



# Screening of depression and anxiety amongst resident doctors at a tertiary care hospital in Gujarat during the COVID-19 pandemic: an online survey

## Abstract

**Background:** The coronavirus disease 2019 (COVID-19) pandemic has emerged as a public health emergency and has affected people in several domains including physical, financial, and psychological. Resident doctors have also suffered from psychological issues while working at the frontline to help the community. **Aim:** To screen for anxiety and depression among resident doctors of various departments involved/not involved in COVID-19 duty. **Methods:** This was a cross-sectional study conducted on 175 resident doctors of various departments at a tertiary care hospital. They were screened for depression using the Public Health Questionnaire (PHQ)-9 and for anxiety using a seven-item generalized anxiety disorder scale (GAD-7). The study was conducted through an online survey using Google forms. **Results:** Out of 175 resident doctors, 15.42% were screened positive for depression requiring treatment and 15.42% for anxiety requiring further evaluation. Significant association was found between depression and presence of any kind of symptoms and psychiatric comorbidity, between anxiety and gender, presence of psychiatric comorbidity, and any kind of symptoms. **Conclusion:** Our study suggested elevated levels of anxiety and depression due to COVID-19 pandemic. This alarmed the need of early psychiatric intervention to help them cope with the issue.

**Keywords:** Healthcare Workers. Corona. Psychological Impact.

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## INTRODUCTION

Coronavirus causing the coronavirus disease 2019 (COVID-19), named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) originated from the city of Wuhan in China as a local transmission. Within a short span of time, it has spread domestically and internationally. The World Health Organization (WHO) declared it as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020.[1] On March 11, 2020, WHO declared COVID-19 as global pandemic.[2] There were around 14 lakhs total cases with 4.85 lakhs active cases and around 32,000 deaths reported due to COVID-19 in India at the time of writing this article.[3]

Healthcare professionals (HCPs) play a major role in these kinds of situations, as we have seen during previous pandemics. Resident doctors are among frontline workers involved in diagnosis, treatment, and care of patients with COVID-19. Due to this pandemic, they have to push their limits up to maximum possible extent. But, due to certain factors other than pandemic itself like unpreparedness of the healthcare system, shortage of resources and personal protective equipment (PPE), lack of specific drugs, repeatedly changing guidelines, etc., increase the burden over resident doctors both physically as well as psychologically. They have to work in this pandemic without any holiday, at times working continuously without provision

of quarantine period after his/her COVID-19 duty (which includes screening of patients for COVID-19, collection of oropharyngeal and/or nasopharyngeal swab, testing the samples in laboratory, and treatment of patients with COVID-19), not getting time to eat and unable to get proper rest. Sometimes they are also posted at other hospitals in the state. Resident doctors from pre- and para-clinical departments, who have not handled clinical work, are being posted for COVID-19 duty in view of the pandemic making it difficult for them to adapt to the change in their duty. During their duty, many of the resident doctors also got infected with COVID-19 adding to their physical and psychological burden.

COVID-19 has emerged as a challenge to HCPs exposing them to various psychological problems such as stress, anxiety, and depression. Staying away from their family and stigma from the society increase the psychological burden amongst doctors, affecting their work efficiency, and ultimately affecting healthcare delivery.

There are only few studies assessing psychological impact among resident doctors; during situations like this, it is often overlooked and may result in adverse outcome. We aimed to screen for depression and anxiety (both of which were assessed by the Patient Health Questionnaire [PHQ]-9 and a seven-item generalized anxiety disorder

scale [GAD-7] respectively),[4,5] among resident doctors, so that we can screen them and provide them with necessary psychiatric intervention as early as possible. This will help them to maintain their physical and psychological wellbeing, ultimately resulting in a better healthcare delivery.

## MATERIALS AND METHODS

### Study design

This was a cross-sectional study conducted through an online questionnaire involving resident doctors of various departments at Sir Sayajirao General (S.S.G.) Hospital, Vadodara, Gujarat, India, a tertiary care hospital. The online questionnaire was designed through the medium of Google form and was circulated among resident doctors through social media platforms.

### Study population

Resident doctors of various departments aged more than or equal to 18 years and less than or equal to 40 years, who responded and gave consent (both those who were involved in COVID-19 duty and those who were not involved in COVID-19 duty) were included in the study.

### Study procedure

We started our study on 20th June 2020 after getting approval from the institutional ethics committee. We circulated the link of google form through WhatsApp messenger among all the resident doctors. Those who responded and gave consent were included in the study. Resident doctors were given three reminders to fill the Google form. Data was collected up to 20th July 2020. Data was collected anonymously and only one response was allowed per participant.

