Anxiety and depressive symptoms among COVID-19 patients admitted to three isolation facilities in Bangladesh

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Abstract

The COVID-19 pandemic can impose a profound impact on the mental health of hospitalised patients infected with SARS-CoV-2. However, there have been no studies that explored the psychological distress of the COVID-19 inpatients in Bangladesh. Therefore, this study aimed to assess the prevalence of anxiety and depressive symptoms and explore the associated factors among inpatients with COVID-19. A cross-sectional study was conducted among 138 COVID-19 patients admitted to three isolation facilities in Dhaka, Bangladesh, from September to October 2020. Participants' sociodemographic and clinical data were obtained. Mental health symptoms were evaluated with the Hospital Anxiety and Depression Scale (HADS). Descriptive statistics, bivariate and multivariate logistic regression models were performed to analyse the data. The prevalence of anxiety and depressive symptoms were 57.2% (95% CI: 48.2–65.2) and 52.2% (95% CI: 43.8–62.7), respectively. Presence of comorbidity (aOR: 5.64, 95% CI: 2.21–14.35) and having ≥3 COVID-19 physical symptoms (aOR: 6.90, 95% CI: 2.71–17.56) were associated with anxiety symptoms. Besides, presence of comorbidity (aOR: 2.73, 95% CI: 1.07–6.99), having ≥3 COVID-19 physical symptoms (aOR: 4.46, 95% CI: 1.78–11.20) and patient with ≤93% oxygen saturation (aOR: 2.33, 95% CI: 1.01–5.36) were associated with depressive symptoms. Considerable numbers of COVID-19 patients in Bangladesh experienced psychological distress during hospitalisation, requiring more attention and timely mental health interventions.

Keywords

Depression, anxiety, inpatient, COVID-19, HADS, Bangladesh

Introduction

Since the dawn of 2020, the world has been experiencing a significant challenge of a pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), responsible for the highly contagious coronavirus disease-2019 (COVID-19). Since its discovery, nearly 124 million confirmed cases of COVID-19 have been identified worldwide, including an estimated 2.7 million deaths in about 217 countries (World Health Organization (WHO), 2020c). Bangladesh has been suffering from this highly transmissible zoonotic disease since March 2020. As of 25 March 2021, 584,395 confirmed COVID-19 cases in Bangladesh, of which 8797 died (Director General of Health Services (DGHS), 2020).

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Viral respiratory infections are linked to chronic and acute psychological effects among the survivors (Bohmwald et al., 2018). According to earlier studies, a large number of severe acute respiratory syndrome (SARS)- and the Middle East respiratory syndrome (MERS)-infected patients experienced several psychological symptoms, including posttraumatic stress, insomnia, depression, anxiety and even suicidality (Kim et al., 2018; Li and Zhang, 2003; Sheng et al., 2005). After discharge, many of these patients' mental disturbances persisted and continued for a long time (Lam et al., 2009).

However, the psychiatric effect of previous coronavirus outbreaks can be outweighed by the COVID-19 pandemic due to the widespread circulation of falsification on social media (Zarocostas, 2020), and scarcity of medical facilities (Sommer and Bakker, 2020). COVID-19-infected patients are isolated due to their high level of transmissibility and are mainly treated in hospital facilities. While being treated in isolation, lack of interaction with friends, family, or loved ones may produce mental instability among people with COVID-19 (Li et al., 2020). Besides, recent findings have demonstrated prevailing acute psychiatric symptoms among patients admitted to intensive care units (ICUs) and required mechanical ventilation (Jackson and Khan, 2015; Hatch et al., 2018). Because of the high rate of admission (Abate et al., 2020) and prolonged length of stay in the ICU of a patient infected with SARS-CoV-2 (Rees et al., 2020), COVID-19 patients requiring ICU admission may eventually become susceptible to develop psychological distress (Sommer and Bakker, 2020). A recent systematic review reported that the pooled prevalence of depression and anxiety among COVID-19 patients was 45% and 47%, respectively (Deng et al., 2020). High levels of posttraumatic symptoms have also been identified in medically stabilised people released from the hospital following the COVID-19 recovery (Bo et al., 2020).

