

Original Article

NURSING STRESS AND ASSOCIATED FACTORS DURING COVID-19 PANDEMIC: FINDINGS OF A CROSS-SECTIONAL STUDY AT TERTIARY HOSPITALS IN BANGLADESH

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ABSTRACT

Background: The COVID-19 epidemic has posed an unparalleled obstacle to healthcare systems worldwide. Particularly in the pandemic period, nursing is seen as a demanding profession with high standards. This study was conducted to assess the level of nursing stress and to identify the factors related to high nursing stress among nurses working in dedicated COVID-19 hospitals.

Methods: The cross-sectional study was conducted from selected three dedicated COVID-19 public hospitals in Dhaka city of Bangladesh named Dhaka Medical College Hospital, Shaheed Suhrawardy Medical College, and Hospital, Dhaka North City Corporation dedicated COVID-19 hospital from 1st July 2021 to 30th June 2022. Total respondents were 368 who had working experience more than 6 months in above mentioned hospitals. Data were collected by face-to-face interview through pre-tested semi-structured questionnaire. Nursing stress was assessed by Nursing Stress Scale (NSS) and categorized as low (≤ 39), moderate (40-62), and high (> 62) stress score. Data analysis was carried out by using SPSS version 26.

Results: The mean age of the respondents was 30.8 ± 7.8 years, wherein highest number of respondents were in age group 20-30 years (50.3%). Among the respondents 86.7% were female, 83.4% were married and average monthly family income Tk. 53839 ± 28587.7 taka. About 63% respondents had diploma degrees, 77.4% worked in different wards, and mean working hour per week was 51.9 ± 5.6 hour. Overall, maximum 52.2% had moderate stress, while 39.4% had high stress and only 8.4% had low stress. Age > 30 years, male, marital status, working place, having senior citizen (> 60 years) and feeling stressed for isolation were the significant risk factors for having high stress level.

Conclusion: Occupational health education, training programs, stress relieving programs, and motivational programs must be implemented in tertiary level hospitals. Special attention should be given on older aged married male nurses, having elderly family members and feeling stressed for isolation.

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KEY WORDS: COVID-19, healthcare workers, nurses, nursing stress scale, occupational stress.

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INTRODUCTION

The novel coronavirus disease (COVID-19) pandemic has presented an unprecedented challenge to healthcare systems across the globe. The COVID-19 epidemic has posed a remarkable threat to public health. By January 2021, the World Health Organization (WHO) was reporting more than 93

million reported cases and over 2 million deaths globally since the start of the COVID-19 pandemic.¹ From March 8, 2020, the virus started spreading in Bangladesh. Since then, people got infected so exponentially that the country positions at the list of top infected countries in the world, which simultaneously increased the pressure on hospitals, surpassing their capacities and leaving hospitals in

near collapse.² This scenario caused multiple issues, particularly for hospital medical staff, such as increased demand for healthcare, increased patient mortality, overwhelming workload, working with patients infected with COVID-19, emotional overburden, and uncertainty. In addition, medical staff from various specialties had to relocate to assist COVID-19 patients. Furthermore, healthcare workers were exposed to a high level of patient suffering, and had to deal with patients' traumatic experiences and the unexpected loss of friends, family, and colleagues in an overwhelmed healthcare system. All of these experiences have the potential to affect mental status.

Stress, is an internal cue in the physical, psychological or social environment that threatens the equilibrium of an individual, has a great impact in terms of work performance. According to the American Institute of Stress, stress is a major factor in up to 80 % of all work-related injuries and 40 % of workplace turnovers.³ Work-related factors affect the employees, changing their psychological and Physiological condition so that the person is unable to function as normal.

