

Prevalence of Depression and its Associated Risk Factors among University Students in Bangladesh: Evidence from A Cross-Sectional Study

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ABSTRACT

Depression has now been known to affect the most people in the world. It is also known that students from low-and-middle income countries (LMICs) were also more likely to be predisposed to depression, with most studies reporting the prevalence to be more than half. A short 21-item BDASS-21 was used for primary data collection from the students of Gopalganj Science and Technology University, Gopalganj, Bangladesh. Descriptive statistics were used to explore the variations of the data. Chi-square test of independent and two-sample t-test was employed to test the association of categorical and continuous independent variables, respectively, with depression. Finally, a logistic regression model was fitted to check the influence of each independent variable on depression. Out of the 384 university students, 75.26 % reported depression. In the final binary logistic regression model, students from joint family had massive odds of depression (OR = 3.42, 95% CI: 1.61-7.27, $p < 0.01$) when compared to students from nuclear families. Similarly, the students that spent more than 5 hours on screen had significantly greater odds (OR= 6.69, 95% CI: 2.81-15.96, $p < 0.01$) than those that did not. Another important significant variable was monthly family income, with students from the upper-class category less likely to report depression (OR = 0.35, 95% CI: 0.14-0.93, $p = 0.04$) than those in the Lower Class. The other significant variables were faculty of respondent, mother's education, and father's education. Three in four university students reported depression in our study. Students from joint families who also had a habit of using the internet more than five hours daily were in an increased risk group. Proper mental health support and awareness along with providing necessary resources to these vulnerable groups could help alleviate the current state of depression.

KEYWORDS

Depression, BDASS-21, Mental Health, Cross-Sectional Study.

1. Introduction

Depression has become one of the most common mental health disorders in the world [1]. It is characterized by the feeling and loss of interest of a person [2]. Some researchers label it as one of the major illnesses of the modern age [3]. Depression has

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also been linked with other physical and mental illnesses such as cardiovascular diseases [4], anxiety [5], weight loss [6] among others. According to the World Health Organization (WHO), mental illnesses such as depression shorten a person's lifespan by ten to twenty years [7].

Although the prevalences of depressions vary widely among the countries, it is widely accepted that low-and-middle income countries (LMICs) bear most of the burden [8]. The symptoms of depression appear early in the adulthood of a person, with some studies indicating probable age to be 24 or before [9, 10]. University Students fall in the same age category and consequently have a relatively high prevalence of depression, with one meta-analysis in Iran finding the prevalence to be 33% [11]. Another meta-analysis utilizing studies from 20 different countries found a pooled prevalence of 24.4% [12].

As a part of the LMICs, university students in Bangladesh also face difficulties in dealing with depression and other types of mental illnesses. The treatments for mental health are still not widespread in the country, with only 0.44% of health budget spent on mental health [13]. The prevalence of depression is especially high for the first-year university students, with a couple of studies estimating it to be over half of the total population [14, 15]. In a recent study conducted across two different universities, 47.3% of the total students were found to be moderately or severely depressed [16]. Moreover, females were typically more depressed than males which is also confirmed by many other studies in Bangladesh [15, 17].

Numerous factors influence the university student that predispose them to depression and other forms of mental illnesses. Exposure to new environments such as new food, study, accommodation or people contributes significantly to mental deterioration of the students [18, 19]. Lower social status and socio-economic class has also been found to be associated with depression among the university students [20]. A drop-off in academic performances also correlates with depressive tendencies as one study in Malaysia found [21]. Physical attributes such as sleeping hours, hours of exercise per day, time spent on social media were identified as key indicators for depressive symptoms among university students [22, 23]. These factors were also confirmed by a study in Bangladesh conducted in a university in the capital city [15].

Depression is an important topic of discussion in the academic field across the world. University students in Bangladesh are in an especially high-risk group in an already predisposed country for depression. Although several studies in the country were conducted and estimated prevalences of depression across multiple university students, proper prevention and treatment still has not been undertaken. To implement countrywide policy for mental health treatment and prevention, consensus needs to be reached about depression among university students.

The objective of our study is to help researchers and policy makers alike reach this consensus by investigating the prevalences and factors associated with depression at Gopalganj Science and Technology University (GSTU), Gopalganj, Bangladesh in the southern part of Bangladesh. Our study will add to the already vast literature and help policy makers mitigate depression in young adults.

2. Methods

2.1. Data Source and Study Design

In this cross-sectional study, a total of 384 primary data points were systematically collected from students at Gopalganj Science and Technology University (GSTU), Gopalganj, Bangladesh, encompassing various academic years and 34 departments. Data collection was carried out between 5 November 2023 and 25 December 2023. The participants were between 20 and 27 years old. To ensure a representative sample, the researchers employed a stratified random sampling technique.

Since one of the goals of this study was to ascertain the prevalence (proportion) of depression among students, the following formula was used to calculate the minimum sample size:

$$n = \frac{p(1-p)z_{\alpha/2}^2}{d^2} \approx 384$$

where n is the required sample size, $z_{\alpha/2}$ is the two-sided normal variate value at a 95% confidence interval (1.96), p is the indicator percentage (0.5 for unknown prevalence), and d is the margin of error (5%).

Participants volunteered willingly after being assured of the confidentiality of their information. Following the receipt of informed consent, data collection was conducted under the close supervision of a research student and the principal investigator. A team of five trained graduate students, guided by a pre-established training session on data collection procedures, is responsible for gathering primary data.

