

Feeling the Early Impact of COVID-19 Pandemic: Mental Health of Nurses in India

Jithin Thomas Parel^{1*}, Mohit Varshney¹, Mini George¹, Ruparna Khurana², Linsu Thomas³, Deepika C Khakha²

¹Institute of Liver and Biliary Sciences, New Delhi, India; ²All India Institute of Medical Sciences, New Delhi, India; ³Ram Manohar Lohia Hospital, New Delhi, India

ABSTRACT

Background: Nurses are front-line health care warriors who deliver comprehensive and holistic patient care could have immense amount of distress due to this outbreak. The current study has undertaken to investigate the level of depression, stress and anxiety among nurses.

Methods: A cross-sectional online survey conducted among 1131 nurses across Indian subcontinent through snowball sampling technique using depression, anxiety and stress scale DASS-21. Institutional ethical clearance and informed consent was obtained. Binary logistic regression analysis was performed to identify the predictors of depression, stress and anxiety.

Results: The survey was completed from 26th March 2020 to 8th April 2020 after the declaration of country-wide lockdown. A total of 1305 respondents completed the survey; among which 1131 were included in the final analysis. Overall a significant proportion of nurses had Depression (41.3%), anxiety (49.1%) and stress (29.5%) based on the responses. The odds of having depression, anxiety and stress were lower in nurses who have not been posted for care of confirmed or suspected COVID-19 cases. Similarly, female nurses had higher odds of depression (OR 4.361; $p=0.02$) and anxiety (OR 5.498; $p=0.01$) as compared to males.

Discussion and Conclusion: The magnitude of psychological impact among the nurses, which in most cases are the part of frontline teams, deserves attention while policy makers plan comprehensive intervention to tackle the pandemic. Our study demonstrated that a significant proportion of them have psychological issues during this crisis period. Hence addressing the factors impacting their mental health can go a long way in sustaining the much needed healthcare workforce.

Keywords: Depression anxiety and stress in nurses; Psychological impact of COVID-19; Predictors of Depression and anxiety; Nurses' mental health

INTRODUCTION

The novel corona virus disease (COVID-19), formerly known as the '2019 Novel Coronavirus (2019-nCoV) Pneumonia', which was originated from a wet market in Wuhan, Hubei province, China (early December 2019) has brought world to a standstill with unforeseen impact on health, economy, livelihood and depletion of resources [1-3]. As world facing its utmost unprecedented global health emergency, containment of the pandemic is the utmost priority [4,5]. The World Health Organization has declared as global public health emergency and called for country preparedness to tackle the pandemic on January 30, 2020 [6,7]. The death toll

due to disease outbreak is quiet alarming and shocking to public and mainstream health professional alike [8].

In the global war against pandemic, health professionals, especially nurses, are the main work force. They work day and night from the point of community health awareness, prevention, identification and diagnosis of the disease, working for the speedy recovery, life support care, and end of life care. As they are taking care of the needy, they are not only risking their life but also of their loved ones [9].

Facing this critical situation, and being involved in the direct

Correspondence to: Jithin Thomas Parel, Lecturer College of Nursing, Institute of Liver and Biliary Sciences, New Delhi -110070, India, Tel: +918368621295; E-mail: jithuparel@gmail.com

Received: October 16, 2020, **Accepted:** December 17, 2020, **Published:** December 24, 2020

Citation: Parel JT, Varshney M, George M, Khurana R, Thomas L, Khakha DC (2020) Feeling the Early Impact of COVID-19 Pandemic: Mental Health of Nurses in India. J Depress Anxiety. 9:381.

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diagnosis, treatment, and care of patients, nurses are at risk of developing psychological distress [10], anxiety, sleep disturbances [11] and other mental health symptoms [12]. The ever-increasing number of confirmed and suspected cases of COVID-19, exhausting workload, lack or depletion of personal protection equipment (PPE), widespread media coverage about fatalities, lack of specific drugs or vaccines, and feelings of being inadequately supported may all contribute to the mental burden of these health care workers [13,14].

