# Assessing the Psychosocial Determinants of Mental Health Decline Among Bangladeshi University Students During the COVID-19 Pandemic: A Rapid Systematic Review

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## Abstract

**Background:** The COVID-19 epidemic has profoundly impacted the mental health of university students. This review investigates the psychosocial factors contributing to the mental health decline of Bangladeshi university students, particularly in Dhaka city, with the objective of identifying the primary elements exacerbating their mental health issues during the pandemic. **Method:** Employing a mixed-methods approach, this review integrates quantitative and qualitative data, adhering to PRISMA guidelines. Data were extracted using MeSH keywords from databases such as PubMed, PsycINFO, EMBASE, Medline, and ARU-E-Library. Out of 822 initially identified publications, 24 met the inclusion criteria. Thematic analysis was used to investigate pertinent data, and studies were appraised using CASP and AXIS tools. Data interpretation involved SPSS and R, utilizing descriptive statistics, t-tests, ANOVA, and regression analyses. **Results:** The review identified critical factors contributing to mental health deterioration, including financial hardships, academic disruption, social isolation, excessive smartphone use, and career instability. High prevalence rates of anxiety (61.2%), depression (64.7%), and stress (52.4%) were found. Inferential statistics revealed significant differences in mental health outcomes across demographic groups, with female students showing a 20% higher risk of anxiety and those living with parents showing a 15% higher risk of depression. **Discussion:** The results emphasize the multifaceted nature of the mental health challenges that students encounter. The transition to online learning, financial instability, and social isolation were substantial stressors. The review emphasizes the necessity of legislative changes and targeted mental health interventions. **Conclusion:** To address the mental health crisis among university students, policymakers must reform frameworks and provide support systems, including flexible learning models and targeted mental health interventions, to ensure students' long-term well-being and academic success.

Keywords: COVID-19, Psychosocial impacts, Mental health deterioration, University students, Bangladesh, Systematic review

## Introduction

The COVID-19 pandemic has presented a significant global challenge, substantially disrupting lives on a global scale. Starting on March 26, 2020, the government of Bangladesh implemented a state-wide quarantine to mitigate the virus's dissemination. This closure encompassed the prohibition of inter-district travel, the suspension of economic activities except for essential services, and the prohibition of public gatherings (Anwar et al., 2020). Bangladesh had reported 7,667 cases and 168 fatalities by April 30, 2020 (IEDCR, 2020). The pandemic significantly altered daily life, resulting in a pervasive sense of insecurity, a rapid increase in cases, poor medical supplies, misinformation in the media, and widespread panic, anxiety, mental health issues, and even suicidal tendencies among the youth (Ahorsu et al., 2020). The mental health effects of COVID-19 extended beyond Bangladesh to India and other Asian countries as well, where prolonged about isolation, educational disruptions and deep-seated uncertainties about future increased anxiety and psychological distress

(Kabir, Bai et al., 2023). Many university students, a substantial demographic, experienced acute psychological challenges, including concerns regarding academic disruptions, which resulted in an increase in mental health stigma(Hossain, Md Mahbub et al., 2021). The decline in students' psychological well-being during the pandemic has been associated with a variety of factors, including excessive internet use, academic frustrations, sleep disturbances, and substance addiction (Islam, Md Saiful, Sujan et al., 2020). According to a survey conducted during the pandemic, 15% of Bangladeshi pupils were affected by severe despondency, while 18% were affected by anxiety disorders (Islam, Md Saiful et al., 2020). 6.7% of university students reported severe anxiety disorders, 4.5% reported frustration, and 0.9% suffered from sleep disorders. More than 70% of students and working professionals in Bangladesh experienced moderate to high stress during the COVID-19 lockdown, with 44% reporting clinically significant anxiety (Patwary et al., 2022).The mental health of students was considerably impacted by the protracted closure of academic institutions for 17 months, which required them to remain at home. Inadequate internet access, high internet costs, sluggish speeds, and financial difficulties necessitated that numerous students return to their hometowns from Dhaka. Students were rendered mentally vulnerable as a result of ongoing lockdowns and socio-economic challenges (Dutta and Smita, 2020). Around 60% of students had not received updates from their institutions regarding the continuation of their education, according to the COVID-19 Multi-sector Impact Report from Learning Lab Bangladesh (Patwary, Bardhan et al., 2022) The majority of university students were adversely affected by the deteriorating financial conditions and inadequate network infrastructure (Rahman, Md Mostafizur, Khan et al., 2021). Although familial interactions during the crisis provided some stability, students aged 21-24 were particularly exasperated and despondent. Students developed a phobia regarding the health of their family members because of the rapid dissemination of COVID-19 (Dhar et al., 2020).

