

## ORIGINAL ARTICLE

# Effect of COVID 19 on Mental Health Status of Health Care Providers Working in a District Medical College Hospital of West Bengal - A Questionnaire-Based Study

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## Abstract:

COVID-19 has become a threat to human civilization since its outbreak. Doctors, nurses, and other health care workers (HCWs) have been detected COVID-19 positive across the country and many of them have lost their lives too. Not only them but also their family members and close ones are susceptible to the infection. Fear of getting infected, losing near and dear ones, and social ostracization have led to unprecedented psychological stress among health care workers. The objective of this study is to know about the prevalence of depression, anxiety, and stress among the said population and their attitude and knowledge about COVID-19 and to establish any correlation between these parameters. It was a cross-sectional study done at Rampurhat Govt. Medical College, West Bengal, India over a period of 2 months on 150 subjects. DASS 21 scale was used for scoring depression, anxiety, and stress level. Prevalence of depression, anxiety, and stress was studied and their correlation with knowledge, attitude, and demographic factors were studied. The prevalence of depression, anxiety, and stress noted in this study is 34.7%, 50.7% and 34.7% respectively. Statistically significant correlations between depression and age, anxiety and occupation-gender, stress, and COVID positive family history were established. COVID-19 is an important factor for mental health among the health care providers which in turn is affected by other demographic factors. This must be dealt accordingly to ensure maximum service from the health care workers for the society.

**Keywords:** Depression, Anxiety, Stress, DASS 21, COVID-19.

## Introduction:

Presently entire civilization is going through a tough time due to the emergence of a novel Severe Acute Respiratory Syndrome Coronavirus (SARS-Cov-2).<sup>1,2</sup> Starting from the Wuhan city of China 16 months COVID-19 D 19 is the most dangerous threat to the mankind now.<sup>3</sup> It was declared a pandemic on 11<sup>th</sup> February 2020 by WHO after being declared as sixth Public Health Emergency under International Health Regulation.<sup>4</sup> In spite of having good health infrastructure, USA, UK and other many European countries have witnessed a sharp peak of the pandemic very soon after its outbreak.<sup>5</sup> Starting late, India has suffered from the outbreak fast due to the large population. To date, nearly 10.8 million people have got infected and more than 150000 people died.<sup>6</sup> This pandemic is affecting mental health severely.<sup>1,7</sup> Studies have revealed that a significant number of doctors and health care workers (HCWs) are vulnerable to suffering from depression and anxiety.<sup>8</sup> It has also been associated with significant anxiety and stress among HCWs experiencing work-related exhaustion, difficult triage decisions, separation from families, fear of being infected, fear of infecting close ones, and pain of losing patients and colleagues.<sup>9</sup> A preventive measure can be taken by setting up multidisciplinary mental health teams at

regional and national levels to deal with mental health issues and providing psychological support.<sup>10</sup> Research studies have been conducted in nine countries in Eastern Mediterranean Region (EMR) countries, United Arab Emirates (UAE), Saudi Arab, Egypt, Italy, Jordan and Singapore for the prevalence of depression, anxiety, and stress among doctors and other HCWs as an effect of COVID 19 but study on Indian population is scarce.<sup>1,11-16</sup> Our aim in this study is to find out the prevalence of depression, anxiety, and stress among the doctors and other HCWs along with search for any correlation with their demographic parameters between the mental health status of health care workers in the Indian population, especially in a District Medical College & Hospital in West Bengal, an eastern state of India.

## Materials and methods:

**Sampling** - This was a cross-sectional study conducted among doctors, nurses and other HCWs in a district-level tertiary care medical centre of Eastern Indian state of West Bengal. This questionnaire-based study was conducted over a period of two months (1<sup>st</sup> November 2020 to 31<sup>st</sup> December 2020). Ethical clearance was obtained from the Institutional Ethics Committee. Sample size was calculated using the formula  $4pq/l^2$  where  $p$ = Prevalence=0.39,<sup>17</sup>  $q$ =(1-p),  $l$ = allowable error=10%. The sample size was found to be 95.16≈96. Questionnaires were distributed to 182 healthcare workers including all doctors, nurses, and other healthcare workers of the hospital via e-mail after obtaining informed consent from them with an assurance not to disclose the personal information of any participant. 150 of them responded

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## Article History

DOR : 01.09.2022 DOA : 29.03.2023

finally (response rate=82.4%) including 81 doctors, 40 nurses and 29 other health care providers.

