



THE STUDY OF PSYCHOLOGICAL IMPACT OF COVID-19 ON HEALTHCARE PROFESSIONALS AND GENERAL POPULATION IN INDIA

Deshmukh Rohit P. *	Resident Department of Psychiatry, Grant Govt. Medical college and Sir JJ Group of Hospitals, Mumbai, Maharashtra. *Corresponding Author
Mane Astik B.	Assistant Professor Department of Psychiatry, HBT Medical College & Dr. R. N. Cooper Mun. Gen. Hospital, Mumbai, Maharashtra.
Miskin Tejaswini S.	Resident Department of Psychiatry, Grant Govt. Medical college and Sir JJ Group of Hospitals, Mumbai, Maharashtra.
Singh Shachi	Assistant Professor Department of Psychiatry, Grant Govt. Medical college and Sir JJ Group of Hospitals, Mumbai, Maharashtra.

ABSTRACT

Introduction- Covid 19 pandemic is having a psychological impact not only on the frontline healthcare worker but also on the general population. The comparative data on psychological impact of covid 19 pandemic on healthcare professional and general population is limited.

Objective: To study the psychological impact of covid-19 pandemic on healthcare workers and general populations and also comparing the results between the two groups.

Material and Methods: A cross sectional study was conducted on 840 consecutive participants according to inclusion/exclusion criteria. The participants were assessed using semi-structured sociodemographic details, medical history proforma and Depression Anxiety Stress Scales-21 (DASS- 21) using digital platform (Google Forms). Chi-square test and Independent Samples Mann-Whitney U test were used to explore association between these aspects.

Results: The significant difference was found between the two groups i.e. the healthcare professionals and general population in the prevalence of stress ($P=0.033$) with level higher among the healthcare workers. The healthcare professionals, who were involved in direct care of covid 19 patients were found to have significantly higher level of stress ($P= 0.006$) and anxiety ($P=0.002$) than those who were not directly involved.

Conclusion: Study reveals that significant difference was found in prevalence of stress among healthcare workers but the prevalence of depression and anxiety was not significantly different among the two. Significant difference was found in prevalence of anxiety and stress in healthcare workers involved in the care of Covid-19 patients and the healthcare professionals not involved. Psychological intervention may be considered for the healthcare professionals involved covid-19 patients.

KEYWORDS : Depression, stress, anxiety, DASS-21, healthcare workers, general population.

1. INTRODUCTION:

Since December 2019, there has been an outbreak of pneumonia which has an unknown aetiology and was first reported in Wuhan, Hubei Province, China.^[1] After a few days of this outbreak, a novel coronavirus was identified as the causative virus for the pandemic in the world and was labelled as, SARS-CoV-2, by the World Health Organization (WHO).^[2] The World Health Organization (WHO) declared the COVID-19 outbreak an international public health emergency on January 30, 2020, and a pandemic on March 11, 2020.^[3,4] By February 2020 positive cases were also reported in India. Increasing menace of the epidemic led to a global atmosphere of anxiety and depression due to disrupted travel plans, social isolation, overloaded media information, and panic buying of essential commodities.^[5]

Widespread outbreaks of infectious diseases, like the COVID-19 pandemic, are associated with psychological distress and symptoms of mental illness.^[6] As the number grows, more and more psychological symptoms are being reported in people who are directly or indirectly related to COVID-19 patients. Healthcare professionals, in turn may increasingly find themselves involved in the care of patients with the novel COVID-19 virus. All these have thrown an unpredicted challenge to psychological health across all settings in India. The current situation may open the door to interactions between stress, anxiety, depression, sleep and appetite disturbances as well as substance misuse ranging from mild to severe to receive any Mental health support. Separation from loved ones, the loss of freedom, uncertainty over disease status and boredom can, on occasion has created dramatic effects. Suicide has also been reported.^[7,8]

