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ORIGINAL ARTICLE

Patterns and Trends of Homicide Cases Autopsied at a Tertiary Care Hospital in Visakhapatnam: A Retrospective Study (2023–2024)

Manchala Jeevan Anudeep Babu,[1,*] Srinivasa Reddy Nandiki,[2] Sravani Yandava,[2] S.M. Krishna Sagar,[2] Annie P[1] and Kattamreddy Ananth Rupesh[3]

[1]*Resident, Department of Forensic Medicine and Toxicology, Andhra Medical College, Visakhapatnam*
[2]*Assistant Professor of Forensic Medicine, Andhra Medical College, Visakhapatnam*
[3]*Assistant Professor of Forensic Medicine, Government Medical College, Ongole*

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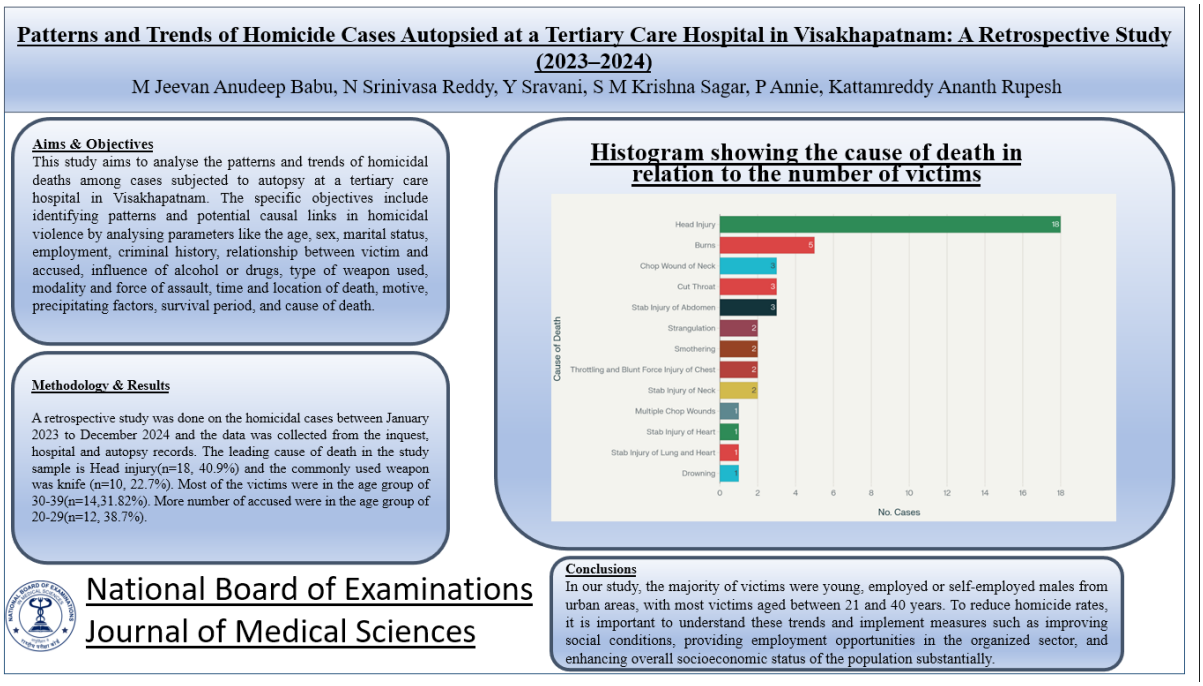
Abstract

Homicide is defined as the killing of one human being by another which continues to evolve with modern methods, though its underlying causes remain rooted in longstanding social and psychological factors. This retrospective inquest, hospital and autopsy records based study aimed to identify the patterns and trends of homicidal deaths among cases subjected to autopsy at Andhra Medical College/King George Hospital, Visakhapatnam, during the years 2023–2024. Among the 3779 autopsies conducted in two years, data from a total of 44 homicide cases (1.16%) were analysed. The majority of victims were in the 30–39 years age group (n=14). Males constituted 31 cases, while females accounted for 13 cases. Of the 31 cases with available data on the accused, most perpetrators (n=12) were between 20–29 years of age. Most homicides were premeditated and occurred during nighttime hours, with the accused often being known to the victim. The majority of victims were young, employed or self-employed males from urban backgrounds. Blunt force injuries accounted for more deaths than sharp force injuries, with head injury being the predominant cause of death. The study endorses the fact that interpersonal relationships, familiarity between victim and offender, and the use of blunt force remain key factors influencing homicidal deaths in and around Visakhapatnam city.

