REVIEW ARTICLE

Assessing the mental health condition of home-confined university level students of Bangladesh due to the COVID-19 pandemic

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Abstract

Aim The COVID-19 pandemic drove the Government of Bangladesh to shut down educational institutions, which had an enormous effect on the psychological health of students. This study aimed to assess the mental health status of Bangladeshi university students during the lockdown period.

Subject and methods Through an online-based questionnaire, information was collected from 509 university students of Bangladesh from June 19, 2020, to June 28, 2020, using convenient sampling. K-means clustering was applied to organize students according to their psychological health score, and confirmatory factor analysis (CFA) was also conducted to determine the association among the student's activities and their mental health during the pandemic. In addition, these associations were examined through chi-square test and ordinal logistic regression.

Results Students were categorized into four categories where 4.32% had mild, 72.7% had moderate, 12.57% had moderately severe, and 10.41% suffered from severe mental health imbalance. The results showed that having family members affected by the coronavirus, facing insecurity, using social media, and smoking habits increased the mental health imbalances of students; in contrast, being worried about studying, future career, spending more time with family members, and participation in household chores reduced the mental health disturbances of students. On the other hand, the results of the ordinal logistic regression indicated that sleeping time and participation in household chores were preventive factors for students.

Conclusion This study reveals that a large proportion of University students of Bangladesh suffered from mental health disturbances during the lockdown period. Implementing mental health plans and providing job security, improved communication approaches toward family members, not flattening illusive news, and preoccupation in household activities may assist to enhance the mental health status of the university students. The authors believe that this study's findings will be helpful to expedite the rate of attaining the sustainable development goal associated with health status in Bangladesh.

Keywords COVID-19 · Lockdown · University students · Mental health assessment

Introduction

The coronavirus disease 2019 (COVID-19) pandemic caused by the novel coronavirus (2019-nCoV) originated in Wuhan, Hubei province, China at the end of 2019, and has gained intense attention globally (Wang et al. 2020a; Xiang et al. 2020). The World Health Organization (WHO) revealed the appearance of the novel coronavirus (2019-nCoV) on January 30, 2020, as a public health emergency of international concern (PHEIC) (World Health Organization 2020a). The pandemic has been threatening human welfare globally, including in Bangladesh. COVID-19 was officially introduced in Bangladesh on March 8, 2020 (Banik et al. 2020), and since then, approximately 68,504 cases of COVID-19 were recorded and inveterate with at least 930 deaths as of June 08, 2020 (Institute of Epidemiology Disease Control and Research 2020). The COVID-19 pandemic impacts not only on substantial strength but also the mental health of the public due to being in quarantine for a long time during this ongoing global concern (Brooks et al. 2020; Wang et al. 2020b). Uncertainty and unpredictability concerning such pandemics ranging from epidemiological features, rapid transmission

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patterns, novelty, and severity of public health have effects in an extensive range of psychosocial aspects and mental catastrophes such as depression, anxiety, and traumatic stress (Xiao 2020; Zandifar and Badrfam 2020).

To deal with these pandemic social distancing measures such as quarantine, lockdown is most effective (Anderson et al. 2020; Brooks et al. 2020). Similar to many affected countries, the Government of Bangladesh has also declared the closing of all educational institutions, including schools, colleges, and universities since March 18, 2020, to restrict public gathering and encourage staying home (The Daily star 2020). As a result, students' regular lifestyles were disturbed and this long lockdown period psychologically affects people, including through increased media reporting about an invasion of the latest transmissions (Rubin and Wessely 2020). Evidence from another study showed that people in the quarantine may suffer psychological distress mostly in the form of anxiety, anger, frustration, and symptoms of post-traumatic stress (Brooks et al. 2020).

Owing to this pandemic situation, students have spent a longer time at home than usual and that may have an adverse effect on their mental health, which not only harms specific students but also has substantial negative impacts on society (Goothy et al. 2020). Because there is a certain age limit (30 years) of students to obtain a government job in Bangladesh, this unexpected delay to complete their final degree makes them upset as well as depressed (Lipi 2020). Additionally, it is difficult to be confined in the home for a young person within the age range 19–28 years, which may lead to cabin fever that refers to the distressing claustrophobic irritability or restlessness experienced when a person, or group, is stuck at an isolated location or in confined quarters for an extended time. Moreover, the students who just started their university journey (first year) have done very few classes and therefore become impatient day by day. Importantly, many students plan to pursue higher education abroad each year, but due to this worldwide emergency, they had to cancel their plans. All these factors will lead to feeling psychological insecurity.

