers participating in this study 94.8% had teaching training while only 21 teachers (5.2%) did not have teaching

Table 4: The responses of teachers for "having teaching training"

Category	Frequency	Percent
Yes	385	94.8 %
No	21	5.2 %
Total	406	100.0 %

Table (5) reveals the responses of the teachers regarding if they had first- aid course during the period of training, almost 60% of them responded that they did not enrolled in any first-aid course, while 40% indicated that they already enrolled in such course.

As table (6) shows, only 20 of the participants (4.9%) had formal first-aid on their own. While the most of teachers indicated that they did not afford the cost of training.

Even though some participants had first-aid course, table (7) reveals that just nine (out of 163 teachers) or 5.5% had cover the issue related to the management of dental trauma in that course. The remaining, 85.5% of the respondents answered "No" while 9% said they were not sure.

Table 5: The responses of teachers for "having first aid course"

Category	Frequency	Percent
Yes	163	40.1 %
No	243	59.9 %
Total	406	100.0 %

Table 6: The responses of teachers for "having first aid on their own"

Category	Frequency	Percent
Yes	20	4.9 %
No	386	95.1 %
Total	406	100.0 %

Table 7: The responses of teachers for "the first aid cover the management of dental trauma"

Category	Frequency	Percent
Yes	9	5.5%
No	139	85.5 %
Not sure	15	9.0%
Total	163	100.0 %

5.2 Case One:

Tables (8) and (9) represent the respondents of the teachers regarding a case study with mild dental trauma involving uncomplicated crown fracture. The case stated that "During a physical education session an 8 years old girl was hit on the face with a soft ball. Her upper front teeth were broken. She was otherwise unhurted and did not lose consciousness".

To investigate the participants knowledge regarding distinguish between permanent and baby tooth if a front tooth was damaged, table (8) reveals that 170 teachers 41.9% thought that they were permanent teeth, while 18.7% thought that they were baby teeth. However, the remaining of participants 39.4% were not sure what kind of teeth they were.

Many actions might be considered to be the most appropriate one in case of facing a damaged tooth (uncomplicated crown fracture). To view what action might be taken by the participants of this study, table (9) shows that 67.7% of the teachers would send the childe immediately to the school nurse or a care taker, while 20.7% of the respondents preferred to contact the child’s parents to take him/her to a dentist. Actions would be taken by the rest of the respondents were varies, just few teachers 3.9% preferred the action of searching for the pieces of broken tooth, others, about 3.7% preferred to wait until the end of class and then contact the child’s parents and explain what happened.

Table 8: The responses of teachers for case I

"The damaged front teeth likely to be"

Category	Frequency	Percent
Permanent	170	41.9 %
Milk (baby) teeth	76	18.7 %
Not sure	160	39.4 %
Total	406	100.0 %

Table 9: The responses of teachers for case I

"Actions considered being more appropriate"

Category	Frequency	Percent
At the end of the class contact the parents and explain what happened	15	3.7 %
Give her a warm drink and contact her parents	13	3.2 %
Send her immediately to the school nurse	275	67.7 %
Search for the pieces of the broken teeth	16	3.9 %
Contact her parents and take her to a dentist	84	20.7 %
Others	3	0.8 %
Total	406	100.0 %

5.3 Case Two:

Tables (10) to (22) represent the responses of the teachers regarding a case study that involved avulsed permanent tooth and its management. The case stated that "During a game 13 years old boy got hit in the mouth by another student. His mouth was bleeding and an upper front tooth was found to be missing".

With regard to the action might be taken by the teacher in case of bleeding and a missing tooth, table (10) indicated that 181 (44.6%) of the respondents would side line the injured boy, getting him to bite on a handkerchief to control the bleeding. Others 174 of the respondents (42.8%) would follow the action that got the boy to hold the tooth carefully in his mouth and took him immediately to the nearest dentist. Twenty-two of the participants (5.4%) preferred to put the tooth in a liquid and sent the boy home straightaway.

Table (11) analyzed responses of the teachers in case if they needed further training to manage trauma. Three hundred and fifty teachers (86.2%) answered yes, they did need such training while the remaining 13.8% said they did not need further training.

Table 10: The responses of teachers for case II

"Actions may be taken"

Category	Frequency	Percent
Side line the injured boy, getting him to bite on handkerchief to control the bleeding	181	44.6%
Look for the tooth, wash it and give it to him to take it home	15	3.7%
Look for the tooth and put it back into the socket	6	1.5%
Put the tooth in a liquid and send the boy home	22	5.4%
Get the boy to hold the tooth carefully in his mouth, and take him immediately to the nearest dentist	174	42.8%
Others	8	2.0%
Total	406	100.0

Table 11: The responses of teachers for case II

"Further training needed"

Category	Frequency	Percent
Yes	350	86.2 %
No	56	13.8 %
Total	406	100.0 %

Concerning any previous experience the teachers might have before, one question was asked if the teacher had witnessed an accident where a tooth knocked out. Most of the teachers 79.8% revealed that they did not have him/her or spouse or student had an accident where tooth was knocked out, while only 20.2% said they did have such experience as Table (12) indicated.

To see how the teacher acted in case of a child came with knocked out tooth in the hand after an accident, which was the first place the respondent would contact and seek treatment? Table (13) showed that most of respondents 372 teachers (91.6%) contacted a dentist while the remaining 8.4% would either contact a general hospital or other places.

Table (14) reveals how urgent teachers would act to seek professional help if a permanent tooth had been knocked out. Three hundred and ten 76.3% of the participants would immediately look for a professional help, only 6.9% would seek such help within 30 minutes, while the others either acted within few hours 9.4% or before the next day 7.4%

Table 12: The responses of teachers for

"Having someone had an accident where a tooth knocked out"

Category	Frequency	Percent
Yes	82	20.2 %
No	324	79.8 %
Total	406	100.0 %

Table 13: The responses of teachers for case II

"First place you contact"

Category	Frequency	Percent
Dentist	372	91.6 %
General hospital	23	5.7 %
Other places	11	2.7 %
Total	406	100.0 %

Table 14: The responses of teachers for case II

"How urgent do you seek professional help"

Category	Frequency	Percent
Immediately	310	76.3 %
Within 30 minutes	28	6.9 %
Within few hours	38	9.4 %
Before next day	30	7.4 %
Total	406	100.0 %

As trying to manage the case, some teachers replanted (put back) the tooth into the socket from which it came out. Table (15) indicated that almost half (51.7%) of the respondents would replant the knocked out tooth while the remaining 48.3% said they would not replant such tooth.

To find out the knowledge of the respondents regarding whether or not replant (put back) a baby tooth which had been knocked out, data in table (16) showed that most of the respondents 82.8% did not think that the baby tooth should be replanted, while the remaining 17.2% indicated they did think the tooth should be replanted.

Table (17) showed the actions might be taken by the teachers in case of replant (put back) a tooth which had already fallen in the ground and was covered in dirt. More than half of the respondents 51.7% said they did not know how to act. 19.5% revealed they would rinse the tooth under tap water and 15.8% said they preferred to scrub the tooth gently with a tooth brush.

Table 15: The responses of teachers for case II

"Put back the tooth into the socket"

Category	Frequency	Percent
Yes	210	51.7 %
No	196	48.3 %
Total	406	100.0 %

Table 16: The responses of teachers for case II

"Think to put baby tooth back into the socket"

Category	Frequency	Percent
Yes	70	17.2 %
No	336	82.8 %
Total	406	100.0 %

Table 17: The responses of teachers for

"In case of the tooth fallen in dirt"

Category	Frequency	Percent
Scrub the tooth gently with a tooth brush	64	15.8 %
Rinse the tooth under tap water	79	19.5 %
Put the tooth straight back into the socket without other things	7	1.7 %
Don’t know	210	51.7 %
Other place	46	11.3 %
Total	406	100.0 %

In case of facing a permanent tooth that had been knocked out and broken, most of the respondents 85.5% reported that they would take it to dentist. Further, table (18) shows that only 4.4% of the teachers responded said they still put back the tooth into the socket.

