International Journal of Community Medicine and Public Health
Waghmare PR et al. Int J Community Med Public Health. 2021 Oct;8(10):4895-4901
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20213790

Original Research Article

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

Paras R. Waghmare[1], Ujwala U. Ukey[2]*, Sarita K. Sharma[2], Sumaiya A. Meman[1]

[1]MBBS student, [2]Department of Community Medicine, Government Medical College and Hospital, Nagpur, Maharashtra, India

Received: 12 August 2021
Revised: 14 September 2021
Accepted: 15 September 2021

***Correspondence:**
Dr. Ujwala U. Ukey,
E-mail: drujwalachitre@gmail.com

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 CoV_2). 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

concern on 30 January 2020 and a pandemic on 11 February.[4] As of 18 September 2020, more than 30 million cases have been reported in 188 countries and territories, resulting in more than 944,000 deaths; more than 20.4 million people have recovered.[5]

The disease mainly spreads between people when they are in close proximity.[6] It spreads very easily and sustainably, primarily via contaminated droplets produced during breathing, coughing, sneezing, talking and singing.[7,8] There are several vaccine candidates in development, although none have completed clinical trials to prove their safety and efficacy. There is no known specific antiviral medication, so primary treatment is currently symptomatic.

The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020.[4]

India currently has the largest number of confirmed cases in Asia, and has the second-highest number of confirmed cases in the world after the United States with the number of total confirmed cases breaching the 100,000 mark on 19 May, and 1,000,000 confirmed cases on 17 July 2020. On 29 August 2020, India recorded the global highest single-day spike in COVID-19 cases with 97,793 cases on 17th September 2020.[5]

India's case fatality rate is among the lowest in the world at 2.41% as of 23 July and is steadily declining. By mid-May 2020, six cities accounted for around half of all reported cases in the country Mumbai, Delhi, Ahmedabad, Chennai, Pune and Kolkata. As of 10 September 2020, Lakshadweep was the only region which has not reported a case.[5]

On 22 March, India observed a 14-hour voluntary public curfew at the insistence of Prime Minister Narendra Modi. It was followed by mandatory lockdowns in COVID-19 hotspots and all major cities. Further, on 24 March, the prime minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion-person population of India. On 14 April, India extended the nationwide lockdown till 3 May which was followed by two-week extensions starting 3 and 17 May with substantial relaxations. From 1 June, the government started "unlocking" the country (barring "containment zones") in three unlock phases.[9]

The pandemic has caused global social and economic disruption, including the largest global recession since the great depression.[10,11] It has led to the postponement or cancellation of sporting, religious, political, and cultural events.[12] Widespread supply shortages exacerbated by panic buying, and decreased emissions of pollutants and greenhouse gases.[13-16] Educational institutions have been partially or fully closed, with many switching to online schooling.[17]

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.[18,19] Students who managed to go home are worried about being unable to return to their respective institutions for further studies.[20]

The global prevalence rate of anxiety among medical students was 33.8% (95% Confidence Interval: 29.2-38.7%).[21]

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.[22] 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 depression, anxiety and stress scale-21 items (DASS-21). The DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. Each item is scored in a self-rated Likert scale from 0 (didn't apply to me all) to 3 (much or mostly applied to me) in the past 1 week.[22]

The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia, the anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect and the stress scale is sensitive to levels of chronic nonspecific arousal. The rating of DASS sub items such as depression, anxiety, and stress can be rated as normal, mild, moderate, and extremely severe.

Statistical analysis

The analysis was carried out with the help of open Epi info software. Chi square test was applied to test the statistical significance and draw meaningful conclusion. 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.