The data were acquired through a self-administered questionnaire consisting of two sections. The initial section focuses on socio-demographic, socioeconomic, and behavioral traits, while the second section employs the BDASS-21 tool to capture specific dimensions relevant to the study. In the end, however, the students from Agriculture and Law departments coalesced into one because of low frequency.

2.2. Socio-demographic measures

The study gathered a comprehensive set of socio-demographic data to enrich the understanding of the participants' backgrounds. Information was collected on various factors including age, gender, year of study, faculty of study, CGPA in honours, religion, academic performance, accommodation type (hall, mess/home), permanent residence (urban or rural), family living systems, socioeconomic status (categorized as upper, middle, and lower class), relationship status (i.e., single, in a relationship, or married), and details regarding parents' educational and occupational backgrounds. It is noteworthy that Gopalganj Science and Technology University (GSTU) comprises three institutes and eight faculties, encompassing 34 departments such as Engineering, Science, Biological Science, Social Science, Humanities, Business Studies, Agriculture, and Law. It is pertinent to mention that for data collection, all faculties were included, excluding the institutes, as these do not admit undergraduate students.

2.3. *Behavioral factors*

In this study, a set of lifestyle-related inquiries was incorporated to gain insights into participants' habits and behaviors. Firstly, participants were asked to disclose their smoking habits, responding with either "Yes" or "No." Subsequently, participants were queried about their engagement in daily physical activities, specifically whether they exercised for a minimum of 20 minutes per day, encompassing activities such as walking, playing sports, games, cycling, swimming, or any other form of physical engagement. Participants were also prompted to categorize their daily average sleep duration of time as normal (6-7 hours), short (< 6 hours), or long (> 7 hours), in accordance with established classifications. Additionally, participants were probed about their internet usage patterns, gauging the nature and extent of their online activities. Finally, the study delved into participants' study habits, specifically the number of hours dedicated to studying each week.

2.4. *Bangla Depression Anxiety Stress Scale (BDASS- 21)*

To understand the levels of depression, anxiety and stress, the Depression Anxiety Stress Scale (DASS) is a useful tool [24]. It is a 42-item scale where the participants can report their own states of depression, anxiety or stress. A short 21-item scale called the Bangla Depression Anxiety Stress Scale (BDASS-21) was used in this study. The BDASS-21 is known to be robust, especially in non-clinical studies [17, 25]. In this study, assessed the level of depression using the seven of the twenty-one questions of BDASS-21 that was related to depression.

2.5. *Response Variable*

In the original BDASS-21, the depression scales exhibited high internal consistency with Cronbach's alphas of 0.99. However, a subsequent study reported slightly lower Cronbach's alphas for these scales, measuring at 0.77. According to established classifications for depression severity, the scores are categorized as follows: normal (0–9), mild (10–13), moderate (14–20), severe (21–27), and extremely severe (28 and more). It was further categorized into binary groups. Normal was converted to "No Depression" and was recorded as 0. On the other hand, the remaining categories were converted to "Has Depression" and was recorded as 1.

2.6. *Explanatory Variables*

To understand the variation of depression of the participants, the study used various socio-demographic and behavioral variables. The socio-demographic variables were included to understand the background characteristics of the participant. On the other hand, behavioral variables were utilized to understand the lifestyle and habits of the students. Together, the variables draw a complete picture of the factors that could cause depression.

2.7. *Statistical Analysis*

To test the association between the set of categorical independent variables and depression, chi-square test was conducted with 5% level of significance. Similarly, with

continuous independent variable, two sample t-tests were conducted with dependent variable to test the association between them. Variables with p-values less than 0.20 were selected for final analysis. Multiple logistic regression was fitted to estimate the effects of the different independent variables on depression. STATA 15 was used for all analyses.

3. Results

3.1. Descriptive Statistics

Let's examine the preliminary results before proceeding to the next phase. Among the 384 students 24.70% students have no depression, 18.20% have mild depression, 30.70% have moderate depression, 10.40% have severe depression and 15.90% have extremely severe depression. That means overall, 75.30% of the participants reported depression during their university life [Figure 1].

