Original Research Article

Cross sectional study of depression, anxiety and stress due to COVID-19 pandemic among undergraduate medical students from Maharashtra

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ABSTRACT

Background: The ongoing pandemic due to novel corona virus has caused global social and economic disruption, including the largest global recession since the great depression. Pandemic has led to essential supply shortage like daily needs medicine that led to haphazard among population. Worldwide increase in case numbers have increases anxiety among population and also increase the tremendous stress among students due to lack of educational activity. This affects psychology of students to move away from studies. Due to pandemic many students were unable to attend clinics that create anxiousness among them which led to anxiety and stress.

Methods: The survey was conducted among the undergraduate medical students across the state of Maharashtra. The online semi-structured questionnaire was developed with the aid of Google form, among various undergraduate medical students by using DASS-21 scale.

Results: In the present study, total 435 students responded and returned completely filled in questionnaire. Out of these 435 study participants, 213 (48.97%) were male students and remaining 222 (51.03%) were female students. Based on responses to the DASS-21 scale, study participants can be categorized as normal or with mild, moderate, severe and extremely severe depression, anxiety or stress.

Conclusions: The present study concludes that psychological health of the undergraduate medical students who participated for the survey is involved to a sizeable extent. Depression and anxiety and some or other degree of stress was detected in the participants as a common finding.

Keywords: Corona virus, Medical undergraduates, Mental health, Pandemic, Psychological impact

INTRODUCTION

With masks becoming an attire-essential, the economy of countries trembling of fear, infected crowd touching millions, COVID-19 has emerged as a major threat to mankind. It has immensely transformed the very way of living. The awaited vaccine has become the utmost concern of the public. The intensity of its effect is global and it’s a challenge which mankind has no plan to deal with.

A pandemic is defined as “an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.”¹ Human corona viruses constitute a large family of viruses that usually cause mild to moderate upper respiratory illnesses in people such as the common cold.²

The COVID 19 pandemic, also known as the coronavirus pandemic, is an on-going pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV₂). The disease was first identified in December 2019 in Wuhan, China.³ The World Health Organization declared the outbreak a public health emergency of international
The worldwide rapid increase of infected cases has created a sense of uncertainty and anxiety about what is going to happen. It has also caused a tremendous level of stress among the students. This stress may lead to unfavourable effects on the learning and psychological health of students. Students who managed to go home are worried about being unable to return to their respective institutions for further studies.

The global prevalence rate of anxiety among medical students was 33.8% (95% Confidence Interval: 29.2-38.7%).

The COVID-19 pandemic may have a serious impact on the careers of this year’s medical students. They are experiencing major interruptions in teaching and assessment in the final part of their studies. Further, the students are going to face the severe challenges of the global recession caused by the COVID-19 crisis.

So, with this background the present study was planned with objectives to evaluate depression, anxiety and stress among medical students of Maharashtra using DASS-21 and to assess the factors for it.

**METHODS**

The present online survey was conducted among the undergraduate medical students across the state of Maharashtra.

**Study type**

It was a descriptive cross-sectional questionnaire-based study carried out to assess depression, anxiety and stress among the medical undergraduate students of Maharashtra.

**Study participants**

The students admitted in undergraduate medical colleges in Maharashtra. In this study the questionnaire was shared with the contacts of the researchers who were requested to share the same with their contacts who further also shared the questionnaire with their contacts. This was continued for the data collection period. Thus, snow ball sampling technique was used to collect the sample.

**Inclusion and exclusion criteria**

In the study only the students admitted to undergraduate medical colleges in Maharashtra were included and postgraduate medical students and other pre-medical students were excluded from the study.

**Study period**

The data collection for study was carried out in the span of eight days from 5th September 2020 to 12th September 2020.
Ethical considerations

Approval was obtained from the institutional ethics committee (IEC) of Government Medical College Nagpur regarding conduct of the study. The questionnaire had a short description about nature and purpose of the study. Participation in the study was entirely voluntary. The study tool had an informed consent form appended to it.

Study tool

An online semi-structured questionnaire was developed with the aid of a Google form, which had a consent form attached to it. The link of the questionnaire was sent through e-mails, WhatsApp, and other social media to the contacts of the investigators. The link was also posted in social media group comprised of only undergraduate medical students. On receiving and clicking the link, the participants got auto directed to the information about the study and informed consent. Once they accepted to take the survey, they filled up the demographic details. Then, a set of several questions appeared sequentially, which the participants were to answer.

The study questionnaire contained two sections. The section of demographic profile (age, gender, pursuing course) was added in the questionnaire and in the second section of study “depression anxiety and stress scale” (DASS-21) was administered. DASS is a validated and reliable tool to assess psychological distress in clinical and non-clinical populations. The DASS-21 is based on three subscales of depression, stress, and anxiety, and each subscale consists of seven questions each.