Table (19) revealed that 244 of the respondents 60.1% would use either a paper tissue or clean handkerchief in case of the knocked out tooth to carry it to the dentist. 18.2% of the teachers used ice while 29 of the respondents 7.1% preferred to use plastic wrap as transportation media.

Table 18: The responses of teachers for "If the permanent tooth which knocked out was broken"

Category	Frequency	Percent
Still replant (put back) the tooth into the socket	18	4.4%
Take it to dentist	347	85.5%
Other place	41	10.1%
Total	406	100. %

Table 19: The responses of teachers for "How to transport the tooth to the dentist"

Category	Frequency	Percent
Ice	74	18.2 %
Child's mouth	16	3.6 %
Child's hand	9	2.2 %
Paper tissue or clean handkerchief	244	60.1 %
Plastic wrap	29	7.1 %
Other place	34	8.4 %
Total	406	100.0%

In case of using a liquid for either washing or as transporting media for the tooth, table (20) indicated that more than half of the teachers responded preferred to use Antiseptic solution 59.2% for washing and 57.5% for transporting. Few participants preferred using tap water for washing 23.4% while only 9.7% of teachers preferred using such liquid as transporting media. Only 16.5%of participants preferred iced water as

transporting media. A percentage of 5 to about 7% of the respondents indicated that they would use alcohol to wash and to transport the tooth.

Table (21) revealed that most of the teachers participated in this study 82.8% did not receive any advice on what to do and what not to do in the event of an accident where a tooth had been knocked out. Only 17.2% of the respondents said they has already received such advice.

5.4 Comparison between the Experience, Training, First-aid and the Knowledge of Libyan School Teachers Regarding the Management of Dental Trauma:

To analyze the relationship - if any- between experience might a teacher gained and the knowledge level of managing trauma, teachers already participated in this study were categorized into two groups. The relation had been formulated into three categories as follows:

Table 20: The responses of teachers for case II "What kind of liquid to be used in case of washing or transporting the tooth to the dentist"

Category	For Washing		For Transporting	
	Frequency	Percent	Frequency	Percent
Tap water	95	23.5 %	39	9.7 %
Fresh milk	3	0.7 %	15	3.7 %
Fruit juice	1	0.2 %	2	0.4 %
Alcohol	23	5.7 %	30	7.4 %
Normal saline	14	3.4 %	13	3.1 %
Iced water	25	6.1 %	67	16.5 %
Antiseptic solution	240	59.2 %	233	57.5 %
Other liquid	5	1.2 %	7	1.7 %
Total	406	100.0%	406	100.0 %

Table 21: The responses of teachers for "Receiving advice on what to do"

Category	Frequency	Percent
Yes	70	17.2 %
No	336	82.8 %
Total	406	100.0 %

A. With regard to the duration of service in years as a teacher: Group I represent teachers who served less than 10 years, while Group II represent those who spend more than 10 years in service.
B. Considering teacher training: Group I represented teachers who had teaching training course(s), while Group II represents those who did not have such training.
C. As the importance of taking a first-aid course in dealing with medical cases, the respondents were categorized into two groups. Group I represented teachers had first-aid course, while group II represented those who did not have first-aid course.

Tables (22) – (29) revealed the analysis of the responses obtained for each category A, B, and C. Further, the tables showed the value of statistical analysis (Chi - Square, df, and P - value). Following are the data analysis for each category: A (tables 22, 23, 24), B (tables 25, 26, 27), and C (tables 28, 29).

5.4.1 Comparison between the Experience and the Knowledge: Category: A

Table (22) showed the correlation between the duration of service as a teacher in years and the actions the respondent would be considered if case I in the questionnaire (uncomplicated crown fracture) have happened. Sending the child immediately to school nurse was the action

most of the teachers in both groups would consider. Hence, both groups reported a relatively similar action.

Statistical analysis was resulted:

$\chi 2 = 27.017$ and P-value = 0.000

Results indicated that the experienced and un-experienced teacher showed comparatively same level of awareness regarding the actions would be taken in the case of broken tooth.

Table 22: Relation between teaching experience and action would be taken in case of broken tooth

Length of services as a teacher (in years)	Which of the following actions would you consider most						
	At the end of the class contact her parents and explain what happened	Give her a warm drink and contact her parents	Send her immediately to the school nurse/care taker	Search for the pieces of the broken teeth	Contact her parents and take her to a dentist	Others please state	Total
5-10 yrs	–	3	39	–	8	3	53
	–	5.7 %	73.5 %	–	15.1 %	5.7 %	100%
More than 10 yrs	15	10	236	16	76	–	353
	4.3 %	2.8 %	66.9 %	4.5 %	21.5 %	–	100%
Total	15	13	275	16	84	3	406
	3.7 %	3.2 %	67.7 %	3.9 %	20.7 %	0.8 %	100%
	$\chi 2 = 27.017$		df = 5	p-value = 0.000			

Regarding case II in the questionnaire (avulsed permanent tooth), the relation between the length of service as a teacher in years and the actions the respondent would take were presented in table (23). About 45% of each group would side line the injured boy, getting him to bite on a handkerchief to control bleeding. About 43% of each group would get the boy to hold the tooth carefully in his mouth, and take him immediately to the nearest dentist. Therefore, actions would be taking by both groups were relatively similar.

Statistical analysis was resulted:

$\chi 2 = 12.504$

P - value = 0.028

The results revealed that the experienced and un-experienced teacher showed a comparatively same level of awareness regarding the actions would be taken in the case of avulsed tooth.

To measure the relation between the length of service as a teacher in years and seeking a professional treatment, table (24) revealed that most of the teachers (more than 90%) in both groups would first contact a dentist to seek the treatment. Hence, the respondents in both groups reported relatively similar answer.

Statistical analysis was resulted:

$\chi 2 = 6.809$ and P-value = 0.033

The results revealed that the experienced and un-experienced teacher showed a comparatively same level of awareness regarding places of seeking treatment in the case of an avulsion.

Table 23: Relation between teaching experience and action would be taken in case of avulsed tooth

Length of services as a teacher (in years)	Which actions of the following you may take						
	Side line the injured boy, getting him to bite on a handkerchf control the bleeding	Look for the tooth, wash it and give it to him	Look for the tooth and put it back into the socket	Put the tooth in a liquid and send the boy home straightaway	Get the boy to hold the tooth carefully in his mouth, and take him immediately to dentist	Others please state	Total
5-10 yrs	24	1	2	6	17	3	53
	45.3 %	1.9 %	3.8 %	11.3 %	32.0 %	5.7%	100%
More than 10 yrs	157	14	4	16	157	**5**	353
	44.5 %	4.0 %	1.1 %	4.5 %	44.5 %	1.4%	100%
Total	181	15	6	22	174	8	406
	44.6 %	3.7 %	1.5 %	5.4 %	42.8 %	2.0%	100%
$\chi 2 = 12.504$ df = 5 P - value = 0.028							

Table 24: Relation between teaching experience and contacts to seek treatment

Length of services as a teacher (in years)	If your child/student came to you with a knocked out tooth in the hand after an accident, which would you be the first place you would contact and seek treatment?			
	Dentist	**General hospital**	**Other places**	**Total**
5-10 yrs	48	1	4	53
	90.6 %	1.9 %	7.5 %	100%
More than 10 yrs	324	22	7	353
	91.8 %	6.2 %	2.0 %	100%
Total	372	23	11	406
	91.6 %	5.7 %	2.7 %	100%
$\chi 2 = 6.809$ df = 2 P - value = 0.033				

According to statistical analysis it was obvious that there were no relation between the length of service as a teacher and awareness and knowledge of emergency management of dental trauma.