Keywords: Homicide, Autopsy, Cause of Death, Assault, Violence, Murder

*Corresponding Author: Manchala Jeevan Anudeep Babu
Email: jeevananudeep@gmail.com

Graphical Abstact



Introduction

Homicide, defined as the killing of one human being by another, has been documented throughout history and remains a significant concern worldwide [1,2]. Societies have long implemented measures to prevent such acts, with punishments evolving over time; from the death penalty to life imprisonment [3]. In many low and middle income nations, blunt and sharp force trauma remains the predominant cause of homicidal deaths whereas countries with permissive firearm laws tend to report higher firearm-related homicide rates. According to WHO data, the global homicide rate in 2019 stood at 6.2 per 100,000 population, while India reported a relatively lower rate of 3.8 per 100,000 [4].

Variations in homicide rates across nations can be attributed to a complex interplay of factors including legal frameworks, law enforcement efficacy, systemic corruption, cultural norms, education, employment, and socioeconomic status of the citizens. Studies consistently link higher homicide rates to poverty, unemployment, and illiteracy [5].

Demographically, individuals involved in organized crime are typically middle-aged, whereas perpetrators of other crimes span across all age groups. Statistically, males commit crimes at a significantly higher rate than females. Psychological factors also contribute to criminal behavior, more so in cases involving serial killers and individuals with psychopathic traits, where actions may occur without clear benefit and are often driven by underlying mental health conditions [6].

This study aims to analyze the patterns and trends of homicidal deaths among cases subjected to autopsy at a tertiary care hospital in Visakhapatnam.

Materials and Methods

This two-year retrospective study based on inquest, hospital and autopsy

records; analyses the sociodemographic and forensic characteristics of homicidal cases subjected to autopsy between January 2023 and December 2024 at the Modern Mortuary, Department of Forensic Medicine and Toxicology, Andhra Medical College, Visakhapatnam. Pertaining to the details of the crime, the data were sourced exclusively from inquest reports provided for autopsy, without incorporating findings from subsequent police investigations since the institution doesn't have access to all such records and the matter is still sub judice in most of the cases.

The study examined parameters like the age, sex, marital status, employment, criminal history, relationship between victim and accused, influence of alcohol or drugs, type of weapon used, modality and force of assault, time and location of death, motive, precipitating factors, survival period, and cause of death.

All collected data were analysed to identify patterns and potential causal links in homicidal violence. The aim was to understand the socio-demographic and situational factors contributing to homicide, thereby generating evidence for future forensic, legal, and public health interventions. All ethical considerations were addressed by the authors and consent for conducting postmortem examinations in homicide cases was obtained from law enforcement agencies. The study was approved by the Institutional Ethics Committee, Andhra Medical College, Visakhapatnam.

Results

A total of 44 homicide cases were recorded among all the autopsies (1852 autopsies in 2023 and 1927 autopsies in 2024) conducted during the two-year study period of January 2023 to December 2024 and all of them were included in the analysis.

Demographic Characteristics of Victims (Table 1)

Table 1. Age and gender wise distribution of male and female victims

Age Group	Female (f)	Female %	Male (m)	Male %	Grand Total	Grand Total %
0–9	0	0%	2	4.55%	2	**4.55%**
10–19	0	0%	2	4.55%	2	**4.55%**
20–29	2	4.55%	8	18.18%	10	**22.73%**
30–39	6	13.64%	8	18.18%	14	**31.82%**
40–49	2	4.55%	3	6.82%	5	**11.36%**
50–59	1	2.27%	4	9.09%	5	**11.36%**
60–69	1	2.27%	1	2.27%	2	**4.55%**
70–79	1	2.27%	3	6.82%	4	**9.09%**
Grand Total	**13**	**29.55%**	**31**	**70.45%**	**44**	**100%**

