



EPIDEMIOLOGICAL STUDY ON THE PATTERN AND DISTRIBUTION OF HOMICIDAL DEATHS IN UDAIPUR REGION

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ABSTRACT **Objective:** To assess the pattern and demographic distribution, injury patterns, and weapons used in homicidal deaths in the Udaipur region. **Methods:** A prospective observational study was conducted at the Department of Forensic Medicine, RNT Medical College, Udaipur, from July 2024 to June 2025. Fifty confirmed homicidal death cases undergoing medico-legal autopsy were included. Data on demographic variables, circumstances, and detailed injury characteristics were collected using a structured proforma. Findings were analyzed using descriptive statistics and chi-square tests. **Results:** The majority of victims were males (76%), with the peak age group being 21–40 years (56%). Most of the victims were males (64%). Blunt force trauma (56%) and sharp weapon injuries (20%) were the leading causes of death. Hospital deaths were common (78.00%) than the crime scene death (22%). Enmity and property disputes were leading motives. **Conclusion:** Homicidal deaths in Udaipur predominantly affect young males in their productive years, with blunt force trauma being the most common causes. The findings highlight the need for targeted violence prevention strategies, community education, and stricter weapon regulation.

KEYWORDS : Homicide, Epidemiology, Autopsy, Injury pattern, Udaipur

INTRODUCTION

The term *homicide* is derived from the Latin words *homo* (human) and *caedere* (to kill), and legally it is defined as the destruction of human life by the act, agency, procurement, or culpable omission of another person. Two essential elements underlie homicide: *mens rea* (the intent or mental element) and *actus rea* (the physical act of killing). The concurrence of both factors constitutes the crime of murder.

In India, homicide continues to be a pressing issue. The National Crime Records Bureau (NCRB) reported 29,017 murders in 2018, translating to a crime rate of 2.2 per 100,000 population. Violent crimes, including homicide, constituted 0.9% of the total Bharatiya Nyaya Sanhita (BNS) crimes during the same period. Regional variations exist, with certain states reporting disproportionately higher rates. While states such as Haryana reported a homicide rate of 3.9 per 100,000 in 2018, the data for Rajasthan also suggest that homicide is a persistent challenge in maintaining law and order.

In the context of Udaipur and the surrounding region, socio-cultural diversity, economic disparities, and urban–rural differences may influence the distribution and nature of homicidal deaths. Despite the forensic significance of homicide, there is a paucity of systematic studies analyzing the distribution, weapon involvement, and injury characteristics in this region.

Hence, the present study is designed to comprehensively analyse the distribution and patterns of homicidal deaths in Udaipur region, with particular emphasis on demographic factors, weapon and injury patterns, and situational variables. The findings of this study are expected to provide valuable insights for forensic medicine, law enforcement, and public health policy aimed at violence prevention.

MATERIALS AND METHODS

This study was conducted in the Department of Forensic Medicine & Toxicology at RNT Medical College & Hospitals, employing a cross-sectional design over a period of 1 year.

Study Setting

The study took place within the Department of Forensic Medicine at RNT Medical College.

Sample Size Determination

The calculation yielded a sample size of 43, which was rounded up to

50 to enhance the robustness of the study findings.

Source Of Cases

Homicide cases reported to this institution during the years 2024–2025 were included. Cases were documented using a specially designed proforma. Included were deceased individuals brought by police to the mortuary of the Department of Forensic Medicine or transferred from the casualty department, including those who died despite treatment.

Inclusion Criteria

The study included:

- All deceased homicidal cases, irrespective of age, gender, religion, and marital status, socioeconomic background, or residence.
- Cases with any history of assault, regardless of the body's condition (fresh or decomposed).

Exclusion Criteria

Bodies brought to the mortuary other than homicidal cases were excluded from the study.

Conflict Of Interest

There were no conflicts of interest reported.

Funding

The study was self-funded.

Data Analysis

Data entry and initial cleaning were performed using Microsoft Excel to ensure data quality. Statistical analyses were conducted to compute rates, ratios, and proportions for qualitative data. The chi-square test was applied for statistical inference, with a significance level set at $p < 0.05$. All findings and conclusions were derived from the analyzed data.

