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Prevalence and Associated Risk Factors of Suicidal Tendencies Among Bangladeshi Public University Students: A Mixed-Methods Exploration

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ABSTRACT

Background and Aims: This study investigates the prevalence and associated risk factors of suicidal tendencies among public university students in Bangladesh.

Methods: This study design was employed with a total of 200 participants (male: 118; female: 82). Data collection utilized a mixed-methods approach, combining online and offline surveys with in-depth interviews. The survey instrument captured socio-demographic characteristics, risk factors for suicidal tendencies, prevalence, perception levels, and potential mitigation strategies. Data were analyzed using IBM SPSS 26 and NVivo 12 software.

Results: Multinomial logistic regression identified significant associations between suicidal tendencies and age ($p < 0.002$), screen time ($p < 0.047$), and the interaction of prevalence level with age ($p < 0.004$). Additional findings revealed strong relationships between cyberbullying and suicide with income ($p < 0.02$), media contagion effect with income ($p < 0.024$), and age with suicidal cases inducing suicidal tendencies ($p < 0.034$). Correlation analyses highlighted cyberbullying, stressful life events, media contagion, screen time, and easy access to suicide-related information as key contributors to suicidal behavior (mean = 0.364).

Conclusion: This study underscores significant associations between suicidal tendencies and factors such as age, income, cyberbullying, media contagion, online platforms, and access to suicide-related information. The findings emphasize the need for targeted interventions addressing these determinants to mitigate the rising incidence of suicidal tendencies among university students.

1 | Introduction

Suicide is the second leading cause of death among adolescents and young adults after motor vehicle accidents [1]. However, suicide is so fatal that it should be considered a significant issue. There has been an alarming rise in student suicides globally, including in Bangladesh, and the causes of this crisis are little understood [1]. One of the world's most pressing public health concerns, suicide claims the lives of over 800,000 people annually across all age categories [2]. Among these suicides, 79% take place in nations with low or medium incomes, such as Bangladesh [2]. Death by suicide ranks second only to accidental injuries among people aged 15–29, the majority of whom are students [2].

Nurul Islam Uzzal and Md. Al Mamun are Joint first authorship. They contributed equally to this paper.

Globally, suicide is a major and intricate issue. Some 800,000 people take their own lives each year [3], 10–20 million try to end their own lives, and 50–120 million are touched by the suicide of someone they know [4]. Worldwide, 14.7% Years of Life Lost of all deaths are attributable to suicide and self-harm, which results in 22.5 million due to early death [5]. According to a Forbes study, correlation exists between the countries ranked as the happiest nations and suicide rates. Norway, Denmark, Finland, Australia, New Zealand, Sweden, Canada, Switzerland, the Netherlands, and the United States ranked as the top 10 happiest countries, all of which had correspondingly higher suicide rates [6]. One study in Ontario, Canada found that 10.8% of primary education students had suicidal ideation and 3% having attempted suicide in the past 12 months [7]. Among the most pressing public health concerns worldwide, suicide is disproportionately prevalent in Asia. Nearly 60% of all suicides happen in Asia, with 40% of those happening in China, 40% in India, and 12% in Japan [8]. Suicidal thoughts and actions are greatly influenced by Bangladesh's socio-cultural and economic climate, especially among at-risk populations like college students. Research in nations with comparable cultural, political, and social environments, like Iraq, has shown that economic instability, social norms, and social demography all interact to influence suicide ideation and behaviour [9]. Similar to the difficulties encountered in Bangladesh, research conducted in Iraq has highlighted the multifaceted nature of socio-religious elements and the availability of mental health services.

Suicides in Bangladesh are now happening every day [10]. Statistics from the Bangladeshi police show that 1109 persons took their own lives in 2017. This equates to about 30 suicides per day [11, 12]. The susceptibility of Bangladeshi students to suicide has been investigated in a small number of retrospective studies that have made use of media reporting. One study found five suicides among University of Dhaka students in 10 days [13], while another found thirteen suicides among medical science students in Bangladesh over 23 months [14]. Additionally, between January 2018 and June 2019, 56 occurrences of public university students suicide were documented in Bangladesh [14]. According to the Bangladeshi Newspaper of Daily Star, there were 85 suicidal cases among university students in 2022, while the number was 62 in 2021 [2]. The reason behind this was the mental traumatic situation imposed by the covid-19. Besides COVID-19, increased social, media addiction, cyberbullying, stress, anxiety, traumatic situation, relationship breakdown, financial losses, fear of future and family pressures have also been liable for the increment of suicidal cases [14–16].

When compared to other demographics and periods, university students from Bangladesh are thought to have an exceptionally high suicide risk [16]. Social media are now integral to every facet of modern life and can no longer be separated. The rise in adolescent social media use has coincided with an increase in suicide, attempted suicide, and intentional self-harm [17]. Perceptions, patterns, risk factors, and prevalence of suicidal behavior are being changed due to urbanization, globalization, and digitalization. Earlier female gender, being a fifth-year student, having a lower socioeconomic situation, experiencing trauma, and having a family history of suicide and depression were all identified as risk factors for suicidal thoughts among university students in Bangladesh [18]. Spending more time on social networking sites brought more harmful effects, for instance, feelings of depression, suicidal thinking, and unmet needs for help [19].

A cross-sectional study conducted among University of Dhaka students indicated a correlation between suicidal ideation, loneliness, hopelessness, and depression [20]. However, the study did not specifically examine suicide attempts or completed suicides, and it was limited to a single university student. There has been an upsurge in studies addressing the issue of suicide behavior among teenagers, with a focus on the correlation between excessive screen time and social media usage. Suicide seems like a permanent answer to emotionally fragile adolescents. The societal hazard of suicide is substantial and has detrimental effects on families and society as a whole, regardless of age or setting. The topic of suicide is becoming an increasingly pressing social concern in Bangladesh, even if media coverage of the problem is limited. The present social climate necessitates an investigation into the incidence and risk factors of suicidal thoughts and behaviors among public university students in Bangladesh. The broad objective of this is to dealt with the prevalence and associated risk factors of suicidal cases from university students' perspectives. Besides, it put emphasis on association between suicidal factors and suicidal situation. Moreover, this study entails chi-square test, multinominal logistic regression, reliability statistics and in-depth interviews to scrutinize overall suicidal facts and tendencies among university students. The research will identify important areas for future studies by analyzing particular demographic factors, mental health issues, and environmental pressures. Social agencies, including mental health groups and student support services, will benefit from the results since they will offer light on the reasons behind student suicides. University students in Bangladesh can benefit from this information since it will help organizations to develop more effective intervention programs and better support services, which will help to decrease the suicide rate and improve students' mental health.

