

Article

## Gender disparities in suicide prevalence and risk factors in 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 (OR=1.05, 95% CI: [0.45-1.42]) and Chittagong the lowest at 76% (OR=0.24, 95% CI: [0.18-0.41]) compared to Sylhet. Certain methods like hanging, poisoning, and jumping show elevated odds 1.75 (95% CI: [1.51-1.86]), 1.83 (95% CI: [0.79-1.98]), and 1.72 (95% CI: [1.53-1.97]), respectively, compared to self-harm methods among women, while factors like family issues and blackmail exhibit significantly higher odds 2.82 (95% CI: [1.85-3.10]), 1.01 (95% CI: [0.89-1.12]), and 2.06 (95% CI: [1.99-2.15]), respectively, compared to physical illness among women. 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:** newspaper analysis; gender-specific; socioeconomic factors; mental health; preventive strategies

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### 1. Introduction

Suicide refers to purposeful self-inflicted harm leading to death. According to the World Health Organization's (WHO) 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 show significant variation across different studies and WHO data. The 2014 WHO report indicates a global suicide rate of 7.8 per 100,000 for both genders. In contrast, in Bangladesh in 2012, the rate was 8.7 per 100,000 for females and 6.8 per 100,000 for males (Arafat, 2017). 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 (Arafat *et al.*, 2021). Mental illness, especially depression, is the primary cause of suicide and is notably linked to suicidal ideation among university students globally, including in Bangladesh (Pervin and Ferdoushi, 2016). Suicidal ideation is also associated with the hopelessness and loneliness experienced by university 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 (WHO, 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 such as 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 (Arafat, 2018). Previous studies in Bangladesh highlight female gender, age under 30, and immediate emotionally charged events, rather than mental disorders, as risk factors (Reza *et al.*, 2013; Arafat *et al.*, 2021). Even while previous studies have identified several risk factors for suicide in Bangladesh, there is a substantial knowledge vacuum on these aspects, particularly about the methods and causes of suicide. There is a dearth of systematic research on suicide risk factors in this population in the present literature, especially when it comes to gender-specific variations. Effective national preventive initiatives for suicide must be informed by a thorough investigation of the gender-specific risk factors for suicide, given the inconsistent results of earlier studies. 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. The results will give policymakers in Bangladesh the critical information they need to develop and put into practice gender-specific suicide prevention initiatives. This may result in more successful interventions that are suited to the particular requirements of certain demographic groups.

## 2. Materials and Methods

### 2.1. Ethical approval

Since this is a desktop survey-based investigation, no ethical approval was required to conduct the study.

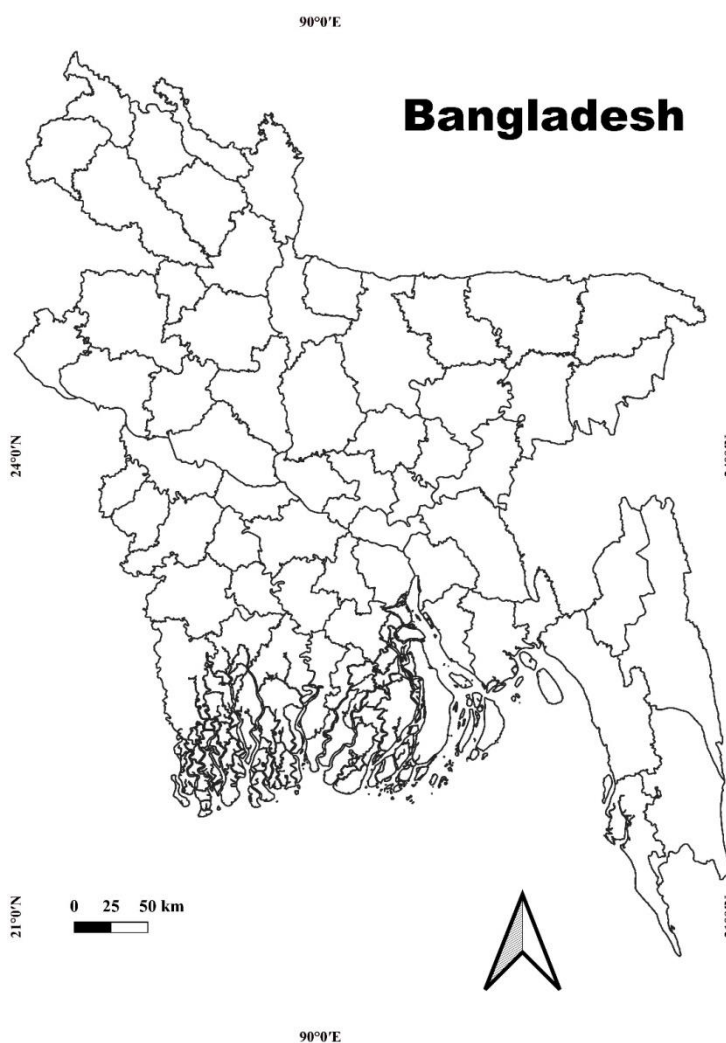
### 2.2. Study design and data collection

