

Pattern of Injuries and Medico-Legal Outcomes among Survivors of Physical Assault - A Hospital-Based Prospective Study

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Abstract

Background: Physical assault is one of the most common forms of interpersonal violence encountered in emergency departments and medico-legal practice. Assault-related injuries contribute substantially to morbidity, disability, psychological trauma, and medico-legal litigation. Survivors of physical assault frequently present with varying patterns of blunt, sharp, or mixed-force injuries, the characteristics of which depend upon the nature of the assault, type of weapon used, number of assailants, duration of violence, and the victim's defensive response. Accurate documentation of injury

patterns and medico-legal outcomes is essential for clinical management, forensic interpretation, judicial proceedings, and formulation of violence prevention strategies.

Objectives: To study the pattern of injuries and medico-legal outcomes among survivors of physical assault attending a tertiary care hospital, to evaluate the demographic characteristics of victims, identify common injury types and anatomical sites involved, assess the weapons used during assault, determine the medico-legal nature of injuries, and analyze clinical outcomes following treatment.

Materials and Methods: A prospective hospital-based observational study was conducted among 50 survivors of physical assault presenting to the Emergency Department and Department of Forensic Medicine of a tertiary care teaching hospital over a period of 24 months. Demographic information, circumstances of assault, type of weapon, anatomical distribution of injuries, clinical findings, medico-legal opinion, and treatment outcomes were recorded using a structured proforma. All injured persons underwent detailed clinical examination, and relevant investigations were performed whenever indicated. The collected data were compiled and analyzed using descriptive statistical methods.

Results: Among the 50 assault survivors included in the study, males constituted the majority of victims. Young adults between 21 and 40 years were most commonly affected. Blunt-force assault was the predominant mechanism of injury, with abrasions, contusions, and lacerations being the most frequent injury types. The head and upper limbs were the most commonly involved anatomical regions. Most injuries were classified as simple in nature, while grievous injuries constituted a smaller proportion. The majority of patients recovered following appropriate medical treatment without permanent disability.

Conclusion: Young adult males constitute the most vulnerable group for physical assault. Blunt-force trauma producing abrasions, contusions, and lacerations represents the predominant injury pattern. Early medico-legal examination, meticulous documentation of injuries, and timely medical management are essential for ensuring appropriate patient care and facilitating judicial proceedings.

Keywords: Physical Assault, Medico-Legal Examination, Injury Pattern, Assault Survivors, Blunt Force Trauma, Hospital-Based Study, Forensic Medicine.

Introduction

Interpersonal violence remains a major public health, social, and medico-legal problem throughout the world. Physical assault contributes significantly to emergency department visits, hospital admissions, long-term disability, psychological trauma, and criminal litigation. The burden of assault-related injuries is particularly high among young adults, resulting in considerable healthcare expenditure, loss of productivity, and adverse social consequences.^{1,3}

Physical assault encompasses the intentional application of force by one or more individuals resulting in bodily harm. The severity and pattern of injuries depend upon multiple factors including the type of weapon employed, force of impact, duration of assault, anatomical site involved, number of assailants, defensive actions of the victim, and availability of immediate medical care. Accurate assessment of these injuries is essential for both clinical management and medico - legal documentation^{4,6}

The medico-legal examination of assault survivors serves a vital role in the administration of justice. Detailed documentation of injury characteristics assists in determining the nature of force used, probable weapon involved, age of injuries, mechanism of assault, and the medico-legal classification of injuries. Such documentation provides objective scientific evidence during criminal investigations and judicial proceedings while ensuring appropriate medical treatment for victims.^{7,8}

Blunt-force trauma represents the most frequent mechanism of injury encountered in assault cases. Abrasions, contusions, lacerations, fractures, and internal organ injuries are commonly observed depending upon the severity of violence. Assaults involving sharp - edged weapons produce incised wounds, stab wounds, and chop injuries, whereas mixed mechanisms may result in complex injury patterns involving multiple body regions.^{9,10}