2 | Theoretical Foundation

This study draws on established theoretical perspectives to explore the interaction of societal, psychological, and behavioral factors contributing to suicidal tendencies. By focusing on cyberbullying, economic stress, and relationship problems, this framework contextualizes these factors within the Bangladeshi socio-cultural and economic landscape, offering insights into why they are hypothesized to predict suicidal behaviors.

2.1 | Social Integration and Regulation

Durkheim's theory of suicide [21] provides a foundational lens to understand the societal context influencing suicidal tendencies. According to Durkheim, disruptions in social integration and regulation lead to heightened vulnerability to suicide. In the Bangladeshi context, where strong familial and community ties traditionally mitigate individual distress, changes in societal norms, urbanization, and economic pressures weaken these protective structures. For instance, economic stress, a prevalent issue in Bangladesh due to income disparity and unemployment, can erode social bonds and increase isolation, amplifying suicidal ideation [18]. Furthermore, the stigma associated with relationship

breakdowns in a conservative society often results in reduced social support, aligning with Durkheim's framework of egoistic suicide caused by diminished integration.

2.2 | Psychological Vulnerabilities and Cyberbullying

Joiner's interpersonal theory of suicide (2005) highlights the role of thwarted belongingness and perceived burdensomeness in suicidal behavior [22]. In the digital age, cyberbullying intensifies these psychological vulnerabilities. In Bangladesh among university students, increasing internet penetration and social media usage expose students to cyberbullying, where public shaming and harassment exacerbate feelings of isolation and burden. Victims of cyberbullying often experience chronic stress, reinforcing a sense of alienation and inadequacy [13]. These experiences resonate with Joiner's assertion that the capacity for self-harm develops through prolonged exposure to pain and abuse, contributing to a higher risk of suicide.

2.3 | Behavioral and Environmental Influences

The interaction of relationship problems and economic stress with environmental factors can be understood through behavioral theories, such as the media contagion effect [23]. In Bangladesh, societal norms place significant emphasis on family and marriage, making relationship failures highly stigmatized. This stigma can lead to social withdrawal, reinforcing feelings of hopelessness. Similarly, economic stress, exacerbated by financial insecurity, aligns with Beck's cognitive theory of depression [24], where negative self-schemas and hopelessness contribute to suicidal thoughts. These stressors are magnified by exposure to idealized portrayals on social media, perpetuating dissatisfaction and feelings of inadequacy [18–20].

These factors often overlap and interact, creating a cumulative effect (see Figure 1). For example, economic stress may limit access to resources, increasing dependence on family or partners, thereby exacerbating relationship tensions. Simultaneously, cyberbullying can erode self-esteem, making individuals more vulnerable to the impacts of economic and relational stress. The Bangladeshi socio-economic structure, marked by limited mental health resources and pervasive stigma surrounding suicide, further intensifies these risks.

3 | Materials and Methods

3.1 | Study Setting and Design

Mixed research design was agreed to carry out the study. For further illustration, survey method for quantitative and in-depth interview for qualitative was used to gather necessary data. Among undergraduate and graduate students at public universities in Bangladesh, this mixed-methods study was carried out from July 30 to December 30, 2023, to evaluate the prevalence and associated risks of suicidal tendencies among public university students. The data for this study were from mixed-method approach that relied on survey and in-depth interview. As per the University Grant Commission (UGC) annual report (2020), 46 public universities can be found in Bangladesh. The total number of students enrolled in public universities is 43,62,187. The study population was thus 43,62,187 [25]. Suicidal facts prevailed among all educational institutions. But mostly university students were the worst sufferers. In addition, only four universities were selected due to budget and time limitation. Moreover, geographical factors, statistical complexity, data management procedure, ethical barriers, and existing suicidal rates also prompted my selection. The chosen universities were Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Dhaka University, Khulna University, and Shahjalal Science and Technology University. This study was reviewed and approved by the Institutional Review Board (IRB) of the Department of Sociology, Gopalganj Science and Technology University (GSTU), Gopalganj-8100, Bangladesh. The approval number for this research is GSTU/SOC/IRB/2025/027. All procedures performed in this study involving human participants were in accordance with the ethical standards of the IRB at GSTU and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Written informed consent was obtained from all participants prior to their inclusion in the study, and data confidentiality was rigorously maintained.

3.2 | Sampling and Sample Size Determination

University premises involve both male and female students. Since, suicidal tendencies vary from gender perspectives, stratified sampling technique was used to determine the respondents. The sample size calculation was based on the following assumption: taking P as the prevalence of suicidal tendencies from a previous study (15.4%) [16], confidence level of 95%, and 5% margin of error. Based on these assumptions, the actual sample size for the study was computed using the following formula for a single population proportion [26].

$$\text{The formula is} \quad \left[n_0 = \frac{Z^2 pq}{e^2} \right]$$

Where, n_0= sample size, Z^2= reliability coefficient for 95% confidence interval (1.96),

P = prevalence of suicidal tendencies from a previous study (15.4%), $q = 1-p$ and e = margin of error (5% = 0.05).

Then, $n = (1.96)^2 \times 0.13/(0.05)^2$

The required sample size was 200.

We have mentioned that sample size (p) was selected based on a previous study. The sample size of 200 participants was determined based on practical considerations, including time constraints, resource availability, and the sensitive nature of the topic, which often poses challenges in participant recruitment. While this may appear modest, it is important to note that the study aimed to achieve a balance between quantitative rigor and qualitative depth.

In addition, the mixed-methods design of the study provides a robust framework for understanding the nuances of suicidal tendencies. The quantitative component offers statistical insights, while the qualitative interviews enrich the findings by exploring individual and contextual factors that may not be captured by numerical data alone.