Nurses have always played an important role in infection prevention, infection control, isolation, containment and public health. There is an acute shortage of nurses worldwide including Bangladesh. Quality of work life is important for quality of patient care and nurse retention. Nurses on the front line in this event are showing the commitment and compassion that nurses do everywhere, but the truth is they are putting their lives at risk in the course of their duties.⁴

Exposure to pain and death or lack of support from clinical managers can affect nurses physically and psychologically.⁵ All this generates stress for nurses, affects their psychological well-being and job satisfaction, enhances absenteeism and abandonment of the profession⁶, and finally, and negatively the quality of patient care and the health of the staff. Stress has now become a part of everyday life and burnout as a consequence of it can hardly be denied. The work load and burden of work is another main cause to create severe stress and burnout. Stressful working conditions are correlated with a negative impact on the well-being of nurses, job satisfaction, and quality of patient care and the health of the staff. The aim of the present study was to assess the level of nursing stress and its associated factors in COVID-19 dedicated hospitals.

METHODS

The cross-sectional study was conducted from 1st July 2021 to 30th June 2022 in three dedicated COVID-19

public hospitals named Dhaka Medical College Hospital, Shaheed Suhrawardy Medical College Hospital, Dhaka North City Corporation Hospital in Dhaka city of Bangladesh. Total 368 respondents who had more than 6 months working experience at COVID-19 dedicated public hospitals and gave written consent were selected in the study.

Following approval from the Ethical Review Committee (ERC) of National Institute of Preventive and Social Medicine (NIPSOM), eligible nurses were approached by the main researcher informed written consents. Face to face interview was taken through a semi-structured questionnaire. The interview was conducted privately as far as possible. Each questionnaire took approximately 30 minutes to fill up. Data were collected every day except Fridays from 10 AM to 4 PM. On an average 5-6 respondents were interviewed daily. All the methods in the study were carried out following the ethical guidelines of the 1975 Declaration of Helsinki and its later amendment.

NSS has 34 items and seven sub scales/factors. The seven scales/factors included the following 34 items were: (i) Death and suffering (7 items), (ii) Conflict with physicians (5 items), (iii) Inadequate training (3 items), (iv) Lack of support (3 items), (v) Conflict with other nurses (5 items), (vi) Workload (6 items), (vii) Uncertainty about treatments (5 items). The Total score 0-102, higher score indicating more frequent stress. A four-point Likert item represents each of the items. Likert item has options from 0 to 3 where never (0), occasionally (1), frequently (2), very frequently (3). They are categorized mild stress score ≤ 39 , moderate stress score 40-62, and high stress score >62 .⁷

Data were checked first in the field immediately after completion of interview. Again, before data processing, collected information were checked for completeness and initial consistency considering the norms of missing data. The data were thoroughly edited through checking and rechecking for quality control. Data analysis was carried out by using SPSS version 26 (IBM Corp., Armonk, NY). Descriptive statistic included frequency distribution, percentage, mean, range, standard deviation etc. For inferential statistics non-parametric test Chi-square test was done to find out association of categorical data. Binary logistic regression was performed to find out crude ORs and adjusted ORs. Statistical significance was set at $p < 0.05$, with a 95% confidence interval.

RESULTS

The mean age of the study respondents was 30.8 ± 7.8 years, wherein maximum were 20-30 years old (50.3%), female (86.7%), married (83.4%), passed

diploma in nursing (63%), had average mean (\pm SD) monthly family income Tk. 53839 \pm 28587.71(30,000-132,000) Taka, almost 79.6% respondents had two

children and 44.6% respondents had senior citizen (>60 years), which is shown in the Table 1.

Table-1: Socio-demographic characteristics of the respondents (n=368)

