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## Psychological impact of COVID-19 healthcare workers at a tertiary care center of Rohilkhand region using DASS 21

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### Abstract

**Objectives:** Aim of this study was to determine the Depression, Stress, and Anxiety level among COVID 19 positive healthcare workers working at a tertiary care center of Rohilkhand area during COVID-19 pandemic.

**Methods:** This is a retrospective study was conducted using online survey from March 2020 till Jan 2021 at the Shri Ram Murti Smarak Institute of Medical Sciences Bareilly (UP). Participants of the study were fulltime employees of hospital. Data were collected about several aspects of demographic factors, clinical symptoms, co-morbidities and mental health status. We assessed by using an online questionnaire and Depression, Anxiety and Stress - 21 (DASS-21) scale was used.

**Results:** A total of 224 healthcare workers were included who came COVID 19 positive during their duties in SRMS IMS Bareilly, Out of which, 46 (20.5%) participants were suffered from moderate to severe depression, 20.1% (45) from moderate to severe anxiety, and 14.7% (33) from moderate to severe stress.

**Conclusion:** A significant levels of depression, anxiety, and stress were noted with the major concerns of workplace exposure, increased risk of infection, and transmission to their families and friends.

**Keywords:** anxiety, COVID-19, depression, healthcare workers, pandemic, psychological, stress, anxiety

### Introduction

Whole world is silent, gazing at each other with ray of hope with empty looks, there is still darkness everywhere, all people are scared, unknown fear of uncertainty and death is prevailing everywhere, global health infrastructure has flooded with sick patients, world's economy has crashed, COVID-19 pandemic is sweeping across world tolling billions of cases, millions of deaths and consequently destroying millions of families costing trillions USD extra burden of health and on global economic due to COVID-19 since its origin from Wuhan in November 2019 [1,2].

According to world meter, as of December, 2020, the COVID-19 outbreak affected 213 countries around the world, including India, with 1,28,01,785 total cases, 8,43,473, 6.59%, active cases, 1,17,92,135, 92.1% cured and death toll of 1,66,177 with the death rate of 1.30% upto 6 April 2021.

Healthcare workers who gets infected during their duties It had significant negative impact on the mental health of individuals reflecting as mood disorders, depression, anger, anxiety, psychosis, fear of unknown, OCD, feeling loneliness, socially isolated.

Anxiety and depression among healthcare professionals is a common feature of epidemics, such as SARS and H1N1 epidemics and now COVID-19. A high incidence of stress and anxiety disorders have been report. Therefore, aim of this study was to determine the depression, stress, and anxiety level among positive COVID 19 healthcare workers during pandemic at a tertiary care center of Rohilkhand Region using DASS 21.

### Methods

This is a retrospective study was conducted at the Shri ram Murti Smarak institute of medical sciences, from March 2020 to January 2021. Participants of the study were health care worker included consultants, physicians, Post graduates residents, nursing staff, technicians, administrators, and clerical staff who were diagnosed with COVID 19 during their COVID

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duties Employees of either sex between 18 and 65 years of age without any pre-existing psychiatric illness were included in this study.

Data were collected using an online questionnaire formed on Google Forms which consisted of two sections, demographic and depression, anxiety, and stress assessment section. Demographic section comprises of age (years), sex, marital status, occupation, education, area/department of work, co-morbid conditions, Depression, anxiety, and stress were assessed using the 21 items Depression, Anxiety and Stress - 21 (DASS-21) scale by the Psychology Foundation of Australia.

The DASS is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The process of defining, understanding, and measuring the ubiquitous and clinically significant emotional states usually described as depression, anxiety and stress. The DASS should thus meet the requirements of both researchers and scientist-professional clinicians.

DASS-21 is a shorter version of basic 42-item questionnaire which comprises of seven item each for depression, anxiety, and stress and each item is four point rating scale (0 to 3) indicating how much statement applies to the respondent

over the past 1 week from “did not apply at all” to “applied very much.” The computed score (sum of rating) for each domain was multiplied by two to compute the final score and severity was categorized based on the cut-off scores values recommended in the manual for the DASS.