In Bangladesh, COVID-19 also imposed psychological consequences (Mamun et al., 2021). Suicidal deaths of a suspected COVID-19 patient at a Bangladeshi hospital were reported due to treatment-related negligence (Mamun et al., 2020), indicating the presence of serious psychological distress among COVID-19 patients in Bangladesh. As a result, this long-term psychological distress could pose a significant socioeconomic threat such as loss of productivity, human capital cost and slow economic growth of the post-pandemic world (Trautmann et al., 2016), primarily in developing countries like Bangladesh. Furthermore, depression may make the prognosis of COVID-19 worse as mental depression and distress negatively affect the patients' immunity (Leonard, 2001). Despite its increasing significance, present estimates on the prevalence of psychological distress, such as anxiety and depressive symptoms, among COVID-19 patients are uncertain (Deng et al., 2020; Rogers et al., 2020).

To date, no studies have been conducted regarding the prevalence and associated factors of anxiety and depressive symptoms among inpatients with COVID-19 in Bangladesh. However, we hypothesised that COVID-19 inpatients would demonstrate a high rate of psychological distress, including depression and anxiety, considering the scant reported findings on COVID-19 and evidence of SARS and MERS outbreaks. Therefore, this study aimed to assess the prevalence of anxiety and depressive symptoms and explore the factors associated with anxiety and depressive symptoms among inpatients with COVID-19.

Methods

Study design, setting and participants

This cross-sectional study was conducted among 138 inpatients with COVID-19 in three COVID-19 isolation facilities, including Mugda Medical College Hospital (MMCH), Kurmitola General Hospital (KGH) and Kuwait Bangladesh Friendship Government Hospital (KBFGH). MMCH and KGH are tertiary level facilities, and KBFGH is a secondary level hospital, and all these facilities are located in Dhaka, Bangladesh. A total of 989 COVID-19-infected patients were admitted to these facilities during the data collection period (Director General of Health Services (DGHS), 2020). The non-random sampling technique was followed with a 7.7% of margin of error. All of the enrolled participants were definitive COVID-19 patients diagnosed by an RT-PCR laboratory test. The present study did not include patients with the following conditions: critical symptoms, impaired awareness, mechanical ventilation, oxygen therapy, severe psychological distress and dementia (Figure 1).

Data collection

International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) in collaboration with the Director General of Health Services (DGHS), Bangladesh has been implementing a psychological support project entitled "Psychological Support to Healthcare Providers and COVID-19 Infected Patients" in Bangladesh to maintain the psychological health of the healthcare providers and patients with COVID-19. As part of the project, a survey was carried out in MMCH, KGH and KBFGH between 14 September 2020 and 19 October 2020 by seven well-trained psychiatric social workers who had been volunteering to provide psychological support to COVID-19 inpatients at those COVID-19 isolation facilities upon permission from Director of Hospital and Clinical Services, Bangladesh. Data collectors received 2 days of online training by expert trainers on the data collection tools and methods. A trained research assistant was recruited to ensure data quality, and the accuracy, consistency and completeness of the obtained data were checked. Verbal
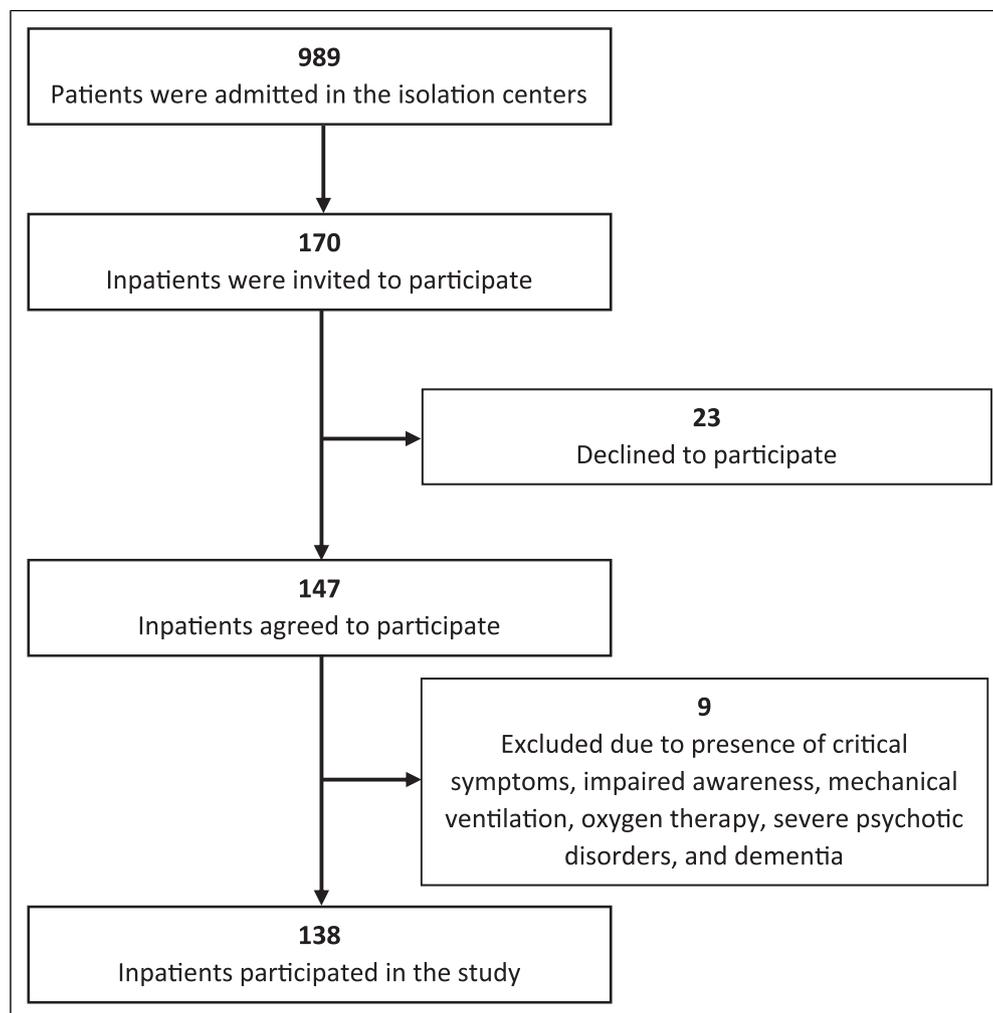
Figure 1: Participant selection procedure.

