

Impact of COVID-19 pandemic on mental health of health-care workers in a tertiary care teaching and dedicated COVID-19 hospital

ABSTRACT

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Aim: We aimed to assess the consequences of dealing with patients during the COVID-19 pandemic lockdown period on the mental state of health-care workers. **Materials and Methods:** An anonymous online survey was conducted with 353 participants using a self-made questionnaire comparing the prevalence of low mood, apprehension, tension, and coping skills used and the Depression, Anxiety, and Stress Scale-21. The data were analyzed to compare the mental health of male and female doctors. To identify predictors of mental health outcomes, a multivariate logistic regression was carried out. **Results:** Both men and women were almost equally affected in terms of developing features of low mood, with easy physical and mental exhaustion. While the feeling of being isolated and irritability was slightly higher in females, both sexes were equally affected by the media. It was observed that the prevalence of smoking (tobacco/marijuana, etc.) had increased in both with slightly higher percentage in males as compared to females while there was a considerable increase in caffeine and alcohol consumption in males. The sleeping pattern and appetite were equally affected in both sexes. The sexual drive was also altered in both male and female residents, but the change was considerably more in males. The significant predictors of anxiety were age, depression, mental exhaustion, burden of increased quantity of work, and feeling of having no choice but to work due to obligation. **Conclusion:** Both male and female doctors working during the COVID-19 pandemic developed anxiety and depression. While substance use and altered sexual drive were more in males, exhaustion and stress were more in females.

Keywords: COVID-19, health-care workers, mental health, pandemic

A global pandemic is bound to cause fear and concern among many and affect the well-being of most individuals, directly or indirectly. Due to the serious and adverse effects that are anticipated, the lives of family members and friends, especially the infected or immunocompromised ones, are at stake.

Moreover, pandemics are not just a medical phenomenon but have the potential of causing disruptions at many levels in the society. The adverse effects on society include

stigmatization of infected individuals, their caregivers and also those who come in contact with them. Xenophobia also rears its head. As concern over the perceived threat grows, it may start having an impact on the mental health of individuals. This is most pronounced in those who are directly dealing with the patients or working in a hospital environment. The neuropsychiatric linkage between an outbreak of acute respiratory infections and mental

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illnesses dates back to the outbreak of influenza and severe acute respiratory syndrome (SARS) that was years ago. Individuals undergoing quarantine are reported to feel bored, angry, and lonely. Previous studies on SARS and Ebola reveal a severity in emotional distress during the outbreaks of such epidemics. The situation with COVID-19 is no different and has a huge impact on mental health of health-care workers (HCWs).^[1-3] While the majority of the population was under a lockdown, the doctors had to continue working. Despite following all the precautions and maintaining social distancing, there is an uncertainty of the risk of exposure associated with working in a hospital. This caused psychological stress especially because colleagues were getting infected. Prevalent mental health problems among the affected individuals include depression, anxiety, mood disorders, psychological distress, posttraumatic stress disorder, insomnia, fear, stigmatization, low self-esteem, lack of self-control, and other adverse mental health outcomes or re-appearance of previous mental health issues. How we as a society manage and deal with the psychological and social impacts of this uncertainty and crisis is critical.^[4,5]

Autonomy refers to the perceptions of control that we have over our behavior. A lack of control over decision-making can be perceived as a stress. For good mental health, it is essential to recognize these triggers and cope with them in healthy ways. Often, doctors feel valued by this ability to make decisions for others in terms of health. It is inevitable to our well-being to take charge of self-care during this tough phase and build a healthy lifestyle and encourage those around us to do the same. Raising public awareness, media and social media engagement, and advocacy around the pandemic could also be helpful to doctors to enhance the sense of autonomy. Maintaining social connections and activities can also help. Belonging encompasses the human need to connect with others in order to feel valued and supported. A combined purpose underpins a certain sense of belonging, but mutual concern for the well-being of all team members is also essential, especially under current circumstances. Even brief conversations, especially with those who are in a similar situation like your colleagues, can be beneficial. Asking them how they are coping or just recognizing their efforts and some light or casual conversation are most likely to benefit both. If it is possible, team meetings should be encouraged. Doctors are often disinclined to avail of the psychiatric counseling that is available to them, but it is especially important to do so under the present current conditions. Competence refers to the belief that we are able to complete personally challenging tasks. The initial stages of the pandemic are most likely to be extremely overwhelming for many people owing to the uncertainty, but trying to identify what can be achieved realistically in the given time frame can be of help.

