

Research Paper

## The effect of the COVID-19 pandemic on the mental health of Indian health care workers

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### ABSTRACT

**Introduction:** In the fight against the 2019 novel coronavirus (COVID-19), medical workers in India have been facing enormous pressure. Facing this critical situation, health care workers on the front line are likely to undergo psychological distress both, short term and long-term. **Aim:** The aim of this study was to determine the overall impact of COVID-19 outbreak on health care workers in terms of Anxiety, Depression, Insomnia, and Psychological Distress along with identifying how Perceived social support contributed to an individual's overall Psychological Distress. This study aimed to provide a better understanding of the mental health burden of Indian health care workers. **Methodology:** The study is a hospital-based survey conducted at Sir H.N. Reliance Hospital and Research Centre. A convenience sample of 200 (100 Patient Facing and 100 non-patients facing) participants from the hospital was selected for the study. Participants were both males and females. The age range of the participants is between 20 to 60 years. The degree of symptoms was assessed by The Beck Depression Inventory (BDI-II), The Hamilton Anxiety Rating Scale (HAM-A), Insomnia Severity Index (ISI), The Kessler Psychological Distress Scale (K10), and Multidimensional Scale of Perceived Social Support respectively. A multifactorial Analysis of variance (ANOVA) along with Correlational analysis. **Results:** There was higher prevalence of distress among nurses than in doctors. Statistical analysis indicated that there was a significant difference in the depression scores of health care workers who were seeing patient's vs health care workers who were not seeing any patients. Higher levels of perceived social support among health care workers was negatively correlated with depression. However, the reverse could be true where people with lower depressive features show high perceived social support as the two were reciprocally related.

**Keywords:** COVID-19, Depression, Anxiety, Insomnia, Psychological Distress, Perceived Social support, Health care workers

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Since the end of December 2019, the Chinese city of Wuhan has reported a novel pneumonia caused by coronavirus disease 2019 (COVID-19), which has had a widespread impact both domestically and internationally- across the world (Li Q et al, 2020; National Health Commission of China, 2020). The virus has been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which is also commonly referred as COVID-19. The first case of the coronavirus pandemic in India was reported on 30<sup>th</sup> January 2020, originating from China.

As of today, India is looking at a huge number of individuals who have contracted the COVID-19 virus. It has also been suggested that the exact number of infected cases can be much higher as India's testing rates are among the lowest in the world (Ministry of health and family welfare, 2020). The infection rate of COVID-19 in India is reported to be 1.7 per million, which was reported to be significantly lower than in the worst affected countries (BBC, 2020).

This outbreak has been declared an epidemic in more than a dozen states and union territories, where provisions of the Epidemic Diseases Act, 1897 have been invoked. As a result of this educational institutions and many commercial establishments have been shut down.

India has also taken drastic steps in an attempt to curb the spread of the virus which included nationwide lockdown for 21 days along with graded plan to lift the lockdown (The Indian Express, 2020).

In light of the present scenario, there is a huge impact on the nation's health care providers. In the fight against the 2019 novel coronavirus (COVID-19), medical workers in India have been facing enormous pressure. Facing this critical situation, health care workers on the front line who are directly involved in the diagnosis, treatment, and care of patients with COVID-19 are at risk of developing psychological distress and other severe mental health symptoms. With the ever-increasing number of confirmed and suspected cases along with overwhelming workload, depletion of personal protection equipment, widespread media coverage, lack of specific drugs, and feelings of being inadequately supported, frustration, discrimination, isolation, patients with negative emotions, a lack of contact with their families, and exhaustion may all contribute to the mental burden of these health care workers (Jianbo Lai J et al (2020); Maunder et al, 2003; Koh D et al, 2003; Bai Y et al, 2004; Lee & McAlonan, 2007; Chua et al 2004)

The severe situation is causing mental health problems such as stress, anxiety, depression, insomnia, denial, anger, psychological distress and fear. These mental health problems not only affect the medical workers' attention, understanding, and decision-making ability, which might hinder the fight against COVID-19, but could also have a lasting effect on their overall wellbeing. Protecting the mental health of these medical workers is thus important for control of the epidemic and their own long-term health (Wang et al, 2020; Lancet, 2020).

A review of previous literature across the world have reported adverse psychological reactions to the 2003 SARS outbreak among health care workers (Maunder et al, 2003; Koh D et al, 2003).

