**Exploring Gender Disparities in Suicide Risk Factors Across Bangladesh**

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**Abstract**

Effective preventive methods for suicide need a thorough understanding of the risk factors associated with this complex and varied public health issue. This research aims to explore instances of suicide as documented in Bangladeshi newspapers, specifically examining distinctive risk factors associated with gender and demographics. 13 national daily newspapers were selected purposively data in this investigation. The logistic regression method was used for analysis and fitting to the dataset. Higher suicide odds among individuals under 30 and employed individuals. Significant regional differences are noted, with Khulna having a rate of 1.05 and Chittagong the lowest at 76% less. Certain methods like hanging, poisoning, and jumping show elevated odds, while factors like family issues and blackmail exhibit significantly higher odds compared to physical illness among women. The analysis suggests that the newspaper types, season, division, occupation, methods, and causes of suicide were the major reasons why gender is most important in suicide, and some other covariates were considered in the analysis but they were not significant. The study strives to provide targeted suicide prevention measures that are sensitive to the unique requirements of various gender groups. It highlights the significance of culturally appropriate interventions. By elucidating the intricacies associated with suicide risk factors in Bangladesh, our study adds to the international conversation on suicide prevention by promoting a more sophisticated comprehension of gender differences to augment the efficacy of public health campaigns.

***Keywords:*** *Suicide, Gender-specific, Risk factors, Mental health, Bangladesh*

1. **Introduction:**

Suicide refers to purposeful self-inflicted harm leading to death. According to the World Health Organization's 2019 data, over 700,000 suicides occur annually, with 77% transpiring in low- and middle-income countries, including Bangladesh (WHO, 2019). Despite its significance as a preventable global public health issue, suicide often faces neglect from researchers, policymakers, gatekeepers, and clinicians, particularly in lower-income nations like Bangladesh (Begum et al., 2017). The country lacks a national suicide surveillance system, dedicated database, or prevention strategy. Unlike many high-income countries with robust mortality reporting systems, low-income nations often lack mechanisms to document mortality rates and causes of death. The majority of suicides in these settings take place at home, frequently going unreported, with limited or unreliable information about the causes of death (Mashreky et al., 2013).

Suicide rates exhibit substantial variation across studies and World Health Organization (WHO) data. According to the 2014 WHO report, the global suicide rate was 7.8 per 100,000 for both genders, whereas in Bangladesh in 2012, it was 8.7 per 100,000 for females and 6.8 per 100,000 for males (Yasir Arafat, 2018). Underreporting of suicide events is likely in the country, as all such incidents are expected to be reported to the police, and legal authorities determine the verdict of suicide (S. M. Y. Arafat et al., 2021). The primary cause of suicide, notably linked to suicidal ideation among university students globally, including those in Bangladesh, is mental illness, particularly depression (Pervin & Ferdowshi, 2016). Suicidal ideation is also associated with the hopelessness and loneliness experienced by graduate students (Garcia-Williams et al., 2014). Gender disparities in the incidence of suicidal conduct are known in suicide research as the "Gender Paradox." This paradox changes as people get older (Rahman et al., 2021), with male suicide rates rising until early adulthood and female suicide attempt rates peaking in mid-adolescence among teenagers and young adults(World Health Organization, 2014). Previous suicide attempts, particularly among females, strongly predict suicide death. Gender differences in suicidal behavior may be attributed to variations in emotional and behavioral problems, with females more prone to internalizing disorders like anxiety and mood disorders, which can mediate the association with suicidal thoughts and behaviors (Mars et al., 2014).

Although a brief review on suicide in Bangladesh identifies common risk factors such as economic crisis, family discord, chronic diseases (Ferdushi et al., 2020), love failure, academic failure (Hasan, 2020), family history of suicide, drug addiction, unwanted pregnancy, misfortune, property loss, criminality, and mental illness, these factors have not been specifically explored among university students. The systematic study of suicide risk factors is lacking in Bangladesh, with variations in findings from existing studies and a lack of psychological autopsy. Existing research suggests different sociodemographic and risk factors, emphasizing the need for gender-specific investigations (S. Arafat, 2017). Previous studies in Bangladesh highlight female gender, age under 30, and immediate emotionally charged events, rather than mental disorders, as risk factors (S. M. Y. Arafat et al., 2021; Nazmul Karim et al., 2013). Given this background, there is an urgent and unmet need to identify gender-specific risk factors for suicide in Bangladesh to develop an effective national suicide prevention strategy. The purpose of this research is to investigate suicide as reported in Bangladeshi newspapers, with a focus on risk factors unique to gender and demographics.

