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Original Article

Hanging and Poisoning Deaths - A Comparative Study of Urban and Rural Incidents

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ABSTRACT

Background: *This study compares the socio-demographic profiles and motives behind hanging and poisoning in urban and rural areas, highlighting differences driven by accessibility, intent, and underlying social, economic, and psychological factors.* ***Methods & Materials:*** *This was a comparative cross-sectional study that was conducted at department of Forensic Medicine and Toxicology, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from July, 2022 to June, 2023. A total of 167 cases of hanging and poisoning incidents were included in the study. Data on the characteristics and presentations of these incidents were collected to facilitate a comparison between rural and urban cases. The data analysis was performed using SPSS version 23.0.* ***Results:*** *In this study on hanging and poisoning deaths, no significant differences were found between urban and rural participants in the method of death (p=0.4059). However, the distribution of causes of death differed slightly between the two groups. In the urban group, 21% of poisoning cases and 52% of hanging cases resulted in death, while in the rural group, 27% of poisoning cases and 59% of hanging cases were fatal. Additionally, significant differences were observed in financial problems (p=0.033) and interpersonal conflict (p=0.019) between the two groups.* ***Conclusion:*** *This study reveals no significant differences in death methods between urban and rural participants, though variations in death distribution by hanging and poisoning exist. Socio-clinical factors like financial problems and interpersonal conflicts are more prevalent in urban areas.*

Keywords: *Alcohol abuse, Hanging, Psychiatric disorder, Self-poisoning, Suicide*

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INTRODUCTION

Hanging and poisoning remain two of the most common methods of unnatural death globally, contributing significantly to mortality rates across urban and rural populations. These methods are often associated with suicidal intent, yet their prevalence and causative factors vary depending on geographical, socio-economic, and cultural contexts [1,2]. Understanding these variations is crucial for developing targeted prevention strategies and improving mental health services. Risk factors for suicide among rural populations include social isolation, limited access to mental health services, and stigma related to mental illness. Hanging is a highly lethal and accessible method, often employed in both rural and urban areas. In rural settings, factors such as isolation, limited access to mental health resources, and socioeconomic challenges contribute to the high incidence of hanging-related deaths. Conversely, urban areas report hanging incidents more frequently in association with stressors such as financial burdens, academic pressures, and mental health disorders [3,4]. Poisoning, as a method of death, also demonstrates diverse patterns. In rural areas, the easy availability of pesticides and other toxic substances makes them a common choice, whereas in urban settings, pharmaceutical overdoses are more prevalent [5,6]. The disparities between urban and rural environments in the choice of methods, underlying causes, and demographic characteristics of victims highlight the need for localized data and interventions. Studies have shown that rural populations often face higher mortality rates due to delayed access to emergency medical care and antidotes, particularly in poisoning cases [7]. On the other hand, urban populations experience a higher prevalence of deaths linked to substance abuse and psychiatric disorders, underscoring the complexity of factors influencing these incidents [8,9]. This study aimed to compare the prevalence, demographic features, and circumstances surrounding hanging and poisoning deaths in urban and rural regions of Bangladesh. By identifying risk factors and socio-demographic trends, this research seeks to inform policymakers and healthcare professionals in tailoring region-specific interventions to reduce the burden of these preventable deaths.

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METHODS & MATERIALS

This comparative cross-sectional study was conducted at department of Forensic Medicine and Toxicology, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from July, 2022 to June, 2023 to evaluate differences in hanging and poisoning deaths between urban and rural areas. The intervention adhered to the principles of human research outlined in the Helsinki Declaration and was conducted following relevant regulations, including the General Data Protection Regulation (GDPR) [10,11]. The study included hospitalized individuals with confirmed cases of hanging or poisoning, excluding cases with incomplete autopsy data or unclear residential status. Data were collected using a structured proforma to capture demographic details, manner of death, toxicological findings, and anatomical features. Statistical analysis was performed using SPSS version 25, employing descriptive statistics, chi-square tests, and independent t-tests, with significance set at $p<0.05$. Ethical approval was obtained from the institutional review board, and confidentiality was strictly maintained throughout the study.