5.4.2 Comparison between Teaching Training and the Knowledge: Category: B

With regard to the relation of the teacher's experience might be gained by any training course (s) in the field of teaching and/or other fields, and the effect of such training on handling trauma cases, tables (25-29) showed the responses of both groups. Group I represent those who did take training course while group II represent teachers who did not take any training course.

Table (25) revealed that most of the respondents in both groups indicated that they still need further training to manage trauma cases. Therefore, there was no difference in their answer. This means that even though they already had teacher training, they still need further training to manage emergency trauma cases.

Statistical analysis was resulted:

$\chi 2 = 4.068$

P - value = 0.044

Based on the results, the trained and untrained teacher showed a comparatively same level of knowledge regarding the need of further training to manage trauma cases.

Table (26) represented knowledge of the participants in both groups regarding how urgent they would seek professional help in case of a permanent tooth had been knocked out. Most of the respondents in both groups said they would act immediately. Hence, actions would be taken by teachers in both groups were relatively similar. Therefore, no difference in the answer had been noticed between both groups.

Statistical analysis was resulted:

$\chi 2 = 11.095$

P - value = 0.011

The above result indicated that the trained and untrained teacher showed a comparatively same level of knowledge regarding the urgency of seeking treatment in the case of an avulsion.

Considering the opinion of respondents in both groups regarding replant the tooth into the socket from which it came out, table (27) reveals that more than half of the respondents of each group were stated that they would not replant that tooth. Once again, the answer was identical in both groups,

Statistical analysis was resulted:

$\chi 2 = 4.754$

P - value = 0.029

According to the results, trained and untrained teacher revealed a comparatively same level of knowledge regarding replant (put back) the tooth into the socket from which it came out.

Table 25: Relation between teaching experience and the need of further training to manage trauma cases

Did you have teacher training?	**Do you think that you need further training to manage trauma cases?**		
	Yes	**No**	**Total**
Yes	335	50	385
	87.0 %	13.0 %	100%
No	15	6	21
	71.4 %	28.6 %	100%
Total	350	56	406
	86.2 %	13.8 %	100%
$\chi 2 = 4.068$	df = 1	P value = 0.044	

Table 26: Relation between teaching experience and the urgency of seeking professional helped

Did you have teacher training?	How urgent do you think it is to seek professional help if a permanent tooth has been knocked out?				
	Immediately	Within 30 minutes	Within few hours	Before the next day	Total
Yes	296	23	36	30	385
	76.9 %	6.0 %	9.4 %	7.7 %	100%
No	14	5	2	–	21
	66.7 %	23.8 %	9.5 %	–	100%
Total	310	28	38	30	406
	76.4 %	6.9 %	9.4 %	7.3 %	100%
$\chi 2 = 11.095$	df = 3	P- value = 0.011			

Table 27: Relation between teaching experience and Replant a knocked out tooth

Did you have teacher training?	Would you replant (put back) the tooth into the socket from which it came out?		
	Yes	No	Total
Yes	204	181	385
	53.0 %	47.0 %	100%
No	6	15	21
	28.6 %	71.4 %	100%
Total	210	196	406
	51.7 %	48.3 %	100%
$\chi 2 = 4.754$	df =1	p-value = 0.029	

Based on the results and statistical analysis it was obvious that there were no relation between training gained by teachers and the knowledge of emergency management of dental trauma.

5.4.3 Comparison between First - Aid and the Knowledge: Category: C

Table (28) revealed that although the first-aid course was taken, most of the respondents in both groups indicated that they still need further course to know better how to manage trauma. Therefore, no difference had been noticed between the answer of the respondents in both groups.

Statistical analysis was resulted:

$\chi 2 = 3.623$

P - value = 0.047

The result indicated that teachers did take first-aid course and who did not take it showed a similar level of knowledge regarding the need of further training to manage trauma cases.

Table 28: Relation between first-aid experience and the need of further training to manage trauma cases

During your training period did you have first-aid course component?	Do you think that you need further training to manage trauma cases?		
	Yes	**No**	**Total**
Yes	147	16	163
	90.2 %	9.8 %	100%
No	203	40	243
	83.5 %	16.5 %	100%
Total	350	56	406
	86.2 %	13.8 %	100%
$\chi 2 = 3.623$ df = 1	p - value = 0.047		

Table 29: Relation between first-aid experience and replant a knocked out tooth

During your training period did you have first-aid course component?	Do you think that a baby tooth has been knocked out should be replanted (put back) in to the socket?		
	Yes	**No**	**Total**
Yes	20	143	163
	12.3 %	87.7 %	100%
No	50	193	243
	20.6 %	79.4 %	100%
Total	70	336	406
	17.2 %	82.8 %	100%
$\chi 2 = 4.717$ df = 1	p - value = 0.030		

Regarding replantation of baby tooth if it was knocked out, most of the respondents in both groups who already had first-aid course said they would not replant that tooth. Hence, the answers of respondents in both groups were similar as table (29) above, indicated.

Statistical analysis was resulted:

$\chi 2 = 4.717$

P-value = 0.030

Hence, the result showed that teachers did take first-aid course and who did not take it presented a similar level of knowledge regarding replanting a baby tooth.

According to the results and statistical analysis it was obvious that there was no relation between teachers who took first-aid course and the knowledge of emergency management of dental trauma.

5.5 Examination of Hypotheses:

Based on the results and statistical analysis hypothesis may be accepted or rejected.

For the purpose of this study, three hypotheses were formulated. The following are the discussion related to each hypothesis:

- **Hypothesis One**:

  The awareness and knowledge of Libyan primary and preparatory school teachers regarding the management of dental trauma injuries is sufficient.

  Based upon the results, the statistical analysis obtained from the participants indicated that there was a statistical significant (P. <.05) which lead to reject the hypothesis. Therefore, the awareness and knowledge of Libyan primary and preparatory school teachers regarding the management of dental trauma injuries is insufficient.

- **Hypothesis Two:**

There is relation between awareness and knowledge of primary and preparatory school teachers and the length of their service.

According to the results, the statistical analysis obtained from the participants revealed that there was a statistical significant (P. <.05). This result lead to reject the hypothesis which mean that there is no relation between awareness and knowledge of primary and preparatory school teachers and the length of their service

- **Hypothesis Three**:

  There is relation between awareness and knowledge of primary and preparatory school teachers and the presence or absence of first-aid course as a component of their teacher training programs.

  Based upon the results, the statistical analysis obtained from the participants indicated that there was a statistical significant (P. <.05) hence, the hypothesis would be rejected, Therefore, There is no relation between awareness and knowledge of primary and preparatory school teachers and the presence or absence of first-aid course as a compound of their teacher training programs.

Chapter 6

DISCUSSION

6.0 DISCUSSION

Trauma to both primary and permanent dentition and their supporting structure represent one of the major public health problems worldwide.

Trauma can be varying from simple crack of the crown to more extensive injury involving the teeth and their supporting structures and displacement or avulsion of the teeth[3], There is perhaps no single dental disturbance that has a greater psychological impact on the parents and the child than the loss or fracture of a child's anterior teeth.