Thirteen national daily newspapers were purposively selected for inclusion in the study, scrutinizing issues from January to December 2021. Among these, eight were Bangla newspapers (Daily Prothom Alo, Daily Amader Shomoy, Daily Janakantha, Daily Jugantor, Daily Shomokal, Daily Kalerkontho, Daily Bangla Tribune, and Daily Bangla News 24) and five were English newspapers (New Age, Daily Sun, Daily Observer, Daily Tribune, and Daily Independent) published in Bangladesh (Figure 1). Data from the selected parts were organized along with the variables and compiled into a master sheet. A total of 126 pieces of data were collected and analyzed using the Statistical Package for Social Sciences (SPSS) version 25 software.

### 2.3. Variables

Gender is the dependent variable in this study, and it is reported in the newspapers that were examined together with other factors (Table 1). Awareness of different facets of suicide risk and behaviour requires an awareness of gender as a basic component. In this study, a number of demographic and socioeconomic variables that have been found in other studies are regarded as predictor variables (Table 1). These predictor variables cover a wide range of characteristics, such as age, employment status, marital status, economic status, and educational background, among others. The study attempts to clarify the varying effects of demographic and socioeconomic

characteristics on suicide risk among different gender groups by looking at how these predictor variables connect to gender.



**Figure 1. Suicide data collected through desktop surveys of newspapers published in Bangladesh.**

**Table 1. Factors used for the study.**

<b>Response variable</b>	<b>Values</b>
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

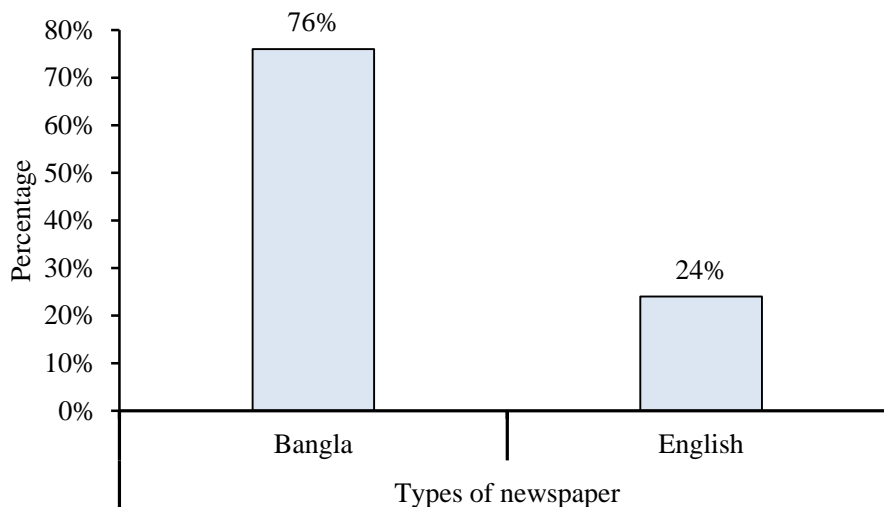
**2.4. Statistical analysis**

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. 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.

