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Original Article

Analysis of Autopsy Finding in Suicidal Death

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ABSTRACT

Background: *Suicide remains a pressing global public health issue, often driven by multifactorial causes including emotional distress, socioeconomic challenges, and undiagnosed psychiatric conditions. Autopsy-based evaluations provide essential data to understand the patterns and medico-legal implications of such deaths.* ***Aim of the study:*** *This study aimed to analyze autopsy findings in suicidal deaths with the goal of identifying demographic trends, methods of suicide, and underlying motives to inform targeted prevention strategies.* ***Methods & Materials:*** *This retrospective study reviewed 263 autopsy reports of confirmed suicidal deaths conducted within a year at Dhaka medical college hospital. Variables such as age, sex, education, marital status, occupation, method of suicide, motive, and place of death were analyzed using SPSS v26.0.* ***Result:*** *The highest prevalence of suicide was among individuals aged 26–30 years (59.70%). Gender distribution was equal. Poisoning (35.36%) and hanging (34.22%) were the most common methods, with emotional stress (37.26%) and financial problems (27.00%) identified as leading motives.* ***Conclusion:*** *Suicide predominantly affects young adults in their most productive years, with emotional and financial stress as key driving factors. This underscores the need for early mental health interventions and robust socio-psychological support systems.*

Keywords: *Suicide, Autopsy, Forensic medicine, Hanging, Poisoning, Risk factors, Psychosocial stressors.*

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INTRODUCTION

Suicide represents a profound and multifactorial public health challenge that affects individuals, families, and societies across the globe. It is a uniquely human act, often arising from an overwhelming combination of psychological distress, biological vulnerabilities, and social adversities[1]. Suicide is not merely an impulsive behavior but rather a complex process driven by unresolved inner conflict, existential crisis, and, frequently, undiagnosed or untreated mental illness[2]. According to the World Health Organization, more than 700,000 individuals die by suicide annually, making it a significant contributor to premature mortality worldwide[3]. From a philosophical and medico-legal standpoint, suicide has long intrigued scholars and healthcare providers alike. Durkheim defined suicide as a fatal act intentionally initiated and executed by an individual with full awareness of its outcome[4]. This behavior reflects a critical failure of coping mechanisms in response to acute or chronic stressors such as interpersonal conflicts, socioeconomic hardship, chronic illness, substance misuse, or psychological disorders like depression and anxiety[5,6]. In many instances, individuals who engage in suicidal behavior do not wish to die permanently, but rather seek to escape unbearable emotional pain. As such, suicide is often seen as a permanent solution to what may be a temporary crisis[7]. Despite increasing awareness and evolving therapeutic interventions, the global burden of suicide remains high, and it is often underreported due to stigma, cultural beliefs, and legal implications[8]. There remains a widespread misconception—even among some healthcare professionals—that suicide is inevitable or unpreventable due to its association with larger societal issues. However, emerging evidence strongly suggests that early identification of risk factors, timely mental health support, and appropriate crisis intervention can significantly reduce the likelihood of suicide[9]. Autopsy plays an indispensable role in the medico-legal investigation of suicidal deaths. A forensic autopsy provides critical insight into the physiological and toxicological aspects of death, clarifying the cause, mechanism, and manner of death[10]. Through systematic examination, autopsies contribute valuable data regarding the mode of suicide—whether physical (e.g., hanging, firearm injury) or chemical (e.g., poisoning, overdose)—as well as any underlying pathology, substance use, or mental health indicators[11]. In addition, autopsy findings support epidemiological surveillance, enable pattern recognition, and help guide targeted prevention strategies[12]. Previous studies

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have demonstrated that suicide is most prevalent among individuals in their second and third decades of life, with males showing a higher predisposition to violent methods and females more commonly choosing chemical means[13]. Hanging, poisoning, and firearm injuries consistently emerge as leading methods of suicide, with considerable overlap between method, intent, and accessibility[14]. Psychological autopsy investigations also reveal frequent associations with undiagnosed psychiatric conditions, substance abuse, and adverse life events shortly before death[15]. The aim of this study is to systematically analyze autopsy findings in suicidal deaths to identify prevalent patterns, risk factors, and medico-legal implications in a tertiary care setting.

