

Effect of COVID 19 pandemic lockdown on sleep pattern of university students: A web based cross sectional study

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Abstract

Objectives: In addition to the physical morbidity and mortality, COVID-19 Pandemic has created a mental burden on the population as a whole. In our present web based cross sectional study we tried to assess the prevalence of the sleep pattern and different psychological problem in young University students.

Material and Methods: Using a web based study we collected data from 100 University students who volunteered to participate. We analyzed the demographic data, generalized anxiety disorder (GAD), depressive symptoms and sleep quality.

Results: The overall prevalence of GAD, depressive symptoms and sleep quality of the students were 100%, 79% and 79% respectively. Bivariate regression analysis showed female students to be more likely to have mild anxiety and moderately severe depression whereas younger age students were more likely to have mild anxiety. There was a reduction in physical activity in 58% of students.

Conclusion: In our study, we found the recent COVID-19 outbreak as a major psychological burden for the student population irrespective of gender and age. Formulation of a prior guideline, targeted at such group of population during a pandemic is necessary to avoid the development of such psychological problems as well as their fatal consequences.

Keywords: Generalized anxiety disorder, depressive symptoms, sleep quality

Introduction

Importance of sleep can be ascertained from a number of negative impact it puts on health. Even a few days of sleep deprivation can result in deterioration of physical activity, cognitive balance as well as overall productivity and health of a person. Starting from the risk of obesity, it has a strong influence on cardiovascular and metabolic diseases, mood and cognitive disorders as well as for an accelerated cellular senescence and aging. Sleep has been hypothesized to have a restorative effect on immune processes as well. Therefore, sleep deprivation and disorders of sleep are thought to impair the mechanism of defense to pathogens and a susceptibility to viral and bacterial diseases.

Stressful life event has remained as one of the major factor for starting of the pathophysiology of sleep disturbance. Personal vulnerability frequently acts as an additional contributing factor. Episodes of stress may not only exacerbate any existing sleep disturbance but also can create a new onset sleep problem as well attenuating the defense against pathogens. Coronavirus Disease 2019 (COVID-19) has emerged as a global pandemic since its start from December-2019. Most countries have implemented strict protective measures like lockdown and shutdown which have profoundly changed the customs, and day to day home and work related practices of the entire population. The stress induced by such rigorous restrictions such as cutting off of social interaction, disruption of daily routine and above all the anxiety of the future of this disease have affected the security and wellbeing of the people dramatically. In particular, young adult students are experiencing complex situations such as suspension of their regular offline classes, continuous online classes at home and reduced physical activities during this ongoing pandemic. In this prevailing scenario some studies have reported about the pandemic related altered sleep patterns in different strata of population ^[1, 2].

We hypothesized that the COVID-19 pandemic has also affected subjective sleep quality as well as sleep related practices of young students in this part of the world also. To test this hypothesis, we planned to conduct a sleep related web-based cross sectional study among the MBBS University students, with an objective to assess the prevalence and to explore the potential influencing factors of sleep related symptoms of young adults affected by the isolation measures during COVID-19. We hope that the findings of our study will contribute to the data support for the target interventions on psychological health in student mass during the future outbreak of this type of pandemic.

Methods

In this online study all students from 1st to final year MBBS students were invited to participate. The study was conducted on May 2021. Students were asked through WhatsApp to participate in the study conducted with the Google form.

Sleep quality

Self-administered Questionnaire of Pittsburgh Sleep Quality Index (PSQI) was used for the clinical assessment of sleep quality ^[3]. The PSQI scale contains seven components (subjective sleep quality, sleep duration, sleep latency, habitual sleep efficiency, use of sleep medications, sleep disturbance, and day time dysfunction). Score for each component ranges from 0-21, with higher score indicating more severe sleep disturbance. A global PSQI score of 7 indicates poor sleep quality.

Generalized anxiety disorder

We used GAD-7 (Generalized Anxiety Disorder-7) to assess subject's anxiety status ^[4]. Seven questions assessed the presence of anxiety symptoms on a 4 point Likert scale ranging from 0 (never) to 3 (nearly every day). Out of the total score value range of 0-21, increasing scores indicates more severe symptoms of anxiety. We took a GAD score of 9 points or greater as the presence of anxiety.

Depressive symptoms

Patient health Questionnaire-9 (PHQ-9) was used for the assessment of depressive symptoms over the last 2 weeks ^[5]. A total of 9 questions were given in this questionnaire. Each of the

question assessed the presence of depressive symptoms on a 4 point Likert type scale ranging from 0(not at all) to 3(nearly every day). Out of the total score of 0-27, a score of more than 5 was taken as the presence of depressive symptoms, with 5-9 as mild, 10-14 as moderate, 15-19 as moderately severe and 20-27 as severe.