The anatomical distribution of injuries often provides valuable forensic information regarding the circumstances surrounding the assault. Head and facial injuries are frequently encountered because of their exposed location, while injuries involving the upper limbs may represent defensive wounds sustained during attempts to protect vital body parts.^{11,12} Identification of defensive injuries contributes significantly to reconstruction of assault events during medico-legal investigation.^{13,16}

Young adult males constitute the population most frequently affected by physical assault because of greater occupational exposure, interpersonal conflicts, alcohol consumption, and involvement in social violence. However, females, children, and elderly individuals may also become victims under varying domestic, occupational, or community circumstances. Socioeconomic status, educational level, substance abuse, and environmental factors further influence the epidemiology of assault-related injuries.¹⁷

Hospital-based prospective studies provide valuable information regarding injury patterns, treatment outcomes, and medico-legal characteristics of assault survivors. Such studies assist clinicians, forensic experts, law enforcement agencies, and policymakers in understanding prevailing trends of interpersonal violence

and developing effective preventive strategies. Comprehensive analysis of assault-related injuries also contributes to improvement of medico-legal services and trauma care systems.¹⁸

The present prospective hospital-based study was therefore undertaken to evaluate the pattern of injuries and medico-legal outcomes among survivors of physical assault presenting to a tertiary care hospital, with particular emphasis on demographic profile, injury characteristics, weapons used, anatomical distribution of injuries, medico-legal classification, and treatment outcomes.

Materials and Methods

Study Design

A prospective, hospital-based observational study was conducted to evaluate the pattern of injuries outcomes among survivors of physical assault presenting to a tertiary care teaching hospital.

Study Setting

The study was carried out in the Department of Forensic Medicine and Toxicology in collaboration with the Emergency Medicine and General Surgery Departments of a tertiary care centre for a period of 24 months. All assault victims referred for medico-legal examination during the study period were evaluated.

Study Duration

The study was conducted over a period of 24 months.

Study Population

The study included 50 consecutive survivors of physical assault who attended the emergency department and were referred for medico-legal examination.

Sample Size

A total of 50 patients fulfilling the inclusion criteria were enrolled in the study.

Inclusion Criteria

1. Patients of either sex aged 18 years and above.
2. Survivors of alleged physical assault presenting during the study period.
3. Patients willing to participate and provide informed written consent.
4. Patients undergoing medico-legal examination.

Exclusion Criteria

1. Patients refusing consent.
2. Victims with incomplete medico-legal records.
3. Patients who were brought dead.
4. Assault victims requiring immediate life-saving intervention before complete medico-legal documentation.
5. Cases in which assault history could not be reliably obtained.

Clinical Evaluation

Each participant underwent a detailed medico-legal examination.

The following information was recorded:

- Age
- Sex
- Occupation
- Residence
- Time and place of assault
- Number of assailants
- Alleged weapon used
- History of alcohol or substance use
- Time interval between assault and examination
- Clinical symptoms
- Treatment received

A thorough general physical and systemic examination was performed in every patient.

Injury Assessment

Each injury was examined carefully and documented according to standard medico-legal protocols.

The following observations were recorded:

- Nature of injury
- Number of injuries
- Site of injuries
- Size and dimensions
- Shape and margins
- Direction of injury
- Associated fractures
- Presence of defence injuries
- Signs of internal injury
- Healing status at examination

Whenever indicated, patients underwent:

- Digital radiography
- Ultrasonography
- Computed tomography (CT)
- Magnetic resonance imaging (MRI)
- Routine laboratory investigations

Variables Studied

Demographic Variables

- Age
- Sex
- Occupation

Assault-related Variables

- Place of occurrence
- Number of assailants
- Type of weapon
- Time of assault
- Time to hospital presentation

Injury Variables

- Abrasions
- Contusions
- Lacerations

- Incised wounds
- Stab wounds
- Fractures
- Defence injuries
- Anatomical distribution of injuries