METHODOLOGY & MATERIALS

This study was designed as a retrospective analysis conducted at the Department of Forensic Medicine in Dhaka Medical College Hospital, Dhaka Bangladesh. The primary objective was to examine autopsy findings in cases of suicidal deaths to identify patterns based on demographic and circumstantial variables. The study reviewed postmortem reports of all cases identified as suicidal deaths brought to the mortuary within the 1 years from March 2023 to March 2024. A total of 263 cases were included in this study.

Inclusion Criteria

- Cases of suicide within the age group of 18 to 45 years
- Autopsy cases confirmed as suicidal deaths.
- Complete postmortem reports available for review.

Exclusion Criteria

- Deaths lacking adequate evidential documentation.
- Suspected poisoning cases where chemical analysis reports from the Forensic Science Laboratory were negative.
- Cases clearly categorized as homicidal or accidental deaths, based on thorough investigation.
- Bodies in an advanced state of decomposition where the cause of death could not be conclusively determined.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee. Verbal consent was obtained from the medical personnel who conducted the autopsies, and all data were anonymized to ensure confidentiality and ethical integrity.

Data Collection

Data were extracted from the archived third copies of postmortem reports maintained in the department. Additional details were obtained from hospital records where available. Parameters recorded included age, gender, marital and occupational status, education level, method of suicide, the probable motive behind the act, and place of death. In poisoning cases, relevant viscera were preserved and forwarded for toxicological analysis. Each case underwent a thorough and standardized postmortem examination, conducted in Dhaka Medical College Hospital, in accordance with forensic protocols.

Data Analysis

Collected data were organized using Microsoft excel and analyzed using SPSS version 26.0. Variables were summarized using frequency distributions and percentages, and findings were illustrated through tables and figures to ensure clarity.

RESULT

A total of 263 participants were enrolled in the study, the highest proportion was in the 26–30 years age group, accounting for 59.70%, followed by the 36–40 years (11.79%), 31–35 years (11.03%), and 41–45 years (9.89%) groups. A smaller proportion belonged to the 18–25 years category (7.60%). In terms of marital status, 56.65% were married, although 28.14% were divorced, 10.27% widowed, and 4.94% unmarried. Educational attainment showed that 41.44% had completed college education, 30.80% had university-level education, and 23.95% had school-level education; only 6.46% were illiterate. Regarding occupation, 44.49% were employed in the service sector, 16.35% were involved in business, and 11.41% were unemployed. Socio-economic status was distributed among the middle class (36.88%), lower class (34.60%), and upper class (28.52%) (Table I). Figure 1 illustrated an equal gender distribution of suicidal deaths, with males and females each comprising 50% of the total cases. Table II outlines the distribution of suicide methods. Poisoning was the most common, reported in 93 cases (35.36%), with a higher frequency among females. Hanging was the second most frequent method, accounting for 90 cases (34.22%), predominantly among males. Substance-related methods involving sedatives, alcohol, or opium were noted in 63 cases (23.95%), also more common among males. Other methods such as burning, falls from height, firearms, and drowning were found in 17 cases (6.46%), with higher occurrence in females. Emotional factors were the most frequently cited cause, involved in 98 cases (37.26%), followed by financial problems in 71 cases (27.00%), marriage-related issues in 53 cases (20.15%), and love failure in 33 cases (12.55%). Illness was the motive in 6 cases (2.28%), and in 2 cases (0.76%) the cause remained unknown (Table III). Figure 2 depicted the location of death. Deaths occurring outside were most frequent (n=4.5), followed by home (n=4.2). The workplace had a lower frequency (n=2.5) but the highest relative percentage (4.3%), while railway deaths were least frequent (n=3.5), contributing 1.7%.

