



# Second Wave of COVID-19 and Mental Health of Indian Undergraduates

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## ABSTRACT

The Corona Virus Disease (COVID-19) pandemic has caused massive disturbances in the lives of everyone. This study was set out to explore the severity of mental health in terms of Depression, Anxiety and Stress among undergraduate population in India during the second wave of COVID-19 lockdown. A cross sectional survey was adopted through an online survey from a sample of 1,719 students in India. Vaccination status and Demographic variables (gender, age, locale, religion and stream of study) of respondents were also deliberated. It was reported that depression was prevailing highest among symptoms of mental health, followed by stress symptoms and then anxiety. The results suggest unfavourable impacts of lockdown on mental health.

**Keywords:** COVID-19, pandemic, lockdown, undergraduate, mental health

During December 2019, in Wuhan city of China a viral outbreak with around 40 reported cases of pneumonia led to the beginning of COVID-19 (Holshue *et al.* 2020) and China reported its first death because of this on 11<sup>th</sup> January (WHO, 2020a). WHO along with other international agencies studied the causing agent and discovered a new contagious virus termed- Novel Corona Virus (2019-nCoV). Meanwhile, at a very rapid pace the virus swept across the globe within a few weeks. On 30<sup>th</sup> January 2020, WHO announced a Public Health Emergency of International Concern after looking at the outburst of infection and casualties caused by this deadly virus in large number of countries (WHO, 2020b). This new disease was given a name on 11<sup>th</sup> February 2020 by WHO as “the coronavirus disease: COVID-19” and by 11<sup>th</sup> March 2020, around 114 countries were under its influence, it is then when WHO have declared COVID-19 as a pandemic (WHO, 2020b).

Today the entire world is facing a crisis because of this pandemic. In view of rising number of cases

and to keep a check on the transmission, a wide range of extraordinary policies and treatments are introduced in every country that have also resulted in the implementation of mandatory curfews and lockdowns. On 25<sup>th</sup> March 2020, the first nationwide complete lockdown was imposed by the Government of India (WHO, 2020c). As per the guidelines issued by the government of India, all the classes, examinations and admission procedures for all the schools and universities were switched to online mode, which is still followed. All this chaos has led to closure of all educational institutions, restriction in mobility of citizens across places in order to avoid the further spread of infection. India began its Vaccination Drive against COVID-19 on 16<sup>th</sup> January 2021, but the situation got worsened when the deadly second wave of COVID-19 hit

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India on 10<sup>th</sup> February 2021 with 10,916,589 active cases in the country (WHO, 2020d, 2021e). India became one of the most affected countries having millions of cases during April to June 2021 due to COVID-19.

*"Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community."*

— World Health Organisation.

The WHO stresses that mental health is "more than just the absence of mental disorders or disabilities." Mental health refers to the cognitive, behavioural, and emotional well-being of an individual. It's all about how one thinks, feels, and behaves in normal day to day life. The term "mental health" is also used to explain a state of absence of a mental disorder. Conditions such as stress, depression, and anxiety can all affect mental health and disrupt a person's daily routine. It can be said that the overall functioning of an individual depends upon his/her mental health and its very important to study different aspect of mental health.

Lockdown may entail risk of great mental and emotional turbulence as it comes with fear of separation from loved ones, poor peer interaction, loss of job and wages, restrictions from leaving home, loss of freedom, a lot of leisure time, increase in screen time, and uncertainty over the status of the disease. In India, the first and foremost responses to the pandemic has been unfounded fear and a sense of clear and imminent danger which is based on information/misinformation circulating on the internet, particularly social media. This kind of unnatural circumstances, loneliness and social isolation may be responsible for suicidal thoughts (Monteith *et al.* 2020). Due to the disconnections from friends and society some students start feeling loneliness and isolated (Zhai and Du, 2020). Khan *et al.* (2020) have described that the two strong predictors of mental health consequences are: depressive, anxiety, stress, and COVID-19 like symptoms and fear of getting infected. He further propagates that this pandemic is causing negative impacts on mental health and worsening the pre-existing psychological conditions like depression,

anxiety, stress, etc. Pandey *et al.* (2020) in a study found out that there is manyfold increase in cases of anxiety and depression among Indians during COVID-19 lockdown.

