



Research article

Mental health and well-being of indigenous people during the COVID-19 pandemic in Bangladesh

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ABSTRACT

Background: The ongoing pandemic caused by the novel coronavirus and the subsequent containment strategies has taken a heavy toll on the mental health of people irrespective of age, gender, race, ethnicity, and geographical location. Studies have documented the mental health status of non-indigenous Bangladeshi people, but little attention has been paid during the pandemic to the investigation of the mental health status of indigenous people living in remote hilly areas. To address this gap the present study aimed at investigating the prevalence and accompanying risk factors of depression, anxiety, stress, and compromised well-being among indigenous people during the pandemic.

Methods: A cross-sectional survey was conducted on 422 indigenous people aged between 16 and 90 using the 21-item Bangla Depression Anxiety Stress Scale (BDASS-21) and the Bangla version of the WHO-5 Well-being Index from January 30 to April 10, 2021. Data were collected by trained research assistants from three remote hilly areas namely Bandarban, Rangamati, and Khagrachhari in the Chattogram Hill Tracts (CHT). Chi-squares, logistic regression, and ANOVA were performed to examine the association of variables.

Results: The prevalence of moderate to extremely severe depression, anxiety, stress, and low well-being among the indigenous population during the pandemic was found to be 49.3%, 47.2%, 36.7%, and 50.9%, respectively. Risk predictors for depression, anxiety, and stress included age, ethnicity, geographical locations, educational attainment, occupation, and marital status.

Conclusions: The results suggest that the ongoing pandemic has led to the rise of common mental health problems among indigenous people during the pandemic. The results can contribute to the formation of mental health policy for indigenous people and the development of suitable mental health intervention strategies especially during and after the COVID-19 pandemic.

1. Introduction

The unprecedented crisis caused by the novel coronavirus has taken a heavy toll on the mental health and well-being of people irrespective of age, gender, race, and geographical location. Governments of respective countries have imposed several containment measures that included imposing lockdowns, restricting movement, closure of educational institutions or businesses, and following safety measures to halt the spread of the deadly virus. The Bangladesh government, too, imposed a countrywide lockdown to prevent transmission and keep infections at bay. While the containment measures have had an adverse impact on the mental health and well-being of all people across the country, the impact of the pandemic on the mental health and well-being of the indigenous

population has gained little attention to date. The present study aimed to shed light on the mental health status and well-being of indigenous people during the COVID-19 pandemic in Bangladesh.

Evidence suggests that indigenous people across the globe are at a disproportionate risk of mental health problems (see Nasir et al., 2018; Chmielowska and Fuhr, 2017; Heffernan et al., 2012; Jorm et al., 2012; Isaacs et al., 2010; Heffernan et al., 2009). For example, depressive and anxiety disorders were found to be prevalent among indigenous people including the risk of posttraumatic stress disorder and social phobia (Kisely et al., 2017). In another study, it was found that suicidal ideation, suicidal attempt, depression, anxiety, and drug abuse were more prevalent among indigenous people than compared to their non-indigenous counterparts (Hop Wo et al., 2020). This was again partially supported

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by Clark et al. (2011) who maintained that depression and anxiety can be risk factors for suicidal attempts among indigenous people. Comorbid mental disorders were found to be threefold to fourfold higher among indigenous people than non-indigenous people (Nasir et al., 2018). Nevertheless, efforts to document the varying mental health problems of indigenous people have gained little attention to date (King et al., 2009).

The reason for the rise of mental health problems among indigenous people is multifaceted. For example, a lack of employment, family violence, suicidal ideation, substance abuse, widespread exclusion from social, political, and economic life, loss of land, family, and culture, and poverty are some of the factors leading to an alarming state of mental health. Other factors include the absence of access to mental health services (Isaacs et al., 2010).

Saunders (1993) showed a number of key factors serving as barriers in seeking mental health services for indigenous people. Poor mental health literacy, varying concepts of mental health and well-being, the negative influence of supportive network, widespread stigma, gender stereotypes, lack of trust due to racism, perceived unfriendliness prevailing at the service environments, distance to and from the service centers, fear of separation caused by the hospitalization, denial of treatment, reluctance to talk to non-indigenous mental health professionals, language barriers, staff ignorance to indigenous culture, language, current life circumstances, and long queues.

The ongoing pandemic has been intensified into a major mental health crisis for indigenous people across the globe. Evidence suggests that the pandemic has revealed a lack of specialized mental health services and professionals, and a lack of access to accurate and quality information about the pandemic likely to exacerbate pre-existing mental health problems including depression and suicidal ideation (Júnior et al., 2020). Indigenous people are at higher risk for infection with more severe symptoms and death compared to the general population during the pandemic which can lead to increased susceptibility for developing mental health problems. Data from previous pandemics bear testimony to that with figures demonstrating five to eight times higher infection rates among indigenous people (Power et al., 2020). For example, mortality and hospitalization rates are also three to four times higher among indigenous people (Power et al., 2020) that can later develop into mental health crises. The pandemic has also unleashed systemic racism leading to a heightened sense of anxiety and stress (Blake et al., 2021). While documentation of mental health issues experienced by indigenous people is witnessing a slow pace across the globe, efforts in pursuit of that are surprisingly low in Bangladesh. Besides, the adverse impact of the pandemic has also been shown in compromised well-being (O'Connor et al., 2020) and indigenous people are at increased risk of impaired well-being (Mesa Vieira et al., 2020). Investigation of these issues, with respect to its indigenous population, has largely been ignored in Bangladesh. Therefore, the present study aimed to reduce the knowledge gap.

