



Prevalence of Eating Disorders and Their Association with Mental and Behavioral Health among University Students in Bangladesh

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KEYWORDS

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ABSTRACT:

Background: University students' concerns about eating disorders have been growing, especially in poorer countries. However, we could address the relationship between eating disorders and different behavioral issues. This study investigates the relationship between eating disorders (EDs) and behavioral and mental health issues among Bangladeshi undergraduate students.

Methods: Cross-sectional research was performed including 420 undergraduate students from four institutions, utilizing validated instruments: the Eating Disorder Examination Questionnaire (EDE-Q 28) and the Generalized Anxiety Disorder scale (GAD-7). Behavioral challenges were also evaluated. Multiple linear regression was conducted to identify characteristics strongly correlated with ED symptoms.

Results: The incidence of eating disorders was 2.6%, whereas 5.8% of students indicated experiencing severe anxiety. ED symptoms were significantly predicted by generalized anxiety disorder ($p < 0.001$), low appetite ($p = 0.0159$), fear for relatives' health ($p < 0.001$), gender ($p = 0.0154$), university type ($p = 0.0008$), and monthly family income ($p = 0.0029$). A slight correlation was seen between positive thoughts ($p = 0.0515$). Behavioral difficulties like fatigue, insomnia, and worry were not statistically significant but were commonly reported

Conclusion: The results demonstrate how EDs are complex and impacted by both sociodemographic and psychological aspects. In Bangladeshi university settings, early screening programs and integrated mental health interventions are crucial for addressing eating disorders.

INTRODUCTION

Almost 14% of the global population suffers from mental illness, which represents around 970 million individuals worldwide [1]. Globally, approximately 1

in every 8 people, or 970 million individuals, lived with a mental disorder in 2019 [2]. Anorexia Nervosa is a complex and often chronic eating disorder marked by an extreme fear of gaining weight and a relentless pursuit of thinness through strict caloric restriction [3]. Lifetime



prevalence rates of Anorexia Nervosa range between 0.3% and 4% across genders [4]. Other eating disorders include Bulimia Nervosa and Binge Eating Disorder. A binge-eating episode is defined as consuming an unusually large quantity of food in a discrete period, accompanied by a sense of loss of control [5]. Binge Eating Disorder is prevalent among individuals seeking weight loss treatment, with rates ranging from 1.3% to 30.1% [5]. Bulimia Nervosa involves comparable binge-eating behavior, which is followed by compensatory activities such as vomiting, excessive exercise, or laxative abuse. Bulimia sufferers frequently sense extreme remorse and attempt to conceal their activities. For instance, they might separate themselves after meals to purge. [6].

Eating disorders (EDs) are psychiatric conditions characterized by severe disturbances in eating behaviors, accompanied by distressing thoughts and emotions related to food, weight, and body image [7]. Individuals with EDs often experience intense anxiety about body weight and self-perception, which contributes to dysfunctional behaviors that significantly impair daily functioning. In some cases, individuals may face dissociative symptoms such as detachment, trance-like states, memory loss, or multiple identities—often related to early-life trauma [8]. These disorders can have life-threatening consequences, making EDs a growing concern among young populations worldwide.

Treatment options for EDs include Enhanced Cognitive Behavioral Therapy (CBT-E), which is tailored for individuals with Anorexia, Bulimia, or Binge Eating Disorder. CBT-E addresses distorted beliefs about food and body image and is considered effective across weight ranges [9]. Another therapy, Interpersonal Psychotherapy (IPT), focuses on the individual's relationships and how they relate to eating behaviors. IPT may produce slower but longer-lasting benefits [10].

Mental and behavioral difficulties—such as insomnia, anxiety, or irritability—have been strongly connected to EDs among university students. Globally, an estimated 11.5% of students report having an eating disorder [11]. A study in France found that students with anxiety disorders were more likely to develop EDs, often alongside depressive

symptoms, insomnia, and substance use [12]. In Iceland, a survey of 3,052 university students reported ED prevalence rates of 15.2% among females and 1.8% among males [13]. In Turkey, ED symptoms were more common among women, particularly those who were underweight or overweight [14].

