

# Effects of Full Cycle Pandemic on Psycho - Physiological Conditions of College Students in West Bengal, India

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**Abstract:** *The COVID - 19 pandemic has led to significant changes in daily routines and lifestyles worldwide and mental health issues appeared as one of the consequences of it. This study aimed to assess the presence of several psycho - physiological parameters among young college - going undergraduate and postgraduate students due to the lockdown situation. Besides these, the evaluation of autonomous learning capacity as a positive effect of lockdown was also an important aspect of this work. Cross - sectional data were collected through Google - based questionnaires from different college and university students in West Bengal, India from late May to 1st week of July 2021. A total of 315 complete responses were obtained. Among them, 11.42% of students were under moderate depressive conditions, while 27% were suffering from moderate anxiety. Students have to use digital devices for about 7.5±3.74 hours/day, where 16.13% of respondents reported an increase in their screen time since the lockdown was declared. Sleep disorders have been reported as 19% of respondents referred to have suffered from highly variable sleeping patterns, and 15.90% suffered from insomnia. From this study, it can be concluded that social isolation as home confinement had detrimental psycho - physiological effects on college students.*

**Keywords:** College students, COVID - 19 lockdown, psychological problems, sleep disorders, digital - device use

## 1. Introduction

COVID - 19 pandemic condition affected the majority of the population worldwide physically, economically, and psychologically since last year. Due to its high infectivity and mortality rate, the society is going through anxiety and trauma over the rising number of fatalities all around the world. India is a deeply populated country with a people of 1.3 billion expansions over states having wide health inequalities, communal variety, and broad financial and individual cultivation that reflect large assert in this period. COVID - 19 report was first revealed in India on 27th January, 2020 in Kerala [Andrews MA et al., 2020]. Noticing the huge cases throughout the country the World Health Organization (WHO) urged individuals to maintain social distancing and stay at home to reduce the virus's transmission. Despite that, unfortunately, COVID - 19 cases had exceeded 15.9 million as on April 23, 2021, with 1, 85, 000 fatalities [Jain VK et al., 2021]. These situations induced huge anxiety among the total population. Several studies have been conducted on various working populations such as healthcare workers, IT sector personnel and students regarding their psychological state during lockdown phase [Bahkir FA et al., 2020; Majumdar P et al., 2020; Elhai JD et al., 2020]. Lockdown and social isolation could be the major cause of anxiety, depression, sleep disorders, and increased levels of digital device usage [Erren et al., 2020; Wang et al., 2020; Zhou et al., 2020]. Besides these, body mass index (BMI) rises as a result of sedentary lifestyles while excessive screen time and poor sleeping patterns hampered the cognitive functions. The use of social media and digital gadgets can surely help to reduce social isolation, but if used late at night, it can have a detrimental influence on sleep amongst young individuals [Majumdar P et al., 2020]. Frequent and prolonged use of digital media by young individuals aged 18 to 35 was also found to be associated

with an increased risk of developing sleep disturbances and disrupting regular activities of daily lives [Sivertsen B et al., 2019]. Furthermore, extensive screen usage has been shown to be linked with sleep habit disruptions and loss of concentration in regular work [Parent J et al., 2016; Guerrero MD et al., 2020]. In the present study, we investigated the presence of several psychophysiological parameters and the prevalence of ocular problems among young college - going undergraduate (UG) and postgraduate (PG) students due to the increased screen - time during COVID - 19 outbreak and lockdown situation. Further, the evaluation of autonomous software management and digital learning capacity as a positive effect of lockdown was also an important aspect of this study.

## 2. Materials and Methods

### 2.1. Study population and procedure:

The study was conducted on randomly selected undergraduate and postgraduate students of West Bengal, majority of which belongs to West Midnapore region. The study was held through Google form based online questionnaire survey, which was distributed on May 07, 2021 and data were collected over a period of two months (up to July 7, 2021). Initially a total of 325 responses were collected but 2 participants were of different age groups and other 10 participants responded incompletely which cannot be included in this study. Hence only 315 accurately completed responses were considered for final analysis.

### 2.2. Ethical considerations

All participants voluntarily gave their informed consent to participate in the online data acquiring survey after being informed about the purpose of the study mandatorily. No

name and other personal information were taken from the respondents throughout this survey.