1. **Methods**
   1. **Study design and data collection**

13 national daily newspapers were selected purposively to be included in the study and those were scrutinized from January to December 2022. Among them, 8 were Bangla newspapers (Daily Prothom Alo, Daily Amader Shomoy, Daily Janakantha, Daily Jugantor, Daily Shomokal, Daily Kalerkontho, Daily Bangla Tribune, Daily Bangla News 24) and 5 were English newspapers (New Age, Daily Sun, Daily Observer, Daily Tribune, Daily Independent). From the selected parts, data were organized along with the variables and written in a master sheet. A total of 126 pieces of data were collected and analyzed by Statistical Package for Social Sciences (SPSS) version 25 software.

* 1. **Response variable**

In this study, the dependent variable is the gender. Gender is reported in newspapers along with all other variables (Table 1).

* 1. **Predictor variable**

Several demographic and socio-economic factors are associated with the gender. Predictor variables based on the previous study are included in this study (Table 1).

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| Table 1. Factors used for predicting school attrition | |
| Response Variable | **Values** |
| Newspaper types | Bangla, English |
| Seasons | Pre-monsoon (March-May), Monsoon (June-October), Post-monsoon (November-February) |
| Age | <30, >=30 |
| Marital Status | Married, Unmarried |
| Division | Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, Sylhet |
| Occupation | Employed, Housewife/Student, Others, Unemployed |
| Methods of suicide | Hanging (pipe/fan/others), Poison/medicine, Jump (Roof/Vehicle), Self-harm (shot/blade/burn) |
| Causes of suicide | Family issues (Husband pressure/Relation), Mental stress (Anxiousness/Depression/loneliness), Blackmail (Photos/Police case), Rape |

* 1. **Statistical analysis**

We employed a two-stage analysis using a multiple logistic regression model to identify gender-related risk factors. In the initial stage, a Chi-Square test was conducted, revealing significance in eight variables associated with gender at a 95% confidence level (Table 2). Subsequently, a multiple logistic regression model was applied, encompassing independent variables such as newspaper types, seasons, age, marital status, division, occupation, methods of suicide, and causes of suicide.

1. **Ethics approval**

No formal ethical clearance was needed as the data included only the printed and published information.

1. **Result**

A total of 126 cases were reported in 13 collected newspapers in 2023. Among them, 75 (59.50%) cases from Bangla Newspapers and 51 (40.50%) cases from English newspapers were included in the analysis (Fig.1)**.** Among Bangla newspapers, 40 (65.60%) were female and 35 (53.80%) cases were male. Similarly, the percentage of male and female cases were 30 (46.20%) and 21 (34.40%), respectively (Fig. 2)**.**

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| **Fig. 2. Percentage of suicidal cases by types of newspaper** | **Fig. 3. Percentage of suicidal cases by sex and types of newspaper** |

Table 2,shows that 15 (23.10%) male cases reported to suicide were from pre-monsoon, and only 16 (26.20%) were female cases reported on that season. Among those under 30 years old, 51 (78.50%) were reported as male, and 50 (82.00%) were female. 16 (24.60%) males were reported from Dhaka and 19 (31.10%) females were reported from that Division. Employed male cases were reported 14 (21.50%) and females reported 18 (29.50%). The most frequent method of suicide is hanging himself, 36 (59.00%) reported as female cases and 40 (61.50%) were male. Among all causes of suicide, family issues are most frequently among males 29 (44.60%) and females 37 (60.70%). According to the P-value, all socio-demographic characteristics were statistically insignificant among school dropouts.

