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Article in *Journal of Affective Disorders* · February 2021

DOI: 10.1016/j.jad.2021.100103

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Research Paper

Mental health difficulties of adults with COVID-19-like symptoms in Bangladesh: A cross-sectional correlational study



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ARTICLE INFO

Keywords:

Mental health
COVID-19 like symptoms
Bangladesh
Cross-sectional correlational

ABSTRACT

Background: The rapid spread of novel corona virus disease (COVID-19) coupled with inefficient testing capacities in Bangladesh has resulted in a number of deaths from COVID-19-like symptoms that have no official test results. This study was the first study that explored the mental health of adults with the most common COVID-19-like symptoms in Bangladesh.

Methods: This cross-sectional correlational study gathered data via an online survey to explore the mental health of Bangladeshi adults with symptoms akin to COVID-19. Level of stress, anxiety symptoms, and depressive symptoms were measured with the DASS-21. Chi-square tests and multivariate logistic regression was performed to examine the association of variables.

Results: The prevalence rates of anxiety symptoms and depressive symptoms of the overall population were 26.9% and 52.0% respectively and 55.6% reported mild to extremely severe levels of stress. Multivariate logistic regression determined that respondents with COVID-19-like symptoms reported higher odds for stress level (AOR = 2.043, CI = 1.51 to 2.76), anxiety symptoms (AOR = 2.770, CI = 2.04 to 3.77) and depressive symptoms (AOR = 1.482, CI = 1.12 to 1.96) than asymptomatic respondents.

Limitations: There was a chance of recall bias as it was not possible to validate the information due to the retrospective design of the study. Recruitment methods only captured internet users, which reduces the generalizability of findings.

Conclusions: Patients with symptoms like those of COVID-19 should be prioritized in the healthcare setting in order to reduce mental health difficulties throughout the pandemic.

Introduction

The emergence and progression of the COVID-19 pandemic have received global attention since February of 2020 when the WHO declared the virus a public health emergency. As of July 21, 2020, there are over 14 million cases and over 600 thousand deaths worldwide

due to COVID-19 WHO (2020a). Similar to many countries, Bangladesh instituted precautionary measures, such as lockdowns and quarantines. Unfortunately, numbers of infected cases have been increasing within the country. As of July 21, 2020, over 200 thousand cases and over 2 thousand COVID-19 deaths have been confirmed in Bangladesh IEDCR (2020). Exacerbating the situation is the fragile health care sector of Bangladesh, which is poorly equipped to deal with an influx of

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<https://doi.org/10.1016/j.jadr.2021.100103>

Received 4 November 2020; Received in revised form 21 January 2021; Accepted 29 January 2021

Available online 1 February 2021

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pandemic patients, in part due to a lack of testing facilities, COVID-19 testing kits and skilled healthcare workers (Dhakatribune, 2020; Molla, 2020; Sujun and Hasan, 2020).

Despite the lack of access to COVID-19 tests, Bangladesh news outlets are reporting that general hospitals are refusing to admit patients who cannot prove they have tested negative, while hospitals designated specifically for COVID-19 treatment are refusing to admit patients who cannot prove they have tested positive, creating a difficult dilemma for the public with limited access to testing NEW AGE (2020a). Thus, Bangladeshi residents with COVID-19-like symptoms are struggling to access adequate healthcare in a hospital setting. A national daily newspaper has reported an increase in deaths from symptoms similar to COVID-19, and speculated that this may be because the hospital refused them NEW AGE (2020b). These healthcare issues directly caused by the pandemic elicit common mental health distress, such as stress, anxiety and depression, which are compounded by socioeconomic problems indirectly caused by the pandemic, such as unemployment and isolation (Anwar et al., 2020).