Bangladesh is home to 49 different indigenous communities living in both plain and hill tract areas comprising approximately 2 percent of the total population. The majority of them (44%) are Buddhist, 24% are Hindu, 13% are Christian, and the remaining 19% classified themselves as other. The Chittagong Hill Tracts (CHT) area covers about 10% of the total area of Bangladesh and consists of 13 different indigenous communities. Chakma and Marma are the largest communities in the CHT (Jamil and Panday, 2008). Each community in the CHT has unique cultural customs with a distinct language, clothing, and livelihoods. Health care including mental health in the CHT regions is mostly neglected due to the geographical location. Amidst the shortage of healthcare facilities in the CHT and the growing vulnerability of mental health problems of the indigenous population, it is imperative to shed light on the mental health status and well-being of indigenous people in CHT.

2. Method

2.1. Participants

A cross-sectional study was conducted with participants living in the hill-tracts areas of Rangamati, Khagrachhari, and Bandarban. The study

aimed to look into the impact of the pandemic on the mental health of indigenous people living in three remote hilly areas namely Barkal, Balipara, and Mahalchari of Rangamati, Bandarban, and Khagrachhari, respectively. Barkal is an Upazila of Rangamati with a total area of 760.88 km² and bounded by Mizoram of India on the east. The total population of Barkal is 39781 (Bangladesh Population Census, 2001). Balipara is a union of Bandarban having a total area and population of 83.974 km² and 4241, respectively (Hasan, 2020). Mahalchari, an Upazila of Khagrachhari on the north has a total area of 248.64 km² with a total population of 44086 (Bangladesh Population Census, 2001). Indigenous people living in rural and isolated locations away from urban facilities are predisposed to ill health, including poor mental health due to low socioeconomic status, lower awareness, and lack of access to preventive measures (Tabassum, 2016). In addition, the remote hill tract areas are not well-connected to the government health facilities in the respective districts. Therefore, it was necessary to investigate the impact of the pandemic on mental health amidst the restricted access to health care facilities.

The psychometric tools used in the study were extensively used on different age groups (see Patrick et al., 2010; de Wit et al., 2007). Participants were recruited purposefully with age starting from 16 and above. A total of 430 participants took part in the survey from January 30 to April 10, 2021. However, data from only 422 participants were retained for final analyses after the removal of participants with incomplete data. Of the final sample, 202 were Marma, 153 were Chakma, 34 were Tripura, and the remaining 33 were from other tribes. There were 241 (57.1%) female and 181 (42.9%) male participants. The mean age for participants was 31.51 (SD = 17.446) and the age range 16–90. Students outnumbered (45%) other participants (collectively 55% of the total participants). Homemakers were participants with no job outside the home whereas participants of both genders termed as unemployed were not engaged with any job during the data collection. The areas where the data collection took place were Buddhist majority regions. Therefore, the majority of the participants were Buddhists. Participants belonging to the middle socioeconomic status were found higher compared to other socioeconomic statuses. Similarly, unmarried participants outnumbered married participants.

2.2. Procedure

Data were collected purposively by an offline survey. In-person surveys were conducted by a group of three research assistants belonging to the respective tribes and regions. Research assistants were provided with training prior to the survey. They were undergraduate students at the respective districts' government colleges. The data collection training included understanding of the topics under study (depression, anxiety, stress, well-being, and the impact of the pandemic on mental health), the administration of the questionnaires, cognitive interviewing, maintaining confidentiality, and use of dignified language (e.g., indigenous people instead of minority people).

A written description of the nature and purpose of the study was included in the survey. Research assistants helped the participants with no and little literacy to respond to the questions. Safety measures during the COVID-19 pandemic were strictly followed. It should be noted that the survey was conducted after the countrywide lockdown was lifted. Participation in the study was completely voluntary and no monetary compensation was given to the participants.

2.3. Measures

The following measures were analyzed.

2.3.1. Sociodemographic measures

The demographics measures included age, gender, ethnicity, geographical location, educational status, occupation, socioeconomic status (SES), religion, and relationship status.

2.3.2. Bangla Depression Anxiety Stress Scale (BDASS)

The self-report rating scale was designed to assess depression, anxiety, and stress. The widely-used Depression Anxiety Stress Scale (DASS) was originally developed by Lovibond and Lovibond (1995) with 42 items. The Bangla Depression Anxiety Stress Scale with 21 items (BDASS-21) was used in the present study (Alim et al., 2017). The four-point Likert-type scale ranged from *never* (score 0) to *always* (score 3), and yields results on three sub-scales, namely, depression, anxiety, and stress (each with seven items). The BDASS-21 demonstrated good to excellent psychometric properties in non-clinical samples (Ostovar et al., 2016). The Bangla version of the scale also yielded satisfactory to good psychometric properties with Cronbach's alphas (α) of 0.99, 0.96 and 0.96 for depression, anxiety, and stress, respectively (Alim et al., 2017). The alphas of depression, anxiety, and stress for the present study were .841, .787, and .760, respectively.