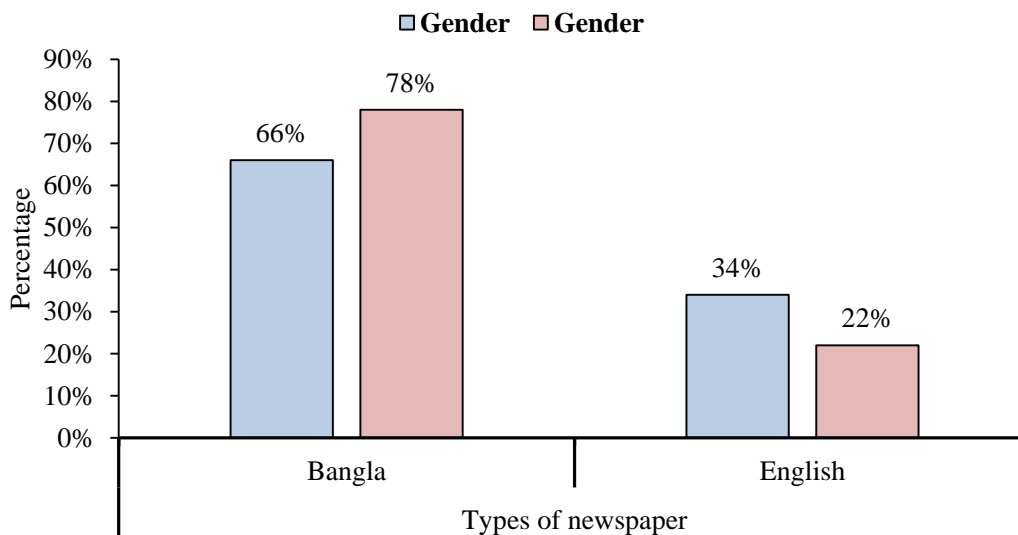
**3. Results**

A total of 126 cases were reported in 13 collected newspapers in 2021. Among them, 75 (59.50%) cases from Bangla Newspapers and 51 (40.50%) cases from English newspapers were included in the analysis (Figure 2).



**Figure 2. Percentage of suicidal cases by types of newspaper.**

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 (Figure 3).



**Figure 3. Percentage of suicidal cases by sex and types of newspaper.**

A total of 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 (Table 2).

**Table 2. Prevalence and Chi-Square test of attrition by different factors.**

Characteristics	Sex			P-value
	Male, n (%)	Female, n (%)	Total, n (%)	
<b>Newspaper types</b>				
Bangla	35 (46.70)	40 (53.30)	75(59.5)	0.018
English	30 (46.20)	21(34.40)	51(40.50)	
<b>Seasons</b>				
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)	
<b>Age</b>				
<30	51 (78.50)	50 (82.00)	101(80.20)	0.062
>=30	14 (21.50)	11 (18.00)	25 (19.80)	
<b>Division</b>				
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 (7.20)	
Mymensingh	6 (9.20)	4 (6.60)	10 (8.00)	
<b>Occupation</b>				
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)	
<b>Methods of suicide</b>				
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)	
<b>Causes of suicide</b>				
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)	

Age is a crucial factor in suicide cases, with individuals under 30 having higher odds (OR=1.24, 95% CI: [0.51-3.01]) of committing suicide. Employment status also influences suicide rates, with employed individuals having 1.28 times higher odds (OR=1.28, 95% CI: [0.87-2.41]) compared to the unemployed. Significant variations in suicide rates are observed across different divisions in Bangladesh. For instance, Khulna has an odds ratio of 1.05 (OR=1.05, 95% CI: [0.45-1.42]), while Chittagong has the lowest rate, with 76% lower odds (OR=0.24, 95% CI: [0.18-0.41]) compared to Sylhet (Table 3).

**Table 3. Prevalence and Chi-Square test of attrition by different factors.**

Characteristics	COR (95% CI)	P-value	AOR (95% CI)	P-value
<b>Newspaper types</b>				
Bangla	1.63 [1.19-2.35]	0.038	1.87 [1.36-2.05]	0.011
English	Reference		Reference	
<b>Seasons</b>				
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	
<b>Age</b>				
<30	1.24 [0.51-3.01]	0.062	1.35 [0.52-3.48]	0.053
>=30	Reference		Reference	

Table 3. Contd.

