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

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**Abstract**

Many girls who enrolled in a school but didn’t complete elementary or secondary education, have become a serious problem in the last few decades in Bangladesh. Several studies have been conducted to identify the determinants of school dropout by constructing bivariate and multiple logistic regression (MLR) models. Bangladesh Multiple Indicator Cluster Surveys (MICS) 2012 data were selected in this investigation. This study was based on girls aged between 15 years to 17 years since all these girls should have been in school or have completed primary education. The backward stepwise method was used for model selection and fitting to the dataset. Of 4800 girls, 29.1% were out of school and 70.9% attended school. The backward stepwise method confirms that a girl’s marital status, area, division, wealth index, religion, mother's and father’s aliveness & and household education were the major reasons why a girl’s dropout, and these covariates are only considered in the analysis. The MLR analysis shows that married girls were significantly (OR 11.06; 95% CI 9.05–13.56) more likely to attrition than unmarried girls. School-based programs aimed at preventing child marriage should target girls from the fifth grade because of their escalated risk, and they need to prioritize girls from disadvantaged groups.

***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 [1]. 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 [2]. 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 [3].

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 [4]. 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 [5]. The primary cause of suicide, notably linked to suicidal ideation among university students globally, including those in Bangladesh, is mental illness, particularly depression [6]. Suicidal ideation is also associated with the hopelessness and loneliness experienced by graduate students [7]. In suicide research, gender differences in suicidal behavior rates are recognized as the "Gender Paradox." Among adolescents and young adults, this paradox shifts with age, with female suicide attempt rates peaking in mid-adolescence and male suicide rates increasing until early adulthood [8]. 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 [9].

Although a brief review on suicide in Bangladesh identifies common risk factors such as economic crisis, family discord, chronic diseases, love failure, family history of suicide, drug addiction, unwanted pregnancy, misfortune, property loss, criminality, and mental illness, these factors haven't 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 [10]. Previous studies in Bangladesh highlight female gender, age under 30, and immediate emotionally charged events, rather than mental disorders, as risk factors [5], [11]. 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. This paper aims to explore suicide based on newspaper reports in Bangladesh, concentrating on demographic variables and gender-specific risk factors.

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 2023. Among them, 4 were Bangla newspapers (the Daily Jugantor, the Daily Ittefaq, Kaler Kantho, and Daily Prothom Alo) and two were English newspapers (the Daily Star and the Independent). The six papers were collected regularly and initial screening was conducted. 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** |
| Gender | Male, Female |
| Predictor Variables |  |
| 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, Agriculture, Housewife/Student, Others, Unemployed |
| Methods of suicide | Hanging (pipe/fan/others), Poisson/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 151 cases were reported in 12 collected newspapers in 2023. Among them, 96 (86.40%) cases from Bangla Newspapers and 55 (29.50%) cases from English newspapers were included in the analysis (Fig.1)**.** Among Bangla newspapers, 66 (67.20%) were female and 30 (29.20%) cases were male. Similarly, the percentage of male and female cases were 35 (60.60%) and 25 (11.30%), respectively (Fig. 2)**.**

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| Fig. 2. Percentage of girls by age | Fig. 3. Percentage of girls by age and attrition |

Table 2,shows that 510 (7.21%) male cases reported to suicide were from pre-monsoon, and only 242 (5.04%) were female cases reported on that season. Among those under 30 years old, 210 (65.90%) were reported as male, and 638 (18.44%) were female. 108 (24.69%) males were reported from the Barisal and 379 (7.90%) females were reported from that Division. Employed male cases were reported 394 (4.38%) and females reported 412 (8.58%). Cases that were reported from Muslim families, 1252 (16.75%) male and 412 (1.69%) female. The most frequent method of suicide is hanging himself, 1252 (26.08%) reported as female cases and 3308 (68.92%) were male. Among all causes of suicide, family issues are most frequently among males 1299 (27.06%) and females 3187 (66.40%). According to the P-value, all socio-demographic characteristics were statistically significant 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 | 346 (7.21) | 1400 (29.17) | 1746 (36.38) | 0.000 |
|  | English | 509 (10.60) | 1129 (23.52) | 1638 (34.12) |  |
| Seasons | | | | | |
|  | Pre-monsoon | 510 (10.62) | 242 (5.04) | 752(15.66) | 0.000 |
|  | Monsoon |  |  |  |  |
|  | Post-monsoon | 885 (18.44) | 3163 (65.90) | 4048(84.34) |  |
| Age | | | | | |
|  | <30 | 210(4.38) | 638(13.29) | 848(17.67) | 0.003 |
|  | >=30 | 1185(24.69) | 2767(57.65) | 3952(82.34) |  |
| Division | | | | | |
|  | Barisal | 108(2.25) | 379(7.90) | 487(10.15) | 0.000 |
|  | Chittagong | 280(5.83) | 627(13.06) | 907(18.89) |  |
|  | Dhaka | 344(7.17) | 849(17.69) | 1193(24.86) |  |
|  | Khulna | 169(3.52) | 509(10.60) | 678(14.12) |  |
|  | Rajshahi | 143(2.98) | 350(7.29) | 493(10.27) |  |
|  | Rangpur | 150(3.12) | 440(9.17) | 590(12.29) |  |
|  | Sylhet | 201(4.19) | 251(5.23) | 452(9.42) |  |
| Occupation | | | | | |
|  | Employed | 394(8.21) | 412(8.58) | 806(16.79) | 0.000 |
|  | Agriculture | 365(7.60) | 671(13.98) | 1036(21.58) |  |
|  | Housewife/Student | 275(5.73) | 773(16.10) | 1048(21.83) |  |
|  | Others | 239(4.98) | 815(16.98) | 1054(21.96) |  |
|  | Unemployed | 122(2.54) | 734(15.29) | 856(17.83) |  |
| Methods of suicide | | | | | |
|  | Hanging | 1299(27.06) | 3308(68.92) | 4607(95.98) | 0.000 |
|  | Poisson/Drug | 1299(27.06) | 3308(68.92) | 4607(95.98) | 0.000 |
|  | Jump | 1299(27.06) | 3308(68.92) | 4607(95.98) | 0.000 |
|  | Self-harm | 96(2.00) | 97(2.02) | 193(4.02) |  |
| Causes of suicide | | | | | |
|  | Family issues | 1241(25.85) | 3187(66.40) | 4428(92.25) | 0.000 |
|  | Mental stress | 154(3.21) | 218(4.54) | 372(7.75) |  |
|  | Blackmail |  |  |  |  |
|  | Rape |  |  |  |  |