Table – I: Demographic characteristics of the study population (*n*=263)

Variable	Frequency (n)	Percentage (%)
Age (years)		
18-25	20	7.60
26-30	157	59.70
31-35	29	11.03

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36-40	31	11.79
41-45	26	9.89
Marital status		
Unmarried	13	4.94
Married	149	56.65
Divorced	74	28.14
Widowed	27	10.27
Education		
Illiterate	17	6.46
School	63	23.95
College	109	41.44
University	81	30.80
Occupation		
Unemployed	30	11.41
Service	117	44.49
Business	43	16.35
Socio-economic status		
Lower class	91	34.60
Middle class	97	36.88
Upper class	75	28.52

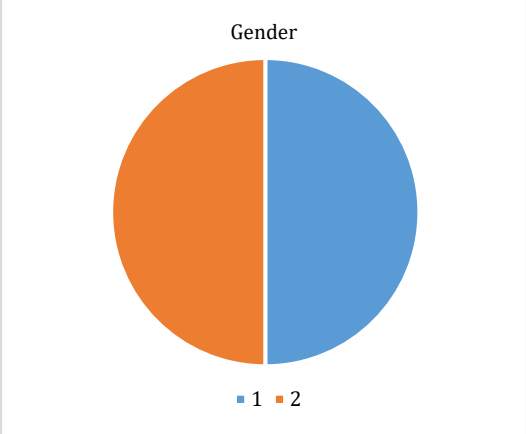

Figure – 1: Distribution of suicidal deaths by gender

Table – II: Number of suicidal death by different methods (*n*=263)

Method of suicide	Male	Female	No. of autopsy	Percentage (%)
Hanging	63	27	90	34.22
Poisoning- Organophosphorus and Others	26	67	93	35.36
Like sedatives, alcohol, Opium etc.	41	22	63	23.95
Other cases like burn, fall from height, firearm, Drowning etc.	4	13	17	6.46

Table – III: Distribution of study population according to motive of death

Motive behind suicide	Frequency (n)	Percentage (%)
Emotional factors	98	37.26
Marriage related issues	53	20.15
Financial problems	71	27.00
Illness	6	2.28
Love failure	33	12.55
Not known	2	0.76

