



**NURSES' ANXIETY AND DEPRESSION FOR PROVIDING CARE TO COVID-19
PATIENT IN SHAHEED ZIAUR RAHMAN MEDICAL COLLEGE HOSPITAL,
BOGURA, BANGLADESH**

Protima Rani Sarker^{1*} and Ashees Kumar Saha²

¹Nursing Instructor, Rajshahi Nursing College, Rajshahi, Bangladesh.

²Nursing Instructor, Pabna Nursing College, Pabna, Bangladesh.

***Corresponding Author: Protima Rani Sarker**

Nursing Instructor, Rajshahi Nursing College, Rajshahi, Bangladesh.

Article Received on 13/08/2022

Article Revised on 02/09/2022

Article Accepted on 23/09/2022

ABSTRACT

Background: Nurses are frontline health care provider face significant mental health issues during the Coronavirus Disease 2019 (COVID-19) pandemic. There is currently a scarcity of epidemiological data on the psychological health of frontline nurses. The aim of this study was to explore the level of anxiety, depression, and relevant issues among frontline nurses that have been involved with COVID-19 patient's care. **Objective:** The aim of this study was to explore the level of anxiety, depression, and relevant issues among frontline nurses caring for COVID-19 patients. **Methodology:** This is a cross-sectional, descriptive, quantitative and correlational study design. The study included purposively 326 eligible frontline nurses from the Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. A set of valid and reliable tools was developed to evaluate anxiety and depression outcomes, in addition to socio-demographic and background data. **Findings:** Out of 326 nurses (17%) reported severe anxiety, (13%) reported severe depression as well as (29%) reported moderate anxiety, (22.6%) reported moderate depression, followed by (21.3%) reported mild anxiety, (19.4%) reported mild depression, and rest of them (32.7%) reported no anxiety, (45%) reported no depression. The majority of the nurses (91.1%) opinion had no training on COVID-19 patient care as well as maximum (89.0%) opinion had no training on COVID-19 infection prevention & control followed by highest number of nurses (89.0%) opinion had no training on donning & doffing PPE respectively. Highly statistical significant association were found between sex female with depression, married & had children, no willing to participate, 12 hours per shift working hours and 1-8 weeks work period for covid-19 patient care with anxiety & depression respectively (P<0.000). **Interpretation:** The frontline nurses faced a variety of psychological issues, particularly anxiety and depression, which demand policymakers' attention and support. Future national and organizational actions are required to improve mental health throughout this pandemic by avoiding and managing anxiety and depression, increasing self-efficacy and resilience, providing the necessary social support, and assuring frontline work willingness.

KEYWORDS: Covid-19; Frontline nurses; Anxiety; Depression; Bangladesh.

INTRODUCTION

The planet has been dealing with an epidemic of COVID-19, a novel pneumonia caused by the coronavirus disease, since the end of December 2019. The disease was first identified in China, in the city of Wuhan in the province of Hubei,^[1] and is caused by a virus known as severe acute respiratory syndrome coronavirus^[2] (SARS-CoV-2). The world was also witness to the outbreak of a coronavirus disease (SARS) in Canton, Mainland China, in late 2002. However, due to the global spread of COVID-19, the World Health Organization declared the outbreak a pandemic in March 2020. COVID-19 had already been diagnosed in over 100,000 people around the world at the time (World Health Organization, 2020).^[3] COVID-19's population explosion can be explained by general factors that pass

through all regions (e.g., biological characteristics of the virus, incubation period, etc.). Additionally, specific factors that differ by area and/or city can be defined (e.g., the complex interaction between air pollution, meteorological conditions, and biological characteristics of viral infectivity). Indeed, in the early stages of viral infectivity propagation, air pollution in cities appears to be a more significant indicator than interpersonal interactions.^[4] As a result, the key factors influencing the spread of infectious diseases like the COVID-19 are (a) air pollution, (b) atmospheric stability/instability as determined by air velocity, and (c) demographic factors.

