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# Perception of undergraduate medical students toward stressors and de-stressors during COVID-19 pandemic: Online cross-sectional survey from a medical institute in Eastern India

Swayam Pragyan Parida, Prajna Paramita Giri, Dinesh Prasad Sahu, Bimal Kumar Sahoo, Sonu H. Subba

## Abstract

**Introduction:** COVID-19 has affected the quality of life of all age groups. Medical education during the pandemic shifted to online mode due to lockdown restrictions. The stress felt by medical students during the pandemic has been studied less. The current study aimed to assess the stressors and de-stressors for undergraduate medical students during the COVID-19 pandemic.

**Materials and methods:** A cross-sectional online survey was conducted for the undergraduate medical students of a tertiary care institute of eastern India. A total of 307 medical students were included in the study by convenient and snowball sampling. A self-designed semi-structural questionnaire was created as a Google form and circulated among the students between September and October 2020. A combination of purposive and snowball sampling was adopted. Responses regarding stressors and de-stressors were recorded on a Likert scale. Data analysis was performed using Statistical Package for Social Sciences (SPSS) version 22. Categorical variables were presented as percentages and descriptive statistics were performed.

**Results:** A total of 307 students responded and 64.5% of them were men and 35.5% were women. 47.6% of the students experienced stress due to changes brought about by COVID-19. Risk of parents getting infection (63.2%), fear of not easily returning home (53.1%), lack of clinical exposure (52.7%), and financial impact (47.9%) were the major stressors perceived by the students. Connecting with family and friends through social media (47.5%), gaming (45.0%), online streaming platform (51.2%), spending time with family members (54.4%) were the coping strategies adopted by these students.

**Conclusion:** Higher level of psychological stress perceived by the undergraduate students needs psychological intervention. Academic revamp and adaptation of coping strategies are required for the medical under-graduates.

## Keywords:

COVID-19, de-stressor, medical students, pandemic, psychological stress, SARS-CoV-2, stressor

Department of Community  
Medicine and Family  
Medicine, All India Institute  
of Medical Sciences,  
Bhubaneswar, Odisha,  
India

## Address for correspondence:

Dr Dinesh Prasad Sahu,  
Third Floor, Academic  
Block, All India Institute  
of Medical Sciences,  
Bhubaneswar - 751 019,  
Odisha, India.  
E-mail: dineshprasad.  
sahu@yahoo.in

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## Introduction

The COVID-19 pandemic has created an unprecedented scenario all around the globe, forcing people to adopt new ways of

living.<sup>[1]</sup> India has passed through various stages of the pandemic and the subsequent lockdowns.<sup>[2]</sup> The pandemic has also brought immense changes to the field of medicine. Medical education, especially clinical classes,

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was suspended to prevent transmission of SARS-CoV-2 infection from patient to the students and also for a reason that the infected student may act as a portal of spread of infection.<sup>[3]</sup> Preclinical classes were also similarly affected during the pandemic. In most part of the country, medical education went online. In this difficult time, the Medical Council of India came out with its guidance for medical students.<sup>[4]</sup> Not just healthcare providers and administrators, but also students were facing the difficult situation which has created a lot of stress for them.<sup>[5]</sup>

As per the American Psychological Association, stress is defined as “an uncomfortable emotional experience which is accompanied by predictable biochemical, physiological and behavioral changes”.<sup>[6]</sup> It mostly arises when a person perceives a malaligned balance between the resources available and the demands that are placed on him. Stress has a profound effect on the physical and emotional domains of the health of a student.<sup>[7,8]</sup> Thus, there is a need to address the stress among medical students during the ongoing pandemic.