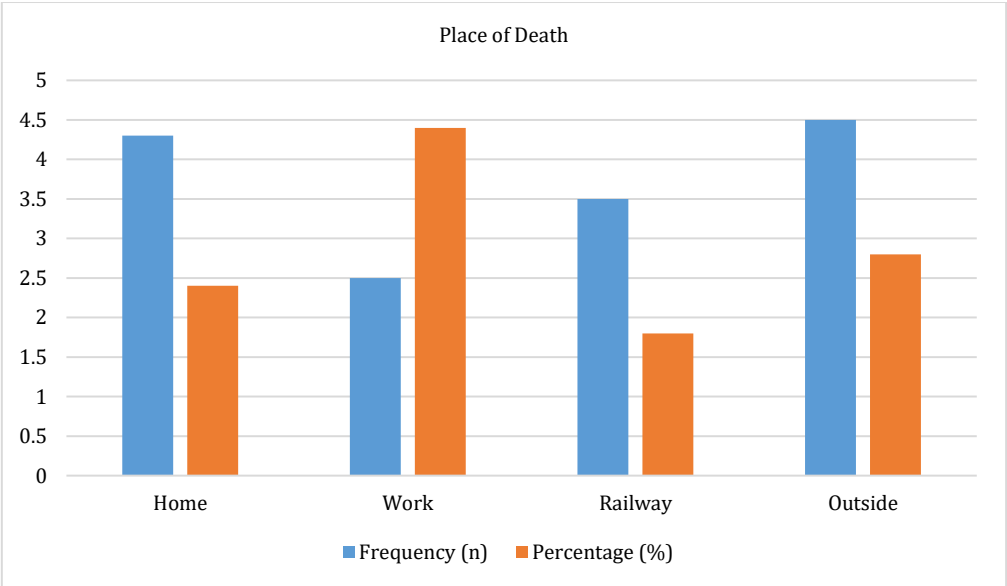

Figure – 2: Distribution of study population according to place

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DISCUSSION

Suicide is a major public health concern worldwide, contributing significantly to premature mortality and years of potential life lost. Autopsy-based evaluations provide crucial insights into the demographic, psychosocial, and medico-legal factors contributing to suicide, thereby informing prevention strategies[16,17]. This study intended to examine the demographic profiles, suicide methods, underlying motives, and death locations of individuals who died by suicide, using autopsy findings from 263 cases. In the present study, the highest proportion of suicides occurred among individuals aged 26–30 years (59.70%), followed by the 36–40 (11.79%), 31–35 (11.03%), and 41–45 (9.89%) year age groups. The 18–25-year group accounted for only 7.60% of cases. This majority of suicide in the late twenties aligns with outcomes by Sharma et al., who reported that most suicide victims were young adults between 21 and 30 years[18]. Similarly, a study from South India observed that 53% of suicide victims were in the 20–30 years age group[19]. The high incidence among individuals in their late twenties may reflect heightened vulnerability due to career instability, economic pressures, emotional stress, and interpersonal conflict commonly encountered during this transitional life stage[20]. As regards marital status, more than half of the cases were married (56.65%), while divorced and widowed individuals accounted for 28.14% and 10.27%, respectively. This distribution suggests that marital status alone does not confer protection from suicide risk. Srivastava et al. have predictable similar verdicts, where a significant number of suicide victims were married individuals[21]. The added responsibilities, financial burdens, and familial disputes in marital life may contribute to emotional instability leading to suicidal behavior[22]. Educational background showed that most individuals had attained college (41.44%) or university-level education (30.80%), with fewer having only school education (23.95%) or being illiterate (6.46%). Contrary to assumptions that lower education correlates with suicide, this study observed that educated individuals were more frequently affected. This finding is consistent with Foster et al., who reported a high suicide rate among individuals with higher educational qualifications[23]. High aspirations, coupled with employment stress or underemployment, may play a role in the psychological deterioration of educated individuals. Occupational analysis revealed that 44.49% were employed in the service sector, followed by businesspersons (16.35%) and unemployed individuals (11.41%). These findings corroborate earlier studies that linked professional stress and job dissatisfaction with suicide[24]. Notably, unemployment also emerged as a risk factor, although to a lesser degree than expected. This dual trend implies that both job-related stress and the absence of stable employment can be associated with suicidal tendencies. Socioeconomic status showed a predominance of suicides among middle-class individuals (36.88%), followed by lower (34.60%) and upper (28.52%) classes. This suggests that suicide is not confined to economically disadvantaged groups but spans across all strata. In comparison, a study by Vijaykumar et al. emphasized that socioeconomic stress, irrespective of class, contributes significantly to suicidality in Indian settings[25]. Interestingly, the gender distribution was equal, with males and females each accounting for 50% of suicide cases. This finding diverges from several Indian studies where male predominance was commonly observed[18,19]. However, it aligns with global trends showing increasing suicide rates among women, particularly in developing countries[26]. Changing gender roles, increased stress due to dual responsibilities and social stigma may underlie this shift. Regarding methods of suicide, poisoning (especially organophosphorus compounds) was the most frequent (35.36%), followed closely by hanging (34.22%). Substance-related methods, including sedatives and alcohol, accounted for 23.95%, while more violent methods like burning, drowning, falls from height, and firearms comprised 6.46%. These patterns are consistent with Indian literature, where poisoning and hanging remain the most common methods due to ease of access and lethality[27]. Poisoning was more prevalent among females, likely due to its less violent nature, whereas hanging and substance abuse were predominant among males. Sandhu et al. have previously reported these gender-specific trends in suicide methods, where females preferred non-violent methods and males chose more lethal options[28]. The motive behind suicide was predominantly emotional distress (37.26%), followed by financial problems (27.00%), marriage-related issues (20.15%), and love failure (12.55%). Illness was cited in only 2.28% of cases, and the cause remained unknown in 0.76%. These findings resonate with the conclusions of Radhakrishnan and Andrade, who emphasized that interpersonal conflicts, rather than mental illness alone, are major drivers of suicide in low- and middle-income countries[29]. Marriage-related distress, especially in the context of dowry disputes and domestic violence, has been previously documented in Indian autopsy studies[30]. Similarly, financial distress is frequently reported as a significant stressor, particularly among those from urban and peri-urban backgrounds[31]. Place of death data indicated that most deaths occurred outside the home, followed by those occurring at home and the workplace. Interestingly, although workplace deaths were fewer in number, they had the highest relative percentage, suggesting that suicides in such settings may be more impulsive or symbolic. These results are in line with Al Azad's study, which noted that the location of suicide often reflects the psychological state of the individual and their intent to be found or remain undiscovered[32].