The data from all the Google forms was pooled in the MS Excel 2010 and then was analysed on the basis of demographic profile and clinical characteristics of study participants.

The p value less than 0.05 were considered statistically significant.

RESULTS

In the present study, total 435 students responded by completely filling the questionnaire. Out of these 435 study participants, 213 (48.97%) were male students and remaining 222 (51.03%) were female students. Mean age of the students who participated in the survey was 20.15 years with a standard deviation (SD) of 1.19 years. The age as reported by the study participants was in the range of 18 to 26 years. The age-wise details are shown in Figure 1.

![Figure 1: Age-wise distribution of study participants.](image)

Table 1: Distribution of study participants according to depression, anxiety, stress.

| Level            | Depression | Anxiety | Stress |
|------------------|------------|---------|--------|
| Normal           | 183        | 42.07   | 129    |
| Mild             | 67         | 15.40   | 55     |
| Moderate         | 100        | 22.99   | 119    |
| Severe           | 43         | 9.89    | 55     |
| Extremely severe | 42         | 9.66    | 77     |
| Total            | 435        | 100.00  | 435    |

Study participants were asked about other demographic details like area of residence either urban or rural before admission to the medical college. Those from urban area comprised 304 (69.89%) study respondents and those
from rural area were 131 (30.11%). The undergraduate medical students who participated in the current survey belonged to various medical colleges from different regions in the state of Maharashtra viz. Akola, Chandrapur, Gondla, Latur, Mumbai, Nagpur, Nanded, Wardha and Yeotmal. For the sake of simplicity, they were grouped as those belonging to regions of the state as Vidarbha, Marathwada and rest of Maharashtra. Number of study respondents from Vidarbha was 325 (74.71%), Marathwada was 39 (8.97%) and rest of Maharashtra was 71 (16.32%). The year of study of MBBS was first year in 222 (51.03 %), second year in 163 (37.47%), third minor in 43 (9.89%) and third major in 7 (1.61 %) respondents.

In response to the closed ended single response type question on preferred mode of learning inclination towards offline type was observed. Classroom was chosen by 301 respondents; online recorded classes was chosen by 95 and only 39 respondents chose online live class as their preferred mode. This is presented in graphical manner in Figure 2.

| Table 2: Factors related to depression in the study participants. |
|---------------------------------|
| **Factor**                       | **Depression** |
|                                 | No  | Mild | Moderate | Severe | Extremely severe | Total |
| Male                            | 89  | 39   | 45       | 16     | 24              | 213   |
| Female                          | 94  | 28   | 55       | 27     | 18              | 222   |
| Staying with parents            | 175 | 62   | 92       | 39     | 36              | 404   |
| Not staying with parents        | 8   | 5    | 8        | 4      | 6               | 31    |
| COVID infection in a relative   | 28  | 15   | 17       | 12     | 14              | 86    |
| No                              | 155 | 52   | 83       | 31     | 28              | 349   |
| Staying with parents            | 175 | 62   | 92       | 39     | 36              | 404   |
| Not staying with parents        | 8   | 5    | 8        | 4      | 6               | 31    |
| COVID infection in a relative   | 28  | 15   | 17       | 12     | 14              | 86    |
| No                              | 155 | 52   | 83       | 31     | 28              | 349   |

| Table 3: Factors related to anxiety among study participants. |
|---------------------------------|
| **Factor**                       | **Anxiety** |
|                                 | No  | Mild | Moderate | Severe | Extremely severe | Total |
| Male                            | 72  | 22   | 55       | 29     | 35              | 213   |
| Female                          | 57  | 33   | 64       | 26     | 42              | 222   |
| Staying with parents            | 124 | 53   | 106      | 52     | 69              | 404   |
| Not staying with parents        | 5   | 2    | 13       | 3      | 8               | 31    |
| COVID infection in a relative   | 17  | 14   | 22       | 12     | 21              | 86    |
| No                              | 112 | 41   | 97       | 43     | 56              | 349   |
| PG coaching                     | 44  | 24   | 38       | 32     | 24              | 163   |
| No PG coaching                  | 85  | 31   | 81       | 23     | 52              | 272   |
| Age less than 20 years          | 34  | 15   | 40       | 17     | 16              | 122   |
| Age ≥20 years                   | 95  | 40   | 79       | 38     | 61              | 313   |
| Resident of urban area          | 90  | 41   | 77       | 39     | 57              | 304   |
| Rural area                      | 39  | 14   | 42       | 16     | 20              | 131   |

*Indicates significant p value
The study participants with doctor parents were 30 (6.90%) whereas for majority i.e. 405 (93.10%) parents were not doctor. In response to the statement if currently staying with parents, 404 (92.87%) responded as yes and remaining 31 (7.13%) replied as no. COVID-19 infection in relatives was reported by 86 (19.77%) study participants and rest of the 349 (80.23%) did not have COVID-19 in their relatives. Undergraduate students who were having coaching for post graduate entrance were 213 (48.99%) and 272 (62.53%) students were not taking such coaching. Based on responses to the DASS-21 scale, study participants can be categorized as normal or with mil, moderate, severe and extremely severe depression, anxiety or stress. The details are tabulated in Table 1.

