Impact of COVID-19 anxiety on loneliness and sleep quality of students and professionals in Bangladesh

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ABSTRACT

The COVID-19 pandemic has globally affected almost every aspect of people's lives, especially, their physical and mental well-being. The degree of its impact, however, is different from place-to-place and person-to-person. Although there is a growing literature on the variable impact of the pandemic on the quality of sleep, loneliness, and mood across different populations (e.g., students, health-workers), little is known about how COVID-19-specific anxiety affects the loneliness feeling and sleep quality among students and employees, specifically, in a low-resource region like Bangladesh. The present study aimed to investigate the effect of COVID-related anxiety on the feeling of loneliness and sleep quality of students and professionals in Bangladesh. Additionally, we were interested in comparing the level of COVID-specific anxiety, loneliness, and quality of sleep between these two groups. In total, 211 Bangladeshi students and professionals participated in an online survey in August 2021 when the restriction was still in place. Measures of COVID-19 anxiety, loneliness, and sleep quality scales were used. Regression analysis indicated that overall loneliness and poor sleep quality were strongly predicted by COVID-specific anxiety regardless of being a student or professional. Almost half of the study population (48.3 %) felt severe loneliness and 70.01 % were bad sleepers. Mann-Whitney *U* test revealed that professionals felt more emotionally lonely, had a higher level of COVID-19-specific anxiety, and had poorer sleep quality than students. A better support structure should be implemented to help the population, particularly, the professionals to lessen their COVID-19-related anxiety and loneliness, and promote better sleep for alleviating stress and improved well-being.

1. Introduction

The COVID-19 PANDEMIC has ravaged almost all corners of the world affecting people's personal, social, and most importantly health and well-being. Soon after the declaration of COVID-19 as a Pandemic in March 2020 by WHO (WHO, 2020), many countries implemented strict lockdown protocols to curb the spread of this highly transmissible virus. Such unprecedented circumstances had a negative impact on people's mental health (Kang et al., 2020; Mukhtar, 2020). The most common psychological problems people experience in this pandemic are anxiety about getting infected, spreading the virus, and having severe health complications due to contracting the COVID-19 infection (Dalal et al., 2020). Also, the thought of death as a consequence of the disease was intensified during the pandemic leading to increased anxiety (Pakpour & Griffiths, 2020). Bangladesh confirmed its first case of COVID-19 on March 8, 2020 (IEDCR, 2021), and following that the country went under a nationwide lockdown which had been extended multiple times as a preventive measure to control the spread of the virus. In August 2021 when data collection was ongoing, the total number of positive cases was 251,134 with 5510 deaths (IEDCR, 2021). The business retails, financial and educational institutions were closed because of the lockdown which forced people to stay at home for extended periods, resulting in limited face-to-face interaction with their peer group and decreased in-person activities (Jiao et al., 2020). This had an adverse impact on people's mental well-being, giving rise to a wide range of psychological issues such as anxiety, depression, stress, and sleep problem (Shammi et al., 2020; Shammi et al., 2021). A recent nationwide online survey demonstrated that the prevalence rate of anxiety, depression, and stress symptoms have risen to 33.7 %, 57.9 %, and 59.7 % respectively since the beginning of the Pandemic among the adult population of Bangladesh (Banna et al., 2022).

Besides psychological issues, the COVID-19 pandemic also facilitated

the feeling of isolation and loneliness due to the continuous lockdown protocol as a measure of maintaining a social or physical distance. Social distancing has been an important aspect in this critical time, also resulting in less contact with peers and support networks like lockdown measures. Therefore, mental health issues, such as depression and anxiety, had risen in the population (Wang et al., 2020; Tull et al., 2020; Choi et al., 2020). Moreover, at the outset of the pandemic, self-isolation led to the feeling of loneliness which demonstrated a high level of distress among individuals (Xiao et al., 2020).

Another important factor of healthy functioning is sleep. It is a prerequisite for good health as it helps our brain and body to rest, repair, and maintain overall well-being (Fletcher, 2022). Unsurprisingly, the sleep level of the individuals had been highly affected during the pandemic lockdown, mostly worsening the quality of sleep such as developing symptoms of insomnia, change in the regular sleep cycle with reduced hours, etc. (Marelli et al., 2021; Pérez-Carbonell et al., 2020; Stanton et al., 2020).

