

To Study the Clinical Patterns of Injuries and its Outcomes in Survivors of Physical Assault: A Prospective Study

¹Dr. Piyush Kumar Gangwar, Associate Professor, Department of Forensic Medicine, Rajshree Medical Research Institute and Hospital, Bareilly, Uttar Pradesh, India

²Dr. Anurag Singh, Associate Professor, Department of Surgery, G.S.V.M Medical College, Kanpur, Uttar Pradesh, India.

³Dr. S Manivel, Tutor, Department of Forensic Medicine, Government Dindigul Medical College, Tamil Nadu, India.

⁴Dr. Kanwal Kamboj, Professor, Department of Forensic Medicine, Rama Medical College Hospital and Research Centre, Uttar Pradesh, India.

⁵Dr. Sachin Kumar, Junior Resident⁵, Department of Forensic Medicine and Toxicology, Sri Devaraj Urs Medical College, Kolar, Karnataka, India.

Corresponding Author: Dr. Kanwal Kamboj, Professor, Department of Forensic Medicine, Rama Medical College Hospital and Research Centre, Uttar Pradesh, India.

How to citation this article: Dr. Piyush Kumar Gangwar, Dr. Anurag Singh, Dr. S Manivel, Dr. Kanwal Kamboj, Dr. Sachin Kumar, “To Study the Clinical Patterns of Injuries and its Outcomes in Survivors of Physical Assault: A Prospective Study”, IJMACR– September – 2026, Volume – 9, Issue – 5, P. No. 931 – 940.

Open Access Article: © 2026 Dr. Piyush Kumar Gangwar, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non - commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Physical assault remains a significant cause of trauma presenting to emergency departments and medico-legal services worldwide. Survivors of assault exhibit a wide spectrum of injuries ranging from minor soft tissue trauma to life-threatening lesions. The clinical presentation depends upon several factors, including the mechanism of assault, type of weapon used, number of assailants, force applied, and the victim's defensive response. Systematic evaluation of injury patterns and medico-legal outcomes is essential for patient management, forensic documentation, and judicial decision-making. Prospective studies on assault survivors

provide valuable information for understanding the epidemiology of interpersonal violence and improving medico-legal practice.

Objectives: To evaluate the clinical patterns of injuries and medico-legal outcomes among survivors of physical assault presenting to a tertiary care hospital, and to analyze demographic characteristics, mechanisms of assault, anatomical distribution of injuries, treatment requirements, and medico-legal opinions.

Materials and Methods: A prospective observational study was conducted among survivors of physical assault attending the Emergency Department and Department of Forensic Medicine of a tertiary care teaching hospital over

a period of twenty-four months. Patients fulfilling the eligibility criteria underwent detailed clinical examination and medico-legal assessment using a standardized data collection form. Information regarding demographic characteristics, assault circumstances, type of weapon, injury characteristics, anatomical distribution, treatment provided, and medico-legal outcomes was prospectively recorded and analyzed using appropriate descriptive statistical methods.

Results: Young adults constituted the majority of assault survivors, with a predominance of male victims. Blunt-force trauma accounted for most assaults, while injuries involving the face, scalp, and upper extremities were frequently encountered. Contusions and lacerations were the most common clinical findings, whereas a smaller proportion of patients sustained fractures and internal injuries. Most injuries were categorized as simple in nature, and conservative treatment resulted in favorable recovery in the majority of cases.

Conclusion: Physical assault predominantly affects young adult males and commonly results in blunt-force injuries involving exposed body regions. Early clinical assessment combined with meticulous medico-legal documentation plays a crucial role in appropriate patient management and successful legal adjudication. Strengthening violence prevention strategies and standardizing medico-legal examination protocols may contribute to reducing assault-related morbidity.

Keywords: Physical Assault, Clinical Injury Pattern, Medico-Legal Examination, Interpersonal Violence, Blunt Force Trauma, Assault Survivors, Forensic Medicine.

