

# Internet addiction, depression, anxiety and stress among first year medical students after COVID-19 lockdown: A cross sectional study in West Bengal, India

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## ABSTRACT

**Objectives:** 1. To assess the impact of COVID-19 lockdown on Internet addiction on first year medical students. 2. To evaluate the associations, if any, between internet addiction, anxiety, depression and stress. **Methods:** Internet addiction, depression, anxiety and stress among medical students across West Bengal have been studied using Young's Internet Addiction Test (IAT) scale and the Depression, Anxiety and Stress Scale (DASS-21). A web-based questionnaire was made and circulated via different social media platforms. All interested candidates who gave consent were included in the study. All statistical analyses were done using SPSS version 25.0. **Results:** The study population consisted of 37.2% of males and 63.8% of females. 80.23% of the participants showed moderate levels of internet addiction. Strong positive correlation was found between anxiety and stress ( $r = 0.83, P < 0.05$ ), depression and anxiety ( $r = 0.92, P < 0.05$ ) and between depression and stress ( $r = 0.86, P < 0.05$ ). **Conclusion:** The unprecedented ramifications of lockdown are incessant, with internet addiction, magnification in depression, anxiety and stress to name a few. Internet addiction coupled with psychological disorders still remains a matter of concern for medical students.

**Keywords:** Anxiety, depression, internet addiction, stress

## Introduction

The World Health Organisation (WHO) declared COVID-19 as a pandemic on 11 March 2020.<sup>[1]</sup> While the lockdown due to the COVID-19 pandemic may have helped curb the skyrocketing number of cases, certain unavoidable consequences on mental health of people all around the globe have sprung up.<sup>[2]</sup>

The magnification of anxiety and stress can be attributed to increasing infections and mortality, as portrayed by newspapers, articles, news channels, etc. With schools, colleges, and offices closed, the internet usage has increased manifold. People being

locked up in their homes have led to disruption in their daily schedule, further leading to an increase in screen usage due to ample amount of time.<sup>[3]</sup> Social isolation has also resulted in an increase in screen time as several users have shifted to social media to keep in touch with their near-and-dear ones.

In our study, we aim to assess the impact of COVID-19 lockdown on medical students, the people who will be treating patients in the near future. Are the doctors of tomorrow in good health today? Due to the strict impositions of countrywide lockdown, all colleges were closed for an indefinite period accompanied by a shift to online mode of academics. Students were isolated in their homes and contact restrictions were foisted, resulting in many psychological disorders.

The internet has emerged as a crucial part of our life. Approximately, 45% of the Indian population uses the internet

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for various purposes, and most importantly, students form 68.6% of it as of January 2021.<sup>[4]</sup> Internet usage has increased over the past couple of years and has also been seen to be significantly higher among medical students. The unlistable uses of the internet brings along with it the bane of over-usage, and this has led to an emanation of internet addiction. The concept of “internet addiction” was first brought forward by Dr Ivan Goldberg, who described it as the pathological urge for extended internet usage.<sup>[5]</sup> Internet addiction is neither listed as a disorder in the Diagnostic and Statistical Manual of Diagnostic Disorders (DSM) nor in the International Classification of Diseases (ICD-11). However, it was formally recognized by the American Psychiatric Association (APA).<sup>[6]</sup> Controversy regarding its diagnosis as a separate clinical entity or as a result of underlying psychiatric disorder has been studied extensively, but no universally standardised consensus has been reached.

There is a plethora of factors which can be associated with internet addiction, but the most important among them is the easy and cheap access to the internet. During the lockdown, mobile companies used attractive offers to lure its customers into upgrading their plan while sticking to their budget. This has led to an increase in the number of internet users. A recent study shows that there is a 24.6% prevalence of internet addiction disorder among Indian adolescents.<sup>[7]</sup> An Indian Council of Medical Research (ICMR)–funded survey among 2755 participants in Bengaluru in the age group of 18–65 revealed that 1.2% of the population was addicted to the internet.<sup>[8]</sup> Several small regional studies concluded mild-to-moderate addiction to the Internet. These factors were further impeded by the lockdown restrictions.<sup>[8–10]</sup>

Medical students are especially more vulnerable to this because of their stressful life and complicated academic problems. The entire medical curriculum was being conducted online. Students had to attend online classes as per the routine given from the authorities which extended for five to six hours daily. Also, every objective and subjective assessment along with viva examinations were conducted over the internet. Excessive internet usage was previously linked to various psychological disorders like depression, anxiety, obsessive compulsive disorder, etc., but no clear causal relationship was obtained.<sup>[11]</sup> Early screening, hence, becomes quintessential in order to put a check on the increasing prevalence of such disorders.