Since the outbreak, response efforts by the Indian government have been swift, and weeks into the epidemic, in an unprecedented move to retard the spread of the virus, a lockdown was imposed in India on 25th March, with travel restrictions. Many stayed at home and socially isolated themselves to prevent being infected, leading to a "desperate plea".^[9] The ongoing COVID-19 pandemic is inducing fear, and an understanding of mental health status is urgently needed.^[10] Previous research has shown a profound and wide range of psychosocial impacts on people at the individual, community, and international levels during outbreaks of infection. On an individual level, people are likely to experience fear of getting infected or dying themselves, feelings of helplessness, and stigma.^[11] With the closure of schools and business, negative emotions experienced by individuals are compounded.^[12] The devastation caused by COVID-19 can be comparable to that caused by the 2003 SARS epidemic. The SARS epidemic caused >8000 infections and 800 deaths worldwide (in 26 countries).^[7,13] During the SARS outbreak, many studies were carried out to study the impact of an outbreak on the mental health of the community and revealed significant psychiatric morbidities to be associated with younger age and increased self-blame.^[14] Moderate-to-severe post-traumatic stress symptoms were also reported among the population in areas severely affected by the SARS epidemic.^[15] Risk factors such as being female were associated with a higher risk of developing SARS-related post-traumatic stress symptoms.^[15] Similarly, the effect of Ebola, MERS and H1N1 epidemics on mental health including depression, anxiety, and substance use have also been recorded.^[7]

To date, there are limited studies to show how severe the

impact of COVID-19 pandemic is on mental health. During the COVID-19 pandemic, it is imperative to understand how the population, especially those in the severely affected countries such as India, have been coping with such a major disaster. Therefore, this present study represents the psychological impact conducted in healthcare workers and the general population in India during the COVID-19 outbreak.

The aim of this study is to establish the prevalence of psychiatric symptoms, identify the risk and protective factors contributing to psychological stress. This may help government agencies and healthcare professionals in safeguarding the psychological wellbeing of the healthcare workers and community in the COVID-19 outbreak.

2. METHODS.

2.1 Samples:

We adopted a cross-sectional survey design to assess the public's immediate psychological response during the pandemic of COVID-19 by using an anonymous online questionnaire. A snowball sampling strategy, focused on recruiting the healthcare worker and general public during the epidemic of COVID-19, was utilized. The online survey was simultaneously disseminated to healthcare workers and the general population and they were encouraged to pass it on to others.

2.2 Procedure:

As the Indian Government recommended the public to minimize face-to-face interaction and isolate themselves at home, potential respondents were electronically invited by existing study respondents. They completed the questionnaires in English through an online survey platform (Google Forms). Expedited ethics approval was obtained from our Institutional Ethics committee. All respondents provided informed consent. Data collection took place over three days.

2.3 MATERIALS:

Sociodemographic data were collected on gender, age, education, residential location and employment status. Respondents were asked to distinguish themselves between healthcare professionals or the general population by choosing a correct option. Past history of any major medical illness like Diabetes, Hypertension etc. and past history of mental illness in self or in family was noted.

Mental health status was measured using the Depression, Anxiety and Stress Scale (DASS-21). DASS-21, is a self-report questionnaire consisting of 21 items, 7 items per subscale: depression, anxiety and stress. Patients are asked to score every item on a scale from 0 (did not apply to me at all) to 3 (applied to me very much). Sum scores are computed by adding up the scores on the items per (sub)scale and multiplying them by a factor 2. Sum scores for the total DASS-total scale thus range between 0 and 120, and those for each of the subscales may range between 0 and 42. Cut-off scores of 60 and 21 are used for the total DASS score and for the depression subscale respectively. These cut-off scores are derived from a set of severity ratings, proposed by Lovibond and Lovibond.^[16]

2.4 Data Analysis:

To analyze the differences in psychological impact, levels of depression, anxiety and stress, the Independent Samples Mann-Whitney U test was used to compare the mean score between the two groups. Percentages of response to other questions were calculated according to the number of respondents per response to the number of total responses of a question and presented as categorical variables. The chi-squared test was used to analyze the differences in categorical variables between the two groups. Statistical analysis was performed by Microsoft Excel.

3. RESULTS:

In our survey, a total of 840 people responded to the

questionnaire, out of which 40 participants were excluded from the study because of invalid responses. 126 participants with a history of mental health disorder in the past or present, or family history of mental health disorder were also excluded from the sample. The sample of population was urban only. Out of the remaining 674 participants, 343(51%) were healthcare professionals which included 184 males and 159 females. The remaining 331 (49%) participants were from the general population which included 181 males and 150 females.

Table 1: Comparison of sex wise distribution of healthcare professionals and general population.

	Profession		Total	Chi-Square Tests	Fisher's Exact Test
Sex	Healthcare professional	General Population		P-value	P-Value
Male	184	181	365	0.787	0.817
Female	159	150	309		
Total	343	331	674		

P-Value significant at <0.05

When gender based distribution was compared, there was no significant difference found in the distribution of males and females (P = 0.787) between the Healthcare professionals and general population. (See Table 1)

Table 2: Comparison of age distribution of healthcare professionals and general population.