WHO highlights that the health workers including nurses are at the front line of the COVID-19 outbreak response. They are not only exposed to the risk of infection but the pathogen exposure, long working hours, psychological distress [15], fatigue, occupational burnout, stigma, and physical and psychological violence as well [16]. The effect of anxiety is also correlated with developing depression in the long run through the burnout caused by the epidemic [17]. The International Council of Nurses (ICN) in collaboration with World Health Organization (WHO) started addressing the mental health concerns of nurses as their mental wellbeing is extremely important to continue to provide the highest quality care as possible [18,19].

BACKGROUND

Though early studies from China show that men are more likely to die from COVID-19 than women, some experts wonder if women are at greater risk of catching it because of their role in health care [20,21]. In china, more than 90% of health-care workers affected by corona virus were women especially nurses [22].

Recently, Peter Roy-Byrne, conducted a cross-sectional, geographically stratified survey on 1257 healthcare workers (39% physicians; 61% nurses; 72% of nurses had junior titles) from 34 hospitals of Hubei province China; found high rates of depression (50%), anxiety (45%), insomnia (34%), and distress (72%). Symptoms were higher in nurses, women, and those involved in the care of COVID-19 patients in Wuhan. The researchers concluded that "Protecting health care workers is an important component of public health measures for addressing the COVID-19 epidemic," and "Special interventions to promote mental well-being in health care workers exposed to COVID-19 need to be immediately implemented, with women, nurses, and frontline workers requiring particular attention" [22,23].

In an earlier study conducted by Maunder R et al. in Toronto, on the immediate psychological and occupational impact of the 2003 SARS outbreak, found that the health care workers were affected by fear of contagion and of infecting family, friends and colleagues. Uncertainty and stigmatization were prominent themes identified in the study [24]. Another Survey conducted by Bai Y et al on stress reactions among health care workers involved with the SARS Outbreak, found that 20% of staff reported feeling stigmatized and rejected in their neighborhood because of their hospital work and the study results highlighted the value of shortened work hours to tackle the stress caused by outbreak [25].

The self-reported and media reported issues among nurses working in COVID-19 pandemic are a major concern not only for the public but also for the authorities. The statistical information about the need for their mental wellbeing is less researched and need to get more attention during the current period [26]. The current study is an online survey among the nurses working all over the country. The researchers intend to know the major mental health issues

of nursing community in India while dealing with the spread of COVID-19.

RESEARCH METHODOLOGY

Study design

This online survey is carried out in nurses across the country with snowball sampling technique. The link to complete the questionnaire was sent to respondents through 'WhatsApp', text messaging and email. Those who completed the survey circulated among their social circles and hospital circles to get maximum reach of the survey. The study followed standard guideline given by Indian Council of Medical Research (ICMR). Institutional ethical committee permission was taken as a part of FEEL-COVID survey (letter no: IEC/2020/73/MA04). Informed consent was obtained online after explaining the purpose of the study, before initiation. Those who agreed to participate filled the questionnaire. Rest was taken to the end of survey, without any consequences. The respondent participation in the survey was completely voluntary. The information provided during the survey was strictly kept confidential and anonymous

Data collection tools

The tool used for current study consisted of two sections. The first section had questions related to socio-demographic details like age, gender, marital status, educational status, experience (in years), residence, type of hospital and being involved in the care of corona affected or suspected patients.

The second section of tool was designed to assess depression, anxiety and stress using the Depression, Anxiety and stress scale (DASS-21) [27,28]. It is a standardized scale with a well-established validity (Cronbach's alpha score >0.7) [29] and reliability. This scale has three subscales to identify depression, stress and anxiety. Each of the variables has seven items comprising a total of 21 items. The responses are rated on a 4 point likert's scale ranges from 0- 'did not apply to me at all', 1- 'applied to me some of the time', 2- 'applied to me for a considerable amount of time' to 3- 'applied to me very much/most of the time'. The scoring and the sub scoring is calculated according to the Black Dog Institute, Australia (Table 1). The tool has been validated in Indian population in previous research [28,29].