RESULTS

The study analyzed homicide cases in the Udaipur region with findings categorized by age, gender, place of death and weapon/means. The age distribution of homicide victims (Table 1) showed a higher incidence in younger age groups, with 56% of the cases aged between 21–40 years, followed by 22% of the cases aged between 41–60 years. The age groups of 0–20 years and those above 60 years had a lower frequency of cases, representing 12% and 10% respectively.

Gender distribution (Table 2) revealed a significant male

predominance in homicidal incidents, with males accounting for 92% of the cases compared to 8% for females. This aligns with the global trends where homicidal incidents are typically higher among males.

In terms of place of death (Table 3), the majority of homicidal deaths were in hospital (78%), while death at crime scenes were less frequent, constituting 22% of the cases. These findings suggest that improving emergency medical access and early healthcare access can reduce the homicidal death rates.

The analysis of the type of weapon used indicated that blunt weapons were the most commonly used means of homicide (56.00%), followed by sharp weapons (20.00%). Firearms were involved in 10.00% of the cases. Combined use of sharp and blunt weapons was seen in 06.00% of cases, while burns (04.00%) and asphyxial methods (04.00%) were less frequent.

Table 1: Age-wise Distribution Of Victims Of Homicidal Deaths

Age Group (Years)	No. of Cases	Percentage (%)
0–20	06	12.00%
21–40	28	56.00%
41–60	11	22.00%
> 60	05	10.00%
Total	50	100.00%

Table 2: Gender-wise Distribution Of Victims Of Homicidal Deaths

Gender	No. of Cases	Percentage (%)
Male	46	92.00%
Female	04	08.00%
Total	50	100.00%

Table 3: Place Of Death Among Victims Of Homicidal Deaths

Place of Death	No. of Cases	Percentage (%)
Hospital	39	78.00%
At Crime Scene	11	22.00%
Total	50	100.00%

Table 4: Means Of Homicide Among Victims Of Homicidal Deaths

Weapon/Mean	No. of Cases	Percentage (%)
Blunt Weapon	28	56.00%
Sharp Weapon	10	20.00%
Firearm	05	10.00%
Sharp & Blunt	03	06.00%
Burns	02	04.00%
Asphyxia (Strangulation)	01	02.00%
Asphyxia (Throttling)	01	02.00%
Total	50	100.00%

DISCUSSION

The present study provides a comprehensive analysis of homicidal deaths in the Udaipur region, focusing on key epidemiological and forensic variables such as age, gender, place of death, and means of homicide. The findings align with national and international trends, while also revealing region-specific patterns that warrant further attention.

The majority of victims were in the age group of 21–40 years (56%), followed by those aged 41–60 years (22%), suggesting that young and middle-aged adults are at a heightened risk of homicide. This distribution is consistent with prior literature, which indicates that individuals in these age groups are more likely to be involved in interpersonal conflicts, occupational disputes, and other high-risk situations [1]. The relatively lower incidence among the elderly (>60 years, 10%) and children or adolescents (0–20 years, 12%) may reflect reduced exposure to such risk factors.

A significant male predominance (92%) was observed, which is consistent with global and national data on homicide victims. Males are more frequently exposed to environments and behaviours associated with violent encounters, including substance abuse, criminal involvement, and high-risk occupations. The low percentage of female victims (8%) suggests that although women are less frequently involved, gender-based violence may still be underreported or manifest differently, requiring further investigation.

The place of death analysis revealed that a substantial proportion of victims (78%) succumbed to their injuries in hospital settings, while 22% died at the crime scene. This indicates that a significant number of victims initially survive the assault, highlighting the critical role of

timely emergency response and trauma care in reducing homicide-related mortality. Strengthening pre-hospital care services and ensuring prompt access to tertiary care facilities could potentially improve survival rates.