Additionally, the lack of medical resources and trained personnel make prompt diagnosis and treatment close to impossible. Most familiar symptoms reported for COVID-19 are fever, headache, dry cough, breathing difficulties, sore throat and fatigue (Huang et al., 2020) which are mostly similar for common flu or cold. These factors are likely to cause psychological distress in individuals suffering from any of these common symptoms. This study explored the mental health of adults with the most common COVID-19-like symptoms. We hypothesized that symptomatic respondents would experience more mental health distress than asymptomatic respondents. The main objective of this study is to investigate whether adults with COVID-19-like symptoms during the initial pandemic period in Bangladesh experience higher levels of stress, anxiety symptoms and depressive symptoms than adults who have not had any COVID-19-like symptoms.

Materials and methods

Study design and subject

A cross-sectional correlational web-based survey was conducted to assess the association of psychological response with COVID-19-like symptoms among the general population from April 29th to May 14th, 2020. Data was collected online using a snowball sampling technique, in which the research team distributed the survey link through social media to all divisions of Bangladesh. Seven participants were initially sampled to start the “snowball”. They then shared the link among Bangladeshi residents aged more than 18 years. Among 1427 respondents, 306 reported having experienced COVID-19-like symptoms within the last two weeks. Psychological outcomes were compared between symptomatic and non-symptomatic cases. Respondents who reported chronic illnesses were excluded from our analyses, because their chronic illnesses and associated symptoms might impact their mental health (Sayeed et al., 2020a), which could interfere with our objectives of isolating mental health difficulties to those brought on by COVID-19-like symptoms. Finally, a total of 686 asymptomatic, healthy respondents (without COVID-19-like symptoms) were included in the analysis. A symptom list was conceptualized using coronavirus guidelines published by the World Health Organization (WHO, 2020b). Individuals aged 18 years and older were eligible for the study.

Procedures

The Research Ethical Committee of the Department of Food Microbiology, Patuakhali Science and Technology University, Bangladesh, reviewed and approved this research protocol (approval no.:FMB:24/04/2020:05). The survey was originally written in English and then translated into Bangla by an expert interpreter. The questionnaire was piloted in a small group of random online users to

confirm understanding of the survey questions and rectify any problematic wording. Clicking on the link originally distributed by the research team automatically led respondents to the study overview page and informed consent. This first page included a short overview of the study background, aims, and procedures, eligibility criteria, confidentiality agreement, consent form, instructions and study members' contact information for respondents who had questions or wished for more information. Completion of demographic information was required in order to move forward to the rest of the survey. The survey collection was conducted following the Helsinki Declaration as revised in 2013 Williams (2008) and the Checklist for Reporting Results of Internet ESurveys (CHERRIES) guidelines Eysenbach (2004).

Survey contents

This survey was split into three sections: socio-demographic information, an assessment of COVID-19-like symptoms and a mental health assessment. Sociodemographic information included age, gender, education, residence, monthly income and smoking behavior. WHO guidelines on coronavirus advice to the public WHO (2020b) were utilized to create a COVID-19-like symptoms checklist for this study. Respondents who reported having any of the checklist symptoms (fever, headache, dry cough, breathing difficulties, sore throat, and fatigue) within the last 14 days were considered “symptomatic.” This symptoms checklist included binary-choice questions such as, “In the past 14 days, have you experienced any fever?” with answer choices, “yes/ no.”

A validated Bangla version of the Depression, Anxiety, and Stress Scale (DASS-21) was used to assess the mental health of respondents (Alim et al., 2014). The DASS-21 contains three self-report scales with a total of 21-items designed to assess symptoms of the negative domains of depressive symptoms, anxiety symptoms, and stress levels Lovibond and Lovibond (1995). Likert scale scores range from 0 (item does not apply at all) to 3 (item applies strongly) for occurrences over the last week. The DASS-21 has proven to be reliable and relevant for assessing mental health in the Bangladeshi population (Alim et al., 2015; Banna et al., 2020; Sadiq et al., 2019; Sayeed et al., 2020b, 2020a). The Cronbach's alpha coefficient of the DASS-21 was 0.92, indicating acceptable internal consistency Taber (2018). In this study, the Cronbach's alpha value of the DASS-21 scale was 0.87. Prior to this, the DASS-21 scale was also used in SARS research (McAlonan et al., 2007).