Students often experience great mental, social and emotional turbulences in their lifestyles, education and schedules during the COVID-19 pandemic lockdown than any other groups in the society because they are more concerned about their future academic competency and ability to enter workforce. Additionally, students who were living in hostels and not at their homes may find it difficult returning back to their families and hometowns for such a long duration of time that may not be as conducive and comfortable as their hostel life and college environment. Bortel *et al.* (2016) have reported that during closures like holidays and vacations, college students usually have heightened negative emotions and suffer from poor mental health due to disturbance of academic routine (Agnew and Khan, 2019). Public health emergencies could have psychological impacts on college students inflicting anxiety, fear, stress, and worry (Baloran, 2020; Cao *et al.* 2020).

Numerous authors across the globe have tried to study children's' and adolescents' mental and psychological health during the ongoing pandemic. However, to the best of our knowledge, in India very few studies have been conducted for finding out about mental health issues of undergraduate students during COVID-19 lockdown. The aim of this study is to assess the impact of second wave of COVID-19 in India on mental health in terms of depressive, anxiety and stress symptoms of students pursuing under graduation with reference to their few demographic variables (age, gender, locale, religion and stream of study) and vaccination status (not vaccinated at all, got first dose of vaccination and got both dose of vaccination). Based on the reviews of related literature about mental health symptoms and COVID-19 pandemic lockdown, the investigator hypothesized that the respondents would report higher on levels of depressive, anxiety and stress symbols during the lockdown period. Additionally, it was also hypothesized that the reported mental health symptoms would relate to the selected demographic variables and vaccination status of the participants. This assessment might help in future to cope up with the issues related to

mental health problems of the population during pandemics.

## METHODOLOGY

### Participants

This was a cross-sectional study across different parts of the country. This was administered through a web-based survey design amongst the Indian undergraduate students during the lockdown period of second wave of COVID-19 pandemic in India. Most of the participants were from 15-25 years of age group. Informed consent was obtained from all individual participants included in the study. Response was collected online from 1719 undergraduate students of both the genders, following diverse religions, studying different courses in different parts of the country and was analysed by the investigator.

### Data collection

As community-based or face-to-face survey wasn't practicable during this pandemic lockdown phase with risk of getting infected and mandatory college closure, the investigator collected the data online. A specially designed questionnaire link using 'Google form' was created and shared to students via e-mails, WhatsApp and various social networking forums. Snowball sampling technique was adapted by the investigator and the participants were asked to roll out the link to as many undergraduate students as possible. So, the survey was forwarded to individuals from the first point of contact by the investigator and so on by the participants and the data was collected from across various states of India.

Data collection took place in duration of a month from 10 July, 2021 to 10 August, 2021. The eligibility criteria included the students pursuing graduation who are well versed with English language, have smartphones or laptops, have access to the data recruiting platforms and internet during the lockdown period due to second wave of COVID-19 in India.

### Procedure

The online survey provided a brief picture of the study, eligibility requirements, and e-consent form. On clicking in the survey link the respondents get

auto directed to the summary of the study and informed e-consent form. The investigator followed the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines (Eysenbach, 2004). The personal information collected during the procedure of all the participants was kept strictly confidential.

### Survey instruments

The e-questionnaire was split up into three parts: demographics, reported vaccination status and mental health assessment. Demographic details of the respondents were also collected (age, gender, locale, religion and stream of study) by incorporating in the same online survey. The respondents were asked for their vaccination status (not vaccinated at all, got first dose of vaccination, and got both dose of vaccination) through questions regarding the same. The widely accepted and internationally validated tool Depression, Anxiety, Stress Scale (DASS-21) was used by the investigator to assess the mental health symptoms of the participants. It contains total 21 items, having 7 items allocated respectively for the three subscales- depressive symptoms, anxiety, and stress symptoms. Each item is scored on a 4-point Likert scale ranging from 0 (didn't apply at all) to 3 (applied very much). For each subscale, a respondent could score ranging from 0-21. The depression, anxiety and stress of participants could be further classified into normal, mild, moderate, severe, and extremely severe through using advised cut-off points. The total scores for depressive symptoms were categorized into normal (0-9), mild depression (10-12), moderate depression (13-20), severe depression (21-27), and extremely severe depression (28-42). The total anxiety subscale score was categorized into normal anxiety (0-6), mild anxiety (7-9), moderate anxiety (10-14), severe anxiety (15-19), and extremely severe anxiety (20-42). The total stress subscale score was categorized into normal stress (0-10), mild stress (11-18), moderate stress (19-26), severe stress (27-34), and extremely severe stress (35-42). (Banna *et al.* 2020; Wang *et al.* 2020a).