Regarding the means of homicide, blunt weapons were the most common (56%), followed by sharp weapons (20%) and firearms (10%). The use of blunt force suggests that many homicides may occur in domestic or spontaneous confrontational settings where such weapons are readily available. The relatively lower incidence of firearms could reflect stricter gun control measures or limited access to firearms in the region. Additionally, the presence of homicidal deaths caused by burns and asphyxia (each accounting for 4%) indicates a need to explore the social and psychological motives underlying such methods, particularly in cases of intimate partner or domestic violence.

These findings underscore the complex interplay of socioeconomic, cultural, and situational factors in the epidemiology of homicide. There is an evident need for multi-sectoral strategies involving law enforcement, healthcare providers, and community-based organizations to address the root causes and consequences of homicidal violence.

CONCLUSION

This epidemiological study on homicidal deaths in the Udaipur region highlights several critical patterns with forensic, public health, and law enforcement implications. The data reveal that young adult males, particularly those aged 21–40 years, are the most affected demographic, reflecting their increased exposure to interpersonal violence, occupational stress, and social disputes. The predominance of blunt force trauma as a mode of homicide suggests that many assaults may arise from spontaneous altercations using easily accessible objects, often in domestic or familiar environments.

The high proportion of hospital-based deaths underscores the potential to reduce mortality through improved emergency response systems and timely medical intervention. Moreover, the varied use of weapons, including sharp objects, firearms, and asphyxial methods, indicates the multifaceted nature of homicidal violence and the need for comprehensive weapon control policies.

These findings emphasize the importance of integrated violence prevention strategies that combine community education, conflict resolution programs, timely healthcare access, and effective law enforcement. Further research incorporating psychosocial and criminological perspectives is necessary to understand the root causes of homicide and to inform holistic, evidence-based interventions aimed at reducing violent deaths in the region.

REFERENCES

- Chauhan S, Kumar R, Singh UP, Tripathi A, Dev K, Abhishek A. A Cross-sectional Record-based Study on Homicidal Death Pattern in Bareilly Region, Uttar Pradesh. *Indian J Forensic Med Pathol*. 2021;14(2):Special Issue. doi:10.21088/ijfmp.0974.3383.14221.29.
- Chavan MS, Dere RC, Sawardekar SG, Vats M. Autopsy study of homicidal deaths. *Int J Sci Res*. 2021;10(2):11-2.
- Datta A, Rastogi P, Tiwari P, Kautilya V, Singh LP. Pattern of homicidal death in a district hospital of Rajasthan. *Int J Med Toxicol Forensic Med*. 2021;24(1&2):115-9.
- Gupta N, Aggarwal NK, Verma SK. Pattern of homicidal deaths in North East Delhi. *Int J Forensic Med Toxicol*. 2018;35(1):70-5.
- Kumar SV, Tejas J, Shruthi, Kumar S. A cross-sectional autopsy based study of homicidal deaths in Vijayapura, Karnataka. *Medico-legal Update*. 2020;20(3):191-5.
- National Crime Records Bureau. Crime in India 2018: statistics. New Delhi: Ministry of Home Affairs, Government of India; 2019.
- National Crime Records Bureau. Crime in India 2019: statistics. New Delhi: Ministry of Home Affairs, Government of India; 2020.
- Rahimi R, Kasim NAM, Zainun KA, Aazizan NAM, Mansori MA, Kamal NSM, Daud ZZ. Medico-legal autopsies of homicidal deaths: A five-year retrospective study in Hospital Sungai Buloh. *Malays J Pathol*. 2020;42(1):65-70.
- Rathod VV, Choudhary UK, Ghormade PS, Keoliya AN. Study of characteristics of victims and alleged accused in cases of deaths due to homicide. *Indian J Forensic Med Toxicol*. 2025;19(1):161–167. doi:10.37506/zqshg991.
- Slater S, Subramanyam S. An autopsy study on injuries in homicidal deaths due to weapons. *Indian J Forensic Community Med*. 2021;8(3):157-60.
- Wan Razali WMH, Mohd Nor F, Shafee MS. The pattern of injuries in homicidal deaths: A retrospective study. *Malays J Pathol*. 2025;47(1):103–111.