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=2.19, 95%, CI: [1.82,2.64]) of taking suicide. The table showed us that the rate of suicide is high among married people and it was 11.03 times higher (OR=11.03, 95%, CI: [9.02,13.53]) and compared with the unemployed the rate of suicide in employed was 31% (OR=0.69, 95%, CI: [0.56,0.86]). Compared to Sylhet there was a noticeable difference in suicide proportion between different divisions in Bangladesh. The suicide rate is very high in Barisal 4.63 times (OR=4.60, 95%, CI: [3.32,6.41]) while Khulna holds the lowest rate and it was (OR=0.90, 95%, CI: [0.65,1.26]).

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| Table 2. Prevalence & Chi-Square test of attrition by different factors | | | | | |
| Characteristics |  | COR (95% CI) | P-value | AOR (95% CI) | P-Value |
| Newspaper types | | | | | |
|  | Bangla | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | English | Reference |  | Reference |  |
| Seasons | | | | | |
|  | Pre-monsoon | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Monsoon | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Post-monsoon | Reference |  | Reference |  |
| Age | | | | | |
|  | <30 | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | >=30 | Reference |  | Reference |  |
| Division | | | | | |
|  | Barisal | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Chittagong | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Dhaka | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Khulna | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Rajshahi | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Rangpur | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Sylhet | Reference |  | Reference |  |
| Occupation | | | | | |
|  | Employed | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Agriculture | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Housewife/Student | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Others | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Unemployed | Reference |  | Reference |  |
| Methods of suicide | | | | | |
|  | Hanging | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Poison/Drug | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Jump | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Self-harm | Reference |  | Reference |  |
| Causes of suicide | | | | | |
|  | Family issues | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Mental stress | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Blackmail | 1.22 [105-1.32] | <0.001 | 1.22 [105-1.32] | <0.001 |
|  | Rape/sexual harassment | Reference |  | Reference |  |

The methods of suicide played a great role in the suicide rate. The household primary hanging, poison/drug, and jump have a 39% (OR=0.61, 95%, CI: [0.49,0.75]), 34% (OR=0.66, 95%, CI: [0.51,0.83]), 55% (OR=0.45, 95%, CI: [0.36,0.56]) and 68% (OR=0.32, 95%, CI: [0.24,0.44]) less 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 39% (OR=0.61, 95%, CI: [0.49,0.75]), 34% (OR=0.66, 95%, CI: [0.51,0.83]), 55% (OR=0.45, 95%, CI: [0.36,0.56]) and 68% (OR=0.32, 95%, CI: [0.24,0.44]) fewer odds of suicide in comparison with the women who are raped/sexually harassed.

**Discussion**

This study reveals a notable prevalence of suicidal ideation in Bangla newspapers, with a higher occurrence among women (1.87%) compared to men [12]. While more men called the helpline, the rate of suicidal ideation was 2:1 in favor of women. Ideators were mostly aged 30-49, reaching out during summer or spring, on weekends, and in the evening or night [13]. 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 [14]. The study suggests that young males may be less inclined to seek help, potentially influenced by societal expectations of masculine behaviors and coping strategies [15].

Consistent with prior research [16], 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 [17]. Early exposure to traumatic life events, such as childhood maltreatment and bullying, contributes to increased vulnerability for suicidal behaviors in both genders, influencing psychopathology and maladaptive personality features [18]. Childhood abuse is linked to a lack of social support and risky health behaviors, impacting mental health [19]. Traumatic experiences in childhood are associated with a heightened risk of health-harming behaviors, including suicide attempts [20], emphasizing the importance of addressing such factors in suicide prevention [21].

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 [22]. 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 [23].

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 [24]. This suggests that males may face greater vulnerability after losing a spouse and lacking supportive social connections compared to females [25]. 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 [25]. The nuanced impact of marital status on suicide attempts highlights the need for continued research to unravel these gender-specific dynamics [22]. 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 for 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 is 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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