### Statistical Analysis

The entire data was statistically analysed using a software developed for MS Windows, namely: SPSS (version 26, IBM Corporation). The p-value

< 0.05 was regarded statistically significant all through this study. T-tests, Chi-square test and Pearson Correlation Matrix were applied to test the inter-group statistical comparison and association between variables.

## RESULTS

### Demographic variables and mental health symptoms

It was reported that 55.0% respondents were 15-20 years of age and the rest were of 20-25 years of age, and 54.3% were male and the rest were female among them. Around two third of the respondents (66.6%) were residing in cities and the remaining 33.4% belong to town areas. Majority of the respondents were Hindu (63%), 26 % were followers of Islam, 9% were Sikhs and the rest 2% were followers of other religions. It was also reported that 41.1% of participants have opted humanities, 22.6% have science and 36.3% have opted commerce as their stream of study.

The rate of reports of mental health symptoms altered among the subgroups. Varied rate of depressive symptoms was reportedly higher in females (64.3%), respondents in the age group of 20-25 years (60.2%), those who are residing in cities (58.1%), followers of Islam (55.3%) and (60.8%) students who have opted science as their stream of study. The rate of anxiety symptoms was significantly higher in males (29.1%), in the age group of 15-20 years (36.9%), residing in town (36.1%), those who are Sikhs (59.1%) and (30.3%)

students who have opted commerce as their stream of study. Stress symptoms rate have reportedly higher in males (59.4%), in the age group of 20-25 years (69.1%), residing in city (61.1%), those who are followers of Islam (58.1%) and (64.7%) students who have opted science as their stream of study (Table 1).

### Vaccination status and mental health symptoms

Among the respondents, 62.4% have got first dose of vaccination, 20.9% haven't got vaccinated at all and 16.7% are completely vaccinated, i.e., have got the second dose till the date of data collection. Depressive symptoms are reported more in those respondents who haven't got vaccinated (62.9%) than those who have got their first dose of vaccination (59.3%), and least in the people who are completely vaccinated. The participants who have got their first dose of vaccination have reported 29.6% anxiety symptoms, which is comparatively more than those who are completely vaccinated and those not vaccinated at all. Stress symptoms are reported more in respondents who haven't got vaccinated (29.1%) than those who have got their first and second dose of vaccination (Table 2).

### Prevalence of depressive, anxiety, and stress symptoms

It was found that respondents have reported highest on depressive symptoms, followed by stress symptoms and then anxiety. It was reportedly found that approximately half of the respondents (49.5%) have normal to mild depressive symptoms (25.6%

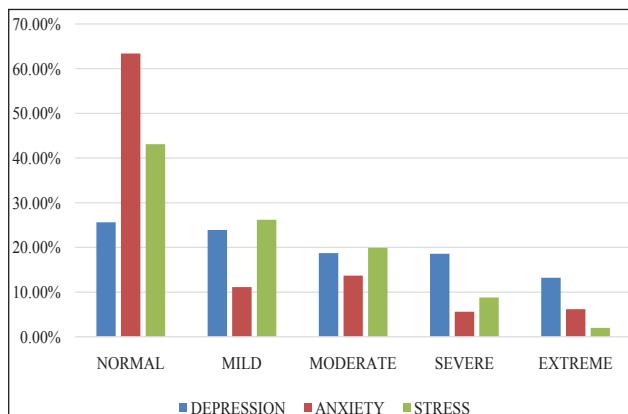
**Table 1:** Prevalence of mental health symptoms (depression, anxiety, stress) across demographic variables

Demographic Variables	Category	Percentage in the Sample (%)	Depression (%)	Anxiety (%)	Stress (%)
Age	>20	55.0	56.3	17.0	45.5
	<20	45.0	60.2	36.9	69.1
Gender	Male	54.3	60.1	29.1	59.4
	Female	45.7	64.3	23.8	54.3
Locale	City	66.6	58.1	35.2	61.1
	Town	33.4	54.4	36.1	59.4
Religion	Hinduism	63	54.1	54.4	53.7
	Islam	26	55.3	57.3	58.1
	Sikhs	9	51.1	59.1	52.0
	Others	2	50	60.1	53.3
Stream of Study	Humanities	41.1	59.1	24.9	59.8
	Science	22.6	60.8	28.9	64.7
	Commerce	36.3	50.4	30.3	51.1