Coronavirus disease has emerged as a new challenge to global public health and, in particular, to the health systems of individual countries. It can be spread through

air droplets, direct touch, and aerosols. WHO declared COVID-19 a global public health emergency on January 30, 2020, and labelled it a pandemic two months later, on March.^[11] People's physical as well as mental wellbeing are adversely affected in such environments. Individuals may experience constant worries and fears, and each may view reality in a different way.^[5] Medical teams were issued instructions to deal with patients who appeared to have the specific COVID-19 symptoms due to the rapid spread of Coronavirus. The number of patients was too much for some hospitals to handle. The growing need for acute and intensive care, as well as a lack of staff and facilities, were both realities. Healthcare staff must care for patients while still protecting themselves.^[6] Nursing workers can be placed under a lot of stress when they are working in a crisis. Nurses spend much more time with patients than most health practitioners, dealing with their immediate and potentially life-threatening needs. During the Ebola outbreak, nurses experienced much more suffering than physicians.^[7] Several studies have shown that nurses and their families experience high levels of tension, depressive symptoms, resignation, and stigmatization when they are faced with the risk of contagion.^[8] Following the SARS event, several studies focused on the emotional effects of caring for contagious patients, encouraging the advancement of nursing care models, and evaluating the quality of care delivered.^[9] Of course, pressing conditions would have an effect on health care workers' mental health, and it's easy to see how psychological support for nurses could help them perform better.^[10]

Nurses must preserve their psychological and mental wellbeing in order to effectively play their part during this pandemic; however, the literature shows that the emergence of COVID-19 has had a substantial impact on nurses' psychological and mental well-being. A substantial link has been established between the COVID-19 outbreak and negative mental health problems, according to a huge amount of evidence such as stress or burnout, depression and anxiety.^[12] Nurses have to defend themselves and monitor the regulation of the Centers for Disease Control and Prevention or other authorized health agencies.^[13] They will always be at the frontline caring for the patient, promising that he or she gets the greatest excellence of care and measuring each period the opportunity of increased care requirement. The international pandemic needs nurses' cooperation to medical care, education and form of a public health strategy that they will have to part and support. Through this pandemic emergency, all nurses must regularly prove their reputation, necessity and importance within a holistic health care organization aiming to improve Nursing occupation. Our study aimed to explore the level of anxiety, depression, and relevant issues among frontline nurses that have been involved with COVID-19 patient's care at Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh.

METHODOLOGY

This was a cross-sectional, descriptive, quantitative, correlational study. This research was carried out at Shaheed Ziaur Rahman Medical College Hospital, Bogura. It is a public tertiary level hospital had 500 beds in total, with approximately 500 nurses who were caring for COVID-19 patients. This study was offered to all frontline nurses in the participating hospitals who were caring for COVID-19 patients. Purposively we selected 326 nurses for final data collection. Nurses having a history of mental illness and/or the COVID-19 were not allowed to participate in the study. The study was conducted from 1st July to 31st October, 2020. A self-developed questionnaire was used to collect socio-demographic and other COVID-9-related background data. Necessary modifications were done and the questionnaire was finalized before collection of data. The questionnaire had four parts. First part contained questions regarding socio-demographic status of the respondents. This part contained age, sex, marital status, child-rearing, educational qualification, work experience, work period for covid-19 patient care, per shift working hours, willing to participate in covid-19 patient care. Second part contained questions regarding previous training on infectious disease patient's care, training on COVID-19 patient care, training on COVID-19 infection prevention & control, training on donning & doffing of PPE and sources of information about COVID-19. Third part contained questions regarding Nurses' anxiety. We measured Nurses anxiety by Zung W. W., SAS (Self-Rating Anxiety Scale).^[13] This scale contained 20 items. We examine symptoms of anxiety such as physical and emotional symptoms. Four-point Likert scale was used to measure the severity of anxiety. The total scores ranged from 25 to 100. Scores less than 50 indicate no anxiety, 50–59 indicate mild anxiety, 60–69 indicate moderate anxiety and 70 or above indicate severe anxiety respectively. In this study the Cronbach's alpha value was 0.87 for SAS. Fourth part contained questions regarding Nurses' depression. We measured Nurses depression by Zung W. W., SDS (Self-Rating Depression Scale).^[14] This scale contained 20 items to examine psychomotor, emotional, psychological and physiological imbalance. Four-point Likert scale was used to measure the severity of depression. The total scores ranged from 25 to 100. Scores less than 53 indicate no depression, 53–62 indicate mild depression, 63–72 indicate moderate depression and 73 or above indicate severe depression respectively. In this study the Cronbach's alpha value was 0.88 for SDS. After obtaining ethical approval from the participating hospitals director and the nursing superintendent were informed about the inclusion and exclusion criteria. Distributed the survey questionnaire to the frontline nurses who were caring for COVID-19 patients. Those who had interest in the survey then provide signature on written consent and complete the questionnaire. All nurses provided written consent that indicate their willingness to participate in the survey. Voluntary participation and data confidentiality were emphasized.

