

Research Article

# Effect of COVID-19 Pandemic Lockdown on the Mental Health of Medical Students in Gujarat, India

Apurva Patel<sup>1</sup>, Kalpita Shringarpure<sup>2</sup>

<sup>1</sup>Intern, Medical College Baroda, Baroda, Gujarat, India.

<sup>2</sup>Assistant Professor, Department of Preventive and Social Medicine, Medical College Baroda, Baroda, Gujarat, India.

DOI: <https://doi.org/10.24321/2349.2880.202116>

## I N F O

### Corresponding Author:

Apurva Patel, Medical College Baroda, Baroda, Gujarat, India.

### E-mail Id:

[doc.apurvapatel@gmail.com](mailto:doc.apurvapatel@gmail.com)

### Orcid Id:

<https://orcid.org/0000-0002-2837-3066>

### How to cite this article:

Patel A, Shringarpure K. Effect of COVID-19 Pandemic Lockdown on the Mental Health of Medical Students in Gujarat, India. *Ind J Youth Adol Health*. 2021;8(4):22-27.

Date of Submission: 2021-12-01

Date of Acceptance: 2021-12-17

## A B S T R A C T

**Background:** Following the COVID-19 pandemic, a nationwide lockdown was announced in India in March 2020; wherein medical institutes throughout the country were closed. Various factors like physical inactivity, lack of social interaction, media news, uncertainty regarding examinations and course completion were expected to affect the mental health of medical students. This study was undertaken to understand the effect of COVID-19 lockdown on the mental health of medical students in Gujarat, India.

**Settings and Design:** This was an analytical cross-sectional study conducted over 26 medical colleges in Gujarat.

**Method:** An online survey was carried out over a period of ten days through Google Forms which included demographic details and the Depression, Anxiety and Stress Scale-21 (DASS-21). MedCalc software was used as a statistical software for data analysis.

**Results:** 2021 students (1107 males and 914 females) across 26 medical colleges participated in the survey. More than two-thirds (68.1%) of total students reported being physically less active during the lockdown. Around half of the participants reported some severity of depression (50.27%), anxiety (51.46%) and stress (41.61%). Significant difference was found in terms of gender, physical exercise, meditation for the severity of depression, anxiety and stress. Females reported more severe depression and stress. Physical exercise and meditation were found to be having a positive impact on the mental health of the students.

**Conclusion:** The lockdown has negatively affected the mental health of medical students in terms of increased depression, anxiety, stress among them.

**Keywords:** DASS-21, Medical Students, Mental Health, COVID-19, Lockdown

## Introduction

The first case of COVID-19 disease was recorded on December 31st, 2019, which spread from Wuhan city of China to other provinces in the country and then other countries due to international travel. WHO declared COVID-19 as a pandemic on March 11th, 2020, because of its widespread incidence and prevalence.<sup>1</sup> Over 353,279,995 confirmed cases of COVID-19 and 5,617,594 deaths due to COVID-19 infection are recorded all over the world.<sup>2</sup> India is one of the leading countries in terms of the number of cases and deaths due to COVID-19 infection with the number of total recorded cases crossing 39,543,328 and the number of mortalities being 489,896.<sup>3</sup> To fight against COVID-19, in terms of prevention of the spread of the disease, India declared lockdown on March 24, 2020. It was introduced in a phase-wise manner from March 25th, 2020 to May 31st, 2020, after which from June 1st, 2020, relaxations were given in a phased manner and the phases were termed Unlock. After such five unlock phases, almost all services were resumed with some restrictions in containment zones.<sup>4</sup> Medical institutes were closed throughout the lockdown with most of them being closed even during the month of November with no certainty of reopening. The continuous increase in the number of cases, parallel infodemic, self-isolation, closure of all educational institutes were expected to affect the mental health of each student. Medical students are believed to be having higher cases of stress and depression even during normal days<sup>5</sup> and thereby, greater effects of COVID-19 were expected on the mental health of medical students due to uncertainty in the teaching and examination schedules. The lockdown may initially have offered a much needed break during the month of March; however, as it extended, it may have led to boredom, physical inactivity, consumption of unnecessary calories in the diet, lack of social interaction, and changes in sleep pattern. Currently, physical inactivity is considered to be the fourth major risk factor for global mortality.<sup>6</sup> The lockdown may have limited physical activity and staying home would have led to the consumption of unnecessary calories. This can lead to an increase in weight. Stress is an important factor affecting eating habits. It may lead to over or under-eating. Chronic stress is found to be involved in weight gain.<sup>7</sup> A study done in China on "the psychological impact of COVID-19 epidemic on college students in China" suggested the need to monitor the mental health of college students during epidemics.<sup>8</sup> It was also found that compared to other population, college students were more sedentary and were having more anxiety and depression due to COVID-19.<sup>9</sup> Keeping in mind all the changes during the COVID-19 pandemic, lockdown and increasing evidence on the effects of lockdown on medical students, this study was conducted among the medical students of Gujarat to understand the effects of lockdown on their mental health.