Medico-Legal Variables

- Nature of injury
- Simple injury
- Grievous injury
- Dangerous injury
- Duration of treatment
- Hospital admission
- Surgical intervention
- Final medico-legal opinion

Outcome Measures

Primary Outcomes

- Pattern of injuries among assault survivors
- Anatomical distribution of injuries
- Medico-legal classification of injuries

Secondary Outcomes

- Type of weapon used
- Requirement for hospitalization
- Surgical management
- Duration of treatment
- Clinical outcome

Data Collection

Data were collected using a standardized structured medico-legal proforma specifically designed for the study.

Information was obtained from:

- Patient interview
- Police requisition
- Medico-legal case papers
- Emergency department records

- Radiological reports
- Surgical records (where applicable)

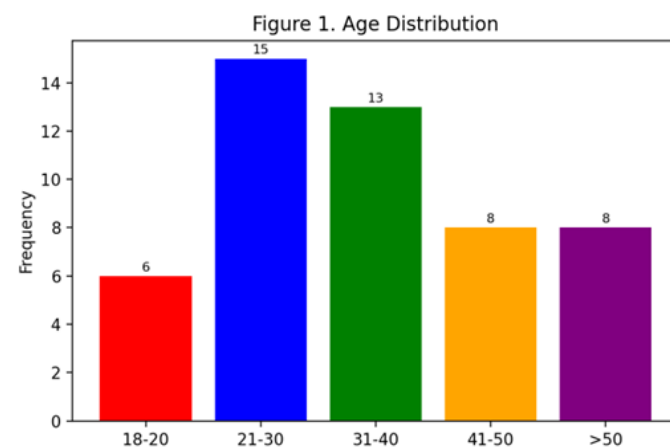
Results

A total of 50 survivors of physical assault were included in the present study. The majority of victims were young adult males. Blunt-force assault was the predominant mechanism of injury, and most victims sustained abrasions, contusions, or lacerations. Upper limbs and head were the most frequently involved anatomical regions. The majority of injuries were classified as simple injuries, while a smaller proportion required hospital admission and surgical intervention.

Table 1: Age and Gender Distribution of Assault Survivors (n = 50)

Age Group (Years)	Male	Female	Total	Percentage
18–20	4	2	6	12.0
21–30	12	3	15	30.0
31–40	10	3	13	26.0
41–50	6	2	8	16.0
>50	5	3	8	16.0
Total	37	13	50	100.0

Figure 1:

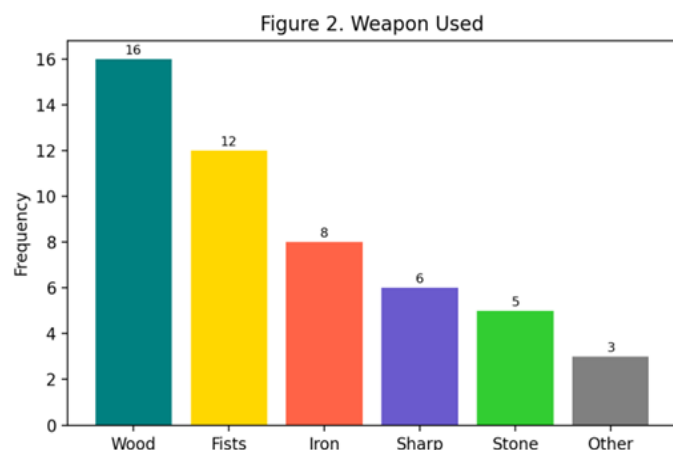


Young adults aged 21–40 years (56%) constituted the majority of assault survivors. Males accounted for 74% of cases, indicating a marked male predominance.