Therefore, it is necessary to assess the mental health condition among university level students as well as to identify the factors that affect their psychological health while quarantined at home as an extensive lockdown due to COVID-19. This study endeavors to investigate the psychological health challenges faced by Bangladeshi university students during this COVID-19 pandemic.

Methods

Study population and sample

To assess the mental health condition during the COVID-19 pandemic, this cross-sectional study was conducted among the university students of Bangladesh from June 19, 2020, to June 28, 2020, through an online survey. Owing to health concerns, face-to-face interviews were avoided. The data was collected via an online questionnaire (Google Form) from students after 110 days of home-quarantine following lockdown declared by the Government on March 25, 2020 (World Health Organization 2020b). The respondents in the target population were sampled following the convenient sampling strategy. The questionnaires were unidentified to guarantee the secrecy and consistency of data. Formal consent was obtained from each respondent before completing the questionnaire. The online form was shared with students through social media (Facebook, WhatsApp, and Instagram). Being a student of any university in Bangladesh was the only eligible criterion. A total number of 509 respondents completed the questionnaires and were included in the final analysis.

Data collection procedure

The questionnaire consists of four sections: (i) basic information of students (age, gender, current living place, type of university, studying year, and living status), (ii) student's information related to COVID-19, (iii) activities during the lockdown period, and (vi) mental health assessment questionnaire.

Mental health assessment

Student's depression was assessed by the 9-item Patient Health Questionnaire (PHQ-9) (Kroenke et al. 2001). (i.e., little interest or pleasure, feeling down, depressed or hopeless, difficulty falling or staying slumbering, feeling tired or having little energy, poor appetite or overeating, feeling terrible about yourself or your family down, trouble concentrating on reading the newspaper or watching television, moving or speaking slowly, better off dead or of hurting yourself). The score of each scale is measured by a 4-point scale (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day), where total scores were represented as 0–5 = mild, 6–10 = moderate, 11–15 = moderately severe, and 16–20 = severe depression.

Generalized anxiety disorder (GAD-7) was used to evaluate the anxiety of students. The GAD is a 7-item questionnaire (i.e., feeling nervous, anxious or on edge, not being able to stop or control worrying, worrying too much about different things, trouble relaxing, being so restless that it is hard to sit still, becoming easily annoyed or irritable and feeling afraid as if something awful might happen) (Budikayanti et al. 2019). The occurrence of each scale is judged by a 4-point scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day), and overall scores were represented as 0–5 = mild, 6–10 = moderate, 11–15 = moderately severe anxiety, and 15–21 = severe anxiety.

A more accurate measure of individual stress is the Perceived Stress Scale (PSS). It measures the degree of stress to a particular situation in one's life (Cohen et al. 1994). The PSS score can be determined by first overturn scores for questions 4, 5, 7, and 8. For these four questions, the changes score as 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0. For each question, the 4-point scale is 0 = never, 1 = rarely, 2 = sometimes, 3 = fairly often, and 4 = very often. The object scores on the PSS can range from 0 to 40 with higher scores representing the top level of stress. The overall scores were represented as 0–13: low stress, 14–26: moderate stress, and 27–40: high perceived stress.

Data analysis

Descriptive statistics were conducted to exemplify the basic information of students and other selected characteristics. K-means clustering methods were applied to cluster the three scales PHQ-9, GAD-7, and PSS. The Euclidean distance was considered as a measurement scale. Students were partitioned into four categories by the Ward's method. Corresponding to the grouping, the mental health assessment of students was compared. The association test was applied to determine the relationship between clusters and different variables related to the characteristics of students.

The estimates of the strength of association were measured by Ordinal logistic regression analysis with 95% confidence interval. Confirmatory factor analysis (CFA) was constructed to explore the relationship among the four components, such as student information, thinking related to COVID-19, activities during a pandemic, and mental health (GAD-7, PHQ-9, PSS). In CFA, root mean squares (RMS) values are close to 0.06 and Tucker–Lewis index (TLI) values >0.90, which is considered as an indicator for a good fit of the proposed model. Finally, using the proposed cutoff criteria, the ML-based TLI, RMSEA is less preferable for small sample sizes (<200) (Hu et al. 1999). Data analysis was conducted using IBM SPSS (Statistical package for social science) for Windows (Version 22.0) and SPSS AMOS (Version 25.0).

