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Prevalence of Depression, Anxiety, and Stress among Health Workers at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during COVID-19 pandemic: A Cross-Sectional Study.

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ABSTRACT

Background:

The COVID-19 pandemic has triggered severe social and economic disruption around the world, throughout the world. However, incidence of COVID-19 Pandemic has influenced every sector of Bangladesh badly. COVID-19 is the pandemic disease declared by World Health Organization (WHO) on 11th March 2020 [1] which is potentially severe acute respiratory infection caused by a novel evolving severe acute respiratory syndrome corona virus2 (SARS-CoV-2). The virus was identified as the cause of an outbreak of pneumonia of unknown cause in Wuhan City, Hubei Province, China, in December 2019. The current descriptive cross-sectional study aims to identify the level of psychological distress among health workers at Bangabandhu Sheikh Mujib Medical university in Dhaka during the COVID-19 pandemic.

Objectives: *To find out the prevalence of depression, anxiety, and stress among Health Workers at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during COVID-19 pandemic.*

Methods:

This study was carried out in a sample of 420 health workers aged between 25 and 60 years from July to October 2022, at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka district. Data was collected using an online questionnaire that included informed consent, socio-demographic questions, and a psychometric scale such as DASS-21, COVID Stress Scale (CSS-36) and Cognitive Test Anxiety Scale (CTAS) – Revised in purposes of determining the stress caused by the coronavirus disease (COVID-19) in pandemic.

Results: *The results revealed that most health workers experienced moderate to severe levels of anxiety (89.1%) and depression (72.1%), whereas less than half of them (35.7%) experienced moderate to severe stress. Stress, anxiety, and depression scores were significantly different across gender, age groups, family size, and family's economic status.*

Conclusion: *We assessed mental health problems among health workers at BSMMU in the present study. The consequences of the mental health problems of health workers may impose a prolonged negative impact on the*

total healthcare system. Therefore, the authority should give more attention to the mental health issues of Bangladeshi Health workers during this pandemic.

Key words: *Health Workers, Depression, Anxiety, Stress and COVID-19 pandemic.*

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I. INTRODUCTION

Human civilization is continuously facing challenges due to the COVID-19 outbreak with a speedy transmission across the world.[1] Emergencies times can affect the public's well-being, protection, and health (causing confusion, insecurity, stigma, and emotional isolation) and communities (causing school closures, work loss, food insecurity, deficient distribution of necessities, and inadequate resources for medical responses and demand of supplies).

Therefore, the world is probably passing the most critical time after spreading the coronavirus in almost all countries.[2] After the alarming level of spread and severity of infection, WHO officially declared the COVID-19 as a pandemic on March 11, 2020.[3,4] Major pandemic outbreaks bring many negative impacts on human life and society.[5]

During any health crisis, people tend to suffer from the panic and stress of being infected with the disease resulting in depression, stress, and anxiety. Bangladesh reported the first three confirmed COVID-19 cases on March 5, 2020.[6] Like most nations, in Bangladesh, nearly all non-essential human activities were banned by lockdown or restricting movement in the early stage of COVID-19.[7] All the hospitals unexpectedly received thousands of critically infected COVID-19 patients. The authority compelled them to enforce their emergency protocols.[8] Like others, health workers are more prone to be infected by a coronavirus.[9–11] Globally, the COVID-19 pandemic has put the health workers in an unprecedented situation to make difficult choices and work under intense pressure.[12] From the very beginning, health workers have been facing enormous problems due to the scarcity of personal protective equipment (PPE), allocation of limited resources to equally severe COVID-19 patients, management of their physical and mental health.[13,14] Worldwide, the authorities advised general people to go slow in regular activities and to maintain social distancing to minimize the risk of infections. However, the health workers had to go the opposite direction to serve the nations.[14] The health workers have been attending a long job shift with limited facilities due to the rapid increase in their demand to manage the pandemic.[15] Also, many physicians were unprepared to deal with the new virus. Till now, many things are unknown about it, and there is no well-established therapeutic approach.[16] In this situation, the fear of getting infected, carrying the virus to family members, friends, or colleagues were the major mental health issues for each health workers.[9,17] Also, there is a reported suicide case of patients from the hospital due to the treatment negligence in Bangladesh. Because the nurses and doctors suspected the person might be COVID-19 positive, they did not want to get infected.[18] This fear of infection and transmission of the virus may lead the health workers to be isolated from their family members, changed their routine, and reduced their social support network.[16]