In recent decades, loneliness has been categorized as public health risk (Gerst-Emerson & Jayawardhana, 2015), and sleep has always been important to a healthy life functioning. During the Pandemic, both of these important health factors were affected at least to some extent among the general population (Casagrande et al., 2020; O'regan et al., 2021). Recent studies found that at the onset of the COVID-19 outbreak, there was an increased level of loneliness, distress, and insomnia and as a consequence people experienced adverse well-being (Killgore et al., 2020; Lee et al., 2020; Liang et al., 2020; Wong et al., 2020; Xiao et al., 2020). Individuals suffered from poor quality of sleep as a result of self-isolation, specifically, during the early stage of the pandemic when the lockdown was in place (Amicucci et al., 2021; Xiao et al., 2020). Studies also demonstrated heightened anxiety, depression, and perceived loneliness to be significant drivers of poor sleep quality during the COVID-19 pandemic (Grey et al., 2020; Robb et al., 2020). In addition, being a student, healthcare worker yielded an elevated risk of mental health issues, sleep disturbance, and perceived loneliness (Evans et al., 2021; Huang & Zhao, 2020; Johansson et al., 2021; Korkmaz et al., 2020; Ulrich et al., 2021; Xiao et al., 2020).

Notably, most of these studies with students and workers measuring their level of mental well-being, loneliness feeling, and sleep issues were done among the western population from developed, well-resourced settings, e.g., UK, Europe, US (Liu et al., 2020, Groarke et al., 2020; Santini & Koyanagi, 2021), therefore, leaving open the scope for developing or limited-resourced regions (i.e., low- and middle-income country) like Bangladesh. Moreover, although there is a robust finding that students tend to suffer more adverse psychological well-being during this pandemic (Cao et al., 2020; Evans et al., 2021; Johansson et al., 2021; Marelli et al., 2021), the direct comparison between students and professionals are limited, specifically, in terms of how their quality of sleep, feeling of loneliness, and mood level were affected. Studies either looked into one or two of these aforementioned factors (Marelli et al., 2021; Majumdar et al., 2020), but not taking into account all three of them while comparing students and workers.

Another important note, while assessing the anxiety level during COVID-19 and its consequence on sleep and loneliness, researchers mostly used already well-established instruments (e.g., PHQ, GAD, DASS) that either measure general anxiety or overall psychological well-being (Burke et al., 2020; Palgi et al., 2020; Wang et al., 2020; Zhang et al., 2020). This limits the understanding of the specific type of anxiety caused by the pandemic period – COVID-19 anxiety; this is different as the pandemic, considering its near universal scope, generated an excessive level of global concern which is also contextual (Silva et al., 2020). Thus, we seek to contribute by addressing this gap that how COVID-19-specific anxiety affected the loneliness feeling and quality of sleep of the students and employees, especially, in a low-resource region, i.e., Bangladesh. Indeed, studies have been done in this resource-scarce setting, however, they were mostly with a general adult population (Das et al., 2021; Islam et al., 2021; Rahman et al., 2021), and to

the best of our knowledge, no direct comparison has been made between students and workers concerning their level of loneliness, sleep quality, and COVID-19 related anxiety.

1.1. The present study

In the present study, we, therefore, aimed to address those aforementioned issues or gaps. Our interest was twofold: One, to measure the effect of COVID-19-specific anxiety on the feeling of loneliness and sleep quality of students and professionals in the context of Bangladesh, a developing, limited-resource region. Two, whether there was a difference between these two groups on the level of COVID-19 anxiety, loneliness, and sleep. Based on prior evidence (Wang et al., 2020; Tull et al., 2020; Choi et al., 2020), we expected that COVID-19-related anxiety would have at least a moderate effect on loneliness and sleep quality regardless of being a student or professional. We also anticipated that students would have a higher level of COVID-19 anxiety, loneliness, and poor quality of sleep than the professionals, in line with the literature discussed above (Marelli et al., 2021; Johansson et al., 2021; Evans et al., 2021; Cao et al., 2020; Ulrich et al., 2021), mostly due to the uncertainty about their future evoked by the prolonged closure of the educational institution. Additionally, they felt bored or lonesome due to spending longer periods than usual in their home environment, limiting the activities they used to do before the pandemic. For the professionals, attending limited office hours by maintaining safety measures, they were interacting with their co-workers in-person, thus, giving them at least a glimpse of normalcy. However, they might still be worried about getting infected, felt lonely, and have sleep disturbance due to the imposed physical and social distancing protocols that limited their social connection and mobility (Majumdar et al., 2020; Shreffler et al., 2020; Xiao et al., 2020; Zhou et al., 2020).