Results

The survey was conducted on a total number of 509 participants, where 358 (70.3%) are from public and 151 (29.7%) are form private university students of Bangladesh. Among them, 298 (58.5%) students were male and 211 (41.5%) female. In the sample population, 96.7% of students were aged between 18 to 28, and 88.8% of students were living with their family members. Additionally, 74.3% students were living in an urban area, 99.2% of the students had awareness about COVID-19, 65.8% of students faced insecurity and stress, and 79.9%

of students felt uncomfortable thinking about COVID-19. The results are illustrated in Table 1.

By considering the GAD-7, PHQ-9, and PSS scores, 509 students were partitioned into four groups. Among them, 4.32% of students had mild mental health instabilities (average PSS 1.82, PHQ-9 1.91, GAD-7 1.73), 72.7% of students had moderate instabilities (average PSS 2.46, PHQ-9 3.69, GAD-7 3.48), 12.57% of students had moderately severe instabilities (average PSS 2.48, PHQ-9 3.44, GAD-7 1.52), and 10.41% of students had severe instabilities (average PSS 2.23, PHQ-9 1.45, GAD-7 3.51). There were significant differences between these three scales scores among the four groups. The results are shown in Table 2.

To find the significant differences in different characteristics among the four groups, the chi-square test was used. There were significant differences in the age of students; in the severe disturbance group, most of the students were 18–22 aged 25 (47.20%). No other variable in the section "Basic information of students" was significantly different among these four groups. In contrast, there were no significant differences in the section "Information related to COVID-19" as shown in Table 3. However, significant differences were found in the duration of staying at home, worrying about their studies and future career, time to go to sleep and wake up from a bad dream. Students worried about their studies and future career 20 (37.7%) and 19 (20.30%), respectively. There was no significant difference among duration of staying at home, watching videos in social media, religious activities, and smoking more during this pandemic with mental health scores of students. Alternatively, the results showed that students spending more time on social media (22.60%), not at all wake up from sleep from bad dreams (50.9%), more interaction with family (26.4%), participation in household chores (24.5%), and feeling bored at staying home (30.20%) were more likely to be severely depressed, anxious, and stressed. The results are shown in Table 3.

The results indicated that students worried about their studies, in respect to not worried about it, was a conservative factor against mental health assessment of students experienced by the students (OR = 3.866, 95% CI = (−1.18,−.002)), students activities on going to sleep were also protective factors against mental health assessment of students ((OR = 8.788, 95% CI = (0.231,1.14)), (OR = 4.666, 95% CI = (0.115,2.39)), (OR = 1.376, 95% CI = (−2.68,0.52))), and participation in household chores (OR = 8.405, 95%CI = (−1.48,−0.29)). Results are shown in Table 4.

The proposed latent variables in CFA were student information included with age, living place, and living status. Thinking related to COVID-19 included knowledge about COVID-19, relatives were affected, and facing financial insecurity. Activities during the pandemic included bad dreams caused waking up, interaction with family members, and participation in household chores. Lastly, mental health

Table 1 Demographic and COVID-19 related information of university level students

Variables	Categories	Frequency (*n*)	Percentage (%)
Age (in years)	18–22	229	45
	23–25	198	38.9
	26–28	65	12.8
	More than 28	17	3.3
Gender	Male	298	58.5
	Female	211	41.5
Current living place	Urban	378	74.3
	Rural	131	25.7
Type of university	Public	358	70.3
	Private	151	29.7
Studying year	First year	57	11.2
	Second year	88	17.3
	Third year	136	26.7
	Fourth year	109	21.4
	Fifth year	4	0.8
	Master's	115	22.6
Living status	With family	452	88.8
	Relatives home	9	1.8
	Alone	33	6.5
	Others	15	2.9
Knowledge about COVID-19	Good	167	32.8
	Medium	239	47.0
	Excellent	99	19.4
	No knowledge	4	0.8
Views about COVID-19	Positive	118	23.2
	Negative	391	76.8
Family member affected by COVID-19	Yes	9	1.8
	No	500	98.2
Relatives or neighbors affected by COVID-19	Yes	128	25.1
	No	381	74.9
Facing insecurity and stress	Yes	335	65.8
	No	174	34.2
Feel discomfort thinking about COVID-19	Strongly disagree	19	3.7
	Disagree	27	5.3
	Neither agree nor disagree	57	11.2
	Agree	223	43.8
	Strongly agree	183	36

assesment is made based on GAD-7, PHQ-9, and PSS scores of students. The chi-square test of the proposed model fits with a value of 82.69, with a degree of freedom 48, *p* value 0.001, TLI 0.924, CFI 0.620, and RMSEA 0.038 indicating