There are many limitations in Bangladesh to deliver healthcare services during this pandemic.[19] Therefore, the COVID-19 pandemic discovers several loopholes in the healthcare system, including a limited number of testing and isolating, inadequate quarantine of the mass people, the weak infrastructure of the healthcare system, insufficient PPEs, etc.[20] In Bangladesh, the infection and mortality rate of the physician is high. The possible reasons behind this may be the lack of infection control techniques, inadequate training to deal with COVID-19 patients, inappropriate use of PPEs, the patient's tendency to hide information, etc.[21] The above factors had created fear among all health workers treating COVID-19 or non-COVID-19 patients in Bangladesh. This fear of getting coronavirus infection might develop mental health problems among them.

The COVID-19 pandemic might trigger mental health problems among the general population as well as health workers.[22,23] As the health workers are always in close contact with the COVID-19 patients, this may make them a super spreader of coronavirus.[24] Therefore, self-isolation and quarantine from family members are frequent for them. These factors due to the health worker's nature of profession may create additional psychological pressure on them.[25] Compare to non-clinical staff, frontline medical staff are 1.4 times more likely to feel fear of infection and twice more likely to suffer from anxiety and depression.[26] Therefore, the frontline fighters of the COVID-19 pandemic are more susceptible to develop mental health problems than others. In developing countries, the healthcare system is already overburdened. These flooded COVID-19 cases are likely to induce anxiety, depression, and stress among the health workers.[27] From the very beginning, Bangladeshi health workers are fighting with COVID-19 under tremendous pressure. However, the authority has paid little attention to their mental health.[28] The mental health of people should be taken into consideration and timely action to maintain health during the pandemics. The World Health Organization (WHO) has published important guidelines to address psychological problems, which in the culminating may reach to suicide [29]. In studies of Wang et al. and Qiu et al., they mentioned that the Chinese people experienced a high level of psychological distress in the time of the COVID-19 era. Most studies carried out in different countries found high psychological difficulties among

participants during the COVID-19 crisis [30]. Therefore, the present study aimed to evaluate the mental health outcomes of Health workers at BSMMU during the COVID-19 pandemic assessing depression, anxiety, and stress level.

OBJECTIVES OF STUDY

General Objective

- To find out the prevalence of depression, anxiety, and stress among Health Workers at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during COVID-19 pandemic.

Specific Objectives

- To find out the socio demographic status among the health workers,
- To determine perceived level of anxiety, depression, and stress among the health workers and
- To recommend on getting resilient in Health worker's Mental health.

II. Materials and methods:

This study was carried out in a sample of 420 health workers aged between 25 and 60 years from July to October 2022, at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka district. Data was collected using an online questionnaire that included informed consent, socio-demographic questions, and a psychometric scale such as DASS-21, COVID Stress Scale (CSS-36) and Cognitive Test Anxiety Scale (CTAS) – Revised in purposes of determining the stress caused by the coronavirus disease (COVID-19) in pandemic.

SPSS version 22 was used to analyze the data. Descriptive statistics including frequency, percentage, mean, and standard deviation were used to describe the socio-demographic characteristics of the participants, depression, anxiety, and stress. One-way analysis of variance (ANOVA) and independent health workers T-test was used to compare mean scores based on demographic variables. Because COVID-19 is a newly developing disease with limited data at national and international level, the sample size was estimated using a single population proportion calculation by assuming a prevalence of 54%, 95% of the confidence level and 5% of the margin of error. We used the p-value from previous studies [12, 31] which were conducted during the same pandemic (54.0%). The calculated sample size of this study was 382 participants. By adding a tolerable non-response rate (10%), the total sample size was 420 participants.