### Statistical analysis

Statistical analyses were carried out using the statistical package for social sciences software (SPSS version 15.0; SPSS Inc, Chicago, Illinois, USA) for windows. Normality of the distribution of age (years), depression, anxiety, and stress scores were assessed by applying Shapiro-Wilk test and P-value of the test were and P-value of the test were <0.05 hence median and interquartile range (IQR) were computed and Mann-Whitney U test was applied to compare the scores by various groups and subgroups of participants. Categorical variables were expressed as frequency (%) and Chi-square tests were applied to assess the association of depression, anxiety, and stress level by various groups and subgroups of participants. The level of significance was set at less than or equal to 0.05 throughout the analysis.

**Table 1:** Demographic Profile, Pre-existing Comorbid Conditions, and COVID-19 Exposure of the Participants

Variable	Total (224)
Gender	
Male	75.9% (170)
Female	24.1% (54)
Age, years	
<35 years	79% (177)
>35 years	21% (47)
Marital status	
Single	37.9% (85)
Married	62.1% (139)
Occupation	
Medical professionals	35% (79)
Non-medical professionals	54% (121)
Others	10.7% (24)
Co-morbid condition	
Diabetes mellitus	4.5% (10)
hypertension	6.7% (15)
Asthma	5.4% (12)
Smoking	11.2% (25)
Hypothyroidism	1.3% (3)

### Results

A total of 224 COVID 19 positive health care workers were included in this survey, 75.9% (170) of them were male participants and majority of the participants were under the age of 35 years (79%) and married (62.1%). 35% (79) were medical professionals (consultant, post graduates residents), 54% (121) were nursing staff and 10.7% were others including technician, clerks, administrator. Co-morbid condition included, 4.5% diabetes mellitus, 6.7% hypertension, 5.4% asthma, 11.2% smoking, 1.3% hypothyroidism. Demographic profile, pre-existing comorbid conditions, and COVID19 exposure are presented in Table 1

The DASS-21 has good internal consistency for all three domains, depression, anxiety, stress scale. The median depression score was 6 [IQR: 2 to 12] with 6.7% (15) fall under the severe depression categorized and 25.4% (57) with mild to moderate depression. The anxiety score was 4 [IQR: 0 to 8] with 7.6% (17) had severe and 20.1% (45) with mild to moderate anxiety. Similarly, stress score was 10 [IQR: 4 to 16] with 4.9% (11) and 21.4% (48) of the participants with severe and mild to moderate stress. Depression, anxiety, and stress levels stratified in COVID 19 positive health care workers are presented in Table 2.

**Table 2:** Depression, Anxiety, and Stress Levels of the Participant

DASS 21	Total	Percentage
Total	224	
<b>Level of depression: 6 (2-12)</b>		
Normal (0-9)	152	67.9%
Mild (10-13)	26	11.6.00%
Moderate(14-20)	31	13.80%
Severe (21-27)	11	4.9.00%
Extremely severe (28+)	4	1.8.00%
<b>Level of anxiety 4 (0-8)</b>		
Normal	162	72.30%
Mild (0-7)	17	7.60%
Moderate (8-9)	28	12.5.00%
Severe (15-19)	8	3.60%
Extremely severe (20+)	15	7.50%
<b>Level of stress 10 (4-16)</b>		
Normal (0-14)	165	73.70%
Mild (15-18)	26	11.6%
Moderate (19-25)	22	9.80%
Severe (26-33)	10	4.50%
Extremely severe (34+)	1	0.40%

**Table 3:** Odds of Participants been Screened Positive for Severe Depression, Anxiety, and Stress Score with Demographic Characteristics and Pre-existing Comorbid Condition

Characteristics	Depression		Anxiety		Stress	
	OR (95% CL)	p-value	OR (95% CL)	p-value	OR (95% CL)	p value
Male	0.9(0.3-2.8)	0.811	0.7 (0.2-2.2)	0.596	0.8 (0.2-3.3)	0.801
Age >35 years	4 (0.5-30.8)	0.190	0.9 (0.3-2.7)	0.789	0.7 (0.2-22.1)	0.340
Married	0.5 (0.2-1.5)	0.210	0.7 (0.2-1.8)	0.423	0.7 (0.2-2.4)	0.600
Diabetes	1.6(0.2-13.4)	0.672	1.4(0.2-11.5)	0.769		
Hypertensive	2.3(0.5-11.4)	0.300	3.5(0.9-13.8)	0.076	1.8 (0.2-15.7)	0.578
Asthma	3.1(0.6-15.4)	0.175	2.6 (0.5-13.1)	0.239		
Smoking	3.3(1-11.1)	0.060	1.8 (0.5-6.8)	0.383	3.3(0.8-13.2)	0.098

COVID 19 Positive healthcare worker screened for severe depression, anxiety, and stress with demographic characteristics and pre-existing comorbid conditions are presented in Table 3.