Limitations of the study:

This retrospective autopsy-based study was constrained by the absence of psychological autopsy data, limiting insights into mental health conditions or psychosocial stressors. The reliance on postmortem records and incomplete circumstantial information may have introduced classification bias. Toxicological analyses were unavailable or inconclusive in some cases, restricting accurate identification of ingested substances. Additionally, findings from a single tertiary center may not be generalizable to wider populations due to regional, cultural, or healthcare disparities influencing suicide methods and motives.

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CONCLUSION

This autopsy-based study offers critical insights into the demographic, psychosocial, and medico-legal aspects of suicidal deaths, emphasizing the vulnerability of individuals in their late twenties, particularly those with higher education and from middle socioeconomic backgrounds. The equal gender distribution challenges prevailing assumptions of male predominance and highlights evolving suicide patterns. Poisoning and hanging emerged as the most prevalent methods, with emotional distress and financial strain being dominant motivators. These findings underscore the urgent need for multifaceted suicide prevention strategies, incorporating early mental health screening, community-level awareness, and accessible psychosocial support. Autopsy data not only aid in accurate cause-of-death determination but also serve as a valuable tool for public health policy and targeted intervention planning.

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REFERENCES

1. *Turecki G, Brent DA. Suicide and suicidal behaviour. The Lancet. 2016 Mar 19;387(10024):1227-39.*
2. *O'Connor RC, Nock MK. The psychology of suicidal behaviour. The Lancet Psychiatry. 2014 Jun 1;1(1):73-85.*
3. *World Health Organization. Suicide worldwide in 2019: global health estimates. InSuicide worldwide in 2019: global health estimates 2021.*
4. *Durkheim E. Suicide: A study in sociology. Routledge; 2005 Aug 4.*
5. *Franklin JC, Ribeiro JD, Fox KR, Bentley KH, Kleiman EM, Huang X, Musacchio KM, Jaroszewski AC, Chang BP, Nock MK. Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. Psychological bulletin. 2017 Feb;143(2):187.*
6. *Arsenault-Lapierre G, Kim C, Turecki G. Psychiatric diagnoses in 3275 suicides: a meta-analysis. BMC psychiatry. 2004 Dec;4:1-1.*
7. *Shneidman ES. Suicide as psychache: A clinical approach to self-destructive behavior. Jason Aronson; 1993.*
8. *Pritchard C, Hansen L. Child, adolescent and youth suicide or undetermined deaths in England and Wales compared with Australia, Canada, France, Germany, Italy, Japan and the USA for the 1974-1999 period. International journal of adolescent medicine and health. 2005 Jul;17(3):239-54.*
9. *Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, Hegerl U, Lonnqvist J, Malone K, Marusic A, Mehlum L. Suicide prevention strategies: a systematic review. Jama. 2005 Oct 26;294(16):2064-74.*
10. *Gentile G, Galante N, Tambuzzi S, Zoja R. A forensic analysis on 53 cases of complex suicides and one complicated assessed at the Bureau of Legal Medicine of Milan (Italy). Forensic science international. 2021 Feb 1;319:110662.*
11. *Menezes R, Monteiro F. Forensic autopsy. StatPearls. 2023 Sep 4.*
12. *Milner A, Page A, LaMontagne AD. Long-term unemployment and suicide: a systematic review and meta-analysis. PloS one. 2013 Jan 16;8(1):e51333.*