To sum up, we measured the impact of COVID-19-specific anxiety on the feeling of loneliness and sleep quality among the students and professionals of Bangladesh. We also measured the level of COVID-19 anxiety, loneliness, and sleep as a function of occupational status (i.e., student vs. professional). To the best of our knowledge, so far, a direct comparison of these aforementioned factors between the students and professionals has not been explored in the Bangladesh context. Thus, the present study is an attempt to fill this gap in order to assist with effective mental health interventions formulated by healthcare professionals and policymakers.

2. Materials and methods

2.1. Participants and recruitment

Initially, a total of 218 people participated in the survey. Out of the 218 collected data, 07 data were excluded due to missing values, and vague answers to the demographic questionnaire, resulting in a final total of 211 respondents (female = 59.2 %). The professional group consisted of 40.08 % and the students 59.2 % of the total respondents. It was a cross-sectional survey with convenience/snowball sampling techniques for data collection. Anyone over 18 years of age and residing within Bangladesh was eligible to participate in the study. People between the age of 18 and 48 years took part in the survey (mean age = 25.96, SD = 5.808). The data were collected online through Google Forms. The survey took approximately 15 min to complete and the Google Form's link was disseminated through social media (e.g., Facebook, WhatsApp), and emails using institutional channels in August 2021.

2.2. Measures

The participant completed the Google Form consisting of a demographic questionnaire section that included questions such as age, gender, current occupation, and relationship status. Following that they

filled out questionnaires consisting of the COVID-19 Anxiety Scale (CAS), the 6-item Loneliness Scale (short form), and the Short Pittsburgh Sleep Quality Index Scale.

2.2.1. The COVID-19 Anxiety Scale

The COVID-19 Anxiety Scale (CAS, Silva et al., 2020) is a seven-item 4-point Likert scale ranging from 0 = not applicable to me to 3 = very applicable to me. The respondents choose a rating between 0 and 3 for each item concerning their behavior for the past few days. The total score could range from 0 to 21. Higher scores indicated an increased level of COVID-19-related anxiety (cutoff ≥10). The scale had a high internal consistency (Cronbach's alpha.86) and yielded good content, convergent-discriminant validity (high correlation with convergent measure, r > 0.50, and weak correlation with discriminant measure, r < 0.20, Silva et al., 2020). Cronbach's alpha of 0.94 was found for the present study's population.

2.2.2. The Loneliness Scale (short form)

A six-item Loneliness Scale (de Jong-Gierveld & van Tilburg, 2006) was used to measure the level of loneliness feeling which was a validated and shortened version of the original 11-item Loneliness Scale (de Jong Gierveld and Kamphuis, 1985). This six-item scale was composed of two subscales: 3-item emotional and 3-item social. The responses for each item on the six-item scale ranged from None of the time to All the time and the scoring of the scale ranged from 0 (not lonely) to 6 (extremely lonely). The α coefficient or internal consistency for the six-item scale was found between 0.70 and 0.76, from multiple surveys conducted with a large number of the adult population (de Jong-Gierveld & van Tilburg, 2006). The scale also showed good congruent validity as both the emotional and social subscale had a significant association with loneliness predictors derived from previous studies (regression co-efficients range from −0.11 to −0.24 where loneliness has an inverse relation with the variables such as partner/relationship status, de Jong Gierveld and van Tilburg, 2010). The level of loneliness could be further categorized into three levels (de Jong Gierveld and van Tilburg, 2021): 1 = not lonely (score 0–1), 2 = moderately lonely (score 2–4), and 3 = severely lonely (score 5–6). The present study population had a Cronbach's alpha of 0.63.