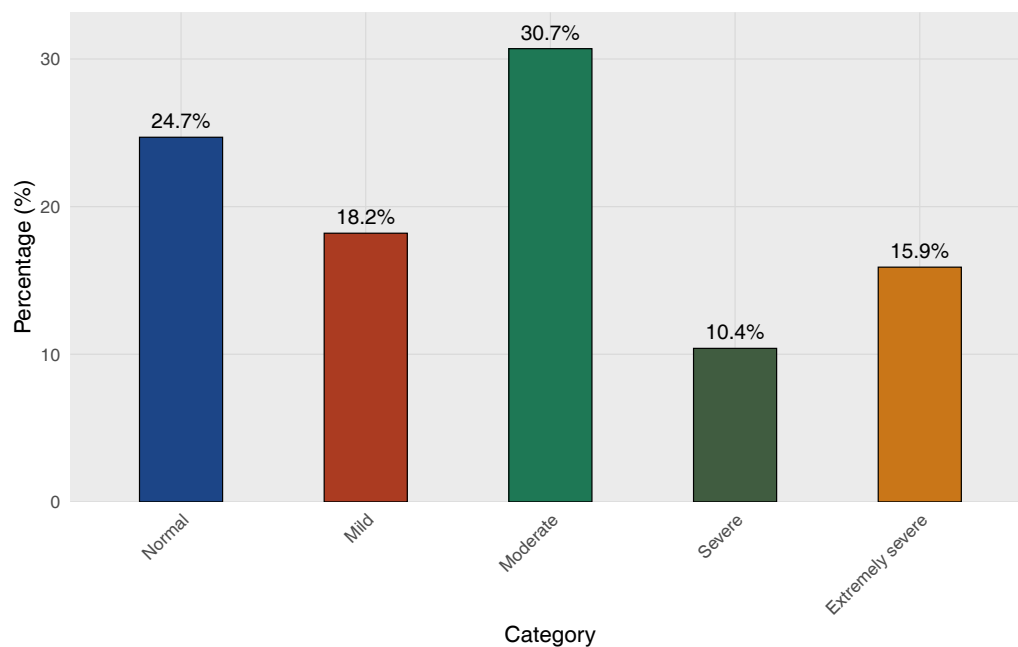


Figure 1. Distribution of Level of Depression among University Students in Bangladesh.

In **Table 1**, the level of depression is examined across various socio-demographic variables among university students. The prevalence of level of depression among university students was 75.26%. The gender distribution reveals that 75.20% of males and 75.30% of females experience depression, suggesting a relatively balanced prevalence. Academic year-wise, the highest depression rates are observed in the master's (78.60%), and the lowest in the First Year (66.70%). Notably, the study faculty demonstrates variations, with the lowest depression in Humanities (65.00%) and the highest in Engineering (85.70%). CGPA categories show a trend where higher academic performance corresponds to lower depression rates, with the "Above 3.25" category having the lowest depression at 78.30% and below 2.25 having the highest depression at 91.70%. Religion does not exhibit a significant impact on depression rates. However, notable differences emerge in accommodation types, where respondents living in

Halls/Mess report higher depression (75.70%) than those at home (71.10%).

The socio-economic status of respondents, as indicated by monthly family income, presents intriguing findings. Those in the “Lower Class (< 10000)” income exhibit a higher level of depression (85.50%) compared to the “Middle Class (10000 to 20000)” and “Upper Class (> 20000)” categories. Weekly time spent on studies seems to have a less impact on level of depression, while relational status suggests a slightly higher level of depression among engaged individuals (79.70%). Smoking status, physical exercise, and sleeping patterns show marginal differences in the level of depression.

Internet usage, academic performance, and satisfaction with social life are interesting dimensions. Those spending “More than 5 hours” on the internet have a notably higher level of depression (86.50%). Excellent academic performers exhibit a lower level of depression (76.20%), contrasting with poor performers (84.60%). Satisfaction with social life shows varying level of depression, with the “Least satisfied” category having a higher level of depression (82.40%). Parents’ professions have showed a clear pattern, those with “Working women” mothers have a relatively lower level of depression (52.10%). Mother’s education indicates lower level of depression among respondents with mothers educated up to “BA / B.Sc. / B.Com.” (47.20%). Father’s factors follow similar trends, with “Farmers or others” having higher level of depression (79.20%) and higher paternal education correlating with lower level of depression [Table 1].

Table 1.: Descriptive and Univariate Analysis of Level of Depression and Different Socio-demographic Variables (Categorical)

Variables	Categories	No Depression		Has Depression		p-Value
		Freq.	in (%)	Freq.	in (%)	
Gender of Respondent	Male	50	24.80%	152	75.20%	1
	Female	45	24.70%	137	75.30%	
Academic Year of Respondent	First Year	17	33.30%	34	66.70%	0.57
	Second Year	7	25.90%	20	74.10%	
	Third Year	21	25.90%	60	74.10%	
	Fourth Year	35	22.60%	120	77.40%	
	Masters	15	21.40%	55	78.60%	
	Engineering	7	14.30%	42	85.70%	
Studying Faculty of Respondent	Science	18	20.70%	69	79.30%	0.13
	Business Studies	12	26.70%	33	73.30%	
	Humanities	28	35.00%	52	65.00%	
	Life Science	13	22.00%	46	78.00%	
	Social Science	17	26.56%	47	73.44%	
	Below 2.25	1	8.30%	11	91.70%	
CGPA Category of Respondent	2.25 to 3.25	36	28.30%	91	71.70%	0.08
	Above 3.25	47	21.70%	170	78.30%	
	Unknown	11	39.30%	17	60.70%	
	Muslim	74	24.90%	223	75.10%	
Religion of Respondent	Hindu / Others	21	24.10%	66	75.90%	0.88
	Hall / Mess	84	24.30%	262	75.70%	
Types of Accommodation	Home	11	28.90%	27	71.10%	0.53
	Nuclear	83	28.50%	208	71.50%	
Types of Family of Respondent						0