The drive to achieve a sense of accomplishment extends beyond the workplace, so it is vital to maintain a healthy balance in work-life along with healthy relationships and pursue personal interests as well.

Within this pandemic, it is all too easy to focus wholly on the needs of patients, but for the strategies to work, you must prioritize your self-care and practice self-compassion. This means that we have to be just as understanding and empathetic as we are to others and recognizing any feelings of inadequacy or personal shortcomings being maximized should be understood and a nonjudgmental and balanced approach should be followed for any negative emotions that are being experienced by self. Sadly, adding to the unpreparedness of even the most developed nations, medical science and research has been the failure to address the mental health aspect of public as most efforts have been focused on understanding the pathology and epidemiology of the illness, clinical features, patterns of transmission, and management of physical symptoms of COVID-19. The medical teams should be able to convey reliable and uniform information about the prevalence of the COVID-19 and the treatment protocols. In addition, regular information on progress of hospitalized individuals should be provided to both the patients and their families.^[6] The government and health organizations should ensure secure electronic information sharing platforms are used to provide and promote tele- psychiatry and psychological counseling. This can promote well-being and help early identification of psychiatric disorders. In order to reduce the cognitive effects of the pandemic, another strategy could be to provide therapy which is time bound to those exhibiting any signs of mental illness. Based on the model of stress adaptation, these psychotherapeutic strategies could be combined with person-focused therapy to face the situations which could include behavioral modifications, recognition, and correction of cognitive distortions.^[7] Not many studies have been carried out in this area which prompted us to undertake a study to assess the impact on mental health of HCWs during the COVID-19 pandemic.

MATERIALS AND METHODS

This cross-sectional study was carried out on HCWs involved in taking care of COVID-19 patients at a dedicated COVID-19 tertiary care hospital attached to a medical college in western Maharashtra. The proposal for the study was approved by the institutional ethical committee. The duration of the study was from April 2020 to July 2020.

A web-based anonymous, voluntary cross-sectional survey was conducted using Google Forms (including

informed consent) to assess the consequences of the pandemic on HCWs. The participants were assured of the confidentiality of the information. The survey was conducted with 353 participants including interns, resident doctors, and practitioners from all clinical and paraclinical departments during the first wave of COVID-19 in India. The study compares the impact on male and female HCWs. The Depression, Anxiety, and Stress Scale-21 (DASS-21) was used as a standard scale, and a questionnaire was created keeping in mind the specific difficulties faced during the pandemic. The DASS-21 comprises three self-report scales that measure depression, anxiety, and stress. The self-made questionnaire that has been used compares the prevalence of feeling low, apprehensive, tense, and the coping skills used by HCWs to overcome the same during the initial and uncertain phase of the pandemic when most of the areas were under lockdown. The primary outcome was the prevalence of depression, stress, and anxiety among all HCWs. The secondary outcomes were comparison of the prevalence of depression, anxiety, and stress and mean DASS-21 score and self-questionnaire scores between female and male care workers.

Statistical analysis

The collected data from the questionnaire and DASS-21 were analyzed using SPSS software (IBM, Chicago, IL, USA) utilizing Chi-square test, Fisher's test, and Mann-Whitney U-test. Multivariable regression was used to identify the predictors of anxiety, depression, and stress.

RESULTS

The mean ($\pm$ standard deviation) of age of the participants was 30.32 ($\pm$ 9.63) years. The range of age was 22 years to 69 years. Marital status showed that 263 were unmarried and 90 were married. There were 174 males and 179 females. Out of the sample, 232 were directly dealing with

COVID-19 patients. The prevalence of stress, anxiety, and depression in both sexes calculated using the DASS-21 is given in Table 1 and Figure 1. The distribution of stress, anxiety, and depression in male and female doctors is given in Table 2 and Figure 2. Although the male doctors had higher mean scores on depression, anxiety, and stress than female doctors, the differences were not significant [Table 1]. In terms of depression, according to

