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Original Research Article

Profile of homicidal cases at the mortuary of a tertiary care hospital in Ambala, Haryana: A ten-year autopsy-based retrospective study

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Abstract

Background: The increasing rates of homicides worldwide are a grave concern for any society. The National Crime Records Bureau (NCRB) 2021 report shows an increasing frequency of homicides in India from 2019-2021.

Aim and Objective: The study aimed to find out the patterns and trends of homicidal deaths in the Ambala district of Haryana, India.

Materials and Methods: The study includes 36 homicidal deaths for which autopsies were conducted from January 2014 to December 2023. Data were collected from autopsy reports and police inquests and were charted and analyzed in Microsoft Excel 2021.

Results: Among 1558 autopsies during the study period, 36 (2.3%) were homicides. Males, were more common victims (86.1%). The majority, 19 (52.8%), were 21-40 years. Most were residents of rural areas (31, 86.1%), and laborers (14, 38.9%) constituted the majority of the victims. The monsoon season (July-September) recorded the most cases (11, 30.6%). The homicides occurred mainly during the daytime, from 06:00 AM to 02:00 PM, with 14 (38.9%) cases. The majority of the cases, 26 (72.2%), died immediately or were brought dead to the hospital. In most cases, 21 (58.3%), only a single offender was found. Blunt weapons were most common in 14 (38.9%) cases of committing homicide, followed by ligature materials and sharp-edged weapons in seven (19.4%) cases each. The cause of death in the majority, 10 (27.8%), was due to hemorrhagic shock.

Conclusion: The study highlighted prevalent weapons in homicides and demographic profiles of the victims, which require intervention from the agencies to lower the murder rates.

Keywords: Autopsy, Homicide, Blunt weapon, Sharp weapon, Fatal injury.

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1. Introduction

Homicide is the killing of a person by another person, and when such act has no justifiable cause.[1] The United Nations in 2023 reported murder rates per 100,000 in America, Africa, Asia, Europe, and the world are 15, 12.7, 2.3, 2.2, and 5.8, respectively.[2] The National Crime Records Bureau (NCRB) 2021 report shows an increasing frequency of homicides in India from 2019-2021. In India, there were 29272 murders in 2021 compared with 29193 murders in 2020.[3] Homicidal deaths increased even though 2020 and 2021 were affected mostly by the COVID-19 pandemic. Understanding the patterns and causes of homicidal deaths is crucial for ensuring public safety, criminal justice, and social welfare. Recently, the incidence of homicide has increased in India and throughout the world due to various factors, such as increased population and various other stresses that may be due to domestic or work-related issues.[4]

The first step in creating an intervention to lessen the effect of homicides is to evaluate such deaths in society. There are very few studies on homicides in this region of Haryana. The patterns and trends of homicidal deaths identified in this study can help law enforcement agencies formulate action plans to lower the crime rate in society. This study aimed to assess the most vulnerable age groups, gender, date and time of incidence, survival period, and types of fatal injuries involved to obtain a better perspective of homicide cases. The findings of this study will help determine the underlying contributing elements of such deaths.

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2. Materials and Methods

This retrospective study included 36 homicidal deaths, which were brought for postmortem examination at a centre in the Ambala district of Haryana. The study's primary objective was to determine the pattern of homicidal deaths in this region from January 2014 to December 2023. The approval to conduct the study was obtained from the Institutional Ethics Committee (IEC-3155/MMIMSR). All cases with a clear history of homicide brought for the autopsy were included in the study. When there was no history of assault but consequently found to be homicidal on postmortem examination were also included. Unknown dead bodies, decomposed bodies, and cases with a history of homicide, but autopsy findings suggested otherwise, were excluded. Data were collected from postmortem examination reports and police inquests. The data were compiled in an anonymised proforma. Microsoft Excel 2021 was used to tabulate the data and for descriptive data analysis.

3. Results

From January 2014 to December 2023, 1558 autopsies were conducted at our centre, of which 36 (2.3%) were homicidal deaths. Maximum numbers of homicidal deaths were observed in 2016 and 2023, with seven (19.4%) cases each in these years. In 2014, six (16.7%), whereas in 2020, four (11.1%) homicides were observed. Three (8.3%) cases were observed in the years 2015 and 2017. Two (5.6%) cases were observed in the year 2019 and 2022. The lowest number of homicidal deaths was recorded in 2018 and 2021, with one (2.8%) case each.