informed consent was taken from all the participants before commencing the interview. Participants were allowed to withdraw themselves from the survey at any time, and all the identifiable information of the participants were kept confidential. The study was conducted as per the guidelines of the Helsinki Declaration, 1975.

Measures

Sociodemographic and clinical information: Sociodemographic variables included gender, age, profession, level of education, marital status and residential status. Clinical variables included the World Health Organization (WHO)–reported physical symptoms of COVID-19 (World Health Organization (WHO), 2020b) and comorbidities discussed in previous literature (Guan et al., 2020). Other clinical variables consisted of inpatient days, home member diagnosed with COVID-19 positive, oxygen saturation at rest, symptoms change after hospitalisation, history of smoking

and alcohol drinking and body mass index (BMI). BMI was calculated using the formula (weight (kg)/squired of height (m2)). According to the WHO's definition (World Health Organization (WHO), 2020a), BMI ≤18.5 kg m-2, 18.6–24.9 kg m-2, 25–29.9 kg m-2 and ≥30 kg m-2 were classified as underweight, normal weight, overweight and obese, respectively.

Hospital Anxiety and Depression Scale (HADS): A Bengali version of the HADS scale, a self-reported screening tool, was used to identify anxiety and depressive symptoms among the COVID-19 inpatients (Snaith, 2003). The tool consists of 14 items across two subscales: HADS-A for anxiety and HADS-D for depression. It uses a 4-point Likert scale in each subscale with a cumulative score of 0–21. This screening tool has been validated and has good reliability (mean Cronbach's alpha=0.83 for HADS-A and mean Cronbach's alpha=0.82 for HADS-D) in different medical settings (Bjelland et al., 2002; Al Aseri et al.,

2015; Annunziata et al., 2020). However, the Cronbach's alpha value for HADS-D was 0.70, and HADS-A was 0.81 in the present study. In this study, a cut-off of greater than or equal to eight in each subscale was used to diagnose anxiety and depressive symptoms (Bjelland et al., 2002). To identify the severity of anxiety and depressive symptoms, the scores of each subscale were categorised as follows: the absence of symptoms (0–7), mild symptoms (8–10), moderate symptoms (11–14) and severe symptoms (15–21) (Stern, 2014).

