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<b>DOI:</b> 10.4103/jehp.jehp_208_22

# Psychological implications of Covid-19 in healthcare workers

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## Abstract:

**BACKGROUND:** The Covid-19 outbreak has led to an unprecedented burden on the healthcare infrastructure. High morbidity and mortality rates have resulted in a state of stress and distress among the general population which has also impacted health professionals.

**AIMS:** This study was conducted to identify mental health disturbances among health professionals during the Covid-19 pandemic.

**MATERIALS AND METHODS:** It was a cross-sectional study, conducted in a Medical College in Himachal Pradesh, India. A self-administered anonymized questionnaire was administered to the healthcare workers. Mental health status was assessed using Patient Health Questionnaire Anxiety-Depression Scale (PHQ-ADS). In addition, a 15-item questionnaire was prepared to identify the probable causes of stress in HCWs during the Covid-19 Pandemic. A statistical analysis used *t*-test was used to find the significance of the correlation between the PHQ-ADS score and the agreement score of different factors.

**RESULTS:** The response rate for the questionnaire was 27%. Anxiety and depression were seen in 29% of participants, ranging from mild (18.3%), moderate (4.7%), and severe (5.9%). Among females 43.7% of the participants and among males, 13.1% had anxiety and depression. High PHQ-ADS scores were seen in nursing staff (70%) and postgraduate students (30%), who were in the third decade of life. Most (81.7%) of the HCWs were concerned about transmitting the disease to their near ones. Fear of coming to the hospital and dealing with patients.

**CONCLUSION:** Even sub-threshold syndromes among HCWs need to be identified before they evolve into overt diseases. The psychological needs of healthcare workers should be prioritized as they are key players in the fight against Covid-19.

## Keywords:

Covid-19, factors, healthcare workers, mental health, psychological

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Received: 08-02-2022  
Revised: 11-04-2022  
Accepted: 19-04-2022  
Published: 25-08-2022

## Introduction

Covid-19 was first reported in December 2019 in Wuhan, China. Following its global spread, it was declared a pandemic on 11<sup>th</sup> March 2020. Covid-19 is caused by a novel virus, SARS-CoV-2, and has a rapid transmission rate. Patients present with variable symptoms ranging from mild fever, and cough to severe respiratory distress. The severity of disease and the higher mortality rate are seen more in the elderly and those having pre-existing diseases leading to an immune-compromised status. Many of the

infected individuals act as asymptomatic carriers. Covid-19 has introduced the world to many restrictive lifestyle changes like lockdown and quarantine. It has also resulted in many social, psychological, and financial implications. After the initial outbreak, increasing morbidity, deaths, and high transmission rates have been a cause of concern worldwide.<sup>[1]</sup> To date, 31,026,829 cases and 412,531 deaths have been reported in India while globally it took a huge toll on human life amounting to more than 40.6 lakh deaths.<sup>[2]</sup> With the onset of this pandemic and the second wave of Covid-19, there has been a marked

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**How to cite this article:** Garg R, Gupta N, Puri S, Kakkar N. Psychological implications of Covid-19 in healthcare workers. *J Edu Health Promot* 2022;11:257.

increase in the burden on the healthcare infrastructure globally. The disease and its spread have led to a state of fear, anxiety, and panic among the general public and healthcare workers.<sup>[3]</sup> In this scenario, the mental health of the healthcare workers (HCWs) is at a risk because of long periods of isolation from family and friends, high risk of contracting the disease, and being a source of transmission themselves. The risk of dealing with asymptomatic patients and inadequate equipment or facilities has contributed to many apprehensions and even suicides among medical professionals.<sup>[4]</sup> The mental health issues of HCWs have been addressed by many researchers from different countries including India.<sup>[5]</sup> Younger workers were found to have a higher level of depression as compared to others (Khan *et al.*).<sup>[6]</sup> Some healthcare workers even feared death because of Covid-19. Different scales have been used to assess the mental health of healthcare workers like self-reporting questionnaire (SRQ20), Self-rating anxiety scale (SAS), Depression, Anxiety and Stress Scale (DASS-21), Patient Health Questionnaire (PHQ-9), and Generalized Anxiety Disorder Scale (GAD-7).<sup>[7,8]</sup> Patient Health Questionnaire Anxiety-Depression Scale (PHQ-ADS) combines the PHQ-9 and GAD-7 scales and is a composite measure of depression and anxiety.<sup>[9,10]</sup> Timely surveys for the mental wellness of HCWs can be of help in finding possible causes and taking appropriate measures to enhance the well-being of service providers. This study was undertaken to analyze the extent of anxiety and depression among HCWs in our hospital.

