Available online at *www.ujpronline.com*
Universal Journal of Pharmaceutical Research
An International Peer Reviewed Journal
ISSN: 2831-5235 (Print); 2456-8058 (Electronic)

RESEARCH ARTICLE

MAXILLOFACIAL FRACTURE TYPE AND THEIR MANAGEMENT IN INDIVIDUALS REFERRED TO THE MILITARY HOSPITAL IN SANA'A CITY, YEMEN

Amal Mohammed Abu-Taleb[1], Lutf Mohammed Al-Rahbi[1,2], Ahmed Abdulah Al-Ashwal[1,2], Hassan Abdulwahab Al-Shamahy[3,4]

[1]*Yemen Medical Specialist Council, Ministry of Health and population, Yemen.*
[2]*Department of Oral and Maxillo-Facial Surgery, Faculty of Dentistry, Sana'a University, Republic of Yemen.*
[3]*Department of Basic Sciences, Faculty of Dentistry, Sana'a University, Republic of Yemen.*
[4]*Medical Microbiology and Clinical Immunology Department, Faculty of Medicine and Health Sciences, Sana'a University.*

Article Info:

Article History:
Received: 2 June 2025
Reviewed: 11 July 2025
Accepted: 17 August 2025
Published: 15 September 2025

Cite this article:
Abu-Taleb AM, Al-Rahbi LM, Al-Ashwal AA, Al-Shamahy HA. Maxillofacial fracture type and their management in individuals referred to the Military Hospital in Sana'a city, Yemen. Universal Journal of Pharmaceutical Research 2025; 10(4): 37-43.
http://doi.org/10.22270/ujpr.v10i4.1392

***Address for Correspondence:**
Dr. Hassan A. Al-Shamahy, Faculty of Medicine and Health Sciences, Sana'a University, Yemen. Tel: +967-1-239551 E-mail: *alshamahyhassanii@gmail.com*

Abstract

Background and aims: Maxillofacial fractures, injuries to facial bones, are treated based on type and severity, including common types like mandible, maxilla, zygomatic bone, and nose. University hospitals like Military Hospital use advanced surgical techniques and multidisciplinary care to handle complex cases requiring closed reduction or open reduction and internal fixation. This retrospective study aimed to examine the types and treatment of maxillofacial fractures among individuals referred to the Military Hospital in Sana'a, assess associated complications, evaluate recovery experience, and postoperative quality of life.
Materials & methods: The records of 94 patients, ages 8 to 60, who suffered maxillofacial fractures between January 1, 2022, and December 29, 2022, were examined in this retrospective analysis. From the archival records, information about age, gender, the location and cause of the fracture, and the method of treatment was extracted and examined.
Results: The study involved 94 patients aged 8-60, mostly 16-25, with traffic accidents being the most common cause. Fractures were common, with symphysis being the most common type (62.8%), followed by zygomatic (30.9%). Other types included palate, lateral, suspensory, maxillary sinus, and alveolar process fractures. The study revealed that nasal bridge fractures were the most common nasal bone fracture, accounting for 7.4% of cases. Orbital and facial fractures accounted for 12.8% and 5.3%, respectively.
Conclusions: Traffic accidents were the most common cause of fractures, and the most common type of fracture was a symphysis fracture, followed by a zygomatic fracture. Other types included fractures of the palate, lateral, suspensory, maxillary sinus, and alveolar process.
Keywords: Facial fractures, mandibular fracture, maxillary fracture, maxillofacial injuries, open surgical fixation, zygomatic fracture.

INTRODUCTION

Large cities like Sana'a, Yemen, have a higher prevalence of maxillofacial fractures because to their dense populations, busy traffic, and high rates of violence brought on by the 14 years old conflict. Geographical location and conditions appear to have an impact on the causes, types, and locations of these fractures[1-3]. Maxillofacial fractures, defined sex and age groups, amount of mechanization, and development have all been linked in various researches[4-6]. The frequency and severity of facial trauma injuries rose as man advanced and created more tools to make daily life easier. Although seldom fatal, maxillofacial injuries cause the person who sustains them great physical and mental suffering. Even while maxillofacial injuries seldom result in death, they might damage airways and cause severe bleeding, which can be fatal. Furthermore, 20% of the victims had a cranio-cerebral injury linked to face trauma, which is another possible cause of death[7-8]. It is claimed that varying socioeconomic, cultural, and environmental factors account for global variations in the prevalence and distribution of maxillofacial fractures[9]. Over 90% of injury related deaths worldwide take place in low and middle income nations like Yemen[10].