P=0.54, where n=required sample

$n=(Z\alpha/2)2[(p*q)/(d2)$, p =0.54= (1.96) (1.96) (0.54) (0.46) / (0.05) (0.05) =382

where, Z is the reliability coefficient of standard error at a 95% confidence interval = 1.96; p = prevalence = 0.54; q = (1 − p) = (1 − 0.54) = 0. 46; d = (margin of error) = 0.05; N = non-response rate 10% = 38; The final total sample = 382 + 38 = 420.

A total of 420 health workers from BSMMU, Dhaka responded to the online questionnaire, which was distributed via social media platforms.

III. RESULT

Background: This study was carried out among 420 Heath workers working during COVID-19 pandemic at BSMMU, Dhaka through the online questionnaire to achieve the aims and objectives of this study and Findings of the Study are illustrated below in forms of Table and bar graphs.

Table 1: Health workers' socio-demographic characteristics (N = 420)

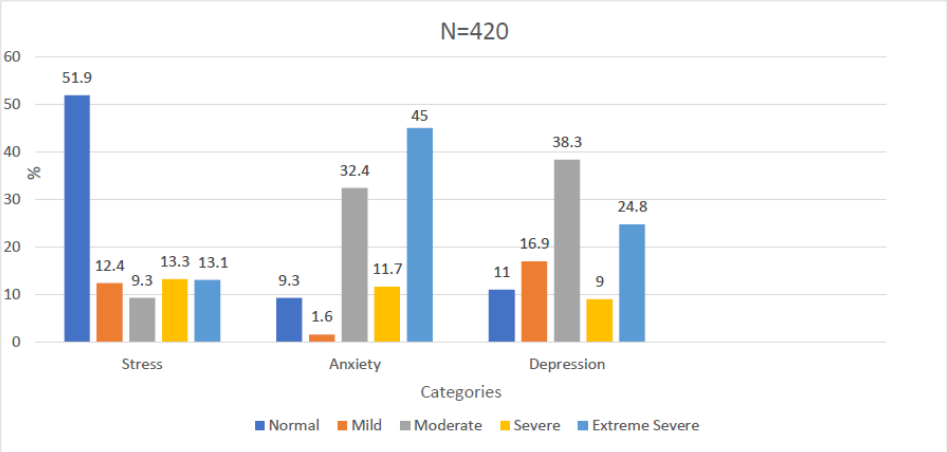
Variable	Category	Frequency(N)	Percentage(%)
Gender	Female	283	67.4
	Male	137	32.6
Age	25-39	315	75.0
	40-60	105	25.0
Family income	Low	114	27.1
	Moderate	273	65.0
	High	33	7.9
Family size	Small	31	7.4
	Medium	278	66.2
	Large	111	26.4

Socio-demographic Characteristics of Health workers

Four hundred and twenty (N = 420) health workers completed the online questionnaire. More than half of the health workers (67.4%) were Females and 32.6% were males. The age frequency showed that 75.0% of health workers were from 25 to 39 years. In addition, about 65.0% confirmed that the economic level of their family is moderate. Two-third of (66.2%) health workers have a medium family and only 7.4% have a small family.

Table 2 : Participants' performance on the three subscales of the Depression, Anxiety and Stress Scale—21 Items (DASS-21)

Subscales of the DASS	Stress	Anxiety	Depression
Score, Mean ± SD	16.94 ± 5.67	20.30 ± 5.53	17.80 ± 5.27
Categories, N (%)			
Normal	218 (51.9)	39 (9.3)	46 (11.0)
Mild	52 (12.4)	7 (1.6)	71 (16.9)
Moderate	39 (9.3)	136 (32.4)	161 (38.3)
Severe	56 (13.3)	49 (11.7)	38 (9.0)
Extremely severe	55 (13.1)	189 (45.0)	104 (24.8)



More than half of the participants (51.9%) had normal scores on the stress subscale, but 12.4% had scores in the mild range, and 13.3% classified as severe. On the anxiety subscale, only 1.6% had scores in the mild range. Severe symptoms of stress were experienced by 13.3%, which is closer to the 11.7% who experienced severe symptoms of anxiety and 9.0% who experienced severe symptoms of depression.