Socio-demographic characteristics	Frequency	Percentage
Age group in years		
20-30	185	50.3
31-40	129	35.1
41-50	37	10.1
51-60	17	4.6
Mean \pm SD	30.85 \pm 7.80	
Sex		
Male	49	13.3
Female	319	86.7
Marital status		
Married	307	83.4
Unmarried	61	16.6
Monthly family income (in BDT)		
53839 \pm 28587.71 Taka		
Educational status		
Diploma in nursing	232	63.0
BSC nursing	89	24.2
MPH/Master of science in Nursing/PhD	47	12.8
Children number		
Two	187	79.6
More than two	48	20.4
Having senior citizen (>60 years)		
163 44.3		

f=Frequency, %=percentage, SD=standard deviation

Working as staff nurse (89.9%), in service for 1-5 years (60.9%), worked at ward (77.4%), doing 4–6-night duty per month (79.9%) and had duration of working in COVID-19 unit for 7-12 months (60.6%). About 1/3rd of the study nurses was working >48

hours per week (32.9%). Maximum study participants always got PPE during COVID-19 patient’s management (83.4%), always maintained physical distance in working place (60.9%), which is shown in the Table 2.

Table 2: Distribution of respondents by Job related attributes (n=368)

Job related attributes of nurses	Frequency	Percentage
Designation		
Staff nurse	331	89.9
In charge	24	6.5
Supervisor	12	3.3
Service duration		
1-5 years	224	60.9
>5 years	144	39.1
Working place		
Ward	285	77.4
ICU	60	16.3
O. T	12	3.3
Out door	11	3.0
Getting PPE during COVID-19 patients management		
Get always	307	83.4

Not get always	24	6.5
Sometimes get always	37	10.1
Physical distance in working place		
Always maintain	224	60.9
Often maintain	89	24.2
Sometimes maintain	55	14.9
Getting COVID-19 training		
Yes	131	35.6
No	237	64.4
Working hour per week		
48 hours	247	67.1
>48 hours	121	32.9
Night duty per month		
1-3	58	15.8
4-6	294	79.9
>6	16	4.3
Duration of working in COVID-19 unit		
7-12 months	223	60.6
13-18 months	107	29.1
>24 months	38	10.3

The Total score 0-102, higher score indicating more frequent stress. Among the respondents highest 52.2% respondents had moderate stress (40-62), then high

stress (≥ 63) 39.4% and only 8.4% had low stress (≤ 39), which is shown in the Table 3.

Table 3: Distribution of respondents by level of nursing stress score (n=368)

Attributes	Frequency	Percentage
Nursing Stress level		
Low stress	31	8.4
Moderate stress	192	52.2
High stress	145	39.4

Factors related to nursing stress included 'high risk to be infected due to work' (79.3%), 'feeling stressed for

isolation' (53.5%) and 'feeling stressed for relatives affected' (85.3%) as show in the Table 4.

Table 4: Distribution of respondents by factors related to nursing stress during COVID-19 duty(n=368)

Factors	Frequency (f)	Percentage (%)
High risk to be infected due to work	292	79.3
Having fear of affected to COVID	170	46.2
Feeling stressed for COVID duty	167	45.4
Feeling stressed for isolation	197	53.5
Feeling stressed for relatives affected	314	85.3

SD=standard deviation, O.T. = Operation theatre

Level of nursing stress was found the significantly associated with age, marital status, children number, having senior citizen (>60 years), (Table 5) and

working place, feeling stressed for isolation ($p < 0.001$), which is shown in the Table 6.

Table 5: Association between selected socio-demographic characteristics and level of nursing scale (n=368)

Variables	Stress level			p-value
	Low (n ₁ =31)	Moderate (n ₂ =192)	High(n ₃ =145)	
Age (in years)				0.004
20-30	24 (13.0)	96 (51.9)	65 (35.1)	
>30	7 (3.8)	96 (52.5)	80 (43.7)	
Sex				0.33
Male	3 (6.1)	22 (44.9)	24 (49.0)	
Female	28 (8.8)	170 (53.3)	121(37.9)	
Marital status				0.025
Married	22(7.2)	156(50.8)	129(42.0)	
Unmarried	9(14.8)	36(59.0)	16(26.2)	
Educational Status				0.60
Diploma nursing	20(8.6)	128(55.2)	84(36.2)	
BSC nursing	7(7.9)	42(47.2)	40(44.9)	
MPH/MSN/PhD	4(8.5)	22(46.8)	21(44.7)	
Children number				0.052
Two	7(3.7)	90(48.1)	90(48.1)	
More than two	6(12.5)	23(47.9)	19(39.6)	
Having senior citizen (>60 years)				0.054
Yes	14(8.6)	74(45.4)	75(46.0)	
No	17(8.3)	118(57.6)	70 (34.1)	
*p-value was determined by Chi-square test. (χ^2)				