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| Table 2. Prevalence & Chi-Square test of attrition by different factors | | | | | |
|  |  | **Sex** | | |  |
| Characteristics |  | Male  n (%) | Female,  n (%) | Total  n (%) | P-Value |
| Newspaper types | | | | | |
|  | Bangla | 35 (46.70) | 40 (53.30) | 75(59.5) | 0.018 |
|  | English | 30 (46.20) | 21(34.40) | 51(40.50) |
| Seasons | | | | | |
|  | Pre-monsoon | 15 (23.10) | 16 (26.20) | 31 (24.60) | 0.048 |
|  | Monsoon | 10 (15.40) | 12 (19.70) | 22 (17.50) |
|  | Post-monsoon | 40(61.50) | 33 (54.10) | 73 (57.90) |
| Age | | | | | |
|  | <30 | 51 (78.50) | 50 (82.00) | 101(80.20) | 0.062 |
|  | >=30 | 14 (21.50) | 11 (18.00) | 25 (19.80) |
| Division | | | | | |
|  | Barisal | 3 (4.60) | 6 (9.80) | 9 (7.10) | 0.034 |
|  | Chittagong | 10 (15.40) | 3 (4.90) | 13 (10.30) |
|  | Dhaka | 16 (24.60) | 19 (31.10) | 35 (27.80) |
|  | Khulna | 4 (6.20) | 5 (8.20) | 9 (7.10) |
|  | Rajshahi | 16 (24.60) | 15 (24.60) | 31 )24.60) |
|  | Rangpur | 6 (9.20) | 4 (6.60) | 10 (7.90) |
|  | Sylhet | 4 (6.20) | 5 (8.20) | 9 (7.10) |
|  | Mymensingh | 6 (9.20) | 4 (6.60) | 10 (7.90) |
| Occupation | | | | | |
|  | Employed | 14 (21.50) | 18 (29.50) | 32 (25.40) | 0.030 |
|  | Housewife | 25 (38.50) | 14 (23.0) | 39 (31.00) |
|  | Student | 25 (38.50) | 28(45.90) | 53 (42.10) |
|  | Unemployed | 1 (1.50) | 1 (1.60) | 2 (1.60) |
| Methods of suicide | | | | | |
|  | Hanging | 40 (61.50) | 36 (59.00) | 76 (60.30) | 0.017 |
|  | Poison | 12 (18.50) | 12 (19.70) | 24 (19.00) |
|  | Jump | 8 (12.30) | 7 (11.50) | 15 (11.90) |
|  | Self-harm | 5 (7.70) | 6 (9.80) | 11 (8.70) |
| Causes of suicide | | | | | |
|  | Family issues | 4 (6.20) | 7 (11.50) | 11 (8.70) | **0.030** |
|  | Mental stress | 27 (41.50) | 17 (27.90) | 44 (34.90) |
|  | Blackmail | 29 (44.60) | 37 (60.70) | 66 (52.40) |
|  | Physical Ill | 5 (7.70) | 0 (0) | 5 (4.00) |

Table 3 depicts that, the age of reported cases is observed as an important factor for suicide; for instance, the suicidal person aged less than 30 years has a higher odds (OR=1.24, 95%, CI: [0.51-3.01]) of taking suicide. Compared with the unemployed the rate of suicide in employed was 1.28 (OR=1.28, 95%, CI: [0.87-2.41]) times. Compared to Sylhet there was a noticeable difference in suicide proportion between different divisions in Bangladesh. The suicide rate is 1.05 in Khulna (OR=1.05, 95%, CI: [0.45-1.42]) while Chittagong holds the lowest rate and it was 76% lowest (OR=0.24, 95%, CI: [0.18-0.41]).