Statistical analysis

The obtained data were entered in Microsoft Excel 2013 to recheck for completeness and consistency. All statistical analyses were performed using IBM SPSS Windows version 24. Descriptive statistics were used for the sociodemographic characteristics of clinical information variables. Chi-square and Fisher's exact test were employed to identify the association between predictor and outcome variables. Bivariate and multivariate logistic regressions were performed by computing crude odds ratio (OR) and adjusted odds ratio (aOR) with 95% confidence interval (CI) to identify the associated factors of anxiety and depressive symptoms among COVID-19 inpatients. The backward logistic regression variable selection method was used to identify the best set of predictors for the outcome variables. A p-value <0.05 was considered statistically significant. Gender, age, profession, marital status, level of education, residential status, BMI, inpatient days, oxygen saturation at rest, presence of at least a comorbidity, number of current physical COVID-19 symptoms, smoking history and symptom change after hospitalisation were included in the full model to run the backward logistic regression analysis for both anxiety and depressive symptoms.

Results

Sociodemographic and clinical information

Table 1 and Table 2 describe the sociodemographic characteristics and clinical information of the participants, respectively. A total of 138 inpatients participated in the study, of whom about half were male (51.4%) and the other half were female (48.6%). The majority of the participants were unemployed (37%), married (89.9%) and had graduation or above educational level (50.7%) (Table 1). The average age of the participants was 49.04 years (standard deviation (SD) =15.09), ranging from 20 to 91 years.

The average length of stay in the hospital was 9.12 (SD=7.15) days, ranging from 1 to 44 days. Around two-thirds (62.3%) of the participants had three or more COVID-19-related physical symptoms. Moreover, comorbidities were present in 61.6% of the participants (Table 2).

Prevalence of anxiety and depressive symptoms. The average score of HADS-D and HADS-A was 9.11 (SD=3.76) and 9.01 (SD=4.27), respectively. Overall, anxiety symptoms (HADS-A ≥8) was present in 57.2% (95% CI: 48.2–65.2) of the participants and depressive symptoms (HADS-D ≥8) was present in 52.2% (95% confidence interval (CI): 43.8–62.7) of the participants. Besides, 43.5% (95% CI: 34.1–53.3) of the participants had anxiety and depressive symptoms. Among the participants who were diagnosed with anxiety and depressive symptoms, the majority had a moderate level of anxiety (32.6%) and depressive (29%) symptoms (Figure 2).

Factors associated with anxiety and depressive symptoms. Multivariate logistic regression analysis showed that presence of comorbidity (adjusted odds ratio (aOR): 5.64, 95% CI: 2.21–14.35, p<0.001) and having ≥3 COVID-19 physical symptoms (aOR: 6.90, 95% CI: 2.71–17.56, p<0.001) were associated with anxiety symptoms. Besides, presence of comorbidity (aOR: 2.73, 95% CI: 1.07–6.99, p<0.05), having ≥3 COVID-19 physical symptoms (aOR: 4.46, 95% CI: 1.78–11.20, p<0.01) and patient with ≤93% oxygen saturation (aOR: 2.33, 95% CI: 1.01–5.36, p<0.05) were associated with depressive symptoms (Table 3).

Discussion

To our knowledge, this is the first survey to explore the immediate psychiatric status among COVID-19 inpatients and its associated factors in Bangladesh. The present study found that over half of the participants had anxiety (57.2%) and depressive (52.2%) symptoms, with a substantial number showing mild to severe symptoms of anxiety and depression. This rate was higher than that reported in a recent meta-analysis of 31 studies, which showed that the prevalence of anxiety and depressive symptoms among patients with COVID-19 were 47% and 45%, respectively (Deng et al., 2020). Compared to the previous studies in developing countries among COVID-19 patients in isolation, the prevalence of anxiety symptoms in the present study was higher than study conducted in Iran; 29.27% (Zarghami et al., 2020) and Wuhan, China; 18.6% (Dai et al., 2020), lower than study conducted in Iran; 100% (Zandifar et al., 2020), and coherent with a study conducted in Ecuador; 58.1% (Paz et al., 2020). Besides, the prevalence of depressive symptoms in the present study was higher than studies conducted in Jordan; 44% (Samrah et al., 2020), Wuhan, China; 13.4% (Dai et al., 2020) and Hubei, China; 43.1% (Ma et al., 2020), lower than study conducted in Iran; 97.2% (Zandifar et al., 2020), and coherent with a study conducted in Ecuador; 52.6% (Paz et al., 2020). However, these studies consisted of different sociodemographic compositions and used different study designs and

