Original Article

Exploring Unnatural Death Patterns in Jashore District: A Descriptive Study

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Abstract

Background: *This study delves into mortality patterns using forensic reports from Jashore District, Bangladesh. It seeks to analyze demographic distributions, monthly variations, and causes of death, emphasizing the importance of comprehensive data for public health interventions.* ***Materials and Methods:*** *A descriptive approach was adopted, scrutinizing 155 forensic reports collected from the Jashore district in Bangladesh for a period of one year. Inclusion criteria ensured data relevance, while statistical techniques, including frequency distributions and percentages were employed. Software tools including IBM SPSS and Microsoft Excel aided analysis.* ***Results:*** *Demographic distributions revealed gender, religious affiliations and geographic disparities. Peaks in reported deaths occurred in February, May, and December. Varied causes of death included asphyxiation, poisonings, and external injuries, complicated by missing data.* ***Conclusion:*** *This study underscores the necessity for meticulous data collection to understand mortality complexities. It highlights the potential for informed public health interventions and policy making, emphasizing the importance of comprehensive forensic analysis for impactful strategies in Jashore District, Bangladesh.*

Keywords: Unnatural death patterns, Suicidal, Accidental, Forensic analysis, Jashore city.

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Introduction

A post-mortem report, also known as an autopsy or coroner's report, is an official document that provides detailed findings from a medical examination conducted on a deceased individual's body.[1] This report is prepared by a qualified pathologist or medical examiner and includes essential information such as the deceased person's identification details, medical history if available, observations from external and internal examinations, findings related to organs and bodily systems, toxicology test results if conducted, and a conclusive summary detailing the cause of death and any contributing factors.[2] Post-mortem reports play a pivotal role in determining the cause of death, especially in cases where it is uncertain or in situations involving legal investigations, insurance claims, or medical research, serving as vital legal documents for official records.[3]

Forensic studies play a crucial role in uncovering mortality patterns within specific geographic areas. The insights gained from such analyses not only shed light on the circumstances surrounding fatalities but also serve as a foundation for informed interventions and policies aimed at safeguarding communities' well-being.[4]

Situated in the southwestern region of Bangladesh, Jashore district offers a distinct landscape for investigating mortality patterns. Despite its importance, there exists a discernible gap in thoroughly examining mortality dynamics within this area. Due to lack of forensic experts all-over Bangladesh, there is serious lag in reporting forensic issues.[5] Prior research efforts have been sporadic, lacked depth, or faced constraints in data analysis, resulting in a critical shortcoming in comprehending the nuances of mortality in Jashore. This study aims to provide a comprehensive analysis of mortality patterns within the Jashore district by examining demographic distributions, identifying causes and circumstances of

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deaths, and outlining prevalent mortality trends. The findings from this research hold immense significance, not only as a forensic analysis but also as a potential catalyst for proactive public health interventions and policy formulation. The insights gained are poised to guide policymakers in developing targeted strategies aimed at addressing specific causes of mortality and enhancing overall community well-being in Jashore.

Materials and Methods

This research adopted a descriptive methodology, utilizing 155 forensic reports collected from the Jashore district in Bangladesh from January 2022 to December 2022. These reports constituted the primary dataset for analysis, encompassing cases handled by forensic authorities in the specified district.

Inclusion and exclusion criteria were applied to ensure the relevance and consistency of the results. Only reports meeting specific criteria, such as data completeness, alignment with study objectives, and compatibility with the analytical scope, were considered. Reports that lacked adequate documentation or incomplete were excluded from the analysis.

The study predominantly employed descriptive statistical techniques for data analysis. These techniques involved generating frequency distributions, percentages, and graphical representations to depict the characteristics and patterns observed in the dataset. Various variables within the forensic reports, including demographic details (gender, age, location), cause and nature of death, toxicological information, and circumstances surrounding the fatalities, were examined. IBM SPSS (Statistical Package for the Social Sciences) version 20 and Microsoft Excel version 2019 were used for data analysis and presentation, given their robust capabilities in statistical analysis and visualization.