Characteristics	COR (95% CI)	P-value	AOR (95% CI)	P-value
<b>Division</b>				
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	
<b>Occupation</b>				
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	
<b>Methods of suicide</b>				
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	
<b>Causes of suicide</b>				
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 method chosen for suicide significantly influences suicide rates. Hanging, poisoning, and jumping exhibit odds ratios of 1.75 (95% CI: [1.51-1.86]), 1.83 (95% CI: [0.79-1.98]), and 1.72 (95% CI: [1.53-1.97]), respectively, compared to self-harm methods among women. Moreover, specific causes of suicide notably contribute to the suicide rate. Family issues, mental stress, and blackmail demonstrate odds ratios of 2.82 (95% CI: [1.85-3.10]), 1.01 (95% CI: [0.89-1.12]), and 2.06 (95% CI: [1.99-2.15]), respectively, relative to physical illness among women.

#### 4. Discussion

The study examined 126 suicide instances that were reported in 13 Bangladeshi newspapers in 2021; 40.50% of the cases were in English media and 59.50% were in Bangla publications. Sixty-six percent of cases in Bangla publications and fifty-three percent of cases in English media were female. Significant correlations between a number of sociodemographic characteristics and suicide were found by the investigation. Interestingly, the factors that were found to be important predictors included age under 30, employment position, division of residency, mode of suicide (hanging mostly), and causes of suicide (blackmail and family troubles in particular). The relationship between many factors and the prevalence of suicide was investigated, including gender, the type of newspaper, the season, age, division, occupation, manner, and reason of suicide. The results emphasize the need of taking gender-specific risk variables into account in attempts to prevent suicide and the necessity of focused interventions catered to various demographic groups.

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 favour 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 behaviours 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; Ferdushi *et al.*, 2023). Early exposure to traumatic events like childhood maltreatment and bullying increases (Islam *et al.*,

2022), vulnerability to suicidal behaviours in both genders, influencing psychopathology and maladaptive personality features (O'Brien and Sher, 2013). Childhood abuse is linked to a lack of social support, (Hasan *et al.*, 2023a) risky health behaviours, and poor mental health (Sheikh *et al.*, 2016). Traumatic experiences in childhood are associated with a heightened risk of health-harming behaviours (Hasan *et al.*, 2023b), 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. Despite gender differences, the study highlights that socioeconomic factors—education, income, employment, and social assistance—are universally linked to suicide attempts, emphasizing the critical role of economic conditions in suicide risk (Lorant *et al.*, 2005).

Our study reveals a gender-specific link between marital status and suicide attempts: being widowed, divorced, or separated increases the risk for males but reduces it for females (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.

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. Research on youth suicidal behaviour should delve into gender differences, emphasizing longitudinal studies examining sociodemographic factors (e.g., socioeconomic status, ethnicity). Further investigation into academic and protective factors, access to means, externalizing problems, family history of mental disorders, and abuse is crucial for both genders. For females, focus on abuse and family history of mental disorders; for males, on relationship problems, bipolar disorder, and eating disorders. Understanding gender-specific pathways is key to reducing suicide mortality. Preventive strategies must consider gender preferences and context, assessing 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.

## 5. Conclusions

The study emphasizes how urgent it is to create a nationwide suicide surveillance system in Bangladesh in order to address the country's high suicide rates. It draws attention to the relationship that exists between suicide thoughts and elements like stress, anxiety, sadness, age, and hopelessness. Important conclusions highlight the need for focused intervention programs that address hopelessness and depression, especially in young people, in order to reduce the rising suicide rate. Suicide prevention initiatives also need to target issues like smoking, violence prevention, racial bias prevention, and health coverage. The impact of gender-related risk variables on the prevention of suicide, such as urban upbringing and parental emotional disorder, has to be further studied. Given its potential impact on the future of the country, early intervention is crucial, highlighting the significance of empowered youth as leaders in efforts to prevent suicide.

## Data availability

All the data used in this research will be made available with the authors' permission.

**Conflict of interest**

None to declare.

**Authors' contribution**

Mir Farjana Sharmin: conducted the research and prepared the draft manuscript. Anik Kumar Saha: assisted the research and manuscript preparation. All authors have read and approved the final manuscript.

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