A study conducted among university students in Spain and other earlier studies reported several risk factors for EDs among adolescents, including female gender, high body mass index (BMI), early academic standing (first-year students), and adolescence itself [15]. Similarly, a study involving 414,299 college students in the United States found that 7.15% had received an ED diagnosis or sought treatment for an ED within the past year [16]. Prevalence rates of EDs vary widely across Asia: 10% or less in Indonesia, Thailand, and Vietnam; 13.8% in Malaysia; and as high as 20.6% in Myanmar. A notable trend of high anxiety levels and ED symptoms has also been reported among Malaysian medical undergraduates [17, 11]. In China, disordered eating behaviors were found in 5.3% of male, 4.0% of female, and 4.5% of all students surveyed (n=1,328) [18]. In Pakistan, 22.75% of 435 medical students in Karachi were found to be at high risk of developing EDs [19]. A study in Saudi Arabia found that 34% of 763 university students were at risk for EDs, raising significant concern [20].

While several studies have investigated the incidence of eating disorders and mental health concerns among students, research into the combined impact of eating disorders on both mental and behavioral health among Bangladeshi university students is limited. In Bangladesh, one study found that 37.6% of private university students were at risk of developing eating disorders [21]. This result may change for public university students, who frequently come from middle-income homes, as opposed to many private university students from more affluent origins. The institutional atmosphere, financial pressures, and academic expectations may all play a role in such differences. Recent research has found a significant prevalence of binge eating disorder (BED) symptoms among university students in Bangladesh, affecting roughly 20% of this population. Key risk factors include being male, being older, having a higher body mass index (BMI), and having depressive



symptoms. [22]

The current study is to investigate the consequences of eating disorders on mental and behavioral health in undergraduate students at both public and private institutions in Bangladesh. According to prior research, female students, those attending private colleges, and those with higher anxiety scores are likely to report considerably more eating disorder symptoms and related behavioral challenges. This study gives a fresh viewpoint on the Bangladeshi setting and serves as a platform for future research and intervention efforts.

Materials and

Methods Study design

This study employed a cross-sectional survey design (Fig 1), which is appropriate for exploring associations between eating disorder symptoms, anxiety levels, and behavioral difficulties among university students. The research was grounded in original data collected through a structured, interviewer-administered questionnaire (attached). A quantitative approach was adopted to ensure objectivity and replicability.

Study Period and settings

The study was conducted between July and September 2024 across four universities in Bangladesh. These included two public universities and two private universities of Bangladesh. The universities were selected from different geographical regions to ensure diversity and representativeness.

Sample Size and Strategy

The sample size was calculated by the following formula:

$$n = \frac{Z^2 p (1-p)}{d^2}$$

Where, n= desired sample size; z = 1.96 (95% confidence interval); p = prevalence of anxiety (47.7%) = 0.48 [23]= 0.48; q = 1-p = 1-0.48= 0.52 and d = 5%

Substituting these values, the minimum necessary sample size estimate was 384. To account for potential non-responses, an additional 5% was added, 300

resulting in a final sample size of 405 participants.

This resulted in a minimum necessary sample size of 384. To account for any non-responses and increase statistical power, a total of 420 students were recruited. The sample frame comprised undergraduate students from all departments at the selected universities. The universities were chosen using basic random sampling.

Within each university, students were selected at random from class rosters and student groups using a lottery system, guaranteeing that each student had an equal chance of being chosen. Both male and female students were selected, ensuring a balance across disciplines and university types.

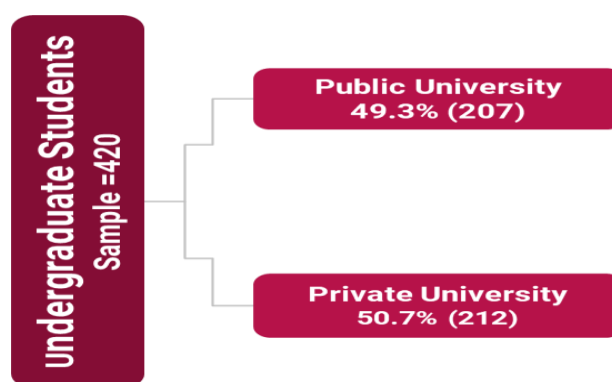


Figure 1: Sampling strategy of the study.

Study participants

The study population was the undergraduate university students of Bangladesh.