Ethical consideration

Ethical considerations were paramount throughout the study. Adherence to ethical guidelines involved maintaining confidentiality and anonymity of individuals in the forensic reports, complying with data protection regulations, and obtaining necessary permissions to access and analyzes the reports while upholding ethical standards in research practices.

Results

This study analyzed 155 cases, utilizing extensive descriptive analysis techniques. The demographic distribution revealed that 71 individuals were female, constituting 45.8% of the sample, while 81 individuals were male, accounting for 52.8% of the total. For 03 (1.4%) cases the gender of the participant was missing.

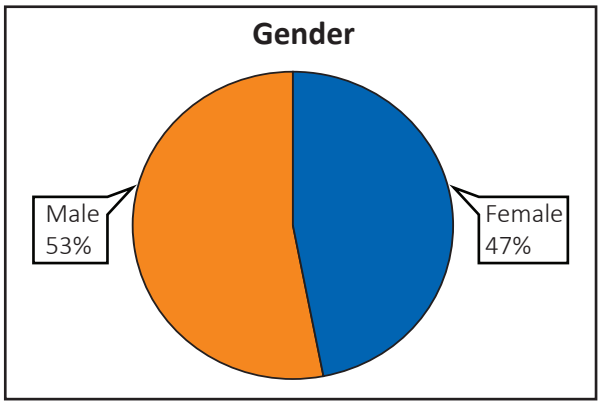

Figure 1: Demographic Distribution

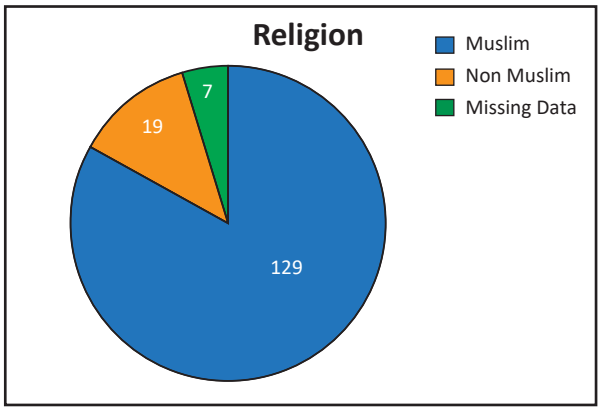

Figure 2: Religious Affiliation

Geographically, the distribution of cases varied across different upazilas. Specifically, the data indicated that the Abhaynagar upazila accounted for 9 cases (5.8%), Bagherpara upazila for 8 cases (5.16%), Chaugachha upazila for 10 cases (6.45%), Jashore Sadar upazila for 33 cases (21.29%), Jhikargacha upazila for 16 cases (10.32%), Keshabpur upazilla for 4 (2.6%) cases, Manirampur upazila for 22 cases (14.19%), Sharsha upazila for 12 cases (7.74%), cases outside Jashore for 30 instances (19.35%), and 11 cases (7.1%) with missing address information.

