Mental stress of nurses involved in treatment of COVID-19 patients in a selected tertiary level hospital

Mst Monowara Begum[1]*, Mst Arzina Khatun[1], Sharnolata Roy[2], Md. Ali Reza Mondol[3], Mohammad Rashidul Alam[4]

[1]Nursing Instructor, Dinajpur Nursing College, Dinajpur, Bangladesh
[2]Nursing & Midwifery College, Tangail, Bangladesh
[3]Nursing Instructor, Nursing Institute, Kurigram, Bangladesh
[4]Department of Health Education, NIPSOM, Mohakhali, Dhaka-1212

ARTICLE INFO	ABSTRACT
  *Corresponding Author Mst. Monowara Begum ✉monowarabegum8522@gmail.com	Coronavirus infection 2019 (COVID-19) outbreak is a worldwide emergency, as its rapid spread and high mortality rate has caused severe disruptions of normal life. Health care professionals, particularly nurses, are on the front line of dealing with this situation and considered as a vulnerable group to experience mental stress amid the COVID-19 pandemic. The aim of the study was to assess mental stress of nurses involved in treatment of COVID-19 patients in a selected tertiary level hospital. This cross-sectional study was conducted among 184 nurses working in M Abdur Rahim Medical College Hospital, Dinajpur from 1st January to 31st December, 2020. Purposive sampling was adopted and semi-structured questionnaire incorporated with Bangla translated version of perceived stress scale (PSS) was used to collect data from the respondents. The mean age of participants was 30.59 ±4.95 years where 87.5% (n=161) were female. Among the nurses, 76.1% (n=140) were married and 66.8% (n=123) were Diploma in nursing passed. Most of the respondents (98.4%, n=181) had no training on COVID-19. Majority of the respondents (76.6%, n=141) had worked in COVID-19 unit for ≤56 hours per week. Majority of the respondents (78.3%, n=144) had moderate level of perceived stress and 19.0% (n=35) had low level of perceived stress. Significant statistical difference was found regarding level of stress and gender of the respondents (p=0.046). Marginally significant statistical difference was found regarding level of stress and marital status of the respondents (p=0.050). Majority of the nurses caring for patients with COVID-19 had moderate stress level. Nurses who were female and married, had greater mental stress than others. Special interventions to promote mental well-being in nurses exposed to COVID-19 need to be immediately implemented where women and married nurses requiring particular attention.

INTRODUCTION

The Coronavirus disease 2019 (COVID-19), first appeared in the area of Wuhan, China, has grown expeditiously into a public health crisis. The rapidness and aggressiveness of COVID-19 in infecting people made it a serious and threatening global health issue (Chanet al. 2020). COVID-19 is highly infectious during the incubation period, and asymptomatic infection exists. It can be transmitted through respiratory droplets, contact and aerosols. Reported illnesses have ranged from patients with little or no symptoms to patients being severely ill and dying (Guan 2020). The

main clinical manifestations include fever, cough, fatigue, and dyspnea (Chen et al. 2020; Wang et al. 2020). Due to the rapid spread of COVID-19, strong contagion, lethality in severe cases, and no specific medicine, it poses a huge threat to human life and health, and also has a huge impact on the mental health of the general public, causing people to differ degree of emotional problem (Gao et al., 2020).

Nurses constitute the majority of healthcare providers. Their roles in treating patients with COVID-19 involve providing essential treatment in an emergency and dealing with suspected

patients with precautions; helping in decontamination and coordination with other healthcare providers; supplying holistic nursing practices in managing multiple infections simultaneously; playing critical roles in expanding care services; and dealing with relatives (Thobaity et al., 2019; Xie et al., 2020).

A study conducted in among frontline nurses who were caring for COVID-19 patients Wuhan, China, reported that 14.3%, 10.7%, and 91.2% nurses reported moderate and high levels of anxiety, depression, and fear, respectively (Hu et al., 2020). Another study showed that, being a woman and working in a tertiary level hospital directly engaged in diagnosing, treating, or providing nursing care to patients with suspected or confirmed COVID-19 suffered more mental stress than others. Other study found that there was a statistically significant difference in stress response scores between nurses worked in epidemic department and non-epidemic department (Liao et al 2021). The main source of stress among frontline healthcare workers caring for COVID-19 patients came from the fear of being infected, the fear of family members being infected, and the discomfort caused by protective equipment. Frontline staffs who were nurses, were married, and had worked more than 20 days suffered higher stress, whereas rescue staff showed lower stress (Wang et al., 2020).

