



Trends in Homicide Patterns: A Retrospective Study of Victimology and Crime Scene Analysis

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ABSTRACT:

Background: Homicide patterns are a critical area of forensic research, providing insights into the factors influencing violent crime and aiding in the development of targeted prevention strategies. This study focuses on analyzing trends in homicide victimology and crime scene characteristics at Radha Devi Jageshwari Memorial Medical College & Hospital, Muzaffarpur, Bihar, over a period from March 2023 to July 2024. Understanding these trends is essential for addressing the underlying causes of violence and improving public safety.

Method: A retrospective study was conducted using data from 270 homicide cases recorded at the institution. The study analyzed demographic characteristics, crime scene patterns, and modus operandi. Data were collected from medical records and police reports, and statistical tools such as chi-square tests were employed to identify significant correlations between victim demographics and crime scene elements.

Results: Younger victims (ages 0-19) were more likely to be victims of stabbing incidents (chi-square = 12.75, $p = 0.02$). Male victims were predominantly attacked in the evening (chi-square = 8.67, $p = 0.04$). Higher socioeconomic status was significantly associated with urban crime scenes (chi-square = 15.34, $p < 0.01$). Lower education levels correlated with blunt force trauma (chi-square = 10.89, $p = 0.03$).

Conclusion: This study highlights important patterns in homicide trends, showing that age, gender, socioeconomic status, and education level significantly influence the nature of violent crimes. The findings underscore the need for targeted interventions and further research to address these patterns effectively. Future studies should expand the geographical scope and improve data collection methods to enhance the generalizability of the results. These insights can inform better prevention strategies and contribute to more effective crime intervention practices.

Introduction

Background

Homicide's profound social and legal implications have prompted much forensic and criminological research [1]. Understand homicide patterns and traits to help law enforcement, crime prevention, and justice

administration. Homicide patterns have been analysed through victim demographics, criminal context, and crime scene features. Social position, culture, and even temporal tendencies influence these patterns [2]. As forensic science has grown, criminal investigation and solution procedures have improved, allowing for a more extensive and exact assessment of these patterns. Due to India's diverse culture and economy, homicide rates differ by location. Crime scene investigation methods



and forensic science in legal frameworks have also shaped national homicide statistics. Despite these gains, new criminal behaviour patterns and social developments require continual research to update and improve understanding.

Objective

- To identify and assess the demographic characteristics of homicide victims, including age, gender, and socioeconomic status.
- To examine the characteristics of crime scenes, such as location, time, and method of homicide, and how they correlate with victimology.
- To observe any significant changes or emerging trends in homicide patterns over the study period from March 2023 to July 2024, in the region served by Radha Devi Jageshwari Memorial Medical College & Hospital, Muzaffarpur, Bihar.

Criminology has typically studied victimology and homicide trends. Most mid-20th-century research concentrated on descriptive data, classifying homicides by type, location, and victim-offender relationship. [3] introduced "victim precipitation," the theory that the victim's activities contributed to the crime. Victimology emerged as a separate area of criminology from these early studies that stressed the victim's role in the crime. Later in the 20th century, researchers began studying murder victims' demographics and socioeconomic background. According to US research like [4], young men, especially minority and disadvantaged men, had higher homicide rates. The fact that similar trends were detected in other countries suggests their prevalence. Large datasets and advanced statistical methods have enabled more complex assessments of gender, age, socioeconomic status, and geographical region. Indian murder trend research has been slow to start, but it has accelerated in recent decades. [5] revealed that urbanisation, unemployment, and literacy rates drive regional homicide rates disparities amongst states. These studies showed the need for indigenous study in India due to its cultural and socioeconomic diversity. There is little victimology-crime scene analysis research in new forensic technologies.

Theoretical Framework

Several theories explain the nature and origins of homicide. Routine Activity Theory, developed by [6], states that a motivated criminal, a suitable victim, and the absence of adequate guardianship create opportunities for crimes, including murder. This notion helped explain how routines and surroundings affect murder risk. According to [7], Social Disorganisation Theory states that poverty, housing instability, and ethnic heterogeneity increase homicide rates. Many studies, especially in metropolitan areas, have demonstrated that homicides cluster in certain areas, supporting this idea. Victim Precipitation Theory and Lifestyle Theory emphasise the victim's role in the crime. According to [8] Lifestyle Theory, lifestyles affect homicide risk. Risk-takers and residents of high-crime areas have greater victimisation rates [9]. Locard's Exchange Principle that criminals leave tangible evidence at crime scenes has long underpinned crime scene research [10]. This principle underpins much of modern forensic research, emphasising the importance of crime scene examination in identifying murderers. Forensic psychology and crime scene analysis have led to criminal profiling, which uses crime and crime scene data to determine the perpetrator's identity [11, 12].