All the questionnaire was sent to each participant. After filling up of the questionnaire, students submitted their forms through the same platform within seven days. The questionnaire consists of Likert-type and open-ended questions for which individual scores were provided.

Statistical analysis

All the data was analyzed using Statistical Package for Social Sciences (SPSS) version 24. Descriptive analyses were done to describe the demographic characteristics. Prevalence of sleep quality, GAD and depressive symptoms were stratified by gender and age. The chi-squared test was used to compare the differences between the groups. Univariate and multivariate logistic regression was performed to find out the potential influencing factors for the sleep quality during COVID 19 pandemic. Odds ratio (OR), adjusted odds ratio and 95% confidence interval (95% CI) were obtained from logistic regression models. P value of less than 0.05 was considered statistically significant.

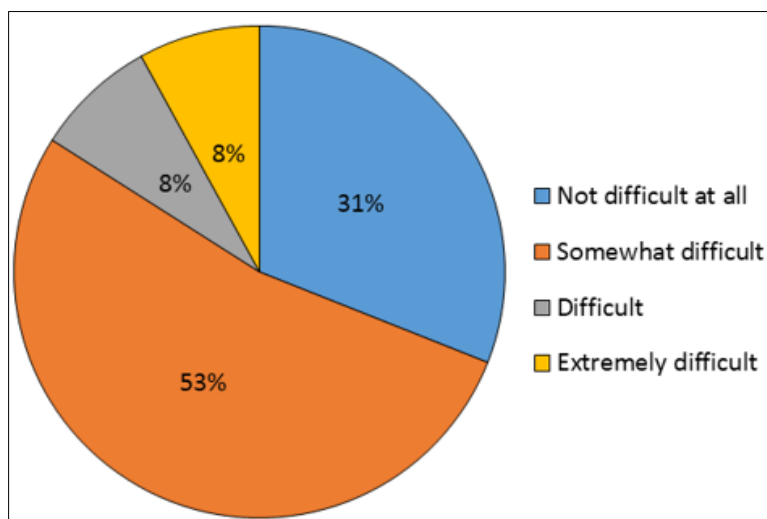
Results

Demographic characteristics

The characteristics of our participants is reflected in Table 1. Out of a total of 100 responses received and analyzed, 39(39%) were males and 61(61%) were females and the mean (standard deviation) was 20.1 ± 1.4 years.

Prevalence of GAD, depressive symptoms and sleep quality stratified by gender and age

The prevalence of generalized anxiety disorder, depressive symptoms, and sleep quality stratified as per gender and age group were shown in Table 2, Table 3 respectively. The overall prevalence of GAD, depressive symptoms, and poor sleep quality were 100%, 79%, and 79%, respectively. This shows that all the students are suffering from some degree of anxiety and most of the students are suffering from a poor sleep quality and depression. There was no statistically significant difference in the prevalence of GAD, depressive symptoms and poor sleep quality by gender and age ($P > 0.05$, shown in table 2 and 3). In the bivariate logistic regression, we found females are more likely to have mild anxiety (OR=1.9, 95% CI: 0.63-5.73) and moderate to severe depression (OR=1.38, 95% CI: 0.32-6.03) than males and age group of less than or equal to 20 is more likely to have mild anxiety than the other group of more than and equal to 21 (OR=1.83, 95% CI: 0.6-5.64) as reflected in table 4.



Graph 1: Distribution of problem

Table 1

Variable	N	%
Male	39	39%
Female	61	61%
Age (Mean ± SD) (100)	20.1 ± 1.4	
≤ 20	67	67%
≥ 21	33	33%

Table 2

Characteristics		Total	Male	Female	Chi-Square test	P-Value	Significance
Generalized anxiety disorder	Minimal Anxiety	26	12	14	2.865	0.4129	Not Significant
	Mild Anxiety	29	9	20			
	Moderate Anxiety	20	6	14			
	Severe Anxiety	25	12	13			
Depressive disorder	No depression	21	8	13	0.5393	0.96956	
	Mild	38	16	22			
	Moderate	13	5	8			
	Moderately severe	13	4	9			
	Severe	15	6	9			
Sleep quality	< 5 Score (Good)	21	8	13	0.0091	0.92381	
	≥ 5 Score (Poor)	79	31	48			