Table 1: Scores obtained by male and female doctors on Depression, Anxiety, and Stress Scale

	Mean $\pm$ SD		MW test	P
	Male (n=174)	Female (n=179)		
Depression	6.25 $\pm$ 4.42	5.72 $\pm$ 5.15	13732.00	0.052 (NS)
Anxiety	5.99 $\pm$ 4.24	5.18 $\pm$ 3.46	14105.00	0.121 (NS)
Stress	9.95 $\pm$ 5.76	8.60 $\pm$ 6.20	13034.00	0.008 (NS)

NS – Not significant; SD – Standard deviation; MW – Mann-Whitney

Table 2: Distribution of male (n=174) and female (n=179) doctors with and without depression, anxiety, and stress on the Depression, Anxiety, and Stress Scale

	Male, n (%)	Female, n (%)	Chi-square test	P
Depression				
Present	45 (25.86)	37 (20.67)	1.334	0.248 (NS)
Normal	129 (74.14)	142 (79.33)		
Anxiety				
Present	67 (38.51)	53 (29.61)	3.113	0.078 (NS)
Normal	107 (61.49)	126 (70.39)		
Stress				
Present	28 (16.09)	20 (11.17)	1.817	0.178 (NS)
Normal	146 (83.91)	159 (88.83)		

NS – Not significant

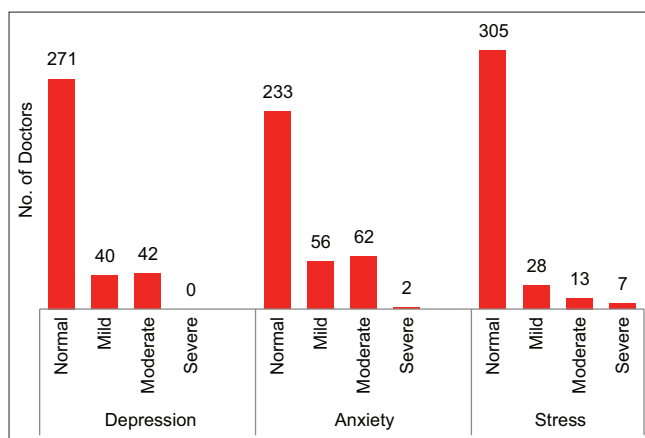


Figure 1: Prevalence of stress, anxiety, and depression in doctors

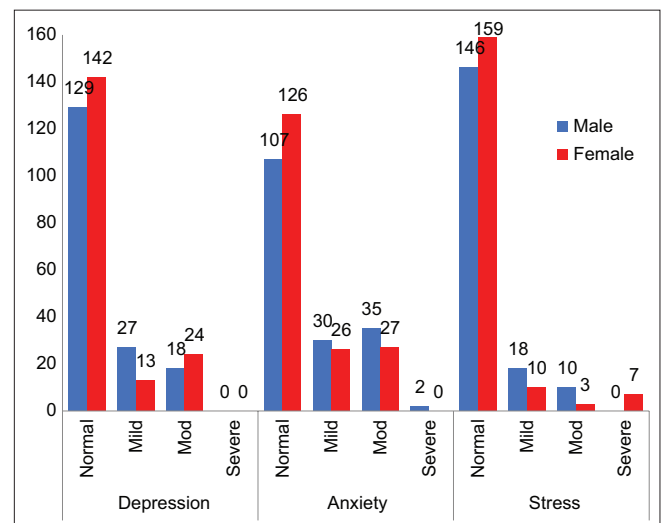


Figure 2: Distribution of depression, anxiety, and stress in male and female doctors

Table 3: Comparison of answers to the self-made questionnaire by male (n=174) and female (n=179) doctors