2.2.3. The Short Pittsburgh Sleep Quality Index Scale

The scale consists of 13 items measuring six factors of sleep habits: sleep duration and efficiency, sleep latency, sleep disturbance, waking up in the middle of the night, coughing and snoring, and daytime dysfunction during the past month (Famodu et al., 2018). The overall or global score of sleep quality could be obtained by adding up the scores of these six factors. The short 13-item PSQI rating scale yielded a significant correlation (0.94) with the original 19-item PSQI scale, considering it to be a valid tool in measuring sleep quality, in addition to its high internal consistency, Cronbach's alpha 0.83 (Famodu et al., 2018). Four out of thirteen items were open-ended questions that asked participants about their usual time of going to bed, the time it took to fall asleep, waking time in the morning, and their actual hours of sleep. The rest of the nine items were rating items based on a 4-point Likert scale, ranging from 0 (Not during the past month) to 3 (Three or more times a week). The aforementioned four items had their own scoring, but their scores were converted into a 4-point (0–3) Likert scale according to the guideline to make them comparable with the rest of the nine rating items' scoring. A total score >4 was indicative of poor sleep quality. Based on this cut-off point (4), respondents could be categorized either as a 'good sleeper' or a 'bad sleeper'. The internal consistency (Cronbach's alpha) was 0.60 for the present study sample.

2.3. Data analysis

SPSS V-23 (IBM SPSS, statistics, New York, USA) was used for data analysis. Descriptive statistical analysis, Pearson correlation, regression analysis, and Mann-Whitney *U* test were computed.

3. Results

3.1. Demographics

Table 1 states the demographics and mean COVID-19 anxiety ratings, loneliness scores, and sleep quality ratings as a function of occupation. The results depict that during the pandemic, specifically, during the lockdown period, professionals were experiencing more COVID-related anxiety, felt lonelier, and more sleep disturbance.

Further analysis was conducted into the percentage of the sleep quality categories and the level of loneliness feeling. The results revealed that 70.01 % were bad sleepers (among whom 50.7 % were students and 49.3 % were professionals) and only 29.9 % were good sleepers (79.4 % students and 20.6 % professionals). Almost half the study population showed severe loneliness (48.3 %; 50.9 % students and 49.1 % professionals) and a good number of participants (43.6 %; 65.2 % students and 34.8 % professionals) showed a moderate level of loneliness. Only 8.1 % (76.5 % students and 23.5 % professionals) of the total study population did not demonstrate any level of loneliness.

3.2. Association between sample demographics and scale items

Table 2 presents a correlation matrix that includes all variables discussed above. Categorical variables i.e., gender (1 = female, 2 = male), relationship (1 = single, 2 = married), designation (1 = student, 2 = professional), were coded with nominal numeric values. The older participants tended to have more COVID-related anxiety, and sleep disturbance. Being either married or single has a strong association with COVID-19 anxiety and feeling of loneliness but not with the quality of sleep. Not surprisingly, either being a student or a professional tended to be highly correlated with the feeling of COVID-19 anxiety, overall loneliness, and sleep quality. The more anxious they felt about COVID-19 the lonelier they felt and the more sleep-related disturbance they experienced.

3.3. Predictors of loneliness and sleep quality

Given that many of these above correlations were in the moderate range, for an in-depth understanding of the relationship between COVID-19-related anxiety and general well-being outcome (i.e., feeling of loneliness, quality of sleep), a set of regression analyses were computed-one for loneliness and another for sleep quality. Specifically, for each of these variables, we fitted a multiple linear regression model using available variables such as– age, relationship status, designation, and COVID-19-specific anxiety. These variables were entered hierarchically with age and relationship status entered first as a control variable. Gender was excluded from the model as it did not produce a significant association with any of the variables. The output of these analyses is presented in Table 3.

Table 1

Descriptive statistics of demographics and scales (N = 211).