## Materials and Methods

### Study design and setting

The study was a cross-sectional study undertaken in a 720-bed teaching hospital in Himachal Pradesh, India.

### Study participants and sampling

A self-administered anonymized questionnaire was e-mailed to healthcare workers including doctors, nurses, and the paramedical staff working in the institute.

Data collection tool and technique: The questionnaire was sent through an online platform (Google forms), keeping in mind the Covid-19 outbreak and social distancing protocols. Mental health status was assessed using standardized questionnaires- Patient Health Questionnaire Anxiety-Depression Scale (PHQ-ADS). The possible maximum cumulative score for this scale is 48.<sup>[9,10]</sup> PHQ-ADS cut-points of 0-9, 10-19, 20-29, and 30-48 indicate minimal, mild, moderate, and severe levels of depression/anxiety, respectively. In addition to this a 15-item questionnaire was prepared to identify the probable causes of stress in HCWs during the Covid-19 pandemic. It was validated with the help of a pilot study comprising 15 participants. Questions were assessed

on a five-point Likert scale (1-strongly agree; 2-agree; 3-undecided; 4-disagree; 5- Strongly disagree), with scores points of 0 to 4. A higher score indicated a higher level of concern. Data were collected over a period of 1 week. Age, gender, department, and designation of the participants were also recorded.

### Ethical consideration

Online consent was taken (MMMCH/IEC/20/371) from the participants. If any participant was unwilling to participate, the questionnaire was not displayed for those participants. The study was approved by the institutional research and ethics committee.

### Statistical analysis

Data were entered in a Microsoft Excel spreadsheet and analyzed using means and proportions. Mean scores were obtained in questions based on the Likert scale. In order to test the significance of correlation coefficients for different factors, we looked at their *P* values. Two tailed student's *t*-test was used to find the significance of the correlation between the PHQ-ADS score and the agreement score of different factors.

## Results

The completed questionnaire was answered by 169 (27%) healthcare workers from different departments. Of these, 87 were females and 82 were males (M:F-1:1). The age of the participants in the study ranged from 21-70 years with a mean age of  $35.6 \pm 12.5$  years. Nearly (49.7%) half of the participants were between 21-30 years of age.

Based on the PHQ-ADS score, 29% of participants had features of anxiety and depression ranging from mild (31/169-18.3%), moderate (8/169-4.7%), and severe (10/169-5.9%). All the participants with PHQ-ADS scores in the range of 30-48 and who had features of severe anxiety and depression were between 21-30 years. HCWs aged between 51-70 years had minimal anxiety and depression. Age-wise scores are shown in Figure 1. Among females 43.7% and males, 13.1% of the participants had anxiety and depression. Severe depression and anxiety were seen in ten HCWs, of which nine were females. Of all the participants, 87.5% and 71% of responders with moderate and mild features were females respectively.

There were 29 nursing personnel in this study. Of these, 17 were posted in ICU and screening laboratory. Mild to moderate to severe depression and anxiety was seen in 13 of the nursing participants. They constituted 70% (7/10) of the total participants with severe depression. High PHQ-ADS scores were seen in nursing staff (70%) and postgraduate students (30%) from different departments. Department-wise and designation-wise details of PHQ-ADS scores are included in Tables 1 and 2 respectively.

**Table 1: Percentage of participants from each department with minimal, mild, moderate and severe anxiety and depression scores**

Score	Medical Allied branches and Nursing College (%)	Medicine branches (%)	ICU, Screening laboratory and Anaesthesia (%)	Surgical Branches (%)	Obstetrics and Gynecology (%)	Laboratories (%)	Preclinical and paramedical branches (%)
	Deramatology, Psychiatry, Nursing college	Medicine, Paediatrics, Respiratory Medicine	ICU, Screening laboratory and Anaesthesia	General Surgery, Orthopaedics, Ophthalmology, ENT, Dentistry	Obstetrics and Gynecology	Radiology Pathology Biochemistry and Microbiology	Anatomy Physiology and Pharmacology PSM and Forensic Medicine
0-9	7.7	16	8.3	12.4	2.9	16.6	7.1
10-19	1.8	1.8	4.7	1.8	1.8	5.3	1.2
20-29	0	0	1.8	0	1.8	0	1.2
30-48	0	0.6	4.1	0	0.6	0.6	0

**Table 2: Designation wise PHQ-ADS score of Healthcare Workers**

Designation (number)	PHQ-ADS Score			
	0-9	10-19	20-29	30-48
Nursing Staff (29)	11	7	4	7
Lab technician (16)	13	2	1	0
Post Graduate students (43)	26	13	1	3
Senior residents and Medical Officers (12)	11	1	0	0
Assistant Prof. and Associate Prof. (41)	32	7	2	0
Professors (28)	27	1	0	0

Most of the HCWs were concerned about transmitting the disease to their near ones (81.7%), missed going out (81.7%), and were concerned about the end of the pandemic (76.3%). The factors which had a strong correlation with high PHQ-ADS score were fear of coming to the hospital and dealing with patients, change in personal plans, fear of contracting Covid-19 infection, and apprehension of getting PPEs ( $P$  value = 0). Further concerns of HCWs are shown in Table 3. Factors showing a correlation of more than 20% were significantly associated with higher PHQ-ADS scores.