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| Table 3. Prevalence & Chi-Square test of attrition by different factors | | | | | |
| Characteristics |  | COR (95% CI) | P-value | AOR (95% CI) | P-Value |
| Newspaper types | | | | | |
|  | Bangla | 1.63 [1.19-2.35] | 0.038 | 1.87 [1.36-2.05] | 0.011 |
|  | English | Reference |  | Reference |  |
| Seasons | | | | | |
|  | Pre-monsoon | 1.29 [0.55-3.00] | 0.055 | 1.61 [0.63-2.06] | 0.051 |
|  | Monsoon | 1.45 [1.25-2.78] | 0.044 | 1.17 [1.12-1.51] | 0.016 |
|  | Post-monsoon | Reference |  | Reference |  |
| Age | | | | | |
|  | <30 | 1.24 [0.51-3.01] | 0.062 | 1.35 [0.52-3.48] | 0.053 |
|  | >=30 | Reference |  | Reference |  |
| Division | | | | | |
|  | Dhaka | 0.95 [0.21-1.14] | 0.094 | 1.05 [0.58-1.22] | 0.104 |
|  | Mymensingh | 0.53 [0.18-0.81] | 0.048 | 0.89 [0.68-0.91] | 0.027 |
|  | Chittagong | 0.24 [0.18-0.41] | 0.012 | 0.33 [0.11-0.39] | <0.001 |
|  | Khulna | 1.05 [0.45-1.42] | 0.892 | 1.15 [0.85-1.52] | 0.781 |
|  | Rajshahi | 0.75 [0.79-1.33] | 0.070 | 0.65 [0.59-1.19] | 0.099 |
|  | Rangpur | 0.53 [0.36-0.97] | 0.049 | 0.41 [0.21-0.77] | 0.015 |
|  | Barisal | 1.31 [0.63-1.80] | 0.063 | 1.10 [0.93-2.51] | 0.087 |
|  | Sylhet | Reference |  | Reference |  |
| Occupation | | | | | |
|  | Employed | 1.28 [0.87-2.41] | 0.086 | 1.55 [1.17-2.11] | <0.001 |
|  | Housewife | 0.56 [0.43-0.66] | 0.016 | 1.56 [1.13-1.89] | 0.021 |
|  | Student | 1.12 [1.05-1.86] | 0.003 | 1.22 [1.05-1.36] | 0.013 |
|  | Unemployed | Reference |  | Reference |  |
| Methods of suicide | | | | | |
|  | Hanging | 1.75 [1.51-1.86] | 0.006 | 0.81 [0.63-0.96] | 0.008 |
|  | Poison/Drug | 1.83 [0.79-1.98] | 0.080 | 0.93 [0.88-2.23] | 0.111 |
|  | Jump | 1.72 [1.53-1.97] | 0.009 | 0.92 [0.79-1.13] | 0.095 |
|  | Self-harm | Reference |  | Reference |  |
| Causes of suicide | | | | | |
|  | Family issues | 2.82 [1.85-3.10] | 0.009 | 2.54 [2.05-3.10] | <0.001 |
|  | Mental stress | 1.01 [0.89-1.12] | 0.099 | 1.44 [1.23-1.88] | 0.013 |
|  | Blackmail | 2.06 [1.99-2.15] | 0.003 | 2.99 [2.51-3.29] | 0.011 |
|  | Physical Ill | Reference |  | Reference |  |

The methods of suicide played a great role in the suicide rate. The household primary hanging, poison, and jump have a (OR=1.75, 95%, CI: [1.51-1.86]), (OR=1.83, 95%, CI: [0.79-1.98]) and (OR=1.72, 95%, CI: [1.53-1.97]) higher odds of suicide in comparison with the women who used self-harm methods. The causes of suicide also played a great role in the suicide rate. The household family issues, mental stress, and blackmail have a 2.82 (OR=2.82, 95%, CI: [1.85-3.10]), 1.01 (OR=1.01, 95%, CI: [0.89-1.12]) and 2.06 (OR=2.06, 95%, CI: [1.99-2.15]) very higher odds of suicide in comparison with the women who are Physically ill.

**Discussion**

This study reveals a notable prevalence of suicidal ideation in Bangla newspapers, with a higher occurrence among women (11.8%) compared to men (Till et al., 2013). While more men called the helpline, the rate of suicidal ideation was 1.2:1 in Favor of women (Hasan et al., 2022). Suicide was mostly aged 30-49, reaching out during summer or spring, on weekends, and in the evening or night (Gould et al., 2016). Life crises, mental disorders, and loneliness were common themes. This aligns with existing studies, emphasizing the prevalence of suicidal thoughts in women and the significance of emotional problems (Ramchand et al., 2017). The study suggests that young males may be less inclined to seek help, potentially influenced by societal expectations of masculine behaviors and coping strategies (Rhodes et al., 2014).

