

Original Research Article

Mental health and sleep: in COVID positive health care workers in India

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ABSTRACT

Background: Starting from Wuhan as a local transmission, COVID-19 turned out to be a pandemic affecting the entire global population either as a patient or at least being exposed to the novel corona virus. The present study has been done to see how much working to treat Covid patients has put stress, anxiety, depression and sleep disturbance on health care professional after becoming covid positive themselves, essentially their own life at risk.

Methods: This was a prospective observational cross-sectional study done in Sri Manakula Vinayagar Medical College and Hospital, Puducherry, with ethics approval. Sample size was 145 health care workers who had covid infection. The study comprised of questions from Dass 21 questionnaire and Likert sleep scale.

Results: Mild levels of stress was seen in 16 members (11.03%), moderate stress was seen in 3 members (2.06%). The chi square value was calculated as significant p value of 0.045. Mild anxiety was seen among 13 (8.96%), moderate anxiety seen in 23 (15.86%), severe anxiety was seen in 2 (1.37%), Extremely severe anxiety was seen in 1 individual (0.68%). Mild depression was seen in 12 (8.27%), moderate depression was seen in 14 (9.65%). The quality of sleep was rated on a 10-point scale, 5.5% had reported poor sleep, 53.8% reported moderate sleep disturbance.

Conclusions: This study reveals that mental health issues are possible for medical professionals too and that anxiety needs to be addressed in health professionals too. More so when isolated from their families and friends.

Keywords: Anxiety, COVID-19, Depression, Sleep, Stress

INTRODUCTION

The minuscule crown like spiked corona virus has changed lives in innumerable ways for everyone, from a new born to the geriatric, the small-scale industrialist to a billionaire, none were spared of its effects.

Starting from Wuhan as a local transmission, COVID-19 turned out to be a pandemic affecting the entire global population either as a patient or at least being exposed to the novel Corona Virus in its many mutated strains. As of

28th February 2023, the number of confirmed COVID-19 cases have been 758,390,564.¹

Among these the documented deaths have been 6,859,093 due to COVID-19. And our vaccinations stand at 13,228,728,467. The disease was so pathological that the incidence of mucormycosis was life threatening at one point in the second wave. More aggravated due to the lack of beds in hospitals, lack of oxygen cylinders, shortage of medications and spiralling cost of health expenditure and the economic effects occurring in due course, and all due to covid.

It has been seen in the past that; the effect of any pandemic is seen not just among the general population per se but on the medical fraternity very much.

We are now at the brink of an emerging possible fourth wave of pandemic with focus again back to China with growing number of positive patients. More so needing to protect our medical fraternity, the frontline warriors of corona virus.

The entire healthcare infrastructure went into turmoil due to shortage of masks, face shields, disposable gowns etc. Propelled at the background of vaccine limitations, manufacturing issues between nations and the approval to use at the onset of emergency.

One of the health bulletins released by WHO had put a note on points such as covid pandemic being a dark time, with need to develop coping skills, and also the ability to live in a safe and peaceful state of mind.

The amount of strain sustained to battle the pandemic was also to push limits of doctors every day. Similar situations have been faced linked to middle east respiratory syndrome, nipah virus and also the age-old Spanish flu. Here the pushing limit has been the duration of the pandemic.

The Russian flu spanned over 4 years starting 1889, likely due to H3N8 virus based on serology and epidemiology data. Here the median clinical attack rate was at 60%, interquartile range 45-70%. The Spanish flu was caused by H1N1 virus, which arose due to human adaptation of the existing avian influenza virus to a new human host. The virus silently spread around the world and its origin was difficult to determine. The attack rate of the flu were 25%-33%, and pandemic spread in 3 distinct waves, within a 9 month period, between 1918-1919, between the summer, spring and winter seasons.²

The brunt of the pandemic is borne by medical professionals. Our lungs are equally exposed as much as the lay person beside us. The clinical manifestation being epithelial necrosis, micro vasculitis, ground glass opacities, and tissue damage to lungs. Often followed by secondary bacterial invasion with *Streptococcus pyogenes*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenza* (Morens et al, 2008). Bacterial pneumonia was a relatively minor cause of fatalities possibly due to the widespread use of antibiotics. The problem for doctors is propelled not just by the infections, but also due to the lack of proper guidelines specific to the current situation, cross border transmissions due to passengers from abroad, unpreparedness by health management professionals, lack of adequate infrastructure, stigma of covid treating doctor, marginalisation due to the disease, prevalence of mental health morbidities. Only limited number of studies on mental health in covid treating healthcare staff has been done. This is one such study with the uniqueness being assessment of sleep health in covid treating health

care warriors. Previously done studies have shown prevalence of depression at 26.6% among doctors.³