2.3.3. Bangla version of the WHO-5 well-being index

The WHO-5 Well-being index is a self-report measure validated in the general population in Bangladesh (Faruk et al., 2021). The six-point Likert-type scale ranges from 'at no time' (score 0) to 'all of the time' (score 5). The raw scores, which range from 0 to 25, are multiplied by 4 to obtain the scores in percentages, where the higher percentages represent higher well-being. The scale demonstrated acceptable internal consistency ($\alpha = 0.754$) and test-retest reliability ($r = 0.713, <.01$), divergent validity ($r = -0.443, <.01$, with the Bangla version of Perceived Stress Scale-10) and convergent validity ($r = 0.542, <.01$, with the Bangla version of the Warwick-Edinburgh Mental Well-being Scale). The WHO-5 Well-being index has been used as a screening tool for depression as well as an outcome measure across a wide range of study fields (Topp et al., 2015).

2.4. Statistical analysis

SPSS 20 was used to analyze the data to glean descriptive statistics (frequencies, percentages, and means) and to compute statistical tests (chi-squares, regression, and ANOVA). Chi-square tests were used to assess the categorical variables with depression, anxiety, stress, and well-being. Binary logistic regression was used to assess significant variables in bivariate analysis. Findings of logistic regression were construed with 95% confidence intervals. Analysis of variance (ANOVA) was performed to assess the difference between sociodemographic variables.

2.5. Ethical considerations

Guidelines of the Declaration of Helsinki were taken into consideration while carrying the study. The study was also approved by the ethical review committee at the Department of Clinical Psychology, University of Dhaka, Bangladesh. Participants were informed about the nature and purpose of the study. Besides, confidentiality pertaining to the identity of participants as well as data was ensured. Participants' right to withdraw from the study at any time was also mentioned.

3. Results

Analyses of sociodemographic status indicated that the majority of participants belonged to the middle socioeconomic class. The majority of the participants were students (45.0%) while the remaining participants such as farmers, service holders, businesspersons, homemakers, and unemployed participants consisted of 25.4%, 12.8%, 6.4%, 8.5%, 1.7% of the total participants, respectively. Participants from the two largest indigenous communities (Chakma and Marma) comprised 36.3% and 47.9%, respectively of the total participants. Tripura, the third-largest community, comprised 8.1% of the total participants. Sociodemographic information is presented in Table 1.

Results from the summated scores of the three individual subscales demonstrated that 49.3% of participants had moderate to extremely

severe depression, 47.2% of participants had moderate to extremely severe anxiety, and 36.7% of participants had moderate to extremely severe stress. The prevalence of low well-being was found to be 50.9%. In each case, higher scores denote a higher level of severity.

3.1. Results from the chi-square analysis

Results obtained from Chi-square analyses indicated that depressed participants were significantly more anxious ($\chi^2 = 83.738, df = 1, p < 0.000$) and stressed ($\chi^2 = 117.213, df = 1, p < 0.000$) compared to their non-depressed counterparts and vice versa. The results also suggested that participants from a particular geographic location (Rangamati's Barkal in this case) likely to be depressed ($\chi^2 = 17.613, df = 3, p < 0.001$), anxious ($\chi^2 = 17.213, df = 3, p < 0.000$), and stressed ($\chi^2 = 8.199, df = 1, p < 0.042$). Chakma people were found to be more depressed ($\chi^2 = 10.170, df = 3, p < 0.017$) and anxious ($\chi^2 = 19.488, df = 3, p < 0.000$) than other indigenous communities (Marma, Tripura, and other tribes).

Results also suggested that participants who had educational achievement up to primary level experienced significantly higher depression ($\chi^2 = 24.301, df = 6, p < 0.000$), anxiety ($\chi^2 = 22.735, df = 6, p < 0.001$), and stress ($\chi^2 = 18.311, df = 6, p < 0.005$). Students were found to be more depressed ($\chi^2 = 33.095, df = 1, p < 0.000$), anxious ($\chi^2 = 20.723, df = 1, p < 0.001$) and stressed ($\chi^2 = 15.970, df = 5, p < 0.007$) compared to other participants. Relationship status was found to have been a risk predictor. For example, being married was found to be associated with depression ($\chi^2 = 13.613, df = 2, p < 0.001$), anxiety ($\chi^2 = 12.167, df = 2, p < 0.002$), and stress ($\chi^2 = 8.440, df = 2, p < 0.015$) than being unmarried, divorced, or widowed. However, results obtained from one-way AVOVA demonstrated that unmarried participants were more likely to be depressed and anxious than married participants. Participants with low well-being also experienced significant stress ($\chi^2 = 9.143, df = 1, p < 0.002$) (Table 2).