Statistical analysis

Data analysis was performed using statistical package SPSS Statistic 22.0 (IBM SPSS Statistics, New York, United States). The significance level was set at α less than 0.05, and all tests were 2-tailed. Shapiro-Wilk test was used to assess normal distribution of the data. Socio-demographic characteristics were presented in frequency and percentages like age, gender, marital status,

Table 1: Depression, anxiety and stress (DASS-21) severity score.

Severity	Depression	Anxiety	Stress
Normal	0-4	0-3	0-7
Mild	5-6	4-5	8-9
Moderate	7-10	6-7	10-12
Severe	11-13	8-9	13-16
Extremely severe	>14	>10	>17

educational status, experience (in years), residence, hospital setting and being involved in care of corona affected or suspected patients.

Univariate logistic regression was performed to assess the predictors of having significant scores of depression, anxiety and stress. Associations between risk factors and outcomes were presented as odds ratios (ORs) with 95% CIs, after adjustment for confounders like age, gender, marital status, and place of residence.

RESULTS

The data collection period was from 26th March 2020 to 8th April 2020. There were total 1305 respondents among which 1131 were included. On hundred seventy four responses were incomplete and were excluded from the study.

Among the total respondents (n= 1131), 782 respondents (69.2%) were females with more than half 585 (51.7%) had B.Sc Nursing as the educational qualifications. A total of 581 (51.4%) nurses were married; with 672 (59.4%) had experience between 0 to 5 years; were residing in urban area 672 (59.4%). The percentage of respondents working in hospital was found to be almost similar in government and private comprising of 410 (36.3%) and 409 (36.1%) respectively. Most importantly, a total of 323(18.6%) nurses had taken care of corona affected or suspected patients during the COVID-19 outbreak (Table 2).

Among the 1131 respondents, 41.3% had some level of depression; severity ranging from mild 134 (11.8%), moderate 155 (13.7%), severe 61 (5.4) and extremely severe 117 (10.3%). A sizeable proportion of respondents had a significant amount of anxiety (554; 49%). Anxiety has found to be more frequently occurring phenomena compared to depression and stress. There were 194 (17.2%) respondents who reported extremely severe anxiety during the COVID-19 pandemic. As far as stress is concerned, around 29.5% of respondents had reported stress which was the least common among the three psychological concerns, tested in the study. Extremely severe stress was seen in 62(5.5%) respondents (Table 3).

A Binary logistic regression was performed to understand factors predicting presence of Depression, anxiety and stress based upon parameters such as age, gender, education, experience and being involved in Corona care duties. Preliminary analysis was performed to ensure there was no violation of the assumption of normality, linearity and multi-collinearity. It was found that female nurses had significantly higher odds of having depression (OR 4.361; 95% CI 1.247 - 15.253; p=0.02) and anxiety (OR 5.498; 95% CI 1.572 - 19.227; p=0.01) as compared to their male counterparts. They also had higher odds of having stress (OR 4.097; 95% CI 0.930 - 18.055; p=0.06), but it did not reach statistical significance. Results suggested lower rates of Depression (OR 0.337; 95% CI 0.257 - 0.443; p = 0.01), anxiety (OR 0.353; 95% CI 0.267 - 0.466; p = 0.01) and stress (OR 0.275; 95% CI 0.208 - 0.334; p = 0.01) in nurses that have not been involved in duties of suspected/confirmed Corona positive patients. Moreover nurses who had lower education levels [GNM (OR 1.403; 95% CI 1.066 - 1.846; p=0.05); and B.sc Nursing (OR 1.280; 95% CI 1.008 - 1.432; p=0.02)] had higher odds of having significant anxiety as compared to higher education (M.Sc and PhD). Other predictors could not reach statistical significance (Table 4).

Table 2: Socio-demographic characteristics of the respondents [N=1131].