Table 1: Sociodemographic characteristics of the inpatients infected with COVID-19

Variables	Total sample n (%)	Depressive symptoms			Anxiety symptoms		
		Yes n (%)	No n (%)	p-value	Yes n (%)	No n (%)	p-value
Gender							
Male	71 (51.4)	39 (54.9)	32 (45.1)	0.505[a]	38 (53.5)	33 (46.5)	0.363[a]
Female	67 (48.6)	33 (49.3)	34 (50.7)		41 (61.2)	26 (38.8)	
Age							
20–29 years	15 (10.9)	6 (40.0)	9 (60.0)	**0.025**[a]	6 (40.0)	9 (60.0)	0.243[a]
30–39 years	27 (19.6)	8 (29.6)	19 (70.4)		12 (44.4)	15 (55.6)	
40–49 years	25 (18.1)	12 (48.0)	13 (52.0)		15 (60.0)	10 (40.0)	
50–59 years	36 (26.1)	23 (63.9)	13 (36.1)		24 (66.7)	12 (33.3)	
>=60 years	35 (25.4)	23 (65.7)	12 (34.3)		22 (62.9)	13 (37.1)	
Profession							
Healthcare provider	9 (6.5)	4 (44.4)	5 (55.6)	0.591[b]	5 (55.6)	4 (44.4)	**0.016**[b]
Private job	32 (23.2)	14 (43.8)	18 (56.3)		18 (56.3)	14 (43.8)	
Student	3 (2.2)	1 (33.3)	2 (66.7)		1 (33.3)	2 (66.7)	
Business	18 (13.0)	10 (55.6)	8 (44.4)		7 (38.9)	11 (61.1)	
Government job	13 (9.4)	6 (46.2)	7 (53.8)		5 (38.5)	8 (61.5)	
Homemaker	12 (8.7)	5 (41.7)	7 (58.3)		4 (33.3)	8 (66.7)	
Unemployed	51 (37.0)	32 (62.7)	19 (37.3)		39 (76.5)	12 (23.5)	
Marital status							
Single	10 (7.2)	3 (30.0)	7 (70.0)	0.303[b]	4 (40.0)	6 (60.0)	0.484[b]
Married	124 (89.9)	67 (54.0)	57 (46.0)		73 (58.9)	51 (41.1)	
Divorced or widowed	3 (2.2)	2 (66.7)	1 (33.3)		2 (66.7)	1 (33.3)	
Level of education							
Graduation or above	70 (50.7)	29 (41.4)	41 (58.6)	0.067[a]	35 (50.0)	35 (50.0)	0.175[b]
Higher secondary	44 (31.9)	28 (63.6)	16 (36.4)		27 (61.4)	17 (38.6)	
Primary	11 (8.0)	7 (63.6)	4 (36.4)		9 (81.8)	2 (18.2)	
No schooling	12 (8.7)	8 (66.7)	4 (33.3)		8 (66.7)	4 (33.3)	
Residential status							
With family	131 (94.9)	69 (52.7)	62 (47.3)	0.709[b]	76 (58.0)	55 (42.0)	0.461[b]
Single person and live with multiple peers	7 (5.1)	3 (42.9)	4 (57.1)		3 (42.9)	4 (57.1)	

n=Frequencies.
[a]Chi-square test.
[b]Fisher's exact test.

measuring instruments. Therefore, the result may vary due to different sociodemographic samples, study design and measuring instruments. Compared to the earlier study among the general citizens during the pandemic of COVID-19 in Bangladesh, both the prevalence of anxiety (57.2% vs 46.0%) and depressive (52.2% vs 47.2%) symptoms in the present study was high (Zubayer et al., 2020). Zubayer et al. also reported that the anxiety and stress were more among the population aged >30 years. This result suggests that the COVID-19 inpatients with anxiety and depressive symptoms may already have this psychological distress before they were so ill to be hospitalised.