The questionnaire had informed consent of participants in the first section, allowing them to proceed further to the questionnaire if they give consent. Questionnaire consisted of three sections. First was having basic history and other sociodemographic details including their year of residency, department, whether they are involved in COVID-19 duty or not, etc. Second was having PHQ-9 and third was having GAD-7 questionnaire.[4,5]

### Instruments

PHQ-9 is a nine-item self-administered, validated screening tool, scoring the severity of depressive symptoms ranging from zero to 27. PHQ-9 score of more than or equal to ten has a sensitivity of 88% and a specificity of 88%, and would be considered as screened positive for major depression requiring treatment.[4]

GAD-7 is a seven-item self-administered, validated screening tool which scores the severity of anxiety symptoms ranging from zero to 21. Score of more than or equal to ten will be considered screened positive for anxiety, and has sensitivity of 89% and specificity of 82%.[5]

### Sample size

We used a non-probability convenience sampling method. We circulated the link of Google form through WhatsApp

messenger among resident doctors and asked them to fill the form. We collected responses for a period of one month. Out of which, 177 responded. Out of 177 residents who responded, 175 resident doctors gave consent to participate in the study and were included in the study.

### Ethical consideration

The study was approved by the Institutional Ethics Committee for Human Research (IECHR). Participants were included in study after getting informed consent from them.

### Statistical analysis

Data was exported from Google forms to Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA, 2016) spreadsheet. Statistical analysis was done using Medcalc software for windows, Version 19.4.1 (Medcalc software ltd., Belgium). Demographic characteristics were summarised using descriptive statistics such as frequency and percentages in case of discrete data. Mean and standard deviation (SD) were used for continuous data. For comparisons between the groups, chi-square test was used for categorical variables. Statistical significance was determined at  $p < 0.05$ .

## RESULTS

The sample had a mean age of 26.73 ( $\pm 2.02$ ) years. Many of the participants were male ( $n=98$ , 56%) and 77 (44%) were female. Out of 175 doctors, 159 (90.86%) were junior residents and 16 (9.14%) were senior residents. Majority of resident doctors (143, 81.71%) were from clinical departments and 32 (18.29%) were from pre- and para-clinical departments. Out of 175 doctors, 74 (42.28%) were involved in COVID-19 duty and 101 (57.72%) were involved in non-COVID-19 duty (Table 1).

Most resident doctors ( $n=124$ , 70.86%) were worried about getting infected with COVID-19, whereas 51 (29.14%) doctors were not worried. Out of 175 resident doctors, 31 (17.71%) were worried about dying from COVID-19 and 144 (82.29%) were not worried about dying from COVID-19 (Table 1).

### Depression

Out of 175 participants, 27 (15.42%) were screened positive for depression, requiring treatment (participants having score of more than or equal to ten on PHQ-9). Participants having score of less than or equal to nine were considered as non-depressed. Mean depression score on PHQ-9 was found to be 4.59 ( $\pm 5.13$ ). Depression was found more common among female; though no statistical difference was found between depression and gender.

On bivariate analysis between non-depressed and depressed groups, statistically significant difference was observed for resident doctors having symptoms (like sore throat, cough, fever, abdominal pain etc.) ( $p < 0.01$ ) and for psychiatric comorbidities ( $p=0.04$ ). No statistically significant difference was found with other variables like age ( $p=0.702$ ), gender ( $p=0.082$ ), year of residency ( $p=0.733$ ), department ( $p=0.972$ ), duty ( $p=0.548$ ), physical comorbidities ( $p=0.075$ ), substance use ( $p=0.386$ ), family history of medical or psychiatric illness ( $p=0.734$ ) (Table 2).

**Table 1:** Demographic characteristics

Characteristic	Frequency (N=175)	Percentage %
Age (years)		
20-28	153	87.43
29-37	22	12.57
Gender		
Male	98	56
Female	77	44
Year of residency		
Junior resident	159	90.86
Senior resident*	16	9.14
Department		
Clinical	143	81.71
Pre- and para-clinical	32	18.29
Involved in COVID-19 duty		
Yes	74	42.28
No	101	57.72
Worried about getting infected with COVID-19		
Yes	124	70.86
No	51	29.14
Worried about dying from COVID-19		
Yes	31	17.71
No	144	82.29
Physical Comorbidity		
Yes	17	9.72
No	158	90.28
Psychiatric comorbidity/history		
Yes	7	4
No	168	96
Family history of medical/psychiatric illness		
Yes	23	13.14
No	152	86.85
Substance history		
Yes	3	1.71
No	172	98.28

\*those who have completed their MD/MS; COVID-19: The coronavirus disease 2019

## Anxiety

Out of 175 participants, 27 (15.42%) were screened positive for anxiety, requiring further evaluation (GAD-7 score of more than or equal to ten). Participants having score of less than or equal to nine on GAD-7 were considered as non-anxious. Mean score for anxiety on GAD-7 was found to be 3.96 ( $\pm 5.02$ ).