	Profession	N	Mean	Std. Deviation	Std. Error Mean	P value
Age	Healthcare professional	343	29.13	6.184	0.334	<0.001
	General Population	331	32.95	10.454	0.575	

P-Value significant at <0.05

On comparing the age distribution between the two groups, the mean age of the healthcare professionals was 29.13 years, and that of the general population was 32.95 years and there was a significant difference seen (P < 0.001) using T-test in the age distribution. (See Table 2)

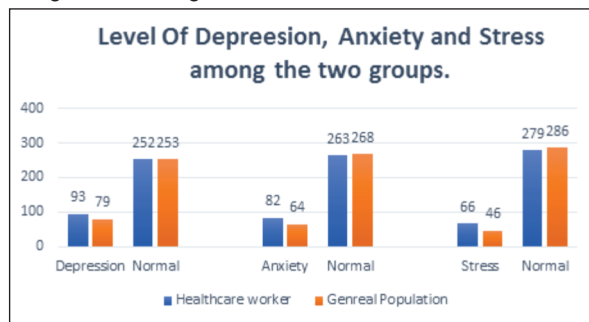


Figure 1: Level of depression, anxiety and stress between healthcare workers and general population as per DASS-21 score.

Table 3: Comparison of stress, depression and anxiety between the healthcare professionals and general population.

Independent Samples Mann-Whitney U Test			
Null Hypothesis	P- Value	Decision	Mean Rank
The distribution of stress is the same	0.033	Reject the null hypothesis	Healthcare professionals
across both the group of healthcare professionals and general population			347.68 General population 326.95

The distribution of depression is the same across both group of healthcare professionals and general population	0.279	Retain the null hypothesis	Healthcare professionals 343.11 General population 331.69
The distribution of anxiety is the same across both group of healthcare professionals and general population	0.141	Retain the null hypothesis	Healthcare professionals 339.40 General population 335.53

P-Value significant at <0.05

The prevalence of depression and anxiety was found to be the same between both the study groups i.e. the healthcare professionals and general population with P value for depression= 0.279 and for anxiety= 0.141. The significant difference was found between the two groups i.e. the healthcare professionals and general population in the prevalence of stress (P=0.033). (See Table 3)

Table 4: Sex- wise distribution of number of healthcare professional whether involved in direct care of covid19 patients or not.

Sex	Involved in direct care of covid patient		Total	Pearson Chi-Square (P-value)	Fisher's Exact Test
	Yes	No			
Male	79	105	184	0.181	0.186
Female	57	102	159		
Total	136	207	343		

P-Value significant at <0.05

No significant difference found in the distribution of males and females (P- value is 0.181) between the two groups and both the groups were comparable with respect to sex.(See Table 4)

Table 5: Comparison of Age of healthcare professionals between the two groups, those involved in direct care of covid 19 patients and those not involved.

Age	Involved in direct care of covid patient	Mean	Std. Deviation	Std. Error Mean	P value
Yes	136	29.455	6.006	0.515	0.427
No	207	28.913	6.303	0.438	

P-Value significant at <0.05

Among the healthcare professionals, on comparing the age distribution between those directly involved in the care of COVID patients and those who were not directly involved, no significant difference was found (P=0.427) and so both the groups were comparable with respect to age.(See Table 5)

Within the healthcare population(343,100%), amongst which healthcare professionals (136) who were directly involved in the care of COVID patients(positive/suspected), 27.2% (37)reported stress, 30.9%(42) reported depression and 30.9%(42) reported anxiety. Compared to them, among the 207 healthcare professionals who were not directly involved in the care of COVID patients(positive/suspected), 15%(31) reported stress, 24.6%(51) reported depression and 16.9%(35) reported anxiety.

Table 6: Comparison of stress, depression and anxiety between the two groups of healthcare professionals, those involved in direct care of covid 19 patients and those not

involved.

Independent Samples Mann-Whitney U Test			
Null Hypothesis	P-Value	Decision	Mean Rank
The distribution of stress is same in healthcare professionals involved in direct care of covid 19 patients and those not involved in direct care	0.006	Rejects the null hypothesis	HCP involved in care 184.68 HCP not involved in care 163.67
The distribution of depression is same in healthcare professionals involved in direct care of covid 19 patients and those not involved in direct care	0.142	Retain the null hypothesis	HCP involved in care 179.58 HCP not involved in care 167.02
The distribution of anxiety is same in healthcare professionals involved in direct care of covid 19 patients and those not involved in direct care	0.002	Rejects the null hypothesis	HCP involved in care 186.66 HCP not involved in care 162.37

P-Value significant at <0.05

On comparing the prevalence of depression, anxiety and stress between the two groups of healthcare professionals, those involved in direct care of covid 19 patients and those not directly involved by applying Independent Samples Mann-Whitney U Test ,the difference was significant for stress(P= 0.006) and anxiety (P=0.002) respectively, but not for depression(P=0.142). This shows that there was a higher level of stress and anxiety among those healthcare workers who were involved in care covid 19 patients.(See Table 6).