Most of the victims, 31 (86.1%), were male, and female victims constituted five (13.9%) cases, with a ratio of 6.19:1. The higher frequency of victims was in the 21-40 years age group, with 19 (52.8%) cases, followed by 61-80 years of age, with seven (19.4%) cases. Least homicides were observed in the 81-100 year age group, with one (2.8%) case **(Figure 1)**.

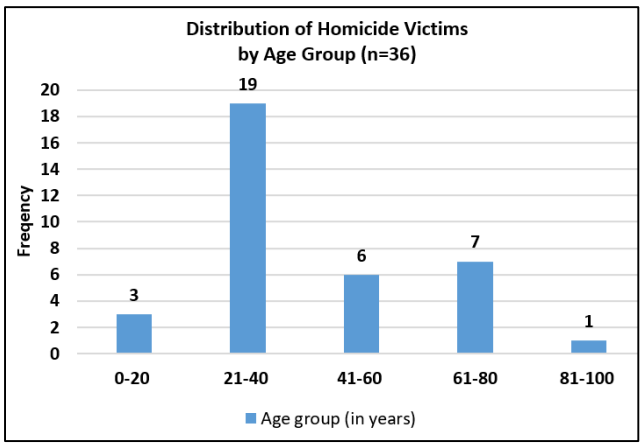

Figure 1: Shows distribution of the victims of homicide by age group

Most of the victims were Hindus, 35 (97.2%), followed by Muslims, one (2.8%). Most victims were residents of rural areas (31, 86.1%), whereas only five (13.9%) lived in urban locality. The majority of the victims were married (29, 80.6%), whereas six (16.7%) were unmarried, and one (2.8%) was divorced. While observing the occupation, most were labourers (14, 38.9%), and private job employees were victims in 10 (27.8%) cases. Farmers and homemakers constituted five (13.9%) cases each, and government servants and students constituted one (2.8%) each.

According to the day of occurrence, most homicides were observed on Tuesday, Wednesday, Saturday, and Sunday, with six (16.7%) cases each. Five (13.9%) cases each on Monday and Thursday, whereas only two (5.6%) homicidal deaths were recorded on Friday. Distribution according to season showed that the majority of the homicides (11, 30.6% cases) occurred in the monsoon season (July-September), followed by 10 (27.8%) cases in the winter season (January-March), and nine (25%) cases were observed in autumn (October-December). The fewest were observed in the summer season (April-June), with six (16.7%) cases.

The maximum number of homicides took place during daytime, 06:00 AM to 02:00 PM, with 14 (38.9%) cases, followed by 12 (33.3%) cases during 02:00 PM to 10:00 PM, whereas another 10 (27.8%) incidents occurred during 10:00 PM to 06:00 AM. Highlighting that homicides are committed more during morning hours.

Among the 36 cases, 26 (72.2%) died immediately or were brought dead to the hospital. Ten were hospitalized before death. Among them, eight (22.2%) died within 24 hours of hospitalization, one (2.8%) victim survived for one week, and the other victim died after one week of treatment.

In most cases, 21 (58.3%), a single offender was found; four (11.1%) cases involved more than two offenders; and four (11.1%) cases involved more than two offenders. The number of offenders was unknown for seven (19.4%) cases **(Table 1)**. Most of the homicides were committed by the offenders at the victim's residence, with 16 (44.4%) cases, 11 (30.6%) cases at the workplace of the victim, eight (22.2%) cases at a public place, and one (2.8%) case when the victim was alone.

Table 1: Shows the distribution of homicides according to the number of offenders involved.

Number of Offenders (n=36)	n (%)
One	21 (58.3%)
Two	04 (11.1%)
More than two	04 (11.1%)
Not known	07 (19.4%)

Among the offending weapons, the majority were blunt weapons in 14 (38.9%) cases. The ligature materials and sharp-edged weapons were the weapon of homicide in seven (19.4%) cases each. In one case, the homicide was committed through burns **(Table 2)**. Concerning the region of the body bearing the fatal injury, in 13 (36.1%) cases, the fatal injury was on the head, followed by 12 (33.3%) cases involving the neck region. Multiple injuries combined to prove fatality in five (13.9%) cases. Only one case involved fatal injury in the abdominal region **(Figure 2)**.