Age-wise distribution of the victims revealed that two victims (4.54%) belonged to the 0–9 years group. Two victims (4.55%) were in the 10–19 years group, 10 (22.73%) in the 20–29 years group, and 14 (31.82%) in the 30–39 years group. Five victims (11.36%) were aged 40–49 years, five (11.36%) were in the 50–59 years group, two (4.55%) was between 60–69 years, and four (9.09%) were in the 70–79 years group. No victims were reported in the 80–89 or 90–99 years age groups.

Of the 44 victims, 31 (70.45%) were male and 13 (29.55%) were female. Regarding marital status, 31 victims (70%) were married, while 13 (30%) were unmarried. Five victims (11%) were under the influence of alcohol or other substances at the time of the incident, whereas 39 (89%) were not.

Profile of the Accused (Table 2)

Table 2. Age and gender wise distribution of male and female assailants

Age Group	Female (f)	Female %	Male (m)	Male %	Grand Total	Grand Total %
0–9	0	0%	0	0%	0	**0%**
10–19	0	0%	7	22.6%	7	**22.6%**
20–29	1	3.2%	11	35.5%	12	**38.7%**
30–39	1	3.2%	6	19.4%	7	**22.6%**
40–49	0	0%	3	9.7%	3	**9.7%**
50–59	1	3.2%	1	3.2%	2	**6.5%**
60–69	0	0%	0	0%	0	**0%**
70–79	0	0%	0	0%	0	**0%**
Grand Total	**3**	**9.7%**	**28**	**90.3%**	**31**	**100%**

Among the known accused (n=31), 7 individuals (22.6%) were aged 10–19 years, 12 (38.7%) were between 20–29 years, 7 (22.6%) were between 30–39 years, 3 (9.7%) were between 40–49 years, and 2 (6.5%) were aged 50 years or older. Four cases involved multiple accused, ranging from two to four individuals. The majority of the accused were male (28, 90.3%), with a few (3, 9.7%) females. Thirty accused (96.8%) had no prior criminal history, and only one individual (3.2%) had a known criminal background. Data regarding the influence of drugs or alcohol were available for only 20 accused individuals. Among them, 18 (90%) were not under the influence of any substance at the time of the incident, while 2 (10%) were found to be under the influence.

Occupational Profile of Victims

Among the victims, 6 (13.6%) were housewives, 5 (11.4%) were sales persons, 5 (11.4%) were farmers, 4 (9.1%) were drivers, and 3 (6.8%) each were construction workers, sanitary workers, or of unknown employment. Two victims (4.5%) each were coolies, unemployed, students, or clerks. One victim (2.3%) each was a cook, painter, maid, vegetable vendor, supervisor, carpenter, or engaged in real estate business, accounting for all 44 individuals (100%).

Weapons Used and Nature of Injuries

Various weapons were used in the commission of the homicides. Knives were the most commonly used weapon in most cases (10, 22.7%), followed by sticks (5, 11.4%), hands (6, 13.6%), sickles (4, 9.1%), iron rods (3, 6.8%), petrol (4, 9.1%), and stones (2, 4.5%). Other less frequent weapons included a rope (1, 2.3%), cricket bat (1, 2.3%), Saree (1, 2.3%), paint thinner (1, 2.3%), thick iron wire (1, 2.3%), water (1, 2.3%), and combinations such as stick and stone (1, 2.3%). Information on the weapon used was unavailable in 3 cases (6.8%).

Scene and Time of Incidents

Most deaths (32 cases, 72.73%) occurred outdoors, while 12 (27.27%) occurred inside residences. The majority of incidents took place at night (18 cases, 40.9%), followed by the evening (9 cases, 20.5%) and morning (8 cases, 18.2%). Fewer cases occurred in the afternoon (6 cases, 13.6%) and early morning (2 cases, 4.5%). One case (2.3%) had an unknown time of occurrence.

