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Anxiety and Depression in Healthcare Providers During Covid-19 Pandemic: A Cross-Sectional Study

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ABSTRACT: *Since the COVID-19 pandemic, psychological well-being has soured considerably. Even elite intellectuals like physicians and researchers could not avert it. No convincing management, till now, have succeeded to unearth the requitals. Guesstimating the manifestations of anxiety and depression among medical professionals can unriddle the enormity of this burden. The objectives were to contrast scores of the Hamilton's anxiety (HAM-A) and depression (HAM-D) scales amongst covid-positives and covid-negatives, plus to estimate the relative risk of acquiring anxiety and depressive symptoms. We took clearance (928 dated 01.12.2021) from Institutional Ethics Committee SCB Medical College, Cuttack, before the study became operational. Nine hundred eighty-three healthcare workers' HAM-A and HAM-D scores were slated for analysis. The participants were 35.95±11.54 years old on average. Of them, 613 (62.36%) were positive for covid. Pursuant to their HAM-A scores, 575 (58.49%) participants endured anxiety. It largely plagued nurses and pharmacists (245, 24.92%), followed by students (236, 24.01%) and clinicians (94, 9.56%). Depression afflicted 620 participants (63.07%). The greatest drivers were the students (301, 30.62%), followed by nurses, pharmacists (211, 21.46%), and the clinicians (108, 10.99%). Contrasted to the covid-negatives, the positive report-holders were less anxious (relative risk: 0.614; 95%CI: 0.538-0.701) and more depressive (relative risk: 2.541; 95%CI: 2.079-3.106). Similar results emerged from the subgroup analyses. When compared to covid positives, covid negatives endured more anxiety. On the contrary, covid-positive individuals manifested depression the most.*

KEYWORDS: anxiety; coronavirus; depression; doctor; mental stress

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INTRODUCTION

For almost three years, the coronavirus pandemic has entangled the human civilization. All facets of our lives, i.e., physical, social, economic, and psychological, have been completely ravaged. From innocuous infection to severe acute respiratory disease, the clinical manifestations of SARS-CoV-2 infection might vary [1]. The severity and chronicity of the disease had a significant detrimental impact on mental well-being. Even scientific geniuses like doctors were impoverished to counter the coronavirus's stifling assault. Regardless of age, race, ethnicity, gender, or occupation, humanity has witnessed increased anxiety and depression amid this global crisis. Aiming to curb psychological issues like stress, anxiety, depression, and suicide risks, the World Health Organization (WHO) has issued international health recommendations [1]. Only proper evaluation of anxiety and depression in medical professionals can demystify the nuances of this extensive skyrocketing pandemic's psychological strain due to absence of irrefutable solution to it. Cheung *et al* campaigned for swift action to mitigate the mental anguish that exists across the entire globe [2].

Social isolation was enacted, and everything crumbled amid the perpetual shutdown. The cataclysmic infection triggered fear and tyranny among those infected with covid-19, and especially their family members. Their ingrained fear of acquiring the flu was the catalyst to their perpetual mental agony. After the pandemic arose, everyone has emanated signs of anxiety and desperation, even the doctors [3-4]. Those placed in the quarantine developed lethargy, frustration, emptiness, and agitation. The aforementioned elements increased alcohol consumption worldwide [5]. Healthcare personnel have been swamped with their challenging and exhaustive job during this catastrophic period. They got psychological illnesses as an aftermath of their tremendous physical and mental stress. Countless health care providers had psychological distress and trepidation due to viral infection symptoms like fever and coughing. During the pandemic, revelations of an assortment of mental issues, including depression, panic attacks, delirium, suicidal thoughts, anxiety, and psychosis, came to light. The mortality crescendo had handcrafted the symptoms of anxiety and depression among the medical staff, including the doctors [6-8].

The mounting burden of psychological well-being could be eased if healthcare professionals were thoroughly scrutinized for anxiety and depression symptoms. Hence, we designed this cross-sectional study to determine the level of anxiety and depressive symptoms among medical staff during the COVID-19 pandemic in a tertiary care hospital in eastern India.