Inclusion and Exclusion Criteria

Undergraduate students from the selected four universities who were willing to participate voluntarily in the study and students who were absent on the day of data collection, those unwilling to participate, or those studying in universities not selected for the study.

Study Variables

We applied an exploratory approach to identify the eating disorder associated with generalized anxiety disorder and behavioral difficulties

Demographic and socio-economic profile:



The participants were drawn from four different universities. The mean age of the participants was 21.83 years. University types were categorized into public and private. The gender distribution revealed a relatively balanced representation, with male and female participants. Regarding family income, respondents reported an income of $\leq 50,000$ taka and exceeding 50,000 taka.

Furthermore, participants were queried about their financial concerns, expressing tension about their financial condition and indicating no such concerns.

Level of anxiety:

The GAD-7 Scale [24] was used. In the study, anxiety levels were systematically evaluated using a scoring system (Table 1). This table categorizes participants into different anxiety levels based on their obtained scores, offering a comprehensive framework for understanding the severity of anxiety within the study population. Participants scoring between 0 and 4 fell into the category of Minimal Anxiety, suggesting a low level of anxiety. Those with scores ranging from 5 to 9 were classified as experiencing Mild Anxiety, indicative of a slightly elevated anxiety level. The category of Moderate Anxiety encompasses scores between 10 and 14, highlighting a moderate degree of anxiety. Notably, individuals with scores exceeding 15 were classified under Severe Anxiety, indicating a high level of anxiety that may warrant closer attention and intervention. Participants scoring 11-14 were categorized as exceeding expectations, 15-19 as meeting expectations, and scores above 20 as needing improvement.

Behavioral Difficulties:

This constituting key facets of the research investigation, include Discomfort, which measures the degree of discomfort experienced by participants; Nightmare, assessing the frequency and intensity of reported nightmares; Fatigue, indicating the level of exhaustion reported by participants; Poor Appetite, gauging the degree of reduction in appetite; Insomnia, measuring the presence and severity of sleep

disturbances; Fear for the Health of Relatives, capturing concerns regarding the health of family members; and Worry, assessing the general level of worry expressed by participants. The inclusion of these variables is instrumental in providing a nuanced and comprehensive understanding of the psychological and health-related aspects within the study population. Each variable has been carefully chosen to contribute unique insights, collectively forming a robust foundation for the exploration of the research objectives and the subsequent analysis of participant well-being. [25]

Eating Disorder:

The study employed an established scale (EDE-Q-28) to assess participants' eating behaviors and body image. [26] These included measures for Restraint, Eating Concern, Shape Concern, Weight Concern, and a Global Score, offering a comprehensive understanding of individuals' attitudes and behaviors. The use of reliable scales enhances the study's validity, providing a robust foundation for analyzing relationships between eating behaviors, body image concerns, and other relevant variables.

Data Collection and Quality Control

Data for this study were collected through face-to-face interviews using a semi-structured questionnaire. The questionnaire was developed and finalized by the research team based on a review of relevant literature and expert input. A pilot study was conducted with 14 undergraduate students to assess the clarity, cultural appropriateness, and reliability of the instrument. Based on feedback, minor adjustments were made. Data were checked and edited carefully before being entered into R programming to ensure accuracy and completeness.

Ethical Issues

This study was conducted following the ethical standards outlined in the Declaration of Helsinki. Prior to data collection, ethical approval was obtained from the institutional Research Ethics Committee (REC). Written informed consent was obtained from all participants after they were provided with clear,



concise information regarding the purpose, procedures, and voluntary nature of the study. Participants were informed that they could withdraw at any time without any negative consequences. No personally identifiable information was collected to ensure anonymity. All responses were recorded confidentially and were accessible only to the research team. The collected data were coded and stored securely in password-protected digital files.

Data Processing and Analysis

All data were checked, coded, and data analysis was performed using R 4.5.1. Descriptive statistics summarized participants' demographic, socioeconomic, and psychological characteristics. A multiple linear regression was conducted to assess factors associated with eating disorder symptoms, measured by the EDE- Q total score, which served as the dependent variable. Predictor variables included generalized anxiety disorder score (GAD-7), behavioral indicators, and demographic and socioeconomic factors.

Regression assumptions were checked prior to analysis. Linearity and homoscedasticity were evaluated through residual versus fitted plots. Normality of residuals was confirmed with Q-Q plots and the Shapiro–Wilk test. Outliers and influential points were assessed using Cook's distance and Mahalanobis distance, with no cases excluded.