Table 2 Cluster analysis combination among three mental health scales (PSS, GAD-7, and PHQ-9)

Variables	Mild *n* (%)	Moderate *n* (%)	Moderately severe *n* (%)	Severe *n* (%)	*p* value
Total	22 (4.32)	370 (72.7)	64 (12.57)	53 (10.41)	
PSS(SD)	1.82 (0.46)	2.46 (0.50)	2.48 (0.50)	2.23 (0.51)	0.000
GAD-7(SD)	1.73 (0.53)	3.48 (0.46)	1.52 (0.50)	3.51 (0.50)	0.000
PHQ-9(SD)	1.91 (0.73)	3.69 (0.55)	3.44 (0.50)	1.45 (0.69)	0.000

Table 3 Comparison of basic information and information related to COVID-19 with different clusters

Factors	Categories	Mild n (%)	Moderate n (%)	Moderately severe n (%)	Severe n (%)	Total n (%)	p value
Age	18–22	6(27.30)	179(48.40)	19(29.70)	25(47.20)	229(45.0)	0.026
	23–25	13(59.10)	136(36.80)	30(46.90)	19(35.80)	198(38.90)	
	26–28	1(4.50)	46(12.40)	10(15.60)	8(15.10)	65(12.80)	
	More than 28	2(9.10)	9(2.40)	5(7.80)	1(1.90)	17(3.30)	
Worried about studies	No	15(68.20)	303(81.9)	46(71.9)	33(62.3)	397(78.0)	0.004
	Yes	7(31.8)	67(18.1)	18(28.1)	20(37.7)	112(22.0)	
Worried about future career	No	13(59.1)	316(85.4)	51(79.7)	34(64.2)	414(81.3)	0.000
	Yes	9(40.9)	54(14.6)	13(20.3)	19(20.3)	95(18.7)	
Spending more time on social media	No	13(59.1)	316(85.4)	51(79.7)	41(77.4)	421(82.7)	0.008
	Yes	9(40.9)	54(14.6)	13(20.3)	12(22.6)	88(17.3)	
Bad dreams made wake up	Once	5(22.7)	56(15.1)	6(9.4)	7(13.2)	74(14.5)	0.001
	A few time	0(0.0)	55(14.9)	6(9.4)	2(3.8)	63(12.4)	
	Frequently	2(9.1)	140(37.8)	25(39.1)	17(32.1)	184(36.1)	
	Not at all	15(68.2)	119(32.2)	27(42.2)	27(50.9)	188(36.9)	
More interaction with family than usual time	No	19(86.4)	306(82.7)	60(93.8)	39(73.6)	424(83.3)	0.031
	Yes	3(13.6)	64(17.3)	4(6.3)	14(26.4)	85(16.7)	
Participation in household chores	No	22(100)	327(88.4)	56(87.5)	40(75.5)	445(87.4)	0.016
	Yes	0(0.0)	43(11.6)	8(12.5)	13(24.5)	64(12.6)	
Feeling bore at staying home	Yes	12(54.50)	302(81.60)	46(71.90)	37(69.80)	397(78.0)	0.004
	No	10(45.50)	68(18.40)	18(28.10)	16(30.20)	112(22.0)	

that the model fit is good for data, and it is assumed that this model is correct. The results also indicate that students' information affected activities during the pandemic. Thinking related to COVID-19 affects students activities, and activities during the pandemic affect the mental health of students. Figure 1 and Table 5 illustrate the results.

Discussion

Students are indispensable for the betterment of any country. Similar to other countries, the Bangladesh government also declared a lockdown to help prevent students from being infected with COVID-19. Though this decision has been taken to ensure the health and safety of the students, the continuous lockdown has led some of them to mental disaster gradually. An online questionnaire-based survey was performed to assess the psychological state of university students of Bangladesh during this lockdown period.