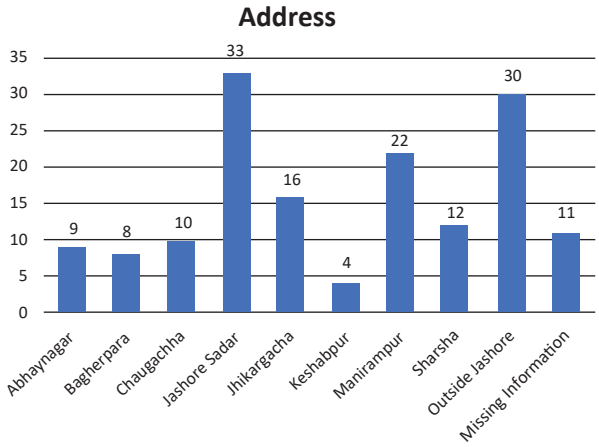

Figure 3: Geographical Distribution of Cases across Upazilas

The distribution of cases based on the month of birth demonstrated varying frequencies, with the highest burden of reported deaths in February, May, and December. Specifically, the data indicated that January accounted for 8 cases (5.2%), February for 19 cases (12.3%), March for 14 cases (9%), April for 11 cases (7.1%), May for 21 cases (13.5%), June for 16 cases (10.3%), July for 8 cases (5.2%), August for 7 cases (4.5%), September for 9 cases (5.8%), October for 4 (2.6%) cases, November for 15 cases (9.7%), and December for 23 cases (14.8%).

The examination of inflicted injuries revealed a diverse distribution among different weapon categories. Among the recorded cases with

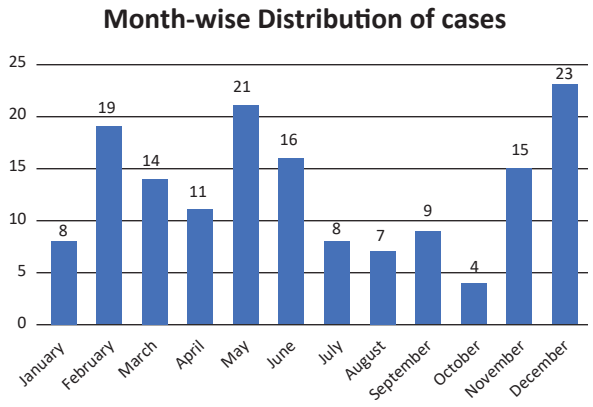

Figure 4: Frequency Distribution of Reported Deaths by Month of Birth

weapon related histories (n=13), the majority, comprising 46.2% (n=6), involved injuries caused by blunt weapons. Close behind were cases involving sharp weapons, accounting for 38.5% (n=5) of the incidents. In contrast, injuries attributed to pointed weapons constituted a smaller proportion, with 15.4% (n=2) of the cases. Among the cases that either were not due to weapon related incidents (n=142), 2 lacked specific classification, making it challenging to attribute the injuries to any defined weapon category. This varied distribution underscores the complexity in classifying weapon-related injuries and highlights the importance of precise categorization methods in forensic investigations to accurately document and interpret such cases.

The examination of ligature marks on deceased bodies uncovered a diverse array of findings. Among the cases reviewed, a majority, accounting for 34.8% (n=54), displayed incomplete ligature marks, while a smaller proportion, constituting 3.2% (5), exhibited completed marks. In contrast, a minimal percentage, just 1.3% (n=2), showed an absence of ligature marks. Notably, a significant portion, approximately 60.3% (n=94), fell under the category of "Not Applicable," potentially indicating cases where the assessment of ligature marks wasn't relevant or couldn't be conclusively determined. This multifaceted distribution

emphasizes the variability in the presence, completeness, and applicability of ligature marks, underscoring the complexity of forensic examinations in determining their significance in post-mortem assessments. 7 (4.5%) of the case reports revealed that these were sexually abused while the rest (n=148, 95.5%) were not abused.

The analysis of post mortem report statuses within the scope of 155 cases reveals a pertinent distribution. Among these cases, 67, constituting 43.20% of the total, remain pending, indicating ongoing investigations or necessary procedural steps yet to be finalized. Conversely, the remaining 88 cases, comprising 56.80% of the total, have completed their post mortem processes and are not pending further action. This dichotomy in statuses delineates a clear division between concluded and ongoing post mortem examinations. The pending cases signify instances where examinations or supplementary procedures are still in progress, while those categorized as not pending denote concluded evaluations within the dataset.