4. DISCUSSION:

The fact that COVID-19 is human-to-human transmissible⁽¹⁷⁾ and associated with high morbidity, and potentially fatal may intensify the perception of personal danger. Additionally, predictable shortages of supplies and an increasing influx of suspected and actual cases of COVID-19 contributes to the pressures and concerns of HealthCare workers.⁽¹⁸⁾ The spread of the virus, given the idea of how the Chinese health care system handled the disease, the deaths, problems and quarantines associated with it. Groups of various countries has also been closely monitoring the dreadful effects of COVID-19.⁽¹⁹⁾

In a study conducted in Italy, which was the first study to report on mental health outcomes related to COVID-19, and related lockdown measures on the general population showed relatively high rates of Depression, Anxiety, Insomnia, Perceived stress with young women. These outcomes were associated with risk factors like being under quarantine, having a family member affected with COVID 19 infection, staying home, discontinuation of work or other stressful events like economic constraints.⁽²⁰⁾

In another study, conducted at Wuhan, China which indicated that the increasing patient load and number of suspected cases, as well as countries affected by the outbreak, have elicited public worry about being infected in this outbreak, which has increased anxiety in public.⁽²¹⁾ However, the significant shortage of masks and disinfectants, the exacerbated news reporting, and information overload via social media have also contributed to provoke anxiety and fear.⁽²²⁾

A study amongst health care workers from two major tertiary

institutions at Singapore, in which 500 healthcare personnel including medical and nonmedical staff were invited out of which 470 participated. In addition to demographic and medical data, DASS-21 and IES-R instruments revealed which 68 (14.5%) participants screened positive for anxiety, 42 (8.9%) for depression, 31 (6.6%) for stress, 36 (7.7%) for significant PTSD. It was found that prevalence of anxiety was greater among non medical healthcare worker in spite of possible adjustment of confounders, than medical personnel (20.7% versus 10.8%; adjusted prevalence ratio, 1.85 [95% CI, 1.15 to 2.99]; $P = 0.011$).⁽²³⁾

In our Study, no significant difference was seen between the healthcare professionals and general population comparing the stress (P value = 0.053), depression (P value = 0.279) and anxiety (P value = 0.141). As the P value for stress was close to significance, however it is important to appreciate and evaluate the psychological impact of emerging cases of COVID-19. It is equally important to plan to alleviate such psychological burden to reduce the stress levels in healthcare workers as well as general population. A clearer understanding of these elements will facilitate to formulate interventions and implement strategies for enhancing psychological wellbeing of healthcare workers and general public to fight against this Pandemic.

A Survey was conducted in Taiwan, during SARS 2003 outbreak, which found out health care workers who were exposed to SARS infection were tended to experience depressive symptoms which might be due to poor healthcare support, social stigma due to isolation in society, economic challenges.⁽²⁴⁾ In our survey when we compared the levels of depression, anxiety and stress and the null hypothesis was tested using Mann-Whitney U test, the levels of depression (p value = 0.112), anxiety (p value = 0.002) and stress (p value = 0.004) among the healthcare professionals who were directly involved in care of COVID 19 patients and those who were not involved in COVID 19 patient care. Our study concluded that there were higher levels of anxiety and stress among those health workers who are directly involved in Covid 19 patient care. Reasons for this can be less preliminary medical information on outbreak and less intensive training on infection control measures, reduced availability of personal protective equipment, inadequate investigations for COVID-19, stressful working hours, fear of getting infected, poor accessibility for psychological first aid. The distress of healthcare care workers might have been increased during post duty quarantine period in order to avoid spread of infection.⁽²⁵⁾

5. Role of funding source:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sector.

6. Conflict of interest

None of the above authors have any conflict of interest to report.

7. Declarations of interest: none.

8. Acknowledgements

The content is solely the responsibility of the authors and does not necessarily reflect the official views of the institution. The authors thank the institution's resident doctors, doctors and general population who participated in this research. We also acknowledge with gratitude the contributions of research team members for their input and research assistants for assisting with data collection.