This high prevalence of anxiety and depressive symptoms among Bangladeshi COVID-19 inpatients could be because of the incompetent healthcare system; shortage of beds, ICU, and ventilator (Sayeed Al-Zaman, 2020); treatment-related negligence in the healthcare facilities (Mamun et al., 2020); less social interaction (Li et al., 2020) and rampant circulation of misinformation on social and conventional media (Zarocostas, 2020). Moreover, symptoms of depression and anxiety among COVID-19 inpatients could increase due to uncertainty about the prognosis of the disease and the experiencing the adverse outcomes. Furthermore, side effects of COVID-19 medication and physical discomfort may also promote psychiatric problems among COVID-19 inpatients.

Our analysis revealed that having COVID-19-related physical symptoms were associated with anxiety and depressive symptoms among inpatients in COVID-19 isolation facilities (Table 3). This finding was supported by a similar study conducted in Wuhan, China, which reported that inpatients with physical symptoms of COVID-19 were more susceptible to psychological distress (Dai et al., 2020). This could be explained because COVID-19

Table 2. Clinical information of inpatients infected with COVID-19.

Variables	Total sample n (%)	Depressive symptoms			Anxiety symptoms		
		Yes n (%)	No n (%)	p-value	Yes n (%)	No n (%)	p-value
BMI (kg/m^2)							
Underweight (<18.5)	1 (0.7)	1 (100)	0 (0)	0.351[b]	1 (100)	0 (0)	0.120[b]
Normal weight (18.5–24.9)	44 (31.9)	27 (61.4)	17 (38.6)		34 (77.3)	10 (22.7)	
Overweight (25–29.9)	40 (29.0)	18 (45.0)	22 (55.0)		22 (55.0)	18 (45.0)	
Obese (≥30)	31 (22.5)	18 (58.1)	13 (41.9)		18 (58.1)	13 (41.9)	
Inpatient days							
≤7 days	72 (52.2)	37 (51.4)	35 (48.6)	0.476[a]	43 (59.7)	29 (40.3)	0.474[a]
8–14 days	44 (31.9)	21 (47.7)	23 (52.3)		22 (50.0)	22 (50.0)	
≥15days	22 (15.9)	14 (63.6)	8 (36.4)		14 (63.6)	8 (36.4)	
Home member diagnosed with COVID-19 positive							
Yes	38 (27.9)	19 (50.0)	19 (50.0)	0.831[a]	17 (44.7)	21 (55.3)	0.082[a]
No	98 (72.1)	51 (52.0)	47 (48.0)		60 (61.2)	38 (38.8)	
Oxygen saturation at rest							
≥94%	75 (54.3)	31 (41.3)	44 (58.7)	**0.003[a]**	34 (45.3)	41 (54.7)	**0.004[a]**
≤93%	60 (43.5)	40 (66.7)	20 (33.3)		42 (70.0)	18 (30.0)	
Presence of at least a comorbidity							
Yes	85 (61.6)	55 (64.7)	30 (35.3)	**<0.001[a]**	63 (74.1)	22 (25.9)	**<0.001[a]**
No	53 (38.4)	17 (32.1)	36 (67.9)		16 (30.2)	37 (69.8)	
Number of current physical COVID-19 symptoms							
≤2	52 (37.7)	13 (25.0)	39 (75.0)	**<0.001[a]**	13 (25.0)	39 (75.0)	**<0.001[a]**
≥3	86 (62.3)	59 (68.6)	27 (31.4)		66 (76.7)	20 (23.3)	
Symptoms change after hospitalisation							
Better	135 (97.8)	70 (51.9)	65 (48.1)	0.990[b]	77 (57.0)	58 (43.0)	0.990[b]
Worse	3 (2.2)	2 (66.7)	1 (33.3)		2 (66.7)	1 (33.3)	
Smoking history							
Yes	32 (23.2)	19 (59.4)	13 (40.6)	0.352[a]	17 (53.1)	15 (46.9)	0.591[a]
No	106 (76.8)	53 (50.0)	53 (50.0)		62 (58.5)	44 (41.5)	
Alcohol drinking history							
Yes	4 (2.9)	3 (75.0)	1 (25.0)	0.621[b]	1 (25.0)	3 (75.0)	0.313[b]
No	134 (97.1)	69 (51.5)	65 (48.5)		78 (58.2)	56 (41.8)	

BMI=Body Mass Index.
[a]Chi-square test.
[b]Fisher's exact test.

symptoms like fever, shortness of breath, and headache can produce mental effects among patients (Fitzgerald, 2020). Symptoms of psychological distress like anxiety and depression were also more prevalent among patients with more clinical symptoms and severity of disease (Da Silva et al., 2011; Piontek et al., 2019). Thus, patients with more symptoms could be more worried about the prognosis of the disease.