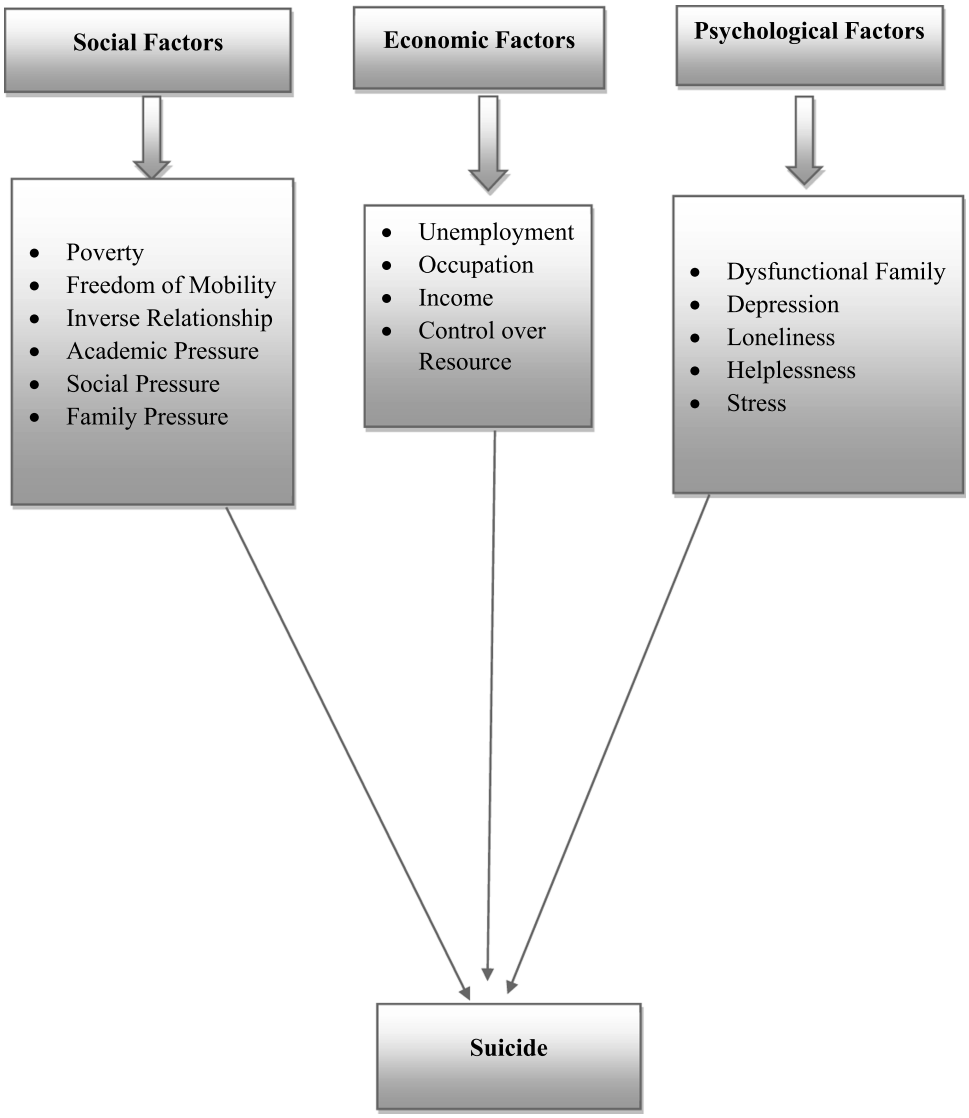

FIGURE 1 | Conceptual framework of the study (*Source:* Authors illustration).

Among the existing 46 public universities, we have selected 04 universities based on suicidal ideation, geographical proximity, and availability of data. The primary reason for focusing solely on public university students was the scope and feasibility of this study, considering the available resources and time constraints. Public universities in Bangladesh typically represent a more socio-economically diverse student population compared to private universities. This diversity allowed us to explore a broader spectrum of risk factors and their associations, such as income levels and family-related cases. Additionally, public and private universities often differ significantly in terms of tuition fees, socio-economic demographics, and campus culture, which may affect the prevalence and nature of suicidal tendencies. In addition, budget, time, and greater promiscuity of data forced us to continue this study among public university students.

Stratified sampling techniques were used to select the required sample from the population. The sampling distribution were from Bangabandhu Sheikh Mujibur Rahman Science and Technology University ($n = 69$), Dhaka University ($n = 46$), Khulna University ($n = 41$), and Shahjalal Science and Technology University ($n = 44$).

3.3 | Statistical Analysis

Data analysis was performed using IBM SPSS version 26 (Statistical Package for Social Science) and NVivo software 12. Numerical data were expressed as frequency (N), standard deviation (SD), minimum and maximum, and categorical data as numbers (n) and percentage (%). Qualitative data were transcribed and included based on themes. Whether the variables were normally distributed or not was determined by the Kolmogorov–Smirnov test and Shapiro–Wilk test. In quantitative two-category data, the difference was analyzed using the Student's t-test when normal distribution assumptions were met and the Mann–Whitney U test when not. Data manipulation requires accuracy and careful justification of the statistical methods employed. Parametric tests, such as t-tests and z-tests, have specific assumptions, including normal distribution and continuity of data. Since our dataset did not meet these assumptions, we employed alternative statistical methods better suited to the characteristics of the data (e.g., chi-square test, reliability test, and multi-nominal logistic regression). The difference between nominal variables such as "cyberbullying and suicide" with "monthly income," "age with suicidal information

induced suicidal tendencies among students and monthly income with media contagion effects were examined using the chi-square test. Multinomial logistic regression analysis was performed to determine the effect of the agent on changing suicidal patterns of the respondents on the age, duration of using media platforms, and suicidal prevalence level. In addition, an internal consistency reliability test (*Cronbach's Alpha*) was used to assess the association between suicidal tendencies, cyberbullying, cyberbullying, media contagion effect, and suicidal means. Data were evaluated over a 95% confidence interval and $p < 0.05$ significance value.

4 | Results

4.1 | Key Variables of the Study

The participants as well as study's key variables are shown in Table 1. The sample comprised of both dependent and independent variables particularly suicidal agents, suicidal prevalence level, cyberbullying, media contagion effect, coping mechanism with stressful situations and suicidal information as dependent variables and independent variables were age, gender, university name, duration, and monthly income.

4.2 | Participant's Socio-Demographic Characteristics

The participants' characteristics and socio-demographic variables are shown in Table 2. The sample comprised of 59% males and 41% females from four selected study area. At the same time, it shows that 37% of respondents were from cities, while 63% from countryside. A total of four public universities in Bangladesh were considered for the survey based on time, budget, geographical barriers, and data management. The remaining responders were from KU (20.5%), SUST (22%), and DU (23%), with 34.5% hailing from BSMRSTU. In addition, it assessed characteristics related to monthly family income and approximately 24.5% of respondents' family income fell into the "15,001–20,000" income category, while 23.5% fell into the "> 25,000" category.

To evaluate individual response towards a social problem age become a major variable. Perceptions and conceptualization of individual varies due to age difference. 21% respondents were belonging to age level 21 and 23, respectively. 18% respondents were belonging to 20 age categories. People in the 26-year-old age made up the smallest percentage of responses (0.5%). 11.5% respondents were from age category 19. The remaining participants belonged to the following age groups: 22 (14%), 24 (8.5%), and 25 (5.5%). 41% of students surveyed spent 3 to 4 h daily interacting with various online platforms, particularly Facebook. On the other hand, 23.5% of students spent 5–6 h on Facebook, and 13% spent more than 7hours on the site.