### 2.3. Measures

**2.3.1. Socio – demographic parameters:** Different socio - demographic characteristics like age, gender, height, weight, education and current location were asked for this survey.

**2.3.2. Evaluation of depressive and anxiety symptoms:** The nine - item patient health questionnaire (PHQ - 9) was used for evaluation of depression severity measures [Choo K et al., 2001]. GAD - 7 questionnaire was used with additional four items for assessing their anxiety levels [Spitzer RL et al., 2006]. Participants responded as per their own feelings for previous 2 weeks from their response date, against each question on the basis of a 4 - point scale ranging from 0 (not at all) to 3 (almost every day) for both PHQ9 and GAD - 7 questionnaires. For each parameter the total score ranged from 0 to 21 where higher scores indicated severe condition of the respondents and vice - versa.

**2.3.3. Evaluation of ocular health related with use of digital devices:** For the analysis of the impact of a complete cycle lockdown on digital device related ocular health, 5 questions were prepared which are listed in the Table 1.

**Table 1:** Questionnaire for evaluation of ocular health related to use of digital devices

S No.	Questions
1	Do you have knowledge regarding the current situation of the COVID - 19 pandemic?
2	Where do you get most of the information regarding the COVID - 19?
3	Do you feel online classes are helping you in study?
4	Do you think you have improved yourself by using digital devices?
5	How many times per day do you use of digital gadgets like Smartphone, Computer, Laptop etc. (in hour) after commencement of online education due to COVID - 19 lockdown?

### 2.3.4. Students' sleep habits questionnaire

Sleep disturbances due to the COVID - 19 lockdown was one of the main measures in this study. The questionnaire was composed of 9 items and each was having respective sub - questions as a modified form of CHSQ by Owens et al., to determine the sleep habits and sleep related difficulties, described in the Table 4 [Owens JA et al, 2000].

### 2.3.5. Questionnaire for assessing students' software management skills during lockdown

In the last section of this survey the subjects were asked the questions given in the following Table 2 to assess their self - learning abilities throughout online classes during COVID - 19 lockdown.

**Table 2:** Questionnaire for evaluating student's software management skills during lockdown.

S. No.	Questions
1	Can you now operate study - related software by yourself?
2	From whom/where did you learn the management of

	software and online studying?
3	Could you operate the learning software (which you are using now) before lockdown?

### 2.3.6. Data analysis

Quantitative data in relation to demographic details and others are presented as mean  $\pm$  standard deviation (SD) and also percentages, where applicable. Pearson's product moment correlation coefficient,  $r$ , was used to evaluate the association between the important psychological variables. For comparison of data a two tailed t test was performed and  $p < 0.001$  and  $< 0.05$  were considered statistically significant. Google form response sheet was exported to the MS Excel for making the working draft and then it was used for all statistical analyses using IBM SPSS Statistics 22.0 and all the figures were made by Origin Lab (2019b) software.

## 3. Results

### 3.1 General Analysis

The socio - demographic and other specifically selected characteristics of the study population are shown in the Table 3. It depicts the demographic features of the students of mean age of  $19.90 \pm 1.56$  years. There are 81.9 % (258) UG and 18.1 % (57) PG students. The average height of the study group is  $156.07 \pm 6.26$  cm and average weight is  $50 \pm 6.41$  kg. Most responders, 88.6 % (279) does not travelled last two weeks from their response time and just few of them, 11.4 % (36) travelled outside from home during that specified time period.