METHODS

Study design: We conducted a cross-sectional study to determine anxiety and depression in the healthcare professionals of Sriram Chandra Bhanja (SCB) Medical College, Cuttack, Odisha, India, from 7th December 2021 to 4th August 2022. We recruited 983 persons from different

medical profession as per the convenience sampling method. The study objectives were to compare the levels of anxiety and depression in the study population (covid-positive versus covid-negative) with Hamilton's anxiety (HAM-A) [9] and Hamilton's depression (HAM-D) [10] scales, respectively, and to estimate the relative risks of experiencing symptoms of anxiety and depression in the study population (covid-positive to covid-negative), and to perform subgroup analyses based on occupation and gender. Abiding by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) [11] guidelines, we performed this study.

Ethical Details: We got the ethical approval (IEC application no: 928 dated 01.12.2021) before the study initiation from the Institutional Ethics Committee, SCB Medical College and Hospital, Cuttack, Odisha, India. All participants provided their written informed consent for this study before their participation.

Inclusion and exclusion criteria: We included the healthcare professionals (doctors, undergraduate and postgraduate students, nurses, and pharmacists of SCB Medical College), of either gender, with the recent covid-19 reports. We excluded those persons who were previously diagnosed with either anxiety or depression, persons who were taking any anti-anxiety or anti-depressant medication for the last two weeks, and persons who were diagnosed with any sleep disorder.

Data collection and statistical analysis: After obtaining the participants' consent for the study, we canvassed them to fill out the HAM-A and HAM-D questionnaires with appropriate responses. The HAM-A questionnaire encapsulates 14 questions, each with five responses, i.e., 'not present,' 'mild', 'moderate', 'severe', and 'very severe'. The corresponding scores are from 0 to 4, which yield a maximum score of 56. Scores '0-7', '8-17', '18-24', '25-30', and '>30' betoken 'no', 'mild', 'moderate', 'severe', and 'very severe' anxiety, respectively. The HAM-D questionnaire embodies 17 questions. Of those, 9 have five responses, scored from 0 to 4, and the rest 8 have three responses, scored from 0 to 2. The scores mount to a maximum of 52. Scores '0-7', '8-16', '17-23', and '>23' presage 'no', 'mild', 'moderate', and 'severe' depression, respectively. We instructed the participants to consult with a psychiatrist or psychologist regarding the questions if they found difficulty comprehending the nuance of the questionnaire's responses. All the participants handed over their completely-filled forms. Subsequently, we applied the Shapiro-Wilk test to assess the normality of data distribution and the Mann-Whitney U test to compare scores between the covid-positive and covid-negatives. We used R software (version 4.1.2) [12] for all the statistical analyses and generation of the plots.

RESULTS

We conducted the study from 7th December 2021 to 4th August 2022 and recruited 983 healthcare professionals from SCB Medical College, Cuttack, Odisha, India. Table 1 corroborates the demographic and clinical details of the study population. The participants had a mean age of 35.95±11.54 years. Six hundred thirteen participants (62.36%) were positive for covid infection,

and 542 (55.14%) were males. The majority of the study population were medical students (518, 52.70%), followed by clinicians (171, 17.40%), nurses, and pharmacists (294, 29.90%). A total of 575 (58.49%) persons had anxiety, as suggested by their HAM-A scores. The majority of them were nurses and pharmacists (245, 24.92%), followed by medical students (236, 24.01%) and clinicians (94, 9.56%). A total of 620 (63.07%) persons had depression, as revealed by their HAM-D scores. Most of them were medical students (301, 30.62%), followed by nurses and pharmacists (211, 21.46%) and clinicians (108, 10.99%).

Table 1: Demographics and clinical parameters of the study population

Characteristics	**Mean ± SD or n (%)**
Age (in years)	35.95 ± 11.54
Occupation	
Clinicians	171 (17.40%)
Medical students	518 (52.70%)
Nurses & Pharmacists	294 (29.90%)
Male gender	
Total	542 (55.14%)
Clinicians	141 (14.34%)
Medical students	310 (31.54%)
Nurses & Pharmacists	91 (9.26%)
Age distribution (in years)	
Clinicians	48.48 ± 5.38
Medical students	27.24 ± 4.82
Nurses & Pharmacists	44.01 ± 9.90
COVID positive persons	
Total	613 (62.36%)
Clinicians	122 (12.40%)
Medical students	345 (35.10%)
Nurses & Pharmacists	146 (14.86%)
Persons with anxiety (HAM-A > 7)	
Total	575 (58.49%)

Clinicians	94 (9.56%)
Medical students	236 (24.01%)
Nurses & Pharmacists	245 (24.92%)
Persons with depression (HAM-D > 7)	
Total	620 (63.07%)
Clinicians	108 (10.99%)
Medical students	301 (30.62%)
Nurses & Pharmacists	211 (21.46%)

