

## Frequency of Mechanical Injuries Presented to Jala Hospital

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### Abstract:

**Introduction:** A medico-legal issue arises whenever an injured person visits a hospital. Therefore, all physicians who treat such patients have a legal duty to accurately document injuries as part of medical treatment. The study aimed to find out the frequency of different types of mechanical injury among medicolegal cases in Jala Hospital (Benghazi city).

**Methods:** A retrospective study was conducted among patients admitted to the Emergency Department of Jala hospital during 2021, 2022. All relevant data were extracted using hospital records.

**Results:** Out of 525 medicolegal cases registered in the Department of Emergency 2021 males 486 (92.6%) females 39 (7.4%) and 1215 in 2022 males 1130(93%) females 85 (7%) were cases of mechanical injuries. Males outnumbered females for all types of mechanical injuries and the highly frequent age group was between (16-26) then (27-37) and the most common type of mechanical injury was Gunshot injury then other fighting injuries.

**Conclusion:** Most of the medicolegal cases involved the male population, while females appeared to be less inclined to the bodily injuries in medicolegal cases the prevalence of mechanical injuries among medicolegal cases was similar in comparison to other studies done in similar settings. The majority of the injuries were caused by Gunshot and fighting, which could have been prevented if a law system approach was followed.

**Keywords:** mechanical injury; Jala hospital, Benghazi.

### 1. INTRODUCTION

Medico-legal center of Benghazi (MLCB) provides forensic services including the examination of the living victims to assess the body damage, its cause, duration of treatment and the permanent infirmity, in cases of violence, road traffic accidents, industrial accidents, self-inflicted wounds, as well as pathological examinations of unnatural deaths and medical malpractice cases. This practice is nearly similar in most countries, but it differs in the problems facing that practice, which is affected by cultural background and administrative as well as legal system in each country. Most doctors come across medico-legal cases (MLC) in their clinical profession.

An MLC is a case of injury wherein an investigation by the law implementation agency is necessary to get to the bottom of the cause of the injury.<sup>1</sup>

In other words, it is a medical case with legal implications for the doctor, where he, after the

examination of the patient, thinks that some investigation by law implementation agencies is necessary.

It also includes a legal case requiring medical expertise when brought by the police for examination since a doctor's knowledge may be necessary for the administration of law.

It is an examination of the living person carried out under the law of the country for the protection of society and help the administration of justice.<sup>2</sup>

The medicolegal examination is generally required in the case of trauma, sexual assault, and poisoning. Cases that are considered as medicolegal are, all cases of injuries (caused by trauma), other unnatural accidents, cases of sexual assault (rape, sodomy) criminal abortion, all cases of poisoning or intoxication, cases for age estimation, cases of self-inflicting injuries, fabrication. Moreover, there is an ascent in the instances of violence against ladies and youngsters over a recent couple of years. Specialist doctors and all healthcare experts

assume a double job in giving medicolegal help, just as in helping survivors in the medicolegal procedures by gathering proof and documentation of the findings.<sup>3-7</sup> In forensic science, the injuries/wounds are produced by physical violence, which break of the natural continuity of any of the tissues of the living body 8.

Trauma is explained as an injury to the body caused by physical, mechanical or chemical factors, which may result in wounds or possible complications. The medical purposes, violence refers to either behavior that result in injury or to the injury itself. This violence may result in both psychological and physical trauma 9.

### 2. TYPES OF INJURIES/WOUNDS AND THEIR PHYSICAL CHARACTERISTICS

Mechanical factors include the use of weapons or instruments such as knives, screwdrivers, scissors, razor blade, galss or guns and injuries results from falls, traffic accident or domestic violence. Chemical factors include damage to tissue by acids, alkalis or poisons.

A wound/ injury to the body occurs when the force applied to the body is greater than the body's ability to absorb such force.

Injury mechanism refers to the various forces commonly associated with trauma (i.e., projectile, sharp, blunt, thermal and poly trauma).

Accurate identification of mechanism is dependent on pattern recognition as well as the contributions of intrinsic and extrinsic factors that dictate the way wounds/injuries 10.