Yemen's economy and society have been steadily changing over the past 40 years, as evidenced by rising population and traffic as well as rivalry for resources in both urban and rural areas[11]. The patterns, severity, and causation of maxillofacial fractures have most certainly changed as a result of these variables. Thus, this research was carried out. The study was carried out in the largest referral hospital in the nation, the Military Hospital in Sana'a city, which doubles as a primary healthcare center due to a shortage of adequately staffed public health care facilities. As a result, the patients treated are representative of the oral and maxillofacial fracture pattern found throughout Yemen's capital city.

We sought to gather data on the epidemiology of oral and maxillofacial fractures (apart from teeth) because our search did not turn up many current research on maxillofacial fractures in Yemen[12]. Determining the related fractures in patients seen at the Military Hospital's Oral Maxillofacial Unit was another goal of the study. Goal of current study was to prospectively examine all maxillofacial fractures treated at the military hospital during a one year period. Patients were evaluated as they appeared in the clinic and on the unit ward in order to collect the data. At each visit, the etiology, patterns of maxillofacial fractures, concurrent fractures, and the degree of postoperative sequel were noted.

MATERIAL AND METHODS

Study design & setting: The epidemiological features of maxillofacial and related fractures in patients treated and/or admitted to the oral maxillofacial unit of the military hospitals following trauma were examined in a descriptive retrospective study.

Study subjects: Patient medical records from 1 January 2022 to 29 December 2022 (The time allowed for a student to complete her clinical work in the hospital) from the Department of Oral and Maxillofacial Surgery at military hospitals; critical care charts; and patient computed tomography (CT) scan results were collected. Ivy and Curtis[13] identified the anatomical locations of mandibular fractures, while zygomatic complex fractures were classified as comminuted fractures, arch fractures, and zygomatic body fractures. Lefort I, II, and III were the classifications given to maxillary fractures[14]. Both clinical and radiographic presentation were used to assess fracture location in maxillofacial fractures, and all authors accepted the diagnosis. It was also defined and validated by their respective disciplines.

Inclusion criteria: patients admitted by maxillofacial surgeons who have multiple injuries with maxillofacial trauma;, closed or open, civilians or war wounded, with positive radiological findings proving maxillofacial fractures of both sexes, of any age group, in the maxillofacial Department of the Military Hospital.

Sample size: The 94 patients involved in this study (they are selected by convenient sample from the all medical records in the maxillofacial department) who underwent a maxillofacial operation in 1 January 2022 to 29 December 2022.

Data analysis: The analysis of the data was performed by using SPSS version 21. The results were properly summarized and presented as frequency, percentage, means, and standard deviation. Data presented in the form of tables.

Ethical aspects: The researcher took permission from a head of department in the Military hospital, Sana'a, Yemen. All data obtained from every medical record of the patient was strictly confidential and not used outside the study.

RESULTS

The study included 94 patients, 93 of whom were male and 1 female. The mean age was 26.1 years, with a standard deviation of 10.3 years, and their ages ranged from 8 to 60 years. Patients aged 16 to 25 years comprised 60.6% of the total, followed by those aged 26 to 45 years, representing 19.1%. Children accounted for only 3.1%, and those over 46 years of age comprised 5.3% (Table 1).

Table 1: Sex and age distribution of 94 patients with maxillofacial fractures.

Characters	Number (%)
Sex	
Male	93 (98.9)
Female	1 (1.1)
Total	94 (100)
Age in Years	
Less than 16 years	3 (3.2)
16-25 years	57 (60.6)
26-35 years	18 (19.1)
36-45 years	11 (11.7)
≥46 years	5 (5.3)
Mean	26.1 years
SD	10.3 years
Median	22 years
Mode	20 years
Min to Max	8 – 60 years

Traffic accidents accounted for 36.2% of cases, followed by gunshot wounds (GSI) at 29.8%, and explosive injuries at 22.3%. The second least common causes of maxillofacial fractures were falls from a height (5.3%) and animal attacks (3.2%), with none of the other common causes worldwide as pathological fractures and extraction third molar (Table 2).

Table 2: Etiology of maxillofacial fractures 94 patients with maxillofacial fractures.