Studies showed that health care workers feared contagion and infection of their family, friends, and colleagues. They also experienced uncertainty and stigmatization, (Bai Y et al,

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2004; Lee AM et al, 2007) whereas some even reported reluctance to work or contemplating resignation and reported experiencing high levels of stress, anxiety, and depression symptoms (Bai Y et al, 2004).

The psychological effects noted, could have long-term psychological implications. (Chua et al, 2004) On similar lines, concerns about mental health, psychological adjustment, and recovery of health care workers treating and caring for patients with COVID-19 are arising. The aim of this study is to determine the overall impact of COVID-19 outbreak on health care workers in terms of Anxiety, Depression, Insomnia, and Psychological Distress along with identifying how Perceived social support contributes to an individual's overall Psychological Distress.

This study aimed to provide a better understanding of the mental health burden of Indian health care workers, which can serve as important evidence to direct the promotion of mental wellbeing among health care workers.

### **METHODOLOGY**

#### *Participants*

The study is a hospital-based survey conducted at Sir H.N. Reliance Hospital and Research Centre. A convenience sample of 280 participants was selected from the hospital- out of which 148 were in direct contact with the patients, and 132 were not. Participants were both males and females. The age range of the participants was between 20 to 65 years. All participants had at least ten years of formal education.

#### *Sample Inclusion Criterion*

Only those individuals who are employed by Sir H.N. Reliance Hospital and Research Centre were included in the sample. Both- individuals who were in direct contact with patients as well as individuals who are not in direct contact but were working in the hospital in various capacities were included.

#### *Sample Exclusion Criterion*

Individuals in their internship or those individuals who do not have 10 years of formal education were not included in the sample. Individuals with a history of psychiatric admission in the past were also excluded from the sample.

#### *Measures*

- 1. Beck Depression Inventory:** The Beck Depression Inventory (BDI-II), created by Aaron T. Beck, is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. The BDI test includes a 21 item self-report using a four-point scale which ranges from 0 (symptom not present) to 3 (symptom very intense). The test takes approximately 5 to 10 minutes to complete. The BDI test is widely known and has been tested for content, concurrent, and construct validity. The BDI has also showed high construct validity with the medical symptoms it measures. Beck's study reported a coefficient alpha rating of .92 for outpatients and .93 for college student samples. The BDI-II positively correlated with the Hamilton Depression Rating Scale,  $r = 0.71$ , had a one-week test-retest reliability of  $r = 0.93$  and an internal consistency  $\alpha = 0.91$ .
- 2. Hamilton Anxiety Rating Scale:** The Hamilton Anxiety Rating Scale (HAM-A), developed by Hamilton M., is a rating scale developed to measure the severity of anxiety symptoms. The test takes approximately 10 to 20 minutes to complete. The

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scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–30 moderate to severe.

3. **Insomnia Severity Index:** The ISI is a 7-item self-report questionnaire assessing the nature, severity, and impact of insomnia. The usual recall period is the “last month” and the dimensions evaluated are: severity of sleep onset, sleep maintenance, and early morning awakening problems, sleep dissatisfaction, interference of sleep difficulties with daytime functioning, noticeability of sleep problems by others, and distress caused by the sleep difficulties. A 5-point Likert scale is used to rate each item (e.g., 0 = no problem; 4 = very severe problem), yielding a total score ranging from 0 to 28. The total score is interpreted as follows: absence of insomnia (0–7); sub-threshold insomnia (8–14); moderate insomnia (15–21); and severe insomnia (22–28). The test takes approximately 5 to 10 minutes to complete.
4. **Kessler Psychological Distress Scale:** The Kessler Psychological Distress Scale (K10), developed by Kessler R. C. et.al., is a simple measure of psychological distress. The K10 scale involves 10 questions about emotional states each with a five-level response scale. The measure can be used as a brief screen to identify levels of distress. The test takes approximately 5 to 10 minutes to complete.

Each item is scored from one ‘none of the time’ to five ‘all of the time’. Scores of the 10 items are then summed, yielding a minimum score of 10 and a maximum score of 50. Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress.