A study from Wuhan China revealed 50.4% of depression, 44.6% of anxiety, 34.0% insomnia and 71.5% of distress among 1257 health care workers.⁴

There was a study done on general population, to assess the predictors of psychological distress due to covid. The study revealed distress among Indians with pre-existing medical conditions. Not just health condition, it is the other factors such as individual characteristics, social conditions, surrounding environment, and health behaviour which contributes to a person's mental health. This particular study had used the random forest classifier.⁵

The intention of this study is to bring to the notice of healthcare managements and administrative officials of the need to support the mental health status of the health care workers, from the doctors' end to the end of clinical support staff comprising of nurses, technicians and other workers functioning in the hospital. This pandemic is possibly going towards being endemic, though we as health care fraternity want this to pandemic to end. The point in reference is that managements should be on more alert and have planning in place at each hospital to handle another epidemic or pandemic situation. This ought to be our learning curve for the future. Sometimes bringing the mental health aspect to the attention will help us to make newer interventions supportive to the staff which will eventually help in better productivity in hospital and overall human wellbeing.

Objective of the study

To estimate the magnitude of mental health outcomes pertaining to stress, anxiety, depression, and sleep among covid positive health care workers.

METHODS

This was a prospective observational cross-sectional study done in Sri Manakula Vinayagar Medical College and Hospital, tertiary care hospital, located in Puducherry, India. This study was initiated in February 2022 after getting approval from the institute ethics committee. Sample size was 145 health care workers who had covid infection.

Sample size

Sample size has been calculated to 142, using Epi info software, calculated based on a proportion of 30%, 7.5% precision, 95% of confidence interval.

The study was conducted after completing the quarantine period of 14 days. The study comprised of questions from Dass 21 questionnaire and Likert sleep scale. We had designed a form for the same and data was documented

with password to protect the identity of participants. In person interviews were taken and data was documented.

Inclusion criteria

Patients above 18 years, history of being covid positive, and working as a healthcare worker. Patients having known psychiatric illness, thyroid disorder, persons already taking sleeping medication were excluded from the study. The study was done after taking consent from each participant.

Instruments

The DASS 21 questionnaire has good internal reliability (Cronbach’s alpha) and its ordinal alpha demonstrated good internal reliability for all its sub-scales.

The questionnaire was formed on 3 sections starting with pre coded numerical identity number, age, gender, qualification. The next section comprised of details of complaints of presentation, co morbidities, medical history, surgical history, followed by rating of DASS scale questionnaire such as depression, anxiety and stress scaled as normal, mild, moderate, and extremely severe. Each question is scored from 0-did not apply to me to 3 mostly applied to me from covid positive date to 1 week post covid quarantine of 14 days. Many studies have been done on mental health and covid, but this study also looked into the sleep aspect being covid positive, contributing to the overall health of the individual. Confidentiality and anonymity was maintained all through. Any person not wanting to be part of the study and were given the freedom to opt out of the study

midway if they wished to do so. Data was entered into Microsoft Excel data sheet.

Statistical analysis was done using SPSS version 26 (IBM Corp., Armonk, NY, USA) for statistical analysis. Categorical variables were analysed using the Pearson Chi- square Test. Statistical significance was determined at P <0.05.

RESULTS

Sample characteristics

The sample had a mean age of 35.81±9.6 years (Table 1). Most of the participants were females (n=74, 51%) and males n=71, 49%, working in tertiary care private medical college and hospital. Considering the educational background of participants (Table 2) 35.9% were post graduate completed, graduates were 49.7%. The rest of the staff had completed higher secondary education. Regarding the co-morbidities type 2 diabetes mellitus was seen among 8.3%, diabetes with hypertension was seen in 2.1%, hypertension alone seen in 4.1%. Among this sample size (Table 3) 77.2% were married, 21.4% were unmarried, 1.4% were widow.

All the participants were health care workers comprising of (Table 4) professors (6%), associate professors 3.4%, assistant professors (3.4%) senior residents (5.5%), junior residents 15.9%, nurses 14.5%, physiotherapist (0.7%), hospital facility and maintenance staff (42.8%), housekeeping (9.7%). Majority of the doctors are using surgical mask for a 6-hour period, had used 70% alcohol-based sanitizer before and after patient contact.