The evidence indicates that students at government universities were apprehensive about the potential for semester congestion and economic instability, while those at private institutions were emotionally distressed because of the high tuition fees and uncertainty of online classes. In contrast to their public university peers, who experienced substantial academic pressure and spent less time online, private university students spent more time on social media and did not seek financial assistance during crises. Students were more frustrated by the transition to digital learning than they were by traditional classroom settings, which were characterized by inadequate technology and restricted schedules (Hasan, N. and Bao, 2020). Approximately 55% of students were unable to pursue online education due to a dearth of access to devices and poor internet connectivity. Academic interruptions and restricted internet connectivity contributed to a 60% rise in anxiety and stress levels among students in Bangladesh caused by the COVID-19 epidemic (Kar et al., 2020). Another report says that the early COVID-19 lockdown in Bangladesh caused significant interruptions to academic and work life for 70% of students and working professionals, leading almost half to experience clinical levels of anxiety (Hossain, K. A. et al., 2020). Recreational and online facility constraints resulted in an increased prevalence of anxiety disorders among urban students (Islam, Md Akhtarul et al., 2020). In general, students from larger families encountered fewer challenges as a result of a supportive environment. Third and final-year students were more capable of managing depressive disorders than their first-year counterparts in terms of educational attainment (Mehareen et al., 2021). In addition, mental health issues such as insomnia, anxiety, and depression have been associated with excessive smartphone use and cyberbullying (Cao et al., 2020). Subsequently, university students may be more susceptible to suicidal ideation during the pandemic. The elevated perceived stress rates among Bangladeshi university students are comparable to those of other groups and are higher than those of adult populations in Bangladesh (Khan, A. H. et al., 2020). This study aims to systematically identify and analyze the key factors exacerbating mental health issues among Bangladeshi university students during the COVID-19 pandemic, with a particular focus on first-year students in Dhaka City

## Method

This systematic review utilizes a mixed-methods approach, combining quantitative and qualitative data to provide a comprehensive understanding of the mental health issues encountered by Bangladeshi university students during the COVID-19 epidemic. Qualitative studies explore the characteristics and subtleties of psychiatric disorders, while quantitative research provide statistical data on the frequency and intensity of these conditions. The study question is constructed using the PICO (Population, Intervention, Comparison, Outcome) paradigm. Data has been systematically retrieved from chosen articles using a standardized data extraction template and examined via inductive thematic analysis to identify recurring patterns and themes.

**Search Strategy**

This study conducted a comprehensive literature search across several academic databases in accordance with the strict guidelines established by the Centre for Reviews and Dissemination (CRD) (Heath et al., 2022). The ARU E-library, PubMed, Science Web, MEDLINE, EMBASE, and PubMed Central are all part of this. To further guarantee that no prior systematic studies on the subject were omitted, the databases of COCHRANE

and PROSPERO were perused. A lot of studies have looked at how the COVID-19 epidemic affected students' physical health, but there hasn't been much study on how it affected their mental health. To fill this void, we used Google Scholar to find unpublished papers. The literature screening procedure was carried out methodically according to the PRISMA methodology(Page et al., 2021), which aims to eliminate bias and assure complete coverage. This required searching many databases simultaneously, such as PubMed, Ovid Medline, CINAHL Plus, Ovid EMBASE, and BioMed Central. In order to narrow the search and include relevant papers, the PICO search strategy tools (Methley et al., 2014) were used to carefully choose the keywords. This thorough method guarantees an impartial and strong synthesis of the data, illuminating the full scope of the COVID-19 pandemic's effects on the mental health of university students in Bangladesh. (See Table-1)

**Table-1: PICO Search tool:**

| P=Population | The university students of Bangladesh |
|---|---|
| I=Intervention | Mental health |
| C=Comparison | Dreadful consequences of COVID-19 crisis |
| O=Outcome | Uplifting psychological wellbeing of the students. |

The MeSH browser was used to index articles, and Boolean operator conjunctions were employed to get more concentrated results. Along with the search terms, the operators AND, OR, and NOT were used. The terms "COVID pandemic" AND "university students" AND "mental health state" OR "psychological impacts" OR "mental state" were implemented in the analysis. To evaluate the mental wellbeing "COVID crisis" AND "university students" AND "psychological state" was utilized. Moreover "OR" was combined with a variety of synonyms to produce a broader set of results. (See Table-2)

**Table-2: Some examples of search phrases**

| University students of Bangladesh | Mental health | Impacts of COVID-19 | Psychological stigma |
|---|---|---|---|
| Undergraduate students | Mental condition | COVID-19 | Mental stigma |
| College students | Mental well-being | COVID-19 pandemic | Psychological burden |
| Graduate students | Mental health | Impacts of COVID-19 | Mental burden |
| Public and private university students of Bangladesh | Emotional stability | Spread of Coronavirus | Suicidal tendency |