**The questionnaire** – Each questionnaire contained three parts. Part 1 was about demographic aspects like age, gender, type of family, marital status, occupation, area of residence (rural or urban), duration of work in health care service, presence of any comorbidity, and training on COVID-19. Part 2 included knowledge, attitude, and practice like area of work in the hospital, precautionary measures are taken, hand washing, sanitization, COVID test status of participants and their family members, and hours of daily work. Part 3 was about the scoring of depression, anxiety, and stress levels with already validated questions from the DASS 21 scale.<sup>18</sup> Questions of part 1 and part 2 were pre-

Meaning	Depression	Anxiety	Stress
Normal	0 - 9	0 - 7	0 - 14
Mild	10 -13	8 - 9	15 - 18
Moderate	14 - 20	10 - 14	19 - 25
Severe	21 - 27	15 - 19	26 - 33
Extremely Severe	28+	20+	34+

validated by experts. Scoring of each item was done using a self-rated Likert scale from 0 (didn't apply to me) to 3 (mostly applied to me). Each score was multiplied by 2 to obtain the final score. Interpretation of scoring was done as follows-<sup>19</sup>

**Assessment tools** – Data was entered in Microsoft Excel Office 365. SPSS Version 21 was used for statistical analysis. Numerical data were expressed by mean value and categorical data as percentage or frequency. A comparison study for continuous data was done by t-test and for categorical data by Chi-square test. Any P value < 0.05 was considered statistically significant

**Results:**

The study was conducted on 150 health care workers among which female participants (n=76, 50.6%) were more than male participants (n=74, 49.4%) and all of them were aged 20 years and above. Male population were seen to be highest in the 31 to 40 years age group (22.7%) while the female and total population were highest in the 21 to 30 (33.3%) years age group. The least were in more the age group than 50 years [Table-1].

This study was conducted among different healthcare workers including doctors, nurses and others among which doctors were highest in numbers followed by nurses and others. More than 2/3<sup>rd</sup> of the study participants came from rural populations and nuclear families while the rest were from urban setups and joint families. Most of the participants (58.7%) had less than 10 years in their field of professional work. More than half of the participants did not receive the COVID training at or before the time of conduction of the study. Comorbidity was not present in more than 2/3<sup>rd</sup> of the study population. Among different comorbidities disclosed by the participants, hypertension was most frequent

**Table 1. Sex Distribution of study participants in different age groups.**

Age (years)	Male (n)	Male (%)	Female (n)	Female (%)	Total (n)	Total (%)
21 to 30	12	8	50	33.3	62	41.3
31 to 40	34	22.7	13	8.7	47	31.4
41 to 50	19	12.7	10	6.6	29	19.3
more than 50	9	6	3	2	12	8
Total	74	49.4	76	50.6	150	100

**Table 2. Frequency distribution of demographic factors among health care providers.**

Attribute (n)	Frequency	Percentage
Profession (n=150)		
Doctor	81	54
Nurse	40	26.7
Other	29	19.3
Home (n=150)		
Rural	102	68
Urban	48	32
Family type (n=150)		
Nuclear	102	68
Joint	48	32
Duration of service (n=50)		
<10 years	88	58.7
10-20 years	43	28.7
20-30 years	16	10.6
>30 years	03	02
COVID training (n=150)		
Received	64	42.7
Not received	86	57.3
Comorbidity (n=150)		
Present	43	28.7
Not present	106	70.7
No comment	01	0.6
Types of comorbidities (n=43)		
Hypertension	20	46.5
Asthma	8	18.6
Dyslipidaemia	7	16.3
Hypothyroidism	6	14
Diabetes mellitus	3	07
Hyperuricemia	3	07
COPD	2	4.7
Gastric ulcer	1	2.3

**Table 3. Frequency distribution of attitude and practice (daily working hours, hand washing, sanitization, covid test).**

Attribute (n)	Frequency	Percentage
Daily working hours (n=150)		
<6 hours	15	10
6 to 12 hours	14	9.3
>12 hours	121	80.7
Frequent hand washing (n=150)		
Yes	144	96
No	06	4
Frequent sanitization (n=150)		
Yes	143	95.3
No	07	4.7
COVID test done (n=150)		
Yes	37	24.7
No	113	75.3
COVID test status (n=37)		
Positive	02	5.4
Negative	35	94.6
COVID +ve family member (n=150)		
Present	17	11.3
Absent	133	88.7
Isolation by society (n=150)		
Yes	22	14.7
No	128	85.3
Proud as Healthcare worker (n=150)		
Yes	139	92.7
No	11	7.3