Questions	Total, n (%)	Male, n (%)	Female, n (%)	χ^2	P
Tension					
Lack knowledge about infectivity and virulence	146 (41.3)	81 (46.55)	65 (36.31)	3.81	0.051 (NS)
Lack of knowledge about protection and prevention from infection	127 (35.9)	72 (41.38)	55 (30.73)	4.347	0.037 (S)
Hesitation to work	221 (62.6)	105 (60.34)	116 (64.81)	0.749	0.487 (NS)
Feeling of being avoided by others	183 (51.8)	89 (51.15)	94 (54.02)	0.041	0.839 (NS)
Feeling of having no choice but to work due to obligation	207 (58.6)	99 (56.90)	108 (60.34)	0.430	0.511 (NS)
Burden of change of quality of work	272 (77)	140 (80.46)	132 (75.86)	2.251	0.133 (NS)
Burden of increased quantity of work	209 (59.2)	100 (57.47)	109 (60.89)	0.428	0.513 (NS)
Feeling of being protected by hospital	250 (70.8)	136 (78.16)	114 (63.69)	8.95	0.003 (S)
Feeling of being protected by national or local government	260 (73.6)	131 (75.29)	129 (72.07)	0.472	0.492 (NS)
Apprehension					
Anxiety about being infected	343 (97.1)	174 (100)	169 (94.41)	0.0017*	<0.05 (S)
Anxiety about you infecting family/coworkers/housemates	342 (96.8)	174 (100)	168 (93.86)	0.0008*	<0.05 (S)
Anxiety about your family members being infected	342 (96.8)	174 (100)	168 (93.86)	0.0008*	<0.05 (S)
Experiencing panic attacks	118 (33.4)	53 (30.46)	65 (36.31)	1.358	0.244 (NS)
Irritability or anger outbursts or excessive ranting	237 (77.3)	114 (65.52)	123 (68.72)	0.409	0.522 (NS)
Distress					
Is the news affecting you	321 (90.9)	162 (93.10)	159 (88.83)	1.958	0.162 (NS)
Motivation to work decreased	341 (96.6)	174 (100)	167 (93.30)	0.0004*	<0.05 (S)
Physical exhaustion	264 (74.7)	128 (73.56)	136 (75.98)	0.273	0.601 (NS)
Mental exhaustion	306 (86.6)	152 (87.36)	154 (86.03)	0.134	0.715 (NS)
Feeling isolated	239 (67.7)	118 (67.82)	121 (67.60)	0.002	0.965 (NS)
Feeling of helplessness and/or impending doom	222 (62.8)	100 (57.47)	122 (68.16)	4.316	0.038 (S)
Coping					
Change in sleeping pattern	269 (76.2)	136 (78.16)	133 (74.30)	0.725	0.395 (NS)
Change in appetite (increase/decrease)	246 (69.6)	124 (71.26)	122 (68.16)	0.404	0.525 (NS)
Altered (increase/decrease) sex drive	183 (51.8)	105 (60.35)	78 (43.58)	9.938	0.002 (S)
Coping by healthy habits such as exercising, painting, and cooking	309 (87.5)	156 (89.66)	153 (85.47)	1.413	0.235 (NS)
Increased alcohol consumption	73 (20.6)	48 (27.59)	25 (13.97)	9.978	0.002 (S)
Increased/decreased consumption of caffeine	210 (59.4)	114 (65.52)	96 (53.63)	5.172	0.023 (S)
Increased smoking	79 (22.3)	50 (28.74)	29 (16.20)	7.980	0.005 (S)

*Fisher's exact test. S – Significant; NS – Not significant

Table 4: Multiple regression analysis for predictors of anxiety: Coefficients^a

Model 5	Unstandardized coefficients		Standardized coefficients (β)	t	Significant	95.0% CI for B (lower bound-upper bound)	Collinearity statistics	
	B	SE					Tolerance	VIF
Constant	3.751	0.583		6.433	0.000	2.604-4.897		
Depression	0.757	0.072	0.476	10.508	0.000	0.616-0.899	0.981	1.020
Mental exhaustion	1.030	0.254	0.232	4.058	0.000	0.531-1.530	0.615	1.627
Burden increased quantity of work	-0.827	0.274	-0.174	-3.021	0.003	-1.365--0.288	0.606	1.650
Age	-0.608	0.270	-0.102	-2.247	0.025	-1.139--0.076	0.986	1.014
Having no choice but to work due to obligation	0.505	0.240	0.116	2.103	0.036	0.033-0.977	0.656	1.524

^aDependent variable: Anxiety; VIF – Variance inflation factor; CI – Confidence interval; SE – Standard error

DASS-21, the prevalence was 25.86% in males and 20.67% in females. Similarly, the distribution of male and female doctors scoring higher than cutoffs on anxiety and stress was not significantly different [Table 2].