In this study, two types of trauma were emphasized: the first one was mild dental trauma involving uncomplicated crown fracture and the second one was avulsed permanent tooth. Avulsion of a tooth occurs when it directly sustains trauma which displaces it from its socket. Tooth avulsion is one of the most serious dental emergencies that occurs at school and teachers are often witnesses to this type of trauma.[92]

Regardless of the importance of this issue to our knowledge, no published studies were conducted in Libya. Therefore, this study aimed to assess the knowledge of primary and preparatory school teachers regarding emergency management of dental trauma, in the city of Benghazi-Libya. As a tool of study, a questionnaire was used with the response rate of 81.2%.

Regarding the socio - demographic characteristics of the participants, the results of the questionnaire showed that the percentage of females 88.2 was much higher than their male counterparts.

Concerning educational level (qualification) the results indicated that 84.5% of participants had a diploma (teaching diploma) while only 15.5% had graduated from universities. The two results stated above were expected as many of the Libyan families encourage their daughters to complete their education in the teacher's institutes rather than higher education level, so professionally they would be qualified as a school

teacher. However, this resulted in the feminization of both elementary and secondary schools in Libya.

Experience is an important factor for developing and increasing knowledge. The results of this study showed that most of the respondents 86.9% had more than ten years of teaching experience.

The above findings were similar to the findings of Francisco et al.[90] who stated that most of the participants were female 83.% and their experience in teaching ranged between 5 - 15 years. However, the result of this study regarding qualification was in contrast with the result of a study carried out by Hashim in UAE[25] which revealed that 61.5% of the respondents had a university qualification.

Training leads to increase the knowledge of the trainees, hence, participants were asked few questions related to their previous training. The results revealed that 94.8% of participants indicated that they already had training in their field, teaching. Considering first-aid training, results showed only 40.1% of participants had first-aid training only once or twice in their teaching career, while the rest; about 60% never had any kind of first-aid training. This was in contrast to the high percentages of first aid training among those teachers in the Hong Kong study which conducted by Cecilia Young et al.[98]However, very small number of teachers, less than 5%, said they had attended first-aid training courses on their own and only 2.2% of participated teachers recalled dental trauma management as being included in their first - aid training. Many reasons were suggested as an explanation for this, such as teachers' lack of awareness of the importance of dental trauma management, or due to their negligence or lack of interest in learning, or most probably because it was not compulsory by schools for teachers to have these training. This result was in contrast to the high percentage of first aid training found among teachers in Hong Kong and England

studies.[13,99] However, this result was close to what previously noticed in Jordan.[11] Only 8.1% of the teachers received dental emergency training as a part of their teaching programs indicated the need to properly and periodically train teachers in first aid which focused on a dental emergency. This result was similar to a study conducted by Hashim[25] which stated that the respondents were not satisfied with their level of knowledge, they were been to learn more about dental trauma management and the majority of the teachers considered the management of dental trauma a priority for them.

Referring to Case - 1, which introduced 8 - year - old girl with mild dental trauma involving uncomplicated crown fracture 41.9% of the participants recognized that at the age of 8 years the upper front teeth was permanent dentition, while 39.4% of the respondents not sure if it was permanent or milk (baby) tooth. This indicated that the general knowledge of the respondents regarding the time of eruption of permanent teeth was inadequate.

Lacking Knowledge in this area may lead to neglect in timely and proper management of a permanent tooth that affects the long-term prognosis. The result of this study according to the percentage of the respondents 39.4% was lower than a study carried by Malazz et al[87] which indicated that 70.5% of the participants from primary schools in Khartoum State (Sudan) not confident in distinguishing between types of teeth (deciduous, permanent).

Regarding the proper action would be taken in case I (a girl with uncomplicated crown fracture), most of the participants 67.7% indicated they would send the girl immediately to the school nurse if it was available, 20.7% preferred to contact her parents to take her to a dentist. About 4% of the respondents would search for the pieces of the broken

tooth. These results revealed that the general knowledge of proper action in case I is grossly lacking. This finding was similar to the finding of study investigated by Chan, et al.,[13] where 70% of the teachers answered they would send child immediately to the school nurse. In contrast with the finding of this study, Mohandas and Chandan.[100] reported low response in their study, only 31% of the teachers would send child immediately to the school nurse if available .

On the other hand, case II, indicated a 13-year - old boy with avulsed upper front tooth, the ideal treatment would be immediate replantation.[39] About 44.6% of the teachers response showed that 'sideline the injured boy asking him to bite on a handkerchief' suggesting that they were concerned with controlling the bleeding immediately. This would be the most common instinctive reaction by most people in such cases, where in the sight of blood sets off a panicky response focusing on controlling the bleeding first. Similar results were observed in the study conducted on school teachers by Chan A.W.[13] However, 42.9% of the respondents indicated that they would get the boy to hold the tooth carefully in his mouth and take him immediately to the nearest dentist. Few teachers 5.4% of the respondents said they would put the tooth in a liquid and send the boy home straightaway. Unfortunately, the child would not benefit from this maneuver because undue delay in replanting the tooth would jeopardize its prognosis.[101] Only 1.5% of teachers responded indicated that they would look for the tooth and put it back in the socket. This percentage of the respondents was much lower when compared to results of a study conducted by Chan [13] where it was 17.5% of the respondents of that study.

Concerning the need of further training to manage trauma cases, this study showed the need for dental health education to be stepped up among school teachers. Providing additional information to the school

teachers were important to improve their knowledge and had possible implications for future pattern of seeking dental care. Although the majority of respondents had undergone teacher training, it was apparent that the level of education had no noticeable influence on knowledge of dental trauma management. This is probably due to shortage or lack of knowledge about tooth avulsion and replantation had been given to most of them. Hence, this study resulted that 86.2% of the participants agreed that they did not have sufficient knowledge and were willing to be trained about managing trauma cases. By this many avulsed teeth in children can be replanted and saved if schoolteachers are aware of the immediate action to be taken after an avulsion injury. By increasing knowledge on how avulsed teeth are to be dealt with at the site of the accident, the risk of permanent tooth loss is minimized. [94]

The result of this study revealed that only 20.2% of the participated teachers had experienced (witnessed) direct or indirect avulsion injury among themselves, their spouses, their children, and/or student. However, most of the respondents 79.8% did not witness any situation where a child's tooth was knocked out. However, this result was higher as compared to school teachers investigated by Antunes L et al.[102] which showed that 16.6% of teachers had witnessing a dental trauma in permanent teeth in Brazilian children aged between 6 and 14 years, and to the prevalence of dental trauma in elementary school teachers, where the prevalence was 10.5% to 17.3%.[103]

When asked about the type of professional help the respondents would seek when faced with a case of knocked out tooth, 91.6 of the participants informed that they would first seek help at a dental clinic and only 5.7% would take the child to a general hospital. The result of this study was concerned to be a positive one and showed that participated teachers had a better knowledge of the correct actions to be

taken in a case of avulsed tooth. However, these findings were higher than the result of a study carried out by Prasanna et al.[104] which revealed that 60% of teachers responded would visit the dentist nearby whereas 10% would opted emergency hospital for the treatment while 9% of the teachers would want to consider the emergency management of school of dentistry.

Time is very important factor for the avulsed tooth to preserve their vitality after replantation, Hence, one question was asked to the participants stated how urgent did they think it was to seek professional help if a permanent tooth had been knocked out. Most of the teachers responded 76.4% said that they would take the child to a dentist immediately while almost 7% said within 30 minutes, whereas 9.4% said within few hours. These results were analogous with the findings noticed by a study conducted by Mamta et al.[105] which revealed that most participants were not aware of the desirability of replanting avulsed teeth immediately or within half an hour. However, the result of this study was considered positive; it showed that the dental professional was considered by the teachers to have a better knowledge of the correct actions to be taken in a case of tooth knocked out when compared with the others.