Variables	Categories	No Depression		Has Depression		p-Value
		Freq.	in (%)	Freq.	in (%)	
Permanent Residence of Respondent	Joint	12	12.90%	81	87.10%	0.44
	Urban	34	27.20%	91	72.80%	
Monthly Family Income (BDT)	Rural	61	23.60%	198	76.40%	0.03
	Lower Class (< 10000)	10	14.50%	59	85.50%	
	Middle Class (10000–20000)	54	24.50%	166	75.50%	
Weakly Time Spent on Studies (Hours)	Upper Class (> 20000)	31	32.60%	64	67.40%	0.25
	< 15 hours	40	21.10%	150	78.90%	
	15 to 30 hours	44	28.60%	110	71.40%	
	> 30 hours	11	27.50%	29	72.50%	
Relational Status of Respondent	Single	74	24.60%	227	75.40%	0.45
Smoking Status of Respondent	Engaged	14	20.30%	55	79.70%	0.89
	No	72	24.90%	217	75.10%	
Physical Exercise (Daily)	Yes	23	24.20%	72	75.80%	0.92
	No	61	23.80%	195	76.20%	
Sleeping Status	Yes	27	24.30%	84	75.70%	0.51
	< 6 hours	18	24.30%	56	75.70%	
	6–7 hours	64	26.30%	179	73.70%	
	> 7 hours	13	19.40%	54	80.60%	
Internet Using Time of Respondent	< 2 hours	23	40.40%	34	59.60%	< 0.01
	2–5 hours	55	27.40%	146	72.60%	
	> 5 hours	17	13.50%	109	86.50%	
Academic Performance of Respondent	Poor	8	15.40%	44	84.60%	0.23
	Average	77	26.60%	213	73.40%	
Satisfaction with Social Life	Excellent	10	23.80%	32	76.20%	0.08
	Satisfied	62	27.70%	162	72.30%	
	Least satisfied	21	17.60%	98	82.40%	
Mother's Profession	Very satisfied	12	31.60%	26	68.40%	< 0.01
	Working women	23	47.90%	25	52.10%	
	Housewife	71	21.40%	261	78.60%	
Mother's Education	Illiterate	13	19.10%	55	80.90%	< 0.01
	Primary to SSC	48	22.20%	168	77.80%	
	HSC	9	16.40%	46	83.60%	
	BA / B.Sc. / B.Com.	19	52.80%	17	47.20%	
Father's Profession	Masters	6	66.70%	3	33.30%	0.29
	Businessman	26	28.60%	65	71.40%	
	Doing job (private/govt.)	31	27.00%	84	73.00%	
Father's Education	Farmers or others	36	20.80%	137	79.20%	0.04
	Illiterate	15	22.70%	51	77.30%	
	Primary to SSC	27	20.90%	102	79.10%	
	HSC	16	20.50%	62	79.50%	
	BA / B.Sc. / B.Com.	30	38.50%	48	61.50%	
	Masters	7	21.20%	26	78.80%	

Table 2 presents the univariate analysis of continuous socio-demographic variables

in relation to the level of depression among respondents. Starting with the age of the respondents, both groups exhibit similar mean ages of 23, with standard deviations of 2. This indicates a relatively homogeneous age distribution among individuals with and without depression. Moving on to academic performance, the mean GPA results for SSC and HSC show marginal differences between the two groups, suggesting comparable academic backgrounds. However, in terms of undergraduate results measured in CGPA, those with depression have a slightly higher mean (3.1) compared to those without depression (2.9).

Examining monthly family expenditure, respondents with depression have a mean expenditure of 19,372 BDT, while those without depression have a higher mean of 21,936 BDT. The standard deviations of 9,710 and 11,894, respectively, indicate a degree of variability within each group. This implies that individuals without depression may experience a wider range of family expenditure compared to those with depression [Table 2].

Table 2. Descriptive and Univariate Analysis between Level of Depression and Different Socio-demographic Variables (Continuous)

Variables	No Depression		Has Depression		P-value
	Mean	SD	Mean	SD	
Age of Respondent	23	2	23	2	0.83
SSC Results (GPA in 5 Scale)	4.73	0.32	4.74	0.32	0.71
HSC Results (GPA in 5 Scale)	4.64	0.43	4.56	0.41	0.10
Undergraduate Results (CGPA in 4 Scale)	2.90	1.09	3.10	0.84	0.12
Monthly Family Expenditure (BDT)	21936	11894	19372	9710	0.05

3.2. Univariate Analysis

In the univariate analysis, several socio-demographic variables were examined to assess their association with the level of depression among respondents using the chi-square test. Notably, certain variables exhibited significant associations with the level of depression. Monthly family income demonstrated a significant relationship ($p=0.03$), indicating that individuals in the lower income (< 10000 BDT) experienced higher levels of depression. Internet usage time also showed a highly significant association ($p<0.01$), revealing a strong correlation between extended internet usage and increased depression among respondents. Mother's profession and education, as well as father's education, proved to be significant factors ($p < 0.01$ and $p = 0.04$, respectively), suggesting the influence of familial background on depression prevalence. On the other hand, variables such as gender, academic year, studying faculty, religion, types of accommodation, weakly time spent on studies, relational status, smoking status, physical exercise, academic performance, satisfaction level of social life, and father's profession did not exhibit statistically significant associations with level of depression [Table 1].

Table 2 presents the results of a t-test examining the univariate analysis between the level of depression and different continuous socio-demographic variables. Among the continuous socio-demographic variables examined, monthly family expenditure stands out as a significant predictor of depression, with a p-value of 0.05. Individuals with depression have a lower mean monthly family expenditure (19,372 BDT) compared to those without depression (21,936 BDT). This suggests a potential association between economic factors and the likelihood of experiencing depression among the re-

spondents. However, when considering other variables, such as age of the respondent, SSC and HSC results, and undergraduate academic performance, no statistically significant differences in mean scores were observed between those with and without depression (p-values of 0.83, 0.71, 0.10, and 0.12, respectively) [Table 2].