### *Multidimensional Scale of Perceived Social Support*

The multidimensional scale of perceived social support was used to measure the social support provided to the individual after he/she has faced victimization at the hands of their peers. It is created by Zimet G. D., Dahlem N. W., Zimet S. G., Farley G. K. The Multidimensional Scale of Perceived Social Support (MSPSS) is a brief research tool designed to measure perceptions of support from 3 sources: Family, Friends, and a Significant Other. The scale is comprised of a total of 12 items, with 4 items for each subscale. Cronbach alpha level of .88 for the scale. The scale is a likert type scale ranging from 1 to 7 where 1 being very strongly disagree to 7 being very strongly agree. The test takes approximately 10 minutes to complete.

### *Procedure*

The participants were contacted and a rapport was established with them. After the brief interview to rule out the comorbidity, the participants who met the inclusion criterion were chosen for the study. The purpose of the study was explained to them and verbal consent was taken from each participant.

The participants were assured of confidentiality of data. The questionnaires were then administered explaining the instructions for answering them. Any queries or doubts of the respondents were answered by the researchers. Although there was no time limit, the respondents were requested to respond with the first response that came to their mind. It took approximately 15 minutes for each respondent to fill all the measures. After making sure that no statement was left unanswered, the participants were debriefed and thanked for their participation in the study.

## RESULTS AND DISCUSSION

Analysis was conducted using statistical program SPSS version 23. p values < 0.05 were considered significant. In total, 280 health-care workers (HCW) completed the survey. Out of 280 HCW, 52.9% of the staff had direct contact with patients, and 47.1% didn't have any contact with the patients. Their demographic characteristics are summarized in Table 1.

Of all the staff 71.4% were females and 28.2% were males. Additionally, 48.6% were nurses, 20% doctors, 26% physiotherapists, 5.7% dietitians, and remaining were in administrative roles. Around 14% of the staff were in the age ranges of 18-24 years, 70.7% were in the age range between 25-34, 13.6% were in the age range between 35-49, and 1.8% above 50 years old were in the age range (Table 1).

*Table 1 Demographic Characteristics of Participants*

Participant characteristics	N	%
Gender		
Female	200	71.4
Male	80	28.2
Age		
18-24	40	14.3
25-34	198	70.7
35-49	38	13.6
50-65	5	1.8
Above 65 years	0	0
Designation		
Nurse	136	48.6
Doctor	56	20
Physiotherapist	26	9.3
Dietitian	16	5.7
Administration	27	9.8
Patient Facing		
Yes	148	52.9
No	132	47.1

The variables measured in the study were gender, patient facing/non-patient facing population, depression, anxiety, insomnia, distress and perceived social support.

A basic descriptive statistic was used for Analysis 1 to determine severity of depression and anxiety in health care workers who were seeing patients vs HCW who were not seeing any patients.

A one-way ANOVA was used for Analysis 2 for the two independent variables, patient facing and gender separately.

For Analysis 3, a simple linear regression was used to understand whether and to what extent can depression and anxiety be predicted by patient facing, gender, insomnia, distress, and perceived social support.

An inferential statistical test was conducted for analysis 2 and 3 to examine if the data is normally distributed. According to the analysis, the data failed to meet assumption of

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normality. Hence, log transformation was used to transform the data to normality which brought the final number to 222 participants.

### *Analysis 1*

Overall, no difference was seen in the number of individuals scoring high on mood scales between the two groups i.e. HCW who were seeing patients vs HCW who were not seeing any patients.

In the current study, about 17%, 7.12%, and 31.67% of HCW scored above the threshold for depression, anxiety, and distress measures respectively (see Table 2 for detailed descriptive).

25%, 12%, and 21.42% of the doctors scored above the threshold for depression, anxiety, and distress measures respectively. 14.7%, 6.61%, and 36.2% of the Nurses scored above the threshold for depression, anxiety, and distress measures respectively. 18.5%, 12.5%, and 31.25% of the dietitians scored above the threshold for depression, anxiety, and distress measures respectively. 22.23%, 11.12%, and 18.52% of the physiotherapists scored above the threshold for depression, anxiety, and distress measures respectively, and 8.34%, 4.1%, and 20.84% of the administrative staff scored above the threshold for depression, anxiety, and distress measures respectively.