**Table 4. Depression, anxiety and stress among study participants.**

	Absent	Mild	Moderate	Severe	Extremely severe
Depression	98(65.3%)		23(15.3%)	5(3.3%)	0
Anxiety	74(49.3%)		33(22%)	12(8%)	18(12%)
Stress	98(65.3%)	23(15.3%)	23(15.3%)	6(4)	0

**Table 6. Comparison of prevalence of depression, anxiety and stress during COVID 19 among different worldwide studies with the present study.**

Study area	Sample size	Male: Female	Depression	Anxiety	Stress
Nine Eastern Mediterranean Region (EMR) countries <sup>1</sup>	1448	51.2: 48.8	57.5%	59.1%	42%
United Arab Emirates <sup>11</sup>	400	15.5: 84.5	76.5%	78.8%	63.5%
Egypt <sup>13</sup>	270	43: 57	92.9%	--	--
Italy <sup>14</sup>	214	84: 130	28.5% in frontline & 16.4% in second line workers	21.4 in frontline & 14.5% in second line workers	33.4% in frontline & 14.5% in second line workers
Jordan <sup>15</sup>	365	44.4 : 55.6	40% extremely severe	60% extremely severe	35% extremely severe
Saudi Arab <sup>12</sup>	283	--	17%	32%	17%
Turkey <sup>21</sup>	442	43.2 : 56.8	64.7%	51.6%	41.2%
India <sup>20</sup>	254	66.1 : 33.9	60.2%	50.4%	13%
Present study	150	49.4 : 50.6	34.7%	50.7%	34.7%

**Table 5. Frequency distribution of depression, anxiety and stress among based on different parameters.**

	No depression (n/%)	De-pression (n/%)	No anxiety (n/%)	Anxiety (n/%)	No stress (n/%)	Stress (n/%)
<b>Gender (n=150)</b>						
Male	51 (68.9)	23 (31.1)	43 (58.1)	31 (41.9)	52 (70.3)	22 (29.7)
Female	47 (61.8)	29 (38.2)	31 (40.8)	43 (59.2)	46 (60.5)	28 (39.5)
<b>Age in years (n=150)</b>						
21 to 30	33 (53.2)	29 (46.8)	24 (38.7)	38 (61.3)	37 (59.7)	25 (40.3)
31 to 40	31 (66)	16 (34)	26 (55.3)	21 (44.7)	30 (63.8)	17 (36.2)
41 to 50	24 (82.8)	05 (17.2)	18 (62)	11 (38)	20 (69)	09 (31)
more than 50	10 (83.3)	02 (16.7)	06 (50)	06 (50)	11 (91.6)	01 (8.4)
<b>Profession (n=150)</b>						
Doctor	57 (70.4)	24 (29.6)	50 (61.7)	31 (38.3)	53 (65.4)	28 (34.6)
Nurse	24 (60)	16 (40)	17 (42.5)	23 (57.5)	26 (65)	14 (35)
Other	17 (58.6)	12 (41.4)	07 (24.1)	22 (75.9)	19 (65.5)	10 (34.5)
<b>Comorbidity (n=149)</b>						
Present	30 (69.8)	13 (30.2)	24 (45.3)	19 (54.7)	31 (72)	12 (28)
Not present	68 (64.2)	38 (35.8)	50 (47.2)	56 (52.8)	67 (63.2)	39 (36.8)
<b>COVID training (n=150)</b>						
Received	42 (65.6)	22 (34.4)	31 (48.4)	33 (51.6)	45 (70.3)	19 (29.7)
Not received	56 (65.1)	30 (34.9)	43 (50)	43 (50)	53 (61.6)	33 (38.4)
<b>COVID test done (n=150)</b>						
Yes	26 (70.3)	11 (29.7)	17 (46)	20 (54)	23 (62.2)	14 (37.8)
No	72 (63.7)	41 (36.3)	57 (50.4)	56 (49.6)	76 (67.3)	37 (32.7)
<b>COVID +ve family member (n=150)</b>						
Present	14 (82.4)	03 (17.6)	06 (35.3)	11 (64.7)	07 (41.2)	10 (58.8)
Absent	84 (63.2)	49 (36.8)	68 (51.1)	65 (48.9)	90 (67.7)	43 (32.3)
<b>Daily working hours (n=150)</b>						
<6 hours	09 (60)	06 (40)	11 (73.3)	04 (26.7)	11 (73.3)	04 (26.7)
6 to 12 hours	80 (66.1)	41 (33.9)	56 (46.3)	65 (53.7)	78 (64.5)	43 (35.5)
>12 hours	09 (64.3)	05 (35.7)	07 (50)	07 (50)	09 (64.5)	05 (35.7)

followed by asthma, dyslipidemia, hypothyroidism, diabetes mellitus, hyperuricemia, COPD, and gastric ulcer [Table-2].