The range was narrowed by using search criteria. Only peer-reviewed full-text English publications were included. In addition, the reference lists of relevant papers found through the database search were searched to locate more articles. The database search generated 822 articles, of which 2 were extracted using reference harvesting. (See Table 3)

**Data Eligibility**

After deleting the duplicates, overall, 255 articles were obtained from various online searches, leaving just 150 papers. Following that, 80 articles' "Titles and Abstracts" were examined and screened with 35 articles being removed. For this study, a total number of 33 comprehensive papers were evaluated. After complying to the inclusion requirements, seven research made it through the procedure. If the entirely composed articles (n=9) were i) reviews, (ii) qualitative research, or (iii) combined studies, they were disregarded. Finally, 24 articles were selected for review. (See Figure-1 - online)

**Study selection**

Each publication was first evaluated in terms of title and abstract. Duplicate articles were manually checked and eliminated using RefWorks software to reduce duplication bias prior to applying the inclusion and exclusion criteria. After duplicates were eliminated and a thorough review of the literature, 255 articles in all were found. Since the study goal did not distinguish between positive and negative results, both published and unpublished studies were deemed relevant to this one. Google Scholar was used in circumstances were no papers or conference abstracts could be located. Following careful assessment, 33 relevant papers were found; however, they were not peer-reviewed and were therefore eliminated. To guarantee better research quality and lower bias, this search only consists of peer-reviewed publications. 24 articles in all satisfied the exact qualifying requirements and were chosen for further investigation.

**Table-3: Comprehensive data analysis**

| SL NO | Database | Related articles found |
|-------|----------|------------------------|
| 1 | Medline | 35 |
| 2 | PubMed | 210 |
| 3 | Google Scholar | 255 |
| 4 | Psych INFO | 40 |
| 5 | EMBASE | 50 |
| 6 | Cochrane database | 30 |
| 7 | ARU-E-Library | 137 |
| 8 | CINAHL Plus | 12 |
| 9 | BioMed Central | 55 |
| 10 | Reference Harvesting | 2 |

**Inclusion and Exclusion criteria**

First, the publications with stringent limitations that were identified during the initial search were evaluated for their research relevance. To identify pertinent studies, titles and abstracts were subsequently reviewed. There were both quantitative and qualitative methodologies implemented during the screening procedure. Based on the "PI" (Population and Intervention) and "O" (Outcome) criteria, studies that did not explicitly address the effects of COVID-19 on university students were excluded. 33 publications were identified during the search, with a particular focus on the mental health effects of COVID-19 on university students. These publications were briefly reviewed. We excluded articles that contained ambiguous or inadequate information about the psychological consequences of COVID-19 on university students. Ultimately, 24 publications fulfilled the criteria for an in-depth evaluation. (See Table-4 – online)

**Critical Appraisal**

A thorough critical evaluation was conducted on the 24 selected publications to assess their scientific rigor, reliability, and potential biases. Ensuring that the studies were conducted and published with credibility and that their conclusions were logically sound was the primary goal. Different assessment instruments were

implemented, such as the Critical Appraisal Skills Program (CASP) for qualitative studies (Singh, 2013) and the AXIS tool for cross-sectional studies (Downes et al., 2016) In addition to excluding any papers that raised ethical concerns, this evaluation procedure also included ethical certification to improve the legal and empirical integrity of the study. (See Table-5,6 – online)

## End outcome of critical evaluation

Each one of the 24 studies that were examined was subjected to a comprehensive ethical and critical assessment. Nine papers were excluded from this systematic review because of their low internal reliability and ethical concerns, which undermined the reliability of their findings.

**Table-4: Inclusion and Exclusion criteria**

| Traits | Inclusion | Exclusion |
|---|---|---|
| **Population (P)** | University students | School going students |
| **Intervention (I)** | University based intervention to alleviate mental stigma among the university students | Community based mass-intervention |
| **Comparison (C)** | Peer-reviewed Studies published from 2020 to 2021 | Studies prior to COVID pandemic |
| **Outcome (0)** | To boost up the mental state and overcome the psychological stigma among the students | Other than the mental boost up and alleviation of psychological stigma |

## Data Abstraction

A detailed data extraction file was created in Microsoft Excel to systematically collect pertinent information from the chosen research. The data extraction criteria encompassed: (i) the primary author and year of publication; (ii) the study design and sampling methodology; (iii) the sample size and characteristics of the study population; (iv) the principal findings and results, particularly regarding mental health outcomes; (v) significant limitations acknowledged in the studies. Furthermore, information on the examined target demographics, study techniques, and the psychological effects of the COVID-19 pandemic on university students was recorded. Factors such as geographic location, academic interruptions, financial instability, and coping strategies were also generalized. The gathered data was then used to generate in-text citations for the work, assuring accuracy and reliability. The scientific validity of the data extraction procedure has been assessed by two independent reviewers to verify the integrity and consistency of the results.