Primary care providers and family physicians form an important part of early screening of internet addiction among vulnerable populations. The information obtained from this study will help them make a proper diagnosis and proceed with adequate treatment in the future so that collateral disorders like depression, anxiety and stress can be alleviated to a greater extent. This study aims to find a correlation between internet addiction and psychological disorders, if any, since there is a paucity of published literature on the subject in this area.

## Objectives

1. To assess the impact of COVID-19 lockdown on internet addiction on first year medical students
2. To evaluate the associations, if any, between internet addiction, anxiety, depression and stress

## Material and Methods

A cross-sectional, descriptive study was conducted among the first year medical students of various medical colleges in West Bengal. A total of 290 students expressed their willingness to participate, out of which 258 students completed the study. The study was done from July to October 2021. Medical students who were unwilling or were suffering from any diagnosed psychiatric illnesses were excluded from the study. A Google Form–based questionnaire distributed over email and other social networking platforms was used to record the responses of the participants.

Sociodemographic data like age, gender, type of institution (government/private), and current place of residence have been taken into consideration.

The scale used for assessing internet addiction is the Internet Addiction Test (IAT) designed by Dr Kimberly S. Young. It is a questionnaire consisting of 20 statements, each statement scoring a maximum of 5 points. The examinee needs to select the most suitable response as per him/her on the 5-point Likert scale.<sup>[12]</sup>

In the maximum score of 100, scores ranging 0–30 portray normal internet usage. Scores of 31–49 reflect mild levels of internet addiction; scores 50–79 indicate moderate levels of addiction, and scores above 80 are deemed to be severe cases. Higher the score, the higher is the severity of internet addiction.

The scale implemented for evaluating the emotional states of depression, anxiety and stress is the Depression, Anxiety and Stress Scale (DASS-21).<sup>[13]</sup> It consists of 21 statements subdivided into three sections. One section is for anxiety, second for stress and third for depression. Each section consists of seven statements. All statements have four options, corresponding to which, scores ranging from 0 to 3 are given. The summation of the relevant scores in each section is then multiplied by 2 to obtain the final score.

The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia and inertia. For depression, the DASS-21 scores ranging from 0 to 9 are deemed normal, 10 to 13 is said to be mild, 14–20 moderate, and 21–27 severe. Scores equal to or exceeding 28 correspond to severe depression.

The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. For anxiety, scores of 0–7 are deemed normal, 8–9 mild, 10–14 moderate, and 15–19 are deemed as severe levels of

anxiety. Scores equal to or above 20 signify an extremely severe degree of anxiety that calls for immediate therapeutic or medical attention.

The stress scale assesses difficulty relaxing, nervous arousal, and being easily upset or agitated, irritable or over-reactive, and impatient. Scores ranging from 0 to 14 are deemed normal, 15 to 18 are mild levels of stress, 19 to 25 moderate, and 26 to 33 severe. Scores equal to or above 34 signify extremely severe levels of stress.

### Study procedure

The Google Form link was sent to the interested participants through email, WhatsApp and other online platforms. The forms contained detailed instructions along with the DASS-21 and IAT scale. An option for inviting a friend was also kept. Confidentiality and anonymity among the study participants was assured.

The collected data was entered into Google Sheets. Data was presented following the principle of descriptive statistics. The Pearson correlation test was done to evaluate the correlation between internet addiction, depression, anxiety and stress. All statistical analyses were done using the Statistical Package for the Social Sciences (SPSS) version 25.0. A *P* value of < 0.05 was considered statistically significant.

Ethical permissions were obtained from the Institutional Ethics Committees.