S.no	Variables	Frequency (%)
1.	Age Mean 29.06 years	
2.	Gender	
	Male	348 (30.8)
	Female	782 (69.2)
3.	Educational Status	
	GNM	228 (20.2)
	B.Sc Nursing	585 (51.7)
	M.Sc Nursing & PhD	318 (28.1)
4	Marital Status	
	Married	581 (51.4)
	Unmarried	550 (48.6)
5.	Experience (in years)	
	0-5	672 (59.4)
	6-10	214 (18.9)
	11-15	126 (11.1)
	16-20	75 (6.6)
	>20	44 (3.8)
6.	Type of Hospital	
	Rural	384 (34)
	Urban	947 (66)
7.	Type of hospital	
	Government	410 (36.3)
	Private	409 (36.1)
	Autonomous	135 (27.6)
	Teaching/Research	
8.	Have you taken care of corona affected/suspected Patients?	
	No	808 (71.4)
	Yes	323 (28.6)

Table 3: Severity of depression, anxiety and stress among respondents according DASS-21 Score [N=1131].

Severity	Depression f (%)	Anxiety f (%)	Stress f (%)
Normal	664 (58.7)	577 (51.1)	797 (70.5)
Mild	134 (11.8)	156 (13.8)	82 (7.2)
Moderate	155 (13.7)	108 (9.5)	111 (9.8)
Severe	61 (5.4)	96 (8.5)	79 (7.0)
Extremely severe	117 (10.3)	194 (17.2)	62 (5.5)

DISCUSSION

This cross sectional survey conducted among 1131 nurses working in Indian subcontinent during the extreme prevailing situations of COVID 19 outbreak; especially after the declaration of lockdown in the country; has been carried out at a large scale level. As per the best of our knowledge, this would probably the first systematic attempt at generating data representing the nursing fraternity of the entire nation. Nurses undergo mental health concerns at various levels both professionally and personally [16]. Professional concerns could include risking the life during their clinical practice primarily because of close contact with the infected COVID-19 patients [30,31] due the shortage of personal protective equipment's [32], extended duty hours, lack of standard protocols and excruciating experience of 'witnessing death' coupled with the added professional accountability for nurturing the health of

Table 4: Regression analysis for factors impacting presence of depression, anxiety and stress.

Variables N (%)	Depression			Anxiety			Stress			
	R ²	Exp Beta (95% CI)	p	R ²	Exp Beta (95% CI)	P	R ²	Exp Beta (95% CI)	p	
Age	1131	0.003	1.015 (0.998 - 1.032)	0.09	0.000	0.995 (0.978 - 1.012)	0.56	0.081	0.970 (0.934 - 1.006)	0.93
Gender	Female	0.009	4.361 (1.247 - 15.253)	0.02*	0.010	5.498 (1.572 - 19.227)	0.01*	0.007	4.097 (0.930 - 18.055)	0.06
	Male		1 (Reference)			1 (Reference)			1 (Reference)	
Marital status	Unmarried	0.001	1.133 (0.916 - 1.402)	0.24	0.001	0.905 (0.734 - 1.116)	0.35	0.000	1.072 (0.853 - 1.358)	0.55
	Married		1 (Reference)			1 (Reference)			1 (Reference)	
Education	GNM	0.001	0.985 (0.911 - 1.061)	0.69	0.003	0.928 (0.860 - 1.002)	0.05*	0.001	1.029 (0.947 - 1.118)	0.50
	B.Sc Nursing		1.070 (0.810 - 1.412)	0.64		1.403 (1.066 - 1.846)	0.02*		1.028 (0.764 - 1.383)	0.86
	M.Sc Nursing		1 (Reference)			1 (Reference)			1 (Reference)	
Total experience (in years)	0 - 5	0.006	1.155 (1.032 - 1.293)	0.19	0.000	1.029 (0.921 - 1.151)	0.61	0.001	1.313 (0.649 - 2.659)	0.45
	6 - 10		1.075 (0.561 - 2.058)	0.83		1.022 (0.533 - 1.956)	0.95		1.030 (0.486 - 2.182)	0.94
	11 - 15		1.038 (0.433 - 2.489)	0.93		0.865 (0.445 - 1.758)	0.74		1.292 (0.507 - 3.291)	0.59
	20 and above		1 (Reference)			1 (Reference)			1 (Reference)	
Involved in COVID care	No	0.055	0.337 (0.257 - 0.443)	0.01*	0.050	0.353 (0.267 - 0.466)	0.01*	0.101	0.275 (0.208 - 0.334)	0.01*
	Yes (Reference)		1 (Reference)			1 (Reference)			1 (Reference)	