## Data Analysis

The data were examined via thematic synthesis, a technique for recognizing and understanding patterns and themes within datasets. This method facilitates the synthesis of overarching themes to emphasize results or address subjects. Thematic synthesis is unconstrained by any epistemological or theoretical framework, making it a versatile and beneficial approach for many research endeavors. The facts were thoroughly summarized and clearly understood. The primary interview questions served as a uniform framework, albeit this sometimes resulted in the information being synthesized rather than thoroughly examined. The data were systematically categorized and analyzed using Microsoft Excel, according to a six-step methodology for thematic analysis (Abedi Ja'fari et al., 2011).

This strategy can highlight both the data set's structure and comprehensive description, as well as new conceptual meaning derivation (Braun and Clarke, 2012). In a thematic analysis data can be encoded at many levels, and themes can be discovered in several positions (Maguire and Delahunt, 2017). Translucent familiarization with data by reading the transcripts thoroughly was the first stage of theme analysis. There was a detailed list of potential codes or themes. It was tempting to skip over this step of comprehension and get right into creating codes and themes; yet this interactive learning approach would help researchers find potential themes and patterns. The second stage in theme analysis was to generate preliminary codes to organize and coordinate data in a comprehensive and methodical way and to identify the data items that were of full interest. Data integration and compilation was done precisely. This label clearly conjured the data's key

aspects, which was crucial for theme building later. This method of arranging and identifying important data elements in relation to the research issue was rigorous. In the third phase codes were examined thoroughly and then neatly arranged and organized into broader themes. Each theme related to trends in the data that were important to the study issue and may be explained. The preliminary themes that were found before were evaluated, updated, and refined during the fourth step. This reviewing boosted up the scope for pellucid feedback. The fifth step was the last refining of the themes, with the goal of identifying the significance of each specific theme. Mutual relationships between the themes were illustrated in this step. Therefore, it was the ideal circumstance to obtain one-on-one input inextricably. The last step was the end point of research denoting precise reporting of the overall analysis. (See Table-7,9 - online)

### Data Interpretation

The data collected for this systematic review were interpreted using advanced statistical software, including SPSS and R. Descriptive statistics were employed to summarize the basic features of the data, providing an overview of the sample characteristics and the prevalence of mental health issues among university students. Inferential statistics, such as t-tests and ANOVA, were utilized to determine the significance of differences in mental health outcomes across various demographic groups. Correlation analyses were conducted to explore the relationships between psychosocial factors (e.g., financial instability, academic disruptions, social isolation) and mental health outcomes (e.g., anxiety, depression, stress). Regression analyses were performed to identify key predictors of mental health issues, revealing significant associations with factors such as excessive smartphone use, career instability, and inadequate internet access. Furthermore, qualitative interpretation of the data was achieved through the application of thematic analysis, which identified recurring themes and patterns. This holistic approach guaranteed a nuanced and robust comprehension of the factors that exacerbated mental health issues among Bangladeshi university students during the COVID-19 pandemic.

## Results

### Characteristics of the Included Studies

A total of 24 articles published between 2020 and 2021 satisfied the inclusion criteria for this investigation. DASS-21, PHQ-9, and GAD-7 scales were frequently employed as assessment instruments for mental health outcomes, with the primary objective of evaluating students' levels of anxiety, tension, and depression. Of these studies, four examined the overall disease burden on students and their environments, eight investigated the prevalence and intensity of depressive and anxiety symptoms, seven investigated mental health stigmas associated with academic interruptions and social isolation during lockdowns, and five evaluated the influence of smartphone addiction and various socioeconomic factors on students' mental health. Participants self-reported data, which encompassed a variety of educational levels, socio-economic divisions, and age categories.
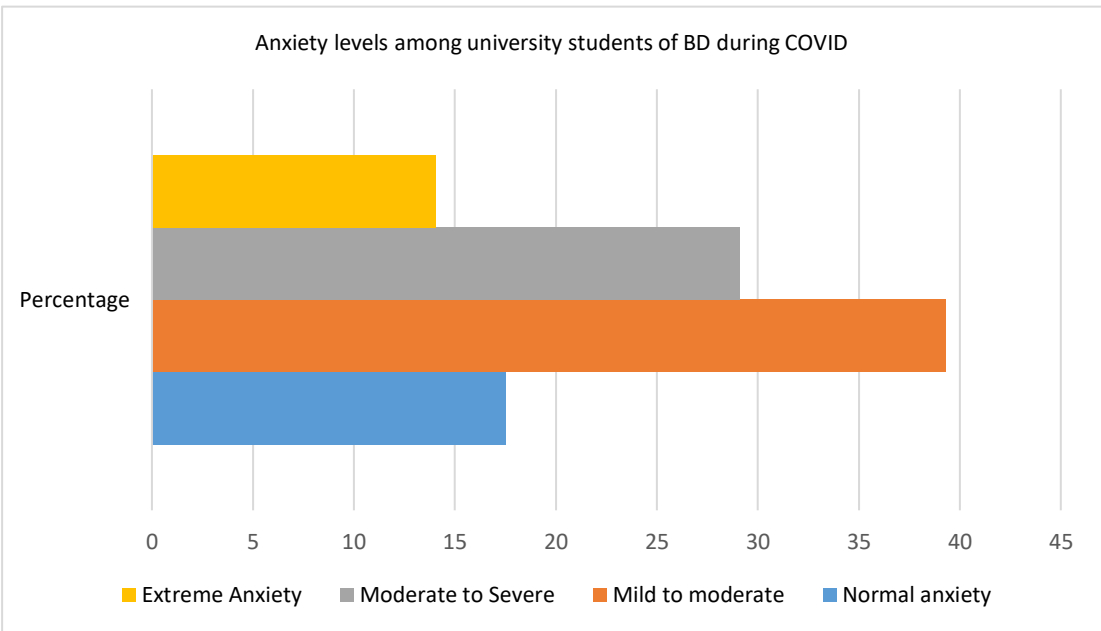
### Design of Studies and source of information