## Materials and Method

This was an analytical cross-sectional study conducted over a period of ten days from June 5th, 2020 to June 14th, 2020 using a Google-based questionnaire approach, given the lockdown scenario.

Permission from the Institutional Ethics Committee of Medical College, Baroda was obtained to carry out the study. Necessary permissions from the Deans' offices were taken to conduct the study among medical students.

## Data Collection

A structured questionnaire regarding general demographic information, age, gender of the students, year of study, college of study, their physical health, level of social interaction, meditation and questions from the Depression, Anxiety and Stress-21 scale<sup>10</sup> was floated through an online survey. This online survey tool was generated as a Google Form and the responses were collected in Google drive.

The DASS-21 score was assessed based on the scoring table, the severity of anxiety, depression and stress was characterised as normal, mild, moderate, severe, or extremely severe.<sup>10</sup> A study suggests the reliability of DASS-21 showing excellent Cronbach's alpha values for the subclasses of depression, anxiety, stress (0.81, 0.89 and 0.78 respectively).<sup>11</sup>

The target populations of the study were medical students enrolled in 26 medical institutes in Gujarat, India. The Google Form was sent to the WhatsApp groups of each year from the first year to the final year across 26 medical colleges and 2021 students out of approximately 19,000 students (response rate = 10.64%) from various colleges filled the online questionnaire. Informed online consent was taken by stating that the study was voluntary and that the students were not bound to fill the form. It was also stated that there would not be any monetary benefits, but their participation would help to understand the impact of lockdown on the mental health of medical students. The students were ensured that their information would be kept anonymous.

The Google Form was sent on June 5th, 9th, 11th and 14th, 2020. Entries were frozen at midnight on June 14th.

## Data Entry and Analysis

The data collected in Google drive was transferred to Microsoft Excel 2016. The distribution of quantitative variables like age, duration of exercise, weight gain was assessed and the quantitative variables with normal distribution were presented as mean and standard deviation. Qualitative variables were reported as percentages (proportions). The data collected for the Depression Anxiety Stress-21 scale were assessed through the DASS-21 scoring table. Pivot tables were created for the analysis and the

results were reported in proportions in a table format. The population was classified depending on the state of depression, anxiety, stress and their severity as normal, mild, moderate, severe, or extremely severe. The scores on DASS-21 were multiplied by 2 to calculate the final score. For normal depression, anxiety, stress, the scores were 0-9, 0-7, 0-14 respectively. The scores for other severity are mentioned in the scoring table.<sup>10</sup> For assessing the association and its significance between depression, anxiety, stress and other variables like meditation, the data were divided into 3 groups, namely normal, mild-moderate, and severe-extremely severe instead of 5 groups in the original data.

For statistical analysis, MedCalc v.19.2 was used. Wilson 95% confidence was applied to each proportion. Chi-squared test was done to find associations between variables. Significance level P was set to < 0.05.

### Results

Over a period of ten days, the survey form was sent to 26 different medical institutes asking the students to take part in the research; which received 2021 responses. All the participants' responses were analysed and scored as per the scoring table (Table 1).

### Participants' Characteristics

Out of 2021 participants, 1107 (54.78%) were male and 914 (45.22%) were female. The mean age of participants was 20.5 years (Standard deviation SD: 3.5 years). Participants included 805 (39.83%) students from 1st Year, 365 (18.06%) from 2nd prof 1 year, 225 (11.13%) from 2nd prof 2 year, 418 (20.68%) from 3rd year, and 208 (10.29%) from final year.

### Changes During Lockdown

When asked about the changes faced during the lockdown, 68.14% (n = 1377) of the students mentioned becoming physically less active, while 58% (n = 1179) performed some kind of physical exercise. Food intake was increased among 57.8% (n = 1168) of students. Almost three-fourths of the students (1388, 68.7%) were satisfied with sleep. Social interaction decreased in 69.4% of the students (Table 2).