Upon examining post mortem findings within the sample set, a distinctive pattern emerges. Rigor mortis, the natural stiffening of muscles after death, predominates the observations, evident in 139 cases, comprising 89.68% of the total (n=155). A smaller subset, approximately 6.45% of the cases (10 instances), displayed signs of advanced decomposition. Additionally, a minority of cases, accounting for 3.87% (6 cases), presented with diverse conditions beyond rigor mortis or decomposition. This breakdown underscores the prevalence of rigor mortis in the majority of cases, with a notable yet smaller proportion indicating advanced decomposition, while a few others manifest distinct post-mortem conditions or characteristics.

The data pertaining to the presence of parchmentization in post mortem examinations offers valuable insights. Among the cases scrutinized, 99 instances, comprising approximately 63.9% of the total, displayed an absence of parchmentization. Contrastingly, parchmentization was identified in 54 cases, representing about 34.8% of the total cases examined. Interestingly, only 2 cases, a mere 1.3% of the dataset, lacked documentation regarding the presence or absence of parchmentization. This distribution underscores the varied occurrence of parchmentization within these post mortem observations, with a notable majority showing its absence, a significant proportion revealing its presence, and a minor subset where specific details were unrecorded.

The investigation of the nature of death among the decedents displayed a multifaceted distribution pattern. Out of the 155 cases analyzed, 53 were attributed to suicidal incidents, which constituted 34.2% of the sample. Homicidal causes were linked to 18 cases, accounting for 11.6% of the total. On the other hand, 10 cases were classified as accidental deaths, making up 6.5% of the studied cohort. It is noteworthy that, 1 case (0.6%) did not fall into the previous classifications and 73 cases (47.1%) lacked unambiguous classification within the specified categories, presenting as missing data within this classification schema. This diverse distribution emphasizes the intricacy and variety of circumstances surrounding the documented fatalities.

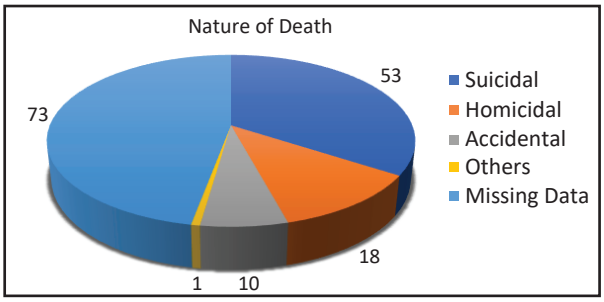

Figure 5: Nature of Death among Decedents

The analysis of the cause of death unveiled a vast array of circumstances. Asphyxia realted deaths were reported in 63 cases, comprising 40.65% of the total cases studied. Instances of poisoning were identified in 42 cases, amounting to 27.1% of the sample. Deaths resulting from external injuries were documented in 24 cases, which accounted for 15.48% of the studied cohort. Furthermore, 26 cases (16.77%) were categorized as missing data within this classification, signifying the absence of clear information regarding the cause of death for this particular group of individuals. This sophisticated categorization underscores the diverse factors contributing to the recorded fatalities and highlights the complexity of attributing specific causes in some instances.

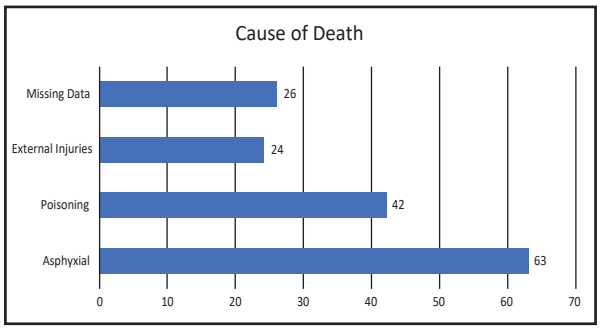

Figure 6: Analysis of Causes of Death

The specific categorization of cases revealed that hanging incidents were reported in 53 cases, constituting 34.2% of the studied cohort. Notably, a considerable number of cases, totaling 92 (59.4%), were classified as "Not applicable" within this context. The rest included 5 (3.2%) cases of strangulation, 2 (1.3%) cases of smothering, 2 (1.3%) cases of drowning and 1 (0.6%) case of missing information. This classification likely indicates cases where hanging was not a pertinent or applicable factor in the cause or circumstances of death, emphasizing the extensive range of situations and factors contributing to fatalities within this dataset.