3.2. Results from the regression analysis

Logistic regression was conducted to ascertain the effects of those same demographic variables (age group, gender, ethnicity, area, educational achievement, occupation, marital status, religion, socio-economic status, and well-being diagnosis) on the likelihood that participants were depressed. The logistic regression model was statistically significant, $\chi^2 (28) = 62.823, p > .005$. The model explained between 13.8% (Cox and Snell R square) and 18.4% (Nagelkerke R^2) of the variance in depression and correctly classified 64.9% of cases as a whole. The only occupation made a unique statistically significant contribution to the model. The strongest occupational predictor of being diagnosed with depression was business, with the farmer as a baseline, recording an odds ratio of 7.518. This indicated that businessmen were over 7.5 times more likely to be diagnosed with depression than farmers, controlling for all other factors in the model.

A second logistic regression was performed to ascertain the effects of demographic variables on the likelihood that participants were anxious. The logistic regression model was statistically significant, $\chi^2 (28) = 53.089, p > .005$. The model explained between 11.8% (Cox and Snell R square) and 15.8% (Nagelkerke R^2) of the variance in depression and correctly classified 63.7% of cases as a whole. The only ethnicity made a unique statistically significant contribution to the model. The strongest significant ethnic predictor of being diagnosed with anxiety was Marma, with Chakma as a baseline, recording an odds ratio of 0.515. This indicated that the likelihood of being diagnosed with anxiety for a Marma person was half as much like that of a Chakma person, controlling for all other factors in the model.

A third logistic regression was performed with the same demographic variables on the likelihood that participants suffered stress. The logistic regression model was statistically significant, $\chi^2 (28) = 59.493, p > .005$. The model explained between 13.1% (Cox and Snell R square) and 18.0%

(Nagelkerke R^2) of the variance in depression and correctly classified 69% of cases as a whole. Two variables made a unique statistically significant contribution to the model (Marital Status and Wellbeing Status). The strongest significant marital predictor of being diagnosed with stress was being a widow, with married as a baseline, recording an odds ratio of 5.654. This indicated that the likelihood of being diagnosed with stress for a widowed person was 5.5 times more than a married person, controlling for all other factors in the model. The odds ratio of 0.493 for well-being indicated that people with high well-being were 0.4 times less likely of being diagnosed with stress.

3.3. Results from the ANOVA

A one-way ANOVA was conducted to test whether sociodemographic variables had significant differences in relation to depression, anxiety, stress, and well-being. There was a significant difference of age on the experience of depression, $F(3,418) = 3.139, p < .02$, and anxiety $F(3,418) = 3.599, p < .01$. Tukey HSD posthoc comparisons showed that

participants aged above 65 ($M = 4.88, SD = 4.295$) experienced depression significantly more than other participants. Similarly, age was found to have significantly associated with the experience of anxiety, $F(3,418) = 3.599, p < 0.04$. Tukey posthoc comparisons showed that participants aged between 51 and 65 ($M = 4.94, SD = 4.405$) experienced more anxiety than others. Age had no significant difference in the experience of stress and well-being. Ethnicity was found to have a significant effect on anxiety, $F(3,418) = 4.164, p < 0.00$ for Chakma ($M = 7.24, SD = 4.547$) and Marma people ($M = 5.54, SD = 4.510$). Geographical location was also found to have an impact on depression and anxiety, $F(3,418) = 5.508, p < 0.00$ and $F(3,418) = 4.720, p < 0.00$, respectively. Tukey's post-hoc comparison demonstrated that participants from Rangmati and Khagrachari experienced more depression and anxiety than participants in Bandarban (Table 3).

4. Discussion

Mental health problems are widespread among indigenous people across the globe and in some regions (e.g., Australia and Canada) mental health problems continue to be the leading cause of disease burden among indigenous people (Isaacs et al., 2010; Kirmayer et al., 2003). Therefore, growing international attention has focused on the need to overcome health problems, especially mental health problems, for more than 370 million indigenous people around the globe (Brown et al., 2012). However, the mental health status and well-being of indigenous people in Bangladesh remain understudied especially during emergencies (e.g., the COVID-19 pandemic). To address the gap, the present study assessed depression, anxiety, stress, and well-being among indigenous people in Bangladesh during the pandemic.

The results indicated that around 50% of the total participants were classified as having moderate to extremely severe levels of depression (49.3%) and anxiety (47.2%) with 36.7% experiencing moderate to extremely severe levels of stress. The prevalence of lower levels of well-being was found to be 50.9%. Studies carried out for non-indigenous people during the pandemic recorded prevalence rates of depression, anxiety, and stress to be 57.9%, 33.7%, and 59.7%, respectively (Banna et al., 2020). Another study on university students found the prevalence of depression, anxiety, and stress to be 19.7%, 27.5%, and 16.5%, respectively (Islam et al., 2020). In a separate study designed for university students, it was found that the prevalence of moderate to severe anxiety was 40%, while the prevalence of depressive symptoms was 72% (Faisal et al., 2021). A varying prevalence of depression, anxiety, and stress for the general population was also found (see Mina et al., 2021; Abir et al., 2021; Yeasmin et al., 2020). Prevalence rates for depression, anxiety, and stress among persons with disabilities were found to be 67.6%, 72.6%, and 49.5%, respectively (Faruk et al., 2021). The aforementioned studies revealed high prevalence rates of mental health problems for non-indigenous people. Nonetheless, no study has previously looked at the prevalence of mental health problems of indigenous people in Bangladesh during the pandemic.