Medical undergraduates are budding healthcare workers, and their academic build-up and knowledge acquisition enables quality service provisions after completion of the course. Normally, MBBS students have the pressure of a vast medical curriculum to undergo which itself acts as a stressor for the students. The pandemic has led to a shift of the classroom lecture to bedside teaching, and in-person demonstration to a virtual way of learning for students. There are studies that have assessed stress among undergraduate students before the COVID-19 pandemic and the ways they overcome it, but few studies have been conducted to find out stress factors during the ongoing pandemic. The students are now at their homes with e-learning the only way of acquiring knowledge and virtual communication between teachers and students. Past studies have described the stressors, but de-stressors have not been studied. This study was intended to understand the perception among students on stressful factors and the approach they employ at their disposal to combat any stressful situations during the COVID-19 pandemic. The result of the study can be useful in implementation of mental health interventions to reduce psychological stress during the pandemic.

## Material and Methods

### Study design and setting

The cross-sectional study was conducted at the All India Institute of Medical Sciences, Bhubaneswar, Odisha from September 2020 to October 2020.

### Study participants and sampling

The study participants were students of third, fifth, seventh, and ninth semesters of the institute. The first

semester students were yet to join the course. A sample of 400 students (consisting of 100 students per semester) was finalized for the study. As the students could not be contacted physically, non-probabilistic sampling (a combination of convenient and snowball sampling) was adopted.

### Data collection tool and technique

A semi-structural questionnaire was prepared for the quantitative assessment. The questionnaire was pre-tested prior to data collection. A Google form was prepared and circulated among the students through their common batch mail IDs. The students were asked to circulate the Google form within their friend circle. The first question in the form was about consent of the participants. They were requested to read the participant information sheet in the Google form and then provide their acceptance for participation in the study. Those who gave consent to participate were included in the study.

### Ethical consideration

Ethical permission was taken from the Institutional Ethical Committee of AIIMS, Bhubaneswar. (IEC Ref No: T/IM-NF/CM&FM/20/121) The participation of the students in the study was purely voluntary and they were assured that any kind of non-participation or withdrawal at any point of time will not impact the assessment of their academic activities at the department.

The study variables included sociodemographic details, academic performance during the last semester, perception of the conditions leading to stressful conditions, and their perspectives on the methods to de-stress themselves. Informed consent was obtained prior to data collection.

### Statistical analysis

The responses were recorded on a Likert scale from 1–5, where 1 denoted “strongly agree” and 5 “strongly disagree” with 2, 3 and 4 denoting “agree,” “neither agree nor disagree,” and “disagree,” respectively. The data collected from the Google forms was analyzed using Microsoft Excel and Statistical Package for Social Sciences, version 22 (SPSS, IBM, Inc., Chicago, IL, USA). Categorical variables were presented as proportions and percentages. The continuous variables were described as mean and standard deviation. Chi-squared test was used for test of significance for determining stressors among medical students. A *P* value of less than 0.05 was considered significant.

## Results

A total of 307 students participated in the study. The mean age of the study participants was  $20.86 \pm 1.41$  years. Among the participants, 201 were men (65.5%) and 106

were women (34.5%). Stress was felt by 47.6% of the students due to changes brought by COVID-19. More than half of the students (52.8%) were anxious regarding the chance of infection while returning to college. Fear of quarantine was observed among 51.5% of the students [Table 1].

Fear of not easily returning home due to quarantine rules and risk of parents catching the infection was observed among 53.1% and 63.2% students, respectively. Financial impact of COVID-19 on their family and chance of passing infection to family members bothered 47.9% and 61.2% of the students, respectively. Difficulty in socialization and lack of physical activities were stressors perceived by 48.2% and 52.1% of the students, respectively. Family pressure regarding education, an unclear future, and an urge for substance use were stressors observed among 40.1%, 45.3%, and 39.5% of the students, respectively.

Lack of clinical exposure and poor concentration on studies were stressors for 52.7% and 51.8% of the students, respectively. Loss of one-year medical education, being unable to do combined studies, and piling up of syllabus for professional examination were the stressors for 45.2%, 45.3%, and 58.3% students,

respectively. Poor internet connectivity and physical problems related to online classes were stressors for 49.5% and 53.7% of the students, respectively.