IBM SPSS version 25.0 was used to analyze the data. Nurses' socio-demographic and other COVID-related background variables were summarized using descriptive statistics. The Pearson product-moment correlation coefficient was utilized to investigate the relationship between anxiety and depression with socio-demographic

characteristics. Statistical significance was defined as a P value of less than 0.05. A group of experts assessed the questionnaire and made revisions based on their feedback. Following that, a pilot study was done to assess the questionnaire's internal consistency and validity by asking 38 nurses to complete it.

RESULTS

Table 1: Distribution of the nurses according to demo-graphic characteristics (n-326)

Traits	Characteristics	Frequency (n)	Percent (%)
Age	25- 30 yrs.	220	67.5
	31- 35 yrs.	12	3.6
	36- 40 yrs.	08	2.4
	Above 40 yrs.	86	26.5
	Mean (SD) 31.53 (7.71)		
Sex	Male	25	7.7
	Female	301	92.3
Marital status	Married	279	85.6
	Other marital status (Single, Widow, Separate)	47	14.4
Had children	Yes	265	80.1
	No	61	19.9
Educational qualification	Diploma in nursing	280	85.9
	Bachelor's in nursing or above	46	14.1
work experience	Less than 5 yrs.	212	65.0
	More than 5 yrs.	114	35.0
	Mean (SD) 5.28 (3.27)		
Willing to participate in covid-19 patient care	Yes	249	76.0
	No	77	24.0
Per shift working hours	6 hours	00	00
	8 hours	00	00
	12 hours	326	100.0
work period for covid-19 patient care	1-8 weeks	204	62.6
	9-12 weeks	79	24.2
	More than 12 weeks	43	13.2

Table 1 represents the nurses' demographic characteristics. Here, out of 326 nurses maximum (67.5%) age group were 25-30 years and lowest (2.4%) age group were 36-40 years. Nurses minimum age was 25 years, maximum 45 years, range 20 years as well as mean and SD was 31.53 (± 7.71) years old. Highest number of nurses were female (92.3%). The majority nurses were married (85.6%) and (14.4%) nurses were other marital status. Large number of nurses had children (80.1%) and lowest number of nurses (19.9%) had no children. The majority of the nurses had diploma in nursing (85.9%). Most of the nurses working experience was (65%) less than 5 years and (35%) was more than 5 years. The majority of the nurses (76%) told they participate in caring COVID-19 patient willingly, 100% nurses working hours was 12 hours per shift and large number of nurses working period for COVID-19 patient (62.6%) was 1-8 weeks.

Figure 1 represents nurse's previous experience on infectious disease patient's care. Here out of 326 nurses, large number (76.4%) opinion had previous experience on infectious disease patient's care and few number (23.6%) of them had no previous experience on infectious disease patient's care respectively.

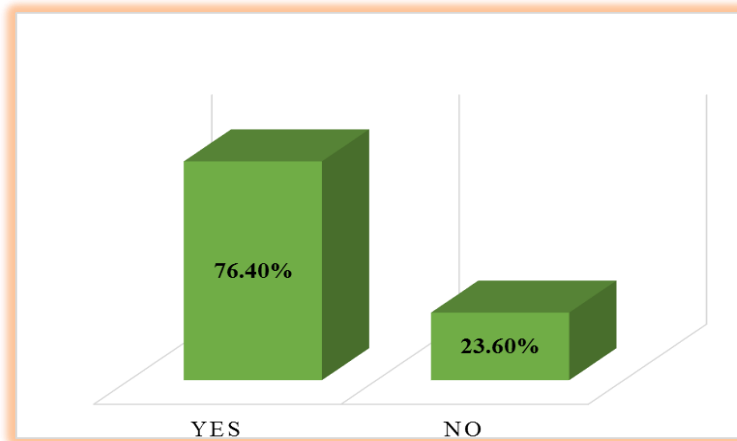


Figure 1: Distribution of the nurses according to previous experience on infectious disease patient's care (n-326)

Figure 2 represents nurses training on COVID-19 patient care. Here out of 326 nurses, most of them (91.1%) opinion had no training on COVID-19 patient care and rest of them (8.9%) had training on COVID-19 patient care respectively.