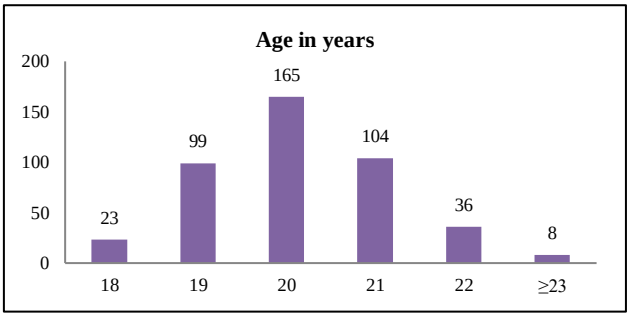

Figure 1: Age-wise distribution of study participants.

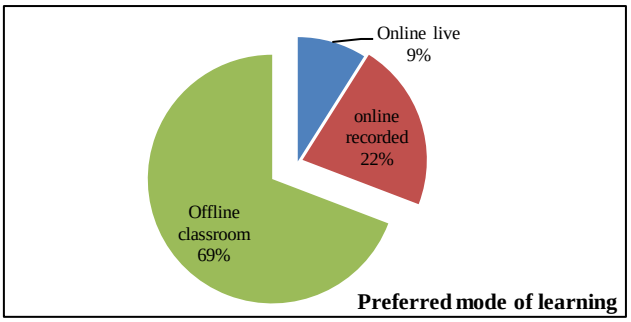

Figure 2: Preferred mode of learning of study participants.

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

Level	Depression		Anxiety		Stress	
	N	%	N	%	N	%
Normal	183	42.07	129	29.66	210	48.28
Mild	67	15.40	55	12.64	82	18.85
Moderate	100	22.99	119	27.36	82	18.85
Severe	43	9.89	55	12.64	44	10.11
Extremely severe	42	9.66	77	17.70	17	3.91
Total	435	100.00	435	100.00	435	100.00

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, Gondia, 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
Chi square=6.43, df=2, p=0.16						
Staying with parents	175	62	92	39	36	404
Not staying with parents	8	5	8	4	6	31
Chi-square=5.7853, df=4, p value=0.215						
COVID infection in a relative	28	15	17	12	14	86
No	155	52	83	31	28	349
Chi-square=9.7441, df=4, p value=0.044*						
PG coaching	67	29	38	12	17	163
No PG coaching	116	38	62	31	25	272
Chi-square=2.8763, df=4, p value=0.57						
Age less than 20 years	53	16	29	11	13	122
Age ≥20 years	130	51	71	32	29	313
Chi-square=1.0024, df=4, p value=0.909						
Resident of urban area	126	45	71	33	29	304
Rural area	57	22	29	10	13	131
Chi-square=1.3627, df=4, p value=0.85						

*Indicates significant p value

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
Chi-square=5.240, df=4, p value=0.263						
Staying with parents	124	53	106	52	69	404
Not staying with parents	5	2	13	3	8	31
Chi-square=7.136, df=4, p value=0.12						
COVID infection in a relative	17	14	22	12	21	86
No	112	41	97	43	56	349
Chi-square=7.6558, df=4, p value=0.105						
PG coaching	44	24	38	32	24	163
No PG coaching	85	31	81	23	52	272
Chi-square=14.2, df=4, p value=0.006*						
Age less than 20 years	34	15	40	17	16	122
Age ≥20 years	95	40	79	38	61	313
Chi-square=4.264, df=4, p value=0.371						
Resident of urban area	90	41	77	39	57	304
Rural area	39	14	42	16	20	131
Chi-square=2.73, df=4, p value=0.60						

*Indicates significant p value

Table 4: Factors related to stress among study participants.

Factor	Stress					
	No	Mild	Moderate	Severe	Extremely severe	Total
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

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 163 (37.47%) 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.[19] 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.

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.

ACKNOWLEDGEMENTS

The authors acknowledge all the study participants for their cooperation and participation in this survey.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Waghmare PR, Ukey UU, Sharma SK, Meman SA. Cross sectional study of depression, anxiety and stress due to COVID-19 pandemic among undergraduate medical students from Maharashtra. Int J Community Med Public Health 2021;8:4895-901.