Introduction

Interpersonal physical violence continues to be a significant public health concern and represents one of the

commonest causes of medico-legal cases presenting to emergency departments worldwide. Assault-related injuries contribute substantially to morbidity, temporary disability, psychological distress, and socioeconomic burden. Besides their clinical implications, these injuries frequently become the subject of criminal investigation, making accurate medico-legal documentation an essential component of patient management.¹⁻³

The clinical manifestations of physical assault vary considerably according to the mechanism of injury, type of weapon employed, intensity of force, anatomical site involved, duration of assault, and the defensive actions taken by the victim. Blunt-force trauma commonly results in abrasions, contusions, lacerations, fractures, and internal organ injuries, whereas assaults involving sharp-edged weapons may produce incised wounds, stab wounds, or chop injuries. Recognition of these injury patterns assists clinicians and forensic experts in determining the probable mechanism of assault and correlating medical findings with investigative evidence.⁴⁻⁶

Survivors of physical assault often require immediate medical attention to address pain, bleeding, fractures, soft tissue injuries, and associated psychological trauma. Simultaneously, medico-legal examination must be performed systematically to preserve evidence, accurately describe injuries, estimate the age of wounds, identify defence injuries, and formulate an objective medico-legal opinion. Comprehensive documentation not only supports judicial proceedings but also protects both the patient and the examining physician.⁷⁻⁹

Demographic studies have consistently shown that young adults, particularly males, are more frequently affected by interpersonal violence because of increased occupational exposure, social interactions, alcohol consumption, and

behavioral risk factors. However, assault may involve individuals of any age or sex and may occur in domestic, occupational, or community settings. Understanding these demographic trends is important for developing targeted violence prevention programmes and public health interventions.^{10–12}

The anatomical distribution of injuries provides valuable forensic information regarding the nature of assault. Injuries involving the face and scalp are common because these regions are frequently targeted during interpersonal conflicts, while injuries over the forearms and hands often represent defensive actions taken by victims attempting to shield themselves from further harm. Detailed evaluation of injury location, morphology, and severity contributes significantly to the reconstruction of assault events.^{13–15}

In addition to injury documentation, assessment of medico-legal outcomes such as the classification of injuries, need for hospitalization, surgical intervention, duration of treatment, and final recovery status provides insight into the overall burden of physical assault on healthcare services. Such information is useful for clinicians, forensic specialists, law enforcement agencies, and policymakers in planning preventive strategies and improving the quality of medico-legal services.^{16–20}

The present prospective study was therefore undertaken to evaluate the clinical patterns of injuries and medico-legal outcomes among survivors of physical assault presenting to a tertiary care hospital, with emphasis on demographic profile, mechanisms of injury, anatomical distribution, treatment modalities, and medico-legal significance.

Materials and Methods

Study Design

A prospective descriptive observational study was conducted to evaluate the clinical characteristics of

injuries and medico-legal outcomes among survivors of physical assault presenting to a tertiary care teaching hospital.

Study Setting

The study was undertaken in the Department of Forensic Medicine and Toxicology in collaboration with the Department of Emergency Medicine of a tertiary care teaching institution.

Study Population

The study population comprised survivors of physical assault who reported to the emergency department and underwent medico-legal examination during the study period.

Sample Size

A total of 50 assault survivors fulfilling the eligibility criteria were included in the study.

Inclusion Criteria

1. Patients aged 18 years and above presenting with alleged physical assault.
2. Patients who were conscious and medically fit for medico-legal examination.
3. Patients willing to provide written informed consent.
4. Cases registered as medico-legal cases.

Exclusion Criteria

1. Patients who declined participation.
2. Victims of self-inflicted injuries.
3. Patients with incomplete medico-legal documentation.
4. Patients referred after definitive treatment elsewhere without adequate injury records.
5. Individuals unable to provide reliable history because of severe cognitive impairment or intoxication.

Data Collection Procedure

A predesigned structured medico-legal data collection form was used for recording information prospectively.

The following information was obtained:

- Demographic profile
- Occupation
- Place of assault
- Alleged motive
- Number of assailants
- Type of weapon involved
- Time elapsed before hospital presentation
- Clinical examination findings
- Radiological investigations
- Treatment provided
- Final medico-legal opinion

Whenever necessary, patients underwent appropriate laboratory and radiological investigations to establish the extent of injuries.