3.3. Final Logistic Regression Model for Depression

The logistic regression model presented in Table 3 aims to explore the factors associated with the level of depression among university students. The final logistic model delineates the odds ratios (OR), 95% confidence intervals (CI), and corresponding p-values associated with various socio-demographic variables influencing the level of depression among university students. For the studying faculty, Humanities students exhibit a significantly lower odds of depression compared to their Engineering counterparts (OR = 0.29, 95% CI: 0.10-0.83, $p = 0.02$). Joint family structure significantly increases the odds of depression (OR = 3.42, 95% CI: 1.61-7.27, $p < 0.01$) when compared to students from nuclear families. In terms of monthly family income, students from the upper-class category show a decreased odds of depression (OR = 0.35, 95% CI: 0.14-0.93, $p = 0.04$) compared to those in the Lower Class.

Furthermore, prolonged internet usage significantly elevates the odds of depression, with students spending more than 5 hours having an OR of 6.69 (95% CI: 2.81-15.96, $p < 0.01$). The education level of both mothers and fathers plays a role in depression levels. Students with mothers educated in “BA / B.Sc. / B.Com.” (OR = 0.14, 95% CI: 0.04-0.56, $p = 0.01$) and “Masters” levels (OR = 0.14, 95% CI: 0.02-0.98, $p = 0.05$) have significantly lower odds of depression. However, father’s education levels do not reach statistical significance [Table 3].

4. Discussion

Mental health disorders among university students are a largely overlooked public health concern in Bangladesh. However, it has gained significant attention in mental health policy development and university campus health services worldwide [19, 26, 27]. Despite a growing body of evidence highlighting mental health challenges among university students, there is insufficient research on this issue in lower-and-middle-income countries such as Bangladesh. Given that depression is identified as a critical factor contributing to suicide [28], the present study aims to address this knowledge gap by evaluating depression and its associated risk factors.

This study emphasizes the substantial impact of depression, with 75.26% of university students affected. The observed prevalence of depression in this study surpasses rates documented in prior investigations, highlighting the significance of the issue among university students [14, 15, 29]. A little over half of the participants were classified as having moderate to extremely severe degrees of depression based on their Bangla DASS-21 scores. A different recent survey of graduate students from Bangladesh found that 49.6% of them had depression [14, 29].

In the final logistic regression model, several factors emerged as statistically significant contributors to depression levels, including the studying faculty, family structure, monthly family income, and internet usage. Additionally, the educational levels of both mothers were identified as significant predictors. Conversely, variables such as gender, academic year, religion, types of accommodation, weekly study time, relational status, smoking status, physical exercise, academic performance, satisfaction level of social

Table 3. Final logistic model of level of depression among university students.

Variables	Categories	Odds Ratio	95% CI	p-Value
Studying Faculty of Respondent	Engineering	ref.		
	Science	0.58	0.20–1.65	0.30
	Business Studies	0.32	0.10–1.03	0.06
	Humanities	0.29	0.10–0.83	0.02
	Life Science	0.50	0.16–1.54	0.23
	Social Science and Others	0.42	0.14–1.24	0.12
Types of Family of Respondent	Nuclear	ref.		
	Joint	3.42	1.61–7.27	< 0.01
Monthly Family Income (BDT)	Lower Class (< 10000)	ref.		
	Middle Class (10000–20000)	0.42	0.18–1.00	0.05
	Upper Class (> 20000)	0.35	0.14–0.93	0.04
Internet Using Time	< 2 hours	ref.		
	2–5 hours	2.26	1.10–4.66	0.03
	> 5 hours	6.69	2.81–15.96	< 0.01
Satisfaction with Social Life	Satisfied	ref.		
	Least satisfied	1.85	0.99–3.46	0.06
	Very satisfied	0.66	0.27–1.66	0.38
Mother's Education	Illiterate	ref.		
	Primary to SSC	0.78	0.29–2.07	0.62
	HSC	0.97	0.30–3.22	0.97
	BA / B.Sc. / B.Com.	0.14	0.04–0.56	0.01
	Masters	0.14	0.02–0.98	0.05
Father's Education	Illiterate	ref.		
	Primary to SSC	1.81	0.68–4.81	0.23
	HSC	1.97	0.70–5.50	0.20
	BA / B.Sc. / B.Com.	1.92	0.62–5.94	0.26
	Masters	2.91	0.80–10.60	0.11

life, and father's profession did not exhibit statistically significant associations with depression levels in the univariate analysis. Furthermore, there were no statistically significant differences in mean scores between individuals with and without depression in terms of age, SSC and HSC results, and undergraduate academic performance in the univariate analysis. Similar findings were reported in multiple studies [14–16, 28, 30].

In this study, no notable gender differences were observed regarding depression. This absence of significant gender distinctions aligns with findings from earlier studies conducted in Bangladesh, which also reported no significant variations in the prevalence of depression between genders [15]. On the contrary, mental disorders tend to impact more females than males [31–33]; however, some studies suggest that male students are also susceptible to elevated levels of depression [34, 35]. The research indicates that final-year students exhibit higher rates of depression in comparison to their first-year counterparts. Conversely, another study reveals that the prevalence of

depression and anxiety is elevated among first-year university students in the country [15].

The study highlights variations across study faculties, revealing the highest rates of depression in Engineering and the lowest in Humanities. Conversely, the relational status of individuals indicates a slightly elevated depression rate among those who are engaged. This observation could be attributed to factors such as students residing away from their partners or having limited time for interpersonal interactions due to academic demands [36].