R² = Cox and Snell R² value; Univariate logistic regression; * = p < 0.05 Statistically significant.

entire citizens [33]. Nurses at their personal level faces issues like contracting the infection and being a carrier of the disease process [24,25]. Moreover, they also have fear of transmission [34] to their own families [35] and loved ones; specifically among children and old age members [36-38]. Despite being the primary care givers nurses undergo emotional distress because of various reasons [39].

The current study had a female preponderance (69.2%) similar to a research from China [40] where 76.7% were women. The major mental health concern found were anxiety (49.1%), depression (41.3%) and stress (17.2%) ranging with varied severity. Female respondents had higher levels of depression and anxiety; which was less as compared with the previous study among health care workers of China who reported considerable proportion of participants manifesting symptoms of depression (50.4%), anxiety (44.6%), insomnia (34.0%), and distress (71.5%) [22]. The reasons could be nurses might have taken adequate precaution due to the sensitization and awareness conducted by various health agencies. Moreover, there may be good family and social support system in Indian setting [18]. The nurses who were not involved indirect care of COVID-19 patients had lesser odds of having depression, stress and anxiety. This finding was expected as well as consistent with previous literature [22]. However, another study from China reported a lower level of psychological distress among nurses [41]. Considering the fact that the data was from the initial period of pandemic in India, a significant amount of variation can be expected as the associated health burden increases. As efforts of increasing awareness are being made throughout the world, we need to continue evaluating and addressing psychological issues, in order to plan effective strategies to promote better mental health.

The major strength of this study was the ample representation of two different cluster of nurses reported with mental health concerns, first being directly involved in care of patients suspected or diagnosed with COVID-19 and on the other side the nurses who had anticipated or prepared for COVID duties were also been included. The sample size is large hence findings are generalizable. As seen generally in surveys, there may have been a social desirability bias. But despite these limitations, this research provides a background for conducting larger and more systematic studies on this important public health aspect.

Early identification, accurate diagnostic testing systems, reducing transmission and critical patient care are considered to be the prime focus of care. Little attention has been shown to psychological effects arising out of pandemics and its effect on mental health. The psychological and emotional aspects of the nurses should be addressed with the level of importance it deserves [42,43].

Various global public health agencies have been suggesting ways to handle these issues. World Health Organization has identified the importance of mental health consideration during pandemic and taken effective intervention through online and virtual platforms like zoom for consultation [44-47]. The International Council of Nurses had suggested not only the need for adequate break during the shifts to reduce their fatigue and provision of sufficient supply of PPEs; but also the need for healthy coping mechanisms and mental wellbeing in the unhealthy work situations [18]. A comprehensive crisis intervention program including psychological first aid should be developed to reduce the psychological impact and further preventing the onset of mental illness [48].

CONCLUSION

This was an online survey conducted to assess mental health issues in nurses; being the frontline warriors in the COVID-19 pandemic in India. A sizeable proportion of nurses were found to be having significant depression, anxiety and fear during the current period. Hence policy makers should take cognizance of the issues affecting them while planning interventions for tackling various aspects of the illness.

APPLICATION TO CLINICAL PRACTICE

During pandemic direction of care and research largely stressed on general public and community as whole. However, authorities should provide customized psychological support for their self-care because the mental health of nursing professionals have been affected during this pandemic, as they are the frontline workers dealing with COVID-19. This reveals the importance of assessment, identification, diagnosis and treatment for this mental health concerns like stress, anxiety and depression during crisis among the nurses. Nurse Managers could provide conducive environment and provision of adequate support system especially during pandemic.

ACKNOWLEDGEMENTS

None.

FUNDING

None.

CONFLICT OF INTEREST

None.

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