Mental stress can increase depression and anxiety, reduce job satisfaction, impair individual relationships, and even lead to suicidal thoughts to nurses. It can also reduce the effects of psychological interventions due to the reduction in concentration and decision-making skills, and by influencing the mental health professional's ability to communicate strongly with clients (Nourbala et al., 2002).

To date, epidemiological data on the mental health of frontline nurses who are caring for COVID-19 patients is still limited. Such evidence-based knowledge is crucial for health care workers and the government to prepare for health responses to pandemics such as COVID-19.Therefore, the purpose of the study was to measure the status of mental stress of nurses involved in treatment of COVID-19 patients in a selected tertiary level hospital. The study can provide guidance for the mental health care and intervention counseling for nurses in the high-exposure area of emergencies.

MATERIALS AND METHODS

Study design

It was a descriptive cross-sectional study. Data were collected from the respondents once only. The study was conducted one year from 1st January 2020 to 31st December 2020.

Study place& Study population

The study was conducted in M Abdur Rahim Medical College Hospital which is a government medical college located in the town of Dinajpur. It was a COVID dedicated hospital during COVID pandemic situation. Nurses working in M Abdur Rahim Medical College Hospital, Dinajpur were the study population.

Sample Size

The sample size was determined by using the following formula

$n=z^2pq/d^2$

here, n = sample size
z= 1.96 at 95% confidence level;
p= 0.59 [Less than 60% of healthcare workers had moderate or severe stress for each stressor of the scale (Wang, et al., 2020)]
q= 1-p = 0.41
d = Acceptable error (Considered 5% of p value)
 = 0.5
So, n= [(1.96)^2 (0.41) (0.59)]/ (0.05)^2 = 371

The calculated sample size was 371. However, due to COVID-19 pandemic situation, it was not possible to collect data from 371 nurses. One hundred and eighty four nurses fulfill the selection criteria and were included in the study.

Sampling technique

Purposive type of non-probability sampling was done in this study.

Research instrument

Semi-structured questionnaire incorporated with perceived stress scale was used to collect data from the respondents. The Bangla translated version of Perceived Stress Scale was used in this study (Islam et al., 2013).

Perceived Stress Scale Scoring

Perceived Stress Scale contained 10 items. Each item is rated on a 5-point scale ranging from never (0) to almost always (4). Positively worded items are reverse scored, and the ratings are summed, with higher scores indicating more perceived stress. PSS-10 scores are obtained by reversing the scores on the four positive items. For example, 0=4, 1=3, 2=2, etc. and then summing across all 10 items. Items 4, 5, 7, and 8 are the positively stated items.

Scores ranging from 0-13 considered as low stress. Scores ranging from 14-26 considered as moderate stress. Scores ranging from 27-40 considered as high perceived stress (Islam et al., 2013).

Data collection technique

Data was collected by face-to-face interview in Bangla. Each respondent was interviewed separately and their privacy and confidentiality were maintained strictly. The right was being given to the participants not to participate and to discontinue participation at any time in study with consideration/without penalty. Informed written consent was obtained from each respondent.

Data analysis

After completion of data collection, the data were checked and edited manually and verified before tabulation. Data were coded, entered and analyzed in a computer. The statistical analysis was conducted using SPSS (Statistical Package for Social Science) version 26 statistical software. The findings of the study were presented by frequency, percentage in tables and graphs. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. Fisher's Exact test was used to find out association. Here, $p<0.05$ was considered significant and all p-values were two sided.

Ethical consideration

At the beginning, approval was obtained from the ethical committee of NIPSOM, under the Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Before collection of data, written permission was taken from the Director of the hospital. Also written permission was taken from the respondents. A complete assurance was given that all information keeps confidentially.

RESULTS

This cross-sectional study was carried out among 184 nurses to assess the level of mental stress of nurses involved in treatment of COVID-19 patients in a selected tertiary level hospital. The findings of the study were presented in this section. The results were presented here in three categories 1.Socio-demographic characteristics of the respondents, 2. Job related information, 3.Perceived Stress.