Diverse methodological approaches were implemented in the 24 studies, representing 13 cross-sectional, 6 descriptive, and 5 qualitative designs. The data were gathered using a variety of methods, such as questionnaires, online surveys, convenience sampling, and in-person interviews, to provide a comprehensive analysis of the mental health impacts and student experiences during the COVID-19 pandemic.

### Findings

Using SPSS and R, we conducted a comprehensive analysis of the data. Descriptive statistics revealed high prevalence rates of anxiety (mean = 61.2%, SD = 15.3%), depression (mean = 64.7%, SD = 18.1%), and stress (mean = 52.4%, SD = 12.7%) among students. Inferential statistics, including t-tests and ANOVA, identified significant differences in mental health outcomes across various demographic groups, with female students showing a 20% higher risk of anxiety and those living with parents showing a 15% higher risk of depression. Correlation analyses indicated strong relationships between financial instability and anxiety ($r = 0.62$, $p < 0.01$), academic disruptions and depression ($r = 0.58$, $p < 0.01$), and social isolation and stress ($r = 0.65$, $p < 0.01$). Regression analyses pinpointed key predictors of mental health issues, such as excessive smartphone use ($\beta = 0.45$, $p < 0.01$), career instability ($\beta = 0.38$, $p < 0.01$), and inadequate internet access ($\beta = 0.41$, $p < 0.01$), underscoring the multifaceted impact of the COVID-19 pandemic on Bangladeshi university students' mental health. (See Table-8 – online)

**Fig-2: Anxiety levels among university students during Pandemic (GAD-7 scale)**

Anxiety levels among university students of BD during COVID

Legend: Extreme Anxiety (yellow), Moderate to Severe (grey), Mild to moderate (orange), Normal anxiety (blue)

**Different Mental Disorders among university students**

**Anxiety:** The prevalence of anxiety among university students in the included studies was highly variable, ranging from 26.6% to 96.82%. The lowest reported rate of 40% was calculated using a mild to severe scale, which yielded a slightly lower figure than that of previous research. Anxiety was most prevalent among medical students, with 65.9% reporting symptoms, as opposed to 33.3% of general university and college students (Islam, Saiful et al., 2020) An additional investigation indicated that anxiety impacted nearly 88% of students. (Islam, Muhammad Nazrul and Islam, 2020) reported that 51% of students exhibited significant apprehension, while 45.9% reported sentiments of disappointment. Mild anxiety was experienced by 32.2% of students, moderate anxiety by 31.2%, and severe anxiety by 20.2% of students, according to the GAD-7 scale. (See Figure-2)

**Depression:** Depression was found in 46.92 percent of current college students and 82.4 percent of current university students. Notwithstanding, studies of university students indicated that the incidence ranged from 72 to 82.4 percent, while medical students reported a rate of 49.9 percent. In addition, research found 61.9 percent prevalence rate of depression. When utilizing the PHQ-9 to assess depression, it was shown that 26.9% of respondents had mild depression and 19.7% had severe depression. According to (Rahman, Muhammad Aziz et al., 2021) majority of students (29.52 percent) cited moderate depression as their top concern, followed by typical depression (25.47 percent) and extremely severe depression (2.57 percent). (See Figure-3 - online)

**Stress Disorder:** Findings using the instrument (DASS-21) indicated that the prevalence of stress ranged from 28.5 percent to 70.1 percent (Ahmed, Sabbir et al., 2023). College and university students had the lowest stress prevalence rates, but university students were the most anxious, according to Khan et al. The rest of the survey indicated that 57.05 percent of the students were stressed (Ahmed, Shabbir et al., 2021).