RESULT

In this study, 57% of the cases were from urban areas, while 43% were from rural areas. Among the urban participants (n=96), the largest age group was 40-49 years (19.8%), followed by 20-29 years (18.8%) and 50-59 years (17.7%). In the rural group (n=71), the highest percentages were observed in the 30-39 years and 50-59 years age groups (22.5% each), with 40-49 years close behind at 21.1%. A higher proportion of younger participants (10-19 years) was found in the urban group (12.5%) compared to the rural group (4.2%). Similarly, those aged ≥70 years were slightly more prevalent in the urban group (5.2%) than in the rural group (4.2%). Both groups showed a predominance of females, with 54.2% in the urban group and 54.9% in the rural group. No significant differences were observed between the urban and rural participants in employment status (p=0.065), living arrangements (p=0.321), or education status (p=0.145). Similarly, there were no significant differences in the method of death (p=0.4059), alcohol presence at the time of death (p=0.251), or the presence of a suicide note (p=0.248). However, significant differences were observed in financial problems (p=0.033), interpersonal conflict (p=0.019), and chronic disease (p=0.030) between the two groups. No significant differences were found in other social and clinical characteristics, including trouble with the law (p=0.973), private problems (p=0.329), history of gambling (p=0.219), family history (p=0.596), suicidal thoughts (p=0.705), past suicide attempts (p=0.783), psychiatric disorders (p=0.690), alcohol abuse history (p=0.136), or pain (p=0.136). Regarding the manner of death, 21% of poisoning cases and 52% of hanging cases occurred in the urban group. In the rural group, 27% of poisoning cases and 59% of hanging cases resulted in death.

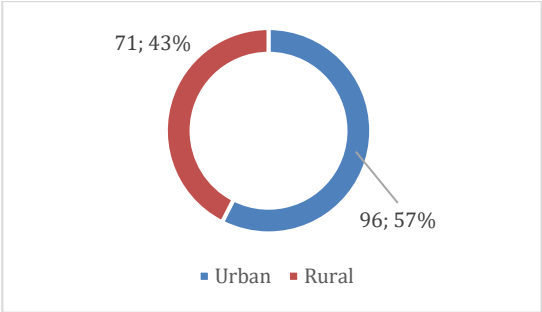

Figure – 1: Distribution of residence

Table – I: Age distribution of rural and urban participants

Age (Years)	Urban (n=96)		Rural (n=71)	
	n	%	n	%
10-19	12	12.5%	3	4.2%
20-29	18	18.8%	10	14.1%
30-39	15	15.6%	16	22.5%
40-49	19	19.8%	15	21.1%
50-59	17	17.7%	16	22.5%
60-69	10	10.4%	8	11.3%
≥70	5	5.2%	3	4.2%

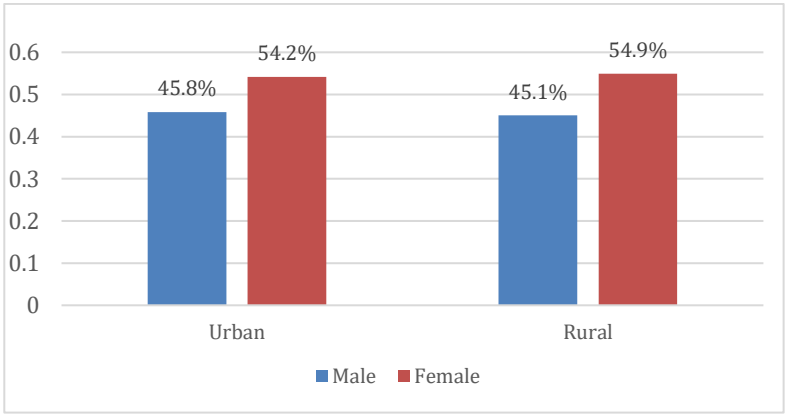

Figure – 2: Distribution of gender

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Table – II: Socio-demographic characteristics of participants

Characteristics	Urban (n=96)		Rural (n=71)		p-value
	n	%	n	%	
Employment status					
Student	14	14.5%	4	5.6%	0.065
Employed	31	32.2%	29	40.8%	
Unemployed	37	38.5%	27	38.0%	
Retired	14	14.5%	11	15.4%	
Living arrangements					
Living alone	18	18.7%	18	25.3%	0.321
Living with 1	52	54.1%	46	64.7%	
Living with ≥2	26	27.0%	7	9.8%	
Education status					
Primary school	15	15.6%	12	18.1%	0.145
High school	48	50.0%	38	51.8%	
HSC or above	33	34.3%	21	30.1%	

Regression analysis was performed

Table – III: Circumstances and manner of death among rural and urban participants

Variable	Urban (n=96)		Rural (n=71)		p-value
	n	%	n	%	
Method					
Self-poisoning	32	33.3%	28	39.4%	0.4059
Hanging	64	66.7%	43	60.6%	
Any alcohol at the time of death					
Alcohol in system	2	2.1%	3	4.2%	0.251
Suicide note					
Found	7	7.3%	9	12.7%	0.248