4.3 | Analysis of Contributors, Factors, and Patterns of Suicidal Tendencies

Why is the suicide rate so high in today's world? Here Table 3 delves factors and contributors to suicidal behavior were crucial to this discussion. According to the data in the table above, 29% of people think that issues in relationships were a major factor. There were also 22.5% who cited economic considerations and 19% who cited personal factors (others) as significant causes. In addition, when asked what factors could lead to suicide thoughts or actions, 35.5% cited career pressures and 22.5% cited interpersonal issues. When asked what circumstances might lead to suicidal thoughts or actions, the fewest people cited family history (4% of respondents) and gaming addiction (4.5%). Sudden premature deaths fluctuate with time. Scientists

TABLE 1 | Measurement of the variables.

Variable type	Variable	Measurement
Dependent	Suicidal Agents	Measured as EF, TF, CD, LSA, RP, and Others.
	Suicidal Prevalence Level	Measured as IS, IS, RS, DS, DS, and NS.
	Coping mechanisms with stressful situations	Measured as friends & family, physical exercise, professional help, using technology and limiting stressors
	Suicide and cyberbullying are related	Measured as SA, A, N, DA, and SD
	Media contagion effect has an association with suicidal tendencies	Measured as SA, A, N, DA, and SD
	Hearing about a suicide induced suicidality	Measured as SA, A, N, DA, and SD
Explanatory/ Independent	Monthly Income	Measured in BDT
	University Name	Measured (conceptualized) as BSMRSTU, KU, SUST, and DU
	Age	Measured as 19, 20, 21, 22, 23, 24, 25, and 26
	Gender	Measured as male and female
	Duration	Measure as less than 1, 1–2, 3–4, 5–6, and more than 7 h.

Note: A, Agree; CD, Cultural deviance; DA, Disagree; DS, Decreased significantly; DS, Decreased somewhat; DU, Dhaka University; EF, Economic factors; IS, Increased significantly; IS, Increased somewhat; KU, Khulna University and BSMRSTU, Bangabandhu Sheikh Mujibur Rahman Science and Technology University; LSA, Lack of social agency; N, Neutral; RP, Relationship problems; RS, Remained the same; SA, Strongly agree; SD, Strongly disagree; SUST, Shahjalal Science and Technology University; TF, Technological factors.

TABLE 2 | Distribution of respondents with socio-demographic variables ($N = 200$).

Demographic information			
Characteristics	Categories	Frequency (n)	Percentage (%)
Gender	Male	118	59%
	Female	82	41%
Residence	Urban	74	37%
	Rural	126	63%
University	BSMRSTU	69	34.5%
	KU	41	20.5%
	SUST	44	22%
	DU	46	23%
Age	19	23	11.5%
	20	36	18%
	21	42	21%
	22	28	14%
	23	42	21%
	24	17	8.5%
	25	11	5.5%
	26	1	0.5%
Monthly income	5000–10,000	44	22%
	10,001–15,000	28	14%
	15,001–20,000	49	24.5%
	20,001–25,000	32	16%
	> 25,000	47	23.5%
Duration of using Online Platforms	Less than 1 h	4	2%
	1–2 h	41	20.5%
	3–4h	82	41%
	5–6 h	47	23.5%
	More than 7 h	26	13%

Abbreviations: DU, Dhaka University; KU, Khulna University and BSMRSTU, Bangabandhu Sheikh Mujibur Rahman Science and Technology University; SUST, Shahjalal Science and Technology University.

found that the greatest danger was to young people. Nowadays, suicide pacts, clusters of suicides, and cybercides are all too common. 28% of respondents who took the survey mentioned cybercrime, clustering, and suicide pacts as suicide methods they saw nowadays. Suicide due to an overdose or a fall from a great height was reported by 21.7% of respondents, while 14% cited relationship problems or depression as the reason, and 14% cited financial or academic pressures as the reason.

4.4 | Mental Health Issues

High levels of stress, anxiety, and depression are common among students, often due to academic pressures, lack of support, and personal issues. Major depressive disorder (MDD) is associated with a number of negative life events, including but not limited to: feeling helpless, losing a loved one, going through a breakup, having problems with family or friends, doing poorly on an exam, experiencing economic hardship, severe emotional pain, being unemployed, being a victim of cyberbullying, being addicted to media, and bullying.

> *The majority of students attending public universities do not receive sufficient funding to cover both their living expenses and the cost of their education. This makes it so they can't keep their lives under control, and their irritation levels rise over time.*
>
> (IDI_5)

4.5 | Relationship Problem

Nowadays, most university pupils are too absorbed in their phones and computers to bother with extracurriculars. This means that when things are tough, they have no one to talk to. A participant in the study put forward the following:

> *One of my first-year classmates took his own life after a breakup. Afterwards, the other pupils would assume that the family's unfavorable attitude was the cause of the deceased's demise.*
>
> (IDI_1)

TABLE 3 | Contributors and factors of suicidal tendencies ($N = 200$).

Characteristics	Categories	Frequency	Percentage (%)
Strong contributors to suicidal behavior	Economic crisis	45	22.5%
	Unemployment	28	14%
	Relationship problems	58	29%
	Academic failures	15	7.5%
	Sexual harassment	16	8%
	Others	38	19%
	Total	***N* = 200**	**100%**
Factors prompting suicide among public university students	Screen time	17	8.5
	Game addiction	9	4.5
	Suicide endorsing site	10	5.0
	Both I & III	27	13.5
	Drug addiction	13	6.5
	Family history	8	4.0
	Relationship problem	45	22.5
	Career stress	71	35.5
	Total	***N* = 200**	**100%**
Patterns of modern days suicide	Cybercide, suicide pact, and suicide clusters	37	28.7%
	Overdose; Jump from roof	28	21.7%
	Electrical shock and poisoning	13	10.1%
	Economic crisis, academic stress, and social problems	18	14%
	Relationship, family problems, and depression	18	14%
	Sexual harassment and ganging	15	11.6%
	Total	***N* = 200**	**100%**

A life consumed by selfishness and reliant on technology is a contributing factor to his despair, which ultimately leads to his tragic fall down. Isolation from society is a later consequence of screen addiction. We get estranged from society due to our heavy reliance on technology.