A large portion of the students were from urban areas, most of them were males and aged between 18 to 28 (Table 1). In this study, the student's mental health numbers were categorized into four groups: severe, moderately severe, moderate, and mild. Of which, 10.41% of them had severe, 12.57% of them had moderately severe, 72.7% of them had moderate, and 4.32% of them had a mild mental disorder (Table 2).

Duration of staying home during this lockdown period, concerned about studies and future career, managing of social media, wasting more time on social media, sleeping time in general, awakened by bad dreams, communication with family members, and assistance with household chores were significantly ($p < 0.05$) connected variables with student's mental health problems (Table 3).

The result of the research designated that university students' mental health status regarding the pandemic situation was associated with the age of the students. Students who live in urban areas compared to those who live in rural areas suffer more stress. This situation occurs because of the strong maintenance of this deadly pandemic in urban rather than rural areas. The pandemic situation has produced much skepticism among the students. Students all across the world have suffered because of the COVID-19 pandemic. Studies have shown that undergraduate students were suffering from mental health stress during the COVID-19 pandemic (Kecojevic et al. 2020). Pupils were anxious about their ultimate career, and the result recommended broadly that students were extremely concerned about not being able to arrange work because of the limitation of age restrictions of Bangladesh (Table 3). Students were also troubled about this endless lockdown due to COVID-19 influencing their legitimate education negatively, and eliminating the opportunity of promotion and profession as well (Lipi 2020).

Table 4 Ordinal logistic regression analysis of factors influencing university student's mental health problems

Variables	Categories	Frequency (n)	SE	OR	p value	OR(95%CI)
Age	18–22	229	0.579	0.575	0.448	(−1.57,.70)
	23–25	198	0.583	0.295	0.587	(−1.46,.83)
	26–28	65	0.625	0.010	0.918	(−1.16,1.29)
	More than28*	17	–	–	–	–
Feeling bore at staying home	Yes	397	0.252	0.001	0.971	(− 0.494,0.512)
	No*	112	–	–	–	–
Worried about studies	Yes	397	0.299	3.866	0.045	(−1.118,-0.02)
	No*	112	–	–	–	–
Worried about future career	Yes	414	0.319	0.000	0.996	(−0.63,0.63)
	No*	95	–	–	–	–
Spending more time on social media	Yes	421	0.294	0.850	0.356	(−0.31,0.85)
	No*	88	–	–	–	–
Sleeping time in general	Before 10 PM	141	0.230	8.788	0.003	(0.231,1.14)
	Within 10–11 PM	14	0.582	4.666	0.031	(0.115,2.39)
	Within 11–12 PM	16	0.663	1.376	0.023	(−2.68,0.52)
	More than 12 AM*	338	–	–	–	–
More interaction in this quarantine with family	Yes	424	0.300	0.528	0.468	(0.-37,0.81)
	No*	85	–	–	–	–
Participation in household chores	Yes	445	0.304	8.405	0.004	(−1.48,-0.29)
	No*	64	–	–	–	–
There are many more people diagnosed with coronavirus in Bangladesh and worldwide than what is being shown	Strongly disagree	50	0.373	5.558	0.018	(−0.15,1.61)
	Disagree	52	0.369	1.385	0.239	(−0.29,1.16)
	Neither agree nor disagree	104	0.279	0.226	0.634	(−0.42,0.68)
	Agree*	33	–	–	–	–

SE Standard error, *OR* Odds ratio, *CI* Confidence interval

* reference group

Students using social sites frequently in a day caused higher mental problems compared to those who used sites once or twice a day (Table 3). Students who were able to sleep well were more likely to subdue the psychological health status concerning sleeping late. There is a general relationship between anxiety and sleep disturbances, which plays an enormous role during this pandemic situation, as people think more about job self-doubt and losing people around them (Akundi 2020). Students who participated in household chores felt less mental health problems compared to those who did not participate (Table 3). The sharing of household duties was also supportive of overcoming the mental health problems of students. A survey was conducted of 1060 parents in different-sex couples, and the results show the portion of people sharing household weight equally since the outset of this pandemic (Ebbert 2020). This result also indicated that more communication with family members had a positive impact on the mental health of students (Table 3). The investigation proposed that pandemic situations make connections stronger with family and friends; 60% of personalities had a higher level of caring in pandemic situations than regular times (Liu 2020). The results showed that students who wake up from sleep several times felt higher mental health problems compared to others (Table 3). A study suggested that students more often found an increase in bed time hour, sleep latency, and wake-up time between before and during the COVID-19 emergency and a worsening of sleep quality and of insomnia symptoms (Marelli et al. 2020).