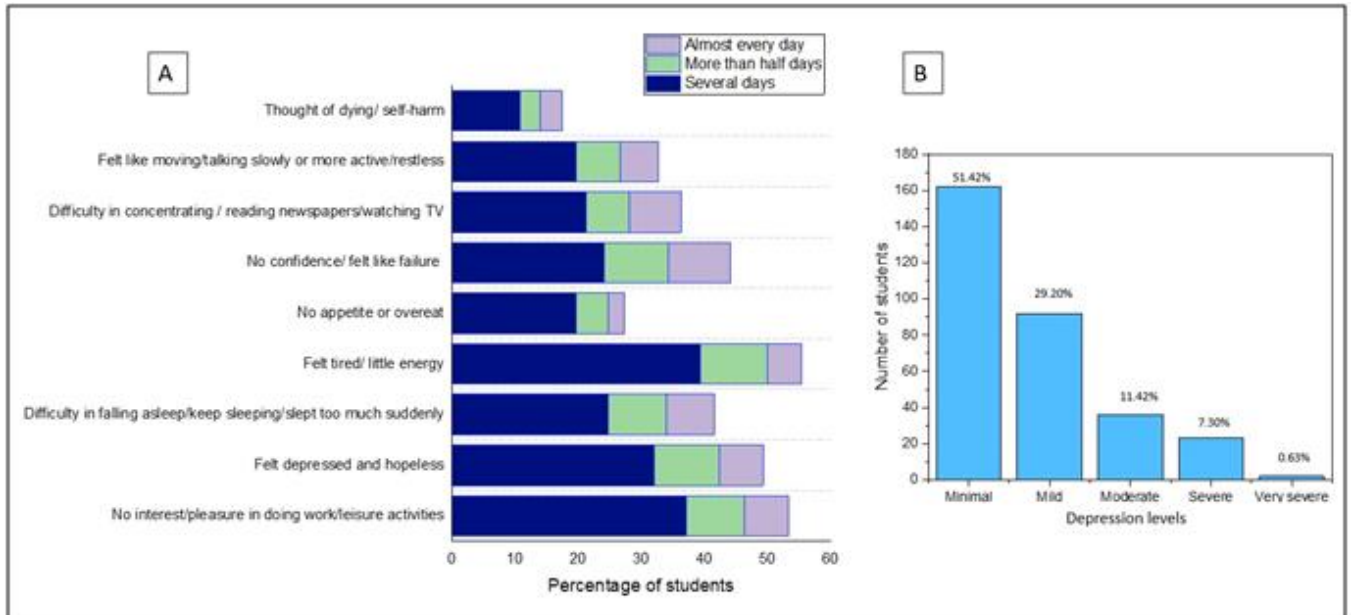
**Table 3:** Descriptive statistics of socio - demographic details among the students (N=315)

Variables	Students (N=315)
Age	$19.90 \pm 1.56$ years
Height	$156.07 \pm 6.26$ cm
Weight	$50 \pm 6.41$ Kg
<b>Sex</b>	
Male	2.5% (N=8)
Female	97.5% (N=307)
<b>Education</b>	
Under Graduate	81.9% (N=258)
Post Graduate	18.1% (N= 57)

Data represented as mean  $\pm$ SD or percentage as and where applicable.

### 3.2 Analysis of depression levels

During pandemic and lockdown situation, both UG and PG students remained confined at their homes and were found to be associated with various depressive symptoms. Before lockdown 51.11% students does not have any depressive symptoms, while 26.04% and 22.85% of students reported to have less than 50% and more than 50% depressive symptoms, respectively. Depressive symptoms increased markedly among the college students during pandemic. About 162 students (51.42%) can be seen to have minimal depression, while 92 students (29.20%), 36 students (11.42%), 23 (7.30%) and 2 (0.63%) students were found to be in mild depressive, moderate depressive, severe and in very severe depressive conditions respectively (Figure 1).