(IDI_2)

4.6 | Economic Problem

Most public university students in Bangladesh come from lower-middle-class households, which puts them in a difficult financial position. Maintaining a stress-free environment is crucial for students to focus on their studies. Their frustration stems from the fact that they come from a lower-income family and have been unable to secure employment following their graduation.

Suicide is more common among undergraduate and graduate. Mental agility is often lost by the graduate. Their vulnerability is exacerbated by the pressure to shoulder the burdens of their family.

(IDI_3)

A resident of Narayanganj named Ismail (pseudonym) has just earned a degree in public administration from Shahjalal Science and Technology University. He is having an affair with a fellow student. While he was studying for a job test one night, his soulmate called to tell him she was getting married. The financial and familial circumstances of Ismail were not ideal. Also, he wasn't exactly flush with options when it came to rescuing his beloved. Because of that, he became somewhat anxious and irritated. A while later, he ran away from his family and took a job as a hired hand. His career misery was solely caused by relationship troubles and economic crisis.

(IDI_6)

4.7 | Social Condition and Stigma

A number of social, psychological, and environmental factors contribute to the disturbing trend of student suicide attempts. In order to create successful strategies for prevention and intervention, it is essential to understand these underlying disorders and the stigma that surrounds mental health.

People visit doctors and take medication when they are sick with fever or any other bodily disease. Society severely criticizes and bullies' mental health issues since no one wants to comprehend them as seriously as physical health problems.

(IDI_4)

At the very beginning of my first year, I was ragged by senior students. I was absent from class for a long time and I was so worried about my academic life. At that time my anxiety and frustration enforced me to take suicidal attempts.

(IDI_7)

4.8 | Multinominal Logistic Regression Analysis of Suicidal Agents With Suicidal Prevalence Level Age and Duration

Multinominal logistic regression is used to predict a nominal dependent variable given one or more independent variable. In this study, multinominal logistic regression test was used to access the association between suicidal agents with respect to suicidal prevalence level, age, and duration of the respondents. The required hypotheses were

H_o: There was no significant impact in the agent for changing suicidal patterns of the respondents on the age, duration of using media platforms and suicidal prevalence level.

H_A: There was a significant impact in the agent for changing suicidal patterns of the respondents on the age, duration of using media platforms and suicidal prevalence level.

In addition, multinomial logistic regression test showed age, duration, and suicidal prevalence level had a strong relationship with agents of suicide (age < 0.002; screen timing < 0.047; prevalence level * age < 0.004).

4.9 | Association Between Suicidal Agents, Suicidal Prevalence, Age and Duration of Using Online Platforms

Table 4 was used to analyze the preliminary association between independent (duration and age) and dependent (suicidal agents) variables. Here (Q31 suicidal prevalence changed due to technological factors*age) was significant but age*duration wasn't significant. The chi-square statistic Q31*age was significant (47.718, $p < 0.004$) indicating that this interaction had a significant effect on the agent for changing suicidal patterns. The model fitness was assessed using the Chi-square statistics. The chi-square value was 58.375 and $p < 0.05$. This identifies that there is a significant relationship between the dependent variable [Q32 (agents for changing Suicidal Patterns)] and independent variables [Q18 (duration) and Q8 (age)] in the final model. The Pearson (373.885) and deviance (319.064) statistics test proved that the model is fit. Since the test weren't statistically significant that is the $p > 0.05$. The likelihood ratio test proved that the independent variables like duration and age*suicidal prevalence level of the respondents was significant which proved that these predictors contribute significantly to the final model.

Table 5 shows that age and duration of using online platforms had a significant association with suicidal agents and suicidal prevalence level. The results indicated that duration of using online platforms had an association with economic factors and respondents more likely to select it as suicidal agents than other factors (OR = 2.333; 95% CI = 1.109–4.908, $p = 0.026$). As duration increased by 2.333 unit the odds ratio/probability to select economic factors compared to technological, cultural, social agency, and relationship problems was more by 2.33 times. The odds ratio of a respondent whose age increases with increased significantly criteria was likely to select economic factors relative to other factors was 1.122 times than those who select others. Similarly the odds ratio of a respondent whose age increases with increased somewhat criteria was likely to select

TABLE 4 | Association between changing suicidal patterns with age, duration of using social media, and prevalence level by using Multinominal Logistic Regression Model.

Basic terminology of multinominal logistic regression				
Dependent variable	Nominal scale data		Q32 (Agents for changing Suicidal Patterns)	
Independent variable	Covariates (continuous)		Q18 (Duration) and Q8 (Age)	
Factors	Categorical		Q31 (Suicidal prevalence due to technological factors)	
	Effects	Chi-square	*df*	Sig.
Step Summary	Intercept, age (in years), duration			
	Did suicidal rate increase due to technological advancements? * Age (in years)	47.718	25	0.004*
Model Fitting Information		58.375	35	0.008*
Goodness-of-Fit	Pearson	373.885	365	0.363*
	Deviance	319.064	365	0.960*
Likelihood Ratio Tests	Duration	11.232	5	0.047*
	Age* Suicidal prevalence level	47.718	25	0.004*

Note: Here, the symbol (*) usually indicate positive and significant relationship.

TABLE 5 | Parameter estimates (suicidal agents, suicidal prevalence level, age, and duration) [$N = 200$].