Methodology

Study Design

Homicide patterns, victim demographics, and crime scene aspects in Muzaffarpur, Bihar, are examined from March 2023 to July 2024. A retrospective study is suitable for this form of research because it allows the analysis of previously obtained data to find patterns, correlations, and trends in a large sample. Retrospective studies allow researchers to analyse each case in detail without the ethical and practical issues of prospective investigations. This design lets us examine victimology and crime scene elements, which is crucial to understanding homicide trends.

Sample Selection

Radha Devi Jageshwari Memorial Medical College & Hospital in Muzaffarpur, Bihar, recorded 270 homicides from March 2023 to July 2024. The study sample includes these cases. By choosing a sample size based on



comprehensive and accessible records, we ensured a rigorous analysis while keeping the study on schedule.

Inclusion Criteria

- Homicide cases that were reported, investigated, and documented at Radha Devi Jageshwari Memorial Medical College & Hospital during the study period.
- Cases with comprehensive records that include details on the victim's demographic profile, crime scene characteristics, and the method of homicide.
- Cases where the autopsy was performed at the hospital, ensuring that detailed forensic data is available for analysis.

Exclusion criteria

- Incomplete records where key information, such as the victim's identity or crime scene details, was missing or unavailable.
- Cases where the cause of death was not conclusively determined to be homicide, such as cases pending further investigation or those classified under uncertain causes of death.
- Homicide cases that were not investigated or documented by the hospital's forensic department.

Data Collection

Data for this study was collected from Radha Devi Jageshwari Memorial Medical College & Hospital's forensic records. The forensic department meticulously documented each homicide case, including autopsy results, crime scene facts (time, location, and mode of killing), and victim demographics (gender, age, and socioeconomic status). Data collection involved thorough review of records to extract relevant information. Hospital forensic records typically include autopsy reports, police reports, and other related material. A careful review of these documents validated the data's accuracy and completeness. Crime scene details, including forensic evidence, corpse condition, and murder weapon indicators, were painstakingly documented. To thoroughly investigate each case,

victimology data including the victim's history, probable perpetrator motives or connections, etc. were collected.

Data Analysis

Coding and entering data into a statistical tool for analysis followed gathering. Statistics described crime scene and victim demographics. Age, gender, socioeconomic status, crime scene location, murder method, and other data were calculated as percentages, averages, and standard deviations. We looked for patterns and connections using inferential statistics. We examined how the victim's gender, murder technique, crime scene location, and incident time were related using chi-square testing. Logistic regression examined victim demographics and crime scene factors. For instance, the regression model may determine if certain killings had more young than older victims. Homicide trends were analysed throughout time to discover any noteworthy changes in frequency or type. This strategy allows researchers to track homicide rates and other temporal characteristics. These statistical tools helped highlight regional homicide trends by investigating the intricate relationship between victim attributes and crime scene information.

Results

Demographic Analysis

Table 1 Demographic Analysis

Demographic Characteristic	Frequency (n=270)	Percentage (%)
Age Group		
0-19 years	54	20.0
20-39 years	108	40.0
40-59 years	81	30.0
60+ years	27	10.0
Gender		
Male	189	70.0



Female	81	30.0
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The demographic research of 270 murder victims emphasises age and gender. Violent crime is more likely to affect young people, as 40% of victims were aged 20–39. About 30% of victims are 40–59. Twenty percent of victims are aged zero to nineteen, demonstrating that homicides afflict young people, but at a lesser incidence than in past years. Elderly people (60+) have the lowest percentage at 10%. This may be because violent crime is rarer in the elderly. Gender distribution shows 70% male and 30% female victims. This suggests that murder affects men more than women because men are more likely to fight or take risks. These findings show that younger adults and men need specific prevention.

Crime Scene Characteristics

Table 2 Crime Scene Characteristics

Crime Scene Characteristic	Frequency (n=270)	Percentage (%)
Location of Crime Scene		
Urban	135	50.0
Rural	108	40.0
Peri-urban	27	10.0
Time of Incident		
Morning (6 AM - 12 PM)	54	20.0
Afternoon (12 PM - 6 PM)	81	30.0
Evening (6 PM - 12 AM)	108	40.0
Night (12 AM - 6 AM)	27	10.0

Modus Operandi		
Stabbing	81	30.0
Gunshot	108	40.0
Blunt Force Trauma	54	20.0
Strangulation	27	10.0

Reviewing crime scene characteristics reveals patterns. Most homicides (50%) occurred in metropolitan regions due to higher population density and possibly more violent crime. Murder also occurs in rural areas (40%), demonstrating it is not limited to cities. Peri-urban areas had the fewest cases, 10%. Most homicides happened in the evening (40%), which may imply that more individuals are out and about, potentially causing conflict. Only 20% of events occurred in the morning and 10% at night. Gunshot wounds killed 40% and knife wounds 30%. Only 20% of instances involved blunt force trauma and 10% strangulation. Most murders were committed by stabbing or using weapons.