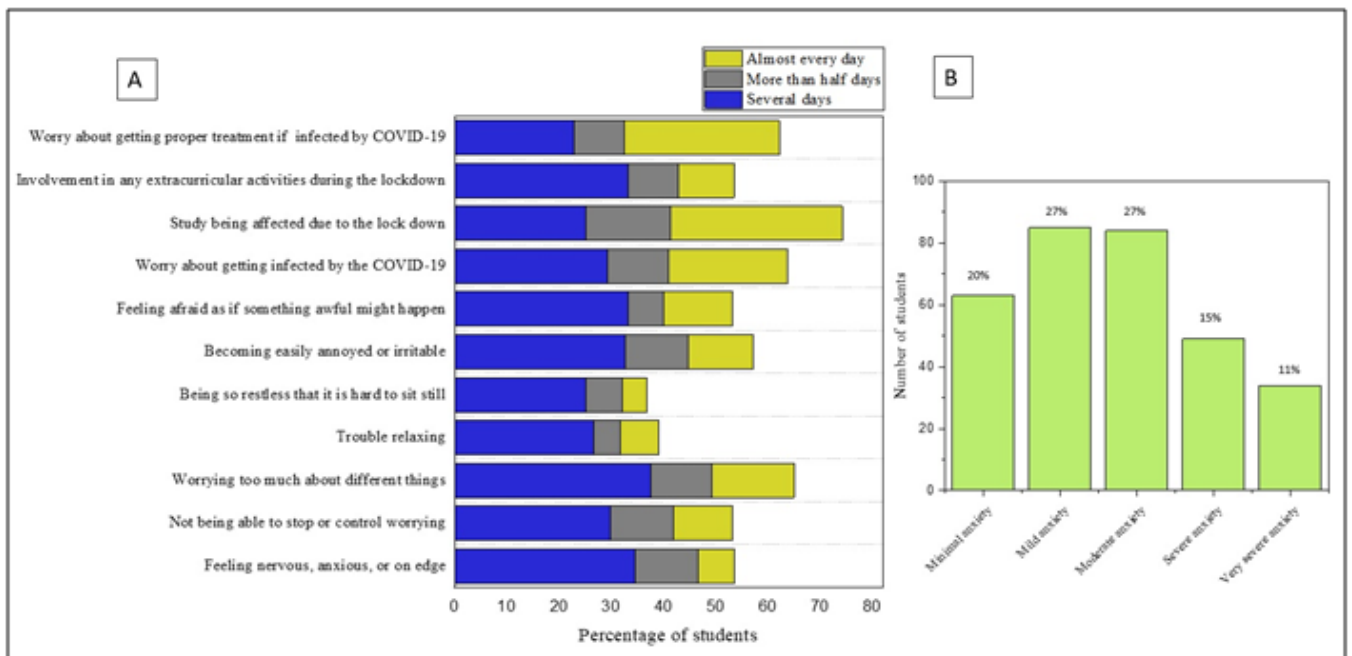


**Figure 1:** Analysis of depressive symptoms among college students during lockdown. A. Different depressive symptoms prevalent as per day basis, and B. Prevailing depression levels among college students

**3.3. Analysis of anxiety levels**

It has been reported that 52% students had no feeling of anxiety before COVID - 19 lockdown situation. As per the survey, 23.80% students reported as they had feeling <50% anxiety and 24.20% student showed they had felt >50% anxiety. After a year of lockdown 63 students (20%) reported as they were suffering from minimal anxiety, 85 students (27%) were suffering from mild anxiety, 84

students (27%), 49 students (15%) and 34 students (11%) were suffering from moderate anxiety, severe anxiety and very severe anxiety, respectively as depicted in Figure 2B. Students also reported that they were suffering with different anxious thoughts about getting infected by COVID - 19, environment conditions, becoming easily irritated, restless, trouble relaxing, not able to control worrying and feeling nervous easily as illustrated in the Figure 2A.



**Figure 2:** Analysis of anxiety among college students during lockdown. A. Different anxious symptoms prevalent as per day basis, and B. Prevailing anxiety levels among college students.

**3.4. Effect of lockdown on screen time**

During pandemic situation increased usage of electronic gadgets for online for study and other purposes enhanced active screen time for students. It has been shown that

maximum 33.01 % (104) of responders reported an increase in their digital device usage after lockdown was initiated. They also reported that they have to remain active for an average of 7.5±3.74 hours per day. However only 53 % (167) of the study population were regularly following the

news related with current situations. As a source of information internet and smart phone usage increased significantly to 56.5% (178) compared to television 38.4% (121) and newspaper 5.1% (16). Among all the participants, 57.10% (180) of students informed that they have improved themselves using digital devices, and 52% (257) of students found online learning method really helpful while 18.4% (58) of students didn't agree with this.

**3.5 Effect on sleep pattern during covid - 19 lockdown among students**

The Table 4 shows that 19% of respondents referred to have highly variable sleeping habit during lockdown confinement while 51.10% of them did not have concern about their sleep. Among them 15.90% of the participants had suffered from difficulty in falling asleep and 11.1 % of the participants had suffered from morning headache. All other sleep pattern related parameters are also shown in Table 4.