### Gender and Mental Health

A higher percentage of females among the total respondents reported suffering from higher severity in each condition than males. This finding was statistically significant for depression (Chi-square (2, N = 2021) = 28.78, p ≤ 0.00001) and stress (Chi-square (2, N = 2021) = 30.55, p ≤ 0.00001) but not for anxiety (Chi-square (2, N = 2021) = 4.10, p = 0.12823) (Table 3).

**Table 1. DASS 21 Scale**

Severity	Depression		Anxiety		Stress	
	Frequency (Percentage)	Wilson 95% CI	Frequency (Percentage)	Wilson 95% CI	Frequency (Percentage)	Wilson 95% CI
Normal	1005 (49.73)	47.55%-51.91%	981 (48.54)	46.37% -50.72%	1180 (58.39)	56.22% - 60.52%
Mild	322 (15.93)	14.40%-17.59%	264 (13.06)	11.66% -14.60%	447 (22.12)	20.36% - 23.98%
Moderate	409 (20.24)	18.54%-22.04%	490 (24.25)	22.43% 26.16%	212 (10.49)	9.23% - 11.90%
Severe	122 (6.04)	5.08%-7.16%	152 (7.52)	6.45% -8.75%	141 (6.98)	5.95% - 8.17%
Extremely severe	163 (8.07)	6.96%-9.33%	134 (6.63)	5.63% -7.80%	41 (2.03)	1.50% - 2.74%
Total	2021 (100)		2021 (100)		2021 (100)	

**Table 2. Changes during Lockdown**

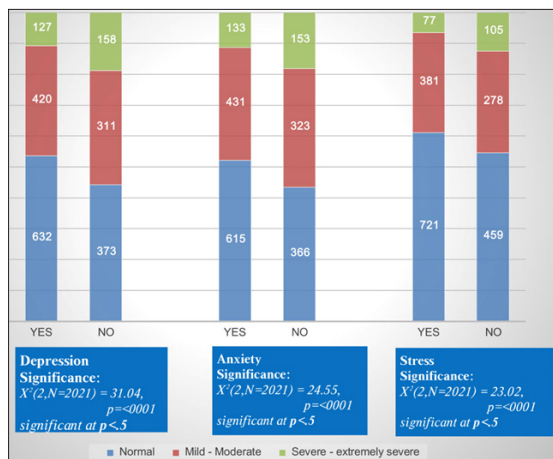
Questions	Response (N, %)	Wilson 95% CI
Have you become physically less active?	Yes (1377, 68.14)	66.07% - 70.13%
Do you perform any kind of physical exercise?	Yes (1179, 58.34)	56.17% - 60.47%
Has your food intake increased?	Yes (1168, 57.79)	55.63% - 59.93%
Are you satisfied with sleep?	Yes (1388, 68.67)	66.62% - 70.66%
How has your social interaction been?	Decreased, (1402, 69.37)	67.29% - 71.57%

**Table 3. Gender and Mental Health**

Severity	Normal	Mild to Moderate	Severe - Extremely Severe	Total
	N (%)	N (%)	N (%)	
<b>Depression</b>				
Male	606 (54.74)	375 (33.87)	126 (11.38)	1107
Female	399 (43.65)	356 (17.07)	159 (17.39)	914
X <sup>2</sup> (2, N = 2021) = 28.78, p ≤ 0.00001 (significant at p < 0.05)				
<b>Anxiety</b>				
Male	558 (50.41)	404 (36.49)	145 (13.09)	1107
Female	423 (46.28)	350 (38.29)	141 (15.42)	914
X <sup>2</sup> (2, N = 2021) = 4.10, p = 0.12823 (not significant at p < 0.05)				
<b>Stress</b>				
Male	706 (63.78)	321 (28.99)	80 (7.22)	1107
Female	474 (51.86)	338 (36.98)	102 (11.15)	914
X <sup>2</sup> (2, N = 2021) = 30.55, p ≤ 0.00001 (significant at p < 0.05)				
				TOTAL: 2021

**Physical Exercise and Mental Health**

The participants who were involved in some kind of physical exercise reported lesser depression, anxiety and stress compared to the participants who were not. Physical exercise was significantly associated with lesser severity of depression (Chi-square (N = 2021) = 31.04, p ≤ 0001), anxiety (Chi-square (N = 2021) = 24.55, p ≤ 0001) and stress (Chi-square (2, N = 2021) = 23.02, p ≤ 0001) (Figure 1).