Regression coefficients, standard errors, t-values, and p- values were reported, with significance set at $p < 0.05$. Results are shown in Table X.

Anxiety Level and Performance Score Classification

The level of anxiety was categorized based on score ranges. Scores from 0 to 4 indicated minimal anxiety, 5 to 9 indicated mild anxiety, 10 to 14 reflected moderate anxiety, and scores above 15 indicated severe anxiety. Separately, performance evaluation scores were interpreted as follows: scores between 15 and 19 suggested a need for improvement, while scores greater than 20 indicated that expectations

were met. In some cases, severe anxiety levels were associated with exceeding expectations. This classification provides insight into both emotional status and performance levels. [27]

RESULTS

The socio-demographic characteristics of the participants, as shown in Table 1, among the participants, 207 (49.3 %) were from a public university, and 213 (50.7%) were from a private university. Major age group between 22-24 was 242 (57.8 %) and a smaller portion was for >25 was 1 (0.1%), and with a mean of 21.8333, (SD± 1.3183). Males made up near the half (47.1%) of the population, while females made up 222 (52.9%). Family monthly income 50000 or less than 50000 was 79.3% (n=334), more than 50000 was 20.7% (n=86). 35% (n=147) of them tensed about their financial condition and 65% (n=273) did not tense about their financial condition.

Table 2 presents the mean EDE-Q global and subscale scores, standard deviations, and percentile ranks. Utilizing a cut-off of ≥ 4 as a marker of clinical significance, there are no critical significance found in restraint, eating concern, weight concern, shape concern and global score. Although none of the subscale means reached the clinical threshold (≥ 4), the 95th percentile for Restraint (3.8) suggests that approximately 2.6% of participants may be at risk for clinically significant eating concerns. Therefore, 2.5% (n=11) have possibility for critical significance in restraint.

Therefore, the prevalence of eating disorder, $P = (\text{Number of Individuals with Eating Disorder} \div \text{Total Number of Individuals}) \times 100$

$$P = (11 \div 420) \times 100 = 2.6\%$$

**Table 1: Socio-demographic characteristics of participants. (n=420)**

Demographic Characteristics		Participants	
		n	%
University Type	Public	207	49.3
	Private	213	50.7
Sex	Male	198	47.1
	Female	222	52.9
Age	18 -21 Years	177	42.1
	22 -25 Years	242	57.8
	> 25 years	01	0.1
Mean, SD \pm		21.8333, (\pm 1.3183)	
Family Income	\leq 50000 taka	334	79.3
	> 50000 taka	86	20.7
Tense About Financial Condition	Yes	147	35
	No	273	65
Total		420	100

Table 2: Mean and Percentile Scores of EDE- Q Subscales and Global Score

	Restraint	Eating Concern	Shape Concern	Weight Concern	Global Score
Mean (SD)	1.3710 (1.28892)	1.2138 (1.05699)	1.3435 (1.00856)	.2387 (.18925)	1.0417 (0.72687)
Percentile					
5	.0000	.0000	.0000	.0000	.0000
10	.0000	.0000	.0000	.0000	.0921
25	.2000	.4000	0.6250	.0800	.5216
50	1.1000	1.0000	1.2500	.2000	.9706
75	2.2000	1.9500	1.8750	.3600	1.4647
90	3.18000	1.2800	2.8625	.5200	2.1473
95	3.8000	3.4060	3.2500	.6000	2.4032

Figure 2 describes the behavioural health difficulties of the participants. These were considered co-occurring symptoms with anxiety among the participants. 320 (76.2%) participants were not uncomfortable in their behaviour, whereas 100 (23.8%) showed discomfort.

Among them 25% (n=105), 31.4% (n=132), 28.1% (n=118), 25% (n=105), 38.6% (n=162), 44.3% (n=186%), 31.0% (n=130), 35.5% (n=149), 64.5% (n=271) and 41% (n=172) showed their behavioural difficulties in Nightmare, Fatigue, Poor appetite, Insomnia, Fear for the health of the relative, Worry, Irritability, Inattentive, Positive thought, Changed in hygiene behaviour respectively.