Certain coping strategies were acquired by 46.0% of the students. Connecting with family and friends through social media, spending time on gaming, online streaming platforms, and spending time with family members were the coping strategies adopted by 47.5%, 44.8%, 51.2%, and 54.3% of the students, respectively. Opportunity for good amount of sleep, homemade food, and time spent on hobbies were the de-stressors for 57.3%, 58.0%, and 46.0% of the students, respectively. Physical exercise, reading books, meditation, journal keeping, household chores, and religious activities helped to get rid of stress for 41.1%, 41.0%, 38.1%, 36.5%, 41.4%, and 39.1% of the students, respectively [Table 2]. Significant association was observed for all of the examined stressors [Table 3].

### Discussion

The current study intended to recognize the important factors that were perceived as stressors by medical undergraduate students during the COVID-19 pandemic. Out of 400 students, 307 gave their consent to participate

**Table 1: Stressors perceived by students during the COVID-19 pandemic (n=307)**

Stressors	Strongly Agree n (%)	Agree n (%)	Neither Agree nor Disagree n (%)	Disagree n (%)	Strongly Disagree n (%)
I feel stressed because of changes brought about by COVID-19 in life	49 (16.0)	97 (31.6)	81 (26.4)	52 (16.9)	24 (7.8)
I am anxious that I might get infected with COVID-19 once I return to college	74 (24.1)	88 (28.7)	68 (22.1)	39 (12.7)	33 (10.7)
The fear of getting into quarantine due to contact with friends or patients	70 (22.8)	88 (28.7)	59 (19.2)	50 (16.3)	34 (11.1)
I may not easily return home after coming back to college	81 (26.4)	82 (26.7)	51 (16.6)	46 (15.0)	41 (13.4)
It would be too risky for my parents/guardians to visit me in my hostel	107 (34.9)	87 (28.3)	23 (7.5)	40 (13.0)	45 (14.7)
I am worried about the impact of COVID-19 on the financial status of my family	69 (22.5)	78 (25.4)	55 (17.9)	57 (18.6)	39 (12.7)
I am afraid that my family members might get infected with COVID-19	95 (30.9)	93 (30.3)	36 (11.7)	37 (12.1)	41 (13.4)
I feel like my clinical knowledge is weak because less or no clinical teaching (bedside/tutorial) happened during this pandemic	98 (31.9)	64 (20.8)	60 (19.5)	34 (11.1)	44 (14.3)
I cannot concentrate on my studies as I used to do, during the college time before COVID-19 era	72 (23.5)	87 (28.3)	56 (15.2)	48 (15.6)	38 (12.4)
I think that almost 1 year of medical education has gone down the drain	77 (25.1)	62 (20.2)	71 (23.1)	49 (16)	41 (13.4)
I feel worried about not being able to do combined studies with my friends	61 (19.9)	78 (25.4)	71 (23.1)	52 (16.9)	40 (13)
The professional/semester exams are coming and my syllabus is piling up	109 (35.5)	70 (22.8)	34 (11.1)	33 (10.7)	56 (18.2)
Poor internet connectivity has affected my online classes	83 (27.0)	69 (22.5)	52 (16.9)	62 (20.2)	35 (11.4)
Online classes have caused physical problems like eye strain, headache, postural issues	83 (27.0)	82 (26.7)	57 (18.6)	41 (13.4)	39 (12.7)
I am not able to socialize myself with friends	71 (23.1)	77 (25.1)	69 (22.5)	55 (17.9)	27 (8.8)
Physical activities/sporting activities has been lacking since long	86 (28.0)	74 (24.1)	58 (18.9)	39 (12.7)	45 (14.7)
A lot of pressure on me from my family to study and focus on education	62 (20.2)	61 (19.9)	84 (27.4)	55 (17.9)	40 (13)
Future is looking bleak and everything seems unclear	78 (25.4)	61 (19.9)	66 (21.5)	47 (15.3)	49 (16)
The urge has sometimes come to take substances like alcohol/tobacco lately	80 (26.1)	41 (13.4)	36 (11.7)	45 (14.7)	99 (32.2)