Table 2: Shows the distribution of the offending weapons used to commit homicide

Offending weapon (n=36)	n (%)
Blunt	14 (38.9%)
Sharp-edged	07 (19.4%)
Ligature material	07 (19.4%)
Blunt + Sharp-edged	04 (11.1%)
Firearm	03 (08.3%)
Burn/Acid burn	01 (02.8%)

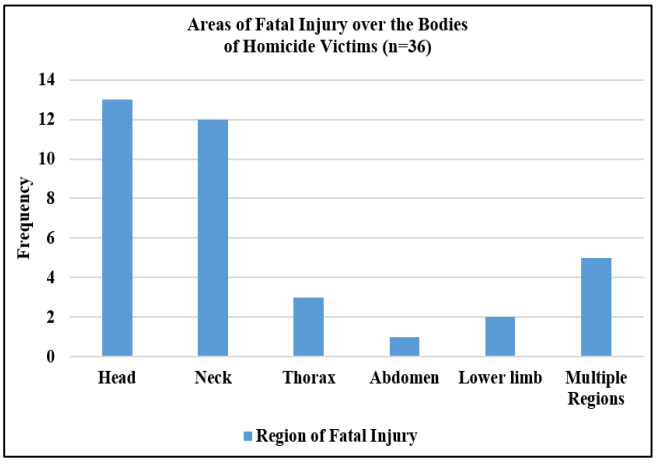

Figure 2: Shows the region of body with fatal injuries in the victims of homicide

Among the 13 cases of fatal injuries to the head, eight (61.53%) cases were caused by blunt weapons, followed by three (23.07%) cases where a combination of blunt and sharp-edged weapons was used to inflict injuries. Among the 12 cases of fatal injury to the neck, seven (58.33%) cases were due to strangulation caused by the use of ligature material, followed by four (33.33%) cases of homicide caused by sharp-edged weapons. The distribution of fatal injuries to the body according to the type of offending weapon is shown in **Table 3**. The cause of death in the majority of cases was hemorrhagic shock (10 (27.8%), followed by head injury in nine (25%) cases. Only two (5.6%) victims died due to thoracic injury **(Figure 3)**.

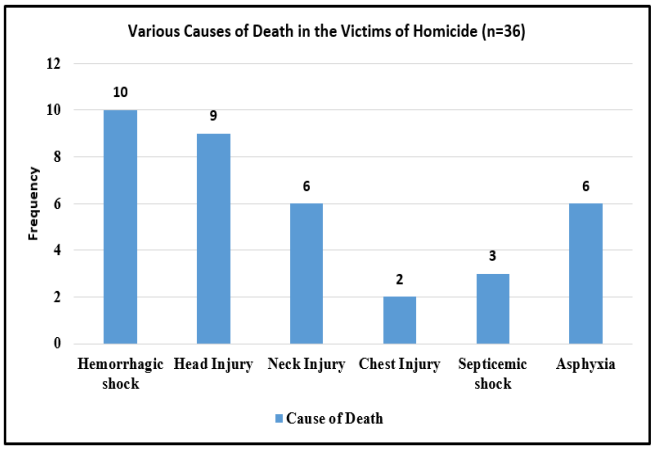

Figure 3: Shows various causes of death in the victims of homicide

Table 3: Shows the fatal injuries over the body according to the causative offending weapon

Region of Fatal Injury / Offending Weapon	Head	Neck	Thorax	Abdomen	Lower limb	Multiple Injuries	Total
Blunt	8	1	2	1	1	1	14
Sharp-edged	1	4	1	0	0	1	7
Ligature material	0	7	0	0	0	0	7
Burn	0	0	0	0	0	1	1
Firearm	1	0	0	0	1	1	3
Blunt + Sharp-edged	3	0	0	0	0	1	4
Total	13	12	3	1	2	5	36

4. Discussion

In this retrospective study, 36 homicidal deaths from January 2014 to December 2023 were analysed. These 36 deaths constituted 2.3% of the total autopsies, which is comparatively lower than that reported in most studies on homicidal deaths in other regions of India.[4-7] Parmar et al. observed similar findings in Gujarat, India.[8]

Males were victimized nearly six times more often than females. This result is similar to previous studies on homicidal deaths.[4-8] The majority of victims of homicide were of 21-40 years. Similar observations were seen in other studies performed in different regions of India.[5-8]

Most of the victims were of the labour class. Mada et al. also observed a higher frequency of homicides in lower-income populations.[9] Whereas Shiva Kumar et al. observed more homicides in higher income groups.[10] Most of the homicide victims were married. Parmar et al. and Mada et al. observed similar profiles of married victims in their studies.[8,9]

Most of the victims in our study were residents of rural area. Similar results have been observed, from studies by Biswas A et al. and Verma LC et al.[11,12] Whereas study by Shiva Kumar et al. have most of the victims from urban region.[10]