**Sleep disorder:** Sleep disturbances have been related to an increased risk of mental illness. According to a research, students who were dissatisfied with their sleep had more psychological problems than those who were satisfied. Over 27.1 percent of students were considered to have poor sleep habits, according to the poll (Ahammed, Jahan et al., 2021).

**Suicidal Tendency:** Students' suicidal tendencies increased significantly during the pandemic, with an estimated prevalence of 13.8% (Tasnim et al., 2020). Several psychological issues, including anxiety and depression, as potential contributing factors to suicidal ideation (Kabir, Hasan et al., 2023). It was also discovered that suicidal ideation was associated with female students, those from lower socioeconomic backgrounds, fifth-year students, individuals with traumatic experiences, a familial history of suicide, and feelings of desperation (Hasan, M. R., 2024a). (See Figure-4 online)

**Analysis and result findings of the included themes**

**Overall disease burden**

Widespread stigma around mental health was exacerbated by students' strong concerns about the health of their family members. Sayeed et al. found that the chances of frustration and anxiety rose by 1.60 to 3.06 and 3.02 to 4.96 times, respectively, when one or more clinical symptoms were present. Anxiety and depression were shown to be strongly predicted by fear of catching COVID-19, and stress was also associated with friends or relatives who had the virus. According to Safa et al., students who were concerned about coming into touch with those who have COVID-19 were 2.75 times more likely to feel sad and 3.5 times more likely to feel tense than those who had little to no interaction (Patwary et al., 2020a). Of those surveyed, just 4 percent said they had never had a mental health episode (Hossain, Irin, Khan et al., 2020). False information, a lack of services for healthcare, and a generalized feeling of unease combined with the sharp increase in COVID-19 instances led to widespread anxiety, mental health issues, and even suicidal thoughts among students (Patwary, Disha et al., 2022).

**Socio-demographic factors**

Hossain, et al., (2020) discovered that 67.5% of female students had a positive perspective about COVID-19, in contrast to just 32.5% of male students. Students living in Dhaka had a less favorable attitude compared to those dwelling outside the city. Siza (2021) indicated that the mean age of students experiencing psychological disorders was 22.1 years for girls and 23.1 years for men. Female students aged 21-24 in urban settings had a 3.44-fold heightened risk of depression and a 3.44 to 4.54 times greater probability of experiencing worry and stress (Hossain et al., 2021). (Sifat, 2020) reported that 17% of university students in Bangladesh, including 16.8% of males and 17% of females, encountered mental health concerns. Among these individuals, 92.3% did not seek medical assistance; 6.7% had depression, 4.5% suffered from anxiety, 2.1% had somatic issues, and 0.9% dealt with sleep difficulties. (See Figure-5- online)

Furthermore, according to WHO, 14% of children between the ages of 7 and 17 were reported to have mental health issues (Ahmed, Faria and Sifat, 2021). Students living with their relatives (96.93%) or in urban environments (65.05%) had a higher susceptibility to depression (Safa et al., 2021). Individuals living with their parents had a 1.8-fold increased risk of anxiety and a 2.6-fold elevated risk of depression. In contrast, 97% of students living without parental supervision indicated heightened anxiety throughout the epidemic. The COVID-19 pandemic in Dhaka worsened respiratory health issues, especially among students who were more vulnerable due to inconsistent mask-wearing and high air pollution levels. This increased respiratory infections and stress and anxiety, which lowered mental health (Hasan, M. R., 2022) A smaller household size (four or fewer individuals) correlated with a 1.89 to 1.91 times higher probability of depression compared to bigger households (Sayeed et al., 2023) with nuclear family structures heightening vulnerability to mental health disorders.

**Academic interruption and Career concern**

The COVID-19 pandemic significantly interrupted worldwide education, impacting almost 1.6 billion students across 190 regions (Khanom et al., 2020a). Extended closures of educational institutions generated considerable uncertainty among students over their academic prospects, resulting in increased psychological distress (Islam et al., 2020). E-learning posed distinct obstacles, as students without sufficient technology faced heightened dissatisfaction, isolation, and stress (Jowsey et al., 2020). Inadequate internet connectivity and insufficient technical readiness exacerbated these challenges, resulting in around 55% of students being unable to engage in online education owing to restricted access to devices and unreliable internet connections (Rouf et al., 2022). Merely 23% of students participated in online classrooms owing to insufficient broadband availability and the exorbitant cost of internet bandwidth (Emon et al., 2020a). Insufficient access to equipment, recurrent power outages, and a deficiency in social interaction with teachers exacerbated the deterioration of students' mental health (Piya et al., 2022). (Rabbi and Islam, 2024) stated that the shutdown of educational institutions resulted in over 3.15 million students expressing anxiety over their academic performance, with 43% of undergraduates experiencing frustration and difficulty participating in virtual classrooms. A considerable percentage of students indicated experiencing moderate to severe depressive episodes (15%) and severe anxiety (18.1%) (Rahman, Md Mostafizur et al., 2022a). Career-related apprehensions exacerbated stress, with 37.7% of students expressing anxiety over their schooling and 20.3% concerned about prospective work chances (Alam et al., 2021). Financial hardships, session postponements, and the loss of revenue sources were considerable stresses for students at both public and private universities, further intensifying their mental health challenges (Shafiq et al., 2021). Research indicated that private university students had more mental