Figure 3 shows that the majority of participants, 49.2% were suffering from mild anxiety, (27.6%) were suffering from minimal anxiety, (17.4%) of participants were suffering from moderate anxiety, and the least number of participants (5.8%) were suffering from severe anxiety.

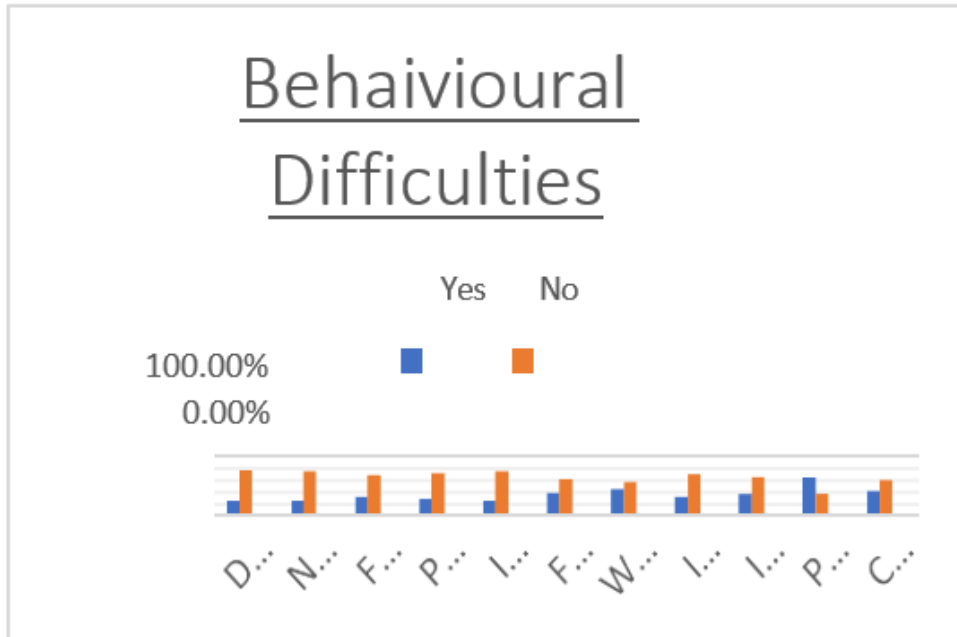


Figure 2: Prevalence of Behavioural Difficulties among Participants

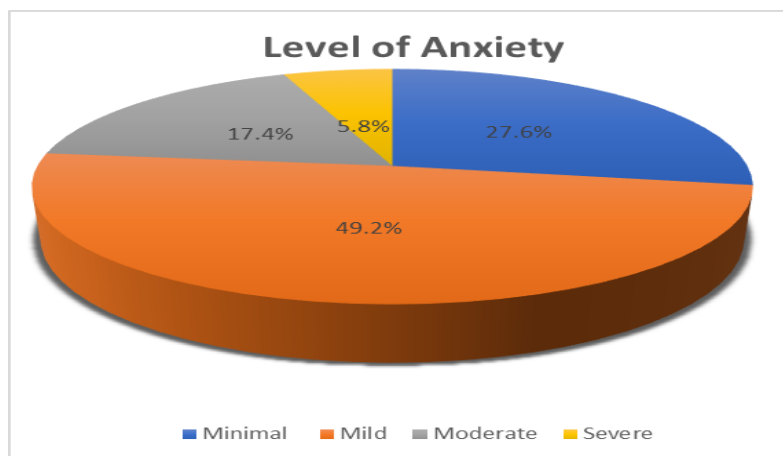


Figure 3: Distribution of Anxiety Levels among Participants Based on GAD-7 Scores

As per Table 3, all the tolerance values are more than 0.10, and the value of the variance inflation factor (VIF) is all less than 5. On the basis of these findings, we can say that there is no multilinearity among all the independent variables in this study. We can see that the p

value for independent variables, that is, fear for the health of the relatives, positives thoughts and generalised anxiety disorder is less than 0.05, which shows they have a significant relationship with the dependent variable, eating disorder.