Health care worker have been screened positive for depression, anxiety, and stress was not found to be associated with either demographic characteristics or pre-existing comorbid conditions.

**Table 4:** Severity of health care worker using DASS 21.

Groups studied	Anxiety (n%)	Depression (n%)	Stress
Physician	55.65%	32.1%	47%
Nurses	48.54%	53.72%	38.2%
Technician	52.35%	42.7%	39.5%
Non health care worker	56%	35%	43%

On analyzing the psychological parameters in the study using DASS 21, anxiety was seen in 55.65%, 48.54%, 52.34%, and 56% of physicians, nursing staff, technicians, and non-healthcare study population while depression was evidently reported from 32.1%, 53.72%, 42.7%, and 35% of the above-mentioned categories, respectively. Stress was found to afflict 47%, 38.2%, 39.4%, and 43% and.

On analyzing the psychological parameters of anxiety, depression and stress between healthcare and non-healthcare professional workers, significance was obtained ( $P = 0.05$ ,  $0.03$ , and  $0.02$ , respectively).

## Discussion

The COVID-19 outbreak has led to significant repercussions across various domains, including the economy, sporting,

education, and health. The pandemic is a health crisis that impacts physical and mental health. For instance, the quarantine and communicating restrictions have resulted in people being stuck indoors and fearing infection. At the same time, anxiety due to fear of infection or transmitting the infection to loved ones, and depression among family and friends as a result of an altered lifestyle, social distancing, and guilt of spreading the virus, are some of the issues that health workers are experiencing. The world has experienced various infectious disease outbreaks, such as the SARS outbreak in 2003, which was contained through various quarantine measures. However, the severity of the COVID-19 pandemic has had a significantly higher impact on mental distress among health workers.

In current study, the presence of anxiety was observed in 55.65%, 48.54%, 52.34%, and 56%, whereas depression was reported from 32.1%, 53.72%, 42.7%, and 35% of physicians, nursing staff, technicians, and non-healthcare study population, respectively. The studied sample reported stress in 47%, 38.2%, 39.4%, and 43% of doctors, nurses, technical staff, and non-healthcare people.

Que *et al.* (2020) [5] conducted a cross-sectional online survey among healthcare professionals during COVID-19 pandemic (which included- medical practitioners, residents, nursing staff, technical staff, and public health workers). The parameters used for assessing psychological stressors which were tested using following scales-(1) the Generalized Anxiety Disorder scale; (2) the Questionnaire for public health and index for assessment of severity of insomnia. According to this study, the symptom prevalence of anxiety, depression, insomnia, and other psychological

problems was found to be 46.04%, 44.37%, 28.75%, and 56.87%, respectively among the healthcare professionals, whereas the prevalence of psychological problems was observed to be- 60.35%, 50.82%, 62.02%, 57.54%, and 62.4%, respectively. Likewise, Luo *et al.* (2020)<sup>[7]</sup> in their systematic review and meta-analysis reported similar prevalence of anxiety and depression as 56% (39–73%) and 55% (48–62%), respectively, in both healthcare workers and general population. Huang and Zhao (2020)<sup>[8]</sup> had reported the presence of psychological symptoms of anxiety, insomnia, and depression . Lai *et al.* (2020)<sup>[6]</sup> also reported incidence of stress in addition to anxiety, depression, and insomnia.

Amal M. *et al* reported he rates of anxiety, depression, and moderate stress were found to be 35.5%, 27.9%, and 72% among health care workers, respectively. These increased levels of anxiety and depression suggest the potential for an increase in stress-related disorders. All three anxiety, depression, and stress scores were found to be positively correlated. It was evident that anxiety and depression rates were significantly associated with the lack of training in infection control.