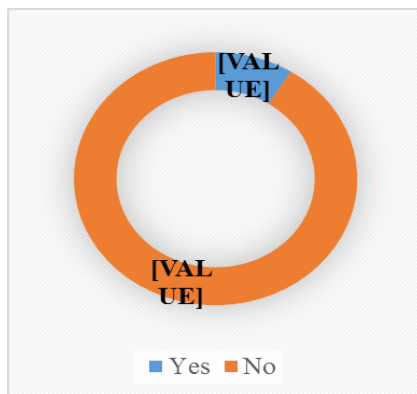


Figure 2: Distribution of the nurses according to training on COVID-19 patient care (n-326)

Figure 3 represents nurses training on COVID-19 infection prevention & control. Here out of 326 nurses, maximum (89.0%) opinion had no training on COVID-19 infection prevention & control and minimum (11.0%) had training on COVID-19 infection prevention & control respectively.

had COVID-19 infection prevention & control respectively.

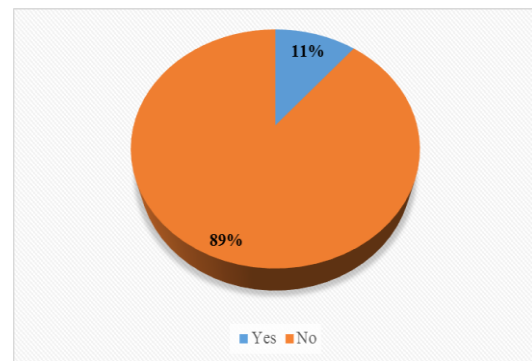


Figure 3. Distribution of the nurses according to training on COVID-19 infection prevention & control (n-326)

Figure 4 represents nurses training on downing & doffing of PPE. Here out of 326 nurses, highest number (89.0%) opinion had no training on downing & doffing of PPE and lowest number (11.0%) had training on downing & doffing of PPE respectively.

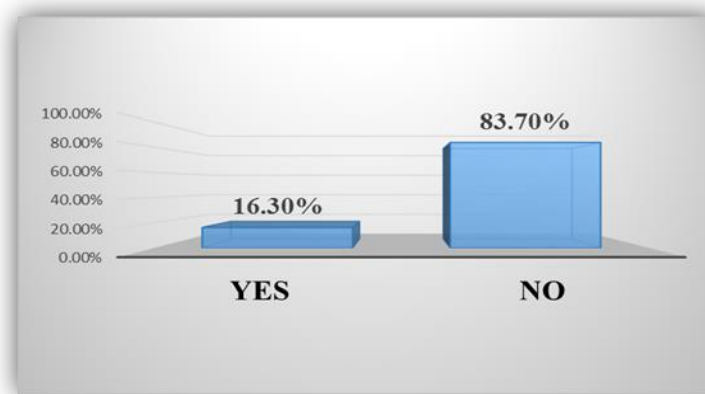


Figure 4. Distribution of the nurses according to training on downing & doffing of PPE (n-326)

Figure 5 represents nurse's sources of information about COVID-19. Majority of the nurses (53%) sources of information was social media, as well as (26%) nurses sources of information was DGHS health bulletin,

whereas (11%) nurses sources of information was radio & television, followed by (6%) nurses sources of information was colleagues and rest of them (4%) nurses sources of information was newspaper respectively.

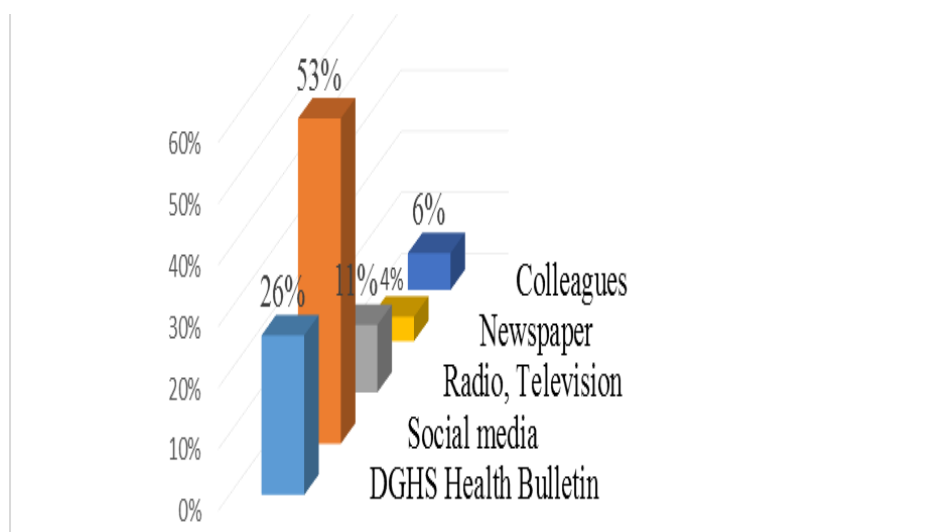


Figure 5. Distribution of the nurses according to Sources of information about COVID-19 (n-326)