In the present study, most cases occurred from morning to afternoon. In contrast, in other studies, the time of the incident was mainly during the evening and night hours.[13,14] Most of the homicidal deaths in the present study were recorded between July and September. Similarly, in Italy, Sisti et al. observed maximum homicidal deaths in July and August.[15] However, Rastogi et al. reported the maximum number of cases from March to June.[16] In our study, the maximum number of homicide incidents occurred on Tuesday, Wednesday, Saturday, and Sunday. No specific pattern was seen according to the day of occurrence of homicide. In contrast, Sisti et al. reported homicide incidents on Sundays and Mondays.[15] Rastogi et al. reported that the maximum number of homicide cases autopsies were performed on Thursdays.[16]

Most of the victims were declared dead on arrival at the hospital. While approximately one-fifth died within a day of admission. Only a single case survived over a week. Other studies also showed similar profiles of homicide victims who were declared dead on arrival at the hospital.[17-19]

Our study revealed that most fatal injuries to the body of the victims of homicide were noted on the head and neck. Similar regions of the body were shown to be involved in other studies on homicidal deaths.[20-22] Most mechanical injuries that were observed on the bodies of the victims were due to blunt weapons. This is consistent with the findings of other studies that reported blunt, weapons as the most common offending weapon.[4,19,23-25] Conversely, Parmar et al., Shah et al., Hugar et al., and Datta et al. reported sharp-edged weapons.[8,17,18,25]

Hemorrhagic shock was the most common cause of death. Several other authors have made similar observations in studies on homicide in India.[13,23,26,27] Whereas Mada et al., Solanki et al., and Thomsen et al. recorded head injury in homicides as the most frequent cause of death.[9,20,28] In contrast, Datta et al. noted asphyxia as the most common cause of death.[25]

5. Conclusion

Our evaluation of victims of homicides is an attempt to understand various factors leading to such heinous crimes. Most of the victims were male, and young adults were found to be more prone to such crimes. As in our patriarchal society, masculinity is associated with aggression and dominance, leading to such violent conflicts. Many victims belonged to the poor labor class. Agencies should ensure the upliftment of lower socioeconomic sections of society to prevent such crimes in these communities. The majority of the victims died before reaching any healthcare facility, thus necessitating measures to provide quick emergency medical response to such incidents and prevent fatalities. The study showed the prevalent use of blunt and sharp weapons by the offenders to inflict fatal wounds on the victims. Therefore, practical concentration on the root causes of poverty, access to education with the promotion of conflict resolution, and strict law enforcement can be vital in controlling these heinous crimes.

6. Limitations

Education-related data among the victims of homicide was not available in the autopsy records.

7. Source of Funding

None.

8. Conflict of interest

None.

9. Ethical Approval

The ethical approval for the study was obtained from the Institutional Ethics Committee, Maharishi Markandeshwar Institute of Medical Sciences and Research (MMIMSR), Mullana, Ambala, Haryana, India (IEC-3155/MMIMSR).