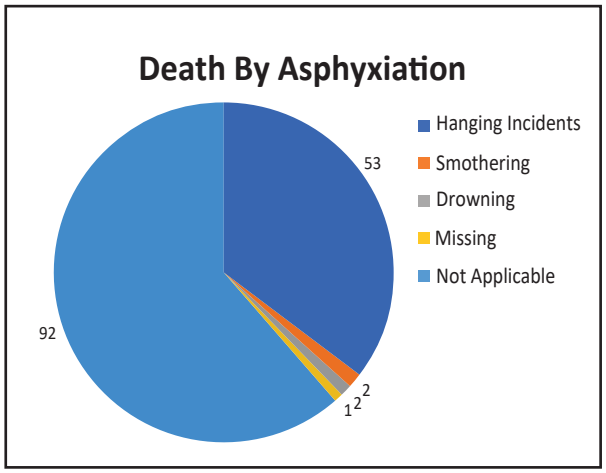

Figure 7: Specific Categorization of Hanging Incidents

In the subset of poisoning cases, an analysis revealed distinct classifications. Of the 155 cases studied, 28 involved insecticides (OPC), representing 18.1% of the total. Additionally, 10 cases (6.5%) were categorized as ill-defined poisoning cases. Notably, a significant majority of 112 cases (72.3%) were placed in the "Not applicable" classification, indicating instances where poisoning, specifically related to insecticides or with clear definitions, was not considered a relevant or applicable factor in the recorded fatalities. This highlights the complexity and diversity of factors contributing to poisoning-related deaths in this dataset.

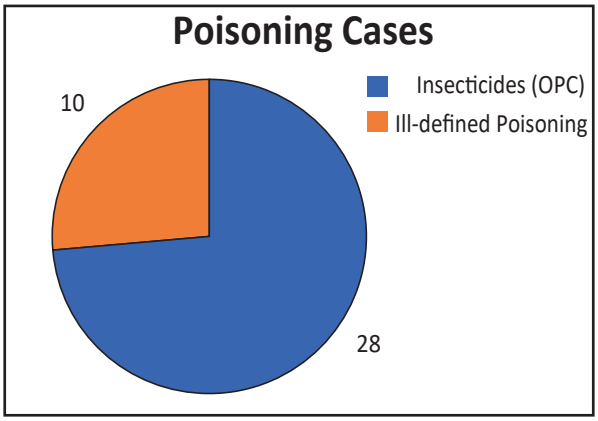

Figure 8: Classification within Poisoning Cases Subset

In examining the case statuses within the studied sample of 155 cases, it was observed that 86 ante mortem cases accounted for 55.5% of the total cohort. Conversely, 69 cases (44.5%) were classified as missing, signifying instances where specific information or data related to the case status was absent or unavailable. This underscores the importance of comprehensive and complete data collection in analyzing the status and details of cases within this study.

Discussion

The outcomes of this cross-sectional study, which involved 155 cases, reveal a wide array of demographic, geographic, and forensic elements. The findings shed light on various aspects of these cases, providing insights into the complexities and patterns that exist within forensic investigations. To further contextualize these results, it is crucial to examine the demographic and geographic aspects alongside forensic details to understand the comprehensive picture painted by the study.