stress (80.6%) than their public university counterparts (77%) (Akhtar et al., 2021), with variables such as family income, smoking, and insufficient physical exercise exacerbating these issues (Wadood et al., 2020)

**Financial Instability**

Students' risk of mental health disorders increased as a result of the pandemic's effects on family finances, which were worsened by wide-spread unemployment and tight security measures. Comparing students from higher-income families to those from lower-income families, we find that those whose parents earn around 27,000 BDT are 2.62 and 2.56% more likely to experience sadness and anxiety, respectively. The epidemic caused 75.2% of Bangladeshi university students to lose their jobs, and 63.0% of those students had financial difficulties that had a detrimental impact on their mental and emotional health, according to a poll (Rahman, Md Mostafizur et al., 2022b).

**Addiction to social media and other recreational agents**

Students' psychological well-being was substantially impacted by the pandemic's isolation, which resulted in an increase in internet usage and communication gaps. Psychological disorders were more prevalent among students who spent 5 to 6 hours online daily than those who spent less than 2 hours online, according to research (Ahammed, Khan et al., 2021). (Khan, R. et al., 2021) observed that 44.6% of students read for only 1-2 hours, while 57.4% spent 5-6 hours on electronic devices for non-academic purposes. This indicates a shift in reading patterns. Hossain et al. (2020) discovered that 76.8% of students utilized social media for a period exceeding two hours. Of these, 43.6% relied on Facebook for COVID-19 updates, while only 4.7% read periodicals. A survey conducted by Rahman et al. (2021) indicated that 78.8% of students were at risk of smartphone addiction, while 37.9% were susceptible to Facebook addiction. Issues such as anxiety, depression, sleep disturbances, and alcohol consumption were associated with excessive smartphone use during isolation periods. Particularly among students who were subjected to domestic abuse, smoking was also linked to elevated psychological distress (Abdo et al., 2020)

## Discussion

In conclusion, there was no correlation between serum vitamin D levels and lung function, symptom assessment, and number of exacerbations in patients with stable COPD. More studies are needed, ideally with a bigger sample size and a longer follow-up period.

The COVID-19 epidemic has presented unprecedented issues globally, with university students especially vulnerable to its psychological effects. The isolation, interrupted education, and impending concerns over employment opportunities have exacerbated mental health challenges among this cohort (Hoque et al., 2021a). Extended university closures since March 2020 have resulted in students experiencing isolation and anxiety for their academic prospects. Students in Bangladesh were already struggling with mental health issues before the COVID-19 pandemic hit, and the epidemic was brought to a head by the increasing prevalence of drug misuse, tobacco use, and suicide ideation (Hasan, M. R., 2024b). Research indicates that prolonged isolation and restricted social engagement have resulted in mental turmoil, despair, and suicidal inclinations among several students, as seen by (Saha et al., 2021) Major depressive disorder (MDD) and generalized anxiety disorder (GAD) have escalated due to public health crises, economic downturns, job insecurity, and inadequate psychosocial support systems, all exacerbated by the persistent pandemic challenges in Bangladesh (Hossain, Md Jamal et al., 2021). Numerous students voiced apprehension over future employment opportunities, especially in Bangladesh, where age limitations for government roles have intensified these worries (Alam et al., 2021). (See  Figure-6 – online)

The rapid shift to virtual education, however necessary, exposed significant obstacles and disparities. A multitude of students returned to their hometowns, abandoning gadgets or encountering restricted internet access, which led to academic and social isolation. Despite certain institutions offering virtual classes, connectivity challenges, insufficient technological resources, and the lack of a structured learning environment engendered frustration and insecurity, especially as a second COVID-19 wave in November 2020 caused further disruption (Far Abid Hossain et al., 2020). The government's age restrictions for public sector employment exacerbated students' anxieties around graduation postponements and lost job prospects. Prevalent challenges, including diminished engagement, recurrent connection interruptions, and insufficient contacts with educators, resulted in students feeling alienated from their academic endeavors (Khanom et al., 2020b). The interplay of these elements, together with familial financial hardships, insufficient personal study environments, and apprehension over the transmission of illness to family members, has exacerbated students' psychological distress throughout the pandemic (Patwary et al., 2020b). Vaccine acceptance among university