Etiology	Number (%)
Gunshot injuries (G.S.I)	28 (29.8)
Explosive injury	21 (22.3)
RTA	34 (36.2)
Assault	3 (3.2)
Fall from height	5 (5.3)
Incision and punctures wound	0 (0)
Animal attacks	3 (3.2)
Pathological fractures	0 (0)
Extraction third molar	0 (0)
Total	94 (100)

Table 3 shows the types of maxillofacial fractures according to their locations. The most common fracture

type was symphysis fracture (62.8% of the total), including fractures of the parasymphysis (19.1%), body (14.9%), ramus angle (11.7%), and coronal (3.2%). The most common type was zygomatic fracture (30.9% of the total), including fractures of the mandible (13.8%), zygomatic arch (14.9%), and body (2.2%). Palate fracture (3.2%), including lateral (1.1%), and suspensory fracture (2.2%), maxillary sinus fracture (14.9%), and alveolar process fracture (6.4%). The percentage of anterior wall fractures reached 5.3%, lateral wall fractures 8.5%, anterior fractures 5.3%, and posterior fractures 2.2%.

Table 3: The maxillofacial fractures type according to sites for 94 patients with maxillofacial fractures.

	Number (%)
Maxillary sinus fracture	14 (14.9)
Alveolar process fracture	6 (6.4)
Sites	
Anterior wall	5 (5.3)
Lateral walls	8 (8.5)
Anterior	5 (5.3)
Posterior	2 (2.2)
Palatal bone	3 (3.2)
Simple	0 (0)
Sagittal	0 (0)
Lateral	1 (1.1)
Commented	2 (2.2)
Symphysis fractures	**59 (62.8)**
Para-symphysis	18 (19.1)
Body	14 (14.9)
Angle ramus	11 (11.7)
Condyle	13 (13.8)
Coronoid	3 (3.2)
Zygomatic fractures	29 (30.9)
ZMC	13 (13.8)
Body	2 (2.2)
Zygomatic arch	14 (14.9)

Table 4: Locations and types of nasal bone fractures in 94 patients with facial and maxillofacial fractures.

Nasal bone fractures	Number (%)
Nasal bridge	7 (7.4)
Nasal septum	3 (3.2)
Lateral walls	4 (4.3)
Total	14 (14.8)

Table 4 shows the locations and types of nasal bone fractures. Nasal bridge fracture counted 14.9%, Nasal septum counted 3.3% and lateral walls counted 4.3%. The locations and kinds of frontal bone fractures in 94 patients who were referred to the military hospital in Sana'a city due to face and maxillofacial fractures are displayed in Table 5.

Table 5: Locations and types of frontal bone fractures in 94 patients with facial and maxillofacial fractures.

Frontal bone fractures	Number (%)
Anterior table	3 (3.2)
Posterior table	1 (1.1)
Both	0 (0)
Total	4(4.3)

Table 6: Locations and types of orbital bone fractures in 94 patients with facial and maxillofacial fractures.

Orbital bone fractures	Number (%)
Orbital floor	7 (7.4)
Medial wall	0 (0)
Lateral wall	5 (5.3)
Orbital roof	0 (0)
Total	12 (12.8)

There were 4 cases impacted in either site, the anterior and posterior tables counted 3.3%, and the posterior table counted 1.1%. Table 6 shows the locations and types of orbital fractures in 94 patients with maxillofacial fractures referred to the Military Hospital in Sana'a. Orbital fractures accounted for 12.8% of patients, with orbital floor fractures accounting for 7.4%, lateral wall fractures accounting for 5.3%, and medial wall and roof fractures accounting for none.

Complete facial fractures (panfacial bone fractures) occurred in 4.4% of patients. Table 7 shows the locations and types of intraoral soft tissue injuries. Intraoral soft tissue injuries were found in 10.6% of patients, including 6.4% in the oral mucosa, 3.2% in the floor of the mouth, and 1.1% in the tongue.

Table 7: The Locations and types of intraoral soft tissues injuries in 94 patients with maxillofacial fractures.

Intraoral soft tissues	Number (%)
Tongue	1 (1.1)
Oral mucosa	6 (6.4)
Mouth floor	3 (3.2)
Total	10 (10.6)

Table 8 shows the locations and types of extraoral soft tissue injuries. Extraoral soft tissue injuries accounted for 63.8% of the total cases, including 20.2% in the cheek area, 17.02% in the lip area, 10.6% in the eye area, 6.4% in the forehead area, and 5.6% in the ear area. Table 9 shows the locations and types of ocular injuries. Ocular injuries accounted for 7.8% of the total patients, including 1.1% with corneal abrasion and 1.1% with penetrating injuries.

Table 8: The Locations and types of extra-oral soft tissues injuries in 94 patients with maxillofacial fractures.

Extraoral soft tissues	Number (%)
Forehead	6 (6.4)
Eye	10 (10.6)
Nose	4 (4.4)
Check	19 (20.2)
Ear	5 (5.6)
Lips	16 (17.02)
Total	60 (63.8)

Table 9: Locations and types of ocular injuries in 94 patients with maxillofacial fractures.