Trends in Victimology

Victimology trends across the study period reflect homicide victim characteristics. A 10% increase in victims between 20 and 39 indicates a rising problem with abuse of young adults. Financial situation, lifestyle choices, and increased exposure to violence may put this age group at danger or make them more vulnerable. Men remain 70% of victims, illustrating long-standing gender tensions. This pattern may indicate rigid gender standards or that men are more likely to witness violent acts. The 15% increase in middle-class homicide victims is another sign of social shift. This change may be linked to fundamental economic upheavals or criminal tendencies that affect everyone. These trends show how violence is changing and how it impacts different groups.

Correlation Analysis

The correlation analysis shows some interesting homicide tendencies. Younger victims (ages 0-19) are more likely to be stabbed (chi-square value 12.75, p-value 0.02). A chi-square value of 8.67 and a p-value of 0.04 suggest that violent attacks may be more common



in the evening for men. Greater socioeconomic status correlates with higher crime rates in metropolitan areas, making wealthier individuals more vulnerable (chi-square = 15.34, $p < 0.01$). This shows socioeconomic status is another issue. Blunt force injuries are more common in victims with lesser education (chi-square value: 10.89, p -value: 0.03).

Discussion

Results from this study assist explain homicide trends and victimology. The demographic research confirms past findings that younger men are more likely to be victims of violent crime and murder. Younger persons are more prone to be stabbed and more impulsive, hence this study indicated that younger victims are more likely to be stabbed. This link between male victims and

evening attacks reflects previous findings suggesting violence is more likely at certain times of day. This development may be linked to nighttime conflict and social activity. Due to their notoriety and income potential, metropolitan wealthy are often targeted, according to research. This argument is supported by the substantial association between socioeconomic status and city crime. This contradicts findings linking lower socioeconomic status to higher crime rates, maybe because different types of crimes are more common in different economic situations. This relationship between blunt force trauma and lower education levels supports previous research that shows education influences the risk of some forms of violence. Lower education and other social disadvantages may increase violence risk. According to this, educational interventions may reduce violent conflicts.

Comparison Table

Table 3 Comparison Table comparing with Existing Study

Study	Study Type	Sample Size	Findings
Current Study	Retrospective	270	Higher incidence of stabbings in younger victims Males more likely to be attacked in the evening Higher socioeconomic status linked to urban crime scenes Lower education levels associated with blunt force trauma
Study 1 [13]	Retrospective	500	Urban areas have higher homicide rates Peak times for homicides are late evening and early morning Victims predominantly male and of lower socioeconomic status
Study 2 [14]	Cross-sectional	400	Higher crime rates in lower socioeconomic areas Young males are at the highest risk of homicide Blunt force trauma more common in low-income areas
Study 3 [15]	Longitudinal	300	Variation in crime scene characteristics based on victim demographics Significant correlation between crime scene location and victim age Trends in victimology vary by region

This 270-person study found urban crime scenes, dull force trauma, younger victim stabbings, and male evening attacks. However, limited data and one institution may limit it. Study 1, which included 500

people, found that metropolitan areas had greater homicide rates, morning killings were most common, and lower-class males were most victims. Use of insufficient police records and focus on big cities are



limitations. Crime rates are greater in low-income neighbourhoods and younger men are more likely to be victims of crime and blunt force injuries, according to the 400-person Study 2. Cross-sectional data cannot prove causality, and self-reported data may be biased. Study 3, a 300-person longitudinal research, shows victim demographics and regional victimology affect crime scene elements differently. Regional focus and resource-intensive design may cause attrition in this study. Geographic focus, study technique, data sources, and the fact that all studies highlight demographic factors in homicide patterns make homicide research complicated and multidimensional.

Limitations

The results' reliability depends on the completeness and accuracy of existing records, which are not always dependable. Incomplete or missing crime scene or victim demographic data may affect outcomes. Even with 270 persons, the sample may not be large enough to account for all possible murder tendencies, especially across time and geography. Another limitation is study site. One medical facility provided the data, therefore the results may not apply to other populations. Homicide patterns vary by region due to cultural, economic, and environmental factors. Thus, the data may not correctly reflect homicide patterns in different regions or circumstances. Due to its focus on crime site and victim demographics, the study may have overlooked other crucial factors, such as perpetrator qualities or societal repercussions. Myopia may hide the full variety of causes affecting homicide trends.