### Results

The study population consisted of 258 participants, out of which 37.2% were males and 62.8% were females. A majority of the study participants (82.6%) were from a government medical college compared to 17.4% who studied in a private medical college. 59.3% of the respondents resided in college hostels in contrast to 25.6% who resided in their own homes and 15.1% in a rented home. A majority of the study population (66.3%) had a sleep duration of 6–8 hours. All data are expressed in Table 1.

As per the DASS-21 criteria, 50% of the participants showed severe depression followed by 17.4% who showed moderate depression. Moderate levels (30.2%) of anxiety were seen among the respondents, and 26.7% showed extremely severe levels of anxiety. Stress levels among the respondents varied between mild (17.4%) and moderate (18.6%). All data are tabulated in Table 2.

The mean value of internet addiction calculated from the scale was 50.64 (SD = 7.64). Mean values of depression, anxiety, and stress, as obtained from scores calculated using the DASS-21, were 14.98 (SD = 9.66), 12.58 (SD = 9.57), 29.72 (SD = 21.45), respectively. All data are expressed in Table 3.

The result of the Pearson correlation test indicated that there was a significantly positive relationship between anxiety and

stress ( $r = 0.83, P < 0.05$ ), depression and anxiety ( $r = 0.92, P < 0.05$ ) and between depression and stress ( $r = 0.86, P < 0.05$ ). A significant small positive relationship was obtained between Internet addiction and other psychological parameters. All data are tabulated in Table 4.

### Discussion

Excessive internet usage is an emerging problem among the youth. Owing to the lockdown, students were stuck in their homes, with the internet being their sole tool for socialisation,

**Table 1: Characteristics of study participants**

Variables	n	%
Gender		
Male	96	37.2
Female	162	62.8
College		
Government	213	82.6
Private	45	17.4
Place of stay		
College hostel	153	59.3
Own house	66	25.6
Rented room	39	15.1
Sleep duration		
<6	60	23.3
6-8	171	66.3
>8	27	10.4

**Table 2: Distribution of levels of depression as per DASS-21**

	Depression	Anxiety	Stress
Normal	48 (18.6)	75 (29.1)	135 (52.3)
Mild	9 (3.5)	24 (9.3)	45 (17.4)
Moderate	45 (17.4)	78 (30.2)	48 (18.6)
Severe	27 (10.5)	12 (4.7)	12 (4.7)
Extremely severe	129 (50)	69 (26.7)	18 (7)

(Data in parentheses represent percentage)

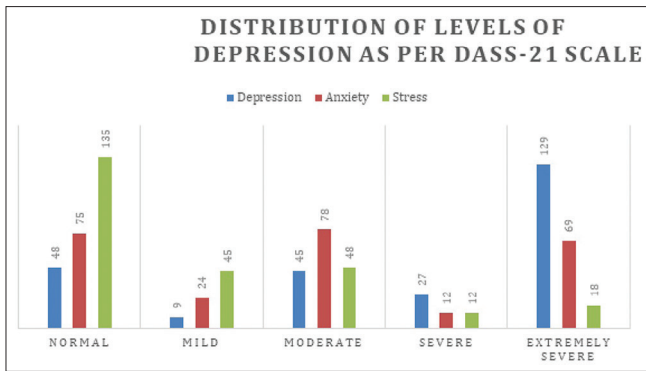
**Table 3: Descriptive statistics of study variables**

	Internet addiction	Stress	Anxiety	Depression
Mean	50.64	14.98	12.58	29.72
Standard deviation	7.64	9.66	9.57	21.45
Minimum	16.00	0.00	0.00	0.00
Maximum	80.00	40.00	40.00	78.00
Confidence level (95%)	1.64	2.07	2.05	2.63

**Table 4: Pearson correlation coefficient (r) between different study variables**

	Internet addiction	Stress	Anxiety	Depression
Internet addiction	1.00			
Stress	0.23*	1.00		
Anxiety	0.18*	0.83*	1.00	
Depression	0.27*	0.92*	0.86*	1.00

\**P*<0.05



communication and amusement. Many studies have already suggested increased levels of depression and stress among medical students but aggravating factors of such were not demonstrated. The pedagogical shift of learning during the lockdown with online lectures and assessments has made it mandatory for the students to have extensive internet usage. In addition to this, regular updates and new drug regimens formed an important learning tool for the medicos. Besides, the internet brings with it captivating content for teenagers and adolescents, which apparently seem to provide some divertissement from their otherwise mundane life.