REFERENCES:

1. Wuhan Municipal Health Commission's Briefing on the Pneumonia Epidemic Situation. Available online: <http://wjw.wuhan.gov.cn/front/web/showDetail/2019123108989>

- (accessed on 31 December 2019).
2. Wilder-Smith A, Chiew C, Lee V. Can we contain the COVID-19 outbreak with the same measures as for SARS?. *The Lancet Infectious Diseases*. 2020;20(5):e102-e107.
3. Mahase E. China coronavirus: WHO declares international emergency as death toll exceeds 200. *BMJ* 2020;368:m408-m.
4. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020>. World Health Organization, 2020.
5. Ho CS, Chee CY, Ho RC. Mental Health Strategies to Combat the Psychological Impact of COVID-19 Beyond Paranoia and Panic. *Ann Acad Med Singapore* 2020;49:1-3.
6. Bao, Y., Sun, Y., Meng, S., Shi, J., Lu, L., 2020. 2019-nCoV epidemic: address mental health care to empower society. *Lancet* 22 (395), e37–e38.
7. Brooks S, Webster R, Smith L, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet* 2020;395:912-920.
8. Barbisch D, Koenig KL, Shih FY. Is there a case for quarantine? Perspectives from SARS to Ebola. *Disaster Med Public Health Prep* 2015; 9: 547–53.
9. Horton R. Offline: 2019-nCoV—“A desperate plea”. *The Lancet*. 2020;395 (10222):400.
10. Xiang, Y.-T. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry* 2020, 7, 228–229.
11. Hail, R.C.W.; Chapman, M.J. The 1995 Kikwit Ebola outbreak: Lessons hospitals and physicians can apply to future viral epidemics. *Gen. Hosp. Psychiatry* 2008, 30, 446–452.
12. Van Bortel, T. Psychosocial effects of an Ebola outbreak at individual, community and international levels. *Bull. World Health Organ*. 2016, 94, 210–214.
13. Graham, R.L.; Donaldson, E.F.; Baric, R.S. A decade after sars: Strategies for controlling emerging coronaviruses. *Nat. Rev. Microbiol*. 2013, 11, 836–848.
14. Sim, K. Psychosocial and coping responses within the community health care setting towards a national outbreak of an infectious disease. *J. Psychosom. Res.* 2010, 68, 195–202.
15. Lau, J.T.; Yang, X.; Pang, E.; Tsui, H.Y.; Wong, E.; Wing, Y.K. Sars-related perceptions in hong kong. *Emerg. Infect. Dis.* 2005, 11, 417–424
16. Lovibond, S. H. & Lovibond, P. F. (1995). *Manual for Depression Anxiety Stress Scale*. (2nd Ed) Sydney: Psychological Foundation.
17. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia [published online January 29, 2020]. *N Engl J Med*. 2020. doi:10.1056/NEJMoA2001316
18. Chan Yeung M. Severe acute respiratory syndrome (SARS) and health care workers. *Int J Occup Environ Health*. 2004;10(4):421-427. Doi: 10.1179/oeh.2004.10.4.421
19. Jung S.-m., Akhmetzhanov A.R., Hayashi K., Linton N.M., Yang Y., Yuan B. Real-time estimation of the risk of death from novel coronavirus (COVID-19) infection: inference using exported cases. *J. Clin. Med*. 2020;9(2):523.
20. Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., et al. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 395, 912–920. doi:10.1016/s0140-6736(20)30460-8.
21. Bo X. Open access epidemiological data from the COVID-19 outbreak. *Lancet Infect. Dis*. 2020 Published online February 19, 2020.
22. Ayittey FK, Ayittey MK, Chiwero NB, Kamasah JS, Dzuvor C. Economic impacts of Wuhan 2019-nCoV in China and the world. *J Med Virol*. 2020;92: 473–475. <https://doi.org/10.1002/jmv.25706>
23. Li Z, Ge J, Yang M, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun*. 2020. [PMID: 32169498] doi:10.1016/j.bbi.2020.03.007.
24. Poon E, Liu SK, Yam LY, Lee CK, Cheong D, Tang WN. Impact of severe acute respiratory syndrome (SARS) on anxiety levels of frontline healthcare workers (HCWS). *Respirology* 2004; 9: 22
25. Wong TW, Yau JK, Chan CL, et al. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency department and how the cope. *Eur J Emerg Med*. 2005;12(1):13-18.