It was found that 75% of men and 6% of women complained of easy fatigability according to the self-made questionnaire. While calculating tension, it was seen that

41% of men and 30% of women had tension regarding lack of knowledge about protection and prevention from infection, and the stress related to the protection from workplace was significantly more in males. According to the self-made questionnaire, apprehension was observed to be more in males with significantly more prevalence of anxiety about being infected themselves, infecting the family members, or them being infected. It was observed

Table 5: Multiple regression analysis for predictors of depression: Coefficients^a

Model 3	Unstandardized coefficients		Standardized coefficients (β)	t	Significant	95.0% CI for B (lower bound-upper bound)	Collinearity statistics	
	B	SE					Tolerance	VIF
Constant	2.924	0.404		7.243	0.000	2.131-3.718		
Anxiety	0.296	0.028	0.470	10.597	0.000	0.241-0.351	0.992	1.008
Coping by healthy habits	0.309	0.126	0.109	2.447	0.015	0.061-0.557	0.987	1.014
Alcohol	-0.278	0.125	-0.098	-2.218	0.027	-0.524--0.032	0.994	1.006

^aDependent variable: Depression. VIF – Variance inflation factor; CI – Confidence interval; SE – Standard error

Table 6: Multiple regression analysis for predictors of stress: Coefficients^a

Model 5	Unstandardized coefficients		Standardized coefficients (β)	t	Significant	95.0% CI for B (lower bound-upper bound)	Collinearity statistics	
	B	SE					Tolerance	VIF
Constant	0.604	0.125		4.816	0.000	0.357-0.851		
Feeling isolated	0.227	0.053	0.236	4.297	0.000	0.123-0.331	0.644	1.554
Hesitation to work	0.142	0.056	0.137	2.534	0.012	0.032-0.252	0.664	1.505
Alcohol	0.164	0.041	0.177	3.954	0.000	0.082-0.245	0.971	1.030
Irritability	0.157	0.046	0.167	3.386	0.001	0.066-0.248	0.800	1.250
Anxiety about being infected	0.170	0.062	0.154	2.754	0.006	0.049-0.292	0.623	1.605

^aDependent variable: Stress. VIF – Variance inflation factor; CI – Confidence interval; SE – Standard error

that the prevalence of smoking (tobacco/marijuana, etc.) was increased in both sexes being 29% and 16% in males and females, respectively, which was a faulty coping skill. There was decreased motivation to work in both sexes but more in men. A feeling of helplessness and/or impending doom was present significantly more in females. This could be attributed to underlying fears about not knowing the initial protocols and lack of knowledge about the illness. Both sexes were equally affected by the media that is around 90% in total. The sleeping patterns were altered in 76.8% of total subjects while 70% complained of a change in eating habits with no significant difference between the two sexes [Table 3]. A multiple regression was run to predict anxiety from age, depression, mental exhaustion, burden of increased quantity of work, and feeling of having no choice but to work due to obligation. These variables statistically significantly predicted anxiety, $F(5, 347) = 29.967, P < 0.05$ [Table 4]. Another multiple regression was run to predict depression from anxiety, coping by healthy habits, and increased alcohol consumption. These variables statistically significantly predicted depression, $F(5, 347) = 42.888, P < 0.000, R^2 = 0.251$. All the variables added statistically significantly to the prediction, $P < 0.05$ [Table 5]. A final multiple regression was run to predict stress from feeling of isolation, hesitation to work, increased use of alcohol, irritability, and anxiety. These variables statistically significantly predicted depression, $F(5, 347) = 33.785, P < 0.000, R^2 = 0.327$. All the variables added statistically significantly to the prediction, $P < 0.05$ [Table 6].

DISCUSSION

A major finding of the study was that while 16%, 26%, and 39% of men showed significant stress, depression, and anxiety, the percentages in women were 11%, 21%, and 30%, respectively. Although the prevalence was higher in men, none of the differences were statistically significant. Sleep disturbance was reported by 76% of the sample. The prevalence of depression and anxiety was much less than a similar study in China, but sleep disturbance was much more and distress was similar to the study done at Wuhan.^[8] Further, in the Chinese study, women reported more severe symptoms of anxiety and depression which was contrary to our findings.^[8] On the other hand, a study in Singapore reported that anxiety was detected in 14.5%, depression in 8.9%, and stress in 6.6% of HCWs which is considerable lower than our findings.^[9] The differences could be due to the studies being carried out during different phases of the pandemic.

