

Psychological impact of COVID-19 pandemic on medical students of Madhya Pradesh, India**Ramesh Agrawal^a, Anil Singh Baghel^b, Harshul Patidar^c, Pratik Akhani^{d*}**^aDepartment of Microbiology, Nandkumar Singh Chouhan Government Medical College, Khandwa-450001, Madhya Pradesh, India.^bDepartment of Community Medicine, Government Medical College, Dungarpur, Rajasthan, India.^cDepartment of Pathology, Nandkumar Singh Chouhan Government Medical College, Khandwa-450001, Madhya Pradesh, India.^dDepartment of Physiology, Banas Medical College and Research Institute, Palanpur-385001, Gujarat, India.**Abstract****Background:** Medical students are the most affected psychologically during COVID-19 pandemic in India. Psychological impact (depression, anxiety and stress) were mild to severe in nature.**Objectives:** Objective of the current study is the assessment of psychological impact of COVID-19 pandemic on medical students of Madhya Pradesh, India.**Patients and methods:** A cross section web based online survey was used for data collection in different medical colleges of Madhya Pradesh. Socio-demographic, COVID-19 related questionnaires and DASS (Depression, anxiety and stress) scale were used for determining the degree of depression, anxiety and stress among medical students. Data was analyzed statically using SPSS 22 and Chi-Square test.**Results:** A total of 717 medical students of different medical colleges of Madhya Pradesh participate in this survey. Psychological impact (depression, anxiety and stress score) was observed in 34 to 47 % ranging from mild to severe in nature. Depression and anxiety was found in 46.7% of patients and stress in 34.3%. Female participants have more psychological impact than male.**Conclusions:** COVID-19 pandemic significantly impact the mental health of the medical students.**Keywords:** COVID-19 pandemic; Depression; Anxiety; Stress; Psychological impact.**DOI:** 10.21608/svuijm.2022.145271.1324***Correspondence:** pratikakhani@yahoo.com.**Received:** 17 June, 2022.**Revised:** 28 July, 2022.**Accepted:** 1 August, 2022**Cite this article as:** Ramesh Agrawal, Anil Singh Baghel, Harshul Patidar, Pratik Akhani (2023). Psychological impact of COVID-19 pandemic on medical students of Madhya Pradesh, India. *SVU-International Journal of Medical Sciences*. Vol.6, Issue 1, pp: 79-88 .

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Introduction

The novel corona virus (2019-nCoV), also known as SARS-CoV-2 or COVID-19 infection is the recently emerging most challenging public health problem in India and many other regions of all over the world (Zhai and Du, 2020). COVID-19 pandemic spread in almost every nation all over the world and led to many economic and political challenges. Also it has impacted on physical as well as mental health of patients (Lau et al., 2006). When we have compared the medical education with many other non medical academic fields, medical education takes a very long time to study, lengthy syllabus and lot of pressure during training; this could enhance the psychological/mental health of the medical student (Safaie et al., 2020). The psychological impact of the COVID-19 on medical students were moderate-to-severe level, the major mental impact was increased anxiety, depression, stress, hypertension, panic, uncertainty, apprehension, phobia, and insomnia etc (Wang et al., 2020; Cullen et al., 2020). A current review study of SARS-CoV-2 virus pandemic outbreaks documented stressors such as fears of infection, boredom, frustration, inadequate information, financial loss, and stigma (Brooks et al., 2020). Predominant reasons of psychological changes (increased anxiety and stress) in medical students are loss of movement, lack of social interaction, online education, worried about course completion & general panic among family members and colleagues (Quek et al., 2019). During the COVID-19 pandemic medical students are especially vulnerable to behavioral and psychological impact; hence they have

required additional and tailored support, distinct from the general population or medical professionals (Sharma and Bhaskar, 2020). COVID-19 pandemic is continuously going on with many antigenic variations on SARS-CoV-2 virus lead to frequent waves of COVID-19, which have more impacts the psychological & behavioral patterns of the medical students. We have conducted this cross-sectional online survey for the assessment of psychological and behavior effects of COVID-19 pandemic on medical students after second wave of COVID-19 pandemic.

Patients and methods

Google based survey and sample collection strategy

We have conducted a web based cross-sectional survey on medical colleges of Madhya Pradesh. Participants included medical students in all years of study in different medical colleges of Madhya Pradesh. Survey was designed to assess psychological or behavioral effects of COVID-19 on medical students. Data collection were done by using an online Google form contain questionnaires. We have collected responses from the medical students of different medical colleges within 10 days of sending this survey link. A total of 517 medical students participated in our web-based survey.