Table 2: Distribution of the nurses according to level of anxiety and depression (n-326)

Traits	Characteristics	Frequency (n)	Percent (%)
Anxiety	No anxiety	106	32.7
	Mild anxiety	69	21.3
	Moderate anxiety	95	29.0
	Severe anxiety	56	17.0
Depression	No depression	147	45.0
	Mild depression	63	19.4
	Moderate depression	74	22.6
	Severe depression	42	13.0

Table 2 represents the nurses according level of anxiety and depression. Here out of 326 nurses (17%) reported severe anxiety, (13%) reported severe depression as well as (29%) reported moderate anxiety, (22.6%) reported

moderate depression, followed by (21.3%) reported mild anxiety, (19.4%) reported mild depression, and rest of them (32.7%) reported no anxiety, (45%) reported no depression respectively.

Table 3: Relationship between anxiety and depression with demographic variables (n-326)

Traits	Characteristics	Anxiety	Depression
Age	25- 30 yrs.	P<0.003	P<0.008
	31- 35 yrs.	P<0.005	P<0.003
	36- 40 yrs.	P<0.006	P<0.002
	Above 40 yrs.	P<0.001	P<0.003
Sex	Male	P<0.006	P<0.003
	Female	P<0.002	P<0.000
Marital status	Married	P<0.004	P<0.007
	Other marital status	P<0.009	P<0.005
Had children	Yes	P<0.000	P<0.000
	No	P<0.003	P<0.008
Educational qualification	Diploma in nursing	P<0.008	P<0.003
	Bachelor's in nursing or above	P<0.007	P<0.005
work experience	<5 yrs.	P<0.006	P<0.003
	>5 yrs.	P<0.008	P<0.005
Willing to	Yes	P<0.006	P<0.003

participate	No	P<0.000	P<0.000
Per shift working hours	6 hours	-	-
	8 hours	-	-
	12 hours	P<0.000	P<0.000
work period for covid-19 patient care	1-8 weeks	P<0.000	P<0.000
	9-12 weeks	P<0.003	P<0.007
	> 12 weeks	P<0.009	P<0.006

Table 3 shows associations among anxiety and depression with demographic variables of the nurses. Highly statistical significant association were found between sex female with depression, married & had children with anxiety & depression, no willing to participate with anxiety & depression, 12 hours per shift working hours with anxiety & depression and 1-8 weeks work period for covid-19 patient care with anxiety & depression respectively (P<0.000).

DISCUSSION

In this study we found the demographic characteristics of the nurses, highest number of nurses (67.5%) age group was 25- 30 yrs., (92.3%) was female, (85.6%) was married, (80.1%) had children, (85.9%) had diploma in nursing, (65.0%) work experience was less than 5 yrs., (76.0%) was willing to participate in covid-19 patient care, (100.0%) per shift working hours was 12 hours and (62.6%) work period for covid-19 patient care was 1-8 weeks. A study conducted in Bangladesh^[15] they found majority of the respondents 983.4%0 were female, educational qualification of the respondents were 956.3%0 diploma in nursing, almost half of the respondents 947.9%0 had length of service within 01 - 05 years. Muslims countries tradition and culture, females are more inclined to be healthcare providers than men. This result is consistent with a United Nations policy brief that women are more confident and have higher self-awareness about the impact of COVID-19 on women.^[16] Previous empirical information that married nurses working in hospitals not only care for patients, but also interact and care for their families.^[17] Therefore, married nurses might be extra careful when caring for COVID-19 patients to prevent transmitting the disease to their families. As a result, married nurses might have a strong motivator to study infectious diseases and be more protected against infection than single nurses. Married women have families, so their preventive behaviour is higher in response to working conditions, and they are more careful in dealing with a patient compared to single nurses. This means that social support from marriage has preventive effects on reducing infection risk.^[18] Furthermore, married nurses foster greater social relationships, emotional support, and economic security.^[19] Working per shift 12 hours this might be a consequence of expanded clinic affirmation, varieties in inpatient needs, or unanticipated understaffing. Nurses working longer than 12-hour shifts are at higher danger for weariness and burnout, prompting bargained quality patient care.^[20] Expressed that medical attendants working for 12 h affects their prosperity, and expands pressure, exhaustion, and nervousness. One investigation