13. *Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, Bruffaerts R, Chiu WT, De Girolamo G, Gluzman S, De Graaf R. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. The British journal of psychiatry. 2008 Feb;192(2):98-105.*
14. *Ajdacic-Gross V, Weiss MG, Ring M, Hepp U, Bopp M, Gutzwiller F, Rössler W. Methods of suicide: international suicide patterns derived from the WHO mortality database. Bulletin of the World Health Organization. 2008;86:726-32.*
15. *Cavanagh JT, Carson AJ, Sharpe M, Lawrie SM. Psychological autopsy studies of suicide: a systematic review. Psychological medicine. 2003 Apr;33(3):395-405.*
16. *Chan JK, Correll CU, Wong CS, Chu RS, Fung VS, Wong GH, Lei JH, Chang WC. Life expectancy and years of potential life lost in people with mental disorders: a systematic review and meta-analysis. EClinicalMedicine. 2023 Nov 1;65*
17. *Batt A, Bellivier F, Delatte B, Spreux-Varoquaux O. Suicide: autopsie psychologique, outil de recherche en prévention (Doctoral dissertation, Institut national de la santé et de la recherche médicale (INSERM)).*
18. *Sharma BR, Gupta M, Sharma AK, Sharma S, Gupta N, Relhan N, Singh H. Suicides in Northern India: comparison of trends and review of literature. Journal of Forensic and Legal Medicine. 2007 Aug 1;14(6):318-26.*
19. *Joseph A, Abraham S, Muliyil JP, George K, Prasad J, Minz S, Abraham VJ, Jacob KS. Evaluation of suicide rates in rural India using verbal autopsies, 1994-9. Bmj. 2003 May 22;326(7399):1121-2.*
20. *Vijayakumar L, Pirkis J, Whiteford H. Suicide in developing countries (3) prevention efforts. Crisis. 2005 Jan;26(3):120-4.*
21. *Srivastava A. Psychological attributes and socio-demographic profile of hundred completed suicide victims in the state of Goa, India. Indian journal of psychiatry. 2013 Jul 1;55(3):268-72.*
22. *Wadood A, Karim R, Hussain AA, Rana M, Hossain G. Risk factors of suicidality among married adults: A cross-sectional survey in Rajshahi City, Bangladesh. Plos one. 2021 May 13;16(5):e0251717.*
23. *Foster T. Suicide note themes and suicide prevention. The International Journal of Psychiatry in Medicine. 2003 Dec;33(4):323-31.*
24. *Srivastava MK, Sahoo RN, Ghotekar LH, Dutta S, Danabalan M, Dutta TK, Das AK. Risk factors associated with attempted suicide: A case control study. Indian Journal of Psychiatry. 2004 Jan 1;46(1):33-8.*
25. *Vijaykumar L. Suicide and its prevention: The urgent need in India. Indian journal of psychiatry. 2007 Apr 1;49(2):81-4.*
26. *Canetto SS, Sakinofsky I. The gender paradox in suicide. Suicide and Life-Threatening Behavior. 1998 Mar;28(1):1-23.*
27. *Patel V, Ramasundarahettige C, Vijayakumar L, Thakur JS, Gajalakshmi V, Gururaj G, Suraweera W, Jha P. Suicide mortality in India: a nationally representative survey. The lancet. 2012 Jun 23;379(9834):2343-51.*
28. *Sandhu SS, Dalal JS. Trends of Poisoning in Faridkot region of Punjab-A retrospective study of one year. Journal of Indian Academy of Forensic Medicine. 2010 Mar;32(1):8-10.*
29. *Radhakrishnan R, Andrade C. Suicide: an Indian perspective. Indian journal of psychiatry. 2012 Oct 1;54(4):304-19.*
30. *Vijayakumar L. Suicide in women. Indian journal of psychiatry. 2015 Jul 1;57(Suppl 2):S233-8.*
31. *Krishnan M. Exploring Suicide Trends in India: An Analysis of Recent National Crime Records Bureau Data. Indian Journal of Psychiatric Nursing. 2023 Jul 1;20(2):179-80.*
32. *Al Azad MA, Rahman MS, Ahmad M, Tabassum T, Rahman Z. Medico-legal Issues and Socio-demographic Profile of Suicidal Deaths in People of Dhaka City-A Study of 827 Cases. Journal of Armed Forces Medical College, Bangladesh. 2017 Apr 21;13(1):33-6.*