**Table 2: De-stressors adopted by the students during COVID-19 pandemic (n=307)**

De-stressors	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
I have found that connecting with friends and family members through social media has helped me to live through this period	48 (15.6)	98 (31.9)	78 (25.4)	54 (17.5)	29 (9.4)
I have engaged myself in spending time on online games to de-stress myself	49 (15.9)	89 (28.9)	71 (23.1)	54 (17.6)	44 (14.3)
Online streaming platforms like Netflix, Amazon, Prime, etc., has helped me a lot	73 (23.8)	84 (27.4)	64 (20.8)	46 (14.9)	40 (13.0)
Spending time with my family members has helped me a lot	90 (29.3)	77 (25.0)	49 (15.9)	52 (16.9)	39 (12.7)
The slowdown in education has led to free time so that I could focus on other activities/honing or acquiring skills along with my studies	64 (20.8)	78 (25.4)	84 (27.4)	54 (17.6)	27 (8.8)
Lockdown has given an opportunity for good amount of sleep at home	99 (32.2)	77 (25.1)	45 (14.7)	35 (11.4)	51 (16.6)
I feel happy that I could take healthy food made in my home	123 (40.1)	55 (17.9)	32 (10.4)	32 (10.4)	65 (21.2)
Giving time towards my hobbies has helped me a lot	61 (19.9)	80 (26.1)	92 (29.9)	42 (13.7)	32 (10.4)
I feel like physical exercise for fitness has helped me a lot	50 (16.28)	76 (24.7)	89 (29.0)	54 (17.6)	38 (12.4)
I feel reading novels and books has helped me a lot	59 (19.2)	67 (21.8)	94 (30.6)	49 (15.9)	38 (12.4)
I feel meditation has helped me a lot	47 (15.3)	70 (22.8)	103 (33.6)	42 (13.7)	45 (14.6)
I feel journal keeping has helped me a lot	51 (16.6)	61 (19.9)	101 (32.9)	49 (15.9)	45 (14.7)
I feel like doing household chores is a big stress reliever	46 (14.9)	81 (26.4)	92 (30.0)	53 (17.3)	35 (11.4)
Spending time in religious activities has de-stressed me	56 (18.2)	61 (19.9)	91 (29.6)	43 (14.0)	56 (18.2)

**Table 3: Determinants of stressors among the undergraduate medical students (n=146)**

Variables	Stressor		P
	Yes (%)	No (%)	
Anxiousness of getting COVID-19 infection	58 (39.7)	88 (61.3)	<0.001
Fear of quarantine	58 (39.7)	88 (61.3)	<0.001
Fear of not coming back to home	67 (45.9)	79 (54.1)	<0.001
Risk of infection to parents during visit to hostel	85 (58.2)	61 (41.8)	<0.001
Financial situation	49 (33.5)	97 (66.5)	<0.001
Fear of family members getting infected	74 (50.7)	72 (49.3)	<0.001
Lack of clinical exposure	63 (43.2)	83 (56.8)	<0.001
Lack of concentration in studies	56 (39.4)	90 (61.6)	<0.001
Thought of wasting one complete year of medical education	50 (34.3)	96 (65.7)	<0.001
Worries about combined studies	55 (37.7)	91 (63.3)	<0.001
Worries about professional/semester examinations	66 (45.2)	80 (54.8)	<0.001
Poor internet connectivity	65 (44.5)	81 (55.5)	<0.001
Physical problems experienced due to online classes	68 (47.6)	78 (53.4)	<0.001
Not able to socialize	55 (36.8)	91 (63.2)	<0.001
Lack of physical activities/sports	62 (42.5)	86 (57.5)	<0.001
Family pressure for studies	47 (32.2)	99 (67.8)	<0.001
Unclear future	50 (34.3)	96 (65.7)	<0.001

in the study. The mean age of the students was  $20.86 \pm 1.41$  years which was similar  $20.7 \pm 1.8$  years in the study done by Sreeramareddy *et al.*<sup>[9]</sup> among undergraduate medical students of Nepal, but was higher than that ( $19.07 \pm 1.70$  years) in a study conducted by Husky *et al.*<sup>[10]</sup> among university students in France.