**Table 4:** Description of the sample related about sleep parameter

Variables		Category	N	Frequency (%)
Sleeping habit		Regular	255	81%
		Highly variable	60	19%
Usual time to go to bed		Earlier	147	46.70%
		Later	168	53.30%
Symptoms of sleep disorders				
Insomnia	Disrupted sleep	No	292	92.70%
		Yes	23	7.30%
	Difficulty in falling asleep	No	265	84.12%
		Yes	50	15.90%
	Difficulty in staying sleep	No	307	97.46%
		Yes	8	2.50%
	No problem at all	-	234	74.30%
Daytimes sleeping	Falling asleep unintentionally	No	286	90.79%
		Yes	29	9.20%
	Daytime naps	No	262	83.17%
		Yes	53	16.80%
	Excessive sleepiness	No	297	94.28%
		Yes	18	5.70%
	Falls/injuries	No	313	99.36%
		Yes	2	0.60%
	None		213	67.60%
Breathing Disorders during sleep	Morning headaches	No	280	89%
		Yes	35	11.10%
	Breathlessness during the night	No	306	97%
		Yes	9	2.90%
	Chocking/gasping at night	No	314	99%
		Yes	1	0.30%
Breath - holding	No	313	99.36%	
	Yes	2	0.60%	
Abnormal behavior	Night mares	No	292	92.70%
		Yes	23	7.30%
	Sleep talking	No	303	96%
		Yes	12	3.80%
	Sleep paralysis	No	311	98%
		Yes	4	1.30%
Eating while asleep	No	314	99%	
	Yes	1	0.30%	
	None		275	87.30%
Restless legs	Restless legs	No	296	93.96%
		Yes	19	6%
	Cramps	No	282	89.52%
		Yes	33	10.50%
	limbs or trunk	No	308	97%
		Yes	7	2.20%
	None		256	81.30%
Concern about sleep	Seriousness	Regular	154	48.90%
		No	161	51.10%

**3.6 Analysis of software management skills during lockdown among the students**

In this study, it was noticed that 47.9% (151) of students were not able to operate the study related software before

lockdown phase, which happened to increase significantly by about 1.6 times (85.7%) during the lockdown situation. As per the analysis 47% (148) of them have learned the software management procedures by themselves while others took help from teachers, friends or family members.

### 3.7 Correlation analysis between different COVID - 19 lockdown related online aspects with depression and anxiety

The result of correlation analysis suggests a significant correlation between different stressors work home status, online timing and sleeping timing of college students with their depression and anxiety levels. The correlation table (Table 5) shows that online timing ( $r=0.230$ ,  $p<0.001$ ) and sleeping time ( $r=0.163$ ,  $p<0.001$ ) are significantly correlated with depression level. Moreover, both online timing ( $r=0.226$ ,  $p<0.001$ ) and sleeping time ( $r=0.226$ ,  $p<0.001$ ) have a moderately positive correlation with anxiety level among the participants. However, the results suggest negative association between work home status of the participants with depression level ( $r= - 0.115$ ,  $p<0.05$ ) and also for anxiety level ( $r= - 0.116$ ,  $p<0.05$ ).

**Table 5:** Correlation analysis between different COVID - 19 lockdown related stressors with depression and anxiety. ( $r =$  Pearson's correlation coefficient)

COVID - 19 lockdown related stressors	Depression level (r)	Anxiety level (r)
1) Work home status	- 0.115*	- 0.116*
2) Online timing	0.230**	0.226**
3) Sleeping time	0.163**	0.226**

\*. Correlation is significant at the 0.05 level (2 - tailed). \*\*. Correlation is significant at the 0.01 level (2 - tailed).

## 4. Discussions

In this study majority of the participants (81.9 %) are UG students because the link was initially distributed among the students of different colleges. Moreover, the PG students may be somewhat reluctant about participating in the survey as this was not done forcefully, only the willing students completed the total survey questionnaire. The level of depression and anxiety levels among young college going - students occurring before and during the lockdown due to the COVID - 19 pandemic were also explored. Both the depressive and anxiety symptoms were seen to increase after a whole year of lockdown. Maximum college students were suffering from more or less depression and most importantly the severe anxiety levels can be seen in 26.6% of students while 10.79% of students were in a very severe anxious phase. According to studies, the major causes for this include a lack of motivation, psychological stress, social distance, and abrupt educational changes as a consequence of lockdown [Chakravarty S et al., 2020]. Students were missing their college life where they used to enjoy a lot with their friends apart from studying and could engage in several extracurricular activities. Furthermore, this study also reveals that home confinement, physical inactivity, lack of academic schedule, and stress among the students resulted in their increased dependency on digital devices. Following the introduction of the novel coronavirus, the abrupt increase in usage of digital devices and internet services, as well as the total hours of screen time logged every day, has been attributed to a change in professions and digitalization of social activities. The main reasons include online conference calls, meetings, webinars, online classes, assignments were being done on digital devices, additionally with personal and