Agents		*B*	Std. Error	Wald	*df*	Sig.	Exp(B)	95% confidence interval for Exp(B)	
								Lower bound	Upper bound
Economic Factors	Intercept	−1.065	4.036	0.070	1	0.792			
	Age (in years)	−0.080	0.188	0.180	1	0.671	0.923	0.639	1.334
	Duration	0.847	0.379	4.982	1	0.026*	2.333	1.109	4.908
	[I.S = 1] * Age	0.115	0.036	10.037	1	0.002*	1.122	1.045	1.205
	[I.S = 2] * Age	0.092	0.043	4.676	1	0.031*	1.096	1.009	1.192
	[R.S = 3] * Age	0.853	119.343	0.000	1	0.994	2.347	6.099E − 102	9.032E + 101
	[D.S = 4] * Age	0.887	154.548	0.000	1	0.995	2.427	6.815E − 132	8.643E + 131
	[D.S = 5] * Age	−1.029	7988.827	0.000	1	1.000	0.357	0.000	.
	[N.S = 6] * Age	0[c]	.	.	0	.	.	.	.
Technological Factors aTechnological Factors	Intercept	−1.705	4.194	0.165	1	0.684			
	Age (in years)	−0.105	0.195	0.287	1	0.592	0.901	0.614	1.321
	Duration	0.857	0.388	4.871	1	0.027*	2.356	1.101	5.042
	[I.S = 1] * Age	0.170	0.041	16.899	1	0.000*	1.185	1.093	1.285
	[I.S = 2] * Age	0.154	0.046	11.012	1	0.001*	1.167	1.065	1.278
	[R.S = 3] * Age	0.840	119.343	0.000	1	0.994	2.317	6.021E − 102	8.916E + 101
	[D.S = 4] * Age	0.888	154.548	0.000	1	0.995	2.431	6.825E − 132	8.657E + 131
	[D.S = 5] * Age	0.067	0.074	0.815	1	0.367	1.069	0.925	1.235
	[N.S = 6] * Age	0[c]	.	.	0	.	.	.	.
Cultural Deviance Cultural Deviance	Intercept	−0.372	4.693	0.006	1	0.937			
	Age (in years)	−0.101	0.218	0.214	1	0.643	0.904	0.589	1.387
	Duration	0.442	0.438	1.018	1	0.313	1.556	0.659	3.670
	[I.S = 1] * Age	0.097	0.044	4.790	1	0.029*	1.101	1.010	1.201
	[I.S = 2] * Age	0.122	0.048	6.531	1	0.011*	1.129	1.029	1.240
	[R.S = 3] * Age	0.835	119.343	0.000	1	0.994	2.305	5.989E − 102	8.869E + 101
	[D.S = 4] * Age	0.907	154.548	0.000	1	0.995	2.478	6.957E − 132	8.824E + 131
	[D.S = 5] * Age	−1.024	0.000	.	1	.	0.359	0.359	0.359
	[N.S = 6] * Age	0[c]	.	.	0	.	.	.	.
Lack of Social Agency	Intercept	−8.666	5.147	2.834	1	0.092			
	Age (in years)	0.136	0.234	0.336	1	0.562	1.145	0.724	1.811
	uration	1.241	0.446	7.730	1	0.005*	3.458	1.442	8.290
	[I.S = 1] * Age	0.109	0.047	5.299	1	0.021*	1.115	1.016	1.224
	[I.S = 2] * Age	0.134	0.051	6.947	1	0.008*	1.143	1.035	1.263

(Continues)

TABLE 5 | (Continued)

Agents		*B*	Std. Error	Wald	*df*	Sig.	Exp(B)	95% confidence interval for Exp(B)	
								Lower bound	Upper bound
	[R.S = 3] * Age	0.911	119.343	0.000	1	0.994	2.488	6.465E − 102	9.574E + 101
	[D.S = 4] * Age	0.930	154.548	0.000	1	0.995	2.535	7.119E − 132	9.029E + 131
	[D.S = 5] * Age	−1.024	0.000	.	1	.	0.359	0.359	0.359
	[N.S = 6] * Age	0[c]	.	.	0	.	.	.	.
Relationship Problem	Intercept	−3.461	4.199	0.680	1	0.410		0.678	1.453
	Age (in years)	−0.007	0.194	0.001	1	0.970	0.993	1.158	5.332
	Duration	0.910	0.390	5.461	1	0.019*	2.485	1.051	1.223
	[I.S = 1] * Age	0.126	0.039	10.437	1	0.001*	1.134	1.054	1.251
	[I.S = 2] * Age	0.138	0.044	10.058	1	0.002*	1.148	6.230E − 102	9.225E + 101
	[R.S = 3] * Age	0.874	119.343	0.000	1	0.994	2.397	6.687E − 132	8.482E + 131
	[D.S = 4] * Age	0.868	154.548	0.000	1	0.996	2.382	0.000	[b]
	[D.S = 5] * Age	−1.018	8927.429	0.000	1	1.000	0.361		
	[N.S = 6] * Age	0[c]			0				

Note: Here, the symbol (*) usually indicate positive and significant relationship. The reference category is: Others.
Abbreviations: DS, Decreased somewhat; DS, Decreased significantly; IS, Increased significantly; IS, Increased somewhat; NS, Not sure; RS, Remained the same.

economic factors relative to other factors was 1.096 times than those who select others. Additionally, duration of using online platforms had association with lack of social agency, technological factors and relationship problem than other factors. Lack of social agency (OR = 3.458; 95% CI = 1.442–8.290, $p = 0.005$), technological factors (OR = 2.356; 95% CI = 1.101–5.042, $p = 0.0$) and relationship problem (OR = 2.485; 95% CI = 1.158–5.332, $p = 0.019$) were more likely to be selected as suicidal agents than others factors. As duration increased by 2.356 unit the odds ratio/probability to select technological factors compared to economic, cultural, social agency, and relationship problems was more by 2.356 times. The odds ratio of a respondent whose age increases with increased significantly criteria was likely to select technological factors relative to other factors was 1.185 times than those who select others. Similarly the odds ratio of a respondent whose age increases with increased somewhat criteria was likely to select technological factors relative to other factors was 1.167 times than those who select others. The odds ratio of a respondent whose age increases with increased significantly criteria was likely to select cultural deviance factors relative to other factors was 1.101 times than those who select others. Similarly the odds ratio of a respondent whose age increases with increased somewhat criteria was likely to select cultural deviance factors relative to other factors was 1.129 times than those who select others. As duration increased by 3.458 unit the odds ratio/probability to select lack of social agency factors compared to economic, cultural, technological and relationship problems was more by 3.458 times. The odds ratio of a respondent whose age increases with increased significantly criteria was likely to select lack of social agency factors relative to other factors was 1.115 times than those who select others. Similarly the odds ratio of a respondent whose age increases with increased somewhat criteria was likely to select lack of social agency factors relative to other factors was 1.143 times than those who select others. As duration increased by 2.485 unit the odds ratio/probability to select relationship factors compared to economic, cultural, technological, and social agency was more by 2.485 times. The odds ratio of a respondent whose age increases with increased significantly criteria was likely to select relationship factors relative to other factors was 1.134 times than those who select others. Similarly, the odds ratio of a respondent whose age increases with increased somewhat criteria was likely to select relationship factors relative to other factors was 1.148 times than those who select others. Moreover, duration of using online platforms had no association with cultural deviance. Finally, age had a significant association with suicidal prevalence level. ($\chi^2 = 47.718$, $df = 25$, $p > 0.004$).