As the immediate replantation is of absolute necessity in order to achieve a propitious sequel of the replanted tooth, one question had been addressed to the teachers if they would replant the knocked out tooth back to the socket, 51.7% of respondents were willing to do that by themselves, while the remaining 48.3% said they would not attempt replantation of the tooth by themselves. The reasons for the reluctance to replant a knocked out tooth could be related to lack of knowledge, fear of hurting the child, or the greater priority given to stopping the bleeding which was perceived by most people as life threatening. Another reason

might be that the teachers preferred dentist to do this job as they were not sure of correct replantation. However, in a study conducted by Hamilton et al.[60] only 10.7% of the respondents knew that the knocked-out tooth could be replaced back into its socket but they feared being sued for replanting the tooth incorrectly. This result might give a teacher an excuse not to replant avulsed tooth her/himself because of the feared of being sued.

The permanent tooth if knocked out must be replanted as soon as possible, while the primary (baby) tooth should not be replanted because of the potential for subsequent damage to developing permanent tooth germs. A question was addressed to the participants whether they thought that a baby tooth had been knocked out should be replanted into the socket, most of the responses 82.8% gave the correct answer which was “no’, while the remaining 17.2% went with ‘yes’ which was incorrect answer. These answers, however, indicated that few of the school teachers had an idea that a baby tooth should be replanted which is wrong.

In most cases of knocked out tooth, the avulsed tooth might fall on the ground and get dirty. Thus, the knowledge to clean an avulsed tooth is quite important. Therefore, knowledge of the most appropriate method to clean a dirty avulsed tooth prior to replantation was investigated using list of alternatives. The results revealed that more than half of the respondents 51.7% did not know what to do if the knocked tooth was covered with dirt while 19.5% were correctly responded about proper cleaning technique for contaminated avulsed tooth that should rinse with tap water. Some of the participants 15.8% indicated that they would scrub the tooth gently with a tooth brush, those of course, unaware that they would be severely decreasing the prognosis of the knocked out tooth to be replanted. However, results of this study were supported by a

study conducted by Reddy et al.[106] which showed that fifty percent of respondents did not know what to do if the knocked tooth was covered with dirt; 24% said they would rinse it with tap water. On the other hand, the result of this study was in contrast with the study carried out by Jyothsna,[97] which revealed that majority of subjects considered sterile saline was the best solution for cleaning teeth.

Regarding actions would be taking if a permanent tooth has been knocked out was broken, most of the respondents 85.5% said they would take the child to dentist, 4.4% of teachers would still replant the tooth into the socket, while 10.1% revealed that they did not know what to do with a broken tooth. This finding ratio was higher than a result of study conducted by Caglar et al.[107] which stated that 50% of teachers participated in that study would take the child to the nearest dentist.

In cases where the teacher would not replant the knocked-out tooth and would like to transport it to a dentist, the options indicated in the questionnaire as transportation media included ice, child's mouth, child's hand and paper/tissue/clean handkerchief and plastic wrap. The results of this study indicated almost 60% of the respondents preferred the paper tissue or clean handkerchief, while 18.2% said ice would be their choice as transportation media. About 6% suggested either child's mouth or child's hand could be used as the storage/transport media which showed the lack of knowledge regarding how to manage a knocked-out tooth. However, Dry storage of the tooth would allow irreversible desiccation of the periodontal membrane, resulting in the loss of the replanted tooth over time as well. [51]

The storage media has influences the prognosis of replantation in which the tooth is kept should have pH and osmolarity compatible for maintaining the vitality of Periodontal Ligament (PDL) cells.[82] Many kinds of liquid are available to be used for such purpose. The suitable

storage media to allow periodontal and pulpal healing are milk, physiological saline, and saliva. Cold milk serves as an appropriate medium for avulsed teeth for up to 3 hours, because of its optimum osmolarity and pH composition, whereas physiological saline remains effective for only 30 min.[81] Storage in tap water should be considered the last option as its potency may result in necrosis of the cells in the periodontal membrane, whereas storage in saliva may cause infection of the periodontal membrane and also risk of swallowing in young children[72]. At the site of the accident, however, only saliva is always available for storage purposes. [81] Most of the participants of this study 59.2% indicated that they would use antiseptic solution, 23.5% preferred to use tap water, 5.6% went with the choice of alcohol, 3.4% their choice was normal saline, and only 0.7% selected fresh milk.

The awareness regarding storage media for avulsed tooth was low in our study which was similar to study conducted by Mesgarzadeh et al.[31] .On the other hand, the response rate was higher in study conducted by Young et al.[98], whereas, it was found to be lower in studies conducted by Chan et al.[13] and Al-Asfour et al.[108].

With respect to the appropriate solutions to wash avulsed tooth, seven kinds of liquids were listed to the respondents to choose what they think the appropriate one. Results were showed that 57.5% of the teachers preferred antiseptic solution, 16.5% had selected iced water, 9.7% went with tap water, few of the respondents 7.4% and 3.7% preferred alcohol and fresh milk respectively. However, this result was contrast with a study carried out by Toure' et, al.[96] which revealed that 40.8% preferred tap water and 14.9% selected antiseptic solution..

When the respondents were asked if they had any previous advices regarding how to deal with an avulsed permanent tooth, less than fifth of them 17.2% indicated a positive response. This result did not have any

relation with the educational background of the participants. Likewise, Shashikiran et al.[109], had reported that significant number of the parents (67.2% urban, 95.1% rural) have not received any advice regarding first-aid management of the same. This clearly indicated the lack of programs which create public awareness concerning emergency management of avulsed tooth.

In order to analyze the relationship - if any - between experience might a teacher gained and the knowledge level of managing trauma, teachers already participated in this study were categorized into two groups, while the relation (correlation) had been formulated into three categories: The first category, represented the teacher's length of service in years where group I represent teachers who served less than 10 years, while group II represent those who spend more than 10 years in service. The second category emphasized teacher training where group I represent teachers who had teaching training course (s), while group II represents those who did not have such training and the third, investigated if teacher took any first-aid course dealing with medical cases, here the respondents were categorized into two groups. Group I represent teachers had first-aid course, while group II represent those who did not have first - aid course.

To investigate the correlation between the length of service the teacher spent in years and the actions might be considered if case I in the questionnaire (uncomplicated crown fracture) had happened. Most of the teachers in both groups revealed that they would send the child immediately to school nurse. Hence, both groups reported a relatively similar action which meant that the experienced and un-experienced teacher showed comparatively same level of awareness regarding the actions would be taken in the case of broken tooth.

Considering an avulsed permanent tooth which was represented in case II in the questionnaire, the data obtained from the respondents revealed that about 45% of each group would side line the injured boy, getting him to bite on a handkerchief to control bleeding. About 43% of each group would get the boy to hold the tooth carefully in his mouth and take him immediately to the nearest dentist. Thus, actions would be taking by both groups were relatively similar. This result indicated that the experienced and un-experienced teacher showed a comparatively same level of awareness with regard to the actions would be taken in the case of avulsed tooth.

With regard to the relation between the length of service as a teacher in years and seeking a professional treatment, data obtained showed that most of the teachers (more than 90%) in both groups would first contact a dentist to seek the treatment. Hence, respondents in both groups reported relatively similar answer. The results revealed that the experienced and un-experienced teacher showed a comparatively same level of awareness concerning places of seeking treatment in the case of an avulsion.

Based on the above illustration data obtained and statistical analysis it was obvious that there was no relation between the length of service teachers spent in teaching and awareness and knowledge of emergency management of dental trauma.

Introducing the second category which dealing with the relation of the teacher's experience might be gained by any training course (s) in the field of teaching and / or other fields, and the effect of such training on handling trauma cases, data obtained revealed that most of the respondents in both groups indicated that they still need further training to manage trauma cases. Therefore, there was similarity in their answer. This means that even though teachers had teacher training they still

needed further training to manage emergency trauma cases. As a result, the trained and untrained teacher showed almost the same level of knowledge regarding the need of further training to manage trauma cases.