Table 1: Descriptive statistics.

	N	Minimum	Maximum	Mean	SD	Sex	Frequency	Percent	Valid %	Cumulative percent for sex
Age (years)	145	22	66	35.81	9.650	Female	74	51.0	51.0	51.0
Height (cm)	145	139	188	162.17	10.341	Male	71	49.0	49.0	100.0
Weight (kg)	145	41	110	69.29	14.080	Total	145	100.0	100.0	

Table 2: Level of education.

	Frequency	Percent	Valid percent	Cumulative percent
Valid	Graduation	72	49.7	49.7
	Higher secondary	8	5.5	55.2
	Post graduation and higher	52	35.9	91.0
	Primary	4	2.8	93.8
	Secondary	9	6.2	100.0
	Total	145	100.0	100.0

Table 3: Marital status of participants.

	Frequency	Percent	Valid percent	Cumulative percent
Valid	Married	112	77.2	77.2
	Unmarried	31	21.4	98.6
	Widow/Widower	2	1.4	100.0
	Total	145	100.0	100.0

Table 4: Designations of participants.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Assistant professor	5	3.4	3.4	3.4
	Associate professor	5	3.4	3.4	6.9
	Attenders	11	7.6	7.6	14.5
	House keeping	3	2.1	2.1	16.6
	JR	23	15.9	15.9	32.4
	Nurses	21	14.5	14.5	46.9
	Others	62	42.8	42.8	89.7
	Physiotherapist	1	0.7	0.7	90.3
	Professor	6	4.1	4.1	94.5
	SR	8	5.5	5.5	100.0
	Total	145	100.0	100.0	

Table 5: Level of stress.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Normal	126	86.9	86.9	86.9
	Mild	16	11.0	11.0	97.9
	Moderate	3	2.1	2.1	100.0
	Total	145	100.0	100.0	

Table 6: Level of anxiety.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Normal	106	73.1	73.1	73.1
	Mild	13	9.0	9.0	82.1
	Moderate	23	15.9	15.9	97.9
	Severe	2	1.4	1.4	99.3
	Extremely severe	1	0.7	0.7	100.0
	Total	145	100.0	100.0	

Table 7: Level of depression.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Normal	119	82.1	82.1	82.1
	Mild	12	8.3	8.3	90.3
	Moderate	14	9.7	9.7	100.0
	Total	145	100.0	100.0	

Stress

Among the total samples of 145 health care workers, normal response was obtained for 126 (86.89%) health care personnel (Table 5), mild level of stress was seen in 16 members (11.03%), moderate stress was seen in 3 members (2.06%).

The Chi square value was calculated as significant p value of 0.045 (Table 8). The questions pertaining to stress were finding hard to wind down, tend to over react to situations, felt that using lot of nervous energy, found myself getting agitated, finding difficulty to relax, finding oneself intolerant of anything that kept them from getting on with what they were doing, feeling of being touchy/excessively sensitive and emotional.

Anxiety

Among the sample of 145, normal responses for anxiety was obtained among 106 (73.10%) (Table 6), mild anxiety was seen among 13 (8.96%), moderate anxiety seen in 23 (15.86%), severe anxiety was seen in 2 (1.37%), extremely severe anxiety was seen in 1 individual (0.68%). The questions pertaining to anxiety were awareness of dryness of mouth, breathing difficulty in the absence of cardiac or pulmonary illness, trembling of hands, being worried of situations in which one may feel panicked, or to make fool of oneself, feeling palpitations in the absence of cardiac illness or thyroid disorder, feeling scared without adequate reason.

Table 8: Crosstab and chi-square.

Crosstab		Level of stress			Total
Count		Normal	Mild	Moderate	
Sex	Female	63	8	3	74
	Male	63	8	0	71
Total		126	16	3	145
P value		0.045			
Chi-Square Tests		Value	df	Asymptotic significance (2-sided)	
Pearson chi-square		2.939 ^a	2	0.230	
Likelihood ratio		4.097	2	0.129	
Number of valid cases		145			p value 0.045

2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.47.

Table 9: Crosstab level of anxiety.

		Normal	Mild	Moderate	Severe	Extremely severe	Total
Sex	Female	54	8	10	1	1	74
	Male	52	5	13	1	0	71
Total		106	13	23	2	1	145

Depression

Among the sample of 145, normal responses was obtained for 119 (82.06%) (Table 7), mild depression was seen in 12 (8.27%), moderate depression was seen in 14 (9.65%). The questions pertaining to depression were could not experience positive feeling at all, finding difficulty to take initiative to do things, feeling of having nothing to look forward to, feeling down hearted and blue, unable to be enthusiastic about anything, feel of being less worth as a person, feeling that life was meaningless.