Table 3: Gender differences

Variable	Gender	N	Mean	SD	Level	t	p value	Eta squared
Stress	Female	283	20.86	4.71	Moderate	2.77	0.006	0.018
	Male	137	18.14	4.74	Mild			
Anxiety	Female	283	18.20	5.77	Severe	3.19	0.002	0.023
	Male	137	14.52	5.44	Moderate			
Depression	Female	283	19.34	5.57	Moderate	3.31	0.001	0.026
	Male	137	17.78	5.27	Moderate			

Females' mean stress, anxiety, and depression levels were 20.86, 18.20, and 19.34, respectively (Table 3). Males' stress, anxiety, and depression mean values were 18.14, 14.52, and 15.44, respectively. Female health workers had higher mean values than male on stress ($p = 0.006$; $\eta 2 = 0.018$), anxiety ($p = 0.002$; $\eta 2 = 0.023$), and depression ($p = 0.001$; $\eta 2 = 0.026$). Males had mild stress and moderate anxiety, while females had moderate stress and severe anxiety. Moderate depression was recorded by both females and males.

Table 4: Age differences

Variable	Age	N	Mean	SD	Level	t	p value	Eta squared
Stress	25–39	106	17.60	5.0	Mild	2.97	0.003	0.021
	40-60	314	20.76	4.6	Moderate			
Anxiety	25–39	106	14.04	5.2	Moderate	3.25	0.001	0.022
	40–60	314	17.98	5.8	Severe			
Depression	25–39	106	14.84	5.5	Moderate	3.36	0.001	0.026
	40-60	314	19.12	5.9	Moderate			

The study showed that the mean stress, anxiety, and depression levels for aged 40 to 60 years were 20.76, 17.98, and 19.12, respectively (Table 4). The mean values for stress, anxiety, and depression in aged 25–39 years were 17.60, 14.04, and 14.84, respectively, with 5.0, 5.2, and 5.8 as standard deviations. Health workers aged 25–39 years had higher mean values than those aged 40–60 years on depression ($p = 0.001$; $\eta 2 = 0.026$), stress ($p = 0.003$; $\eta 2 = 0.021$), and anxiety ($p = 0.001$; $\eta 2 = 0.022$). Moderate depression was identified by both age groups. Moderate stress and severe anxiety were identified by the older .

Table 5 Economic level differences

Variable	Economic Level	N	Mean	SD	Level	t	p value	Eta squared
Stress	Low	114	21.08	4.2	Moderate	3.44	0.033	0.016
	Moderate	273	19.96	4.9	Moderate			
	High	33	16.18	4.2	Mild			
Anxiety	Low	114	19.60	6.0	Severe	5.33	0.005	0.025
	Moderate	273	16.38	5.4	Severe			
	High	33	13.14	5.6	Moderate			
Depression	Low	114	20.28	5.6	Severe	4.67	0.010	0.022
	Moderate	273	17.64	5.6	Moderate			
	High	33	13.86	5.6	Mild			

Table 5 shows how stress, anxiety, and depression vary by level of income family. For health workers from low, moderate, and high-income families, the mean values for stress were 21.08, 19.96, and 16.18, respectively. Health workers from low and moderate-income families showed moderate stress, whereas those from high-income families showed normal levels of stress ($p = 0.033$; $\eta 2 = 0.016$). On anxiety, the scores for health workers from low, moderate, and high-income families were 19.60, 16.38, and 13.14, respectively. Heath workers from low and middle-income families had severe anxiety, while health workers from high-income families had moderate anxiety ($p = 0.005$; $\eta 2 = 0.025$). In terms of depression, health workers from low, moderate, and high-income families reported mean values of 20.28, 17.64, and 13.86, respectively. Health workers from high-income families had normal levels of depression, while health workers from moderate-income families had moderate levels ($p = 0.01$; $\eta 2 = 0.022$). Furthermore, health workers from low-income families expressed severe depression. In addition, since the sample sizes were unequal, a post hoc comparison was conducted using Games Howell. The difference in stress (Md = 2.45, $p = 0.015$), anxiety (Md = 3.23, $p = 0.017$) and depression (Md = 3.20, $p = 0.015$) levels between health workers from low-income families and those from high-income families was low significant. In addition, health workers from low-income families and those from moderate-income families (Md = 1.61, $p = 0.04$) showed a low significant difference in anxiety.