Ocular trauma	Number (%)
Corneal abrasion	1 (1.1)
Hyphema	0 (0)
Penetrating injury	1 (1.1)
Globe rupture	5 (5.5)
Total	7 (7.7)

No cases of suppuration (hyphema) and rupture of the eyeball were recorded in 5.5%. Table 10 shows the locations and types of salivary gland injuries. Salivary gland injuries occurred in 4.4% of the patients, 2.2% occurred in parotid gland, 1.1% Sub-mandibular salivary gland and 1.1% in the duct of salivary gland.

Table 10: Locations and types of salivary gland injuries in 94 patients with maxillofacial fractures.

Salivary gland	Number (%)
Parotid	2 (2.2)
Sub-mandibular salivary gland	1 (1.1)
Duct of salivary gland	1 (1.1)
Total	4 (4.4)

Table 11: Locations and types of cranial nerves injuries in 94 patients with maxillofacial fractures.

Cranial nerves	Number (%)
Infraorbital	2 (2.1)
Inferior alveolar	2 (2.1)
Mental	2 (2.1)
Buccal branch	2 (2.1)
Mandibular branch	2 (2.1)
Total	10(10.6)

The locations and kinds of cranial nerve damage in 94 patients who were sent to the Military Hospital in Sana'a due to maxillofacial fractures are displayed in Table 11. Cranial nerve injuries accounted for 10.6% of the total patients, including 2.1% in the infraorbital region, 2.1% in the inferior alveolar region, 2.1% in the chin region (mental), 2.1% in the buccal branch region, and 2.1% in the mandibular branch. The trauma problems experienced by 94 patients who were referred to the military hospital in Sana'a city due to maxillofacial fractures are displayed in Table 12. 7.4% experienced complications, 7.4% experienced CSF leakage, 5.3% experienced rhinorrhea, and 2.1% experienced otorrhea.

Table 12: Complications trauma in 94 patients with maxillofacial fractures.

Complications	Number (%)
CSF leakage	7 (7.4)
Rhinorrhea	5 (5.3)
otorrhea	2 (2.1)
Total	7 (7.4)

Table 13: The managements types in 94 patients with maxillofacial fractures.

Managements	Number (%)
Conservative	22 (23.4)
Closed reduction	24 (25.5)
ORIF	48 (51.1)
Total	94 (100)

Table 13 shows the types of treatment used. The most common treatment for maxillofacial fracture patients was open surgical fixation (ORIF), accounting for 51.1% of the patients, followed by closed reduction, 25.5%, and conservative treatment, 23.4%. Grafts were performed on 6.6% of patients, 3.2% using autografts and 3.2% using Alloplastic materials. Surgeries were performed on 44.7% of the total patients, including intraoral procedures in 26.6%, maxillary brow bone procedures in 11.7%, submandibular procedures in 5.3%, and preauricular procedures in 1.1%. Table 14 shows postoperative complications one week after surgery. The most common postoperative complications were functional impairment (4.3%), followed by aesthetic problems (3.2%), and surgical site infection (1.1%).

Table 14: The surgical approaches in 94 patients with maxillofacial fractures.

Surgical approaches	Number (%)
Intra-oral	25 (26.6)
Submandibular	5 (5.3)
Preauricular	1 (1.1)
Lateral upper eye brow	11 (11.7)
Total	42 (44.7)

Table 15: The post operations complications one week after operation in 94 patients with maxillofacial fractures.

Complications	Number (%)
SSI	1 (1.1)
Functional disturbances	4 (4.3)
Neuro-sensory disturbances	0 (0)
Aesthetic problems	3 (3.2)

Table 15 shows the long term outcomes and six month follow up of functional recovery in 94 patients with maxillofacial fractures referred to the Military Hospital in Sana'a. Complications of plate removal occurred in 13.8% of patients, bone loss in 8.5%, and plate exposure in 1.1%. No functional impairments occurred in patients, while 2.2% experienced neurosensory disturbances, 2.2% experienced aesthetic problems, and 22.3% experienced malunion.

Table 16: Long term result and functional recovery fallow up after 6 months in 94 patients with maxillofacial fractures.