The prevalence of depression and stress in the present study were found to be lower compared to the findings of previous studies on non-indigenous people during the pandemic (see Abir et al., 2021; Faisal et al., 2021; Mina et al., 2021) with the exception of anxiety. It is widely demonstrated that indigenous people are at increased risk of mental health problems due to the adverse impact of cultural marginalization, discrimination, and low socioeconomic environments (Young et al., 2019). The pandemic has intensified mental health problems for indigenous people (O'Connor et al., 2020; Mesa Vieira et al., 2020). However, adhering to traditional knowledge and skills, inclination to contribute to the community, family and social bonding, culture, history, and language were also identified as protective factors for indigenous mental health (MacDonald et al., 2013). The respective socioeconomic and cultural settings in which indigenous people in Bangladesh have been raised determine the health conditions and outcomes (Tabassum, 2016). For example, during the outbreak of the COVID-19, indigenous people

Table 1. Demographic properties of participants.

Participants Characteristics	N = 422 (%)
Location	
Rangamati	185 (43.8)
Bandarban	181 (42.9)
Khagrachari	43 (10.2)
Others	13 (3.1)
Gender	
Male	181 (42.9)
Female	241 (57.1)
Others	0 (0.0)
Ethnicity	
Chakma	153 (36.3)
Marma	202 (47.9)
Tripura	34 (8.1)
Others	33 (7.8)
Socioeconomic Status (SES)	
Lower SES	104 (24.6)
Lower-middle SES	98 (23.2)
Middle SES	220 (52.1)
Occupation	
Student	190 (45.0)
Service Holder	54 (12.8)
Businessperson	28 (6.6)
Homemaker	36 (8.5)
Unemployed	7 (1.7)
Farmer	107 (25.4)
Marital Status	
Unmarried	260 (61.6)
Married	148 (35.1)
Widow	14 (3.3)
Religion	
Christianity	21 (5.0)
Buddhism	385 (91.2)
Others	16 (3.8)
Literacy	
Up to primary	42 (10.0)
Primary to secondary	41 (9.7)
SSC	43 (10.2)
HSC	90 (21.3)
Up to Hons'	108 (25.6)
Masters and above	8 (1.9)
Illiterate	90 (21.3)

Table 2. Distribution of variables and relationship with depression, anxiety, and stress among indigenous people (N = 422).

Variables	Total 422	Depression (n = 208; 49.3%)				Anxiety (n = 199; 47.2%)				Stress (n = 155; 36.7%)			
	n (%)	Yes (%)	χ^2 value	df	p value	Yes (%)	χ^2 value	df	p value	Yes (%)	χ^2 value	df	p value
Age													
16–35 Years	298 (70.6)	162 (54.4)	12.695	3	0.005	161 (54.0)	19.984	3	0.000	119 (39.9)	7.901	3	0.048
36–50 Years	49 (11.6)	19 (38.8)				17 (34.7)				19 (38.8)			
51–65 Years	50 (11.8)	21 (42.0)				15 (30.0)				12 (24.0)			
Above 65 Years	25 (5.9)	6 (24.0)				6 (24.0)				5 (20.0)			
Gender													
Female	241 (57.1)	93 (51.4)	0.555	1	0.456	86 (47.5)	.016	1	0.899	71 (39.2)	0.850	1	0.357
Male	181 (42.9)	115 (47.7)				113 (46.9)				84 (34.9)			
Ethnicity													
Chakma	153 (36.3)	91 (59.5)	10.170	3	0.017	90 (58.8)	19.488	3	0.000	66 (43.1)	5.048	3	0.168
Marma	202 (47.9)	87 (43.1)				73 (36.1)				64 (31.7)			
Tripura	34 (8.1)	16 (47.1)				19 (55.9)				12 (35.3)			
Others	33 (7.8)	14 (42.4)				17 (51.5)				13 (39.4)			
Area													
Rangamati	185 (43.8)	107 (57.8)	17.613	3	0.001	105 (56.8)	17.337	3	0.001	73 (39.5)	8.199	3	0.042
Khagrachhari	43 (10.2)	26 (60.5)				18 (41.9)				19 (44.2)			
Bandarban	181 (42.9)	68 (37.6)				67 (37.0)				55 (30.4)			
Others	13 (3.1)	7 (53.8)				9 (69.2)				8 (61.5)			
Educational Achievement													
Up to Primary	42 (10.0)	25 (59.5)	24.301	6	0.000	22 (52.4)	22.735	6	0.001	19 (45.2)	18.311	6	0.005
Up to Secondary	41 (9.7)	27 (65.9)				27 (65.9)				23 (56.1)			
SSC	43 (10.2)	23 (53.5)				23 (53.5)				11 (25.6)			
HSC	90 (21.3)	49 (54.4)				45 (50.0)				33 (36.7)			
Honors	108 (25.6)	55 (50.9)				54 (50.0)				45 (41.7)			
Masters and above	8 (1.9)	4 (50.0)				4 (50.0)				3 (37.5)			
Illiterate	90 (21.3)	25 (27.8)				24 (26.7)				21 (23.3)			
Occupation													
Student	246 (58.3)	139 (56.5)	33.095	5	0.000	133 (54.1)	20.723	5	0.001	100 (40.7)	15.970	5	0.007
Service Holder	13 (3.1)	2 (15.4)				5 (38.5)				3 (23.1)			
Business	13 (3.1)	10 (76.9)				8 (61.5)				8 (61.5)			
Housemaker	36 (8.5)	20 (55.6)				16 (44.4)				15 (41.7)			
Unemployed	7 (1.7)	5 (71.4)				5 (71.4)				4 (57.1)			
Farmer	107 (25.4)	32 (29.9)				32 (29.9)				25 (23.4)			
Marital Status													
Married	148 (35.1)	55 (37.2)	13.613	2	0.001	54 (36.5)	12.167	2	0.002	41 (27.7)	8.440	2	0.015
Unmarried	260 (61.6)	146 (56.2)				140 (53.8)				107 (41.2)			
Widowed	14 (3.3)	7 (50.0)				5 (35.7)				7 (50.0)			
Religion													
Christian	21 (5.0)	7 (33.3)	3.272	2	0.195	9 (42.9)	0.690	2	0.708	5 (23.8)	1.876	2	0.391
Buddhist	385 (91.2)	191 (49.6)				181 (47.0)				143 (37.1)			
Others	16 (3.8)	10 (62.5)				9 (56.3)				7 (43.8)			
Socio-economic Status													
Lower class	104 (24.6)	52 (50.0)	2.099	2	0.350	47 (45.2)	0.215	2	0.898	32 (30.8)	2.111	2	0.348
Lower-middle class	98 (23.2)	54 (55.1)				47 (48.0)				38 (38.8)			
Middle class	220 (52.1)	102 (46.4)				105 (47.7)				85 (38.6)			
Well-being													
Low	215 (50.9)	102 (47.4)	0.598	1	0.439	94 (43.7)	2.076	1	0.150	64 (29.8)	9.143	1	0.002
High	207 (49.1)	106 (51.2)	-	-	-	105 (50.7)				91 (44.0)			
Depression													
Yes	208 (49.3)	-	-	-	-	54 (25.2)	83.738	1	0.000	25 (11.7)	117.213	1	0.000
No	214 (50.7)	-	-	-	-	145 (69.7)				130 (62.5)			
Anxiety													
Yes	199 (47.2)	54 (25.2)	83.738	1	0.000	-	-	-	-	32 (14.3)	101.922	1	0.000
No	223 (52.8)	145 (69.7)				-	-	-	-	123 (61.8)			
Stress													
Yes	155 (36.7)	25 (11.7)	117.213	1	0.000	32 (14.3)	101.922	1	0.000	-	-	-	-
No	267 (63.3)	130 (62.5)				123 (61.8)				-	-	-	-