### Discussion

In our study of 169 workers, 29% had mild to severe anxiety and depression. Severe depression and anxiety were seen in nursing staff working in ICU and screening laboratories (70%) and postgraduate students (30%). Women constituted 90% of the cases with high PHQ-ADS scores.

It is a well-known fact that the physical and psychosocial health of individuals is at a major stake due to the Covid-19 pandemic since December 2019. Amidst this, HCWs being in the forefront of the fight against Covid-19 faced new challenges in their day-to-day life affecting their psychological well-being as well. Many studies have been done from different parts of the world that have evaluated the psychological impact of Covid-19 on HCWs.

In a review of six articles, Spoorthy *et al.*<sup>[11]</sup> suggested that evaluation of mental health among health workers

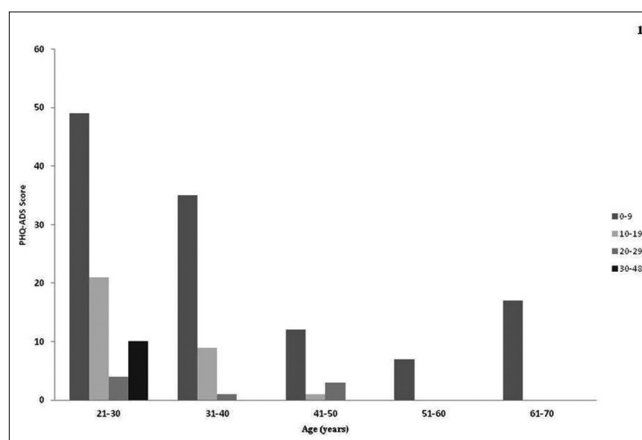


Figure 1: PHQ-ADS score of all study participants according to age

can be done by electronic media through web-based applications. The mean age of the patients in this review study ranged from 26-40 years. Most (68.7%–85.5%) of the participants were females. One of the studies showed that medical staff less than 30 years had higher self-rated scores of depression as compared to those more than 30 years.<sup>[12]</sup> Similar findings were seen in our study too where severe depression and anxiety were reported in those between 21-30 years only and minimal features were seen in senior professionals between 51-70 years.

An online survey was carried out using a semi-structured proforma to measure the psychiatric morbidity in doctors in Kolkata, India. The authors used the Depression, Anxiety, and Stress Scale-21. There were 152 study participants, of which 34.9% were depressed, 39.5% and 32.9% suffered from anxiety and stress respectively.<sup>[7]</sup> Our study had 29% participants with anxiety and depression.

Pappa *et al.*<sup>[3]</sup> conducted a systematic review and meta-analyses of 13 cross-sectional studies with 33,062 participants. Different studies had variable results as varied scales and cut-off scores were used in each study to assess the levels of depression, anxiety, and insomnia during the COVID-19 pandemic among HCWs. The prevalence of anxiety and depression was 23.2% and

**Table 3: Percentage of participants concerned with various factors and correlation of these factors with Anxiety and depression score**

Factors	Percentage of participants concerned with different factors.	Correlation with PHQ-ADS (%)	P
Scared of transmitting disease to near ones	81.7	17.3	0.024
Missing going out	81.7	22.0	0.004
Too concerned about end of pandemic	76.3	20.6	0.007
Missing social life	74.6	21.6	0.005
Constantly watching Corona news/involved in Discussion of disease/Checking updates on corona	72.8	11.6	0.134
Missing friends/family	72.5	23.4	0.002
Upset because of changes in personal plans	69.8	31.2	0.00004
Apprehensive of not getting PPEs	57.4	14.1	0.067
Scared of contracting COVID-19 infection	56.2	29.1	0.0001
Overburdened and confused because of changing guidelines and over load of information	56.2	8.5	0.027
Not hopeful of Covid coming to an end in near future	53.8	24.2	0.002
Apprehensive of financial losses	52.7	10.6	0.171
Not happy with staying at home all the time and not being able to go back to work.(if not working due to unavoidable circumstances)	37.9	5.8	0.454
Scared of dealing with patients	30.2	30.1	0.00007
Scared of coming to hospital	29.6	42.6	0.00000007

22.8% in 12 and 10 studies respectively. Data for grading anxiety and depression was obtained from six and four studies respectively. The pooled prevalence of mild anxiety and depression was 17.9% and 24.6% whereas the pooled prevalence of moderate/severe anxiety and depression was 6.88% and 16.18% respectively. In our study, 18.3% and 10.6% of HCWs had (cumulative score) mild and moderate/severe anxiety and depression respectively.