Victim–Accused Relationship

In most cases, the accused was known to the victim. Fourteen cases (31.82%) involved individuals from the same locality who were known neighbours. Other relationships included friends (5, 11.36%), unknown persons (5, 11.36%), brothers (3, 6.82%), husbands (3, 6.82%), colleagues (2, 4.55%), in-laws (2, 4.55%), uncles (2, 4.55%), and single instances (2.27% each) involving a brother-in-law, lover, mother, father, sister, niece, relative, and customer.

Motives and Precipitating Factors

A majority of homicides (27 cases, 61.36%) were allegedly premeditated, while 13 (29.55%) occurred during a heated argument, and 4 (9.09%) had unknown motives. Common precipitating events were identified in 40 out of 44 cases. These included revenge associated with old family and property disputes (16 cases, 36.36%), suspected or existing extra-marital affairs (13 cases, 29.55%), recent land disputes (4 cases, 9.09%), robbery (2 cases, 4.55%), and isolated incidents involving dowry, teasing/ragging, road rage, threatening, and mental illness (each 1 case, 2.27%). In 4 cases (9.09%), the motive remained unknown.

Causes of Death (Figure 1)

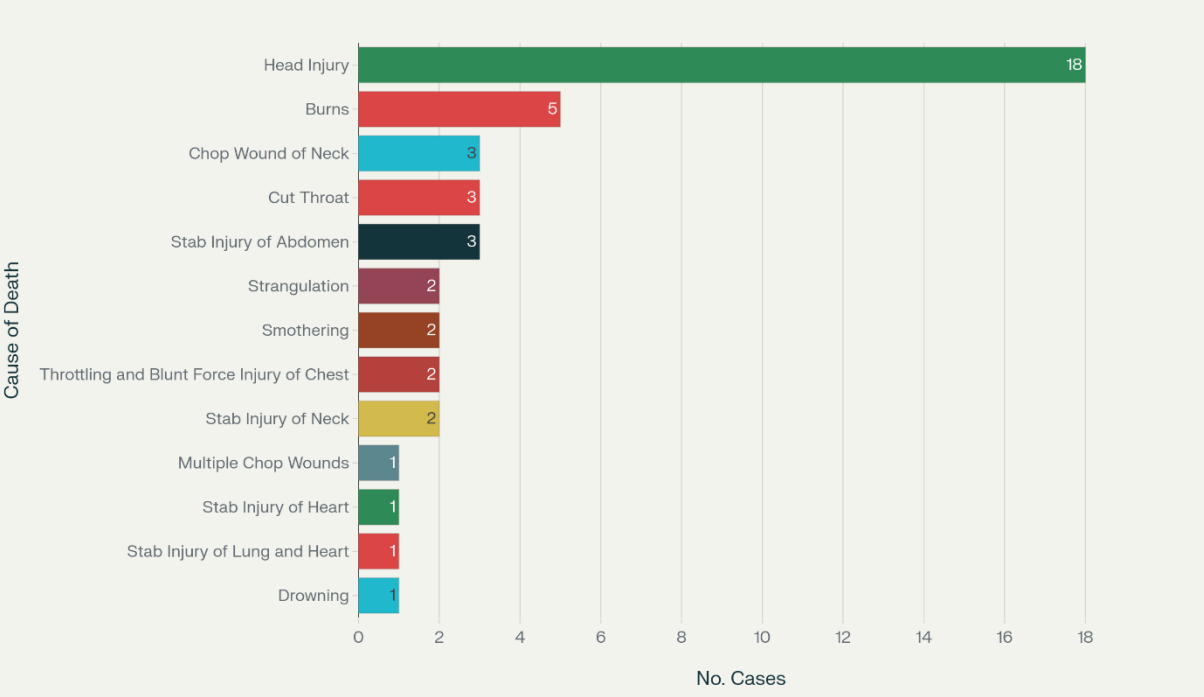


Figure 1. Distribution of cause of death among the victims

The predominant cause of death was head injury in 18 cases (40.9%). Other causes included burns (5, 11.4%), cut throat (3, 6.8%), chop wounds to the neck (3, 6.8%), stab injuries to the abdomen (3, 6.8%), strangulation (2, 4.5%), smothering (2, 4.5%), throttling with blunt chest injury (2, 4.5%), stab wounds to the neck (2, 4.5%), stab injury to the heart (1, 2.3%), stab injury involving lung and heart (1, 2.3%), drowning (1, 2.3%), and multiple chop wounds (1, 2.3%).