Table 3. One-way ANOVA among socioeconomic variables and depression, anxiety, stress, and well-being.

Ethnicity																
	Chakma		Marma		Tripura		Others		F (3, 418)	p						
	M	SD	M	SD	M	SD	M	SD								
Depression	7.83	4.69	6.57	4.83	6.82	4.91	7.12	4.57	2.051	0.106						
Anxiety	7.24	4.55	5.54	4.51	6.59	4.06	6.42	4.96	4.164	0.006						
Stress	8.50	4.54	7.62	4.46	8.26	3.87	7.45	4.73	1.336	0.262						
Wellbeing	12.63	4.733	12.92	5.23	13.56	5.72	11.97	5.02	0.640	0.590						
Age Group																
	18 to 35		36 to 50		51 to 65		Above 65		F (3, 418)	p						
	M	SD	M	SD	M	SD	M	SD								
Depression	7.49	4.78	6.53	4.75	6.36	4.78	4.88	4.29	3.139	0.025						
Anxiety	6.76	4.55	5.76	4.65	4.94	4.41	4.84	4.34	3.599	0.014						
Stress	8.17	4.42	8.33	4.75	7.22	4.62	6.48	4.11	1.710	0.164						
Wellbeing	12.74	5.03	13.57	5.46	13.00	5.12	11.44	4.74	1.017	0.385						
Area																
	Rangamati		Khagrachhari		Bandarban		Others		F (3,418)	p						
	M	SD	M	SD	M	SD	M	SD								
Depression	7.62	4.47	8.65	5.34	6.08	4.76	8.54	5.04	5.508	0.001						
Anxiety	7.05	4.29	5.72	4.98	5.54	4.56	8.54	5.33	4.720	0.003						
Stress	8.20	4.31	8.65	4.55	7.44	4.55	10.08	4.83	2.315	0.075						
Wellbeing	12.74	4.86	13.00	5.62	12.89	5.23	11.46	4.03	0.351	0.789						
Marital Status																
	Married		Unmarried		Widow				F (2, 419)	p						
	M	SD	M	SD	M	SD	M	SD								
Depression	6.14	4.65	7.67	4.80	6.43	4.50			5.104	0.006						
Anxiety	5.48	4.42	6.81	4.57	5.86	5.14			4.102	0.017						
Stress	7.32	4.38	8.31	4.66	8.79	4.66			2.530	0.081						
Wellbeing	13.50	5.20	12.45	4.96	11.57	5.15			2.454	0.087						
Educational Achievement																
	Primary		Secondary		SSC		HSC		Honors		Masters & Above		Illiterate		F (6, 415)	p
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Depression	7.93	4.75	8.98	5.13	7.16	4.75	7.21	4.58	7.41	4.62	6.75	4.65	5.34	4.68	3.486	0.002
Anxiety	7.19	4.78	8.41	4.72	6.93	4.75	6.26	4.32	6.22	4.29	6.38	4.66	4.80	4.57	3.608	0.002
Stress	9.00	4.49	10.1	4.23	7.26	4.54	7.51	4.35	8.38	4.26	7.25	5.31	6.92	4.50	3.410	0.003
Wellbeing	13.9	5.38	14.1	4.71	13.8	4.31	12.2	5.16	12.1	5.28	12.2	6.11	12.6	4.84	1.733	0.112
Occupation																
	Student		Service		Business		Housemaker		Unemployed		Farmer		F (5, 416)	p		
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD				
Depression	7.65	4.65	4.69	5.02	8.38	3.04	7.56	4.92	10.71	6.47	5.55	4.66	4.806	0.000		
Anxiety	6.73	4.46	5.00	4.79	8.23	5.04	6.42	4.06	10.14	7.24	4.98	4.42	4.018	0.001		
Stress	8.20	4.32	5.54	5.16	9.92	5.17	9.00	3.86	12.14	6.18	6.91	4.38	4.370	0.001		
Wellbeing	12.52	5.04	12.23	5.80	14.62	5.57	14.08	5.55	11.00	3.21	12.93	4.89	1.163	0.327		