Table 6 Family size differences

Variable	Family Size	N	Mean	SD	Level	t	p value	Eta squared
Stress	Small	31	16.64	4.2	Mild	3.14	0.044	0.015
	Medium	278	19.78	4.9	Moderate			
	Large	111	21.34	4.1	Moderate			
Anxiety	Small	31	13.66	5.7	Moderate	5.89	0.003	0.028
	Medium	278	16.18	5.4	Severe			
	Large	111	19.98	6.0	Severe			
Depression	Small	31	14.12	5.6	Moderate	4.81	0.009	0.023

	Medium	278	17.52	5.6	Moderate			
	Large	111	20.52	5.6	Moderate			

Table 6 shows the differences in stress, anxiety, and depression among students based on their family size. For health workers from small, medium, and large families, the mean values for stress were 16.64, 19.78, and 21.34, respectively. Moderate stress was reported by health workers from medium and large families, while mild stress was reported by health workers from small families ($p = 0.044$; $\eta 2 = 0.015$). The mean anxiety scores for health workers from small, medium, and large families were 13.66, 16.18, and 19.98, respectively. Health workers from medium and large families had severe anxiety, while health workers from small families had moderate anxiety ($p = 0.003$; $\eta 2 = 0.028$). Health workers from small, medium, and large families recorded 14.12, 17.25, and 20.52 as their mean depression ratings, respectively. With regards to depression, there was a low significant difference between the groups ($p = 0.009$; $\eta 2 = 0.023$). It was clear that all of the health workers were depressed to a moderate level. The results revealed a low significant difference between health workers from small and moderate families in stress (Md = 2.35, $p = 0.023$), anxiety (Md = 3.15, $p = 0.027$) and depression (Md = 3.19, $p = 0.023$). Also, a low significant difference was observed in anxiety (Md = 1.89, $p = 0.013$) and depression (Md = 1.49, $p = 0.049$) levels between health workers from small and large families.

IV. DISCUSSION

During COVID-19 pandemic, the current study aims to identify the levels of depression, stress, and anxiety among Health workers working at BSMMU, Dhaka during COVID 19 pandemic.

The present study is one of the first-ever studies assessing the mental health outcomes of health workers working at Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh due the COVID-19 pandemic. We carried out this study among physicians, pharmacists, nurses, and medical technologists working in Bangladesh to ensure healthcare service during this pandemic. Many of them suffer from loneliness, sleep disturbance, depression, anxiety, and stress as they are continuously serving COVID or non-COVID units of hospital under extensive mental pressure. We observed the depression was higher in health workers with medium financial status. Similarly, the anxiety level was higher in female health workers. Also, the medium economic class female health workers reported a higher depression. Everyone is susceptible to psychological disorders during any pandemic situation. Moreover, the health workers are more prone to be affected by mental health problems.[31] The possible reason for their diminished mental health is the isolation from family members, the risk of carrying viruses, and the continuous fear of getting infected.[32,33] Increased social isolation, quarantine time, social distancing, and loneliness are the adverse consequences of the COVID-19 pandemic that are significantly associated with depression, anxiety, sleep disturbance, self-harm, and suicide attempts.[34,35] Primary health care workers who are in direct contact with the known COVID-19 patients or suspected COVID-19 patients are the most susceptible to be infected by the virus.[16,36] The health workers have to provide service for more work shifts due to increased demand for healthcare needs with limited resources,[15] keeping PPEs on the body for such a long period that may cause difficulty in breathing, physical discomfort, and mental health burden.[16]