Statistical analyses

Continuous variables were converted into categorical variables for ease of interpretation. Monthly family income was categorized based on the median (\leq 35,000 BDT/416 USD vs 35,000 BDT/416 USD). A chi-square test and Fisher's exact test were used to check the association between various factors and outcome variables. Fisher's exact test was employed when the cell frequency was less than 5. A multivariate logistic regression was conducted to analyse the relationship between predictor (COVID-19-like symptoms) and outcome variables (stress level, anxiety symptoms and depressive symptoms) after adjusting for potential confounders. Potential confounders adjusted for were age, gender, education, residence, monthly income and smoking behavior. The final model was selected using a forward selection procedure. The goodness of fit for the model was checked by Hosmer-Lemeshow test. Odds ratios (ORs) and their respective 95% confidence intervals are listed. Data were analyzed with SPSS (Statistical Package for Social Sciences), version 23.0. All p-values of less than 0.05 were considered statistically significant.

Results

The mean age of respondents in the symptomatic group ($n = 247$) was 25.5 years ($SD = 6.7$), while the mean age of respondents in the

Table 1
Demographic characteristics of study participants (n = 994).

Variables	Categories	COVID-19 like symptoms		Total N (%)	Statistics
		No; N (%)	Yes; N (%)		
Age	≤ 25 years	439 (64.0)	226 (73.4)	665 (66.9)	$\chi^2=8.450$, $p=0.004$
	> 25 years	247 (36.0)	82 (26.4)	329 (33.1)	
Gender	Male	493 (71.9)	207 (67.2)	700 (70.4)	$\chi^2=2.214$, $p=0.137$
	Female	193 (28.1)	101 (32.8)	294 (29.6)	
Residence	Rural	432(63.0)	137(44.5)	569(57.2)	$\chi^2=29.70$, $p=0.000$
	Urban	254(37.0)	171(55.5)	425(42.8)	
Education	Secondary	14(2.0)	4(1.3)	18(1.8)	$\chi^2=44.50$, $p=0.000$
	Higher secondary	51(7.4)	66(21.4)	117(11.8)	
	Undergraduate	424(61.8)	180(58.4)	604(60.8)	
	Graduate	197(28.7)	58(18.8)	255(25.7)	
Monthly income	≤ Median income	392(57.1)	170(55.2)	562(56.5)	$\chi^2=0.328$, $p=0.004$
	> Median income	294(42.9)	138(44.8)	432(43.5)	
Smoking	Yes	169(24.6)	71(23.1)	240(24.1)	$\chi^2=0.291$, $p=0.590$
	No	517(75.4)	237(76.9)	754(75.99)	
Stress	Normal	337(49.1)	104(33.8)	441(44.4)	FET=23.31, $p=0.000$
	Mild	193(28.1)	114(37.0)	307(30.9)	
	Moderate	105(15.3)	58(18.8)	163(16.4)	
	Severe	47(6.9)	32(10.4)	79(7.9)	
	Extremely severe	4(0.6)	0(0.0)	4(0.4)	
Anxiety	Normal	544(79.3)	183(59.4)	727(73.1)	FET=45.94, $p=0.000$
	Mild	57(8.3)	36(11.7)	93(9.4)	
	Moderate	37(5.4)	35(11.4)	72(7.2)	
	Severe	19(2.8)	24(7.8)	43(4.3)	
	Extremely severe	29(4.2)	30(9.7)	59(5.9)	
Depression	Normal	354(51.6)	123(39.9)	477(48.0)	FET=36.48, $p=0.000$
	Mild	92(13.4)	44(14.3)	136(13.7)	
	Moderate	135(19.7)	49(15.9)	184(18.5)	
	Severe	54(7.9)	30(9.7)	84(8.5)	
	Extremely severe	51(7.4)	62(20.1)	113(11.4)	