Ethical considerations: The study was performed in line with ethical guidelines for internet-mediated research (Hewson et al., 2017). All the respondents were informed about the objectives of the study including confidentiality of the data.

As they consented to volunteer themselves in this completely anonymised, non-experimental, online study, and as no identifiable information was gathered, no ethical approval was required.

Measurements

Depression Anxiety Stress Scale (DASS) were administered in Google forms to the medical students on WhatsApp groups. DASS is a 21-item self-report questionnaire that assesses recent experiences of stress (e.g., "I found it hard to wind down"), anxiety (e.g., "I felt close to panic"), and depression (e.g., "I felt that I had nothing to look forward to"). Each 7-item subscale is rated on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much). Higher scores represent greater symptomatology (Horowitz et al., 1979). Survey questions included consent question (voluntary written consent for participating in this study), demographic characteristics (i.e., age, gender and marital status), COVID-19-related questions (e.g. COVID-19 positive status during the current

Pandemic, COVID-19 vaccination status) and Depression Anxiety Stress Scale (DASS) related questions.

Statistical analysis

Statistical software used to analyze data were MS Excel, SPSS for Windows Inc. Version 22. Chicago. Proportions were compared using Chi-square test. For all comparison P -value of <0.05 was considered statistically significant. The DASS score was used to determine the severity of psychological (depression, anxiety or stress) effects in students.

Results

A total of 516 medical students of different colleges of Madhya Pradesh are voluntary participate in our online web based survey. Obtained results were analyzed based on socio-demographic and psychological effects. Majority (51.94%) of the participants belongs to 18-20 years of the age groups with equal male: female ratio. Age and gender wise details were shown in (Table. 1).

Table 1. Age and Gender distribution

| Age Group | Male (%) | Female (%) | Total (%) |
|--------------|--------------------|--------------------|------------------|
| 18-20 | 121 (47.45) | 147 (56.32) | 268 (51.94) |
| 21-23 | 111 (43.53) | 112 (42.91) | 223 (43.22) |
| 24-26 | 15 (5.88) | 1 (0.38) | 16 (3.10) |
| 27+ | 8 (3.14) | 1 (0.38) | 9 (1.74) |
| Total | 255 (49.42) | 261 (50.58) | 516 (100) |

In our study most of the medical students are belongs to government medical colleges (97.4%) and predominant students were studying in 1st year MBBS (Bachelor of

Medicine and Bachelor of Surgery). Socio-demographic variables of study participants were shown in (Table. 2).

Table 2. Socio-demographic variables of study participants

| Type of Medical College | N (%) |
|-------------------------|-------------|
| Government | 503 (97.48) |
| Private | 13 (2.52) |
| Year of MBBS | |
| 1st MBBS | 305 (59.11) |
| 2nd MBBS | 160 (31.01) |
| 3rd MBBS Part I | 41 (7.95) |
| 3rd MBBS Part II | 1 (0.19) |
| Internship | 9 (1.74) |

A multivariate analysis was performed with the depression level of the DASS score to all the participants. A higher level of depression score was associated with 3rd year M.B.B.S.

students in the age group 21-23 years. Details descriptions of DASS depression score of the study participants was shown in (Table. 3).

Table 3. Association between baseline characteristics and DASS Depression scores of study participants

| Characteristics | Normal | Mild | Moderate | Severe | Extremely Severe | p-value |
|--------------------------------|-----------|----------|----------|---------|------------------|---------|
| Gender | | | | | | |
| Male | 147 (58%) | 31 (12%) | 39 (15%) | 17 (7%) | 21 (8%) | 0.36 |
| Female | 128 (49%) | 41 (16%) | 42 (16%) | 22 (8%) | 28 (11%) | |
| Age group | | | | | | |
| 18-20 | 148 (55%) | 33 (12%) | 40 (15%) | 22 (8%) | 25 (9%) | 0.65 |
| 21-23 | 113 (51%) | 35 (16%) | 36 (16%) | 15 (7%) | 24 (11%) | |
| 24-26 | 8 (50%) | 2 (13%) | 5 (31%) | 1 (6%) | 0 (0%) | |
| ≥27 | 6 (67%) | 2 (22%) | 0 (0%) | 1 (11%) | 0 (0%) | |
| MBBS Year | | | | | | |
| 1 st MBBS | 164 (54%) | 37 (12%) | 52 (17%) | 25 (8%) | 27 (9%) | 0.81 |
| 2 nd MBBS | 83 (52%) | 25 (16%) | 21 (13%) | 13 (8%) | 18 (11%) | |
| 3 rd MBBS | 22 (52%) | 8 (19%) | 7 (17%) | 1 (2%) | 4 (10%) | |
| Internship | 6 (67%) | 2 (22%) | 1 (11%) | 0 (0%) | 0 (0%) | |
| Type of Medical College | | | | | | |
| Government | 269 (53%) | 69 (14%) | 78 (16%) | 39 (8%) | 48 (10%) | 0.66 |
| Private | 6 (46%) | 3 (23%) | 3 (23%) | 0 (0%) | 1 (8%) | |