Ordinal logistic regression analysis recommended that students worried about their studies during this pandemic situation, in contrast to not worried, was favorable to decrease the mental stresses of University students ($p < 0.05$) (Table 4). This result suggested extensively that students were extremely concerned about not obtaining a job because of the restriction of age barriers in Bangladesh. Students also worried about this continuous lockdown due to COVID-19 impacting their regular studies negatively; reducing the option of improving their career as well (Lipi 2020). An early sleeping schedule was also conducive to reduce the psychological health status in respect to sleeping late ($p < 0.05$). There is a common

Table 5 Covariates among latent variables in the structural model

Relationship			Estimate	S.E.	p value
Information	<—>	Thinking	0.036	0.018	0.047
Information	<—>	Activities	−0.145	0.010	<0.001
Information	<—>	Mental	0.005	0.008	0.007
Thinking	<—>	Activities	−1.689	0.004	<0.001
Thinking	<—>	Mental	0.008	0.006	0.107
Activities	<—>	Mental	1.145	0.004	<0.001

Fig. 1 Students mental health path diagram of CFA representing the factor structure
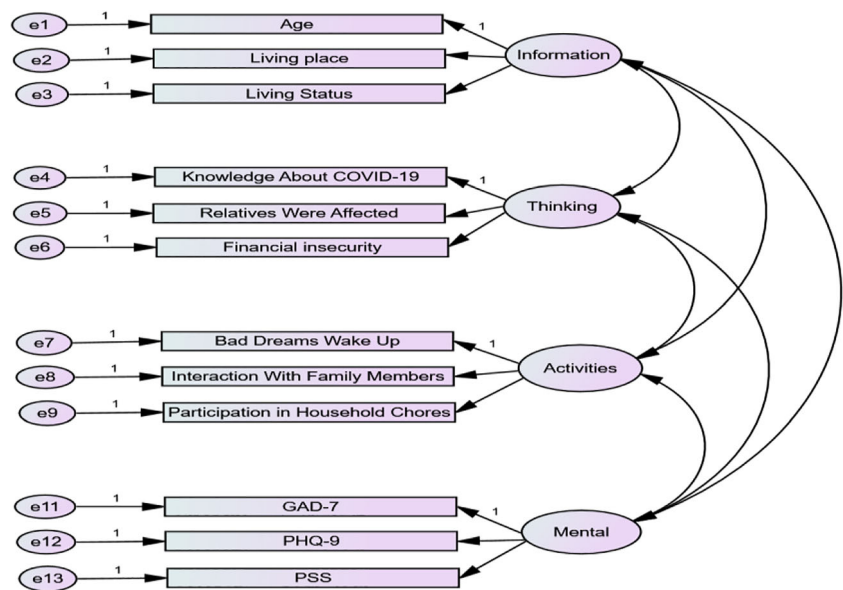
relationship among anxiety and sleep disturbances, which plays a tremendous role during this pandemic situation, because people are thinking more about job insecurity and losing people around them (Akundi 2020). The participation of household chores was also supportive for reducing the mental health problem of students, in respect to not participating ($p <$ 0.05). A survey was conducted of 1060 parents in different sex couples, and the result showed the percentage of people sharing household burdens equally since the outset of this pandemic (Ebbert 2020).

This research indicates that students undergo mostly physiological culmination, and it is recommended that steps should be taken to accomplish mutually settling the difficulty of students as well as contributing physiological well-being services to the university students of Bangladesh. Most of the students seemed unusually stressed concerning their eventual career and education because there is an age limitation for obtaining a government job. The Government and policymakers should take significant actions to minimize mental health problems in university students in Bangladesh.

Limitations

There are some limitations to our research. First, it was impossible to conduct face-to-face interaction with participants, and this study did not conduct the efficacy of mental services as a cross-sectional study. Although this research gives a cross-sectional study of the psychological disturbances of children, the time frame was short and further research is needed to assess the mental health conditions of university students. Finally, a large sample size is needed to underpin the results.

Declarations

Consent for publication   Authors give permission for publications. Authors are responsible for correctness of the statements provided in the manuscript.

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