Figure 1 elucidates the HAM-A and HAM-D scores of the study participants. We plotted both scores primarily based on the occupation and gender of the individual. The widths of the boxes were suggestive of the proportions of total participants with the corresponding parameters. Figures 1a and 1b suggest that the levels of anxiety and nervousness were more significant in the covid-negative men and women [clinicians (HAM-A: 9.0 (9.0-10.0); 7.0 (6.0-8.0); p= 0.043), medical students (HAM-A: 8.0 (7.0-9.0); 7.0 (5.0-8.0); p= 0.137), female (HAM-A: 9.0 (8.0-10.0); 8.0 (8.0-9.0); p= 0.216), and male (HAM-A: 8.0 (7.0-9.0); 6.0 (5.0-8.0); p= 0.093)] except nurses and pharmacists (HAM-A: 9.0 (8.0-10.0); 9.0 (8.0-10.0); p= 0.928). Figures 1c and 1d publish that the levels of depression and despair were notably higher in the covid-positive men and women [clinicians (HAM-D: 6.0 (6.0-7.0); 9.0 (8.0-11.0); p= 0.047), medical students (HAM-D: 6.0 (5.0-7.0); 9.0 (7.0-10.0); p= 0.103), nurses and pharmacists (HAM-D: 7.0 (6.0-12.0); 11.0 (10.0-12.0); p= 0.745), female (HAM-D: 7.0 (6.0-9.0); 11.0 (10.0-12.0); p= 0.062), and male (HAM-D: 6.0 (5.0-7.0); 9.0 (7.0-10.0); p= 0.098)].

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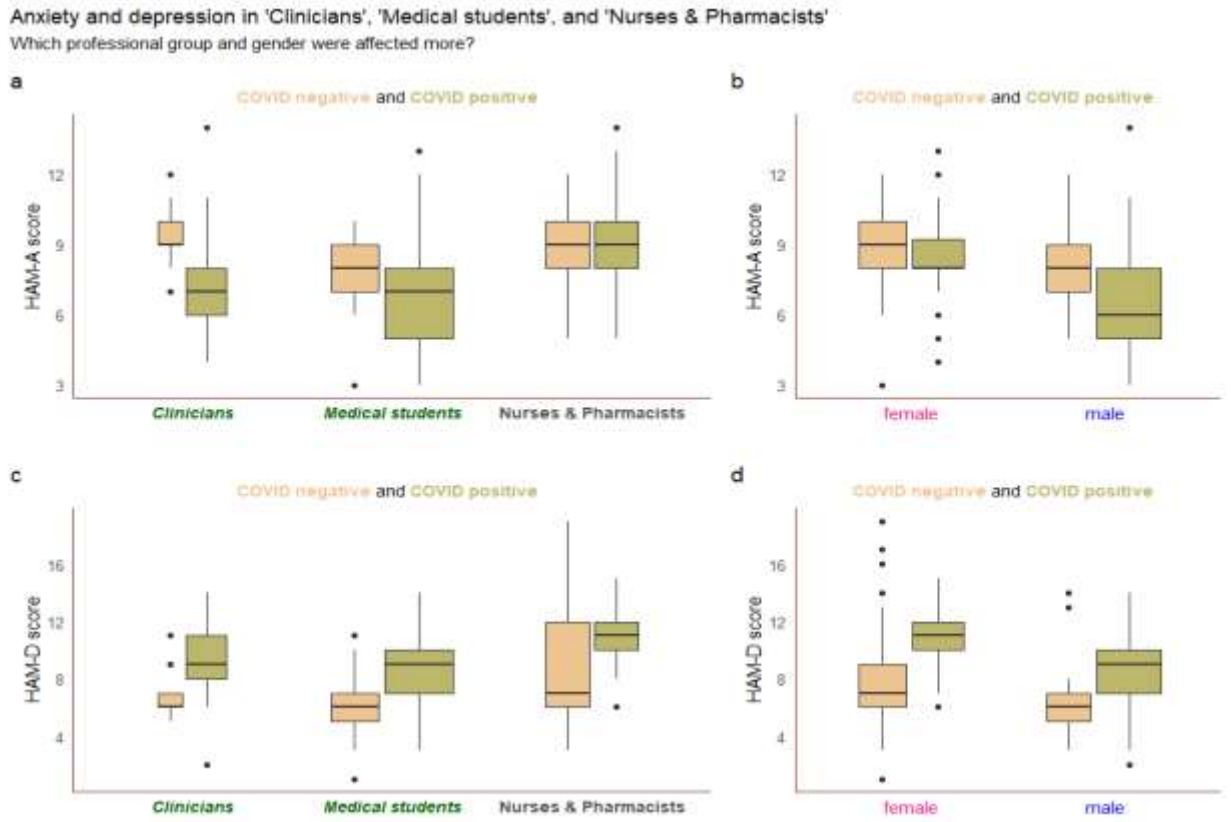
Figure 1: HAM-A and HAM-D scores of the study population