among European medical attendants working in excess of 12 h portrays the nature of nursing care gave to patients on their unit as poor, evaluates tolerant security as reasonable, and records extra consideration instruments and gear left uncompleted on their last move in correlation with attendants working ≤ 8 h what's more, close to their contracted hours.^[19] Longer working hours may affect the efficiency and effectiveness of the labor force in conveying excellent, safe consideration.^[21] A new report in China about medical care suppliers working longer hours because of the spread of COVID-19 passed on high manifestation paces of discouragement, a sleeping disorder, and work pressure.^[22] A worldwide investigation detailed that when attendants wear individual defensive gear (PPE), they typically take 4–6 working hours without a break. This is extremely basic to attendants' prosperity, since longer hours wearing PPE can cause weakness, stress, and fatigue, making medical services suppliers inclined to causing clinical mistakes.^[23] Thus, nursing organization ought to arrange staffing and booking to dodge mental and actual wellbeing debilitation.

Our results revealed that large number of nurses (76.4%) had previous experience on infectious disease patient's care, (91.1%) opinion had no training on COVID-19 patient care, (89.0%) opinion had no training on COVID-19 infection prevention & control, and (89.0%) opinion had no training on downing & doffing of PPE. This result indicate nurses not had the adequate training all about COVID-19. Knowledge about the disease can affect the nurses' attitude and practice so at the beginning of Covid-19, nurses may not receive especial training about pandemic infection control practices which had an impact on their anxiety and attitude.^[24] WHO offers guidelines for patients' management and also specific one for elderly infected patients, but the problem is the inadequate time for training and delivering adequate information. Literature suggested that nurses fighting against Covid-19 feel great amount of stress due to improper knowledge and inadequate personal safety issues.^[25] The present study agrees with a study whom observed Chinese nurses' performance during Covid-19 pandemic, they reported that nurses need to protect themselves and their patients form the sever form of infection by following the infection control measures, as wearing PPE as face mask (N95), eye goggle, and protective suits.^[26] A study agree that providing in hospital training and adequate facilities will reflect on the nurses' performance and attitude, and it is important to empower the health team by supporting their ability to acquire and use evidence-based

information to improve staff members' willingness to work.^[27]

According to our study result maximum nurses (53%) collected COVID-19 information from social media, (26%) from DGHS, (11%) from radio & television, (6%) from colleagues and (4%) from Newspaper. A study found that most common source of the students' information about COVID-19 was the internet (77.1%), including electronic news websites and social media such as Twitter, Facebook, YouTube, Instagram, Snapchat and WhatsApp, followed by mass media (67.6%) such as TV, newspapers, magazines, and radio, and then scientific websites and articles (24.2%). A very small proportion the participants (145, 7.0%) obtained their information from other sources such as friends and family.^[28]

Anxiety disorder causes symptoms like headaches, muscle tension, insomnia, depression, social isolation. An excessive or persistent state of anxiety can have a devastating effect on physical and mental health. Women are more likely to have an anxiety disorder than men. Our study sample showed large number of nurses are female (92.3%). Chronic anxiety leads to depression. Anxiety and depression sometimes causes low job performance and perhaps become emotionally withdrawn. Our study observed that nurses (17%) experienced severe anxiety, (13%) severe depression, as well as (29%) experienced moderate anxiety, (22.6%) moderate depression. This result indicate the moderate level of anxiety and depression. According to the Robert Wood Johnson Foundation's Interdisciplinary Nursing Quality Research Initiative, (18%) of nurses exhibit symptoms of depression — double the rate within the general population. These numbers have increased significantly during the COVID-19 pandemic, with (50%) of nurses treating patients with COVID-19 reporting signs of depression. A Similar study found that frontline nurses were at high risks of anxiety and depression because of SARS happening in 2003, for the dangerous nature of the illness and also the increasing employment.^[29] A study in China among 1257 HCWs in thirty-four hospitals showed that a significant proportion of these directly involved in the care of COVID-19 patients reported symptoms of depression (50.4%), anxiety (44.6%), sleep disorder (34%), and distress (71.5%).^[30] The status of a front-line employee was an associate degree independent risk factor for the deterioration of mental state outcomes found that a significant proportion of participants toughened symptoms anxiety, depression, and sleep disorder, with over (90%) prevalence of those symptoms within the cluster of workers having direct contact with persons suspected or infected with SARS-CoV-2.^[31] Another observational study conducted in Singapore aimed to assess the prevalence of depression, stress, anxiety, and post-traumatic stress syndrome (PTSD) among all HCWs and to match the results between medical and non-medical employees. Of the 470 participants, (14.5%)

showed symptoms of anxiety, (8.9%) depression, (6.6%) stress, and (7.7%) PTSD.^[32]