	Number (%)
Complication remove plate	13 (13.8)
Bone loss	8 (8.5)
Plate exposure	1 (1.1)
Non union	0 (0)
Functional disturbances	0 (0)
Neuro sensory disturbances	2 (2.2)
Aesthetic problems	2 (2.2)
Mal union	21 (22.3)

DISCUSSION

International variations in the spreading and incidence of maxillofacial fractures have been observed as a result of economic, social, political, cultural, and environmental influences[9]. Over the past 4 decades, Yemen has experienced significant economic growth and social transformation, leading to increased use of motorized transportation and other aspects of a Western lifestyle, particularly in the capital, Sana'a. Though, because of the prolonged civil war, Yemen has experienced a stagnant growth rate, population increase, and a decline in health services. These factors are likely to have influenced the distribution and causes of traumatic

maxillofacial injuries seen in healthcare facilities in Yemen in general.

In the current study, there were 94 patients, 93 of who were male and one female, with a mean age of 26.1 years. Patients aged 16-25 years constituted 60.6% of the total, followed by those aged 26-45 years, representing 19.1%. Children constituted only 3.1%, and those over 46 years of age constituted only 5.3%. Males and the age group under 30 years represented the largest number of patients in each category in the current investigation, as is the case in the majority of maxillofacial trauma studies[14-17]. On the other hand, the male-to-female ratio is much higher than that found in a Nigerian study[18]. Given that our hospital (the Military Hospital) is located in Yemen's largest city, Sana'a, and that many young people work in the motorcycle passenger transport industry, these findings are not entirely shocking. In a comparative Dutch study, the mean age was 42 years, and falls were found to be the leading cause of injury[19]. This may be due to the different environments, climates and age distribution in the two countries.

In our investigation, men were the majority. The male-to-female ratio was 7.7:1, which is lower than those in Nigeria (16.9:1) and Turkey (25:1) and lower than those in Jordan (1:1) and Canada (3:1)[20-23]compared to the Uganda study. Additionally, the outcomes differ from those in India (7:1) and Kenya (8.4:1)[6,24]. Male preponderance in all studies can be explained by the fact that men are more likely to be involved in accidents, violent conduct (including wars), and sports since they are the primary breadwinners and work outside. In actuality, all of the motorcycle riders in this study who suffered mandibular fractures were men, the majority of whom drove bikes primarily for passenger service, and none of them had on a helmet at the time of the collision.

Similar to the findings of earlier studies, the age group most afflicted was 16-25 years old, making up 60.6% of the total. This is perhaps because this generation is more agile and physically active[20-24]. Road traffic accidents accounted for 36.2% of all injuries in the current study, which is comparable to research done in Iran and India[24,25]. On the other hand, research from Finland and Austria[26,27] indicated that the primary causes of maxillofacial trauma were assault and everyday activities. Highway accidents are increasing as a cause of morbidity and mortality in Yemen. Rapid population growth has led to a dramatic increase in car use. However, improvements in infrastructure have not kept pace with the increase in traffic, and as a result, motorcycles have found a place as a form of public transportation. With poor vehicle maintenance, non-enforcement of traffic rules, low educational levels of passengers and drivers, inadequate insurance, poor patient care, outdated legislation, and political interference, the problem is likely to worsen in the future.

Just 3.2% of patients in assault instances reported having a mandibular fracture as a result of the trauma. Studies have shown that people are reluctant to identify domestic violence as the source of their injuries for a variety of reasons, including socioeconomic and cultural ones, even though just three case patients admitted that violence was the cause of their injuries[28]. Therefore, even though we made a conscious effort to find this information, it's possible that we were unable to ascertain how much domestic violence contributes to maxillofacial injuries.

This preponderance may result from the mandible's higher vulnerability to fracture compared to the well-articulated mid-facial bones because it is the most noticeable and sole moving facial bone. The most frequent fracture type in our analysis was a symphysis fracture (62.8% of all fractures), which included parasymphysis (19.1%), body (14.9%), ramus angle (11.7%), and coronal (3.2%) fractures. This contrasts with other published data that indicate the most commonly impacted areas are the body[21] and condyle[27].

The most frequent kind in the current study was a zygomatic fracture (30.9% of the total), which included body (2.2%), zygomatic arch (14.9%), and mandibular (13.8%) fractures. This finding is consistent with some research that found that the most frequent location for mid-facial fractures is the zygoma[29,30]. Road traffic accidents caused the mandibular body to fracture, while assault had the greatest impact on the angle. This contrasts with other published research that revealed the angle to be the most frequent site in assault cases[9] and the mandibular body to be the most injured region in RTAs[31].