The current study has found a strong correlation between depression and increased daily social media use. Research indicates that feeling depressed and other psychological issues may be linked to excessive usage of websites, which often serve as a replacement for social interactions [37]. However, other research has found that Bangladeshi undergraduate students who spend a lot of time online each day have a greater prevalence of depression [38, 39].

The present investigation revealed that students belonging to the upper-class category exhibit a lower degree of depression when contrasted with their counterparts in the lower class. In a preceding study, it was established that families with lower income levels were linked to a 50% higher likelihood of experiencing depressive symptoms compared to those with higher income families [40]. This outcome aligns consistently with findings from other earlier studies [41–43].

The latest research revealed that the educational attainment of both mothers and fathers influences the levels of depression. A prior study conducted in China also established an association between parental educational levels and depression in college students, with the correlation being more pronounced at lower levels of parental education. This indicates that lower parental educational levels are linked to the manifestation of depressive symptoms among college students [44]. Additionally, another study has proposed that parental education is a factor associated with the presence of depressive symptoms [45].

Students in the engineering discipline display a notably higher likelihood of experiencing depression when compared to their counterparts in humanities. Correspondingly, prior studies have indicated that engineering students demonstrate a higher prevalence of clinical depression compared to medical students, revealing a statistically significant difference between the two groups [46, 47].

5. Recommendations

Based on the comprehensive findings presented in this study, it is imperative to develop targeted interventions and support mechanisms to address the alarming prevalence of depression among university students in Bangladesh. Recognizing the significant impact of socio-demographic factors such as family structure, monthly family income, and internet usage on depression levels, universities should consider implementing mental health awareness programs and counseling services tailored to the specific needs of students from diverse backgrounds. The observed influence of parental education on depression highlights the importance of involving families in mental health initiatives. Additionally, interventions targeting studying faculties with higher depression rates, such as Humanities, could be beneficial. Furthermore, the association between extended internet usage and higher depression rates underscores the need for educational institutions to promote responsible digital habits among students. Considering the link between academic performance and depression, academic support

programs and stress management workshops may prove beneficial. This multi-faceted approach, encompassing both individual and systemic factors, is crucial in fostering a mentally healthy campus environment.

6. Conclusions

The goal of the study was to estimate the prevalence of level of depression of university students in Bangladesh. The study also identified and studied several socio-demographic and behavioral factors for their influence on level of depression. The prevalence of depression was higher than other studies, indicating an increase in depression among university students. In the final binary logistic regression, faculty of respondent, types of family, monthly family income (BDT), internet using time, mother's and father's education of respondent was found to be significant. In particular, students from joint families whose daily internet usage crossed five hours had significantly higher likelihood of reporting depression than others. Special care and attention need to be given by policymakers and administrative bodies to these high-risk students who are prone to depression during their university life.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Data Availability

Data are available from the corresponding author upon reasonable request.

Author Contributions

Mohammad Kamal Hossain: Funding acquisition; investigation; project administration; supervision; conceptualization; formal analysis; methodology; visualization; writing original draft; and editing. **Arpita Halder and Farhana Nasrin:** Data curation; formal analysis; software; and prepared the draft of the manuscript. All the authors reviewed the manuscript several times.

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References

- [1] World Health Organization, 2024. Mental health. Available from: <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>.
- [2] American Psychiatric Association, 2024. What Is Depression?. Available from: <https://www.psychiatry.org/patients-families/depression/what-is-depression>.