FET – Fisher’s Exact Test, Median Income = 30,000

asymptomatic group (n = 439) was 26.5 years (SD = 6.6). The majority (70.4%) of the respondents were male. More than half of the respondents were from rural areas (57.2%) and completed an undergraduate education (60.8%). Almost half (43.5%) of the respondents’ monthly income was above the median (35000 BDT /~ 416 USD). Only about one-quarter of the respondents were smokers. The prevalence of anxiety symptoms and depressive symptoms of the overall sample were 26.9% and 52.0% respectively and 55.6% reported mild to extremely severe levels of stress. Of the symptomatic group, the prevalence of anxiety and depression were 40.6% and 60.1% respectively, and 66.2% reported mild to extremely severe levels of stress. Symptomatic respondents exhibited between 20–30% higher prevalence estimates of poor mental health than the asymptomatic group. All demographic and mental health variables differed between the symptomatic and asymptomatic groups (Table 1).

The stress level experienced by respondents was significantly associated with age (Chi square, [χ^2] = 23.902, p = 0.000), gender (χ^2 = 13.676, p = 0.000), monthly income (χ^2 = 14.594, p = 0.000), education (χ^2 = 8.098, p = 0.044), smoking behavior (χ^2 = 9.372, p = 0.002), and COVID-19-like symptoms (χ^2 = 20.32, P = 0.000). The level of anxiety symptoms experienced by respondents was significantly associated with age (χ^2 = 5.456, p = 0.019), gender (χ^2 = 15.655, p = 0.000), residence (χ^2 = 18.630, p = 0.000), education (χ^2 = 24.857, p = 0.000), smoking behavior (χ^2 = 11.712, p = 0.001), and COVID-19-like symptoms (χ^2 = 42.78, P = 0.000). The level of depressive symptoms experienced by respondents was significantly associated with age (χ^2 = 47.567, p = 0.00), gender (χ^2 = 10.321, p = 0.001), and education (χ^2 = 18.632, p = 0.000) (Table 2).

The multivariate logistic regression identified factors associated with poor mental health outcomes after adjusting for potential confounders. Respondents with the following factors had significantly greater odds of experiencing mild to extreme levels of stress: being 25 years old or younger (Adjusted Odds Ratio [AOR] = 3.242, 95% Confidence Interval [CI] = 2.26 to 4.65), having a monthly income above median income

(35000BDT/~ 416 USD) BDT (AOR = 1.814, 95% CI = 1.36 to 2.42), and having experienced COVID-19-like symptoms within the past 14 days (AOR = 2.043, 95% CI = 1.51 to 2.76). Those who completed higher secondary (AOR = 0.320, 95% CI = 0.19 to 0.55) or undergraduate education (0.538, 0.36–0.80) had lower odds of experiencing mild to extreme levels of stress than those who completed a master’s degree level or above. Respondents with the following factors had significantly greater odds of experiencing mild to extreme levels of anxiety symptoms: female gender (AOR = 1.827, 95% CI = 1.34 to 2.49), only having completed secondary education (AOR = 12.335, 95% CI = 3.80 to 40.01), and having experienced COVID-19-like symptoms within the past 14 days (AOR = 2.770, 95% CI = 2.04 to 3.77). Respondents with the following factors had significantly greater odds of experiencing mild to extreme levels of depressive symptoms: being 25 years old or younger (AOR = 2.44, 95% CI = 1.86 to 3.22), female gender (AOR = 1.450, 95% CI = 1.09 to 1.92), and having experienced COVID-19-like symptoms within the past 14 days (AOR = 1.482, 95% CI = 1.12 to 1.96) (Table 3).

Discussion

This study correlates the mental health of the adult population with COVID-19-like symptoms and without COVID-19-like symptoms in Bangladesh during the COVID-19 pandemic. About 55.6% of the respondents suffered from mild to extreme severe levels of stress, which is close to the figure (60%) reported in another study in Bangladesh during this pandemic (Banna et al., 2020). However, this estimate is much higher than the 32.1% reported in China (Wang et al., 2020b) and the 16.8% reported in the UK (Shevlin et al., 2020). The research reveals that 26.9% of students reported mild to extremely severe symptoms of anxiety, 52% reported mild to extremely severe symptoms of depression. The level of anxiety symptoms was lower than a Bangladeshi (34%) and Chinese study(28.8%) (Banna et al., 2020; Wang et al., 2020b). The level of depressive symptoms was lower than a Bangladeshi study (57.9%)

Table 2
Distribution of socio-demographic and health related variables according to psychological characteristics (n = 994).