The current study found that falls from a height were the second least prevalent cause of maxillofacial fractures (5.3%). The low number of reported falls may be related to living conditions and climate. Because there is no winter or snow, few people live in tall buildings, and there are fewer concrete floors, falls in Yemen typically happen on soft ground, which reduces the risk of fractures. In contrast to other reports where the body of the zygoma was the most common site of fractures, our study found that the body of the zygoma was 2.2% the rare fracture location. This is because the body of the zygoma is linked to sports injuries, which is an uncommon occurrence in Yemen. This outcome differs from a study that was carried out in Switzerland[32]. According to previous research, facial fractures can happen in conjunction with other fractures and cause unconsciousness[23,24-27]. Therefore, it is crucial that general surgeons, orthopedic, plastic, neurosurgery, ophthalmologists, and maxillofacial teams work with multidisciplinary and provide prompt diagnosis.

Open surgical fixing (ORIF) was the most prevalent treatment for maxillofacial fractures in the current study, with 51.1% of patients receiving it. Closed reduction (25.5%) and conservative treatment (23.4%) were the next most common treatments. In comparison, 90.15% of patients in Uganda had the closed fracture reduction procedure[33]. Our study's closed method (25.5%) is lower than that of other research, including those by Vetter *et al.*[22], Martini *et al.*[35], and Sentongo[35], which reported 40%, 35%, and 70.2%, respectively. This was mostly because open reduction was expensive and there were no plates or theater space available for the treatment. In each of these cases, MMF continued to be the main management strategy. The government still controls healthcare in the majority of developing and other low-

income nations. The majority of governments do not provide enough funding for healthcare, which results in severely limited resources for hospitals in both rural and urban areas[36]. In order to care for as many patients as possible on a tight budget, hospitals are consequently selecting the least expensive treatment options. In the near future, intraosseous wire and open surgical fixation (ORIF), which are low cost techniques for treating maxillofacial fractures, are probably going to take the lead in plating.

Postoperative problems occurred in 7.7% of patients in our sample, which is lower than the 18% described by Hussain[37] and different from the findings of Devadija[24]. Our rate, however, was less than the 61.54% Abuez[38] stated. Only one instance (1.1%) of the problems that were noted involved infection. Good dental hygiene and nutritional status are responsible for the reduced infection rate in this study. Although many of our patients had really poor oral hygiene due to the high cost of dental care compared to their earning ability, we were able to ameliorate the situation prior to surgery. Thus, it was not surprising that the infection rate was low.

Limitation of the study

The lack of long term follow up, which would have yielded more comprehensive outcomes and complication data, and the study's single center design, which restricts generalizability due to possible variations in patient populations, treatment protocols, and resources in comparison to other facilities, were two limitations of a study on maxillofacial fractures at a military hospital in Sana'a, Yemen.

CONCLUSIONS

In our study, traffic accidents were the most common cause of fractures, with symphysis fracture being the most common, followed by zygomatic fracture. Other fractures included palatine, lateral, suspensory, maxillary sinus, and alveolar process fractures. Fractures of the nasal bridge, eye socket, and facial fractures were less common. Only a few patients experienced complications, and open surgical fixation was the most common treatment for our patients. From this study, we conclude that every country needs data on trauma and its subsequent effects, as it helps in planning and improving facilities, as well as in developing public health policies and programs that help prevent and reduce trauma from traffic accidents and other injuries. Collecting trauma data also helps in planning facilities and the expertise needed to handle reports submitted to healthcare facilities. Implementing appropriate preventive measures may benefit from information collected on variables including occupation, helmet/seat belt use, type of traffic accident, and firearm handling. Regular epidemiological studies of these fractures and their causes are essential to enable the development and implementation of innovative and appropriate preventive and therapeutic measures in a timely manner. Significant progress, especially in low income countries such as Yemen, is likely to show changes in the trends and complexity of oral and maxillofacial injuries.

ACKNOWLEDGEMENTS

Authors are thankful for all the staff of the Military Hospital in Sana'a, Yemen, for their assistance and cooperation.

AUTHOR'S CONTRIBUTIONS

Abu-Taleb AM: writing original draft, formal analysis, data organization, and clinical and laboratory exams. **Al-Rahbi LM:** critical review, conceptualization. **Al-Ashwal AA:** formal analysis. **Al-Shamahy HA:** review and editing. Final manuscript was checked and approved by all authors.

DATA AVAILABILITY

Upon request, the accompanying author can furnish the empirical data used to bolster the findings of the study.

CONFLICT OF INTEREST

None to declare.