The box and whisker plots demonstrate the severity of anxiety and depression in the study population as revealed by the HAM-A and the HAM-D scores on the Y-axes. The widths of box plots correspond with the proportion of participants belonging to the confined profession or gender. (a) HAM-A scores of study participants based on various profession. (b) HAM-A scores of study participants based on gender. (c) HAM-D scores of study participants based on various profession. (d) HAM-D scores of study participants based on gender. The left and right plots of each box-whisker pair correspond to covid-negative and covid-positive participants, respectively. HAM-A: Hamilton's anxiety scale; HAM-D: Hamilton's depression rating scale-17 items version.

Figure 2 demonstrates the relative risk of developing symptoms of anxiety and depression. The black boxes in the forest plots were telltale cues of relative risk of anxiety and depression in the covid-positives. Figure 2a substantiates that risks of anxiety and nervousness were remarkably lower in the covid-positive group [total (RR= 0.614; 95% CI= 0.536-0.701), clinicians (RR= 0.402; 95% CI= 0.296-0.544), medical students (RR= 0.477; 95% CI= 0.377-0.602), and male (RR= 0.430; 95% CI= 0.335-0.551)] except nurses and pharmacists (RR= 1.109; 95% CI= 0.969-

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1.270), and female (RR= 0.904; 95% CI= 0.080-1.020). Figure 2b construes that risks of depression and despair were concretely higher in the covid-positive group [total (RR= 2.541; 95% CI= 2.079-3.106), clinicians (RR= 10.443; 95% CI= 3.028-36.015), medical students (RR= 2.780; 95% CI= 1.987-3.889), nurses and pharmacists (RR= 2.086; 95% CI= 1.659-2.624), and female (RR= 2.090; 95% CI= 1.723-2.536), and male (RR= 5.138; 95% CI= 3.100-8.515)].