For example, similarly-shaped striking surfaces produce different patterns if they impact at different velocities, and typically high-velocity projectiles can be slowed in flight by an intermediate target. The injuries inflicted by mechanical force are generally divided into two categories as blunt and sharp forces.

These may be more than one type of skin injury to the body and they may be localized and widespread. Sometimes, the absence of external injury to the skin or genitalia does not exclude the possibility of serious injury to the internal organs/ body parts.

**i) Blunt Force Injury:** On the body due to blunt forces or instruments, these injures are on skin and scratches, grazing, bruising are observed. These injuries are sub-categories as; a) Abrasions: In this type of injuries the skin in which the outer layer of the skin is scarped off.

Examples of the abrasions are scratches, grazing of the skin caused by dragging, imprint caused by belt/hunter/ sticks.

**b) Contusions/Bruises:** This type of injuries occurs when blood vessels in the skin or internal organ are ruptured. A bruise heals by destruction and removal of the extravasated blood. The colour change is very variable, starts at the periphery and extends inwards to the center. At first its col our is red, after few hours to 3 days it converted in to blue on 4th days is changes into bluish-black. When bruising is extensive and deeply situated the colour takes longer time to appear externally.

**c) Lacerations:** Lacerations are tears or splits of skin, mucous membranes, muscle or internal organs produced by application of blunt force or broad are of the body.

Types of lacerations are split lacerations (crushing of the skin between two hard objects), stretch lacerations (overstretching of skin), avulsion, tears etc.

#### ii) Sharp Force Injury

These are caused by cutting or stabbing the skin with sharp instruments/weapons such as knives, swords, tins, broken glass bottles, razor blade and tools (screw driver etc.).

There are three types of sharp force injuries explain as under

**a) Incised/cuts Injury:** This type of wound is a superficial injury in which the size of the injuries on the surface is larger than the depth of the injuries generally made of razor blade, axe and swords.

**b) Stab/Penetrating/Puncture Injury:** This type of injury is produced from the penetration of pointed / sharp instruments/ weapons on to the depth of the body that is deeper than its length, generally knives, broken glass bottles and tools. The stab injuries may be single or multiple.

#### iii) Firearms Injury

They are usually recognized without difficulty. The injuries produced by fire arms vary depending on the projectile, the muzzle velocity, distance, angle of firing and part of the body involved 11.

These wound are subdivided as, when a bullet, passing through a body, produces a wound a the point of entrance on the skin known as entry

wound and another at the point of exit of the bullet known as exit wound.

**3. METHODS**

A retrospective study was conducted among patients admitted to the Emergency Department of Jalal hospital in Benghazi city during 2021, 2022. All relevant data were extracted using hospital records.

**4. RESULTS AND DISCUSSION**

In all injuries/ wound related cases the total number or wounds should be recorded and each wound in carefully measured and it's characteristics described with photography. A blunt force injury comes from impact with a blunt object or something with no sharp edges.

Forensic expert determine the direction of impact, the type of object that caused it and how often the contact was made, often they're made by blows from a hammer or axe head.

Bite marks are also a form of crushing wounds. With a knife or incised wounds the crime scene investigator must make a distinction between cut and stab or puncture wounds and among different types of piercing implements such as an ice pick or small knife. Most knives have a flat edge and a sharp edge which can be seen in the wound angles. Some wounds are defensive such as cuts made on the palms or fingers of a victim's hands. Sometime cuts are associated with suicidal gestures are known as hesitation wounds as the person attempts to inflict self-damage.

As with all instances of a firearms offence that results in an injury, measurements are taken along with photographs to aid in the identification of the weapon used, it is necessary for a Forensic expert. Powder residue samples are taken and if the victim dies as a result of their gunshot wound, the round is removed for ballistic analysis from the corpse at the autopsy stage. The forensic scientists and investigating officer scour the crime scene looking not only for the weapon involved as they are sometimes disposed of but also for spent shell casings and/or loose rounds that were fired but did not hit their intended targets and imbedded themselves in nearby walls, doors or the ground.