Around half of the students perceived stress during the COVID-19 pandemic. Although the study did not employ any scale for assessing the mental status in

form of anxiety, depression, stress, etc., the domains included for acknowledging the stressors were quite strong enough to give an overview about mental health of the participants. In a study conducted in Chennai by Saraswathi *et al.*,<sup>[11]</sup> the results showed that 24.9% of medical students experienced depression, anxiety and stress. Cao *et al.*,<sup>[12]</sup> in a study done on the mental health of medical students in China, observed that 25% of the participants self-reported that they had anxiety. Similar findings on health professionals were also expressed at Sichuan University in China where COVID-19-related psychological stress was found in 27% of participants, with 11% of them exhibiting acute stress reaction. University students in Bangladesh had moderate to severe levels of stress (58.6%) while assessing the psychological responses during the COVID-19 outbreak.<sup>[13]</sup> This points towards the need for psychological intervention for the students.

Lack of socialization was one of the reasons for stress perceived by the undergraduate medical students. A study conducted by Ellis *et al.*<sup>[14]</sup> showed similar results. They also reported that COVID-19 stress was related to more loneliness. Adolescents who spent more time on social media were more stressed than those who spent time with their family members. Family-level intervention can be useful to reduce the stress created by loneliness.

Online teaching is the only feasible solution to prevent the chance of infection. However, online teaching method has its own challenges, such as internet connectivity, poor communication at different levels, negative attitudes, student engagement, etc.<sup>[15]</sup> In the present study, the students perceived lack of clinical exposure



due to COVID-19 pandemic. Similarly, a majority of the medical students in an online survey felt a lack of time for exploring their interest of specialty.<sup>[16]</sup> Advanced virtual curriculum development can be helpful in improving clinical exposure. Undergraduate health science students in Ethiopia reported some fearful conditions where 35% of the participants perceived stress.<sup>[17]</sup> Chances of family members catching COVID-19 infection and decreased household income were stressors listed by the students, which is similar to the present study's findings.

Emotional support, positive reframing, planning, etc., were some of the coping strategies utilized by undergraduate health science students of Jimma university.<sup>[17]</sup> In the present study, participants adopted coping strategies like connecting to family members and friends, engaging themselves with their hobbies, reading books, physical exercise, and spiritual activities. Emotional wellbeing should be taken care of during unusual conditions like lockdowns. The above strategy was also adopted by university students in Poland,<sup>[18]</sup> and public health and preventive medicine students in Vietnam.<sup>[19]</sup>

This study is one of the few studies conducted in India where the impact of COVID-19 was severe and lockdown was imposed nationwide. The study was conducted in an institute of national importance where the students were from all parts of the country, which can bring out the representativeness of the sample. However, due to various reasons only 76.7% of the study participants took part in the study. A larger sample size can be useful to draw better significance to the results. Further studies and interventions are required in this context. The present study was conducted before the availability of vaccines. The results, which showed higher stress, may be due to the unavailability of vaccines against COVID-19 which may be an important coping strategy adopted during this COVID-19 pandemic.

### Limitations and recommendations

The study has few limitations. The samples were selected via non-probabilistic sampling, which can affect the generalizability of the study. The study was conducted at only one site. For better generalizability, multi-centric study and randomly selected sampling can be conducted. Considering the results of the study, future studies are recommended to assess the mental health conditions of the undergraduate medical students. De-stressor activities need to be implemented for the medical students.

### Conclusion

Psychological stress was perceived by the medical undergraduate students. The COVID-19 pandemic not

only brought about transition in medical education but also stress to the undergraduate medical students. Psychological interventions are required for the students who felt stress. Coping strategies were adopted by many students. It may be helpful to promote positive coping strategies during a pandemic-like situation. Mental health issues of the undergraduate medical students need to be addressed. Neglecting the mental health issues may affect the performance of the future medical practitioner.

### Acknowledgment and ethical moral code

The authors would like to acknowledge the undergraduate medical students for their participation in the study. The study was approved by Institute Ethics Committee of All India Institute of Medical Sciences, Bhubaneswar with the approval number: T/IM-NF/CM&FM/20/121

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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