Consistent with prior research (Beautrais, 2002), our study finds that male youths face a significantly higher risk of suicide compared to females, possibly due to the use of more lethal means. Males often employ firearms and hanging methods, while females exhibit a higher incidence of drug poisoning (Mergl et al., 2015) (Fatama Ferdushi et al., 2023). Early exposure to traumatic life events, such as childhood maltreatment and bullying (Islam et al., 2022), contributes to increased vulnerability for suicidal behaviors in both genders, influencing psychopathology and maladaptive personality features (O’Brien & Sher, 2013). Childhood abuse is linked to a lack of social support and risky health behaviors (Hasan, MohanaSundaram, et al., 2023), impacting mental health (Sheikh et al., 2016). Traumatic experiences in childhood are associated with a heightened risk of health-harming behaviors (Hasan, Babu, et al., 2023), including suicide attempts (Sheikh, 2018), emphasizing the importance of addressing such factors in suicide prevention (Bellis et al., 2014).

Our study supports the hypothesis that economic stressors, including employment status and income, have a more pronounced impact on male suicide rates than females. Economic factors like unemployment significantly increase the risk of suicide attempts in males, aligning with traditional gender roles where males are often seen as the family's primary breadwinners (Li et al., 2012). Household income was found to be a significant factor for suicide attempts in males but not females, possibly reflecting societal expectations. While gender differences exist, the study highlights that socioeconomic status indicators such as education, income, employment, and social assistance are universally associated with suicide attempts, emphasizing the critical role of economic conditions in suicide risk (Lorant et al., 2005).

Our study reveals a gender-specific association between marital status and suicide attempts. For males, being widowed, divorced, or separated increases the risk, while for females, it reduces the risk (Handley et al., 2012). This suggests that males may face greater vulnerability after losing a spouse and lacking supportive social connections compared to females (Miret et al., 2014). Previous research aligns with our findings, indicating that divorce specifically impacts suicidal mortality among males. The complex relationship between marital status and suicide attempts warrants further gender-specific investigation. Contrary to some studies, our findings do not show an independent association between education level and suicide attempts (Miret et al., 2014). The nuanced impact of marital status on suicide attempts highlights the need for continued research to unravel these gender-specific dynamics (Li et al., 2012). In Korea, lower education levels are notably linked to elevated suicide rates, possibly due to the heightened influence of educational status on social factors like occupation and income compared to other countries. Our study found that a lower level of education independently increased the risk of suicide attempts in females, highlighting a stronger impact of education on females compared to males.

**Limitations**

This study is constrained by several limitations. Firstly, it focused on newspaper reports from a specific region, potentially introducing bias and limiting generalizability across countries. Secondly, self-report bias may have occurred in assessing suicidal cases, as information often came from known individuals or police, not always reflecting accurate details. Additionally, the study's sample size is limited, hindering a comprehensive exploration of gender differences. Future research should address these methodological limitations for more robust findings.

**Implications for research**

Research on youth suicidal behavior should delve into gender differences, emphasizing longitudinal studies examining sociodemographic factors (e.g., socioeconomic status, ethnicity). Further investigation into academic and protective factors for both females and males is crucial, alongside exploring access to means, externalizing problems, family history of mental disorders, and abuse among females, and relationship problems, bipolar and eating disorders among males. Understanding gender-specific pathways is key to reducing suicide mortality. Preventive strategies must consider gender preferences and context, requiring assessment of youth preferences for public health interventions. Efforts to address health inequalities should prioritize reducing the gender gap, particularly during vulnerable periods like adolescence and young adulthood.

1. **Conclusion**

Bangladesh faces a pressing issue of high suicide rates, necessitating the establishment of national suicide surveillance. This study emphasizes the correlation between suicidal ideation and factors like age, hopelessness, depression, anxiety, and stress. Key findings indicate that targeted intervention programs should address depression and hopelessness, particularly among the youth, to curb the escalating suicide rate. Beyond universal prevention strategies, addressing smoking, preventing violence, combating racial bias, and ensuring health coverage are crucial for suicide prevention. Additionally, urban upbringing and parental affective disorder are significant gender-related suicide risk factors, with implications for future research. Early intervention is imperative, considering the impact on the nation's future and the role of empowered youth as leaders.

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