In the pre-lockdown period, certain studies conducted by Viswakarma A *et al.*<sup>[13]</sup> and Ganapathi AV showed mild levels of internet addiction in the majority of the population.<sup>[14]</sup> However, due to the COVID-19 lockdown, there has been an increase in internet usage, which contributed to the shift from mild to moderate, and in some cases severe, levels of internet addiction.<sup>[15]</sup> Our present study also shows this trend with 80.23% of the participants having moderate levels of usage. These findings are also in line with the study conducted by Singh B among students during the lockdown and Elhai J in the Chinese adult population.<sup>[16]</sup>

Internet addiction was found to be more prevalent among female students compared to male students. This is in line with the results obtained from a study done by Javeed A among undergraduate medical students in Azad Kashmir.<sup>[17]</sup> Contrary findings have been obtained from the studies done by Chen SY *et al.* and Hasanzadeh *et al.*<sup>[18,19]</sup> where male prevalence in internet usage was found to be higher. Increase in female prevalence can be due to the larger number of female participants compared to male in our study.

The lockdown has brought with it abundant free time. People tend to go through news articles all day, which seem to talk of nothing but COVID. Besides preaching misinformation, some of these unverified sources have increased the levels of stress and anxiety in everyone. A strong positive correlation has also been found between depression and stress. This can be attributed to the fact that medical students faced tremendous emotional stress during the lockdown which may have led to depressive symptoms. Internet addiction has drastically affected the mental health of medical students and is said to have caused certain psychological

distress. People tend to portray the “happy” part of their lives on social media, which is often far from the reality. This, however, has a negative impact on the lives of viewers who tend to believe that everyone is exuberant except them. Their so-called perfect public facade masks the bitter reality of difficulties. Viewers fail to realise that social media is just smoke and mirrors. Hence, viewers tend to become depressed, thinking why others have a picture-perfect life and why their own life’s picture is always photobombed by something.

In our study, we also found a positive correlation between internet addiction, depression, stress and anxiety which is in line with the findings obtained in a large number of studies done in India. Despite correlations between these parameters, no cause-effect relationship could be established owing to the design of the present study.<sup>[20]</sup>

### Relevance

The Internet brings with itself both blessings and bane. While it helps to connect and learn, people tend to fall into the scourge of internet addiction. This study will help primary care physicians differentiate between people already with clinical depression and people plummeting into depression due to internet addiction. This gradation of internet addiction and depression, anxiety and stress will facilitate proper diagnosis.

### Conclusion

The COVID-19 lockdown was one of the most unprecedented events in global history. There has been a paradigm shift in lifestyle. Medical students did not have access to practical classes and wards, which created a void in their knowledge. In order to compensate for that, online classes were arranged, which, however, could not replace the offline quality of teaching. The increase in online mode of education has led to magnification in internet usage time. Students locked up in their homes have also led to decreased modes of amusement. Hence, the internet became a necessity for students rather than a luxury. It was the only mode for education, socialisation and leisure. This over-usage of the internet has led students gradually falling prey to internet addiction.

Internet addiction has been one of the causes for psychological distress. Besides, lockdown has significantly contributed to elevation in stress and anxiety levels among medical students. The cumulative effects of these factors have substantial ramifications on students, thereby taking a toll on their emotional and mental health.

### Summary

1. Internet addiction in the pre-COVID-19 era differs significantly from that during the COVID-19 lockdown. A shift from mild to moderate pattern of internet addiction has been noted.
2. The trend of increasing prevalence of internet addiction after

the lockdown period was due to the shift of the entire mode of education from offline to online and more free time.

3. A strong positive correlation has also been found between depression and stress. This can be attributed to the fact that medical students faced tremendous emotional stress during the lockdown, which may have led to depressive symptoms.
4. An increased prevalence of depression and anxiety was noted as people were stuck in their homes worrying about incurring infection and also partly due to spread of information from various unverified sources.
5. This study will help primary care physicians differentiate between people already with clinical depression and people plummeting into depression due to internet addiction. This gradation of internet addiction and depression, anxiety and stress will facilitate proper diagnosis.

### 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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Nil.

### Conflicts of interest

There are no conflicts of interest.

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