Majority (51.1%, n=94) of the respondents were from 26-30 years age group where the mean age of the respondents were 30.59 ±4.95 years. Proportion of female respondents was 87.5% (n=161) and rests 12.5% (n=23) were male. Majority of the respondents 76.1% (n=140) were married. Among the respondents, 66.8% (n=123) were Diploma passed and 25.0% (n=46) had BSc in nursing. The mean of the monthly family income was 38,426.51 ±15,603.92 taka which ranged from 25,000 to 85,000 taka. Rest of them 73.9% were in Muslims (Table 1).

Most of the respondents (98.4%, n=181) had no training on COVID-19 and 94.6% (n=174) had no training on PPE use. Most of the respondents (97.8%, n=180) did not have available PPE while they were on duty. Among the respondents, 60.3% (n= 111) had worked in COVID-19 unit for ≤ 3 months, and 39.7% (n=73) had worked for >3 months. Out of the 184 respondents, 45.7% (n= 84) had worked in COVID-19 unit for ≤ 15 days, 21.2% (n=39) had worked for 16-30 days and 33.2% (n=61) had worked for >30 days. Majority of the respondents (76.6%, n=141) had worked in COVID-19 unit for ≤56 hours (Table 2).

Table 1: Distribution of the respondents by socio-demographic characteristics (n=184)

Variables	Categories	Frequency	Percentage	Statistics
Age group (in years)	≤ 25	24	13	Mean ±SD 30.59 ±4.95
	26-30	94	51.1	
	>30	66	35.9	
Gender	Male	23	12.5	
	Female	161	87.5	
Marital status	Married	140	76.1	
	Unmarried	44	23.9	
Educational status of the respondents	Diploma in nursing	123	66.8	
	BSc in nursing	46	25	
	MPH	15	8.2	
Monthly family income (in taka)	≤ 30000	100	54.3	
	30,001 to 40,000	24	13	Mean ±SD
	40,001 to 50,000	25	13.6	38,426.51 ±15,603.92
	> 50,000	35	19	
Religion	Islam	136	73.9	
	Hinduism	35	19.00	
	Christianity	13	7.1	

Table 2: Distribution of respondents by Job related information (n=184)

Variables	Categories	Frequency	Percentage	Statistics
Training on COVID-19	Present	3	1.6	
	Absent	181	98.4	
Training on PPE use	Present	10	5.4	
	Absent	174	94.6	
Availability of on duty PPE	Available	4	2.2	
	Not Available	180	97.8	
Working month	Up to 3 months	111	60.3	
	>3 months	73	39.7	
Working days	Up to 15 days	84	45.7	Mean ±SD
	16-30 days	39	21.2	34.03 ±39.46 days
	>30 days	61	33.2	
Working hours	Up to 56	141	76.6	
	>56	43	23.4	

Table 3: Distribution of the respondents by perceived helplessness item of Perceived Stress Scale (n=184)

Variables	Categories	Frequency	Percentage
Upset because of something that happened unexpectedly	Never	45	24.5
	Almost Never	19	10.3
	Sometimes	71	38.6
	Fairly Often	40	21.7
	Very Often	9	4.9
Unable to control the important things in your life	Never	19	10.3
	Almost Never	34	18.5
	Sometimes	78	42.4

	Fairly Often	49	26.6
	Very Often	4	2.2
Felt nervous and "stressed"	Never	26	14.1
	Almost Never	17	9.2
	Sometimes	84	45.7
	Fairly Often	48	26.1
	Very Often	9	4.9
Could not cope with all the things that had to do	Never	29	15.8
	Almost Never	38	20.7
	Sometimes	72	39.1
	Fairly Often	41	22.3
	Very Often	4	2.2
Angered because of things that are outside of control	Never	44	23.9
	Almost Never	21	11.4
	Sometimes	70	38
	Fairly Often	40	21.1
	Very Often	9	4.9
Difficulties are piling up so high that one could not overcome them	Never	48	26.1
	Almost Never	29	15.8
	Sometimes	64	34.8
	Fairly Often	40	21.7
	Very Often	3	1.6

Table 4: Distribution of the respondents by perceived self-efficacy item of Perceived Stress Scale (n=184)