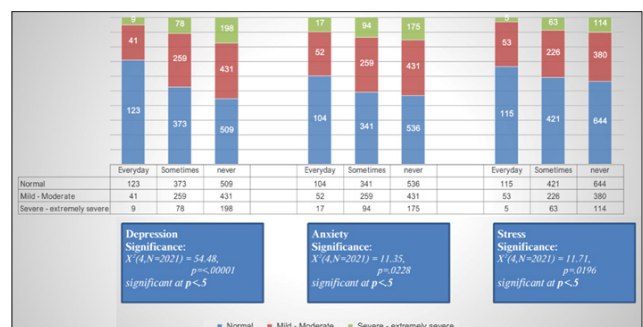


**Figure 1. Physical Exercise and Mental health**

**Meditation and Mental Health**

Among the respondents who reported performing meditation every day (173,8.5%), a higher percentage reported being normal (71.09% for depression, 60.11% for anxiety, and 66.47% for stress) compared to those who did not perform it or performed it sometimes. A significant association was found between meditation and

good mental health (Chi-square = 54.48, p ≤ 0.00001 for depression; 11.35, p = 0.0228 for anxiety; 11.71, p = 0.02 for stress) (Figure 2).



**Figure 2. Meditation and Mental Health**

**Discussion**

This study aimed to assess the mental health of medical students during the COVID-19 lockdown. It was conducted among medical students from 26 medical colleges across Gujarat. The 2021 students were hence representative of the medical student population of Gujarat. 1107 (54.78%) male and 914 (45.22%) female students responded to the survey; which is representative of the current gender proportion of admission to medical colleges.

Data regarding changes in lifestyle has not been collected during this study but various studies around the world have noted changes in adolescents and youth e.g. an Italian study mentions increased sedentary behaviour like napping and usage of electronic devices and decreased physical activity like walking as compared to the pre-COVID period in undergraduate students.<sup>12</sup> A study showed increased BMI

due to physical inactivity among youth in China.<sup>13</sup>

Students were restricted to their homes and were involved in some kind of online teaching. Due to the restrictions of lockdown, most of the participants remained at home and 68.1% of them reported being physically less active. However, some were still managing to perform some kind of physical exercise. Along with the physical inactiveness, the mental health of students was also affected with around half of the participants having some severity of depression, anxiety, and stress. A mental health survey done on medical students in China showed similar results.<sup>14</sup> Various studies show the prevalence of greater depression, anxiety, stress among medical students<sup>15</sup> compared to other students of the same age group and general population. The closure of colleges and universities, uncertainties regarding exams and completion of the course, lack of social interaction, increasing number of COVID-19 cases, and staying isolated in homes would have added more to the distress of the students.

There was no statistically significant difference as per gender in the prevalence of anxiety, but the prevalence of depression and stress was higher in females than in male participants.

Physical exercise has been proposed to reduce depression, anxiety, and stress in any individual regardless of gender and age.<sup>16</sup> Participants involved in physical exercise reported less occurrence or less severity of depression, anxiety, and stress. A study performed on the mitigation effects of exercise on negative mental health symptoms in college students during COVID-19 suggests that regular physical exercise helps in alleviating stress and other negative emotions.<sup>17</sup> Various studies support that meditation and mindfulness activities are effective in decreasing stress, anxiety, and depression in students.<sup>18</sup> A study has shown that meditation and yoga intervention are effective in decreasing the stress of medical students and improving their well-being.<sup>19</sup> There was a statistically significant difference in the prevalence of depression ( $p \leq 0.00001$ ), anxiety ( $p = 0.02$ ), and stress ( $p = 0.02$ ) among participants performing meditation as compared to those who did not. However, activities like meditation and yoga are very subjective and there are no strict rules on how to assess them. A meta-analysis has shown that further studies should be done to present strong evidence in such studies.<sup>20</sup>

## Implications

The negative mental health impact of lockdown can lead to poor performance of students in academics and other severe and harmful consequences. However, studies like this give insight into the proportion of anxiety and stress among the students. Further what can be done to minimise or alleviate the negative impacts of a pandemic and/ or

lockdown on the mental health of medical students can be thought of and studied.

## Conclusion

This study suggests that conditions like the present pandemic and lockdown can have a severe impact on the mental health of medical students.