- [3] Buchanan, Jenna L., 2012. Prevention of depression in the college student population: a review of the literature. *Archives of Psychiatric Nursing* 26, 21–42. doi: 10.1016/j.apnu.2011.03.003.
- [4] Aromaa, A., Raitasalo, R., Reunanen, A., Impivaara, O., Heliovaara, M., Knekt, P., Lehtinen, V., Joukamaa, M. and Maatela, J., 1994. Depression and cardiovascular diseases. *Acta Psychiatrica Scandinavica* 89, 77–82. doi: 10.1111/j.1600-0447.1994.tb05807.x.
- [5] Coughlin, Steven S., 2012. Anxiety and depression: linkages with viral diseases. *Public health reviews* 34, 7.
- [6] Faulconbridge, L.F., Wadden, T.A., Berkowitz, R.I., Sarwer, D.B., Womble, L.G., Hesson, L.A., Stunkard, A.J. and Fabricatore, A.N., 2009. Changes in symptoms of depression with weight loss: results of a randomized trial. *Obesity* 17, 1009–1016. doi: 10.1038/oby.2008.647.
- [7] World Health Organization Guidelines, 2024. Management of physical health conditions in adults with severe mental disorders. Available from: <https://www.who.int/publications-detail-redirect/978-92-4-155038-3>.
- [8] World Population Data Sheet, 2019. Available from: <https://www.prb.org/wp-content/uploads/2019/09/2019-world-population-data-sheet.pdf>.
- [9] Kessler, R.C., Amminger, G.P., Aguilar-Gaxiola, S., Alonso, J., Lee, S. and Üstün, T.B., 2007. Age of onset of mental disorders: a review of recent literature. *Current opinion in psychiatry* 20, 359–364. doi: 10.1097/YCO.0b013e32816ebc8c.
- [10] Mokdad, A.H., Forouzanfar, M.H., Daoud, F., Mokdad, A.A., El Bcheraoui, C., Moradi-Lakeh, M., Kyu, H.H., Barber, R.M., Wagner, J., Cercy, K. and Kravitz, H., 2016. Global burden of diseases, injuries, and risk factors for young people's health during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* 387, 2383–2401. doi: 10.1016/S0140-6736(16)00648-6.
- [11] Sarokhani, D., Delpisheh, A., Veisani, Y., Sarokhani, M.T., Esmaeli Manesh, R. and Sayehmiri, K., 2013. Prevalence of depression among university students: A systematic review and meta-analysis study. *Depression research and treatment* 2013, 373857. doi: 10.1155/2013/373857.
- [12] Akhtar, P., Ma, L., Waqas, A., Naveed, S., Li, Y., Rahman, A. and Wang, Y., 2020. Prevalence of depression among university students in low and middle income countries (LMICs): a systematic review and meta-analysis. *Journal of Affective Disorders* 274, 911–919. doi: 10.1016/j.jad.2020.03.183.
- [13] Hasan, M.T., Anwar, T., Christopher, E., Hossain, S., Hossain, M.M., Koly, K.N., Saif-Ur-Rahman, K.M., Ahmed, H.U., Arman, N. and Hossain, S.W., 2021. The current state of mental healthcare in Bangladesh: part 1—an updated country profile. *BJPsych international* 18, 78–82. doi: 10.1192/bji.2021.41.
- [14] Alim, S.A.H.M., Rabbani, M.G., Karim, E., Mullick, M.S.I., Al Mamun, A. and Khan, M.Z.R., 2015. Assessment of depression, anxiety and stress among first year MBBS students of a public medical college, Bangladesh. *Bangladesh Journal of Psychiatry* 29, 23–29. doi: 10.3329/bjpsy.v29i1.32748.
- [15] Islam, S., Akter, R., Sikder, T. and Griffiths, M.D., 2022. Prevalence and factors associated with depression and anxiety among first-year university students in Bangladesh: a cross-sectional study. *International Journal of Mental Health and Addiction* 20, 1289–1302. doi: 10.1007/s11469-020-00242-y.
- [16] Koly, K.N., Sultana, S., Iqbal, A., Dunn, J.A., Ryan, G. and Chowdhury, A.B., 2021. Prevalence of depression and its correlates among public university students in Bangladesh. *Journal of Affective Disorders* 282, 689–694. doi: 10.1016/j.jad.2020.12.137.
- [17] Hossain, M.M., Alam, M.A. and Masum, M.H., 2022. Prevalence of anxiety, depression, and stress among students of Jahangirnagar University in Bangladesh. *Health science reports* 5, e559. doi: 10.1002/hsr2.559.
- [18] Abdallah, A.R. and Gabr, H.M., 2014. Depression, anxiety and stress among first year medical students in an Egyptian public university. *Int Res J Med Med Sci* 2, 11–19.
- [19] Bayram, N. and Bilgel, N., 2008. The prevalence and socio-demographic correlations of

- depression, anxiety and stress among a group of university students. *Social psychiatry and psychiatric epidemiology* 43, 667–672. doi: 10.1007/s00127-008-0345-x.
- [20] Ibrahim, A.K., Kelly, S.J. and Glazebrook, C., 2013. Socioeconomic status and the risk of depression among UK higher education students. *Social psychiatry and psychiatric epidemiology* 48, 1491–1501. doi: 10.1007/s00127-013-0663-5.
- [21] Yusoff, M.S., 2013. Associations of pass-fail outcomes with psychological health of first-year medical students in a Malaysian medical school. *Sultan Qaboos University Medical Journal* 13, 107. doi: 10.12816/0003203.
- [22] Piumatti, G., 2018. Motivation, health-related lifestyles and depression among university students: A longitudinal analysis. *Psychiatry research* 260, 412–417. doi: 10.1016/j.psychres.2017.12.009.
- [23] Hirshkowitz, M., Whiton, K., Albert, S.M., Alessi, C., Bruni, O., DonCarlos, L., Hazen, N., Herman, J., Hillard, P.J.A., Katz, E.S. and Kheirandish-Gozal, L., 2015. National Sleep Foundation's updated sleep duration recommendations. *Sleep health* 1, 233–243. doi: 10.1016/j.sleh.2015.10.004.
- [24] Lovibond, P.F. and Lovibond, S.H., 1995. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy* 33, 335–343. doi: 10.1016/0005-7967(94)00075-U.
- [25] Alim, S.A.H.M., Kibria, S.M.E., Uddin, M.Z., Nessa, M. and Wahab, M.A., 2014. Translation of DASS 21 into Bangla and validation among medical students. *Bangladesh Journal of Psychiatry* 28, 67–70. doi: 10.3329/bjpsy.v28i2.32740.
- [26] Stewart-Brown, S., Evans, J., Patterson, J., Petersen, S., Doll, H., Balding, J. and Regis, D., 2000. The health of students in institutes of higher education: an important and neglected public health problem?. *Journal of public health* 22, 492–499. doi: 10.1093/pubmed/22.4.492.
- [27] Viñas Poch, F., Villar, E., Caparros, B., Juan, J., Cornella, M. and Perez, I., 2004. Feelings of hopelessness in a Spanish university population: Descriptive analysis and its relationship to adapting to university, depressive symptomatology and suicidal ideation. *Social psychiatry and psychiatric epidemiology* 39, 326–334. doi: 10.1007/s00127-004-0756-2.
- [28] World Health Organization, 2017. Depression and other common mental health disorders. Geneva: Global Health Estimates
- [29] Mamun, M.A., Hossain, M.S. and Griffiths, M.D., 2022. Mental health problems and associated predictors among Bangladeshi students. *International Journal of Mental Health and Addiction* 20, 657–671. doi: 10.1007/s11469-019-00144-8.
- [30] Rasheduzzaman, M., Al Mamun, F., Faruk, M.O., Hosen, I. and Mamun, M.A., 2021. Depression in Bangladeshi university students: The role of sociodemographic, personal, and familial psychopathological factors. *Perspectives in psychiatric care* 57, 1585–1594. doi: 10.1111/ppc.12722.
- [31] Hamaideh, S.H., 2018. Alexithymia among Jordanian university students: Its prevalence and correlates with depression, anxiety, stress, and demographics.. *Perspectives in psychiatric care* 54, 274–280. doi: 10.1111/ppc.12234.
- [32] Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M. and Sammut, S., 2015. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders* 173, 90–96. doi: 10.1016/j.jad.2014.10.054.
- [33] Shamsuddin, K., Fadzil, F., Ismail, W.S.W., Shah, S.A., Omar, K., Muhammad, N.A., Jaffar, A., Ismail, A. and Mahadevan, R., 2013. Correlates of depression, anxiety and stress among Malaysian university students. *Asian journal of psychiatry* 6, 318–323. doi: 10.1016/j.ajp.2013.01.014.
- [34] ul Haq, M.A., Dar, I.S., Aslam, M. and Mahmood, Q.K., 2018. Psychometric study of depression, anxiety and stress among university students. *Journal of Public Health* 26, 211–217. doi: 10.1007/s10389-017-0856-6.
- [35] Nadeem, M., Ali, A. and Buzdar, M.A., 2017. The association between Muslim religiosity