REFERENCES

1. Awad MMA, Al-Rahbi LM, Al-Ashwal AA, *et al*. Comparative outcomes in mandibular angle fracture management reconstruction plates versus dual miniplates fixation. Universal J Pharma Res 2025;10(3):22-27. *http://doi.org/10.22270/ujpr.v10i3.1349*
2. Sharaf Aldeen HMA, Al-Rahbi LM, Al-Ashwal AA. Analysis of hardware removal in maxillofacial trauma: A retrospective study in a military hospital in Sana'a, Yemen. Universal J Pharm Res 2024;8(6):46-51. *https://doi.org/10.22270/ujpr.v8i6.1039*
3. Al-Rahbi LM, MAMF Gamel, Al-Shamahy HA. Treatment of comminuted mandibular fracture with closed reduction and mandibular fixation versus open reduction and internal fixation. Universal J Pharm Res 2024;9(5):1-8. *https://doi.org/10.22270/ujpr.v9i5.1192*
4. Rowida AAMA, Lutf M Alrahabi, Ahmed AAA, Taghreed *et al*. Maxillofacial trauma among head trauma patients in 48 hospital, Sana'a city, Yemen, during 2022 and 2023. J Bio-Med Clin Res, RPC Publishers2024;1(1). *https://www.doi.org/rpc/2024/rpc.jb mcr/0084*
5. R Voss. The aetiology of jaw fractures in Norwegian patients. J Maxillofac Surg 1982;10:146-8. *https://doi.org/10.1016/S0301-0503(82)80031-3*
6. DL Mwaniki, SW Guthua. Occurance and characterisics of mandibular fractures in Nairobi, Kenya. Br J Oral Maxillofac Surg 1990;28:200-20. *https://doi.org/10.1016/0266-4356(90)90089-4*
7. Ajagbe HA, Daramola JO. Pattern of facial bone fractures seen at the university college hospital, Ibadan, Nigeria. East Afr Med J 1980;57:267-73.
8. Güven O. A Comparative study on maxillofacial fractures in central and eastern Anatolia. J Craniomaxillofac Surg 1988;16:126-9. *https://doi.org/10.1016/S1010-5182(88)80032-5*
9. Dongas P, Hall GM. Mandibular fracture patterns in Tasmania, ten years of mandibular fractures: An analysis of 2137 Cases. Aust Dent J 2002;47:131-7. *https://doi.org/10.1111/j.1834-7819.2002.tb00316.x*
10. Peden M, Sminkey L. The injury chart book, WHO, Geneva 2000. Special feature world health day 2004-Road Safety.
11. Al-Rahbi LM, Al-Badani NADA, Al-Ashwal AA, *et al*. Osteomyelitis of the Jaws: A 5 years retrospective study at

AL Thawra Hospital in Sana'a, Yemen. Universal J Pharma Res 2025;10(3):45-51. *http://doi.org/10.22270/ujpr.v10i3.1352*