On analysing anxious and non-anxious groups, significant factors contributing to anxiety were gender ( $p=0.002$ ), having symptoms like sore throat, cough, fever, etc. ( $p<0.01$ ), and having psychiatric comorbidity or history (as reported by

participant in questionnaire) ( $p<0.01$ ). Females showed more anxiety than males. Other variables such as age ( $p=0.803$ ), year of residency ( $p=0.733$ ), department ( $p=0.265$ ), duty ( $p=0.148$ ), physical comorbidity ( $p=0.341$ ), substance use ( $p=0.386$ ), and family history of medical or psychiatric illness ( $p=0.779$ ) did not have significant statistical difference (Table 3).

## DISCUSSION

We conducted an online survey using Google forms to avoid any sort of physical contact. Results of our study revealed prevalence of depression requiring treatment to be 15.42% and anxiety requiring further evaluation to be 15.42% among resident doctors during COVID-19 pandemic. The findings of our study were comparable to the results of other studies assessing the psychological impact of COVID-19 conducted in China and India.

A study conducted by Gupta *et al.*[6] among armed force doctors during this pandemic revealed prevalence of depression and anxiety as 28.2% and 35.2% respectively; which was higher as compared to our study. This might be due to different scales used for screening, separation from family, and different pattern of duty. The prevalence of depression and anxiety was more among females which was comparable to our study.

Another study by Chatterjee *et al.*[7] from Berhampur, India reported a high prevalence of anxiety, depression, and stress among 152 doctors, 39.5%, 35%, and 33% respectively. A study by Wilson *et al.*[8] from Manipal, Karnataka reported prevalence of HCPs with high-level stress was 3.7%, depressive symptoms requiring treatment and anxiety symptoms requiring further evaluation were 11.4% and 17.7% respectively; which were comparable to the findings of our study.

Zhu *et al.*[9] from Wuhan, China, the city of origin of outbreak of coronavirus, have reported that among 5,062 HCPs, the prevalence rates of stress, depression, and anxiety were 29.8%, 13.5%, and 24.1% respectively; showed similar rate of depression but higher prevalence of anxiety as compared to our study. Another study from China, conducted by Lai *et al.*[10] among 1,257 HCPs, showed prevalence of depression to be 50.4%, anxiety 44.6%, insomnia 34.0%, and distress 71.5%. Prevalence of depression and anxiety were higher in this study than ours, which can be attributed to sociocultural difference, availability of health resources, different scales used for assessment, and the time when the study was conducted.

A study involving 500 healthcare workers from Singapore conducted in April 2020, showed similar results that 14.5%, 8.9%, and 6.6% participants were having anxiety, depression, and stress respectively, and 7.7% were also found positive for clinical concern of posttraumatic stress disorder.[11] Our study showed a higher rate of depression than this study, which might be due to different sociocultural or economic factors and presence of better advanced healthcare systems in Singapore.

Studies conducted in Norway, Canada, Britain, United States, Benin, and Japan among resident doctors before COVID-19 pandemic revealed the prevalence of depression as 11%, 15.5%, 12%, 11.3%, 14%, and 8.8%

**Table 2:** Descriptive statistics for the characteristics and associations with depressive symptoms of the participants (N=175)

Variable	No depression (n=148), n (%)	Depression (requiring treatment) present (n=27), n (%)	$\chi^2$	p value
Age(years), mean $\pm$ SD	26.73 $\pm$ 2.06	26.70 $\pm$ 1.81		
20-28	130 (74.29)	23 (13.14)	0.146	0.702
29-37	18 (10.28)	4 (2.29)		
Gender				
Male	87 (49.71)	11 (6.29)	3.016	0.082
Female	61 (34.86)	16 (9.14)		
Year of residency				
Junior resident	134 (76.57)	25 (14.29)	0.115	0.733
Senior resident	14 (8)	2 (1.14)		
Department				
Clinical department	121 (69.14)	22 (12.57)	0.001	0.972
Non-clinical department	27 (15.43)	5 (2.86)		
Duty				
COVID-19 duty	64 (36.57)	10 (5.71)	0.360	0.548
Non-COVID-19 duty	84 (48)	17 (9.72)		
Symptoms <sup>#</sup>				
Present	3 (1.71)	7 (4)	24.206	<b>p &lt; 0.01*</b>
Absent	145 (82.86)	20 (11.43)		
Physical comorbidity				
Present	12 (6.86)	5 (2.86)	3.165	0.075
Absent	136 (77.71)	22 (12.57)		
Psychiatric comorbidity/history				
Present	4 (2.29)	3 (1.71)	4.204	<b>0.04*</b>
Absent	144 (82.29)	24 (13.71)		
Family history of medical/psychiatric illness				
Present	20 (11.43)	3 (1.71)	0.115	0.734
Absent	128 (73.15)	24 (13.71)		
Substance history				
Present	2 (1.14)	1 (0.57)	0.749	0.386
Absent	146 (83.43)	26 (14.86)		