The role of different factors that can possibly influence the occurrence of depression, stress and anxiety is represented in Tables 2, 3 and 4 respectively.

**DISCUSSION**

COVID-19 has impacted all areas of life including the education system. Medical education system is no exception to this. In fact the undergraduate medical students and their learning is affected to a great extent eventually causing some or the other degree of involvement of psychological health leading to depression, anxiety or stress. The present rapid online survey assessed the psychological health of the undergraduate medical students during the first wave of the pandemic.

Number of male and female study participants was almost equal in the present survey. Most of the study participants were of 20 years of age comprising of almost one-third respondents followed by 21 years of age who were nearly one-fourth. Majority i.e., more than three-fourths of them were from urban area. Most of the study participants were staying with their parents. More than half were undergoing coaching for the post graduate (PG) entrance exams.

More than half of the study participants were detected to have depression by the DASS-21 scale. Stress was also a common finding i.e., around half of the participants had stress of varying severity. Anxiety was observed among approximately one-fourth of the study participants.

Occurrence of depression, anxiety and stress among medical undergraduate students relating to COVID-19 has also been reported by other researchers. It is self-explanatory as medical field demands practical skills development with clinical skills an integral part of the syllabus for medical students and the same cannot be acquired by mere e-learning.

While studying the role of various factors that could possibly be affecting psychological health of the undergraduate medical students, analysis by using chi-square test was applied to prove that results are significant. The factors that were studied included gender, age, area of residence PG coaching etc. Depression was found to have a statistically significant relation with PG coaching. May be the uncertainty at the time of the pandemic explains the occurrence of depression in the study group. Anxiety was also found to be associated with PG coaching. Stress however was found to have a statistically significant association with area of residence.

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**Table 4: Factors related to stress among study participants.**

| Factor                        | Stress                  | Total |
|-------------------------------|-------------------------|-------|
|                               | No | Mild | Moderate | Severe | Extremely severe |
| Male                          | 107 | 40   | 43       | 18     | 5               | 213   |
| Female                        | 103 | 42   | 39       | 26     | 12              | 222   |
| Chi square=4.4727 p value=0.345797 |    |      |          |        |                 |       |
| Staying with parents          | 198 | 73   | 77       | 41     | 15              | 404   |
| Not staying with parents      | 12  | 9    | 5        | 3      | 2               | 31    |
| Chi square=3.1584, df=4, p value=0.531 |    |      |          |        |                 |       |
| COVID infection in a relative | 32  | 23   | 17       | 10     | 4               | 86    |
| No                            | 178 | 59   | 65       | 34     | 13              | 349   |
| Chi square=6.7043, df=4, p value=0.152 |    |      |          |        |                 |       |
| PG coaching                   | 75  | 31   | 35       | 12     | 10              | 163   |
| No PG coaching                | 135 | 51   | 47       | 32     | 7               | 272   |
| Chi-square=6.4923, df=4, p value=0.16 |    |      |          |        |                 |       |
| Age less than 20 years        | 56  | 25   | 26       | 9      | 6               | 122   |
| Age ≥20 years                 | 154 | 57   | 56       | 35     | 11              | 313   |
| Chi square=2.6841, df=4, p value=0.612 |    |      |          |        |                 |       |
| Resident of urban area        | 144 | 63   | 24       | 30     | 13              | 304   |
| Rural area                    | 66  | 19   | 28       | 14     | 4               | 131   |
| Chi-square=14.8292, df=4, p value=0.005* |    |      |          |        |                 |       |

*Indicates significant p value
Although the present study covered a sizeable sample it has certain limitations which are inherent to all cross sectional studies. Online platform is also a limitation of the study. Further studies on a larger sample or with a different study design may be carried out for assessing the exact amplitude of the problem as well as to establish a causal relation.

CONCLUSION

The present study concludes that psychological health of the undergraduate medical students who participated for the survey is involved to a sizeable extent. Depression and anxiety and some or other degree of stress was detected in the participants as a common finding.

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