**Table 2 Severity of depression, anxiety and distress in healthcare workers**

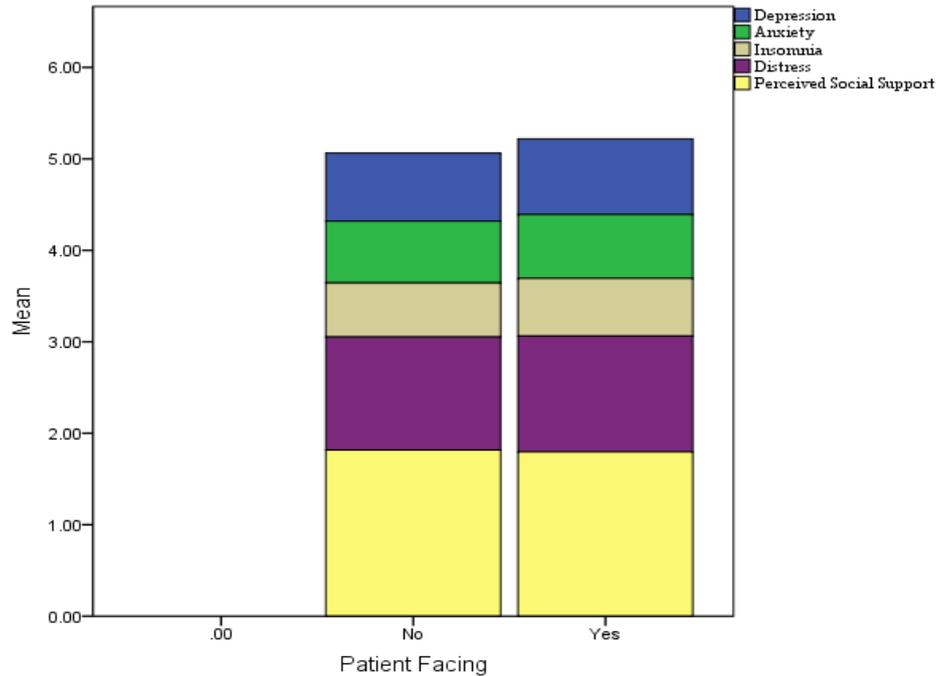
<b>Designation</b>	<b>N</b>	<b>Depression</b>	<b>Anxiety</b>	<b>Distress</b>
Doctors	56	25%	12.5%	21.42%
Nurses	136	14.7%	6.61%	36.02%
Dieticians	16	18.75%	12.5%	31.25%
Physiotherapists	27	22.23%	11.12%	18.52%
Administration	24	8.34%	4.1%	20.84%

### *Analysis 2*

A one-way ANOVA was used to explore if there was any presence of depression, anxiety, insomnia, distress in addition to measuring their perceived social support in HCW who faced patients vs staff that didn't face patients.

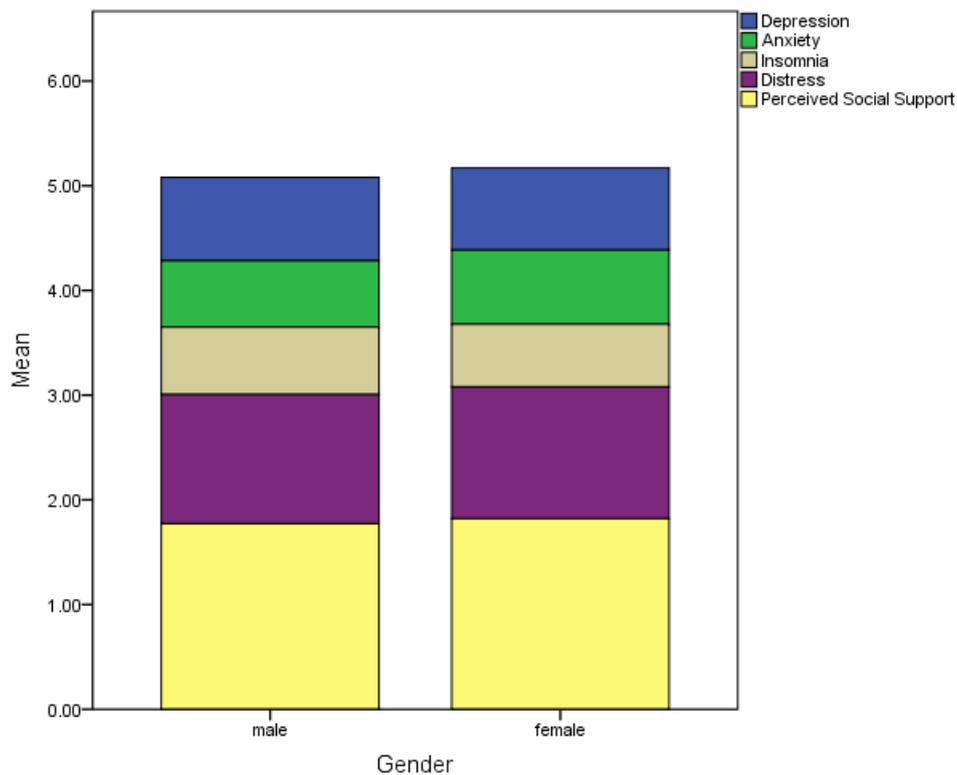
The results indicated that there was a significant difference between the depression scores of staff who faced patients ( $M=.73$ ,  $SD=.36$ ), and the staff who didn't face any patients ( $M=.64$ ,  $SD=.39$ ), ( $F(2, 222) = 3.61$ ,  $p = .05$ ). No statistical difference was found between other groups (Figure 1).