Besides, the present study also found a higher rate of depressive symptoms among COVID-19 inpatients with ≤93% of oxygen saturation at rest (Table 2 and Table 3), which is consistent with a similar study conducted in China among COVID-19 patients (Kong et al., 2020). Patients with depressive symptoms have been reported to have periventricular white matter lesions (Campbell and Coffey, 2001), caused by low arterial oxygen saturation (Van Dijk et al., 2004). Oxygen saturation is considered one of the key indicators to define the clinical severity of the COVID-19 case (World Health Organization (WHO), 2020b). Low oxygen saturation might worsen the clinical condition of the patients and thus could exacerbate adverse psychological outcomes among these COVID-19 patients. More psychological and health care is needed to provide these critically ill patients with low oxygen saturation.

The present study also found that COVID-19 inpatients with comorbidity were more likely to have anxiety and depressive symptoms than those who did not have a comorbidity (Table 3). The same result was also found in a study among people living in Bangladesh during the COVID-19 pandemic (Mamun et al., 2021). Since comorbidities are expected to exacerbate because of the effects of SARS-CoV-2 infection (Chen et al., 2020), it is conceivable that patients
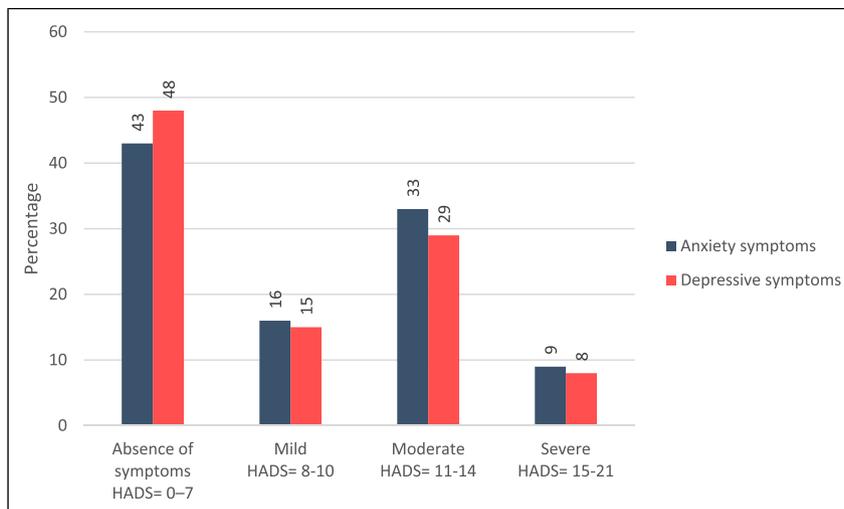
Figure 2: Severity of anxiety and depressive symptoms among COVID-19 inpatients in Bangladesh.

Table 3. Bivariate and multivariate logistic regression analysis of factors associated with anxiety and depressive symptoms among inpatients infected with COVID-19.

Variables		Crude odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value
Model for anxiety symptoms					
Inpatient days	≤7 days	1	—	1	—
	8-14 days	0.67 (0.32-1.44)	0.310	0.49 (0.18-1.30)	0.152
	≥15 days	1.18 (0.44-3.17)	0.740	0.63 (0.17-2.34)	0.491
Home member diagnosed with COVID-19 positive	No	1	—	1	—
	Yes	0.51 (0.24-1.09)	0.084	0.40 (0.15-1.09)	0.074
Oxygen saturation at rest	≥94%	1	—	1	—
	≤93%	2.81 (1.38-5.75)	0.005	1.99 (0.80-4.95)	0.137
Comorbidity	No	—	—	1	—
	Yes	6.62 (3.09-14.18)	<0.001	**5.64 (2.21-14.35)**	**<0.001**
Number of current physical COVID-19 symptoms	≤2	—	—	1	—
	≥3	9.90 (4.44-22.09)	<0.001	**6.90 (2.71-17.56)**	**<0.001**
Model for depressive symptoms					
Age	20-29 years	1	—	1	—
	30-39 years	0.63 (0.17-2.37)	0.496	0.19 (0.04-0.96)	0.054
	40-49 years	1.39 (0.38-5.07)	0.623	0.31 (0.06-1.48)	0.141
	50-59 years	2.65 (0.77-9.14)	0.122	0.70 (0.15-3.16)	0.641
	>=60 years	2.88 (0.83-10.00)	0.097	0.69 (0.14-3.40)	0.651
Oxygen saturation at rest	≥94%	1	—	1	—
	≤93%	2.84 (1.4-5.76)	0.004	**2.33 (1.01-5.36)**	**0.047**
Comorbidity	No	—	—	1	—
	Yes	3.88 (1.87-8.04)	<0.001	**2.73 (1.07-6.99)**	**0.036**
Number of current physical COVID-19 symptoms	≤2	1	—	1	—
	≥3	6.56 (3.02-14.24)	<0.001	**4.46 (1.78-11.20)**	**0.001**