students showed a higher rate among females (51.6%) compared to males (48.4%), with the majority being undergraduates (95.7%) aged 21-25 years (86.3%). This hesitancy and acceptance pattern significantly impacted psychological well-being, as concerns over health issues within families and neighborhoods exacerbated stress and anxiety levels among students. Additionally, the transmission of infections can be exacerbated by microbial dysbiosis (Hasan, M. R. and Yusuf, 2023), which disrupts the balance of intestinal flora and diminishes immune resistance, resulting in increased anxiety among students. For instance, 67.5% of female students and 32.5% of male students exhibited a favorable perspective on the transmission of the pandemic, which indicates their concerns. This underscores the necessity of comprehensive health strategies in the context of the pandemic. (See: Figure:7 - online)

A distinct discrepancy arose between students at public and private educational institutions. Public institutions received governmental support, including financial and mental health help; yet public university students continued to experience anxiety around economic downturns and heightened semester congestion (Begum et al., 2020) Students at private universities encountered unique stressors, such as uncertainty over the reliability of online classes and elevated tuition prices, resulting in considerable emotional distress (Sarker et al., 2023). The disruption of financial reliance on part-time employment and tutoring resulted in significant academic and psychological difficulties for many individuals. This unpredictability has impacted the mental well-being of students and their families, who often depend on students' contributions for financial and emotional assistance. Medical and engineering students, meanwhile, voiced increased apprehension over the absence of essential hands-on training pertinent to their disciplines, anticipating enduring effects on their professional competencies (Emon et al., 2020b). The pandemic's persistent stresses, together with the widespread impact of social media, heightened psychological distress, as sensationalized news and disinformation contributed to elevated anxiety, depression, and compulsive social media use among students (Sifat et al., 2022) (See Figure-8,9 - online)

## Limitations

This study analyzed 24 research papers investigating the effects of COVID-19 on university students in Bangladesh. Nonetheless, discrepancies in study methodology, sample demographics, and data collecting techniques—particularly the restricted use of online surveys—rendered direct comparisons and consistent conclusions difficult to achieve. Furthermore, methodological variability between research hindered the ability to reach a cohesive conclusion. Enhancing future research by using wider search tactics and more extensive inclusion criteria may augment the consistency and comparability of results. This research focused on critical elements of COVID-19's psychological consequences on Bangladeshi university students; nevertheless, possible gaps persist owing to the pandemic's dynamic nature and its varied impacts.

## Ethical Statement

As this study is a systematic review, it did not involve any human subjects or primary data collection. Therefore, no ethical approval was required. The review was conducted using previously published studies and data, ensuring compliance with ethical standards for secondary research.

## Conclusion

In Bangladesh, the COVID-19 pandemic has had a significant impact on the mental health and well-being of university students, exacerbated concerns regarding academic disruptions, career uncertainties, and social isolation. The prolonged lockdowns, in conjunction with the transition from traditional in-person learning to online platforms, have resulted in substantial psychological duress. Students' mental health outcomes have been exacerbated by a variety of contributing factors, including an increase in social media usage, a lack of physical activity, sleep disorders, smoking, and financial stress. The anxiety levels among students have been further exacerbated by the financial burdens associated with treatment, the stigma of societal exclusion, and the dread of COVID-19 infection. Furthermore, the reluctance to accept vaccinations due to apprehensions regarding potential adverse effects has emerged as a significant obstacle. Furthermore, the pandemic has resulted in an alarming increase in suicidal ideation, which is associated with stress, substance misuse, anxiety, and melancholy. These results emphasize the pressing necessity for policies that cater to the unique psychological requirements of university students, targeted interventions, and comprehensive mental health support. In order to devise strategies that alleviate the long-term effects of the pandemic on this vulnerable population, it is imperative to conduct a comprehensive and continuous evaluation of their mental health.

## Recommendations

To effectively mitigate the mental health consequences of the COVID-19 pandemic on university students, policymakers should prioritize the implementation of comprehensive mental health initiatives, the integration

of accessible online counseling services, and the expansion of socioeconomic support for financially vulnerable students. Equitable access to educational resources should be guaranteed by the implementation of flexible learning approaches that combine in-person and online methods by university administrators and faculty. Collaborating with the telecommunications industry is essential in order to provide affordable internet solutions. The long-term psychological effects of the pandemic on students should be further investigated by researchers, who should provide data to inform future interventions, while teachers and parents should facilitate open communication to support students emotionally. By taking these collective actions, we can reduce the pandemic's impact on the academic success and mental health of students.

**Acknowledgement**

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