**Table 3: Effect of Behaviour health Difficulties on Eating disorder and Generalised Anxiety Disorder of Participants**

Predictor	Estimate	Std. Error	t value	p-value
(Intercept)	0.4155	0.5822	0.714	0.4758
GAD	0.053	0.0087	6.092	<0.001
Poor appetite	0.2012	0.0831	2.422	0.0159
Fear for the health of relatives	-0.3164	0.0803	-3.943	<0.001
Positive thoughts	0.1393	0.0713	1.953	0.0515
Age	0.0079	0.0256	0.309	0.7571
Sex	-0.1622	0.0666	-2.434	0.0154
University type	0.2317	0.0684	3.386	0.0008
Monthly family income	9.10E-07	3.03E-07	2.999	0.0029
Tensed about financial condition	-0.085	0.0721	-1.179	0.2389
Fatigue	0.1045	0.0793	1.317	0.1886
Insomnia	-0.1373	0.0914	-1.503	0.1337
Worry	0.0598	0.0859	0.696	0.4866
Irritability	0.0513	0.089	0.577	0.5645
Inattention	0.0279	0.0891	0.313	0.7543

Note: GAD = Generalized Anxiety Disorder. $p < 0.05$ indicates statistical significance. Sex was coded as 1 = male, 0 = female. Predictors included psychological symptoms, behavioral indicators, and demographic variables.

DISCUSSION

The university experience offers opportunities for intellectual, and personal development; but at the same time involves challenges that may influence students' mental well-being and behaviors. Such struggles include increased stress, disrupted eating behavior and emotional disturbances that can contribute to the development of eating disorders (ED) particularly in low-middle income countries such as Bangladesh. [28] This study was conducted to examine the prevalence of eating disorder symptoms among Bangladeshi university students as well as their relationships with anxiety and behavioural problems.

Our study findings reported the prevalence of EDs 2.6%. Although our study found a relatively low prevalence of EDs, global trends show a sharp increase in eating disorders among university-aged populations. One longitudinal study reported that between 2009 and 2021, ED prevalence rose dramatically—from 31.8% to 51.8%

among women, and from 13.0% to 31.3% among men—highlighting an alarming international trend [29] a previous study reported that 37.6% of Bangladeshi students were at risk of developing EDs [30], and research from Turkey found a 2.2% ED prevalence among university students [31], aligning more closely with our results. The variation in prevalence rates may be attributed to differences in tools used, definitions of EDs, cultural perceptions, and sample demographics.

In addition, the degree of anxiety symptoms was also significant; 49.2% reported mild anxiety, 17.4% moderate and 5.8% severe anxiety. These rates are less than the ones found in Turkey (51.3%), Poland (46.8%) and Southern Ethiopia (55%) which reported prevalence of GAD [32,33]. A study conducted in China found high levels of psychological distress among university students—53% reported anxiety, 79% insomnia, 56% depression, and 11% PTSD [34]. One possible explanation for the lower anxiety prevalence in our sample may be the time of data collection or differences in academic pressure, coping



mechanisms, or family support structures.

Our study indicated a significant association between both GAD and the ED symptoms ($p < 0.001$) in agreement with previous research. A report showed that more than half of those with eating disorders met the criteria for at least one anxiety disorder [35]. One study found that approximately 65% of patients with an eating disorder suffer from a comorbid disorder such as generalized anxiety disorder, social phobia or obsessive-compulsive disorder [36]. It's been shown that anxiety disorders often show up before eating disorder (ED) symptoms kick in, and they can stick around even after someone has recovered from ED [37]. This pattern really highlights the importance of early screening and integrated approaches that address both ED and anxiety symptoms, especially in university settings.

Another key takeaway is that a lack of appetite is significantly associated with eating disorder symptoms ($p = 0.0159$). This points to the idea that shifts in typical eating behaviors might stem from deeper psychological issues, such as anxiety or depression. This observation is backed by neurobiological research that has found distinct brain activation patterns in depressed individuals who experience changes in their appetite. Specifically, participants with depression-related appetite loss exhibited hypoactivation in the mid-insula, a region involved in interoceptive awareness, in response to food stimuli—differing significantly from those with increased appetites who showed hyperactivity in reward-related regions [38].

Our study revealed an interesting finding: students who worry about the health of their loved ones tend to show fewer symptoms of eating disorders ($p < 0.001$). This suggests that when students are preoccupied with the well-being of their family members, they might not focus as much on their own body image or eating habits. This contrasts with earlier research, which indicated that fear of negative evaluation strongly predicted the internalization of thin ideals and negative feelings, leading to greater body dissatisfaction and disordered eating behaviors [39]. The difference could be contextual: when fear is directed outward—like concern for family—it may shift focus away from self-image issues. On the other hand, fear that comes from within, such as the fear of being judged, seems to intensify self-critical thoughts and body dissatisfaction.