Variables	Stress		Anxiety		Depression		Statistics
	No	Yes	No	Yes	No	Yes	
Age (years)							
≤ 25	259(58.7)	406(73.4)	471(64.8)	194(72.7)	268(56.2)	397(76.8)	$\chi^2=23.902, P=0.000^S$
> 25	182(41.3)	147(26.6)	256(35.2)	73(27.3)	209(43.8)	120(23.2)	$\chi^2=5.456, P=0.019^A$
Gender – n (%)							$\chi^2=47.567, P=0.00^D$
Male	337(76.4)	363(65.6)	538(74.0)	162(60.7)	359(75.3)	341(66.0)	$\chi^2=13.676, P=0.000^S$
Female	104(23.6)	190(34.4)	189(26.0)	105(39.3)	118(24.7)	176(34.0)	$\chi^2=15.655, P=0.000^A$
Residence							$\chi^2=10.321, P=0.001^S$
Rural	256(58.0)	313(56.6)	446(61.3)	123(46.1)	265(55.6)	304(58.8)	$\chi^2=0.211, P=0.646^S$
Urban	185(42.0)	240(43.4)	281(38.7)	144(53.9)	212(44.4)	213(41.2)	$\chi^2=18.630, P=0.000^A$
Education							$\chi^2=1.068, P=302^D$
Secondary	4(0.9)	14(2.5)	4(6)	14(5.2)	4(0.8)	14(2.7)	$\chi^2=8.098, P=0.044^S$
Higher secondary	63(14.3)	54(9.8)	83(11.4)	34(12.7)	52(10.9)	65(12.6)	$\chi^2=24.857, P=0.000^A$
Undergraduate	264(59.9)	340(61.5)	450(61.9)	154(57.7)	272(57.0)	332(64.2)	$\chi^2=18.632, P=0.000^D$
Graduate	110(24.9)	145(26.2)	190(26.1)	65(24.3)	149(31.2)	106(20.5)	
Family monthly income							
≤ Median income	279(63.3)	283(51.2)	422(58.0)	140(52.4)	266(55.8)	296(57.3)	$\chi^2=14.594, P=0.000^S$
> Median income	162(36.7)	270(48.8)	305(42.0)	127(47.6)	211(44.2)	221(42.7)	$\chi^2=2.03, P=0.114^A$
Smoking status							$\chi^2=.224, P=.636^D$
Yes	127(28.8)	113(20.4)	196(27.0)	44(16.5)	11(23.3)	129(25.0)	$\chi^2=9.372, P=0.002^S$
No	314(71.2)	440(79.6)	531(73.0)	223(83.5)	366(76.7)	388(75.0)	$\chi^2=11.712, P=0.001^A$
Yes	104(23.6)	204(36.9)	183(25.2)	125(46.8)	123(25.8)	185(35.8)	$\chi^2=.383, P=.536^D$

S= Stress; A=Anxiety; D= Depression, Median Income = 30,000

Table 3
Conditional (forward) logistic regression analyses for factors associated with stress, anxiety and depression of participants (n = 994).

Variables	Odds Ratio (95% CI)		
	Stress	Anxiety	Depression
Age (ref.: > 25 years)			
≤ 25 years	3.242(2.26-4.65)***	-	2.44(1.86-3.22)***
Gender (ref.: male)			
Female	-	1.827(1.34-2.49)***	1.45(1.09-1.92)*
Education (ref.: masters and above)			
Secondary	2.448 (0.74-8.14)	12.335(3.80-40.01)***	-
Higher secondary	0.320(0.19-0.55)***	0.848(0.50-1.43)	-
Undergraduate	0.538(0.36-0.80)**	0.962 (0.68-1.36)	-
Family income (ref.: ≤ Median income)			
> Median income	1.814 (1.36-2.42)***	-	-
Smoking status (ref.: no)			
Yes	-	-	-
COVID-19 like symptoms (ref.: no)			
Yes	2.043 (1.51-2.76)***	2.770 (2.04-3.77)***	1.482 (1.12-1.96)**

* Significant at p < 0.05

** Significant at p < 0.01

*** Significant at p < 0.001 "-" means dropped from the model due to forward selection.

Median Income = 30,000

but higher than a Chinese study (16.5%) and a Japanese study(11.4%) (Banna et al., 2020; Ueda et al., 2020; Wang et al., 2020b).