Table 6: Level of nursing stress by selected job related characteristics (n=368)

Characteristics	Stress level			p-value
	Low (n ₁ =31)	Moderate (n ₂ =192)	High(n ₃ =145)	
Service duration				0.27
1-5 years	23 (10.3)	116 (51.8)	85 (37.9)	
>5 years	8 (5.6)	76 (52.8)	60 (41.7)	
Working place				
ICU	13(21.7)	24 (40.0)	23 (38.3)	<0.0001
Ward	15 (5.3)	157 (55.1)	113(39.6)	<0.0001
History of COVID-19 infection	10 (6.3)	84 (52.5)	66 (41.3)	0.40
Working hour (>48 hours/week)	11 (9.1)	58 (47.9)	52 (43.0)	0.52
Night duty (>3 per month)	24 (7.7)	166 (53.5)	120(38.7)	0.36
Working in COVID-19 unit >12 months	8(5.5)	81 (55.9)	56(38.6)	0.22
High risk to be infected due to work	22 (7.5)	152 (52.1)	118(40.4)	0.43
Fear of affected to COVID-19	11 (6.5)	89(52.4)	70 (48.3)	0.43
Felling stressed for COVID duty	12 (7.2)	87 (52.1)	68 (46.7)	0.71
Felling stressed for isolation	19 (9.6)	91 (46.2)	87 (44.2)	0.047
Feeling stressed for relatives affected	25 (8)	162 (51.6)	127(40.4)	0.53
*p-value was determined by Chi-square test. (χ^2)				

Univariate logistic regression analysis found age >30 years, male sex, married nurse, having senior citizen (>60 years) and feeling stressed for isolation were the significant risk factors for having high nurse stress level. After adjusting these factors in multivariate logistic regression model, having senior citizen (>60

years) was found to be the independent factors for high nurse stress level during COVID-19 duty, which is shown in the Table 7.

Table 7: Logistic regression analysis to detect the factors related to high nursing stress

Variables	Univariate			Multivariate		
	COR	95%CI	p-value	AOR	95%CI	p-value
Age >30 years	1.43	0.94-2.18	0.09	1.20	0.77-1.89	0.43
Male	1.57	0.86-2.87	0.14	1.45	0.78-2.70	0.24
Married	2.04	1.1-3.77	0.02	1.85	0.96-3.56	1.85
Having senior citizen (>60 years)	1.64	1.08-2.51	0.02	1.64	1.06-2.52	0.02
Felling stressed for isolation	1.54	1.01-2.35	0.04	1.53	0.99-2.36	0.05

COR=Crude odds ratio, AOR=Adjusted odds ratio

Multivariate logistic regression analysis was done for variables which COR was significant ($p < 0.05$)

DISCUSSION

Nursing is considered as a stressful profession in all countries around the world. They have to go through huge workload both physical and emotional, shifting duties, environmental and workplace hazards and so on. Therefore, nursing community are always more vulnerable to physical and mental health problems. This study assessed the level of stress emerging from the working environment among nurses working in three COVID dedicated hospitals in Dhaka, Bangladesh. Age, gender, marital status, having senior citizen (>60 years), working place, and feeling stressed for isolation were the significant risk factors for having high nurse stress level had significant association with nursing stress level.