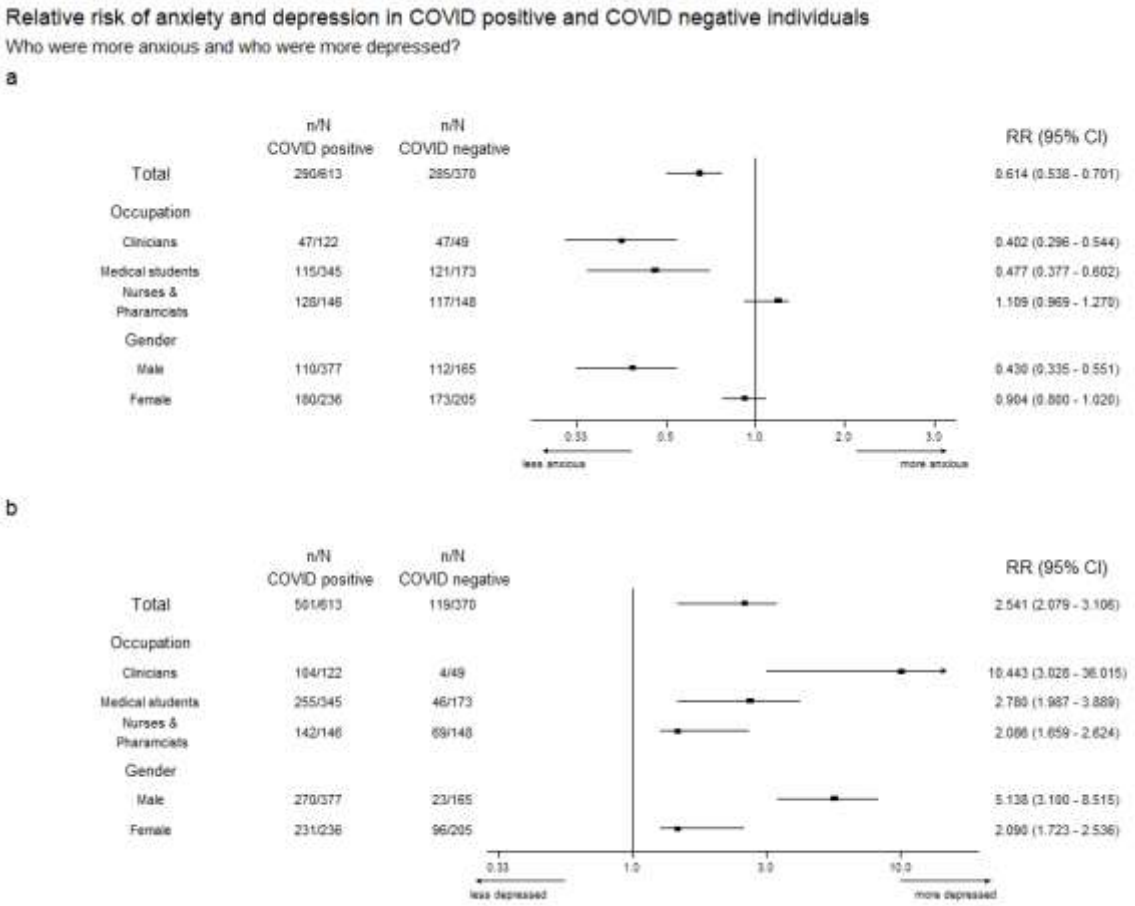

Figure 2: Relative risks of anxiety and depression among the study participants

The forest plots illustrate the relative risks of developing the symptoms of anxiety and depressive disorder in the covid-positive and covid-negative participants from the entire study population as well as the subgroups. (a) relative risk of getting anxiety symptoms. (c) relative risk of experiencing symptoms of depression. CI: confidence interval; n: number of participants with anxiety or depression; N: number of participants with covid infection status; RR: relative risk.

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DISCUSSION

We conducted this cross-sectional study to adjudicate the incidence of mental illnesses like anxiety and depression among the healthcare professionals of our institution during the covid-19 pandemic. Our study provided insights into the psychological impact of the pandemic on clinicians, students, and medical staff. We rummaged that numerous study participants were anxious during the pandemic regardless of age, profession, and covid report. Nevertheless, the active infection began to snowball the nervousness into various depressive symptoms.

Our investigation circumstantiated that 58.49% of participants had anxiety symptoms, and 63.07% had symptoms of depressive disorder. Female participants were more anxious than males, irrespective of covid status and profession. Students had lower anxiety levels than clinicians, nurses, and pharmacists. Conversely, the persons with positive covid-19 infection were more depressed than non-infected ones. These results concord with the studies conducted by Taghizadeh *et al*. [6] and Tomasoni *et al*. [7] in Iran and Italy, respectively.

Our results portrayed that covid-negative persons had a 39% higher risk of developing anxiety symptoms than covid-positives. In this study, we witnessed that the nurses, female students, and clinicians had increased anxiety symptoms despite their covid infection status. However, the covid-positive participants had a 2.5 times increased risk of developing symptoms of depressive disorder as opposed to the covid-negatives. This factuality held good for the entire study population. These results acquiesce with the study by Nayak *et al*. [8] in Trinidad.

Certain things strengthened our study. Incipiently, we anatomized the HAM-A and HAM-D scores of the study participants based on their profession and gender. Secondly, we weighed the relative risk of developing symptoms of anxiety and depressive disorder among the covid-positive participants. For good measure, we did subgroup analyses predicated on gender and profession. However, we do not exhort the generalization of the results of this study as it has a few limitations. Including only healthcare professionals from SCB Medical College, Cuttack, India, limited our study. We excluded the patients, their relatives, and the general public from the study. Owing to the unavailability of the vaccination status of the whole study population, we could not scrutinize the severity of mental illness with the same.

CONCLUSION

We conclude that healthcare professionals had extraneous symptoms of anxiety and depressive disorder during the covid-19 pandemic than the pre-pandemic period. Our study alludes to the desiderata of structured planning for healthcare professionals' psychological well-being. We must hammer out new strategies for those forefront legionnaires. Harnessing such strategies will mitigate the myriad psychological symptoms of blue-ribbon healthcare professionals across the globe.

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