CI Confidence interval

with comorbidities can experience more psychological distress than those with fewer or no comorbidities.

In this study, higher rates of depressive symptoms were found among older age. Both the anxiety and depressive symptoms were more prevalent among participants aged 50

years or above (Table 1). It was also evident that the suicidal cases among the older population spiked during the SARS epidemic in 2003 (Yip et al., 2010). However, this finding was coherent with a previous study conducted in Spain among a population aged over 60 years at the time of the

COVID-19 outbreak (Picaza Gorrochategi et al., 2020). This could be because the older age group has a higher risk of COVID-19 infection and death (Adhikari et al., 2020). Since psychological distress has an adverse effect on the body's immunity (Leonard, 2001), this higher prevalence of anxiety and depressive symptoms could worsen the prognosis of COVID-19 among these already vulnerable populations. Therefore, particular focus should be placed on psychiatric interventions aiming at the older age group.

Although female patients reported having more psychological distress like depression and anxiety than their male counterparts before the COVID-19 outbreak (Abate, 2013), no significant gender differences were found associated with depression and anxiety in the present study. This result is coherent with studies conducted in Iran among patients with COVID-19 (Zandifar et al., 2020; Zarghami et al., 2020). Gender variations could be neutralised in the current study because of the small sample size and circumstances of the COVID-19 pandemic.

Self-rating scales were used in this study rather than a web-based survey to explore the psychological distress comprehensively so that patients, especially the older ones who did not have access to the internet or smartphone, could participate in the study. However, there were some certain limitations to our study. Firstly, because of the restricted interaction with COVID-19 patients, only three isolation facilities were surveyed. The study used a non-random sampling technique and a small sample size that may limit the generalisation of the findings and increase the risk of selection bias. Besides, the present study lacked clinical interviews to confirm the diagnosis of anxiety and depression. Therefore, the findings could be influenced by the high infectivity nature of COVID-19 and the presence of somatic symptoms. For further verification of our findings, a multi-facility study with greater sample size is required. Secondly, since this was a cross-sectional study, dynamic observation and follow-up of the participant's psychological outcomes were not carried out. The causal relationships between the outcome variable and associated factors could not be explored. Thirdly, only some of the factors associated with mental health were assessed in this study, and further research on other possible factors is required. Lastly, HADS present study did not have any control inpatient group to compare the prevalence and severity of anxiety and depressive symptoms.

In conclusion, the findings have shown that substantial numbers of COVID-19 patients in Bangladesh experienced psychological distress during hospitalisation. Therefore, we recommend addressing the psychological health problem among COVID-19 inpatients by giving more attention and timely psychological interventions. Early identification and appropriate treatments like psychological counselling, long-term assessment and

information about where to get support are needed to be delivered in a timely fashion to COVID-19 inpatients. Behavioural change communication interventions are also required to promote healthcare-seeking behaviour for mental health.

Author contribution

Conceptualisation: MR, GB; Data curation: MR, GB and MH; Formal analysis: MR; Investigation: GB, AR, AA, SA and MH; Resources: GB and MH; Validation: GB, AH, AR and AA; Writing – original draft: MR, GB and AH; Writing – review & editing: GB, AH, AR and AA.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical aspects of this study were reviewed and approved by the Institutional Ethical Committee, Department of Environmental Sanitation, Patuakhali Science and Technology University, Bangladesh (reference no.: ENS22/11/2020:006).

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