social video calls, online shopping, leisure and entertainment [Bahkir FA et al., 2020]. The range of online screen timing was reported to be 3 to 22 hours per day. Home confinement and restricted access to be social, led to reduced physical activity and increased screen exposure time which in turn might have played a major role in disturbing sleep patterns. Here in this study Table 4 suggests that a greater number of individuals went to bed later at night during the lockdown. And a large number of responders were not being serious about their sleep time. Because of the disruption or absence of a routine, the lockdown phase affected their normal bed and rising times. Due to lockdown students had to attend social events or were engaged in online shopping which markedly diminished external cues to keep humans on time and control their sleep/wake cycle and other circadian rhythms [Majumdar P et al., 2020]. Also, this unnatural situation contributed to sleep disturbances and for this atypical sleep duration students were individually (16.80%) suffering from sleepiness at unusual times of day, their sleep was affected likely by mental stress, anxiety and screen exposure before bedtime. The present study adds to the increasing evidence that excessive screen usage, particularly during the lockdown, may have a detrimental impact on mental health [Twenge JM et al., 2020]. On the other side, the students with excessive use of the internet and other screen - based technologies inadvertently learnt more about the virus and active cases of the disease from the news, which fuels more anxiety among them [Elhai JD et al., 2020]. Frequent use of digital platforms also takes time away from other health - promoting activities. However, contradictorily, the pandemic and lockdown situation induced the student population to learn and use digital devices more which resulted in increased digital literacy. During pandemics, students can manage their time more effectively in online learning. In this study it can be seen that 52.06% of responders can successfully operate study - related softwares more efficiently than in the pre - pandemic phase. They have also adopted new methods of learning like through presentations, video conferencing, mailing which are considered as one of the best and fast learning mediums of teaching. Students can better analyse what is taught and can surely acquire new computer skills because they have to carry out many activities using PC, laptops or android phones. The psychological reappraisal of stressful events has the potential to mitigate their harmful effects. [Rosa WE et al., 2020]. Adaptive attitudes may also help students to adapt to the changed modes of learning and restructure priorities in order to create stronger connections and a new appreciation for life. Both synchronous (i. e., Microsoft teams, Google - meet, Zoom) and asynchronous (i. e., WhatsApp, Email) online interactions can foster bonding and bridging social connections [Ellison NB et al., 2007]. Although 18.41% of students felt that online study was not as helpful as that of the previous offline teaching - learning method. The problem was that not all teachers and students were ready for this sudden transition from face - to - face learning to online learning mode and thus still now 14.29% of students find it difficult to study online through different softwares which they find hard to operate. And finally financial status, limited or no internet access in the rural areas were the main reasons why few students may not be able to afford computers, laptops or supporting mobile phones for them

and thus online learning may create a digital divide among students.

## 5. Limitations

To the best of our knowledge, the main limitations were the opportunistic sampling and the cross-sectional design which restricted casual interpretations. Another limitation was the self-reported measures rather than face-to-face clinical diagnoses, however, the selected tools were validated and commonly used. Furthermore, no data on those who refused to take part were recorded.

## 6. Conclusions

From this study, it can be concluded that social isolation in the form of home confinement as an important measure to mitigate the risk of enhanced Covid-19 outbreak do have detrimental effects on college students. Psychological and physical well-being were imbalanced as screen exposure increased and the sleep cycle changed. For a sound physical health and the effectiveness of the immune system, sleep is important. It is also a positive regulator of emotional wellbeing and mental health, and it aids in the reduction of stress, sadness, and anxiety. The educational sector was one of the most affected sectors and has suffered a lot due to the outbreak of COVID-19. It has created many negative impacts like class suspension, exam postponement and delayed admission process etc. Moreover, online learning has also been a problem for poor, or lower-middle-class students who did not have any internet facilities. It is unpredictable that how long it will take to reinstate the normal situation but till then we have to follow every single precautionary measure. This study is especially important since the possibility of a subsequent wave and another closure of colleges and universities, as well as a new lockdown, may maintain or even raise students' concerns about their own health and wellbeing of their loved ones, as well as their anxiousness.

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