Investigating the knowledge of the participants in both groups regarding how urgent they would seek professional help in case of a permanent tooth has been knocked out. Most of the respondents in both groups indicated they would act immediately which meant actions would be taken by teachers in both groups were relatively similar. Therefore, no difference in the answer had been noticed between both groups.

The above result indicated that the trained and untrained teacher showed a comparatively same level of knowledge regarding the urgency of seeking treatment in the case of an avulsion.

Considering replant, the tooth into the socket from which it came out, more than half of the respondents of each group were stated that they would not replant that tooth. Once again, the answer was identical in both groups. According to this result, trained and untrained teacher revealed a comparatively same level of knowledge regarding replant (put back) the tooth into the socket from which it came out.

In summary, according to the above illustration, data obtained and statistical analysis it was obvious that there was no relation between training gained by teachers and the knowledge of emergency management of dental trauma.

Results related to category C which investigating any relation between first-aid experience and the need of further training to manage trauma cases, plus the relation between first-aid experience and replant a

knocked out tooth. The results indicated that no difference had been noticed between the answer of the respondents in both groups. Hence, teachers who did take first-aid course and who did not take it showed a similar level of knowledge regarding the need of further training to manage trauma cases.

Concerning replantation of baby tooth if it was knocked out, most of the respondents in both groups who already had first-aid course said they would not replant that tooth. Hence, the answers of respondents in both groups were similar which meant teachers did take first-aid course and who did not take it presented a same level of knowledge regarding replanting a baby tooth. Generally, it was obvious that there was no relation between teachers who took first-aid course and the knowledge of emergency management of dental trauma.

Finally; data obtained, the study results and statistical analysis confirmed that all of the three hypotheses were rejected. That means: the awareness and knowledge of Libyan primary and preparatory school teachers regarding the management of dental trauma injuries is insufficient, that there is no relation between awareness and knowledge of primary and preparatory school teachers and the length of their service, and that there is no relation between awareness and knowledge of primary and preparatory school teachers and the presence or absence of first-aid course as a component of their teacher training programs.

Chapter 7

SUMMARY

AND

CONCLUSIONS

7.1 Summary:

Since school injuries account for a higher proportion of dental trauma, it would be desirable for teachers to be capable of emergency management of such injuries when they occur.

The main purpose of the study was to measure the awareness and knowledge of Libyan school teachers in emergency management of dental trauma, therefore, the population of the study was the teachers work in Benghazi - Libya public schools (primary and preparatory) where children aged between 6 to 15 years having their education.

Five hundred teachers of both genders working in forty public schools (primary and preparatory) were randomly selected to participate in this study, three parts questionnaires were used to collect the data. Four hundred and six of the distributed questionnaire was completed and analyzed.

However, the responses were tabulated, coded and entered on the computer, using SPSS (Statistical Package for Social Sciences) software, Version 14.0 (SPSS Inc., Chicago, IL, USA). Chi-square test was used to compare the knowledge of teachers.

7.2 CONCLUSIONS:

Based on the information, data collected, the results of this study, and research hypothesis, it can be concluded that:

1. The majority of teachers participated were female, having teaching diploma.
2. Most of the participants have served more than ten years in teaching.
3. Most of the teachers participated in this study (94.8%) have teaching training.
4. Almost 60% of the teachers responded that they did not enroll in any first-aid course, while the remaining 40% already did. However, only 5.5% of those had covered the issue related to the management of dental trauma in that course.
5. If a front tooth was damaged, the majority of the teachers participated could not distinguish between permanent and baby tooth.
6. In case of facing a damaged tooth (uncomplicated crown fracture), most of the teachers indicated they would send the child immediately to the school nurse or a caretaker.
7. Regarding the actions may be taken by the teacher in case of bleeding and a missing tooth, most of the respondents would either side line the injured boy, getting him to bite on a handkerchief to control the bleeding, or get the boy to hold the tooth carefully in his mouth, and take him immediately to the nearest dentist.
8. The majority of the teachers said they need further training to be able how to manage trauma cases.
9. Concerning any trauma experience the teachers might have before, most of the participated teachers indicated they did not have witnessed any case where a tooth knocked out.

10. In case of a child came with knocked out tooth in the hand after an accident, the majority of teachers responded would contact dentist in order to seek a professional treatment immediately. However, some teachers indicated they would replant (put back) the tooth into the socket from which it came out if it was not a baby tooth.
11. More than half of the respondents did not know how to act in case of knocked tooth which already fallen in the ground and was covered in dirt.
12. In case of facing a permanent tooth that had been knocked out and broken, most of the respondents would take it to dentist.
13. Most of the respondents would use as transportation media either a paper tissue or clean handkerchief in case of the knocked out tooth.
14. In case of using a liquid for either washing or transporting the tooth to the dentist, more than half of the teachers responded preferred to use antiseptic solution for washing and transporting. Few participants, however, preferred using tap water for washing and as transporting media.
15. The majority of teachers participated did not receive any advice on what to do in case where a tooth has been knocked out.
16. Concerning the relation between teaching experience - determined by the length of services as a teacher (in years) - and action would be taken in case of broken tooth, or an avulsed tooth, it was obvious that the experienced and un-experienced teacher showed a comparatively same level of awareness regarding the actions would be taken in both cases, broken tooth and avulsed tooth.

17. Regarding the relation between teaching training and the knowledge of trauma management, results indicated a comparatively same level of knowledge regarding replant (put back) the tooth into the socket

from which it came out, the urgency of seeking treatment in the case of an avulsion, and the need of further training to manage trauma cases.

18. Measuring the relation between first-aid training and the knowledge of trauma management, results showed a similar level of knowledge regarding both the need for further training to manage trauma cases and replantation.

Hence, it can be concluded that Knowledge regarding emergency management of dental trauma of primary and preparatory school teachers in Benghazi city is insufficient. Results indicated that the specific area of weakness in teachers' knowledge of immediate dental trauma management needs to be emphasized. It has been noticed that management regarding dental trauma is not included in the teaching curriculum.

Based on the statistical analysis it was obvious that there no comparison between awareness and knowledge of emergency management of dental trauma and the length of service as a teacher, training gained by teachers, and teachers who took the first-aid course. Hence, the three hypotheses of this study were rejected.

Chapter 8

RECOMMENDATIONS

8.0 RECOMMENDATIONS

Based on the conclusions (chapter seven), the following recommendations were suggested:

1. Developing interaction between general dentists and school teachers so as to enable the teachers to proceed correctly in rendering the best treatment for ensuring a good prognosis for the traumatized teeth.
2. First aid and dental trauma management training must be compulsory for all primary and preparatory school teachers in Libya,
3. It would be beneficial if instructions as educational posters or Pamphlet in how to manage dental injuries would be more widespread in cities. Many teeth could be saved and the unnecessary suffering from a lost permanent tooth in early childhood could be avoided.
4. Concerned educational authorities are advised to direct their efforts toward well-established educational programs & campaigns for teachers about emergency management of dental trauma.
5. Further research is needed to determine the most effective method to improve the knowledge of primary and preparatory school teachers regarding emergency management of dental trauma.