Multivariate analysis of DASS anxiety score in the medical students was presented in (Table. 4). Anxiety score was higher in 2nd

year M.B.B.S. female students in the age group 18-20 years.

Table 4. Association between baseline characteristics and DASS Anxiety scores of study participants

| Characteristics | Normal | Mild | Moderate | Severe | Extremely Severe | p-value |
|--------------------------------|-----------|---------|----------|----------|------------------|---------|
| Gender | | | | | | |
| Male | 154 (60%) | 16 (6%) | 40 (16%) | 15 (6%) | 30 (12%) | 0.27 |
| Female | 136 (52%) | 19 (7%) | 49 (19%) | 26 (10%) | 31 (12%) | |
| Age group | | | | | | |
| 18-20 | 147 (55%) | 20 (7%) | 47 (18%) | 28 (10%) | 26 (10%) | 0.51 |
| 21-23 | 127 (57%) | 14 (6%) | 39 (17%) | 12 (5%) | 31 (14%) | |
| 24-26 | 9 (56%) | 0 (0%) | 3 (19%) | 1 (6%) | 3 (19%) | |
| ≥27 | 7 (78%) | 1 (11%) | 0 (0%) | 0 (0%) | 1 (11%) | |
| MBBS Year | | | | | | |
| 1 st MBBS | 170 (56%) | 25 (8%) | 51 (17%) | 28 (9%) | 31 (10%) | 0.66 |
| 2 nd MBBS | 87 (54%) | 7 (4%) | 32 (20%) | 11 (7%) | 23 (14%) | |
| 3 rd MBBS | 26 (62%) | 3 (7%) | 5 (12%) | 2 (5%) | 6 (14%) | |
| Internship | 7 (78%) | 0 (0%) | 1 (11%) | 0 (0%) | 1 (11%) | |
| Type of Medical College | | | | | | |
| Government | 284 (56%) | 34 (7%) | 86 (17%) | 41 (8%) | 58 (12%) | 0.56 |
| Private | 6 (46%) | 1 (8%) | 3 (23%) | 0 (0%) | 3 (23%) | |

A multivariate analysis was also performed in the stress score level to all the study participants. DASS stress score was highest in 1st & 2nd year M.B.B.S. Females

students in the age group 24-26 years. Details descriptions of DASS depression score of the study participants was shown in (Table. 5).

Table 5. Association between baseline characteristics and DASS Stress scores of study participants

| Characteristics | Normal | Mild | Moderate | Severe | Extremely Severe | p-value |
|----------------------|-----------|----------|----------|----------|------------------|---------|
| Gender | | | | | | |
| Male | 175 (69%) | 27 (11%) | 27 (11%) | 14 (5%) | 12 (5%) | 0.40 |
| Female | 164 (63%) | 28 (11%) | 33 (13%) | 25 (10%) | 11 (4%) | |
| Age group | | | | | | |
| 18-20 | 172 (64%) | 31 (12%) | 36 (13%) | 22 (8%) | 7 (3%) | 0.42 |
| 21-23 | 149 (67%) | 22 (10%) | 21 (9%) | 16 (7%) | 15 (7%) | |
| 24-26 | 10 (63%) | 2 (13%) | 3 (19%) | 0 (0%) | 1 (6%) | |
| ≥27 | 8 (89%) | 0 (0%) | 0 (0%) | 1 (11%) | 0 (0%) | |
| MBBS Year | | | | | | |
| 1 st MBBS | 197 (65%) | 40 (13%) | 40 (13%) | 19 (6%) | 9 (3%) | 0.09 |
| 2 nd MBBS | 105 (66%) | 11 (7%) | 14 (9%) | 19 (12%) | 11 (7%) | |
| 3 rd MBBS | 29 (69%) | 4 (10%) | 5 (12%) | 1 (2%) | 3 (7%) | |
| Internship | 8 (89%) | 0 (0%) | 1 (11%) | 0 (0%) | 0 (0%) | |