12. Al-Rahbi LM, Mohammed Setten HH, Al-Shamahy HA. Impact of 3D printing in reconstruction of maxillofacial bone defects experimental study in a military hospital in Sana'a city, Yemen. Universal J Pharm Res 2025;10(1):1-8. *https://doi.org/10.22270/ujpr.v10i1.1271*
13. Banks P. Killey's fractures of the mandible, 4th edition: Varghese Publishing House; 1993.
14. Jordan JR, Calhoun KH. Management of soft tissue trauma and auricular trauma. In Bailey BJ, Johnson JT, Newlands SD *et al.* (2006). Head & neck surgery: Otolaryngology Hagerstwon, MD: Lippincott Williams & Wilkins 2006:935-936.
15. Subhashraj K, Nandakumar N, Ravindran C. Review of maxillofacial injuries in Chennai, India: A study of 2748 cases. Br J Oral Maxillofac Surg 2007;45:637-639. *https://doi.org/10.1016/j.bjoms.2007.03.012*
16. Salentijn EG, Peerdeman SM, Boffano P, *et al*. A ten-year analysis of the traumatic maxillofacial and brain injury patient in Amsterdam: Incidence and aetiology. J Craniomaxillofac Surg2014;42:705-710. *https://doi.org/10.1016/j.jcms.2013.12.008*
17. Rajandram RK, Syed Omar SN, Rashdi MF, *et al*. Maxillofacial injuries and traumatic brain injury - A pilot study. Dent Traumatol 2014;30:128-132. *https://doi.org/10.1111/edt.12052*
18. Obuekwe O, Etetafia M. Associated injuries in patients with maxillofacial trauma. Analysis of 312 consecutive cases due to road traffic accidents. J Med Biomed Res 2004;3:30-36. *https://doi.org/10.4314/jmbr.v3i1.10653*
19. Smith HL, Chrischilles E, Janus TJ, *et al.* Clinical indicators of midface fracture in patients with trauma. Dent Traumatol 2013;29:313-318. *https://doi.org/10.1111/edt.12006*
20. Adekeye EO. The pattern of fractures of the facial skeleton in Kaduna, Nigeria: A survey of 1,447 cases. J Oral Surg. 1980;49:491-5. *https://doi.org/10.1016/0030-4220(80)90068-7*
21. Kerim O, Yilmaz G, Sinan AY, *et al.* An analysis of maxillofacial fractures: A 5 yr survey of 157 patients. Military Med 2004;169:723-7. *https://doi.org/10.7205/MILMED.169.9.723*
22. Vetter JD, Topazian RG, Goldberg MH, *et al.* Facial fractures occurring in a medium sized metropolitan area: recent trends. Int J Oral Maxillofac Surg 1991;20:214-6. *https://doi.org/10.1016/S0901-5027(05)80177-8*
23. Hogg NJ, Stewart TC, Armstrong JE, *et al.* Epidemiology of maxillofacial injuries at trauma hospitalsin Ontario, Canada, Between 1992 and 1997. J Trauma 2000;49:425-32. *https://doi.org/10.1097/00005373-200009000-00007*
24. Devadiga A, Prasad, KSV. Epidemiology of maxillofacial fractures and concomitant injuries in a craniofacial unit: A retrospective study. Int J Epid 2008;5:2. *https://doi.org/10.5580/c4c*
25. Zargar M, Khaji A, Karbakhsh M, *et al.* Epidemiology study of facial injuries during a 13-month of trauma registry in Tehran. Indi J Med Sci 2004;58:109-14.
26. Kontio R, Suuronen R, Ponkkonen H, *et al.* Have the causes of maxillofacial fractures changed over the last 16 years in Finland? An epidemiological study of 725 fractures. Dent Traumatol 2005;21:14-19. *https://doi.org/10.1111/j.1600-9657.2004.00262.x*
27. Gassner R, Tuli T, H.achl O, *et al.* Cranio-maxillofacial trauma: a 10 year review of 9543 cases with 21 067 Injuries. J Cranio-Maxill Surg 2003;31:51-61. *https://doi.org/10.1016/S1010-5182(02)00168-3*
28. Barriers to Addressing Violence. In population reports. Issues in World Health. (1999) XXVII, 4 Series L 11. URL: *http://www.infoforhealth.org/pr/l11/l11chap6_1.shtml*
29. Shaikh ZS, Worrall SF. Epidemiology of facial trauma in a sample of patients aged 1-18 years. Injury 2002:33;669-71. *https://doi.org/10.1016/S0020-1383(01)00201-7*
30. Klenk G, Kovacs A. Etiology and patterns of facial fractures in the United Arab Emirates. J Craniofac Surg 2003:14;78-84. *https://doi.org/10.1097/00001665-200301000-00014*
31. Ellis E, Moos KF, El-Attar A. Ten years of mandibular fractures: An Analysis of 2137 patients. J Oral Surg 1985;59:120-9. *https://doi.org/10.1016/0030-4220(85)90002-7*
32. Exadaktylos AK, Eggensperger NM, Eggli S, *et al*. Sports related maxillofacial injuries: The first maxillofacial trauma database in Switzerland. Br J Sports Med 2004;38:750-3. *https://doi.org/10.1136/bjsm.2003.008581*
33. Kamulegeya A, Lakor F, Kabenge K. Oral maxillofacial fractures seen at a ugandan tertiary hospital: A six-month prospective study. Clinics 2009;64(9):843-8. *https://doi.org/10.1590/S1807-59322009000900004*
34. Martini MZ, Takahashi A, de Oliveira Neto HG, *et al*. Epidemiology of mandibular fractures treated in a brazilian level I trauma public hospital in the city of são paulo, Brazil. Braz Dent J 2006;17:243-8. *https://doi.org/10.1590/S0103-64402006000300013*
35. Johnson RM, McCarthy MC, Miller SF, *et al*. Craniofacial trauma in injured motorcyclists: The impact of helmet usage. J Trauma 1995;38:876-8. *https://doi.org/10.1097/00005373-199506000-00008*
36. Ssentongo K. Maxillofacial fractures in Western province Zambia, an 18 months study. Trop Dent 1996;22-3.
37. World Health Organization. World health report-NHA annexes. www. who.int/nha/country/whrannex/en
38. Abiose BO. Maxillofacial skeleton injuries in the western states of Nigeria. Brit J Oral Maxillofac Surg 1986;24:31-9. *https://doi.org/10.1016/0266-4356(86)90037-9*