Variables	Categories	Frequency	Percentage
Felt confident about ability to handle personal problems	Never	7	4.9
	Almost Never	10	5.4
	Sometimes	53	28.8
	Fairly Often	107	58.2
	Very Often	7	4.9
Felt that things are going right way	Never	12	6.5
	Almost Never	23	12.5
	Sometimes	85	46.2
	Fairly Often	56	30.4
	Very Often	8	4.3
Able to control irritations in life	Never	3	1.6
	Almost Never	29	15.8
	Sometimes	64	34.8
	Fairly Often	79	42.9
	Very Often	9	4.9
Felt that one is on top of things	Never	44	23.9
	Almost Never	31	16.8
	Sometimes	61	33.2
	Fairly Often	38	20.7
	Very Often	10	5.4

Among the respondents, 38.6% (n=71) respondents were sometimes upset because of something that happened unexpectedly and 42.4% (n=78) respondents were sometimes unable to control the important things in their lives. Again, 26.1% (n=48) fairly often felt nervous and "stressed", 39.1% (n=72) sometimes could not cope with all the things that had to do and 34.8% (n=64) respondents were sometimes felt difficulties piling up so high that one could not overcome them (Table 3).

Out of the 184 respondents, 58.2% (n=107) respondents fairly often felt confident about ability to handle personal problems and 46.2% (n=85) respondents sometimes felt that things are going right way. Again, 42.9% (n=79) fairly often able to control irritations in life and 33.2% (n=61) respondents were sometimes felt that one is on top of things (Table 4).
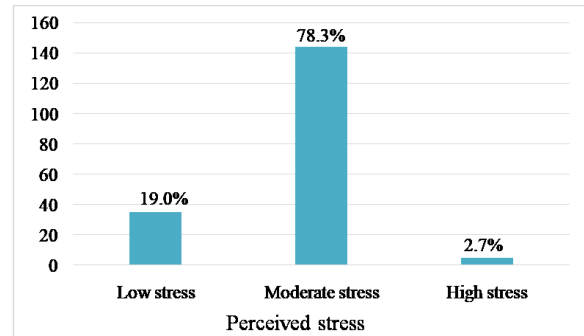

Figure 1: Distribution of the respondents by level of perceived stress (n=184)

Majority of the respondents (78.3%, n=144) had moderate level of perceived stress and 19.0% (n=35) had low level of perceived stress according to Perceived Stress Scale (PSS) (Figure 1).

Table 5: Association between level of perceived stress and age of the respondents (n=184)

		Level of perceived stress			
		Low n (%)	Moderate n (%)	High n (%)	Statistis
	Up to25	5 (20.8)	19 (79.2)	0 (0.0)	
Age group	26-30	22 (23.4)	69 (73.4)	3 (3.2)	p=0.409
	>30	8 (12.1)	59 (84.8)	2 (3.0)	

Table 6: Association between level of perceived stress and gender of the respondents (n=184)

		Level of perceived stress			
		Low n (%)	Moderate n (%)	High n (%)	Statistic
	Male	9 (39.1)	14 (60.9)	0 (0.0)	p<0.046
Gender	Female	26 (16.1)	130 (80.7)	5 (3.1)	
	Married	22 (15.7)	115 (82.1)	3 (2.1)	p=0.050
Marital status	Unmarried	13 (29.5)	29 (65.9)	2 (4.5)	

Regarding the relationship between level of perceived stress and age of the respondents, the result demonstrated that 79.2% respondents up to 25 years had moderate level of perceived stress while 84.8% respondents > 30 years had moderate level of perceived stress. No significant statistical difference was found regarding level of stress and age of the respondents (p=0.409) (obtained by Fisher Exact test) (Table-5).

The relationship between level of perceived stress and gender of the respondents showed that among the 23 male respondents, 60.9% had moderate level of perceived stress while 80.7% female respondents had moderate level of perceived stress. Again, no male respondents had high level of perceived stress while 3.1% female respondents had high level of stress. Significant statistical difference was found regarding level of stress and gender of the respondents (p=0.046). Again, 82.1% married respondents had moderate level of

stress while 65.9% other respondents had moderate level of stress. Marginally significant statistical difference was found regarding level of stress and marital status of the respondents (p=0.050) (obtained by Fisher Exact test) (Table 6).