The Student's T-test was performed

Table – IV: Social and clinical characteristics of rural and urban participants

Variable	Rural (n=96)		Urban (n=71)		p-value
	n	%	n	%	
Financial problems	5	5.2%	11	15.5%	0.033
Trouble with the law	12	12.5%	9	12.6%	0.973
Private problems	27	28.1%	25	35.2%	0.329
Interpersonal conflict	5	5.2%	12	16.9%	0.019
History of gambling	1	1.0%	3	4.2%	0.219
Family history	12	12.5%	7	9.9%	0.596
Suicidal thoughts	17	17.7%	11	15.5%	0.705
Past suicide attempt	15	15.6%	10	14.1%	0.783
Psychiatric disorder	9	9.4%	8	11.3%	0.690
Alcohol abuse history	2	2.1%	5	7.0%	0.136
Pain	2	2.1%	5	7.0%	0.136
Chronic disease	17	17.7%	23	32.4%	0.030

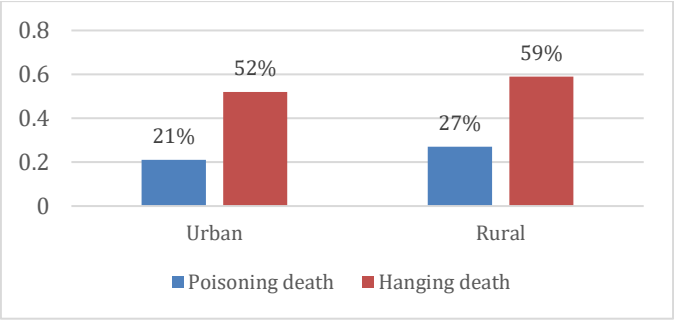

Figure – 3: Frequencies of deaths

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DISCUSSION

This study aimed to investigate the socio-demographic, social, clinical, and circumstantial differences in hanging and poisoning deaths between urban and rural participants. A higher proportion of cases were from urban areas (57%) compared to rural areas (43%). The age distribution of participants differed between the two groups, with urban participants being more likely to be in the younger age group (10-19 years), while rural participants showed a higher prevalence in the 30-39 years and 50-59 years age groups. The predominance of females in both groups (54.2% in urban and 54.9% in rural) highlights the consistent gender pattern observed in suicide-related deaths [12]. No significant differences were found between the two groups in terms of employment status, living arrangements, or education, suggesting similar socio-economic structures across urban and rural populations. However, the study revealed significant differences in certain socio-clinical factors. Urban participants were more likely to experience financial problems (p=0.033) and interpersonal conflict (p=0.019), while chronic diseases were more prevalent in urban individuals (p=0.030). These findings align with previous research, which indicates that urban environments are often associated with higher stress levels, financial strain, and health issues that may increase the risk of suicidal behaviors [13,14]. In terms of the manner of death, there was a notable difference in the distribution of poisoning and hanging cases. A higher proportion of hanging deaths was recorded in both groups, consistent with global trends showing hanging as a prevalent method of suicide [15]. However, poisoning was more common in rural participants (27%) compared to urban participants (21%), which may reflect regional variations in access to toxic substances or different methods of suicide [16]. The presence of alcohol or suicide notes did not significantly differ between the two groups, reinforcing the complexities in understanding the circumstances surrounding suicide deaths [17]. The findings of this study underscore the need for targeted suicide prevention strategies that address both urban and rural socio-clinical factors. Addressing financial difficulties, interpersonal conflicts, and chronic diseases, especially in urban areas, could be key components in reducing suicide rates. Further research, ideally with a multi-center approach and larger sample sizes, is recommended to explore these associations in greater depth and help refine intervention strategies.

Limitation of the study:

This study is limited by its single-center design and relatively small sample size, which may affect the generalizability of the findings to broader populations. Additionally, the cross-sectional nature of the study does not allow for establishing causal relationships.

CONCLUSION & RECOMMENDATION

This study highlights the similarities and differences in hanging and poisoning deaths between urban and rural participants. While the method of death shows no significant differences, the distribution of deaths by hanging and poisoning varies slightly between the two groups. Additionally, socio-clinical factors such as financial problems and interpersonal conflicts are more prevalent in certain areas, particularly in urban participants. These findings emphasize the importance of considering environmental and social factors when addressing the prevention and management of suicide-related deaths in both urban and rural settings.

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