Out of 525 medicolegal cases registered in the Department of Emergency 2021 males

486 (92.6%) females 39 (7.4%) and 1215 in 2022 males 1130(93%) females 85 (7%) table 1&4 and figure 1&4.

The most frequent mechanical injury in 2021 was Gunshot injury 31%, fighting 25%, stab wound 16%, sharp injury 6% and foreign body injury 5%. The most frequent of mechanical injury in 2022 was Gunshot injury 30%, fighting 28%, stab wound 14%, sharp injury 5% and foreign body injury 6% table 2&5 and figure 2&5 . . .

Males outnumbered females for all types of mechanical injuries and the highly frequent age group was between (16-26) then (27-37) 41% and 28% in 2021 and 42% and 30% in 2022 almost the same table 3&6 and figure 3&6.

**Table 1. Frequency in gender 2021**

	N	%
Female	39	7,4%
Male	486	92,6%

**Table 2. Frequency of mechanical injury in 2021**

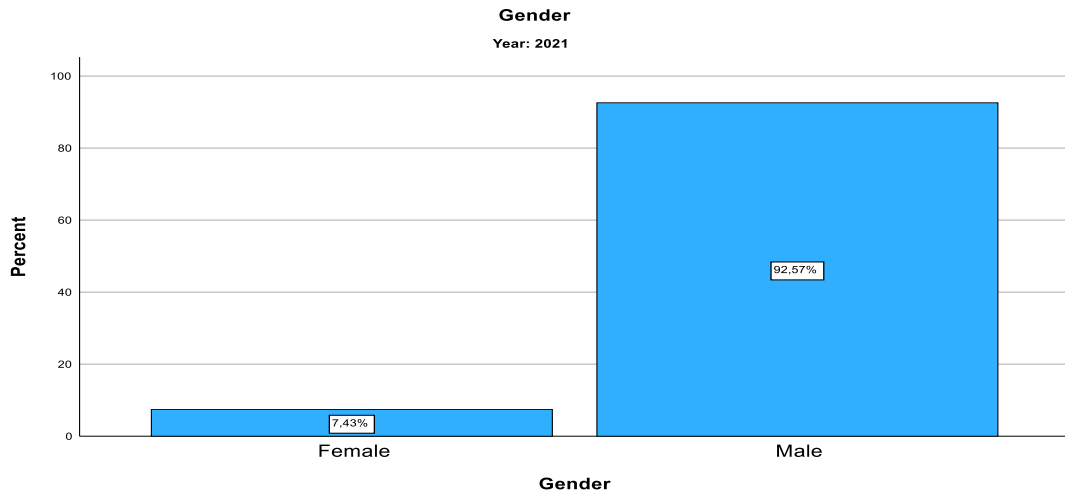
	N	%
Bite mark	4	0,8%
Blunt injury	51	9,7%
Explosive	27	5,1%
Fighting	134	25,5%
Foreign body	27	5,1%
Gunshot injury	163	31,0%
Sharp injury	33	6,3%
Stab wound	85	16,2%
Suicide attempts	1	0,2%