demonstrated community resilience that included fostering mass awareness on safety measures through mic-announcement in the locality spearheaded by local government representatives, local volunteers, and indigenous leaders (Chakma, 2020). Chakma (2020) also reported indigenous people maintaining social distancing with 14 days of essential quarantine after the return from the cities and taking extra precautionary measures (e.g., drinking hot water with ginger and honey). Furthermore, indigenous people in CHT are not unacquainted with the concept of lockdown. They have traditional customs to deal with epidemics from ancient times that include enforcing restrictions of movement to resorting to traditional rituals to manage the adverse impact of the lockdown (Chakma, 2020). Strong community support, adherence to the traditional customs and beliefs, and safety measures may have contributed to the

seemingly lower prevalence of mental health problems (e.g., depression and stress) among indigenous people during the pandemic in CHT. Daily wages earned through labor work and farming are the primary sources of livelihood for indigenous people living in the CHT. Loss of livelihoods and income due to the pandemic escalated a heightened sense of anxiety over survival during the pandemic (Chakma, 2020). The spread of the COVID-19 and the subsequent measures coupled with the inadequate healthcare system and medical facilities led to the experience of anxiety among the general population (Bodrud-Doza et al., 2020). The prevalence of depression (moderate and severe) found in the present study was higher than that found in a previous study on a non-indigenous group (Yeasmin et al., 2020). Compared to university students the prevalence of depression, anxiety, and stress in the present study were also found to be

higher (Islam et al., 2020). The prevalence of well-being could not be compared due to the lack of available data.

A meta-analysis during the pandemic revealed a global prevalence of depression, anxiety, and stress to be 31.9%, 41.1%, and 37.9%, respectively (Wu et al., 2021). The present study suggested common mental health problems among indigenous people in Bangladesh during the pandemic are also prevalent. The findings warrant that special attention is required to prevent mental health problems among indigenous people in Bangladesh.

The relationship between age and depression, anxiety, and stress is not conclusive, suggesting a varying degree with respect to age (Carlucci et al., 2018; Scott et al., 2013; Nguyen and Zonderman, 2006). However, the present study revealed a significant association of age (aged between 18 and 35) in relation to depression, anxiety, and age. Hyland et al. (2020) demonstrated that anxiety disorders and depression were more common among adults aged between 18 and 34 during the pandemic suggesting a supportive finding for the present study.

Females are more likely, in general than males to suffer from mental health problems (Beiter et al., 2015). However, the relationship between gender and mental health problems is not conclusive with evidence suggesting that males are more vulnerable to high levels of depression, anxiety, and stress (Nadeem et al., 2017; Demirbatir, 2012). No significant gender difference was found in the present study. Comorbidity among depression, anxiety, and stress was found in the present study. Evidence suggests that comorbidity between depression and anxiety is a common phenomenon (Groen et al., 2020; Wu and Fang, 2014). Correspondingly, depression and stress are also often found to co-occur (Flory and Yehuda, 2015).

Ethnicity plays an important role in determining the prevalence, severity, course, and treatment of mental health problems (Takeuchi and Williams, 2003). A study conducted on the Chakma and Marma communities showed that anxiety and depression among Marma people were higher than among Chakma people (Faruk et al., 2021). However, the present study revealed that Chakma people were more likely to experience depression and anxiety compared to other ethnic groups. Results obtained from ANOVA also suggest that Chakma people are more anxious than Marma people. Geographical location also tends to have an impact on mental health status (Boksa et al., 2015; Bellamy and Hardy, 2015). Participants from Rangamati, compared to participants from other areas, had a significantly higher level of depression. Findings from ANOVA suggest there was a significant difference among geographical locations. Evidence suggests that educational status and mental health problems are correlated with low education predicting mental health problems (Cornaglia et al., 2015; Havas et al., 2009; Araya et al., 2003). Participants with lower educational status (up to primary level) demonstrated a significant level of anxiety. Students were found to be more anxious and stressed compared to other participants. Studies conducted on students during the pandemic showed an increased prevalence of depression, anxiety, and stress (see Faisal et al., 2021; Islam et al., 2020). However, findings from ANOVA also suggested that participants with no literacy experienced depression, anxiety, and stress. Married individuals tend to report lower levels of mental health problems including depression and higher levels of subjective well-being (Horwitz and Scheid, 1999).