4.10 | Association Between Media Contagion Effect, Cyberbullying, and Suicidal Information With Suicidal Tendencies (Chi-Square Test)

There has been a lot of focus on the media contagion effect, suicidal information, suicide, and cyberbullying recently because of the possible consequences it could have on the mental health and wellbeing of vulnerable groups, such students, as it relates to suicide. Serious concerns to public health, especially among teenagers and young people, include suicide and cyberbullying, which are interrelated problems. Scientific studies have demonstrated that media portrayals of suicide might heighten the likelihood of suicidal thoughts and actions

in vulnerable populations, a phenomenon commonly known as "suicide contagion." Depression, anxiety, and thoughts of suicide have all been associated with cyberbullying, which is defined as the use of cyber communication to harass, threaten, or otherwise abuse another person.

Table 6 indicated chi-square tests for independence with $p = 0.05$ to assess the association between demographic variables (age and income) and suicidal factors (media contagion, cyberbullying, and suicidal facts). The required value of $p = 0.024$ ($p < 0.05$) indicated a strong association between media contagion effect and suicidal tendencies with monthly income. In addition, the required value of $p = 0.02$ ($p < 0.05$) indicated a strong association between suicide and cyberbullying with monthly income. Furthermore, the required value of $p = 0.034$ ($p < 0.05$) indicated a strong association between age and suicidal information. to explore the hidden association between age and suicidal tendencies. To sum up, cyberbullying has more impact on students rather than media contagion and suicidal facts.

Table 7 shows internal consistency reliability test of attitudes towards suicidal related questions for variables Q37(cyberbullying),

TABLE 6 | Chi-square analysis for finding the association between socio-demographic variables and suicidal factors.

		Media contagion effect has an association with suicidal tendencies						
Variables	**Level**	**SA *N* = 32 (16%)**	**A *N* = 91 (45.5%)**	**N *N* = 61 (30.5%)**	***N* *N* = 61 (30.5%)**	**SDA *N* = 2 (1%)**	**Total *N* = 200**	**Chi-square/ likelihood ratio; *p*-value**
Income	5000–10,000	11 (34.4)	20 (22)	7 (11.5)	6 (42.9)	0 (0)	44 (22)	Chi-square/ Likelihood Ratio 29.031 $df = 16$ p value 0.024
	10,001–15,000	4 (12.5)	11 (12.1)	11 (18)	2 (14.3)	0 (0)	28 (14)	
	15,001–20,000	4 (12.5)	20 (22)	20 (32.8)	4 (28.6)	1 (50)	49 (24.5)	
	20,001–25,000	2 (6.3)	15 (16.5)	12 (19.7)	2 (14.3)	1 (50)	32 (16)	
	> 25,000	11 (34.4)	25 (27.5)	11 (18)	0 (0)	0 (0)	47 (23.5)	

a. 11 cells (44.0%) have expected count less than 5. The minimum expected count is 0.28. So, instead of chi-square we used likelihood ratio value since (44.0%) of cells have expected count less than 5.

		Suicide and cyberbullying both are related.						
Variables	**Level**	**SA *N* = 39 (19.5%)**	**A *N* = 86 (43%)**	**N *N* = 53 (26.5%)**	**DA *N* = 16 (8%)**	**SDA *N* = 6 (3%)**	**Total *N* = 200**	**Chi-square/ likelihood ratio; *p*-value**
Income	5000–10,000	11 (28.2)	12 (14)	16 (30.2)	5 (31.3)	0 (0)	44 (22)	Chi-square/ Likelihood Ratio 37.105 $df = 16$ $p = 0.002$
	10,001–15,000	5 (12.8)	14 (16.3)	9 (17)	0 (0)	0 (0)	28 (14)	
	15,001–20,000	6 (15.4)	21 (24.4)	15 (28.3)	5 (31.3)	2 (33.3)	49 (24.5)	
	20,001–25,000	2 (5.1)	18 (20.9)	4 (7.5)	5 (31.3)	3 (50)	32 (16)	
	> 25,000	15 (38.5)	21 (24.4)	9 (17)	1 (6.3)	1 (16.7)	47 (23.5)	

a. 10 cells (40.0%) have expected count less than 5. The minimum expected count is 0.84. So, instead of chi-square we used likelihood ratio value since (40.0%) of cells have expected count less than 5.

		Hearing about a suicidal case induced suicidal tendencies among students.						
Variables	**Level**	**SA *N* = 25 (12.5%)**	**A *N* = 56 (28%)**	**N *N* = 61 (30.5%)**	**DA *N* = 46 (23%)**	**SDA *N* = 12 (6%)**	**Total *N* = 200**	**Chi-square/ likelihood ratio, *p*-value**
Age	19	3 (12)	3 (5.4)	10 (16.4)	7 (15.2)	0 (0)	23 (11.5)	Chi-square value = 43.120 $df = 28$ $p = 0.034$
	20	5 (20)	10 (17.9)	13 (21.3)	7 (15.2)	1 (8.3)	36 (18)	
	21	7 (28)	9 (16.1)	13 (21.3)	11 (23.9)	2 (16.7)	42 (21)	
	22	0 (0)	13 (23.2)	6 (9.8)	6 (13)	3 (25)	28 (14)	
	23	10 (40)	12 (21.4)	10 (16.4)	7 (15.2)	3 (25)	42 (21)	
	24	0 (0)	8 (14.3)	5 (8.2)	3 (6.5)	1 (8.3)	17 (8.5)	
	25	0 (0)	1 (1.8)	3 (4.9)	5 (10.9)	2 (16.7)	11 (5.5)	
	26	0 (0)	0 (0)	1 (1.6)	0 (0)	0 (0)	1 (0.5)	

a. 22 cells (55.0%) have expected count less than 5. The minimum expected count is 0.06. So, instead of chi-square we used likelihood ratio value since (55.0%) of cells have expected count less than 5.

Note: If $p < 0.05$, then it signifies association and if $p > 0.05$, then it signifies no association. Socio-demographic variables: age and income; Suicidal factors: media contagion, cyberbullying, and suicidal facts.

TABLE 7 | Summary item statistics and reliability statistics.

	Mean	Min.	Max	Range	Max./Min.	Variance	N of Items
Inter-item correlations	**0.364**	0.228	0.497	0.269	2.182	0.008	4
Reliability statistics	Cronbach's alpha		Cronbach's alpha based on Standardized Items			N of Items	
	0.685		0.696			4	

Q38(media contagion effect), Q39 (online chatrooms, virtual bulletin boards, and forums), and Q40(suicidal information) were done. The standard value of Cronbach's Alpha should be above 0.7. However, the precondition was violated as there were < 10 questions. So instead of Cronbach's alpha, mean inter-item correlation was used. To sum up suicide, cyberbullying, media contagion effect, suicidal means (online chatrooms, virtual bulletin boards, forums, etc.) and easy availability of suicidal news had a strong correlation (mean inter-item correlation value = 0.364) between them.