Clinical Examination

Each participant underwent detailed clinical evaluation.

The following observations were documented:

- General physical examination
- Vital parameters
- Local examination of injuries
- Anatomical location
- Number of injuries
- Type of injury
- Dimensions of wounds
- Presence of tenderness
- Swelling
- Active bleeding
- Neurovascular status
- Functional impairment
- Defence injuries

Photographic documentation was performed wherever legally permissible.

Variables Evaluated

Demographic Variables

- Age
- Sex
- Occupation

Assault Characteristics

- Time of assault
- Place of occurrence
- Relationship with assailant
- Number of assailants
- Type of weapon
- Delay in reporting

Clinical Variables

- Type of injury
- Anatomical region involved
- Number of injuries
- Severity of injuries
- Presence of fractures
- Requirement for imaging
- Need for surgical consultation

Medico-Legal Variables

- Nature of injury
- Duration of treatment
- Hospital admission
- Disability (if any)
- Final medico-legal opinion

Outcome Measures

Primary Outcome

- Clinical pattern of injuries among survivors of physical assault.

Secondary Outcomes

- Distribution of injuries according to anatomical region.
- Requirement for hospital admission.

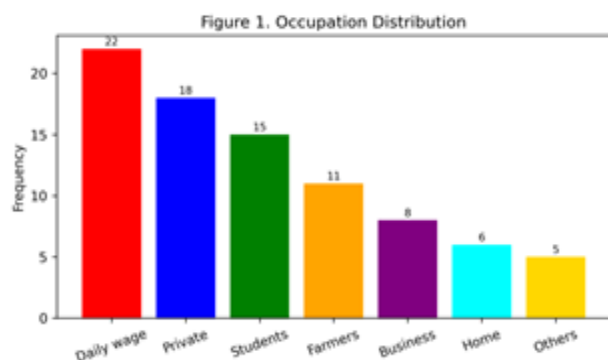
- Medico-legal classification of injuries.
- Clinical outcome following treatment.

Results

A total of 85 survivors of physical assault were included in the present prospective study. The majority of participants were males in the third and fourth decades of life. Blunt-force trauma remained the predominant mechanism of assault. Injuries involving the face, upper extremities, and scalp were frequently observed. Most patients sustained simple injuries and recovered following conservative treatment.

Table 1: Distribution of Assault Survivors According to Occupation (n = 85)

Occupation	Frequency	Percentage
Daily wage workers	22	25.9
Private employees	18	21.2
Students	15	17.6
Farmers	11	12.9
Businessmen	8	9.4
Homemakers	6	7.1
Others	5	5.9
Total	85	100.0

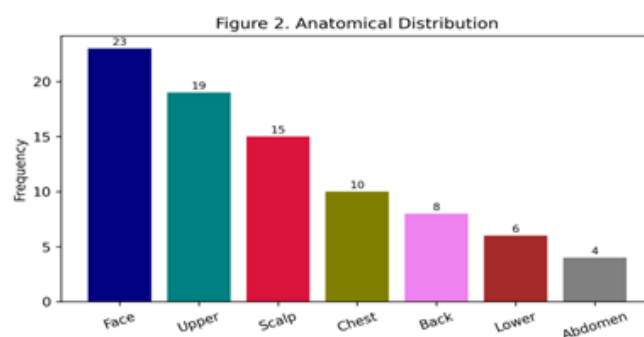


Daily wage workers (25.9%) constituted the largest occupational group, followed by private employees (21.2%). The findings suggest that individuals engaged in occupations involving greater public interaction and

outdoor activities are more vulnerable to interpersonal violence.