Table 2: Type of Weapon Used During Assault

Weapon	Frequency	Percentage
Wooden stick	16	32.0
Fists/Kicks	12	24.0
Iron rod	8	16.0
Sharp weapon	6	12.0
Stone	5	10.0
Others	3	6.0
Total	50	100.0

Figure 2:



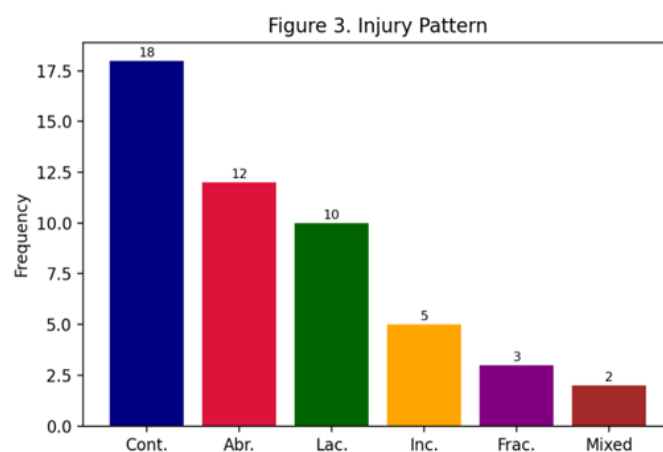
Wooden sticks (32%) were the most commonly used weapons, followed by assaults using fists and kicks (24%). Blunt-force assault predominated over sharp-force injuries.

Table 3: Pattern of Injuries among Survivors of Physical Assault (n = 50)

Type of Injury	Frequency	Percentage
Contusions	18	36.0
Abrasions	12	24.0
Lacerations	10	20.0

Type of Injury	Frequency	Percentage
Incised wounds	5	10.0
Fractures	3	6.0
Mixed injuries	2	4.0
Total	50	100.0

Figure 3:

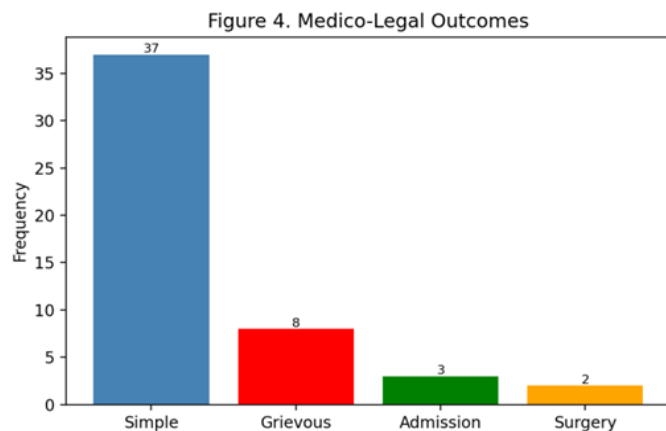


Contusions (36%) were the most frequently observed injuries, followed by abrasions (24%) and lacerations (20%). Most victims sustained blunt-force injuries, whereas sharp-force injuries were comparatively less common.

Table 4: Medico-Legal Outcomes among Assault Survivors (n = 50)

Medico-Legal Outcome	Frequency	Percentage
Simple injuries	37	74.0
Grievous injuries	8	16.0
Hospital admission	3	6.0
Surgical intervention	2	4.0
Total	50	100.0

Figure 4:



Simple injuries accounted for nearly three-fourths (74%) of all cases. Only a small proportion required hospitalization (6%) or surgical intervention (4%), indicating that most assault-related injuries were managed conservatively.

The present prospective hospital-based study evaluated 50 survivors of physical assault presenting for medico-legal examination.

Young adults aged 21–40 years constituted the majority of victims, with males accounting for nearly three-fourths of all assault cases. Wooden sticks, fists, and kicks were the most frequently used means of assault, indicating the predominance of blunt-force violence.

Contusions, abrasions, and lacerations represented the commonest injury patterns. Most injuries were classified as simple injuries, while grievous injuries constituted a relatively smaller proportion. Only a few patients required hospitalization or operative management, and the majority recovered following appropriate treatment.