Survival Interval (Table 3)

Table 3. Survival period of victims

Survival Period	Count
Found dead	20
1 hour	1
6 hours	2
8 hours	1
1 day	5
2 days	1
3 days	3
4 days	3
5 days	4
7 days	1

10 days	1
15 days	1
18 days	1
Total	**44**

Of the 44 victims, 21 (47.7%) were found dead at the scene. Among the remaining victims, survival intervals varied: 1 hour in 1 case (2.3%), 6 hours in 2 cases (4.5%), 8 hours in 1 case (2.3%), 1 day in 5 cases (11.4%), 2 days in 1 case (2.3%), 3 days in 3 cases (6.8%), 4 days in 3 cases (6.8%), 5 days in 3 cases (6.8%), 7 days in 1 case (2.3%), 10 days in 1 case (2.3%), 15 days in 1 case (2.3%), and 18 days in 1 case (2.3%).

Discussion

Homicide rates vary globally, with some regions showing a decline due to targeted policing and community efforts. However, certain areas still experience high levels of violence, contributing to a significant portion of global homicides. Factors like socioeconomic status, education, and employment play a critical role in these trends as mentioned above. Effective homicide prevention requires a multipronged approach that combines law enforcement, community support, and policies aimed at addressing underlying social issues such as inequality and unemployment [5].

In a study conducted on homicide cases in Chennai during 2023 by Hariharan A et al., the victims were predominantly young males aged 18–30 years, with a male-to-female ratio of 2.2:1. Most victims were married, unemployed, illiterate, and belonged to low socioeconomic backgrounds. Personal vengeance and family disputes emerged as the leading motives, with incidents peaking during late evening hours. Sharp force trauma was identified as the leading cause of death. While our findings align with many aspects of this study, the key difference lies in the nature of injuries; whereas sharp force trauma predominated in their cases, blunt force trauma was more prevalent in ours [7]. According to a study conducted in the Oslo and Copenhagen regions, only 77 cases of blunt force homicides were recorded between 1985 and 1994, accounting for just 18% of all homicides during that decade. While blunt force trauma was relatively less common in that context, our study revealed a significantly higher incidence of such injuries [8]. These studies based in Chennai and Scandinavian capitals also highlight the fact that in the metropolitan areas and larger cities, means of homicide strongly vary from small cities.

The study conducted by Sweekriti et al. examined 2,379 medico-legal autopsies, of which 70 cases (2.94%) were homicides, involving 57 males and 13 females, with a male to female ratio of 4.38:1. The most common age group of victims was 21-30 years (50.87%), followed by 31-40 years (22.81%). Most victims (50.8%) were unmarried and came from nuclear families (68.42%). A higher number of male victims (68.42%) were from urban areas. The majority of male victims were brought dead (36.84%), followed by those who died at the spot (35.89%). Most victims were employed (50.88%), with a significant proportion being self-employed (28.81%) [9]. While most findings in our study align with those reported by Sweekriti et al., a

notable divergence was observed in the marital status of victims. In our cohort, the majority were married, contrasting with their study where this was not the case. This discrepancy underscores regional variations in demographic patterns of criminal victimization, suggesting that age and marital status may influence vulnerability to homicide differently across geographic contexts. Nevertheless, migration of citizens in search of employment to bigger cities is one factor that requires an in depth understanding in the context changing dynamics of not only homicides but different types of crime in our country which is under a demographic transition. The percentage of homicides in our case was about 1.16% which is less than Sweekriti et.al.