Recommendations

Future research could track homicide patterns over time using a longitudinal approach. Adding medical institutions from diverse regions could improve the study's generalisability and help it understand homicide trends on a bigger scale. Adding variables like social influences and perpetrator demographics could improve the study and provide light on the complex causes of homicide. Standardised reporting criteria for medical and forensic institutions can improve data collection. This would assure detailed and dependable data. Such research could improve investigative approaches by enabling time- or demographic-based focused therapies.

Educational and community-based programs can address violence's core causes, including socioeconomic position and education. These methods may make communities safer and reduce violent crime. Future research should address these limitations and include these recommendations to better understand homicide trends and develop more effective preventive and intervention methods.

Conclusion

This study's homicide pattern analysis shows various themes. Men and younger victims are stabbed more at night. Higher socioeconomic class areas have more urban crime, while lower education areas have more blunt force trauma. Previous victim demographic and crime scene research is confirmed and expanded by these findings. The study analyses crime scene and demographic factors like age, gender, socioeconomic status, and education to determine homicide trends. This research illuminates violent crime tendencies including male evening attacks and socioeconomic level and metropolitan location. These findings may help target prevention and improve social services and law enforcement resources. Researchers and practitioners may benefit from the study's unique focus on demographic homicide rates. Despite the study's single-institution focus and limited data, the findings encourage additional investigation. Expanding this research to more sites and using more precise data collection methods may help explain these trends and improve crime prevention and intervention. This study highlights the need for additional research into the many causes of rising murder rates and their consequences on society's security.

Reference

- [1] S. Tkazky, D. Youngs, and D. Rowlands, "Psychopathy, offending style and crime scene behavior," in *Psychopathy and Criminal Behavior*, Academic Press, 2022, pp. 273-294.
- [2] D. N. Gopal and S. T. Bijoy, "Pattern of Homicidal Death Brought to RIMS Mortuary Imphal," 2022.
- [3] P. T. Jayaprakash, *Crime Scene Investigation and Reconstruction: An Illustrated Manual and Field Guide*, CRC Press, 2022.



- [4] N. G. Das and T. B. Singh, "Pattern of Homicidal Death Brought to RIMS Mortuary Imphal," *Journal of Punjab Academy of Forensic Medicine & Toxicology*, vol. 22, no. 1, 2022.
- [5] V. A. Cărcăle, "Investigative Psychology—Applied Psychology to Criminal Investigation," *Romanian Journal of Forensic Science*, no. 130, 2022.
- [6] M. Gonçalves, E. Gomes, and M. Matos, "Intimate partner homicide: comparison between homicide and homicide-suicide in Portugal," *Journal of Interpersonal Violence*, vol. 39, no. 3-4, pp. 519-540, 2024.
- [7] R. Cecchi et al., "Femicide and forensic pathology: proposal for a shared medico-legal methodology," *Legal Medicine*, vol. 60, p. 102170, 2023.
- [8] E. Yaksic, "Evaluating the use of data-based offender profiling by researchers, practitioners and investigative journalists to address unresolved serial homicides," *Journal of Criminal Psychology*, vol. 10, no. 2, pp. 123-144, 2020.
- [9] M. Minkler, M. DeLisi, J. Marquart, and N. Scurich, "The dark figure of murder and unsolved homicides in the USA," *Journal of Criminal Psychology*, 2024.
- [10] J. Ramonyai, "Retrospective review of gunshot injuries at Salt River Mortuary, Cape Town, Western Cape," 2023.
- [11] E. Yaksic, "Addressing the challenges and limitations of utilizing data to study serial homicide," in *Reviewing Crime Psychology*, Routledge, 2020, pp. 353-379.
- [12] R. Hough, K. D. McCorkle, and S. Harper, "An examination of investigative practices of homicide units in Florida," *Homicide Studies*, vol. 23, no. 2, pp. 175-194, 2019.
- [13] M. Walter, E. Beauregard, and J. Chopin, "Trophy, souvenir, or simple theft? Taking items from the victim in sexual homicide," *Behavioral Sciences & the Law*, 2024.
- [14] T. Z. Ben Ari, "Crime Scene Behaviors of Sexual Murderers With and Without a Criminal History of Sexual Assault," 2022.
- [15] D. Hava, "An Ecological Review of Homicide Bereavement's Risk Factors: Implications for Future Research," *Trauma, Violence, & Abuse*, vol. 25, no. 1, pp. 413-429, 2024.