5 | Discussion

In this study, the relationship between suicidal behavior with different variables were analyzed. The number of student suicides has increased globally, and Bangladesh is not an exception; however, the underlying causes are not well documented. Suicidal information also prompted suicidal tendencies among students. Similar result was revealed in another study that 76% of teens who are active on social media networks get their news from media [27]. The results indicated that duration of using online platforms had an association with economic factors and respondents more likely to select it as suicidal agents than other factors (OR = 2.333; 95% CI = 1.109-4.908, $p = 0.026$). Additionally, duration of using online platforms had association with lack of social agency, technological factors, and relationship problem than other factors. Lack of social agency (OR = 3.458; 95% CI = 1.442-8.290, $p = 0.005$), technological factors (OR = 2.356; 95% CI = 1.101–5.042, $p = 0.0$) and relationship problem (OR = 2.485; 95% CI = 1.158–5.332, $p = 0.019$) were more likely to be selected as suicidal agents than others factors. Moreover, duration of using online platforms had no association with cultural deviance. Finally, age had a significant association with suicidal prevalence level ($\chi^2 = 47.718$, $df = 25$, $p > 0.004$). Similar results were reported that relationship complexities are the major causes of suicides [28]. Besides, psychological factors coping style, impulsivity, personality, and so forth may influence suicidal tendencies among students [28, 29].

The correlation between cyberbullying and suicide with monthly income (0.02), media contagion effect with monthly income (0.024) and suicidal information with age (0.034) was found statistically significant. Other studies regarding it demonstrated that more than 90% of teens were estimated to own smartphones [30], and 95% of teens had mobile access to the Internet [31], allowing adolescents to communicate via methods that distribute information almost instantly, to potentially hundreds of people simultaneously, and without geographical limitations; consequently, the effects of media addiction may be even more far-reaching. Additionally, multinomial logistic regression test showed age, duration, and suicidal prevalence level had a strong relationship with agents of suicide (age < 0.002; screen timing < 0.047; prevalence level*age < 0.004). Moreover, people were more likely to engage in suicide-related actions due to age, and this risk increases with age [31]. The exact reverse was true in modern society. Suicide is the second leading cause of death among university students [31, 32].

Moreover, cyberbullying, media contagion effect, suicidal information, and online platforms had a strong association with suicidal tendencies (mean inter-item correlation value=0.364). Similarly, other studies found that social media had become a significant aspect of adolescents' lives. [33] It had both negative and positive effects on adolescents. First, media addiction had been linked to lower self-esteem and a lower tolerance for frustration and emotional distress in adolescents [34]. Second, adolescent media addicts may experience more stress as they struggled to fulfill their social and academic obligations [35]. Again it was also revealed in other studies that the risk variables of suicidal behaviors were identified as media coverage, social media use, sites promoting suicide, the media contagion effect, online chatrooms, forums, excessive screen time, etc [36]. In other studies it was restructured that a large number of young suicides have been associated with cyberbullying, according to reports in major media outlets [30]. Furthermore, utilizing text messaging might expedite the planning process and facilitate the formulation of suicide pacts, which in turn increases the likelihood that youth will commit suicide [37].

Since suicidal behavior acts as a byproduct of social and psychological factors, it has become an essential phenomenon in current society. Several papers argued that social media platforms can serve as both positive and negative influences on suicidal facts [28, 29]. There was an upsurge in both suicidal thoughts and actions among teenagers and the elderly [38].

6 | Study Limitations

Certain limitations exist in the current investigation. First, as the research was designed to be survey-based and cross-sectional, it is not possible to determine a cause-and-effect link between the factors. More importantly, the sample population did not exhibit gender parity. We also couldn't generalize the results too much because the survey only included four public universities. Part of this research was place in Bangladesh, a developing nation. Results should be interpreted with a development-level-specific assumption about the prevalence of social media and media addiction. In a multi-dimensional analysis, it has been found that suicidal thoughts and behavior's impact people on a social, physiological, and psychological level; however, the exact processes by which these effects manifest are uncertain. Notwithstanding this, there are a few positive aspects to our study. An examination of the literature revealed no study that dealt with suicidal tendencies using multivariate analysis. Because suicidal thoughts and behaviors

can have a wide range of biopsychosocial impacts on people, researchers believe that multivariate analysis of these tendencies can shed light on the prevalence of suicidal thoughts and behaviors among students.

7 | Conclusion

This study arrived at, relying on its empirical exploration, that suicide is a major problem in Bangladesh, particularly among university students, and that prompt action is necessary to control it. Based on the present research revealed that cyberbullying, media contagion effect, online chatrooms, virtual bulletin boards and forums, and suicidal information had close relation with suicidal tendencies. Besides, suicidal agents, suicidal prevalence level, age and duration of using online platforms had also proved to be significant. When planning initiatives to reduce the suicide rate, it is important to include all of the risk factors, including but not limited to: financial difficulties, media addiction, interpersonal issues, social isolation, and academic pressures. Furthermore, this study recommends that university administration take action to address the concerning trend by instituting suicide prevention measures, such as providing counseling and coordinating follow-up care services for survivors. Lastly, one way to lessen the social stigma around suicide is to organize programs to raise awareness about mental health among parents and students. Future research should aim to address the issues produced by media addiction and social media more comprehensively by doing multi-centered studies with more significant populations. More research on suicide will also make use of new media, as well as studies on suicide and the spread of suicide.

Author Contributions

Nurul Islam Uzzal: conceptualization, investigation, writing – original draft, methodology, formal analysis, writing – review and editing, data curation, resources. **Md. Al Mamun:** conceptualization, investigation, writing – original draft, methodology, writing – review and editing, formal analysis, data curation, software, visualization. **Md. Majnur Rashid:** investigation, formal analysis, supervision, writing – review and editing. **Abul Kalam:** methodology, investigation, writing – review and editing, project administration, supervision, validation, software.

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Ethics Statement

This study received ethical approval from the Institutional Review Board (IRB) of the Department of Sociology, Gopalganj Science and Technology University (GSTU), Gopalganj-8100, Bangladesh. The approval number for this research is GSTU/SOC/IRB/2025/027. All procedures performed in this study involving human participants were in accordance with the ethical standards of the IRB at GSTU and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Written informed consent was obtained from all participants prior to their inclusion in the study, and data confidentiality was rigorously maintained. Ethical review and approval were optional for the study on human participants following the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The manuscript includes all the required data to support the findings. All authors have read and approved the final version of the manuscript. The corresponding author had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Transparency Statement

The lead author, Md. Al Mamun affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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