Doctors working in an epidemic of infectious disease develop complicated psychological responses. There are myriad sources of distress including fear of contacting the disease, awareness of exposure and susceptibility to infection, loss of control, changes in work and concerns about health of self, health of family, and significant others. HCWs in emergency and who are directly in contact with COVID-suspected and COVID-positive cases were much more likely to be distressed. The apprehension about being infected, infecting their family members, or their family being infected was present in 100% of males and 93.8% of females. This is quite understandable since doctors

are more exposed to infection and there is real danger of infecting their family members. A feeling of helplessness and/or impending doom was present significantly more in females. This could be attributed to underlying fears about not knowing the initial protocols and lack of knowledge about the illness. Both sexes were equally affected by the media that is around 90% in total. COVID-19 is a deadly pandemic and therefore the media coverage is inherently negative. Research on effects of media exposure has clearly proved that negative news may cause mild-to-severe mental health problems among consumers. Frequent and repeated exposure to negative news about COVID-19 is positively associated with psychological distress and depression.^[10] Further, due to the enormity of COVID-19 pandemic, media attention has been disproportionately focused on negative pandemic-related news, while positive news is given short shrift. Unquestionably, for television, television rating points are all important, but the media should not forget its social responsibility and sacrifice everything in search of the most sensational news.

Another factor that was associated with anxiety/depression was fear of being unprotected, which is plausible. The predictors of anxiety, depression, and stress give us some clues to combat the distress and improve coping strategies. Coping strategies are of two kinds: problem-solving strategies and emotion-reducing strategies. However, they are not always adaptive. Using maladaptive coping strategies reduces the initial stress by altering the emotional response to stressful circumstances but leads to greater difficulties and illnesses in the long term. Maladaptive coping strategies include the following: use of alcohol or unprescribed drugs and deliberate self-harm. In the present study, it was seen that there was a significant rise in consumption of alcohol and smoking in both sexes, more so in males. Thus, it was evident that maladaptive coping strategies were used by a considerable number of the study group. On the other hand, it was found that healthy coping strategies had a direct correlation with better outcomes. It is obvious that mental health of doctors would improve by inculcating healthy coping strategies.

As the number of people affected by COVID-19 continues to increase, the psychiatric profession – particularly in Asia – is facing both a challenge and an opportunity, the challenge of addressing the numerous barriers and limitations being the opportunity to implement those suggestions or recommendations which are feasible at a local or regional level. With reference to more specific therapeutic strategies, proposals include the development of teams of specialists qualified to address emotional distress, the training of community health personnel in basic aspects of mental health care, the use of online surveys to assess the scope of mental health problems, the development of online materials for mental health

education, the provision of online counseling and self-help services, the use of structured letters as a form of asynchronous telepsychiatry consultation, the development of synchronous telemedicine services for diagnostic purposes as well as counseling, and the need to make online mental health services accessible to all individuals.

Limitations

The study has several limitations. First, the sample was collected online and no interviews were conducted face to face, hence the accuracy of the information provided cannot be determined. Furthermore, it was during the first wave of the pandemic, and because of the increasing workload and arduous situation, the mental health symptoms could become more severe in doctors. Third, this study was unable to distinguish the association of symptoms with any previous mental health symptoms versus new ones. And fourth, the replies could be biased depending on the settings that the questionnaire was filled in, that is no stress or highly stressful environment at that time.

CONCLUSION

Owing to the increased exposure to the virus, there is a fear in the frontline doctors, nurses, and HCWs of contacting the infection themselves. They worry about bringing the virus home and passing it onto loved ones and family members is significant. The stress is mostly associated with the transmission of infection to family members or lack of information regarding the illness. While it has been a significant stressor for causing feelings of helplessness, irritability, and worrying thoughts, there is a direct correlation between the type of coping used and the outcome of illness. Doctors are often reluctant to take the formal support that is available to them, but awareness should be created as professional help is extremely important in such crucial times.

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Conflicts of interest

There are no conflicts of interest.

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