Table 10: Crosstab for depression.

		Normal	Mild	Moderate	Total
Sex	Female	58	9	7	74
	Male	61	3	7	71
Total		119	12	14	145

Sleep analysis

We had used the Likert sleep scale to obtain parameters regarding the quality of sleep during covid infection and more so considering isolation period of 14 days. The points taken into assessment were time taken to fall asleep, the number of night’s person had difficulty to fall asleep, number of times waken during night time, feeling of rested next morning, and overall quality of sleep.

62.1% of the participants opined that they slept within 30 minutes, 9% slept within 40 minutes, 15.9% took more than 50 minutes to fall asleep. 13.1% participants fell asleep within 5 minutes lying on bed.

Coming to number of night’s person had difficulty to fall asleep. 38.6% had <5 episodes of sleep difficulty since covid positive. 11.0% had 5-9 episodes of difficulty since covid positive. 1.4% had 10 times sleep difficulty in a month of covid positive. 4.1% had more than ten times difficulty in falling asleep. There was no difficulty in falling asleep for 44.8% of the participants.

Data collection has been done for how many times a person woke up in between their sleep. 40.7% woke up 1-2 times n between sleep, taken as normal considering bladder habits of an individual.14.5% woke up 3-4 times in between sleep. 2.1% woke up 4-7 times in between sleep. There were 42.8% who did not get up in between sleep.

We asked participants to rate their sleep based on a 10-point scale of how much rested they feel the next morning. 35.2% felt very much rested after 7-8 hours of sleep. 47.6% felt moderately rested for the same hours of sleep. 17.2% felt mildly rested for the same sleep. The quality of sleep was rated on a 10-point scale, 5.5% had reported poor sleep, 53.8% reported moderate sleep, and 40.7% reported excellent sleep among the participants.

DISCUSSION

We had 145 participants in the study. Mean age of participants in the study was 35.81±9.65. There were 71 males and 74 females as part of the study. The participants comprised of professors 4.1%, associate professor 3.4%, assistant professor 3.4%, senior residents 5.5%, junior residents 15.9%, nurses 14.5%, paramedical staff 42.8%, housekeeping and support staff 9.7%, physiotherapist 0.7%. Among the participants 77.2% were married, 21.4% were unmarried, and 1.45% were

widow/widower. Regarding the education of participants 35.9% were post graduate and higher educated, 49.7% were graduates, 5.5% were educated upto higher secondary schooling. Others had attended school, mostly comprising housekeeping staff who had not completed high school education. The point of education is the understanding towards covid symptomatology and the ability to trust to take medication and supportive care, which made a difference in health attitude.

The medical history of participants was obtained. 8.3% had diabetes, 4.1% had isolated hypertension, 2.1% had diabetes and hypertension, 84.8% had no comorbidities, 0.7% had other medical complaints. There was no surgical history among 74.5% of participants, 25.5% had some surgical history. There was an aspect of fear when covid afflicted the diabetic. There were no patients with jaundice in the study. Sometimes icterus can lead to encephalitis so these patients were not part of the study.

The aspect of stress was assessed. Points on Dass questionnaire like difficulty to wind down, tendency to overreact to situations, feeling of using lot of nervous energy, getting agitated over little or normal things, finding difficulty to relax, feeling intolerant to anything that kept them from going on, felt excessively emotional. More of Junior residents were asymptomatic had did not feel much of stress whereas the senior faculty, being married and holding responsibility towards family, the senior faculty members ranging from assistant professors felt mild to moderate stress levels. Mild stress was seen in 11.03%, moderate stress in 2.06%, normal responses were obtained for 86.89% of the 145-sample size. In past pandemic experiences, whenever difficult situations arise, doctors play major roles and push their limits, take maximum brunt and face situations with uncertainty, lack of proper guidelines for each situation, unpreparedness by healthcare infrastructure and organizations, associated fear, stigma, prejudice and marginalization towards the disease.⁶ The p value for stress was significant, 0.045.

The covid situation exposed healthcare workers to increased stressful situations in view of longer work hours due to shortage of co-doctors becoming positive, apprehension on carrying infection back home to family.⁷ Some did voice their concern whether the covid PPE coveralls itself carried the covid droplets from the patient and infect them.