The demographic distribution of the sample revealed gender and religious affiliations, showing a balanced representation across genders and a predominantly Muslim majority. The study also showed diverse geographic distribution of cases across different regions, highlighting the variations in the distribution of cases. These demographic and geographic nuances underscore the importance of considering cultural and regional factors in forensic analysis, as they may influence the patterns observed in the study. Maria reported in her paper that micro-graphical population structure analysis is significant in forensic cases.[6]

The frequency distribution based on the month of birth and the analysis of inflicted injuries showed interesting patterns, demonstrating different frequencies in both birth months and types of injuries caused by various weapon categories. These patterns emphasize the need for precise categorization methods in forensic investigations to accurately interpret and document such cases. When comparing the patterns of birth months and types of injuries, it becomes evident that a more nuanced approach to classification is essential for a comprehensive understanding of the data, considering the varied nature of the observed patterns.[7]

The examination of ligature marks, post mortem report statuses, and post mortem findings provided substantial insights into the complexity and variability of forensic examinations. The prevalence of rigor mortis and the presence or absence of parchmentization in post mortem observations showed distinct characteristics, contributing to the multifaceted nature of these examinations. In delving into the forensic details, it is apparent that the examination of ligature marks and post mortem findings adds depth to the understanding of the cases, showcasing the intricate nature of forensic investigations. A study conducted on the informative aspects of the ligature mark reported that proper investigation of the ligature marks can provide significant inputs regarding hanging and strangulation cases.[8] Furthermore, the distribution of causes and nature of death among the decedents showed a diverse pattern, with a considerable number categorized as missing data, emphasizing the intricacy in classifying specific causes in some situations. When considering the distribution of causes of death, the prevalence of missing data adds a layer of complexity to the analysis. This highlights the challenges in precisely classifying certain cases, underscoring the need for caution in drawing definitive conclusions from incomplete information. A recent study concluded that the distribution of cause and nature of death is essential in better understanding the mortality dynamics of that region.[9] To better understand the epidemiology in regards to forensic reports, distribution of causes and nature of death is essential.[10]

The analysis also revealed an extensive range of circumstances contributing to fatalities within the dataset. To comprehensively assess the findings, it is crucial to acknowledge the diverse circumstances contributing to fatalities. Similar to our concern, a recent study on flood fatalities reported that creating a dataset on the fatalities required trial and errors to address the complex circumstances involved with fatality.[11]

The study utilized a robust dataset of 155 forensic reports collected over a one-year period in the Jashore district of Bangladesh. This comprehensive dataset provides a detailed and diverse sample, enhancing the study's ability to draw meaningful conclusions about mortality patterns in the region. The study conducted a multifaceted analysis, examining demographic distributions, causes and circumstances of deaths, and prevalent mortality trends. This comprehensive approach contributes to a nuanced understanding of mortality patterns in the Jashore district, offering valuable insights for both forensic analysis and potential public health interventions. As similar studies have not been conducted previously, our study highlights the lack of research into this subject-matter and our findings hint that complex analysis of larger data might reveal nuances which may help is shaping policy.

Limitations of the study

The study's limitations, such as missing data in certain categories and the absence of clear information in some cases, imply potential avenues for further research and the necessity for comprehensive data collection methods in future studies. These findings provide a foundational understanding of the complexities inherent in forensic investigations, serving as a starting point for future research endeavors in this field.

Conclusion

This study provides a comprehensive perspective on the demographic, geographic, and forensic factors associated with 155 fatalities, highlighting the diversity of the sampled population through the distribution of demographic data including gender, religious affiliation, geographic distribution, and birth months. The intricate nature of forensic examinations and classifications is further emphasized through the examination of inflicted injuries, ligature marks, post mortem report statuses, and post mortem findings. The varied causes of death, including asphyxial deaths, poisoning, and external injuries, and the classification of cases based on the presence or absence of parchmentization and the classification of poisoning cases provide insight into the characteristics observed in post mortem examinations. The classification of case statuses, such as ante mortem and missing cases, highlights the importance of comprehensive and accessible data. The findings contribute to the understanding of forensic patterns within this dataset and serve as a foundation for further research in forensic science and medicolegal investigations.

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