CONCLUSION

During the COVID-19 outbreak, our research revealed a significant mental health disorder among nurses in Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. According to the findings, nurses are at a greater risk of mental illness. Higher GAD and depressed symptoms were linked to a lack of access to proper personal protective equipment and a suspected COVID-19 infected. During the COVID-19 outbreak. Nurses sleep quality and psychological health status (anxiety and, depression symptoms) varied positively. The only variables directly linked to the COVID-19 outbreak and linked to a positive variance in nurses' anxiety and depression symptoms were the fear of infecting others and the fear of becoming infected. Constant monitoring of the psychological impacts of infectious disease breakouts should be a part of health-care systems' preparedness strategies.

Nurses' anxiety and depression symptoms should be compared and contrasted during and after the COVID-19 pandemic, according to future study. This study has several potential health policy implications, which appear to be especially significant for strengthening healthcare systems in the face of repeated outbreaks of the COVID-19 pandemic. It is critical that governments identify nurses who are at risk of developing major symptoms of depression, anxiety, and/or stress and provide early care. Raising awareness and teaching non-psychiatric medical teams about mental health assessment will help ensure quick diagnosis. It's also important to improve awareness among nurses' coworkers, administrators, and supervisors about the importance of addressing their mental health with early and effective support measures, such as normalizing emotions, speaking properly, meeting basic requirements, allowing sufficient work breaks, and offering psychological support.

ACKNOWLEDGEMENT: The authors would like to express their gratitude to all of the nurses who took part in the study, as well as the panel of experts who evaluated the questionnaire and made changes based on their feedback.

Funding sources: None of the authors have received any funding from any person or any organization.

Conflict of interest statement: None declared.

REFERENCES

1. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *The lancet*, 2020 Feb 15; 395(10223): 470-3.
2. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z. Clinical features of patients infected with 2019 novel