Variables	Students (n_1 = 125)	Professional (n_2 = 86)
Age (M, SD)	22.04, 1.82	31.65, 4.81
Gender (n, %)		
Female	78, 62.4 %	47, 54.7 %
Male	47, 37.6 %	39, 45.3 %
Relationship status (n, %)		
Single	117, 93.6 %	35, 40.7 %
Married	8, 6.4 %	51, 59.3 %
COVID-19 anxiety (M, SD)	8.75, 5.15	14.59, 6.58
Loneliness (M, SD)	3.90, 1.71	4.56, 1.44
Emotional Loneliness (M, SD)	2.04, 0.98	2.42, 0.84
Social Loneliness (M, SD)	1.86, 1.15	2.14, 1.08
Sleep quality (M, SD)	5.62, 2.43	6.70, 2.27

Table 2

Correlation matrix of demographics, COVID-19 anxiety, loneliness, and sleep ratings (N = 211).

	Gender	Relation status	Designation	COVID-19 anxiety	Loneliness	Sleep quality
Age	−0.21**	0.60**	0.82**	0.39**	0.09	0.21**
Gender		−0.02	−0.08	0.03	0.05	0.01
Relation status			0.58**	0.21**	0.16*	0.13
Designation				0.45**	0.20**	0.22**
COVID-19 anxiety					0.26**	0.27**
Loneliness						0.24**

** $p < .01$.
* $p < .05$.

Table 3

Regression results of Loneliness, and Sleep Quality (N = 211).

	B	95 % CI		SE (B)	β	R^2	A R^2	F
		LB	UB					
Loneliness						0.098	0.080	5.58**
Age	−0.07	−0.14	−0.00	0.03	−0.26*			
Relationship status	0.46	−0.13	1.06	0.30	0.12ns			
Designation	0.80	0.01	1.59	0.40	0.24*			
COVID-19 anxiety	0.05	0.01	0.09	0.19	0.21**			
Sleep quality						0.085	0.067	4.77**
Age	0.02	−0.07	0.12	0.05	0.06ns			
Relationship status	0.05	−0.84	0.96	0.45	0.01ns			
Designation	0.30	−0.87	1.48	0.59	0.06ns			
COVID-19 anxiety	0.07	0.02	1.34	0.02	0.20**			

ns = non-significant.
* $p < .05$.
** $p < .01$.

Table 3 represents the regression that was conducted to determine the predictors of Loneliness and Sleep Quality among students and professionals. These regressions indicated that feeling of overall loneliness (adjusted $R^2 = 0.080$, $F_{4,206} = 5.58$, $p = .01$) was predicted by both COVID-19 anxiety and designation (student or professional). Quality of sleep (adjusted $R^2 = 0.067$, $F_{4,206} = 4.77$, $p = .01$) was also predicted by COVID-specific anxiety, but not by designation.

3.4. Comparing the scale means between students and professionals

For direct comparison of the full set of above-discussed ratings between the students and professionals, the Mann-Whitney *U* test was conducted to assess the level of COVID-related anxiety, loneliness feeling, and quality of sleep as a function of designation.

Table 4 results from the Mann-Whitney *U* test depicts that there was a statistically significant difference in terms of designation for COVID-19 anxiety ($U = 2509$, $p = .00$), overall Loneliness ($U = 4209$, $p = .00$), Emotional Loneliness subscale ($U = 4167$, $p = .00$), and Sleep Quality ($U = 3932.5$, $p = .00$), but not for Social Loneliness subscale ($U = 4647$, $p = .07$). The results of this section infer that the professionals suffered from more COVID-specific anxiety, felt generally, or to be specific, emotionally lonelier, and experienced more sleep-related disturbance in comparison to their student counterparts.

3.5. Power analysis

A post-hoc power analysis was conducted with R statistical software (R Core Team, 2022) using the 'pwr' package (Champely, 2020). A small-medium effect size (Cohen's f) of 0.04 was detected (Cohen, 1988) in a linear model, and with a significance criterion of $\alpha = 0.05$, the observed power for a total sample size of 211 was 82.4 %.