<sup>#</sup>Symptoms included fever, cough, sore throat, abdominal pain; \*Significant association was found; p<0.05 was considered as significant

respectively.[12-17] Our study revealed a high prevalence of depression as compared to other developed countries before COVID-19 pandemic. This may possibly be due to sociocultural differences, level of healthcare facility, and due to the pandemic itself. Resident doctors in India and other developing countries are overworked. Having long duty hours, lack of proper health resources, fear of getting infected as well as infecting the family members lead to an increase in anxiety and depression. Our study has revealed a high prevalence of symptoms of anxiety and depression, which are likely due to lack of detailed information regarding newly emerged diseases and its course and prognosis, increasing mortality, unpreparedness of healthcare system,

shortage of resources and PPE, inadequate infrastructure, lack of specific drugs as well as vaccine, repeatedly changing guidelines, and many resident doctors getting infected with COVID-19.

### Limitations of study

Every study has its own limitations like ours has smaller sample size which was not decided by any statistical method; so, we had sampling bias and population was not defined clearly. Due to smaller sample size, results cannot be applied to general population. Another limitation was, we did not take follow-up response, which might help in finding causal association between causative or precipitating factor, and



**Table 3:** Descriptive statistics for the characteristics and associations with anxiety symptoms of the participants (N=175)

Variable	No anxiety (n=148), n (%)	Anxiety (requiring further evaluation) (n=27), n (%)	$\chi^2$	p value
Age (years), mean±SD	26.73±2.06	26.70±1.81		
20-28	129 (73.71)	24 (13.72)	0.061	0.803
29-37	19 (10.86)	3 (1.71)		
Gender				
Male	90 (51.43)	8 (4.57)	9.010	<b>0.002*</b>
Female	58 (33.15)	19 (10.85)		
Year of residency				
Junior resident	134 (76.57)	25 (14.29)	0.115	0.733
Senior resident	14 (8)	2 (1.14)		
Department				
Clinical department	123 (70.29)	20 (11.42)	1.240	0.265
Non-clinical department	25 (14.29)	7 (4)		
Duty				
COVID-19 duty	66 (37.72)	8 (4.57)	2.083	0.148
Non-COVID-19 duty	82 (46.86)	19 (10.85)		
Symptoms#				
Present	3 (1.71)	7 (4)	24.206	<b>p &lt; 0.01*</b>
Absent	145 (82.86)	20 (11.43)		
Physical comorbidity				
Present	11 (6.29)	6 (3.43)	0.904	0.341
Absent	137 (78.28)	21 (12)		
Psychiatric comorbidity/history				
Present	3 (1.71)	4 (2.29)	9.724	<b>p &lt; 0.01*</b>
Absent	145 (82.86)	23 (13.14)		
Family history of medical/psychiatric illness				
Present	19 (10.85)	4 (2.29)	0.078	0.779
Absent	129 (73.72)	23 (13.14)		
Substance history				
Present	2 (1.14)	1 (0.57)	0.749	0.386
Absent	146 (83.43)	26 (14.86)		

#Symptoms included fever, cough, sore throat, abdominal pain; \*Significant association was found; p<0.05 was considered as significant

depression or anxiety as well as progression of symptoms and emergence or relapse of new illness over the period of time. Another limitation was collecting personal data through online open medium, which may have compromised privacy of participant.

## Conclusion

Our study showed a prevalence rate of 15.42%, among resident doctors having depression requiring treatment and anxiety requiring further evaluation, which were similar to other studies. Significant predictors for anxiety were female gender, presence of psychiatric comorbidity, and presence

of any kind of symptom, and for depression were presence of any kind of symptoms and psychiatric comorbidity. High levels of anxiety and depression among resident doctors alarmed the need of early and timely psychiatric intervention to help them cope with the issue they are going through and for their mental wellbeing. Development of new validated scales for assessment of psychological impact following COVID-19 have helped us more for early psychiatric intervention. But, still research is needed to overcome long-term effects of the current pandemic including the development of new scales that can help us to combat this kind of battle in future.[18]

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## AUTHOR CONTRIBUTIONS

CS: Conceptualisation of research, designing the research, data acquisition, data analysis, data interpretation, writing the original draft, final approval of manuscript for publication, agree to be accountable for all aspects of work; CKB: Conceptualisation of research, designing the research, writing the original draft, critical revision of the manuscript, final approval of manuscript for publication, agree to be accountable for all aspects of work.

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