DISCUSSION

This cross-sectional study was carried out to assess the level of mental stress of nurses involved in treatment of COVID-19 patients. A significant number of the frontline nurses of tertiary level hospital found to have moderate level of perceived stress. The result of the present study showed that the mean age of respondents was 30.59 ±4.95 years which ranged from 24-43 years. As evidence started to accumulate that older people are particularly vulnerable to COVID-19-related mortality, young HCWs came to the front of the front-liners. This result was consistent with other studies which dealt with stress of nurses involved in treatment of COVID-19 patients.

Most of the respondents of the present study was female which was similar with other studies. In Bangladesh, percentages of female nurses' recruitment are more compared to male. This might be the reason of more female providers in the current study. Other studies conducted in Bangladesh also showed female nurse predominance.

Majority of the respondents of the present study were married. As majority of the nurses were from above 25 years age group, this result was obvious. Similar findings were presented in other studies.

Most of the respondents had no training on COVID-19 while only 3 nurses (1.6%) had training on COVID-19. Saha et al. (2020) had conducted a study in Bangladesh to identify the nurses' knowledge and practices regarding prevention and control of COVID-19 infection where they found that only 8.68% took training on COVID-19. However, the study of Labrague et al. (2020) which examined the relative influence of fear of COVID-19 on nurses' psychological distress found that <50.0% nurses had training on COVID-19. This dissimilarity might be due to the different study place as the present study was conducted in Bangladesh while the study of Labrague et al. (2020) was conducted in Philippines.

The ability to limit the transmission of COVID-19 in the healthcare setting requires infection prevention and control measures, of which PPE is a fundamental element. This is essential to limit the transmission of the virus to health professionals to protect both the patients they care for and the wider community. However, only 10 nurses (5.4%) had training on Personal protective equipment (PPE) use. Again, most of the respondents (97.8%) did not have available PPE while they were on duty.

Majority of the respondents (78.3%) had moderate level of perceived stress and 19.0% had low level and only 2.7% had high level of perceived stress. They were worried about being infected due to close contact with patients, unfamiliarity with special working environments and procedures, physical discomfort and inconvenience caused by special protection, facing the suffering and death of critically ill patients, long-term separation from family members, and risking their lives to live with patients every day, etc., which all cause a certain psychological response to nurses (Huang, 2020).

Different study reported different results regarding this issue. A study conducted in Dhaka, Bangladesh reported that around 50% of the doctors reportedly have depression and anxiety symptoms respectively. The study of Hu, et al. (2020) showed that 14.3%, 10.7%, and 91.2% nurses reported moderate and high levels of anxiety, depression, and fear, respectively. Wang et al. (2020) found that < 60.0% nurses had moderate to severe stress. Shechter et al. (2020) revealed that nurses are experiencing COVID-19-related psychological distress. They reported 57% nurses had acute stress, 48% had depressive, and 33% had anxiety symptoms. Wilson, et al. aimed to assess the prevalence and predictors of stress, depressive, and anxiety symptoms among healthcare providers of India and found that 3.7% had high level of stress. This inconsistency of findings might be due to the variation in study place, work load, on duty PPE availability.

Female nurses had significantly more mental stress than others. Majority of the male nurses had moderate level of perceived stress while most of the female nurses had moderate level of perceived stress. Again, no male nurse had high level of perceived stress while 3.1% female nurses had high level of stress. Majority of the nurses of the current study were female and married. They were worried about the highly contagious nature of the virus. If they got infected, it could spread to their family members or even it could be fatal. Similar result was reported by other studies. Women themselves attach more importance to their inner experiences and self-perceptions, their emotions are more fragile and sensitive, and they are more vulnerable to depression, anxiety and Loneliness. This indicates that there are gender differences in psychological characteristics in the face of public health emergencies.

Most married respondents had moderate level of stress while majority other respondents had moderate level of stress. Marginally significant statistical difference was found regarding level of stress and marital status of the respondents. Wang, et al. (2020) stated that married healthcare workers were more stressed than unmarried staffs were, possibly because they have a family to worry about.

CONCLUSION

Majority of the nurses caring for patients with COVID-19 in my study had moderate stress level. Nurses who were female and married, had greater pressure. Protecting nurses is an important component of public health measures for addressing the COVID-19 epidemic. Special interventions to promote mental well-being in nurses exposed to COVID-19 need to be immediately implemented where women and married nurses requiring particular attention.

REFERENCES

Al Thobaity A, Alamri S, Plummer V and Williams B. (2019). Exploring the necessary disaster plan components in Saudi Arabian hospitals. International Journal of Disaster Risk Reduction, 1;41:101316.

Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. (2020). A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. The lancet, 15; 395(10223):514-23.

Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. The lancet, 15;395(10223):507-13.

Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. (2020). Mental health problems and social media exposure during COVID-19 outbreak. Plos One, 16;15(4):e0231924.

Gordon C and Thompson A (2020). Use of personal protective equipment during the COVID-19 pandemic. British Journal of Community Nursing, 9; 29(13):748-52.

Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. (2020). Clinical characteristics of coronavirus disease 2019 in China. The New England Journal of Medicine, 30; 382(18):1708-20.

Hossain MA, Rashid MU, Khan MA, Sayeed S, Kader MA and Hawlader MD (2021). Healthcare Workers' knowledge, attitude, and practice regarding personal protective equipment for the prevention of COVID-19. Journal of Multidisciplinary Healthcare, 14:229-38.

Hu D, Kong Y, Li W, Han Q, Zhang X, Zhu LX, et al. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. eClinical Medicine, 1;24:100424.

Huang L, Lei W, Xu F, Liu H and Yu L (2020). Emotional responses and coping strategies in nurses and nursing students during Covid-19 outbreak: A comparative study. PloSOne, 7; 15(8):e0237303.

Islam MZ (2013). Translation of Bangla Perceived Stress Scale. Perceived Stress Scale –Bengali Translation Document. 2013. http://www.psy.cmu.edu/~scohen/Perceived_Stres s_Scale_Bengali_translation.pdf

Khatun R, Akter N, Muhammad F and Chowdhury AA (2018). Job satisfaction among nurse's in public and private sector in Dhaka City of Bangladesh: a comparative study. International Journal Of Community Medicine And Public Health, 5(6):2177.

Labrague LJ and De los Santos JA (2020). COVID-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and

social support. Journal of Nursing Management, 28(7):1653-61.

Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. (2019). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease. JAMA network open, 2; 3(3):e203976.

Liao C, Guo L, Zhang C, Zhang M, Jiang W, Zhong Y, et al. (2021). Emergency stress management among nurses: A lesson from the COVID-19 outbreak in China–a cross-sectional study. Journal of Clinical Nursing, 30(3-4):433-42.

Mahmud I, Azad KA, Al Mamun A, Hoque MM, Mallik MU, Moniruzzaman M, et al. (2020). Psychological Assessment of Doctors Working in a Pandemic Condition in Dhaka Medical College Hospital. Journal of Bangladesh College of Physicians and Surgeons, 9:50-5.

Mondal NI, Faroque O, Rahman O and Hossain S (2012). Job satisfaction among the nurses in Rajshahi City, Bangladesh. Man in India, 92(3-4):583-91.

Morsheda HU, Zaman MN and Afroze N (2016). Assessment of job satisfaction among the senior staff nurses working at Sadar Hospital, Naogaon, Bangladesh. Asian Journal of Medical and Biological Research, 2(4):611-5.

Xie J, Tong Z, Guan X, Du B, Qiu H and Slutsky AS (2020)Critical care crisis and some recommendations during the COVID-19 epidemic in China. Intensive Care Medicine, 46(5):837–40.

Nourbala AA, Mohammad K, Bagheri YS and Yasami MT (2002). Study of mental health status of individuals above 15 years of age in Islamic Republic of Iran in the year 1999. Hakim Research Journal, 5(1):1-10.

Saha AK, Mittra CR, Khatun RA and Reza HM (2020). Nurses' Knowledge and Practices Regarding Prevention and Control of COVID-19 Infection in a Tertiary Level Hospital. Bangladesh Journal of Infectious Diseases,8:S27-33.

Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. (2020). Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. Gen. Hosp. Psychiatry, 1;66:1-8.

Wang J, Cheng Y, Zhou Z, Jiang A, Guo J, Chen Z, et al. (2020). Psychological status of Wuhan medical staff in fighting against COVID-19. Medical Journal of Wuhan University, 2020:547-50.

Wilson W, Raj JP, Rao S, Ghiya M, Nedungalaparambil NM, Mundra H, et al. (2020). Prevalence and predictors of stress, anxiety, and depression among healthcare workers managing COVID-19 pandemic in India: a nationwide observational study. Indian Journal of Psychological Medicine, 42(4):353-8.