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**Figure 1. Presence of mood related disturbances in HCWs who faced patients vs HCWs who didn't face patients.**

Additionally, a one-way ANOVA was conducted to see the effect of gender on mood. The results indicated that there was a significant difference between gender and perceived social support in that females perceived higher social support ( $M=1.83$ ,  $SD= .09$ ), than males ( $M=1.79$ ,  $SD= .13$ ) ( $F(1,222)= 3.79$ ,  $p=0.05$ ). No statistical difference was found between other groups (Figure 2).



**Figure 2: The effect of gender on mood**

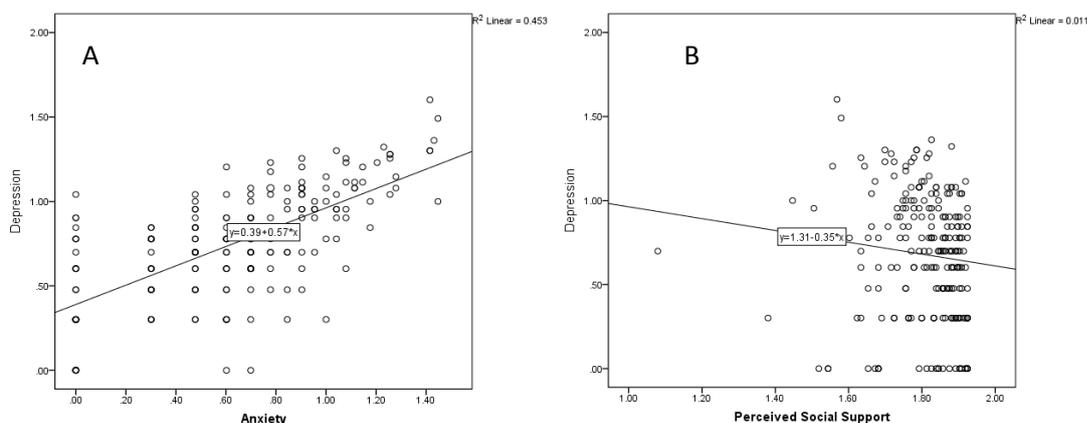
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### Analysis 3

A simple linear regression was carried out to predict depression from gender, patient facing HCWs, anxiety, distress, insomnia, and perceived social support.

These variable predicted depression with statistical significance,  $F(159,6)=15.438$ ,  $p < .001$ ,  $R^2 = .368$ . All the predictors explained 37% of variance.

Anxiety was positively correlated with depression ( $b=.153$ ,  $p < 0.001$ ), and perceived social support was negatively correlated with depression ( $b=-.406$ ,  $p < 0.001$ ) in that the higher the perceived social support, the lower the depression (see figure 3). The rest of the variables were not statistically significant.



**Figure 3.** Scatterplot illustrating a positive correlation between anxiety and depression (A), and a negative correlation between depression and perceived social support (B).

## DISCUSSION

This study aims to understand the mental healthcare burden of Indian HCWs, and to further find ways to promote their mental well-being.

The current study found that overall, no difference was found in the number of individuals scoring high on subjective mood scales between the two groups.