**Table 3. frequency in age grouping 2021**

	N	%
<= 15	45	8,6%
16 - 26	220	41,9%
27 - 37	147	28,0%

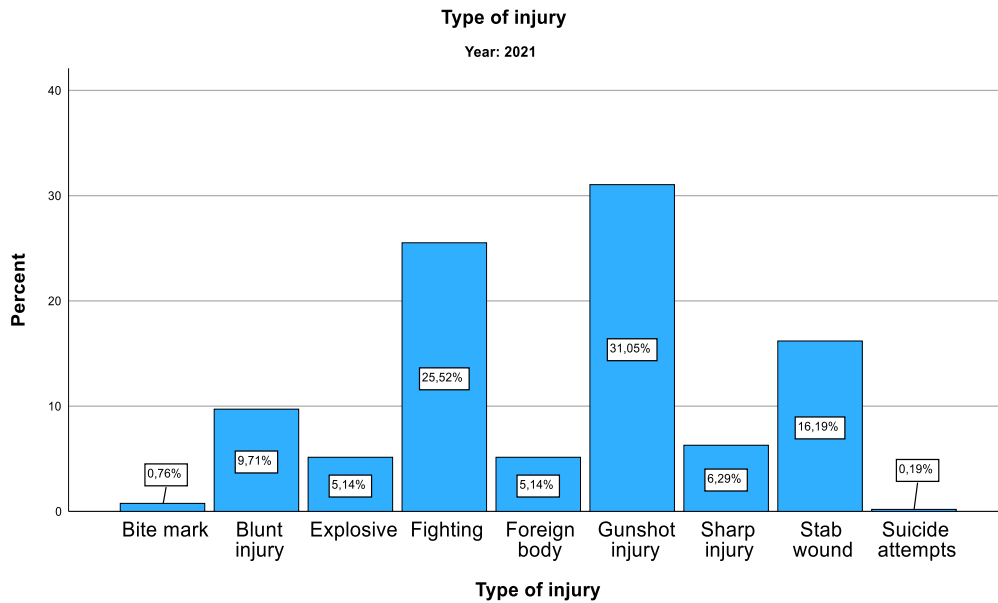
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38 - 48	87	16,6%
49 - 59	20	3,8%
60+	6	1,1%

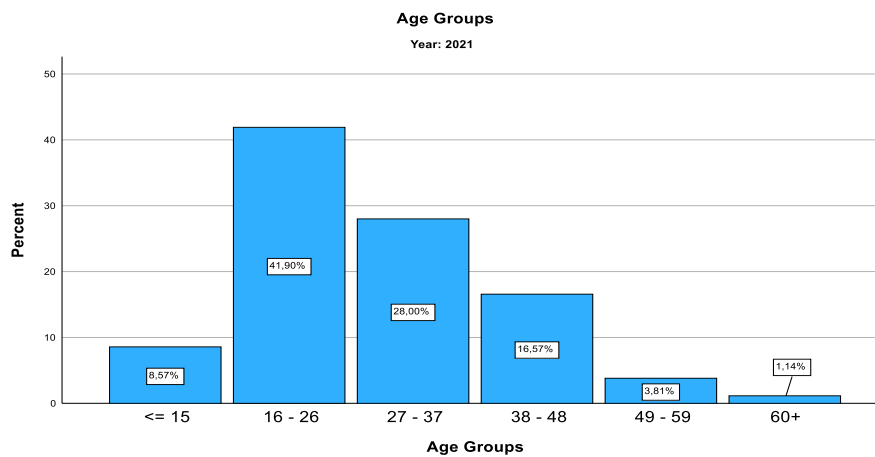


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**Figure 1.** Frequency in gender 2021



**Figure 2.** Frequency of common mechanical injury 2021



**Figure 3.** Frequency of age group 2021

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**Table 4.** Frequency of Gender 2022