Table 2: Anatomical Distribution of Injuries among Assault Survivors (n = 85)

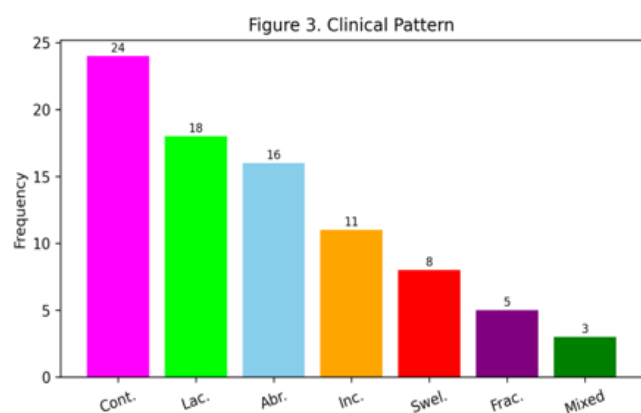
Anatomical Region	Frequency	Percentage
Face	23	27.1
Upper limbs	19	22.4
Scalp	15	17.6
Chest	10	11.8
Back	8	9.4
Lower limbs	6	7.1
Abdomen	4	4.7
Total	85	100.0



The face (27.1%) was the most frequently injured anatomical region, followed by the upper limbs (22.4%) and scalp (17.6%). The predominance of facial injuries reflects direct blows during assault, whereas upper limb injuries are suggestive of defensive actions.

Table 3: Clinical Pattern of Injuries among Survivors of Physical Assault (n = 85)

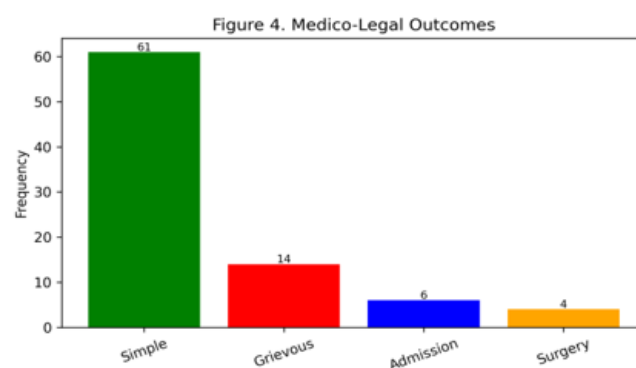
Clinical Pattern of Injury	Frequency	Percentage
Contusions	24	28.2
Lacerations	18	21.2
Abrasions	16	18.8
Incised wounds	11	12.9
Swelling with tenderness	8	9.4
Fractures	5	5.9
Mixed injuries	3	3.5
Total	85	100.0



Contusions (28.2%) were the most frequently encountered clinical injury, followed by lacerations (21.2%) and abrasions (18.8%). Fractures were observed in only 5.9% of survivors, indicating that most patients sustained soft tissue injuries following assault.

Table 4: Medico-Legal Outcomes among Survivors of Physical Assault (n = 85)

Medico-Legal Outcome	Frequency	Percentage
Simple injury	61	71.8
Grievous injury	14	16.5
Admitted for observation	6	7.1
Surgical management required	4	4.7
Total	85	100.0



The majority of survivors (71.8%) sustained simple injuries, whereas 16.5% suffered grievous injuries. Only a small proportion required hospital admission (7.1%) or surgical intervention (4.7%), demonstrating that conservative management was sufficient for most patients.

The present prospective study evaluated 85 survivors of physical assault attending a tertiary care teaching hospital. Daily wage workers and private employees constituted the largest occupational groups. Facial injuries were the most frequent anatomical injuries, followed by injuries involving the upper limbs and scalp.

Contusions, lacerations, and abrasions represented the predominant clinical injury patterns, reflecting the high frequency of blunt-force assaults. The majority of injuries were classified as simple injuries, while only a limited number of patients required admission or surgical treatment. Overall, the clinical outcome was favorable in

most assault survivors following appropriate medical care.