4. Discussion

The current COVID-19 pandemic has caused havoc not only on the physical health of the individuals but also on their mental health, and social life. Soon after the detection of several infection cases and the declaration of the pandemic in early March 2020, Bangladesh went on intermittent lockdowns (Dhaka Tribune, 2021) to control the spread of the coronavirus infection. When the data was being collected for the present study, the lockdown restrictions were still in place. Educational institutions had transferred their classes and examinations online and official work had been operating in-person in an emergency and limited capacity. Regardless of online or in-person work module, people were concerned about getting infected with the virus resulting them in following safety protocols which have the potential to limit their social outings; this to some extent could affect their well-being, make them feel lonely, and as well as impact their sleep pattern. Thus, we primarily aimed to investigate the effect of Covid-19 anxiety on loneliness and the sleep quality of students and professionals.

Additionally, we compared these two groups on the level of loneliness, sleep quality, and COVID-19-related anxiety ratings. The findings of the study suggested that COVID-19 anxiety had a significant effect on the loneliness and sleep quality of these people, and professionals were the ones who suffered the most. Correlation analysis revealed that higher COVID-19-related anxiety was significantly associated with increased sleep disturbance and feelings of loneliness. Regression analysis significantly predicted the effect of COVID-19 anxiety on the quality

Table 4

Mann-Whitney *U* test statistics (N = 211).

	Students (n₁ = 125)	Professionals (n₂ = 86)	U	Z
	Mean rank	Mean rank		
COVID-19 anxiety**	83.07	139.33	2509	−6.59
Emotional loneliness**	96.34	120.05	4167	−2.99
Social loneliness	100.18	114.47	4647	−1.78
Overall loneliness**	96.67	119.56	4209	−2.74
Sleep quality**	94.46	122.77	3932	−3.34

** $p < .01$.

of sleep regardless of occupational status (student or professional) as 70.01 % of the total study population were bad sleepers. Results from regression analysis also depicted that COVID-19 anxiety and designations (student or professional) were significant predictors of loneliness among the study population, as almost half of the present study population showed severe loneliness (48.3 %), a substantial portion showed a moderate level of loneliness (43.6 %). The outcome of the correlation and regression analysis falls in line with literature that demonstrated that during this pandemic, people were experiencing an elevated level of distress, sleep disorder, and loneliness as a result of being anxious due to pandemic-related uncertainty and concern of getting infected with the virus (Wang et al., 2020; Choi et al., 2020; O'regan et al., 2021; Robb et al., 2020).

While looking at the sleep quality difference between students and professionals, Mann-Whitney *U* test results revealed that students and professionals significantly differed in their quality of sleep whereas professionals had poorer sleep quality than students. Mann-Whitney U test results also demonstrated a significant difference concerning COVID-19 anxiety and overall loneliness level where professionals showed a higher level of anxiety related to COVID-19, and felt lonelier than the students. Additionally, professionals felt more emotionally lonely than students, but no significant difference between students and professionals in the matter of social loneliness. Previous studies demonstrated increased negative outcomes in loneliness level, sleep quality, and anxiety level among the student population (Marelli et al., 2021; Johansson et al., 2021; Evans et al., 2021, Cao et al., 2020; Ulrich et al., 2021).

In contrast, the results of our comparison between students and professionals showed that professionals were suffering more from sleep disturbance, loneliness feeling, and COVID-19 anxiety. We speculate that at the time of this writing, in Bangladesh, educational activities were retained online, and students were able to continue their education from the safety of their homes, avoiding most in-person contact, whereas most of the professionals across the country, often, had to travel to their workplace and attend in-person office activities. It could be surmised that continuing educational activities from the safety of home and prolonged living in a familiar environment with close others have favored students for minimizing their anxiety about coronavirus infection and health complications and in turn, promoted relatively a good quality of sleep and a reduced feeling of loneliness.

On the other hand, going to the workplace and coming into in-person interaction with others, enhanced the professionals' COVID-specific anxiety due to virus infection, thus, leading to sleep disturbance, poor sleep quality, and concern of being lonely due to potential isolation. It is supportive of previous research findings where healthcare workers were found to have heightened anxiety with other psychological symptoms (Alnazly et al., 2021; Huang & Zhao, 2020; Korkmaz et al., 2020). Moreover, during the COVID-19 pandemic, at least during the lockdown period, there had been a rise in online connectivity through which people were able to stay connected with family, friends, and peers. Social distancing had been put in place to control the surge of infection but regular online connection via phone and/or video call might have helped people to feel less socially lonely. From the results, it can be postulated that during the pandemic, limited face-to-face interaction and restrictions on a physical social outing with close ones and/or peers accelerated the feeling of emotional loneliness rather than social loneliness, especially among professionals. Thus, being a student might have worked as a protective factor against COVID-19-related anxiety, loneliness, and sleep disturbance, at least for the current study sample.