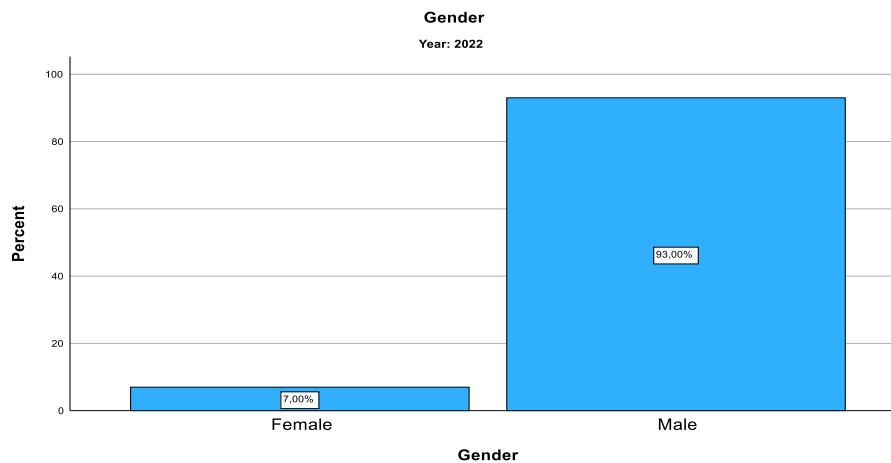
	N	%
Female	85	7,0%
Male	1130	93,0%

**Table 5.** frequency of mechanical injury 2022

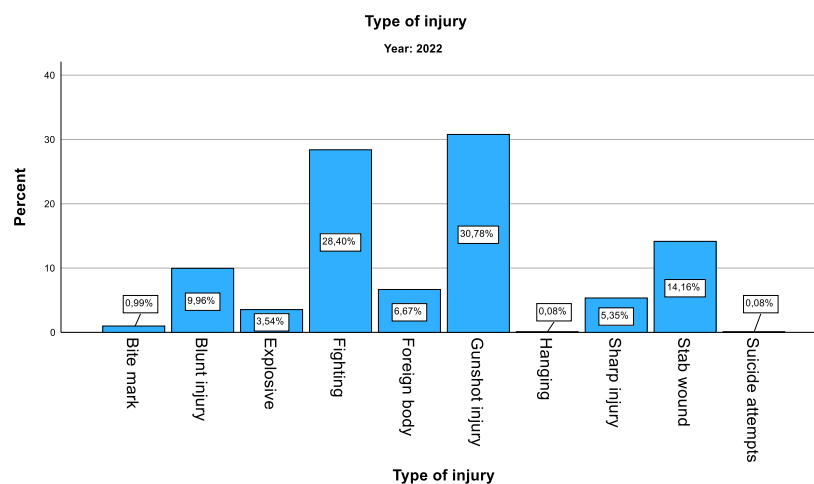
	N	%
Bite mark	12	1,0%
Blunt injury	121	10,0%
Explosive	43	3,5%
Fighting	345	28,4%
Foreign body	81	6,7%
Gunshot injury	374	30,8%
Sharp injury	1	0,1%
Stab wound	65	5,3%
Suicide attempts	172	14,2%

**Table 6.** Frequency in Age Grouping 2022

	N	%
<= 15	103	8,5%
16 - 26	521	42,9%
27 - 37	379	31,2%
38 - 48	141	11,6%
49 - 59	56	4,6%
60+	15	1,2%



**Figure 4.** Frequency in gender 2022



**Figure 5.** Frequency of common mechanical injury 2022

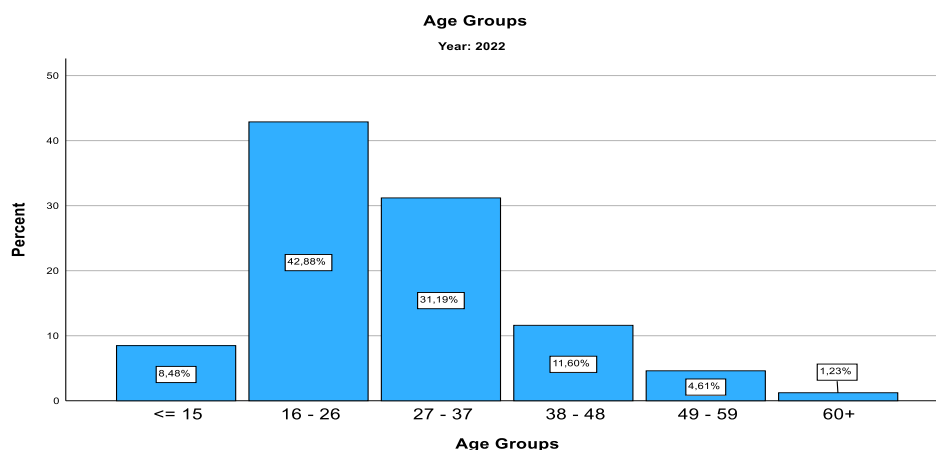


Figure 6. Frequency of age group 2022

## 5. CONCLUSION

Most of the medicolegal cases involved the male population, while females appeared to be less inclined to the bodily injuries

In medicolegal cases the prevalence of mechanical injuries among medicolegal cases was similar in comparison to other studies done in similar settings. The majority of the injuries were caused by Gunshot and fighting, which could have been prevented if a law system approach was followed.

Most of the cases are males and age group 16-37 were maximally involved. The most frequent injury was due to Gun shot and injuries due to fighting (stab wound, foreign body and bite mark).

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