Moreover, our research found a significant link

between the type of university and eating disorder symptoms ($p = 0.0008$), showing that students at private universities reported higher levels of these symptoms. We also noted a significant correlation with sex ($p = 0.0154$), where female students displayed greater vulnerability, aligning with global patterns in disordered eating. There was also a significant link between monthly family income and ED symptoms ($p = 0.0029$). This could be because students from families with more money are more likely to be exposed to body image ideals and social pressures. These results are somewhat consistent with previous studies involving children and adolescents aged 10–18 years, which indicated elevated levels of body dissatisfaction and eating-related concerns among females and older individuals, yet identified no significant variation in eating disorders based on socioeconomic status [40]. In contrast to that study, our findings imply that older youth and young adults in university settings, it's clear they face a lot more pressure compared to younger adolescents. This pressure can come from academics, social situations, and even how they feel about their appearance, which might put them at a higher risk for developing disordered eating habits. This difference could stem from various cultural and developmental influences.

Despite being measured several behavioural traits like fatigue, insomnia, anxiety, irritability, and lack of focus, none of these showed a strong statistical link to eating disorder symptoms. However, the fact that these issues are so common among students highlights a broader concern regarding mental health that we really need to tackle.

On a more positive note, there was a slight connection found between having positive thoughts and symptoms of eating disorders ($p = 0.0515$). This suggests that there might be a psychological factor that helps protect against disordered eating behaviors. It would be worthwhile to explore this relationship further in future studies.

Strengths & Limitation

This study has several strengths. It was the first study to explore the eating disorder and its association with mental health and behavioural difficulties among university students in Bangladesh. Therefore, the present study's findings can be used as baseline characteristics. Moreover, this study used a widely validated tool (EDE- Q 28) and (GAD-7) to screen for eating disorder risk and anxiety disorder. However, the study was not free from limitations. The cross-sectional nature of the study could not be generalized to the whole country. As we administered self-reported questionnaires, there was a



chance of reporting bias.

CONCLUSION AND RECOMMENDATIONS

The study found a 2.6% prevalence of eating disorders and a 5.7% prevalence of generalized anxiety among Bangladeshi university students. Mean scores for restraint, eating concern, shape concern, weight concern, and global score were notable, although below the clinical cut-off. Multiple linear regression analysis showed that generalized anxiety disorder (GAD), poor appetite, fear for the health of relatives, positive thoughts, sex, university type, and monthly family income were significantly associated with eating disorder scores. Specifically, higher anxiety levels, being male, attending a private university, and higher family income increased the likelihood of eating disorder symptoms. Among behavioral difficulties, poor appetite and fear for the health of relatives were key predictors. These findings suggest that both psychological (anxiety, behavioral health indicators) and socio-demographic (sex, income, university type) factors contribute meaningfully to disordered eating among university students. Targeted interventions, such as campus-based mental health screening and support programs, are essential to address these intersecting challenges. Future research should use larger and more diverse samples to examine underlying cultural and psychosocial mechanisms driving these associations.

Author Contribution:

1. **Ebney Sunjida Abdein:** Principal Investor, Conceptualized, designed the research, Prepared the draft of the manuscript, Data collection, lead the data analysis and interpretation,
2. **Taslima Sharmin:** Reviewed the grammatical accuracy, lead the questionnaires preparation, Literature Review and assisted in manuscript writing
3. **Hafiz T.A Khan:** Reviewed the manuscript
4. **Md. Sahin Khan:** Reviewed Grammatical Accuracy, assisted in manuscript writing and data analysis
5. **Skyler Crouch:** Analyzed the data and interpretation of statistical data.
6. **Ronjini Sinha:** Lead the questionnaires preparation, data collection and assisted in

manuscript writing

7. **Tanzina Rahman:** Assisted in drafting of the manuscript and data coding
8. **Subhra Rani Das:** Assisted in manuscript writing
9. **Md Imdadul Haque:** Principal supervisor, guided on total work, Reviewed questionnaires and manuscript.

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