According to this study, maximum nurses had moderate stress (52.2%), while 39.4% had high stress and 8.4% had low stress. A study conducted in Nepal, found that out of 181 nurses 37.6% of nurses experienced high level of stress whereas, 54.7% of nurses experienced moderate level of stress.⁸ In an Indonesian study, most nurses (68.1%) assigned to treat COVID-19 patients at the six referral hospitals experienced moderate levels of occupational stress.⁹ A study in Wuhan, China, found that less than 60% of health workers, predominantly nurses, felt moderate or severe stress while caring for COVID-19 patients.¹⁰ Several other previous studies have also shown that nurses experienced moderate occupational stress.^{10,11}

The mean age of the study participants was 30.85 ± 7.80 years, wherein maximum nurses were 20-30 years old (50.3%, $n=185$). This finding was nearly similar to another study done by Umma Salma in Dhaka medical college from April to September, 2018 in Bangladesh. Their findings were 43.23% from 21-30 age group, followed by 45.48% and 11.29% were from 31-40 and 41-57 age group respectively.¹² Age >30 years was the significant risk factors for having high nurse stress level. Literature reveals that older or more experienced employees record lower levels of stress as compared to younger and less experienced once. The ability to

handle stress associated with job and organization was found to increase with age^{13,14} Older employees have reached a stage where career development is no longer their major concern, and hence a number of job characteristics which may cause stress to younger staff, who have their career ahead of them, do not cause stress to older staff.

The COVID-19 crisis created an imminent challenge for the provision of equal rights for women and men. During the first wave of the pandemic, a significant number of reports, publications, and public policies focused on the necessity of addressing gender inequity and establishing measures to ensure equality between women and men. In this study, maximum study nurses were female, which was comparable to the findings of other studies.^{15,16} Interestingly, male gender was the significant risk factors for having high nurse stress level, which is the opposite of what has been seen in previous studies.^{15,16} this might be due to the fact that men in Bangladesh are responsible for caring for the elderly and disabled than women, for providing family expenses, and also gradual increment of household expenses in pandemic situation. However, gender analysis must be incorporated to analyze this fact better.

In present study, maximum study nurses were married (83.4%, $n=307$), and being married was found to be the significant risk factors for having high nurse stress level. Although there has not been enough research done on marriage and job stress among nurses, the few suggest that there is no a significant association between marital status and job stress.^{17,18} Others disagree and believe that there is a significant association between stress and marital status¹⁹. Ghafoor et al.²⁰ reported that the married workers are more stressed than unmarried workers, while Howels e al.²¹ observed that single or unmarried workers are more stress than the married. This means that, the difference in marital status may not be a variable enough to analyze occupational stress. The quality of the marriage needs to be considered as a scalar to calculate stress.

Maximum study participants had feeling stressed for isolation (53.5%, n=197), which was found to be the significant risk factor for having high nurse stress level. Previous studies also supported this finding.^{22,23} it might be due to the fact that isolation affects individuals across various industries and job roles as employees experience disconnection from colleagues or supervisors. The negative impact of isolation erodes morale and motivation, reduces job satisfaction, diminishes creativity, and increases burnout rate.

Multivariate logistic regression model found that having senior citizen (>60 years) was the independent factors for high nurse stress level during COVID-19 duty. Likewise, a previous Bangladeshi study also found that respondents with one or more elderly family members had higher levels of stress.²⁴ It could be because, in comparison to younger persons, older adults have a more severe case of COVID-19, with higher rates of case fatalities and a greater requirement for intensive care. Besides, infection and vaccine-induced antibody response and long-term effects of COVID-19 also differ in older adults.²⁵

CONCLUSION

Nurses are the most valuable and compassionate resource to the management of COVID-19 patients despite the psychological burden during the pandemic. The findings of the study revealed that more than half of the respondents reported moderate level of stress. Age>30 years, male, married nurse, having senior citizen (>60 years) and feeling stressed for isolation were the significant risk factors for having high stress level. Nurse's ability to cope with the stress in the workplace may be improved with specific occupational health education, training programs, stress relieving programs, motivational program that improve their knowledge and ability. Intervention must be implemented both on individual and organizational level to stabilize their nursing teams and promote their work in the fight against the pandemic.

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