Our findings suggest that COVID-19-like symptoms are related to increased mental health difficulties. Respondents who experienced COVID-19-like symptoms within the past 14 days roughly had twice the odds of experiencing mild or greater levels of stress symptoms than asymptomatic respondents. Symptomatic respondents had 2.7 times the odds of experiencing mild or greater levels of anxiety symptoms than asymptomatic respondents. Respondents having COVID-19-like symptoms had 1.5 times higher odds of depressive symptoms than healthy respondents These findings are similar to another study conducted in China during the COVID-19 pandemic (Wang et al., 2020a).

At least 1,010 people died in the country with COVID-19 symptoms in the 70 days since March 8, 2020. However, the death rate is decreasing with the gradual increase in available tests for coronavirus NEW AGE (2020b). People might not timely be tested due to poor healthcare-seeking behavior of people and lack of easy access to test facilities. Still, many suspected patients reported a long waiting time to find results af-

ter giving the sample. Increasing the number of testing labs and decentralization of medical facilities is important in supporting the population. With the increase of sample collection booths people may be encouraged to take tests more often, which will reduce the spread of the virus.

From the very beginning, there was a lack of communication between the government and the private sector. Unavailability of private doctors and disagreement of private hospitals to take corona patients or suspected patients with symptoms making the health care more disrupted. A news outlet reported that 386 people with Covid-19-like symptoms died in Bangladesh between March 8 and April 30, and 64% of these people died without receiving any treatment Dhaka Tribune (2020). The government has issued directives to healthcare facilities and warned against refusing to treat sick patients, but this has so far failed to lead to any noticeable changes in the situation. For a long time, there was no specific guideline for hospitals or patients regarding admission and treatment who fail to show 'no COVID-19' certification. Even the COVID-19 specialized hospitals refused treatment until patients show 'COVID-19 positive' certification. This situation is

still taking a heavy toll in many parts of the country as is evident in the figure of death of patients with COVID-19-like symptoms. The government, therefore, needs to take a look into the issue of treatment refusal and testing facilities that are largely viewed as responsible for the death of people with COVID-19-like symptoms.

Additionally, rumors and fake news on social media had led to high amounts of fear and frustration. Progressive arguments, conversations and alarming developments of fake news and propaganda, leaving people in psychological trauma and anxiety Ali (2020). Authentic and transparent print and electronic media may minimize these feelings. E-health or telepsychiatry services can be potential sources of primary mental health care, which can reduce the tension of scared patients.

This study has some limitations; the limited research on this emerging topic hindered the robustness of this study's conclusions. Self-reported information is more limited than clinical diagnoses, as they cannot be confirmed. There was a chance of recall bias as it was not possible to validate the information due to the retrospective design of the study. Recruitment methods only captured internet users, which reduces the generalizability of findings. Additionally, other confounding factors, such as domestic violence or exposure to stress-inducing media, were not captured in the survey.

Conclusion

Results suggest a high proportion of respondents with COVID-19-like symptoms showed higher stress levels, anxiety symptoms, and depressive symptoms than those without COVID-19-like symptoms. National and international organizations have already called for actions to reduce the mental health burden created by this pandemic. Specific attention should be given to individuals who exhibit COVID-19-like symptoms to reduce the burden of mental health difficulties amid this crisis period. Access to immediate testing and treatment may reduce the mental health harms of those who are symptomatic.

Declaration of Competing Interest

The authors declare that there is no conflict of interest.

Acknowledgements

The authors like to thank the respondents.

Authors statement

Authors declare that they have no potential conflict of interest regarding to the study.

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