**Source of Funding:** None

**Conflict of Interest:** None

## References

1. World Health Organization [Internet]. Rolling updates on coronavirus disease (COVID-19); 2020 Jul [cited 2020 Nov 7]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>
2. Worldometers.info [Internet]. COVID live - Coronavirus statistics –worldometer; [cited 2021 Sep 24]. Available from: <https://www.worldometers.info/coronavirus/>
3. Worldometers.info [Internet]. India COVID - Coronavirus statistics - worldometer; [cited 2021 Sep 24]. Available from: <https://www.worldometers.info/coronavirus/country/india/>
4. Wikipedia [Internet]. COVID-19 pandemic lockdown in India; [cited 2020 Nov 7]. Available from: [https://en.wikipedia.org/wiki/COVID-19\\_pandemic\\_lockdown\\_in\\_India](https://en.wikipedia.org/wiki/COVID-19_pandemic_lockdown_in_India)
5. Puthran R, Zhang MW, Tam WW, Ho RC. Prevalence of depression amongst medical students: a meta-analysis. *Med Educ.* 2016;50(4):456-68. [PubMed] [Google Scholar]
6. World Health Organization [Internet]. Global recommendations on physical activity for health; 2010 [cited 2020 Nov 7]. Available from: <https://www.who.int/publications/i/item/9789241599979>
7. Torres SJ, Nowson CA. Relationship between stress, eating behavior, and obesity. *Nutrition.* 2007;23(11-12):887-94. [PubMed] [Google Scholar]
8. Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, Zheng J. The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res.* 2020;287:112934. [PubMed] [Google Scholar]
9. Huckins JF, DaSilva AW, Wang W, Hedlund E, Rogers C, Nepal SK, Wu J, Obuchi M, Murphy EI, Meyer ML, Wagner DD, Holtzheimer PE, Campbell AT. Mental health and behavior of college students during the early phases of the COVID-19 pandemic: longitudinal smartphone and ecological momentary assessment study. *J Med Internet Res.* 2020;22(6):e20185. [PubMed] [Google Scholar]
10. Psychology Foundation of Australia [Internet]. Depression Anxiety Stress Scales (DASS); [cited 2020 Nov 7]. Available from: <http://www2.psy.unsw.edu>

- au/groups/dass/
11. Coker AO, Coker OO, Sanni D. Psychometric properties of the 21-item Depression Anxiety Stress Scale (DASS-21). *Afr Res Rev.* 2018;12(2):135. [Google Scholar]
  12. Gallè F, Sabella EA, Ferracuti S, De Giglio O, Caggiano G, Protano C, Valeriani F, Parisi EA, Valerio G, Liguori G, Montagna MT, Spica VR, Molin GD, Orsi GB, Napoli C. Sedentary behaviors and physical activity of Italian undergraduate students during lockdown at the time of CoVID-19 pandemic. *Int J Environ Res Public Health.* 2020;17(17):6171. [PubMed] [Google Scholar]
  13. Jia P, Zhang L, Yu W, Yu B, Liu M, Zhang D, Yang S. Impact of COVID-19 lockdown on activity patterns and weight status among youths in China: the COVID-19 Impact on Lifestyle Change Survey (COINLICS). *Int J Obes.* 2021;45:6959. [PubMed] [Google Scholar]
  14. Liu J, Zhu Q, Fan W, Makamure J, Zheng C, Wang J. Online mental health survey in a medical college in China during the COVID-19 outbreak. *Front Psychiatry.* 2020;11:459. [PubMed] [Google Scholar]
  15. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med.* 2006;81(4):354-73. [PubMed] [Google Scholar]
  16. Guskowska M. [Effects of exercise on anxiety, depression and mood]. *Psychiatr Pol.* 2004;38(4):611-20. Polish. [PubMed] [Google Scholar]
  17. Zhang Y, Zhang H, Ma X, Di Q. Mental health problems during the COVID-19 pandemics and the mitigation effects of exercise: a longitudinal study of college students in China. *Int J Environ Res Public Health.* 2020;17(10):3722. [PubMed] [Google Scholar]
  18. González-Valero G, Zurita-Ortega F, Ubago-Jiménez JL, Puertas-Molero P. Use of meditation and cognitive behavioral therapies for the treatment of stress, depression and anxiety in students. A systematic review and meta-analysis. *Int J Environ Res Public Health.* 2019;16(22):4394. [PubMed] [Google Scholar]
  19. Prasad L, Varrey A, Sisti G. Medical students' stress levels and sense of well being after six weeks of yoga and meditation. *Evid Based Complement Alternat Med.* 2016;2016:9251849. [PubMed] [Google Scholar]
  20. Breedvelt JJ, Amanvermez Y, Harrer M, Karyotaki E, Gilbody S, Bockting CL, Cuijpers P, Ebert DD. The effects of meditation, yoga, and mindfulness on depression, anxiety, and stress in tertiary education students: a meta-analysis. *Front Psychiatry.* 2019;10:193. [PubMed] [Google Scholar]