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APPENDICES

APPENDIX 1

Number of Questionnaires: Distributed and Received from each school

Completed		Received		Distributed		The Name of School
%	No.	%	No.	%	No.	
1.4%	7	1.6%	8	2%	10	القومية العربية
1.2%	6	1.4%	7	2%	10	اللثامة
2.4%	12	2.6%	13	3%	15	الوحدة العربية
2.2%	11	2.4%	12	3%	15	23 أكتوبر
2.0%	10	2.4%	12	3%	15	المجاهد
2.2%	11	2.4%	12	3%	15	الإنتفاضة
2.4%	12	2.8%	14	3%	15	الكرامة
2.2%	11	2.4%	12	3%	15	المنتصر
2.2%	11	2.6%	13	3%	15	فلسطين
1.4%	7	1.6%	8	2%	10	القدس
2.6%	13	2.8%	14	3%	15	شهداء العقيلة
1.4%	7	1.6%	8	2%	10	العروبة
2.0%	10	2.0%	10	2%	10	النموذجية
1.6%	8	1.6%	8	2%	10	المجاهد
2.0%	10	2.0%	10	2%	10	الإستقلال
1.4%	7	1.4%	7	2%	10	جمال عبدالناصر
1.4%	7	1.6%	8	2%	10	الأندلس
2.6%	13	2.6%	13	3%	15	عمر الفاروق
1.6%	8	1.8%	9	2%	10	التحرير
2.6%	13	2.8%	14	3%	15	شهداء بوسليم
2.8%	14	3.0%	15	3%	15	الأمل الواعد
1.4%	7	1.6%	8	2%	10	شهداء الصابري
2.0%	10	2.0%	10	2%	10	الحقيقة
2.4%	12	2.6%	13	3%	15	سكينة
2.0%	10	2.0%	10	2%	10	بلال ابن رباح
2.2%	11	2.4%	12	3%	15	سيدي حسين
1.2%	6	1.6%	8	2%	10	سينـــاء
2.0%	10	2.2%	11	3%	15	رابعة العدوية
2.0%	10	2.0%	10	2%	10	فجر الحرية
2.6%	13	2.8%	14	3%	15	امحمد المقريف
2.0%	10	2.0%	10	2%	10	يوسف بورحيل
2.0%	10	2.4%	12	3%	15	أم الشهيد
1.8%	9	1.8%	9	2%	10	النهضة

APPENDIX 2

English Copy of the Questionnaire

(Please answer part 1,11,&111 of the questionnaire)

(Please tick…. The appropriate choice)

PART 1:

- Name of the school…….
- Address of the school……..
- Qualification of the teacher…….

Q1.Thesex Male…… Female…….

Q2.Length of service as a teacher (in years)

- Under 5 yrs…….
- 5-10 yrs……
- More than 10 yrs……

Q3.Did you have teacher training?

Yes……. No……

Q4.During your training period did you have first-aid course component?

Yes…….. No……

Q5.Do you have any formal first- aid training on your own?

Yes……. No……..

Q6.Did you're first –aid course cover the management of dental trauma?

Yes……. No…….. Not sure……

PART 11: CASE STUDY

CASE ONE: During a physical education session, an 8 year old girl was hit on the face with a soft ball. Her upper front teeth were broken .She was otherwise unhurt and did not lose consciousness.

Q7-Are the damaged front teeth likely to be?

- Permanent ……
- .Milk (baby) teeth……
- Not sure…….

Q8.Which of the following actions would you consider most appropriate:

a) At the end of the class contact her parents and explain what happened……
b) Give her a warm drink and contact her parents……..
c) Send her immediately to the school nurse/ care taker……..
d) Search for the pieces of the broken teeth ……
e) Contact her parents and take her to a dentist ……..
f) Others please state……

PART 111: AVULSION INJURIES

CASE TWO: During a game 13 years old boy gets hit in the mouth by another student. His mouth is bleeding and an upper front tooth is found to be missing.

Q9.What action of the following you may take:

a) Side line the injured boy, getting him to bite on a handkerchief to control the bleeding……
b) Look for the tooth, wash it and give it to him to take it home…….
c) Look for the tooth and put it back into the socket……..
d) Put the tooth in a liquid and send the boy home straightaway……..
e) Get the boy to hold the tooth carefully in his mouth, and take him immediately to the nearest dentist……
f) Others please state……..

Q10.Do you think that you need further training to manage trauma cases?

Yes……

No……

Q11.Have you, your spouse ,your children ,student ever had an accident where tooth was knocked out?

Yes …….

No…….

Q12.If your child / student came to you with a knocked out tooth in the hand after an accident, which would you be the first place you would contact and seek treatment?

a) Medical doctor……..

b) Dentist…….

c) General hospital……..

d) Other places please specify…….

Q13.How urgent do you think it is to seek professional help if a permanent tooth has been knocked out?

a) Immediately……

b) Within 30 minutes…….

c) Within few hours …..

d) Before the next day……

Q14. Would you replant (put back) the tooth into the socket from which it came out?

Yes……. No……..

Q15. Do you think that a baby tooth has been knocked out should be replanted (put back) in to the socket?

Yes……..

No……..

Q16.If you decide to replant a tooth back into the socket which had fallen on the ground and was covered in dirt what would you do?

a) Scrub the tooth gently with a tooth brush……

b) Rinse the tooth under tap water …….

c) Put the tooth straight back into the socket without other things……

d) Do not know……

e) Any other please specify ……..

Q17. If a permanent tooth that has been knocked out was broken, what would you do?

a) Still replant (put back) the tooth into the socket…….

b) Take it to dentist…….

c) Others please specify…….

Q18. If you did not replant (put back) the tooth into the socket, how would you transport it to the dentist?

a) Ice……

b) Any liquid……

c) Childs mouth……..

d) Childs hand…….

e) Paper tissue or clean hand kerchief……

f) Plastic wrap……..

g) Others please specify……..

Q19. If you use a liquid to wash or transport the tooth to the dentist what liquid would you use?

SL.no	FOR WASHING	FOR TRANSPORTING
A	Tap water……..	Tap water……
B	Fresh milk……..	Fresh milk……
C	Fruit juice……..	Fruit juice……
D	Alcohol……	Alcohol…….
E	Normal saline……	Normal saline……..
F	Iced water……	Iced water……

G	Antiseptic solution……..	Antiseptic solution……..
H	Others please specify……	Others please specify ……

Q20. Have you ever received advice on what to do and what not to do in the event of an accident where a tooth has been knocked out?

Yes……

No…….

THESIS PROPOSAL

Awareness and knowledge of a Group of Libyan school Teachers in Emergency Management Of Dental Trauma

وعي ومعرفة من مجموعة من معلمي المدارس الليبيين في التعامل الطارئ مع رضوض الأسنان

BY

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B.D.S (1991)

PROTOCOL

Submitted In Partial Fulfillment of Requirements for the Degree of Master of Dental Science

(M.D.Sc)

In

Pediatric Dentistry

Faculty of Dentistry

Benghazi University

Benghazi - Libya

Supervisor. Prof Suleiman M. Omer

1. INTRODUCTION AND REVIEW OF LITERATURE

Trauma to both Primary and Permanent dentition and their supporting structure continues to be a frequent dental problem.

Trauma can be vary from simple crack of the crown to more extensive injury involving the tooth and their supporting structures and displacement or avulsion of the tooth, this can result in function, esthetic and psychological disturbances, thus causing a concern to both the child and the parents. Studies have shown that when a child reaches school age, accident in the school environment in the form of fall are very common , and that 30% and 22% of school children had experienced trauma in the primary and permanent dentition respectively. Reports also suggested that sport and school injuries accounted for 60% of the dental trauma, and the peak incidence has shown to be between the age group of 2 - 4 and 8 - 12 years and over 16% was in the school environment and 19% of the injury due to fall (Andreson JO 1985).