**Table 2:** Prevalence of mental health symptoms (depression, anxiety, stress) with reference to Vaccination status

Vaccination Status	Percentage in the Sample (%)	Depression (%)	Anxiety (%)	Stress (%)
Not vaccinated at all	20.9	62.9	21.7	29.1
Got 1 <sup>st</sup> dose of vaccination	62.4	59.3	29.5	21.4
Completely vaccinated	16.7	54.9	17.1	22.9
		59.03	22.8	24.5

and 23.9%), 18.7% have moderate, 18.6% have severe and 13.2 have extremely severe symptoms of depression. Over three-fourth of the respondents (74.5%) have normal to mild anxiety symptoms (63.4% and 11.1%), 13.7% have moderate, 5.6% have severe and 6.2 have extremely severe symptoms of anxiety. Among the respondents, 43.1% have normal and nearly one-fourth (26.2%) have mild symptoms of stress, 19.9% are at moderate, 8.8% at severe and 2.0% are at extremely severe level of stress symptoms (Fig. 1).

**Fig. 1:** Percentage of Participants' depression, anxiety and stress symptoms

## DISCUSSION

A pandemic can be defined as an outbreak of a disease occurring over a very wide area or even worldwide usually affecting a large number of people. Pandemics usually bring number of challenges along with it and people are mostly unprepared and unaware about how to deal with such crisis. Although these pandemics are periodic phenomenon but its impact on mental health may be intense (Roy *et al.* 2020). COVID-19 causes various kinds of respiratory infections. Old aged people, children and those with critical medical conditions like diabetes, cancer, cardiovascular disease, and respiratory problems are more prone to getting infected with coronavirus (WHO, 2021f).

In February 2021, the second wave of COVID-19 hits, which have turned to be more deadly and devastating for India, so to slow down its transmission and prevent the infection various states of the country have gone again under lockdown. The future looks very uncertain and scary with the elevation in new cases and casualties. Most of the studies related to impact of COVID-19 and lockdown situation on mental health are from China, because the country was the first one to get effected. Hence, this study investigated mental health (depression, anxiety and stress) of undergraduate students during second wave of COVID-19 lockdown in India.

Mass quarantine or lockdowns in time of a pandemic may lead to extensively increase in depression, anxiety, and stress levels. This uncertain mental turmoil may also affect the physical health (Lima *et al.* 2020). Through various studies, it was found that the most affected group during COVID-19 crisis was the youngsters still pursuing their education, belonging to 15 to 25 years of age. And it was also found that during lockdown situations, students in this age group are psychologically more vulnerable. This is the reason that the investigator has decided to conduct this study on the undergraduate students in India. It was found in this study that students who are of 20-25 years in age reported higher on depressive, anxiety and stress symptoms as compared to those who are 15-20 years of age. So, it can be said that their mental health is more affected by the lockdown might be because they take things more seriously than those who are in the age group of 15-20 years of age. It is also believed that tech-savvy spirit of students and the unrestricted but non-validated information available on internet plays a big role in effecting mental health.

After the declaration of COVID-19 in China, sudden decrease in positive emotions and life satisfaction, while increase in the scores of sensitivities to social risks and negative emotions was recorded. It was also suggested that social media data can be used

during the pandemic period for studying the impact of public health emergencies on mental health of people (Li *et al.* 2020). It was reported in this study that Science students have reported high on depressive, anxiety and stress symbols compared to commerce and humanities students. So, it can be concluded that lockdown due to second wave of COVID-19 in India have affected most the mental health of science students as compared to students from other streams of study.

In Bangladesh, depression (62.7%) was prevalent mostly in rural areas but stress (59.1%) and anxiety (35.3%) were prevailing more in urban areas (Sayeed *et al.* 2020). But in the present study it was found that in India, participants residing in cities have reported high on depressive symptoms (58.1%) and stress symptoms (61.1%), but anxiety (36.1%) was reported high in students residing in towns. This is may be due to the reason that students from cities are more aware and concerned about the impacts of lockdown on their present life and future.

Chinese Government had imposed lockdown in January 2020, and in the first online psychological survey within the first two weeks of the COVID-19 outbreak, approximately 53% of the participants reported to undergo psychological impacts of this threat, among which 16.5% have depressive and 8.1% have stress symptoms ranging from moderate to severe (Wang *et al.* 2020). But in the present study, depression was the most often reported mental health symptom followed by stress symptoms and anxiety in the population.

Women in China as well in Bangladesh were reportedly rated high on all mental health symptoms (depression, anxiety and stress) when compared with men during COVID-19 lockdown (Wang *et al.* 2020 & Sayeed *et al.* 2020). On the contrary, in this present study, females were reported high (64.3%) only on depressive symptoms as compared to males (60.1%).