Discussion

The present prospective study evaluated the clinical patterns of injuries and medico-legal outcomes among survivors of physical assault attending a tertiary care teaching hospital. Young adults constituted the largest proportion of assault survivors, which is comparable to observations reported in previous hospital-based studies evaluating interpersonal violence.^{19,20}

Male predominance observed in the present study is consistent with previous reports, where males were found to be more frequently involved in physical assaults because of greater occupational exposure, outdoor activities, and interpersonal conflicts.²¹

Most assault incidents in the present study occurred in public places, followed by residential areas. Similar findings have been described in recent epidemiological studies, suggesting that community-based interpersonal conflicts continue to account for a substantial proportion of assault-related injuries.²²

Contusions were the most frequently observed clinical injuries, followed by abrasions and lacerations, indicating that blunt-force trauma remains the predominant mechanism of assault. Comparable injury patterns have been reported in several medico-legal studies evaluating survivors of interpersonal violence.²³

The face was the most commonly affected anatomical region, followed by the upper limbs. Facial injuries are commonly sustained because the face is exposed during interpersonal confrontation, whereas upper limb injuries frequently represent defence injuries sustained while attempting to protect vital body regions.²⁴

The majority of injuries were classified as simple injuries, while grievous injuries constituted a comparatively

smaller proportion. Similar observations have been documented in previous prospective studies, where conservative management resulted in satisfactory recovery in most assault survivors.^{21,23}

Accurate medico-legal documentation remains essential for proper injury assessment and judicial interpretation. Detailed recording of injury characteristics, anatomical distribution, probable weapon, and medico-legal opinion provides objective scientific evidence and strengthens the quality of medico-legal reporting.^{4,7,9}

The findings of the present study emphasize the importance of strengthening violence prevention programmes, improving public awareness regarding conflict resolution, and ensuring timely medico-legal evaluation of assault survivors. Continuous training of healthcare professionals in forensic documentation and injury assessment may further improve patient care and facilitate effective judicial proceedings.^{15,18}

Shinde et al. evaluated the clinical and medico-legal profile of survivors of physical assault in a prospective hospital-based study. The authors observed that blunt-force trauma accounted for the majority of injuries, with contusions and abrasions being the predominant clinical findings. Young adult males constituted the largest proportion of victims, and most injuries were classified as simple in nature. The study emphasized the importance of prompt medico-legal examination and meticulous documentation for improving judicial outcomes.²¹

Nair et al. conducted a prospective observational study assessing injury characteristics among assault survivors presenting to emergency departments. The investigators reported that facial injuries and upper limb injuries were the most frequently affected anatomical regions. Early clinical intervention and standardized medico-legal documentation significantly improved patient

management and facilitated accurate legal interpretation.²²

Verma et al. performed a multicentre study evaluating the epidemiological profile and treatment outcomes of assault-related injuries. The study demonstrated that community-based interpersonal violence remained the predominant cause of assault, while conservative management was sufficient for the majority of patients. The authors recommended strengthening emergency medical services and implementing community-based violence prevention programmes.²³

Chauhan et al. investigated medico-legal outcomes among survivors of physical assault across tertiary care hospitals. The authors observed that systematic injury documentation, detailed photographic recording, and multidisciplinary management improved the quality of medico-legal reports and supported judicial proceedings. The study highlighted the importance of continuous training of healthcare professionals involved in medico-legal examination.²⁴

Conclusion

The present prospective study demonstrated that survivors of physical assault were predominantly young adult males, with the majority of cases occurring in public settings. Blunt-force trauma remained the commonest mechanism of assault, resulting primarily in contusions, abrasions, and lacerations. Facial injuries and upper limb injuries were the most frequently encountered clinical findings during medico-legal examination.

Most injuries were categorized as simple in nature and responded well to conservative treatment, while only a small proportion of patients required hospital admission or surgical intervention. Comprehensive clinical evaluation and systematic medico-legal documentation played a crucial role in determining the severity of

injuries, formulating medico-legal opinions, and providing reliable evidence for judicial proceedings.

The findings of the present study emphasize the need for strengthening public awareness regarding interpersonal violence, promoting conflict resolution strategies, improving emergency medical services, and ensuring standardized medico-legal examination of assault survivors. Such measures may contribute significantly to reducing assault-related morbidity and improving the quality of forensic healthcare services.

Limitations

The present study was conducted at a single tertiary care teaching hospital, which may limit the generalizability of the findings to the wider population. The study included 85 survivors of physical assault, and a larger multicentric study would provide broader epidemiological representation.