As a precautionary measure, study participants were mostly habituated to using the N95 mask (n=122), followed by PPE (n=84), surgical mask (n=33) and triple-layer mask (n=6). Area of work in the health care setup varied from fever clinic (n=69) to ICU (n=21), through isolation ward (n=32), COVID ward (n=24), and surgical ward (n=22). More than 3/4<sup>th</sup> of participants (80.7%) used to work for more than 12 hours in the healthcare setup. Almost all the participants practiced frequent hand washing (96%) and frequent sanitization (95.3%). COVID test was done in 24.7% among which most of them (94.6%) were COVID negative. COVID positive family members were present in 11.3% of participants. Most of the participants felt proud (92.7%) of being healthcare worker and were not isolated (85.3%) from society [Table-3].

After assessing the participants through the DASS 21 questionnaire, various degrees of depression, anxiety, and stress

were noted in 34.6%, 50.7%, and 34.6% of the participants respectively [Table-4].

The frequency of presence of depression, anxiety, and stress among different demographic groups and COVID issues have been expressed in Table- 5.

The proportion of study participants having depression differs significantly in statistics by age (p=.022).

The proportion of study participants suffering from anxiety disorder did differ significantly in statistics by occupation (p=.000998) and gender (p=.034).

The proportion of study participants under some degree of stress did differ significantly in statistics by presence of COVID positive family members (p=.03).

**Discussion :**

All the healthcare workers are serving their duties in this COVID pandemic period. In a peripheral district medical college, they are fighting the situation by staying away from home for a long time. This may be a key factor in the psychological impairment of health care providers and has been reflected in our study. The prevalence of depression, anxiety, and stress noted in this study is 34.7%, 50.7%, and 34.7% respectively. Though the prevalence of stress and depression are more or less similar to previous studies, that of anxiety has significantly increased.<sup>6</sup> In terms of the prevalence of stress, our result is much lower than the study conducted in China where stress was noticed in 69% of participants.<sup>20</sup> This study has similar findings as that conducted on HCWs of nine EMR countries, Turkey and India while in UAE, Egypt, and Jordan there was a higher prevalence of depression, anxiety, and stress.<sup>1,11,13,15,21,22</sup> In comparison, Saudi Arabian and Italian study populations showed much less affection for mental health due to COVID-19<sup>12,14</sup> [Table-6]. Lockdown, restricted outdoor activities, altered sleep patterns, and high workload may be precipitating factors for a marked

increase in anxiety.<sup>23</sup> According to our study, the degree of depression and stress due to COVID-19 is 8% and 26% higher than those due to MERS.<sup>8</sup> In a Saudi Arabia-based study, it was suggested that 41% of health care workers were more worried about COVID-19 than MERS COV endemic which supports our result.<sup>24</sup>

Our study revealed nurses and other health care workers are suffering from depression and anxiety more than doctors whereas the prevalence of stress is almost similar for all professions. Females are more depressed, anxious, and stressed than males according to our study. All three parameters are significantly higher in the younger age group (20 to 30 years). Hypertension is the most noticed comorbidity among study participants. Levels of depression and stress are more among those who have some comorbidity. Those who have some friends or family members positive for COVID-19 are more stressed than others which is supported by another Saudi Arabia-based study.<sup>24</sup> Our study revealed that increased daily working hours is responsible for an increased degree of anxiety and stress. The present study also revealed a statistically significant correlation between depression and age, anxiety, and occupation - gender, stress, and COVID positive family history.

The present study has a limitation as a more extensive study with even a larger sample size comprising of an equal population of doctors, nurses, and other health care workers would have yielded a more generalizable result.

#### Conclusion :

To conclude, the present study highlights the fact of emerging concern of mental health challenges among doctors, nurses and other health care providers supporting the view of other authors.<sup>25</sup> Inadequate supply of PPE and other infrastructures may also have aggravated the situation like in other countries.<sup>26</sup>

#### Financial Support: Self

**Conflict of Interest:** None declared.

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