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References

1. Reddy KSN, Murthy OP. Medicolegal aspects of wounds. In: The essentials of forensic medicine and toxicology. 33rd ed. New Delhi, India: Jaypee Brothers Medical Publishers (P) Ltd; 2014. p. 290.
2. United Nations Office on Drugs and Crime. Global study on homicide 2023 [Internet]. Vienna: UNODC; 2023 [cited 2024 Aug 30]. Available from: https://www.unodc.org/documents/data-and-analysis/gsh/2023/Global_study_on_homicide_2023_web.pdf.
3. National Crime Records Bureau. Crime in India 2021 statistics volume I [Internet]. New Delhi: NCRB; 2021 [cited 2024 Aug 30]. Available from: https://ncrb.gov.in/sites/default/files/CII-2021/CII_2021Volume%201.pdf.
4. Sengupta D, Bharatee P, Saha S, Prasad R. Pattern of alleged homicidal deaths in and around Cooch Behar region. *Indian J Forensic Med Toxicol*. 2021;15(1):954–62.
5. Gupta A, Rani M, Mittal AK, Dikshit PC. A study of homicidal deaths in Delhi. *Med Sci Law.* 2004;44(2):127–32.
6. Patowary AJ. Study of pattern of injuries in homicidal firearm injury cases. *J Indian Acad Forensic Med*. 2005;27(2):92–5.
7. Jhaveri S, Raloti S, Patel R, Brahbhatt J, Kaushik V. Profile of homicidal deaths: a three-year study at Surat Municipal Institute of Medical Education and Research, Surat during 2011-13. *Natl J Community Med*. 2014;5(4):406–9.
8. Parmar DJ, Bhag LR, Suvera KM, Bhagora LR, Parmar RD. Recent trends of homicidal deaths Bhavnagar region retrospective study. *Int Arch Integr Med.* 2015; 2(8):45–54.
9. Mada P, Krishna PH. A comprehensive study on homicidal deaths in Hyderabad. *J Indian Acad Forensic Med.* 2013;35(4):312–6.
10. Shiva Kumar BC, Vishwanath D, Srivastava PC. Trends of homicidal deaths at a tertiary care centre Bengaluru. *J Indian Acad Forensic Med.* 2011;33(2):120–4.
11. Biswas A, Kumar P, Majumdar S, Chowdhuri S, Ghosal S, Deb PK. An Epidemiological study of homicidal cases autopsied in the mortuary of the department of forensic medicine and toxicology, North Bengal, Darjeeling. *Indian J Forensic Med Toxicol*. 2021;15(4):183–7.
12. Verma LC, Punia RK, Yadav A. Analysis of homicidal deaths at SMS hospital, Jaipur-A prospective autopsy study. *Medico-Legal Update*. 2014;14(2):72–6.
13. Mohd SI, Subrahmanyam BV. Study of homicide in Surat with special reference to changing trend. *J Forensic Med Toxicol*. 1995;12:8–15.
14. Min Lo, Jane CV, Koelmeyer TD. Homicide in Auckland, New Zealand, A 14 year study. *Am J Forensic Med Pathol*. 1992;13(1):44–9.
15. Sisti D, Rocchi MB, Macciò A, Preti A. The epidemiology of homicide in Italy by season, day of the week and time of day. *Med Sci Law.* 2012;52(2):100–6.
16. Rastogi AK, Singh BK, Dadu SK, Thakur PS, Lanjewar AK, Raput PP. Trends of homicidal deaths in Indore (MP) region one year retrospective study. *J Indian Acad Forensic Med*. 2013;35(4):343–5.
17. Jainik PS, Dipak HV, Mangal HM, Viral NC, Sunil MD, Dipak BC. Profile of Homicidal Deaths in and around Rajkot Region, Gujarat. *J Indian Acad Forensic Med.* 2013;35(1):33–6.
18. Hugar BS, Chndra G, Harish H, Jayanth SH. Pattern of homicidal Deaths. *J Indian Acad Forensic Med*. 2010;32(3):194-8.
19. Bhupinder S, Kumara TK, Syed AM. Pattern of homicidal deaths autopsied at Penang Hospital, Malaysia, 2007-2009: a preliminary study. *Malays J Pathol.* 2010;32(2):81–6.
20. Solanki UM, Modi KA, Algotar GN, Patel RN, Parekh UN, Vaghela DR, et al. Study of patterns of homicidal death during post mortem examination conducted in vs general hospital. *Indian J Forensic Med Toxicol.* 2013;7(2):172–5.
21. Barmate NS, Singh RK, Nagrale N. A study of patterned injuries among homicidal victims. *J Forensic Med Toxicol*. 2019;36(1):113–6.
22. Buchade D, Mohite S. Pattern of Injuries in Homicidal Cases in Greater Mumbai a three year study. *J Indian Acad Forensic Med*. 2011;33(1):46–9.
23. Singh OG, Gupta BD. Evaluation of Mechanical Injuries in Homicidal Deaths (A retrospective study of 5 years). *J Indian Acad Forensic Med.* 2007;29(3):18–22.
24. Das NG, Singh TB. An autopsy based study on patterns of injury in homicidal deaths in Imphal. *J Indian Acad Forensic Med*. 2023;45(2):109–11.
25. Datta A, Rastogi P, Tiwari P, Kautilya V, Singh LP. Pattern of homicidal death in a district hospital of Rajasthan. *Int J Med Toxicol Legal Med.* 2021;24(1and2):115–9.
26. Murthy OP, Agnihotri AK. Homicidal deaths in South Delhi. *J Indian Acad Forensic Med*. 2000;22(1):9–11.
27. Aggarwal NK, Bansal AK. Trends of homicides in capital city of India. *Med Leg Update.* 2004;4(2):41–5.
28. Thomsen JL, Albrektsen SB, Aalund O, Breiting VB, Danielsen L, Helweg-Larsen K, et al. Injuries due to deliberate violence in areas of Denmark. II. Victims of homicide in the Copenhagen area. *Forensic Sci Int*. 1989;40(3):291–7.

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