This finding is consistent with Maunder and colleagues (2003). In their study, they found no difference between HCWs who were seeing patients and HCWs who weren't seeing any patients. The study further reported that staff members who weren't in direct contact with patients or the ones who were asked to stay home reported feeling isolated and felt ineffective in contributing meaningfully to the cause.

Overall, in this study, 17%, 7.12% and 31.67% of out HCW scored above the threshold for depression, anxiety, and psychological distress measures respectively. A study by Nickell and Colleagues in 2003 investigated the psychosocial effects of SARS on HCW. They found that 29% of the respondents scored above the threshold on the GHQ-12. In another study by Tam and colleagues (2004) found that around 68% of their HCWs reported high level of stress, and around 51% were found to have experienced psychological distress which is in line with results of the current study.

In our study, the overall distress score was higher in nurses than doctors. 36% of the nurses scored above the threshold on the K-10 scale as compared to 21.42% of the doctors. This is

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consistent with the study conducted by Nickell and colleagues (2003), where 45% of the nurses scored above the threshold on the GHQ-12. Similarly, another study by Tai Wong and colleagues in 2005 found that the mean distress level for nurses was higher than doctors and healthcare assistant workers. This might be explained by nurses having more direct contact with the patients and performing duties such as feeding, changing solid linen, which might pose a greater risk of infection.

Furthermore, a more detailed statistical analysis indicated that there was a small, but significant difference in the depression scores of HCW who were seeing patients vs HCW's who were not seeing any patients. The difference was primarily in the form of the severity of the depressive traits present.

Additionally, a correlational analysis suggested that higher levels of perceived social support among HCWs was negatively correlated with depression, in that the higher the perceived social support, the lower the presence of depressive features. Previous studies have suggested that deficits in social support increases the risk of depression (Monroe, 1983; Windle; 1992, Stice et al, 2004). The perception that one is accepted and valued on one's interpersonal environment bolsters self-esteem, confidence, and efficacy which could possibly guard against depression. Similarly, studies have found that deficits in perceived social support have predicted increase in depressive symptoms (Lewinsohn et al., 1994; Sheeber et al, 1997; Slavin & Rainer, 1990; Stice & Bearman, 2001; Windle, 1992).

However, the reverse could be true where people with lower depressive features show high perceived social support as the two are reciprocally related.

### ***The present study has limitations***

A convenience-based sample was selected for the study, which may not be an accurate representation of the entire population of health care workers. Another limitation of the study is that the sample is only limited to the employees of Sir H.N. Reliance Hospital. Also, the sample is limited only to the city of Mumbai which also serves as a possible geographic limitation. The study was carried out in approximately 10 days and lacks longitudinal follow-up.

The minimum educational level of the participants was 10 years of formal education, therefore, health care workers with lesser educational qualifications were not included in the study which could also serve as a limitation of the present study.

The sample was not equally divided amongst males and females. The male to female ratio mimics the institution's ratio of the two genders. Individuals identifying themselves as neither males nor females were not represented in the present study.

The study does not account for possible response inconsistency due to the self-report nature of the tools used which could also serve as a possible limitation.

The present study does not account for any pre-existing psychological comorbidities in the participants at the time of administering the tools. There was no separate enquiry about participants who were already undergoing any psychological and pharmacological interventions.

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### **Further Scope**

The present study depicts how mental health of health care workers is affected during the COVID-19 crisis. The findings of the study will redound to the benefit of the society considering the mental health of HCWs in a pandemic situation.

The present study also opens up a gateway to a whole new domain of studies which might be explored in the future.

There is a greater demand for mental health professionals to come up with more intensive therapeutic interventions to aid in dealing with the issues faced by the individuals and for formulation of new therapeutic plans to address these issues in an effective manner. Psychological first aid, a plan for continued psychological support and follow ups needs to be formulated.

Inclusion of a more diverse population across a larger geographic area could be looked at. The use of clinical interviews could also be looked at for a more comprehensive assessment.

### **CONCLUSION**

The present study depicts higher prevalence of distress among nurses than in doctors. Statistical analysis indicated that there was a significant difference in the depression scores of HCW who were seeing patients vs HCW's who were not seeing any patients. Higher levels of perceived social support among HCWs was negatively correlated with depression. However, the reverse could be true where people with lower depressive features show high perceived social support as the two were reciprocally related.

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### **Conflict of Interest**

The author declared no conflict of interest.

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