| | | | | | | |
|--------------------------------|-----------|----------|----------|---------|---------|------|
| Type of Medical College | | | | | | |
| Government | 331 (66%) | 53 (11%) | 59 (12%) | 38 (8%) | 22 (4%) | 0.84 |
| Private | 6 (46%) | 2 (16%) | 1 (8%) | 1 (8%) | 1 (8%) | |

Discussion

This study meant to address the impact of COVID-19 on psychological and mental health of the medical students of Madhya Pradesh, India. COVID-19 pandemic affects mental pressure in all populations but more on health care professionals. As public health emergencies have many psychological effects, the levels of anxiety, depression, and other mental health problems have been worryingly rising since the declaration of COVID-19 as a pandemic (Ansari et al., 2020)

Present study observed majority of the study participant was 18-20 years of age group with female predominance (because of the female medical students are more than male in different medical colleges of Madhya Pradesh) comparable with the study conducted by (Seetan et al., 2021) in contrast to those (Nishimura et al., 2021) found male predominance in their study. In our study majority of the medical students (59.2%) studying in 1st year M.B.B.S. similar to the (Sundrasen et al., 2020).

Psychological or mental impact due to COVID-19 pandemic was 34.3% to 46.7% ranging mild to extremely severe among medical students in present study which was concordance with the (Raj R. et al., 2020). Current study observed DASS stress score was 34.3% mainly mild to

moderate stress which was comparable with the (Agrawal et al., 2021).

Stress score was higher in female than male but it was statically not significant, our finding consistent with (Kumar et al., 2020 and Chhetri et al., 2021), because they have constantly under pressure (stressful life events). High DASS depression score 46.7% was found in present study out of that (mild-13.9%, moderate-15.7%, severe-7.6% and extremely severe-9.5%) accordance with the (Son et al., 2020) observed 44% depression score in their study. Anxiety DASS score was also 46.7% observed in current study (mild-13.6%, moderate-15.8%, severe-7.5% and extremely severe-9.6%), which was comparable with the (Natalia and Syakurah, 2021) found anxiety score was 47.8%.

We have found that anxiety score was higher in female participants as compared to the male but it is not statically significant, accordance to the (Quek et al., 2019 and Torun et al., 2020), this could be due to female medical students are more worried and careful.

Current study observed depression and stress level were mild to moderate and anxiety level were moderate to extremely severe in nature have more in female medical students similar finding also observed by (Selvaraj et al., 2020)

discordance to that (Geo et al., 2021) observed depression, anxiety and stress score was more in male as compared to female medical students.

In our study majority of the participants with moderate depression (15.7%), moderate anxiety (15.7%), and mild stress (10.6%).during COVID-19 outbreak consistent finding was observed by (Saraswathi et al.,2020).

Overall female participants are feeling anxiety, stress and depression score more than male in present study finding consistent with the other study like (Moghel et al., 2020), female students are more prone to psychological stress may be due to they are more concern about health and future, feelings of uncertainty, helplessness and outbursts than male students.

Medical students have much higher prevalence of anxiety, stress and depression as compared to general population's possible reasons for that are added fear of social isolation and stigmatization while dealing with infected people/patients, physical and mental exhaustion due to long duties, consequent sleep deprivation, financial burden, student abuse and exposure to deaths of patients. Therefore, the COVID-19 pandemic had increased anxiety, stress and depression level lead to potential impact on the emotional and mental health state among medical students

Limitations & Further Scope

Homogenous group of population, small sample size in a particular area and using the online platform are the limitations of this

study. A replication of the present research, if done nation-wide, would provide a more representative data for generalization.

Conclusion

Present study analyzed that current COVID-19 pandemic definitely impact the mental health or psychological changes amongst medical students. We have found that 34 to 47 percent of medical students affected with depression, anxiety and stress ranging from mild to severe due to COVID-19 pandemic. The consequences of psychological impact are poor performance in medical studies, social distraction and tendency to self harm. The study emphasizes the need to provide stress relieving activities such as meditation and counseling and develop facilities for recreational activities in medical institutes.

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Conflicts of interest:

There are no conflicts of interest

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