Evidence during the pandemic also suggests that married individuals reported lower mental health problems compared to their unmarried counterparts (Jace and Makridis, 2020). However, other studies suggested that marital status was associated with mental health problems (Hossain et al., 2020). The present study also demonstrated a significant correlation between marital status and depression, anxiety, and stress. Results from one-way ANOVA suggest that unmarried participants were more depressed and anxious than their married counterparts.

Higher socioeconomic status predicts fewer mental health problems in general (Yu and Williams, 1999). However, people with low

socioeconomic status with low financial stability were found to be more susceptible to mental health problems during the pandemic (Hossain et al., 2020). No such differences were found in the present study.

It is well known that stress lowers the subjective well-being of an individual (Wersebe et al., 2018; Sheffield et al., 1994). The present study also demonstrated that low well-being was significantly associated with stress. Further study is required to identify factors lowering well-being including factors triggering stress. Longitudinal studies are also required to examine the interplay of sociodemographic variables and mental health problems. The bivariate associations between depression-anxiety, anxiety-stress, and depression-stress were found to have been statistically significant demonstrating that depression, anxiety, and stress can act as risk factors (see Nadeem et al., 2017; Demirbatir, 2012) providing support for using DASS-21 in the present study.

4.1. Strength and limitations of the study

Investigation of the mental health status of indigenous people in Bangladesh, especially during emergencies (e.g., the COVID-19 pandemic) is scarce as well as understudied. To the best of our knowledge, this is the first study investigating the prevalence of common mental health problems experienced by indigenous people during the pandemic in Bangladesh. The prevalence rates of depression, anxiety, stress, and well-being found in the present study suggest that action is required especially on evidence-based and culturally relevant mental health practices (Ocampo, 2010). The findings of the study also suggest that commonly observed mental health problems are predominant among indigenous people. A previous study has also suggested that anxiety and depression are prevalent among indigenous communities in Bangladesh (Faruk et al., 2021). Evidence suggests that anxiety and depression were associated with suicidal attempts for ethnic groups (Leenaars, 2006; Silvikien and Kvermmo, 2007). Indigenous people have historically been under-represented in mental health care services (Hart et al., 2009), and the ongoing pandemic has shown the dearth of mental health services and mental health professionals, escalating mental health problems including depression and suicidal ideation (Júnior et al., 2020). The growing mental health problems are likely to reduce the well-being of these already vulnerable indigenous people during the pandemic. Therefore, it is recommended to take necessary actions to address mental health problems by increasing mental health literacy among indigenous people (Hart et al., 2009), community-based intervention including reformation of conventional psychiatric emphasis keeping indigenous people in mind (Kirmayer, 1994). Developing culturally capable mental health services (Heffernan et al., 2012) and recovery approaches to indigenous mental health problems (Nagel et al., 2012), and promoting cultural psychiatry to rethink mental health services and well-being for indigenous people across the globe (Kirmayer et al., 2000) can be useful. It is hoped that this study will contribute to the indigenization of mental health services including intervention strategies during emergencies. In addition to that, the study is also likely to pave the way for new studies focusing on further exploration of the mental health of indigenous people.

The present study acknowledges a couple of limitations. First, the cross-sectional study does not establish a causal relationship between depression, anxiety, stress, well-being, and sociodemographic variables. The relatively small sample size with an over-representation of the student population is another limitation of the study. Another limitation is that drawing inferences cannot be used due to the non-random sampling technique (purposive sampling for this study) despite several advantages (e.g., cheaper, easier, and less time-intensive, etc.). Evidence suggests that non-probability sampling methods are prone to selection bias (Galloway, 2005; Forster, 2001). In addition, the study solely emphasized the mental health status of indigenous people in CHT regions, therefore, indigenous people living in plain lands were not included in

the study. Finally, self-report data are subject to various biases (Kreitchmann et al., 2019). Therefore, generalizations based on the findings obtained are restricted and replication of the study on a large scale both in the CHT and involving other indigenous groups is recommended.

5. Conclusions

The present study highlights the vulnerability to mental health problems and compromised well-being experienced by indigenous people in CHT regions during the pandemic. The study demonstrated depression, anxiety, and stress, and low well-being are prevalent among indigenous people in Bangladesh during the pandemic. The findings draw attention toward the proneness of these groups to mental health problems and contribute to the implementation of mental healthcare for all people, especially in emergencies, irrespective of geographical locations. The study is also expected to facilitate more research into the mental health status of indigenous people in Bangladesh.

Declarations

Author contribution statement

Md. Omar Faruk: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Umay Ching: Conceived and designed the experiments; Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Kamal Uddin Ahmed Chowdhury: Conceived and designed the experiments; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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