Discussion

Physical assault remains one of the leading causes of medico-legal cases presenting to emergency departments and tertiary care hospitals. Assault-related injuries not only produce significant physical morbidity but also have important psychological, social, and legal

implications. A detailed analysis of injury patterns and medico-legal outcomes provides valuable information regarding the epidemiology of interpersonal violence and assists clinicians, forensic experts, and law enforcement agencies in ensuring appropriate patient management and judicial proceedings.

The present prospective hospital-based study included 50 survivors of physical assault who underwent medico-legal examination. Young adults between 21 and 40 years constituted the majority of victims, accounting for more than half of the study population. This observation is consistent with the increased occupational exposure, social interactions, and higher risk of interpersonal conflicts among individuals in the economically productive age group. Similar findings have been reported in previous hospital-based studies evaluating assault survivors, where young adults were identified as the most frequently affected population.^{12,13}

A marked male predominance was observed in the present study, with males constituting nearly three-fourths of all assault victims. This may be attributed to greater outdoor activities, occupational exposure, risk-taking behaviour, alcohol consumption, and increased involvement in interpersonal disputes. Female victims constituted a comparatively smaller proportion; however, assaults among women continue to represent an important public health issue requiring multidisciplinary intervention and legal protection.^{18,19}

The present study demonstrated that blunt-force assault was the predominant mechanism of injury. Wooden sticks, fists, and iron rods were the most commonly used weapons. The widespread availability of blunt objects and their frequent use during interpersonal altercations may explain this finding. Similar observations have been documented in previous medico-legal studies, where

blunt-force trauma constituted the commonest mechanism of assault-related injuries.²⁰

Among the various injury patterns observed, contusions were the most common, followed by abrasions and lacerations. These injuries are characteristic of blunt-force impact and are frequently encountered in assault survivors. Sharp-force injuries constituted a relatively smaller proportion of cases, reflecting the comparatively lower use of sharp-edged weapons in the present study population. The predominance of superficial soft tissue injuries may also explain the favourable clinical outcomes observed among most patients.

The head and upper limbs were the most commonly affected anatomical regions. Head injuries result from direct blows during assault, whereas upper limb injuries frequently represent defence injuries sustained while attempting to protect the head and face. Recognition of defence injuries is of considerable medico-legal importance because it provides supportive evidence regarding the manner of assault and assists in reconstruction of the sequence of events.

The majority of patients sustained simple injuries, whereas grievous injuries constituted a smaller proportion of cases. Only a limited number of patients required hospital admission or surgical intervention, indicating that most assault-related injuries were successfully managed by conservative treatment. Early medical evaluation and prompt wound management contributed to favourable clinical outcomes in the majority of patients.

Meticulous medico-legal documentation remains one of the most important responsibilities of the examining physician. Accurate recording of injury characteristics, dimensions, anatomical location, probable weapon used, and opinion regarding the nature of injuries provides

objective scientific evidence for criminal investigation and judicial proceedings. Standardized medico-legal examination also minimizes discrepancies between clinical findings and legal interpretation while improving the quality of forensic reporting.

The findings of the present study emphasize the need for strengthening violence prevention programmes through community awareness, conflict-resolution strategies, strict enforcement of existing laws, and improved access to emergency medical care. Regular training of healthcare professionals in medico-legal documentation and standardized injury assessment may further improve patient care and enhance the quality of forensic evidence presented before courts of law.

Overall, the present study provides valuable information regarding the demographic profile, injury characteristics, and medico-legal outcomes among survivors of physical assault. The findings may assist clinicians, forensic experts, policymakers, and law enforcement agencies in developing evidence-based strategies for reducing assault-related morbidity and improving medico-legal services.