- and young adult college students' depression, anxiety, and stress. *Journal of religion and health* 56, 1170–1179. doi: 10.1007/s10943-016-0338-0.
- [36] Wahed, W.Y.A. and Hassan, S.K., 2017. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. *Alexandria Journal of medicine* 53, 77–84. doi: 10.1016/j.ajme.2016.01.005.
- [37] Blanco, C., Okuda, M., Wright, C., Hasin, D.S., Grant, B.F., Liu, S.M. and Olfson, M., 2008. Mental health of college students and their non-college-attending peers: results from the national epidemiologic study on alcohol and related conditions. *Archives of general psychiatry* 65, 1429–1437. doi: 10.1001/archpsyc.65.12.1429.
- [38] Steel, Z., Marnane, C., Iranpour, C., Chey, T., Jackson, J.W., Patel, V. and Silove, D., 2014. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. *International journal of epidemiology* 43, 476–493. doi: 10.1093/ije/dyu038.
- [39] Hossain, M.M. and Wahab, M.A., 2016. Academic stress, anxiety and depression among the students of Armed Forces Medical College, Dhaka Cantonment. *Journal of Armed Forces Medical College, Bangladesh* 12, 79–82. doi: 10.3329/jafmc.v12i1.39974.
- [40] Ettman, C.K., Cohen, G.H. and Galea, S., 2020. Is wealth associated with depressive symptoms in the United States?. *Annals of epidemiology* 43, 25–31. doi: 10.1016/j.annepidem.2020.02.001.
- [41] Frank, C., Davis, C.G. and Elgar, F.J., 2014. Financial strain, social capital, and perceived health during economic recession: a longitudinal survey in rural Canada. *Anxiety, Stress, & Coping* 27, 422–438. doi: 10.1080/10615806.2013.864389.
- [42] Wilkinson, L.R., 2016. Financial strain and mental health among older adults during the great recession. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 71, 745–754. doi: 10.1093/geronb/gbw001.
- [43] Adams, D.R., Meyers, S.A. and Beidas, R.S., 2016. The relationship between financial strain, perceived stress, psychological symptoms, and academic and social integration in undergraduate students. *Journal of American college health* 64, 362–370. doi: 10.1080/07448481.2016.1154559.
- [44] Zhai, H., Chen, L., Yang, Y., Sun, H., Pan, H., He, J., Zhu, X., Sui, H., Wang, W., Qiu, X. and Qiao, Z., 2016. Family and college environmental exposures mediate the relationship between parental education and depression among college students. *PloS one* 11, e0151759. doi: 10.1371/journal.pone.0151759.
- [45] Jackson, B. and Goodman, E., 2011. Low social status markers: do they predict depressive symptoms in adolescence?. *PloS one* 3, 119–128. doi: 10.1007/s12552-011-9047-1.
- [46] Fatimah, N., Hasnain Nadir, M., Kamran, M., Shakoor, A., Mansoor Khosa, M. and Raza Wagha, M., 2016. Depression among students of a professional degree: Case of undergraduate medical and engineering students. *Int J Ment Health Psychiatry* 2, 2. doi: 10.4172/2471-4372.1000120.
- [47] Goebert, D., Thompson, D., Takeshita, J., Beach, C., Bryson, P., Ephgrave, K., Kent, A., Kunkel, M., Schechter, J. and Tate, J., 2009. Depressive symptoms in medical students and residents: a multischool study. *Academic medicine* 84, 236–241. doi: 10.1097/ACM.0b013e31819391bb.