- coronavirus in Wuhan, China. *The Lancet*. 2020 Feb 15; 395(10223): 497-506.
3. World Health Organization. WHO statement on cases of COVID-19 surpassing 100 000, 2020 Mar. <https://www.who.int/news-room/detail/07-03-2020-who-statement-on-cases-of-covid-19-surpassing-100-000>. (Accessed 6 August 2020).
 4. Coccia M. Factors determining the diffusion of COVID-19 and suggested strategy to prevent future accelerated viral infectivity similar to COVID. *Science of the Total Environment*, 2020 Aug 10; 729: 138474.
 5. Khalid S, Ahmed F, Ashraf S. Residential water conserving behaviors in Muzaffarabad (Ajk): Household profiles and dispositional predictors. *Journal of Applied Environmental and Biological Sciences*, 2016; 6(1): 298-306.
 6. American Nurses Association. (2020). Coronavirus Disease (COVID-19). <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/>
 7. Wong TW, Yau JK, Chan CL, Kwong RS, Ho SM, Lau CC, Lau FL, Lit CH. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *European Journal of Emergency Medicine*, 2005 Feb 1; 12(1): 13-8.
 8. Nayeri Chegeni T, Sharif M, Sarvi S, Moosazadeh M, Montazeri M, Aghayan SA, Balalami NJ, Gholami S, Hosseini Z, Saberi R, Anvari D. Is there any association between *Toxoplasma gondii* infection and depression? A systematic review and meta-analysis. *PloS one*, 2019 Jun 13; 14(6): e0218524.
 9. Watson R. Looking back on SARS. *Journal of clinical nursing*, 2009 Mar 1; 18(5): 625.
 10. National Health Commission. Transcript of press conference on February 29, 2020. <http://www.nhc.gov.cn/xcs/fkdt/202002/f6557445863a447f87014e514263dd91.shtml>. (Accessed October 1, 2020).
 11. Center for Disease Control and Prevention. (2020). Coronavirus Disease 2019 (COVID-19). <https://www.cdc.gov/coronavirus/2019-nCoV/summary.html>
 12. Mo Y, Deng L, Zhang L, Lang Q, Liao C, Wang N, Qin M, Huang H. Work stress among Chinese nurses to support Wuhan in fighting against COVID-19 epidemic. *Journal of nursing management*, 2020 Jul; 28(5): 1002-9.
 13. Zung WW. A rating instrument for anxiety disorders. *Psychosomatics: Journal of Consultation and Liaison Psychiatry*, 1971 Nov.
 14. Zung WW. A self-rating depression scale. *Archives of general psychiatry*, 1965 Jan 1; 12(1): 63-70.
 15. Saha AK, Mitra CR, Khatun RA, Reza HM. Nurses' Knowledge and Practices Regarding Prevention and Control of COVID-19 Infection in a Tertiary Level Hospital. *Bangladesh Journal of Infectious Diseases*, 2020 Nov 8; S27-33.
 16. Women UN. Gender equality: women's rights in review 25 years after Beijing. UN Women, 2020.
 17. Fang L, Hung CH. Predictors of married female nurses' health. *Workplace health & safety*, 2014 Nov; 62(11): 447-55.
 18. Condliffe S, Link CR, Zengin Farias Martinez S. Factors Affecting the Labor Supply Decisions of Registered Nurses. *Contemporary Economic Policy*, 2020 Jan; 38(1): 127-38.
 19. Banakhar M. The impact of 12-hour shifts on nurses' health, wellbeing, and job satisfaction: A systematic review. *Journal of Nursing Education and Practice*, 2017; 7(11): 69-83.
 20. Thompson BJ. Does work-induced fatigue accumulate across three compressed 12 hour shifts in hospital nurses and aides?. *PLoS One*, 2019 Feb 7; 14(2): e0211715.
 21. Tummala-Narra P, Li Z, Chang J, Yang EJ, Jiang J, Sagherian M, Phan J, Alfonso A. Developmental and contextual correlates of mental health and help-seeking among Asian American college students. *American Journal of Orthopsychiatry*, 2018; 88(6): 636.
 22. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*, 2020 Mar 2; 3(3): e203976.
 23. Loibner M, Hagauer S, Schwantzer G, Berghold A, Zatloukal K. Limiting factors for wearing personal protective equipment (PPE) in a health care environment evaluated in a randomised study. *PloS one*, 2019 Jan 22; 14(1): e0210775.
 24. Shahid Z, Kalayanamitra R, McClafferty B, Kepko D, Ramgobin D, Patel R, Aggarwal CS, Vunnam R, Sahu N, Bhatt D, Jones K. COVID-19 and older adults: what we know. *Journal of the American Geriatrics Society*, 2020 May; 68(5): 926-9.
 25. Mo P, Xing Y, Xiao Y, Deng L, Zhao Q, Wang H, Xiong Y, Cheng Z, Gao S, Liang K, Luo M. Clinical characteristics of refractory COVID-19 pneumonia in Wuhan, China. *Clinical Infectious Diseases*, 2020 Mar 16.
 26. Jiang F, Deng L, Zhang L, Cai Y, Cheung CW, Xia Z. Review of the clinical characteristics of coronavirus disease 2019 (COVID-19). *Journal of general internal medicine*, 2020 May; 35(5): 1545-9.
 27. Shi H, Han X, Zheng C. Evolution of CT manifestations in a patient recovered from 2019 novel coronavirus (2019-nCoV) pneumonia in Wuhan, China. *Radiology*, 2020 Apr; 295(1): 20.
 28. Olaimat AN, Aolymat I, Shahbaz HM, Holley RA. Knowledge and information sources about COVID-19 among university students in Jordan: a cross-sectional study. *Frontiers in public health*, 2020 May 29; 8: 254.
 29. Su TP, Lien TC, Yang CY, Su YL, Wang JH, Tsai SL, Yin JC. Prevalence of psychiatric morbidity and

- psychological adaptation of the nurses in a structured SARS caring unit during outbreak: a prospective and periodic assessment study in Taiwan. *Journal of psychiatric research*, 2007 Jan 1; 41(1-2): 119-30.
30. Xiao H, Zhang Y, Kong D, Li S, Yang N. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Medical science monitor: international medical journal of experimental and clinical research*, 2020; 26: e923549-1.
 31. Wańkiewicz P, Szylińska A, Rotter I. Evaluation of mental health factors among people with systemic lupus erythematosus during the SARS-CoV-2 pandemic. *Journal of clinical medicine*, 2020 Sep; 9(9): 2872.
 32. Tan BY, Chew NW, Lee GK, Jing M, Goh Y, Yeo LL, Zhang K, Chin HK, Ahmad A, Khan FA, Shanmugam GN. Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Annals of internal medicine*, 2020 Aug 18; 173(4): 317-20.