Moreover, we observed a connection between mental health problems of health workers with gender difference, level of education, smoking habit, job role, area of residence, economic background, and working environment. Many recent study findings are consistent with the present survey outcomes. A recent study among nurses and physicians working at COVID-19 units reported high levels of stress, anxiety, and post-traumatic stress disorder.[37] The possible reasons behind this might be the long working period, direct contact with the COVID-19 patients, fear of infection, and tension. Another study revealed that physicians' social support level was positively associated with sleep quality.[38] A study among nurses in China found that one-third of the frontline nurses suffered from depression, anxiety, and sleep disturbance during the COVID-19 pandemic that showed consistency with the current findings.[31] The present study findings are consistent with the results of similar past studies.[13,39] According to a meta-analysis including 13 cross-sectional studies where a total of 33,062 health workers reported significantly elevated levels of anxiety, depression, and sleep disturbance during the COVID-19 pandemic.[40] About half of the health workers suffering from depression, anxiety, and sleep disturbance in China than any other occupation or general population with similar age groups.[41] In Bangladesh, insufficient PPEs, intense workload, fear of getting the infected lead to physical tiredness, anxiety, depression, and sleep disturbance among health workers.[42] The psychological response of health workers to a pandemic may depend on different factors that may affect their mental health to cause depression, anxiety, loneliness, sleep disturbance.[36,43] Therefore, the authority should implement comprehensive guidelines to evaluate and manage the mental health issues of the health workers for ensuring the proper treatment of COVID-19 patients.

The present study has few limitations. There might have a possible bias in recruiting the participants since we used an online survey due to the COVID-19 pandemic. The online investigation using Google Form may

not be the best method for data collection. However, we took it as a safe and effective tool during the pandemic situation. And finally, the self-report assessment might not be consistent with the clinical diagnosis.

Limitations of the Study

The e-questionnaire allows to assess the prevalence of anxiety and depression among university students while maintaining the WHO recommended "social distance" during the COVID-19 pandemic, which otherwise would be impossible. Moreover, the data for the e-survey were collected by globally validated standardized tools for quantitative analysis. On the contrary, given the limited resources available and the time-sensitivity of the COVID-19 outbreak, the snowball sampling strategy was chosen instead of random samples. In this cross-sectional study, the identified factors are regarded as associated factors, which could be either be the causes or the results of depression or anxiety. Furthermore, due to ethical requirements on anonymity and confidentiality, the contact details of the respondents were not collected. However, the use of validated screening e-questionnaire was considered as a cost-effective approach to explore the situation in general, therefore, used in this study. Since the research methodology could not reach people with medically examined depression and anxiety symptoms, the provision of the results may not fully reflect the severity of depressive and anxiety symptoms among health workers.

V. CONCLUSIONS

The world is currently fighting the public health issues in this COVID-19 pandemic. We assessed mental health problems among health workers at BSMMU in the present study. The consequences of the mental health problems of health workers may impose a prolonged negative impact on the total healthcare system. Therefore, the authority should give more attention to the mental health issues of Bangladeshi Health workers during this pandemic. This study results may help in identifying Health workers who are at greater risk of mental health problems. Mental health support programs, providing adequate quality PPEs, decreasing workload, introducing remote healthcare services, and providing essential infection control training might reduce the impact of COVID-19 on mental health among Health workers. We recommend further longitudinal studies to find the actual associations between mental health issues of health workers and COVID-19-related factors.

The results showed that most of the health workers experienced moderate to severe levels of anxiety (89.1%) and depression (72.1%), whereas less than half of them (35.7%) experienced moderate to severe stress. Because of their higher psychological distress, females' health workers and those from large and low-income families need immediate care. The level of depression, anxiety, and stress symptoms of Health workers during the pandemic were positively correlated with COVID-19 related stressors such as economic stressors, impacts on daily living, and educational consequences, however, social support was negatively associated with the level of depression, anxiety, and stress. When faced with public health problems, Health worker's mental health suffers significantly, and they require the attention, assistance, and support of society, families, and communities. It is advised that the concerned authority and government to work together to solve this problem so that they can receive high-quality, timely crisis-oriented psychological care. Our results can be used to develop a psychological intervention for health workers, as well as to deploy public mental health measures alongside pandemic response efforts in the early phases of an outbreak.

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