The prevalence of traumatic dental injuries among school children have been reported by many authors, which varies from 2.6% (Macko et al.1979) to 43% By (Marcenes, Murray. 2001)

Petersson, Andersson, Sorensen (1997) and Andersson JO, Andersson (2007) They found that trauma to the oral region occurs frequently and comprise 5% of all injuries for which people seek treatment, in preschool children the figure is as high as 18%, of all injuries .Avulsion of permanent teeth is the most serious of all dental injuries. The prognosis depends on the measures that have been taken at the place of accident or the time immediately after the avulsion.

Tapias et al (2003) revealed that the prognosis of traumatized teeth depends on prompt and appropriate treatment, which often relies on knowledge of lay people such as the child's parents and their school teachers.

Rai, Munshi (1998) & Gabris, Tarjan, Rozs (2001) have revealed that knowledge attitude & practice of physical education teachers have a poor knowledge regarding management of dental trauma.

AL - Jundi, Al - Waeili, Khairalah (2005) assessed the level of knowledge of school health teachers in northern Jordan with regards to the immediate emergency management of dental trauma, using a self administered structured questionnaire. They concluded that there are gross lack of knowledge among school health teachers with regards to dental trauma emergency management They recommended educational programs to improve the knowledge and awareness of this group of adults,. These programs should be properly designed to insure that proper information is retained with a positive effect on attitude, and self assessed competence

AL-Asfour , Andersson, Al - Jame (2008) Concluded studies to assess the knowledge level of emergency measures for tooth avulsion in Kuwaiti intermediate school teachers using questionnaire and to determine if short a informative lecture about tooth avulsion and replantation could improve teachers' knowledge on this topic. They found that improvement in teacher knowledge to an adequate or complete level was observed. They advice that a lecture followed by discussion proved to be an effective and efficient method of intervention to enhance the knowledge level of teachers so that proper dental first-aid procedures can be achieved - MesgarzadehAH, Shahamfar M, Hefzollesan A, (2009) evaluated the knowledge and attitudes of Iranian elementary school teachers with regard to emergency management of dental trauma, in a northwestern urban area . They concluded that there is a substantial lack of knowledge regarding dental trauma management among elementary school teachers. And they recommended educational campaigns to improve their knowledge and awareness regarding

emergency management of dental trauma because there are usually the first to respond in cases of dental trauma accidents in schools.

2. AIMS OF THE STUDY

Since school injuries account for a higher proportion of dental trauma, it would be desirable for teachers to be capable of emergency management of such injuries when they occur.

Reviews of literature have revealed no studies have been conducted in Libya to assess the knowledge of school teachers about the emergency management of dental injuries. Therefore this study is designed to:

1. Assess the awareness and knowledge of Libyan school teachers in regard to immediate emergency management of dental trauma.
2. To compare their awareness and knowledge to the length of their service as school teachers.
3. To compare their awareness and knowledge to the presence or absence of first-aid course as a compound of their teacher training programs.
4. To provide scientific information for authority that could help in planning an emergency program for school teachers to deal with dental trauma .
5. Provide base line data for any further study .

3. MATERIALS AND METHOD

3,1- Study Sample:

The total of 400 school teachers of both sexes will be Selected randomly from the elementary schools in Benghazi city.

3,2- A questionnaire survey:

A questionnaire survey of teachers' backgrounds, awareness and knowledge of dental trauma management will be distributed in Arabic language. The questionnaire divided into three parts:

Patr1: consisted of questions on personal and professional data that recorded sex, age, teaching experience and first-aid training background.

Part11: consisted of case study with mild dental trauma involving uncomplicated crown fracture.

Part 111: consisted of case study that involved avulsed permanent tooth and its management.

4. DATA ANALYSIS:

The result of the study will be collected, tabulated and statistically analyzed using appropriate statistical methods.

Table number (1):

NO. OF SCHOOL	NUMBER OF SCHOOL TEACHERS		TOTAL
	MALE	FEMAL	
1	12	0	12
2	10	1	11
3	12	1	12
4	15	0	15
5	9	0	9
6	4	6	10
7	7	0	7
8	11	2	13
9	11	0	11
10	6	1	7
11	4	3	7
12	2	4	6
13	6	0	6
14	11	0	11
15	10	0	10
16	11	0	11
17	5	6	11
18	12	1	13
19	10	0	10
20	8	0	8

NO. OF SCHOOL	NUMBER OF SCHOOL TEACHERS		TOTAL
	MALE	FEMAL	
21	9	1	10
22	7	6	13
23	10	0	10
24	10	0	10
25	10	0	10
26	9	0	9
27	12	2	14
28	6	1	7
29	14	0	14
30	10	0	10
31	9	1	10
32	9	1	10
33	13	0	13
34	12	0	12
35	6	4	10
36	7	1	8
37	11	0	11
38	7	0	7
39	1	6	7
40	10	0	10
41			10
42			10
Total			414

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ARABIC

ABSTRCAT

وعي ومعرفة مجموعة من معلمي المدارس الليبيين في التعامل الطارئ مع رضوض الأسنان

يعتبر مجال التعامل الطارئ مع رضوض الأسنان من أهم المجالات بطب الأسنان. وتبلورت مشكلة هذه الدراسة في تقييم مدى إدراك ومعرفة معلمي المدارس الليبيين كيفية التعامل الطارئ مع إصابات رضوض الأسنان.

أجريت هذه الدراسة بمدينة بنغازي – ليبيا حيث تكوّن مجتمع الدراسة من جميع معلمي المدارس الابتدائية والإعدادية العامة بمدينة بنغازي. وقد مثّل عدد 500 من معلمي تلك المدارس عينة الدراسة. أداة الدراسة صحيفة استبيان معدّلة اشتملت على ثلاثة أجزاء رئيسية احتوت مجموعة أسئلة عامة وأخرى ذات علاقة بحالتين من حالات رضوض الأسنان. كردود تم استلام عدد 435 صحيفة استبيان من بينها 406 صحيفة كانت صالحة للتحليل. بهذا وصلت نسبة الردود 81% من مجموع عينة الدراسة.

تم تحليل البيانات باستخدام جداول توضح التوزيعات التكرارية وكذلك النسب المئوية. بالإضافة تم استخدام برنامج إحصائي (SPSS) واحتساب اختبار مربع كاي لمقارنة المعرفة لدى المعلمين عند مختلف الحالات.

من خلال التحليل توصلت الدراسة إلى مجموعة نتائج من أهمها:

1. أن إدراك ومعرفة معلمي المدارس الابتدائية والإعدادية غير كافية للتعامل مع الإصابات الطارئة لرضوض الأسنان.

2. ضعف المعلمين من حيث سرعة التعامل مع إصابات معينة عندما تكون طارئة الأمر الذي يتطلب التركيز على نواحي الضعف تلك. وعدم تضمين الموضوع كمادة علمية بالمناهج التعليمية للمعلمين.

3. بيّن التحليل الإحصائي بوضوح عدم وجود علاقة ارتباط بين معرفة وإدراك المعلمين في التعامل مع الإصابات الطارئة لرضوض الأسنان وبين كلا من: خبرة المعلمين من حيث طول فترة التدريس، تدريب المعلمين وانخراط المعلمين في دورات إسعافات أولية.

وقد أوصت الدراسة بضرورة التركيز على زيادة وعي وإدراك المعلمين بكيفية التعامل مع الإصابات الطارئة لرضوض الأسنان وذلك من خلال التوعية والتدريب (عن طريق أطباء الأسنان) وكذلك إعداد المطويات ذات العلاقة بالموضوع وتوزيعها على جميع معلمي المدارس الابتدائية والإعدادية.

وعي ومعرفة مجموعة من معلمي المدارس الليبيين في التعامل الطارئ مع رضوض الأسنان

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قدمت هذه الرسالة استكمالا لمتطلبات درجة الماجستير في تخصص طب الفم والأسنان

جامعة بنغازي

كلية طب الأسنان

أغسطس 2018