In contrast, a severe level of stress was only associated with existing medical problems. This is because the medical practitioners at the forefront of the fight against the virus are experiencing traumatic events arising from the patients' conditions and high death rates. There have been reports of traumatic stress among medical practitioners in the fight against COVID-19, including cases of medical practitioners ending their lives. This is in accordance with the notion that the elevation of traumatic stress results in low physical integrity and subjective response, which poses a threat to one's well-being (Maunder *et al.*, 2006)<sup>[3]</sup>.

Cai *et al.* (2020)<sup>[10]</sup> showed presence of emotional stress during corona outbreak among doctors. They reported that the medical fraternity was highly worried about passing the infection to their family members while the staff aged between 41 and 50 years suffered from greater stress and still older staff attributed an increase in stress because of exhaustion as a result of extended working hours. The commonest determinant of stress in all subjects was the fact that there is no treatment of COVID-19 infection

Another recent study, measuring depression and anxiety among health care providers in KSA by Al Ateeq *et al.* (2020) reported depressive disorder (55.2%), ranging from mild (24.9%), moderate (14.5%), and moderately severe (10%) to severe(5.8%). Half of the sample had a generalized anxiety disorder (51.4%), which ranged from mild (25.1%) and moderate (11%), to severe (15.3%).

In addition, stigmatization against health workers is another aspect identified in this research, with 35.5% of participants reporting incidents of stigmatization. When individuals are faced with potential disease threats, they might develop avoidant behaviour, such as the avoidance of contact with people having similar symptoms, and strictly obeying social distancing norms (Li *et al.*, 2020)<sup>[4]</sup>.

Zhang *et al.* (2020)<sup>[9]</sup> conducted a survey using online platform based on which demographics, marital status, locality (whether urban or rural), and level of education were segregated. Insomnia was quantified using the "Insomnia Severity Index" wherein a score of more than eight indicates presence of insomnia. Anxiety and depression were assessed using the patient Health Questionnaire-4 while symptoms related to obsessive

compulsive disorder and phobia were assessed by symptom Check list-90-revised. All the score rates were found to be significantly higher in medical based subjects when compared to non-medical health care workers. Insomnia was seen in 38.4% medical staff when compared to 30.5% non-medical staff ( $P<0.01$ ). Similarly, higher percentages of medical fraternity (13%) was observed to suffer from anxiety when compared to non-medical staff (8.5%) ( $P<0.01$ ). Also, percentages of depression afflicted individuals was higher in medical when compared to non-medical staff (12.2 in comparison with 9.5%,  $P = 0.04$ ) while obsessive compulsive disorders were found to be higher among medical (15.3%) when compared to non-medical health care professionals (2.2%) with a  $P$  value of less than 0.01

The characteristics of the study population can be linked to the psychological issues addressed in the study. Most of the respondents live with their families, and 34.2% reported not having confidence in the available emotional support because of the withdrawal of their primary source of social support, the family. With most of the participants living with their family, emotional support from the family realm is of great importance. However, the risk of infecting their families might result in withdrawal of close attachment with family members, thus explaining the registered incidences of lack of emotional support

**Limitations:** The study's small sample size is a limitation, as is the fact that the information was collected online due to strict lock-down restrictions at that time. The sample of health care workers was widely diverse, which could have influenced the study in particular ways. The precision of the study might be low because of relatively smaller. The study sample size and data collection procedure that was done through electronic questionnaire due to strict lockdown restrictions at that time.

**Conclusion:** A significant levels of depression, anxiety, and stress were noted among the healthcare worker performing their duties during COVID-19 pandemic. The major concerns were workplace exposure, increased risk of infection, and transmission to their families and friends. Under these extraordinarily difficult circumstances, it is responsibility of the organizations and leadership to recognize the concerns with efforts to support, facilitate, and protect healthcare workers and their families.

**Recommendations:** Medical practitioners at the forefront in the fight against the virus should undergo psychological evaluations. The development of psychological issues among medical practitioners poses a threat in the fight against COVID-19 by reducing the effectiveness of medical personnel, and should therefore be addressed urgently.

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