The questions asked to assess anxiety were dryness of mouth, breathing difficulty without a known respiratory or cardiac cause, trembling of hands, being worried about situations in which they felt they might panic and would make a fool of themselves, feeling of being close to panic, having palpitations without a cardiac cause or any physical exertion, having fear sensation without a reason. Normal responses were obtained for 73.10%, mild anxiety 8.96%, moderate anxiety 15.86%, severe anxiety at 1.37%, extremely severe anxiety at 0.68%. The same data is expressed as normal response for 106 members, mild anxiety in 13, moderate anxiety 23 members, severe

anxiety 2 members, extremely severe anxiety 1 member (Table 9).

Regarding depression questions put forth were ability to feel positive, difficulty to work up the initiative to do things, feeling of having nothing to look forward to, feeling down hearted and blue, unable to be enthusiastic about anything, feeling of loss of self-worth, felt that life was meaningless. Mild depression was seen in 8.27% as per DASS 21 questionnaire. Mild depression was seen 12 participants (Table 10). Moderate depression was seen in 9.65% of the respondents. The feeling of being down hearted was seen by health care workers when they lost their own parent, where they have recovered, but they had lost their father or mother. The aspect of infectivity and fear to contact covid post exposure while performing endotracheal intubation, bronchoscopy, for sick patients was running across doctors' mind which they shared while answering questionnaires. Some did betadine mouth gargle in order to curb possibility of infection.

In April 2020 a study was done in Singapore to assess the impact of covid on mental health of its health care workers. Singapore raised its disease outbreak response system condition alert to "orange", the second highest level.⁸ Here they had used DASS 21 questionnaire and also assessed the aspect of post-traumatic stress disorder due to covid. Of note, the prevalence of anxiety is higher in nurses as compared to doctors, possible reasons for this could be due to reduced accessibility to formal psychological support, decreased information on the way covid spreads or rather the ability to understand for each individual, inadequate training on infection control measures.

A study was done in Bangladesh assessing the factors of stress, anxiety and depression among doctors exposed to covid and working for covid patients showed that coping with this highly infectious disease created feelings of uncertainty around progression in life and future during and beyond this unexpected situation of the pandemic. Well trained physicians were better able to cope with the situation.⁹

The ability to express one self, the ability to speak out about their own mental health issues is not in the capability of some doctors. Suicidal thoughts have occurred among doctors, and the problem of stigmatization has also played its role.¹⁰

Sometimes speaking about their mental health issues has been linked to possibility of affecting the future career growth of the professional, aspect of respect among peers at work place, fears of revoking medical license to practice further.¹¹⁻¹³

One of the major factors for the increased anxiety and depression has been isolation from family, restriction of social engagements, restricted freedom to move out, and financial loss in the given isolation phase.¹⁴

Similarly during the SARS epidemic also the healthcare workers had an incidence of approximately 25-30% higher levels of emotional distress.¹⁵

Not just anxiety, depression the incidence of obsession and compulsion has also been reported from China. The incidence of which was higher among medical fraternity than that of general population during covid. Percentages of depression afflicted individuals was higher in medical when compared to non-medical staff (12.2 in comparison with 9.5%, $p=0.04$) while obsessive compulsive disorders were found to be higher among medical (15.3%) when compared to non-medical health care professionals (2.2%) with a P value of less than 0.01.¹⁶ Similar health issues have been noticed with EBOLA, H1N1 epidemics.

Al-Najjar in their study during the Middle-Eastern respiratory syndrome novel coronavirus (MERS-CoV) in Jeddah (Saudi Arabia) reported moderate anxiety levels in 57.7% of subjects, 13.8% suffered from mild depression, 12.2% showed moderate levels of depression, and 4.3% reported with severe form of depression.¹⁷

One of the stressors felt by healthcare professionals is the acknowledgement that there is no one drug sure cure to Covid if they contacted the infection. And emotional factors and exhaustion due to extended work hours playing its own role during covid.¹⁸

Coming to limitations of this study, this study did not assess the socio-economic conditions of each individual which would have been helpful to suggest specific targeted outcomes. This study was done in one particular setting and not assessed in multiple medical centers so generalization may not be correct, but never the less this study will give a data base and idea to future generations and more preparedness for handling epidemics in future.

CONCLUSION

This study reveals that mental health issues are possible for medical professionals too and that anxiety needs to be addressed in health professionals too. More so when isolated from their families and friends. We hope that this study may pave pathways to proper measures at workplace, better planning and psychological support programs, and interventions for the vulnerable groups may be beneficial in years to come.

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