It was also demonstrated that respondents who haven't got vaccinated have scored higher on depressive (62.9%) and stress (29.1%) symptoms. But this is not same for anxiety in the population. The mental health of respondents who aren't vaccinated at all reported to be most the affected among the population. The reason for this cohort result might be that students who haven't got vaccinated yet due

to any reason are more psychologically disturbed and in fear of getting infected than those who have got vaccinated. People who haven't received even a single dose of vaccine are reporting high on mental health symptoms because might be they are still unaware or confused about when, how and from where to get vaccinated or which vaccine should they opt for. One reason for this is that might be they want to get vaccinated but aren't getting due to shortage of vaccine supplies in the country.

In this time of public health emergency, people throughout whole world are dealing with unbearable psychological and mental pressure because lockdown have distanced people from each other. It is obvious that lockdown triggers depression, anxiety and stress and also cuts the chances of face-to-face routine psychological counselling. It has been observed that novel psychological intervention strategies are the utmost need of the hour to deal with the psychological and mental issues in pandemic lockdown state. E-counselling can prove helpful in this time of crisis. Structured letter therapy was proposed as a feasible psychological intervention approach during this pandemic lockdown (Xiao, 2020). This 21<sup>st</sup> century is the era of e-communication and various social media platforms, which could be benefitted by the researchers in providing mass education, motivation and awareness. It was said that in Asian countries like China and India, execution of online mental health services has its own problems due to various causes (Yao *et al.* 2020).

In India, the mental health issues are more complex in context of COVID-19 pandemic due to large proportion of socially and economically vulnerable population, high cases of pre-existing mental illness, limited mental health services and infrastructure, less insight into digital mental health solutions, and above all fright created due to tremendous misinformation on social media (Murthy, 2017). Thus, interventions should also be specific and relevant to the circumstances in India. So, planning and implementation of strategies and policies should be specific and population centred, i.e., in accordance with the nature and demand of the targeted population. For this, more data and studies are required.

## CONCLUSION

The existing COVID-19 pandemic lockdown seems to have kindled another wave of mental health problems. In this study, a high pervasiveness of mental health symptoms (depression, anxiety and stress) among Indian undergraduate students was observed during the second wave of COVID-19 pandemic lockdown. It was found that demographic variables namely respondents' age, gender, locale, religion and stream of study are associated with mental health conditions. It was also reported that the vaccination status of the students' during the lockdown is associated with the mental health symptoms.

The mental and emotional impacts of mandatory lockdown and curfews should be deliberated in a more thoughtful manner. So, it is advised that mental health of all the students should be checked cautiously by the administration on regular time intervals in order to provide adequate help and mental stability during this ongoing pandemic. As students are spending most of the times at their homes in these pandemic times, parents should be aware of the normative developmental changes occurring in the population. Parents should try to openly engage in non-judgemental communications with their children without any prior assumptions. It is often seen that if children and adolescents have cooperative and supportive parents then they tend to have a better mental health. As it is, mental health alone is a global challenge in itself and the COVID-19 pandemic greatly escalated the mental health burden as well.

To combat this pandemic, it is also suggested that the government and the concerned institutions should motivate maximum number of students to get vaccinated as soon as possible and provide necessary aids. Feasible and novel psychological intervention strategies are the need of the hour in order to overcome the existing crisis of increasing adverse mental health. And it is advised that in order to maintain mental health in these critical times, every individual should try to maintain a sense of hope and positivity, get enough sleep, eat healthy, engage in yoga or exercises, avoid use of alcohol or drugs, try to help others in whatever possible way, and believe only reliable source of information. Additionally, in these tough times, the youths should remain aware and up-to-date

with all the valid information related to COVID-19 pandemic to fight against this biological global threat.

## Limitations

This study is limited to the students who had access to internet, know how to use laptops or smartphones, had ability to understand English and were pursuing graduation. This sample represents the educated segment of the country so it shouldn't be generalized to the whole population. Also, the sample was undergraduate adolescent students, and the findings can't be same for other age groups. So, the mental health of children or adults or uneducated adolescents in lockdown may differ from the findings of our study. But the data and the results could still be useful for further research in the related field. After thorough examination and analysis, this study offers useful findings and insights to understand the subject matter.

## List of Abbreviations

- (i) **WHO:** World Health Organization
- (ii) **COVID-19:** Corona Virus Disease
- (iii) **MoHFW:** Ministry of Health and Family Welfare
- (iv) ***Et al.:*** and others
- (v) **i.e.:** that is
- (vi) **e.g.:** for example
- (vii) **etc.:** et cetera

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