A study from Germany reviewed multiple studies pertaining to the mental health of HCWs during the Covid-19 pandemic. In different studies analyzed, they reported that 2.2%-14.5% of the participants had severe degrees of anxiety and depression.<sup>[13]</sup>

Liu *et al.*<sup>[8]</sup> did a cross-sectional study on the mental health of HCWs in multiple hospitals in Mainland China through a web chat-based survey using a Self-rating anxiety scale (SAS) to evaluate depression symptoms and anxiety. Of all the responders 16.0% had symptoms of anxiety while the majority had mild (10.9%) to moderate (3.04%) symptoms. Only 2.18% of responders had severe anxiety.

A survey of 1257 HCWs working in different hospitals in China used Patient Health Questionnaire 9 and the Generalized Anxiety Disorder scale. Features of depression and anxiety were seen in 50.4% and 44.6% of the participants respectively. PHQ9 scores among physicians versus nurses were 4.0 versus 5.0 ( $P = 0.007$ ). GAD scale scores among men versus women were 2.0 and 4.0 respectively ( $P < 0.001$ ). Women, nurses, and frontline HCWs reported more

severe degrees of mental health symptoms than other health professionals.<sup>[14]</sup>

In another study among 994 medical and nursing staff working in Wuhan, younger women were markedly affected by the prevailing scenario.<sup>[15]</sup> Similar results were seen in our study where women and nurses posted in ICU had higher scores for anxiety and depression. Liu *et al.*<sup>[16]</sup> also found that nurses had a higher prevalence of symptoms of anxiety and depression compared to doctors. They suggested that this could be possible, as nurses remain in contact with patients for a longer duration of time. This has also been attributed to the fact that the incidence rate of anxiety and depression is higher in women who constitute most of the nursing staff.<sup>[17]</sup>

Many studies reported a higher magnitude of stress in frontline workers. Xu *et al.*<sup>[18]</sup> found that HCWs of other specialties, for example, surgeons and anesthesiologists were also affected by the pandemic in terms of mental health. This was possible because all the patients coming for surgery were not tested for Covid-19 during the initial phase. In our hospitals, professionals from Obstetrics and Gynecology department were most affected after the ICU workers as our hospital was the referral center in the region for all antenatal cases who were Covid-19 positive.

Since the outbreak of Covid-19, social media is flooded with news that includes both valid and false information. In another study, 80% of the participants were repeatedly exposed to social media during the COVID-19 pandemic. It has been observed that there was a higher prevalence of mental health problems among those who were exposed to social media than those who were not.



The odds ratio of anxiety and depression and anxiety combined was 1.72 and 1.91 respectively.<sup>[19]</sup> Likewise, 72.8% of the participants in our study were constantly watching news related to Covid-19 or were involved in a discussion of the disease, or were checking updates on Corona. However, this factor did not have an association with the high cumulative score for anxiety and depression (*P* value; 0.134). Scarcity of personal protective equipment and long duty hours has also enhanced the fear of contracting infection which has further added to increased depression, anxiety, and stress levels among HCWs.<sup>[7,20,21]</sup> Spreading the disease to the near ones was a matter of concern among most (81.7%) of the HCWs in our study, however fear of coming to the hospital and contracting Covid-19 infection had a strong correlation with high PHQ-ADS scores.

There are limited studies in the state of Himachal Pradesh during Covid-19 on the mental health of healthcare workers. The alarming incidence of anxiety and depression among healthcare workers is an area of concern that needs urgent attention. Even sub-threshold syndromes need to be identified before they evolve into overt diseases. There should be frequent counseling sessions for medical personnel, especially during pandemics and other natural calamities.

### Limitations and recommendation

One of the limitations of this study is the previously unknown mental health status of the individuals, it was not clear if these features were seen more in those who were already having anxiety or/and depression.

### Conclusion

In our study, severe anxiety and depression were seen among nursing staff, postgraduate students, females, and younger individuals. The psychological needs of healthcare workers should be prioritized as they are key players in the fight against Covid-19. More counseling sessions and need specific interventions should be conducted.

### Acknowledgements

The authors thank Dr. Rajat Gupta and Sushant Garg for their support in statistical analysis.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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