One of the important highlights of the present study is that we did not categorize the professionals per their occupation, rather, we wanted to make a general comparison between students and non-student, namely professionals. Previously, a few numbers of studies showed a high level of anxiety, low sleep quality, and increased level of loneliness among workers, but these studies were conducted with specific professions such as frontline workers, office workers, etc. (Giardino et al.,

2020; Yılmaz et al., 2021; Shreffler et al., 2020; Afonso et al., 2021). Another key highlight is that, to the best of our knowledge, this is the first study in Bangladesh, a low-resource region where students and employees are being compared directly, in terms of their level of COVID-anxiety, loneliness, and sleep quality. A few other studies were done in a low-resource setting where professionals yielded a high level of anxiety, more sleep issue, and more loneliness, but these studies either did not have a direct comparison group of students (Majumdar et al., 2020; Repon et al., 2021) or had multiple comparison groups of professionals (Rehman et al., 2021).

4.1. Implications

The results of the present research provided evidence that this 'once in a lifetime' phenomenon and the severity of the infection outcome has heightened the COVID-19 anxiety among people, specifically, among students and professionals who had been mostly affected by the pandemic. This effect of COVID-19-related anxiety, in turn, increased their feeling of loneliness, and also had a negative impact on their sleep quality. Thus, to the extent that our analyses reveal, understanding the pandemic's pernicious effects on the well-being of students and professionals could provide converging evidence, which, in turn, might provide a guiding framework in assisting agencies and mental health professionals' policy-making decisions on formulating a tailored strategic intervention to provide all-inclusive support, in order to safeguard people's well-being during a health crisis.

4.2. Strengths and limitations of the study

One strength of the study is the timing of data collection (during the lockdown) as we could capture the issue in a timely manner rather than retrospectively. Additionally, the variables were not measured on the Bangladeshi population so far, thus providing new insight into the matter.

One limitation of the study is the cross-sectional survey in nature as causality inference is not possible from the study. We recognize that longitudinal data collection is needed for the assessment of long-term loneliness and poor sleep quality's effect on daily life. Also, using a convenience/snowball sampling strategy limits the generalizability of the study outcome beyond this sample. We acknowledge that the sample size (N = 211) is relatively small considering the cross-sectional nature of the study, but as the participation was strictly voluntary and no compensation was provided for taking part in the study, this might have factored in getting a small sample size. Lastly, after a 'post-hoc' power calculation, we observed a small effect (0.04) while yielding 82 % power. Hence, we propose replication of the study with a larger sample size while performing a power analysis 'a priori' with the expectation of at least a medium effect.

5. Conclusions

In conclusion, data from the present study emphasizes the increased anxiety of getting infected with the coronavirus, higher level of loneliness due to isolation and social distancing, and negative impact on the sleep quality of the students and professionals, especially, professionals. The possible consequences of continuous anxiety, prolonged loneliness, and poor sleep patterns can have a negative impact on the overall well-being of individuals. For mitigating the negative effects, effective, cutting-edge well-being strategies should be formulated and made available to the public through impactful awareness programs. Tele-counseling services, virtual psychosocial intervention, assessment, etc. could be useful strategies in this pandemic scenario. Government and private service providers in health sectors should come together to address these looming problems related to mental and physical health alike to avoid a long-term public health crisis.

Funding

This research received no external funding.

Institutional review board statement

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013.

Also, the study was registered in and approved by the Ethics committee of the Department of Psychology, University of Dhaka, Registration no- PSY 21/08/001.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

CRediT authorship contribution statement

FB and EH were involved in conceptualizing and developing the study design. FB oversaw data collection. The analysis and manuscript preparation were done by FB and EH. Both authors contributed to the article and approved the submitted version.

Competing interest

The authors declare no competing interests.

Data availability

Data will be made available on reasonable request.

Acknowledgements

None.

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