Patel et al. conducted a prospective hospital-based study evaluating the medico-legal profile of survivors of physical assault attending a tertiary care hospital. The investigators reported that young adult males constituted the majority of assault victims, with blunt-force trauma accounting for most injuries. Contusions and abrasions were the predominant injury patterns, while the upper limbs and head were the most commonly affected anatomical regions. The authors emphasized standardized medico-legal documentation and timely clinical management to improve patient care and judicial outcomes.²¹

Sharma et al. performed a multicentre observational study on assault-related injuries presenting to emergency departments. The study demonstrated that interpersonal violence involving wooden sticks, fists, and iron rods remained the most frequent mechanism of assault. Most injuries were categorized as simple in nature, although a smaller proportion required hospitalization and surgical intervention. The authors highlighted the importance of injury documentation, imaging, and multidisciplinary management in medico-legal practice.²²

Gupta et al. evaluated injury patterns and medico-legal outcomes among assault survivors across multiple tertiary care hospitals. The study reported that blunt-force injuries continued to predominate, with contusions, abrasions, and lacerations being the most frequently encountered lesions. Early medico-legal examination significantly improved documentation quality and facilitated judicial proceedings.²³

Kumar et al. conducted a prospective study assessing clinical and medico-legal outcomes following physical assault. The investigators observed favorable recovery in most patients following conservative management, whereas grievous injuries were associated with prolonged hospitalization and surgical intervention. The study recommended strengthening hospital-based medico-legal services, public awareness, and violence prevention programmes to reduce assault-related morbidity.²⁴

Conclusion

The present prospective hospital-based study demonstrated that survivors of physical assault were predominantly young adult males, with the highest incidence observed in the 21–40 years age group. Blunt-force assault was the commonest mechanism of injury, and wooden sticks, fists, and iron rods were the most

frequently used weapons. Contusions, abrasions, and lacerations constituted the predominant injury patterns, while the head and upper limbs were the most commonly affected anatomical regions. The majority of injuries were classified as simple injuries, and only a small proportion of patients required hospitalization or surgical intervention. Most survivors showed favorable clinical outcomes following timely medical management.

The study highlights the critical role of early medico-legal examination, meticulous injury documentation, and appropriate clinical evaluation in determining the nature of injuries, identifying the probable weapon used, and providing reliable scientific evidence for judicial proceedings. Comprehensive medico - legal documentation also facilitates appropriate treatment planning and strengthens the administration of justice.

The findings emphasize the need for effective violence prevention strategies, public awareness programmes, improved emergency medical services, and standardized medico-legal examination protocols to reduce assault-related morbidity and improve patient outcomes. Continuous training of healthcare professionals in injury documentation and forensic reporting can further enhance the quality of medico-legal services and support the criminal justice system.

Limitations

The present study has certain limitations that should be considered while interpreting the findings. First, the study was conducted at a single tertiary care teaching hospital, which may limit the generalizability of the results to the wider population. Second, the sample size of 50 assault survivors was relatively small and may not fully represent the diverse patterns of physical assault encountered in different geographical regions.

Only patients who presented to the hospital and underwent medico-legal examination were included in the study. Victims who did not seek medical attention, those treated at peripheral healthcare facilities, or individuals who failed to report assault to law enforcement agencies were not included, potentially resulting in underrepresentation of less severe assault cases.

The present study primarily evaluated the immediate clinical and medico-legal findings following physical assault. Long-term functional disability, psychological consequences, rehabilitation outcomes, and quality of life after recovery were not assessed. Similarly, socioeconomic factors, alcohol or substance abuse, psychiatric illness, and detailed behavioural characteristics of victims and assailants were beyond the scope of the study.

Information regarding the circumstances of assault was obtained partly from patient history and police records, which may be influenced by recall bias or incomplete reporting. Although every effort was made to correlate the history with clinical findings, minor discrepancies may have existed in individual cases.

Despite these limitations, the study provides valuable insight into the demographic profile, injury patterns, and medico-legal outcomes among survivors of physical assault and may serve as a useful reference for clinicians, forensic experts, researchers, and policymakers involved in violence prevention and medico-legal practice.

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