In a study conducted by Mopuri Venkateswarlu et al., 46 homicide cases were analysed, showing a male predominance among victims, with the highest incidence in the 21–30-year age group. Stab injuries (n = 18) and head injuries (n = 13) were the predominant causes of death. The most prevalent motive combinations were argument and revenge (39.13%), followed by argument-only (17.39%) and revenge-only (15.22%). Other motives, such as dowry harassment or property disputes, were less common, and in 17.39% of cases, the motive remained undetermined.

The findings of our study are largely concordant with those of Mopuri Venkateswarlu et al., except for a higher incidence of blunt-force trauma observed in our cohort. Similar to previous studies, a notable pattern was the predominance of homicides occurring during the evening and night hours. This temporal trend may reflect social and behavioural factors, including increased interpersonal interactions, alcohol consumption, and reduced public surveillance during these hours, which can escalate conflicts into fatal outcomes. Recognizing this pattern can help in targeted preventive measures and law enforcement resource allocation during high-risk periods [10].

The current command-and-control model employed by the police through CCTV surveillance appears inadequate to effectively prevent urban violence. Manual monitoring of such vast amounts of data is inherently prone to error. To improve responsiveness, surveillance systems should be equipped to automatically generate alerts for quick response teams using artificial intelligence and be integrated with public announcement systems at all identified homicide hotspots.

Common themes across these studies include a male predominance in homicide cases, with male victims consistently outnumbering female victims. The most common age group for victims is typically 21-30 years, followed by 31-40 years. The results of this study showed similarities with other studies conducted in India due to less difference in the beliefs of the people and the living conditions. Homicides often occur in urban areas, and a significant proportion of victims are employed or self-employed. Blunt force trauma and stabbing are the leading causes of death in many of these studies, with relationships between victims and perpetrators often being close, such as acquaintances, spouses, or family members. Moreover, many victims were found to have been brought dead or died at the scene of the incident indicating the extreme fatal nature of the injuries sustained during the attacks [11].

Intimate partner violence (IPV) is a growing concern in India, often escalating

to intimate partner homicides (IPH). Recent reports indicate a significant rise in such cases, with factors like financial conflicts, property disputes, extramarital affairs, revenge, and arguments being common motives. Additionally, substance abuse and mental health issues are identified as contributing factors, impairing judgment and increasing the risk of fatal outcomes. Experts emphasize the need for increased awareness, identification of warning signs, and a comprehensive approach involving both mental health and law enforcement to address this issue effectively [12,13].

Conclusion

Homicidal trends vary across regions, cultures, and time periods, influenced by social and demographic factors. In our study, the majority of victims were young, employed or self-employed males from urban areas, with most victims aged between 21 and 40 years. The majority of the homicides were allegedly premeditated and involved the use of both blunt and sharp weapons. In cases arising from heated arguments, easily accessible blunt force injury–causing weapons found in the surroundings were commonly used in spontaneous homicides. Blunt force injuries led to a higher number of deaths than sharp force injuries, with head injury being the most frequent cause of death.

To reduce homicide rates, it is important to understand these trends and implement measures such as improving social conditions, providing employment opportunities in the organized sector, and enhancing overall socioeconomic status of the population substantially. Strengthening the judicial system and conducting ongoing research into factors like weapon types, victim and offender characteristics, and mental health issues are essential. Furthermore, anger and stress management through counselling may help prevent such incidents.

Limitations

The present study did not include data on the educational or economic status of either the accused or the victims in homicide cases. Moreover, the data pertain to only a two-year period. This study relies mainly on the information based on the inquest and doesn't include information about the further investigations and judgments.

Recommendations

A comprehensive study covering at least five years of data from each medico-legal centre would be highly valuable for understanding the micro factors associated with homicide. Greater emphasis on the qualitative aspects of these cases, rather than solely relying on statistical data, would provide deeper insights into the underlying causes and patterns of such crimes. Also, associations between the variables can be better studied using inferential statistics on a bigger dataset for drawing meaningful conclusions.

Conflicts of interest

The authors declare that they do not have conflict of interest.

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No funding was received for conducting this study.

Ethics committee approval

All ethical considerations were addressed by the authors, and the study was approved by the Institutional Ethics Committee, Andhra Medical College, Visakhapatnam.

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