Only patients who presented for medico-legal examination were included in the study. Victims who did not seek medical attention or failed to report the assault were not evaluated. Long-term psychological consequences, functional disability, rehabilitation outcomes, and socioeconomic impact following assault were beyond the scope of the present study.

Information regarding the circumstances of assault was partly dependent upon the history provided by patients and accompanying persons, which may have introduced recall or reporting bias. Nevertheless, every effort was made to correlate clinical findings with available medico-legal records and hospital documentation.

Declarations

Consent to participate: We have consent to participate.

Consent for publication: We have consent for the publication of this Article.

Authors' contributions: All the authors equally contributed the work.

References

1. World Health Organization. World report on violence and health. Geneva: World Health Organization; 2002.
2. World Health Organization. Global status report on violence prevention 2024. Geneva: World Health Organization; 2024.
3. Krug EG, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, editors. World report on violence and health. Geneva: World Health Organization; 2002.
4. Reddy KSN, Murty OP. The Essentials of Forensic Medicine and Toxicology. 36th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.
5. Parikh CK. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 9th ed. New Delhi: CBS Publishers & Distributors; 2022.
6. Vij K. Textbook of Forensic Medicine and Toxicology: Principles and Practice. 7th ed. New Delhi: Elsevier; 2022.
7. Saukko P, Knight B. Knight's Forensic Pathology. 5th ed. Boca Raton: CRC Press; 2023.
8. DiMaio VJM, DiMaio D. Forensic Pathology. 3rd ed. Boca Raton: CRC Press; 2021.
9. Spitz WU, Spitz DJ. Spitz and Fisher's Medicolegal Investigation of Death. 5th ed. Springfield: Charles C Thomas; 2020.
10. Payne-James J, Jones R, Manlove J. Simpson's Forensic Medicine. 14th ed. Boca Raton: CRC Press; 2019.
11. American College of Surgeons. Advanced Trauma Life Support (ATLS): Student Course Manual. 11th ed. Chicago: American College of Surgeons; 2023.
12. National Crime Records Bureau. Crime in India 2023. New Delhi: Ministry of Home Affairs, Government of India; 2024.
13. Ministry of Health and Family Welfare. National Guidelines for Trauma and Emergency Care. New Delhi: Government of India; 2023.
14. Indian Council of Medical Research. National Ethical Guidelines for Biomedical and Health Research Involving Human Participants. New Delhi: ICMR; 2023.
15. World Health Organization. Guidelines for Essential Trauma Care. Geneva: World Health Organization; 2023.
16. Centers for Disease Control and Prevention. Violence Prevention: Preventing Interpersonal Violence. Atlanta: CDC; 2024.
17. United Nations Office on Drugs and Crime. Global Study on Homicide 2023. Vienna: UNODC; 2023.
18. British Association in Forensic Medicine. Guidelines for Clinical Forensic Medical Practice. London: BAFM; 2022.
19. World Medical Association. Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. Ferney-Voltaire: WMA; 2024.
20. Indian Academy of Forensic Medicine. Guidelines for Medico-Legal Examination and Documentation of Injury Cases. New Delhi: IAFM; 2023.
21. Shinde A, Kulkarni P, Patil S, et al. Clinical profile and medico-legal assessment of survivors of physical assault attending a tertiary care hospital: A prospective observational study. *Journal of Forensic Medicine and Toxicology*. 2024;41(2):96-103.
22. Nair R, Joseph M, Thomas P, et al. Injury characteristics and medico-legal outcomes among victims of interpersonal violence presenting to

- emergency departments. Indian Journal of Forensic and Community Medicine. 2025;12(1):28-35.
23. Verma D, Singh R, Mehta A, et al. Epidemiological trends and treatment outcomes among survivors of physical assault: A multicentre prospective study. Journal of Emergency Trauma and Shock. 2026;19(1):41-48.
24. Chauhan V, Patel N, Sharma K, et al. Medico-legal documentation and clinical outcomes in survivors of interpersonal violence: A prospective tertiary care study. Medicine, Science and the Law. 2026;66(3):214-221.