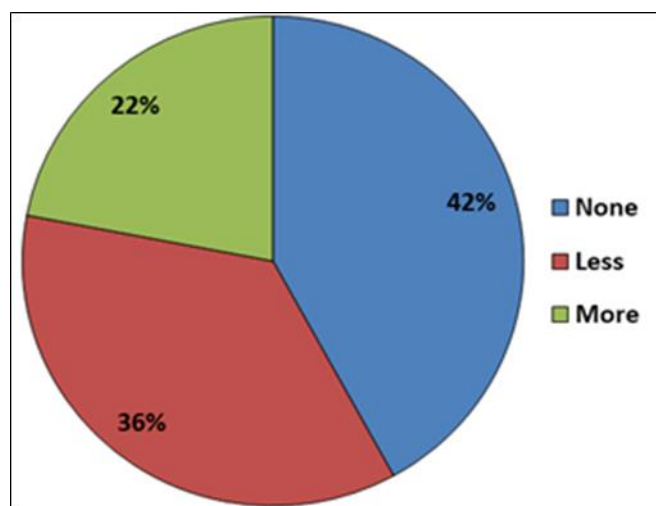
Table 3

Characteristics		Total	≤ 20	≥ 21	Chi-Square test	P-Value	Significance
Generalized anxiety disorder	Minimal Anxiety	26	18	8	2.755	0.431	Not Significant
	Mild Anxiety	29	16	13			
	Moderate Anxiety	20	15	5			
	Severe Anxiety	25	18	7			
Depressive disorder	No depression	21	13	8	2.355	0.67081	
	Mild	38	24	14			
	Moderate	13	11	2			
	Moderately severe	13	9	4			
	Severe	15	10	5			

Sleep quality	< 5 Score (Good)	21	13	8	0.3121	0.57638	
	≥ 5 Score (Poor)	79	54	25			

Table 4

Variable	Gender		Odd's Ratio	95% C.I.	Age		Odd's Ratio	95% C.I.
	Male	Female			≤ 20	≥ 21		
Minimal Anxiety	12	14	1		18	8	1	
Mild Anxiety	9	20	1.9	(0.63 - 5.73)	16	13	1.83	(0.6 - 5.64)
Moderate Anxiety	6	14	2	(0.59 - 6.83)	15	5	0.75	(0.2 - 2.78)
Severe Anxiety	12	13	0.93	(0.31 - 2.79)	18	7	0.88	(0.26 - 2.92)
No depression	8	13	1		13	8	1	
Mild depression	16	22	0.85	(0.28 - 2.52)	24	14	0.95	(0.32 - 2.85)
Moderate depression	5	8	0.98	(0.24 - 4.08)	11	2	0.3	(0.05 - 1.69)
Moderately severe depression	4	9	1.38	(0.32 - 6.03)	9	4	0.72	(0.17 - 3.14)
Severe	6	9	0.92	(0.24 - 3.59)	10	5	0.81	(0.2 - 3.26)
Sleep Quality < 5 Score (Good)	8	13	1		13	8	1	
≥ 5 Score (Poor)	31	48	0.95	(0.35 - 2.56)	54	25	0.75	(0.28 - 2.05)



Graph 2: Distribution of change in physical activity

Discussion

In our web based study, we found a high prevalence of GAD as well as depressive symptoms and poor sleep quality in the University students during COVID-19 pandemic. Out of the three types of problem, different grades of anxiety were found in all the students. This reflects that mostly anxiety related symptoms increases with major infectious disease outbreak which was also shown by the study of Su *et al.*, 2007 during SARS outbreak. Nearly 80% of the students having a sleep problems and depressive symptoms suggests that the future uncertainty of the pandemic progression has its own psychological burden on the students. The different reasons for these features of psychological distress might be associated with the worry of getting infected anytime in the future as well as the fear that the pandemic is hard to control with no effective treatment available [7]. Lack of physical communication for a long time may have resulted in loneliness of the students ultimately manifesting as depressive symptoms and bad sleep quality. When we try to associate gender and age group with different problems, we could not get a statistically significant association for any of the problems with either gender or age. It suggests that the problems are occurring uniformly

irrespective of any gender and age.

After a bivariate logistic regression analyses, we found that female students are more likely to have mild anxiety than males. Even if the association is not there for moderate and severe anxiety, still this finding partially supports the research finding by Guo *et al.*, 2016 and Gao *et al.*, where they found females were more likely to have anxiety than males^[8, 9]. We also found that females are having more association with moderately severe depression than males. This shows the mental helplessness developing specifically in females during this time of stress. This susceptibility for depression by the females was also reported in some previous studies^[10, 11]. Our younger study group of less than or equal to 20 years were found to be more likely to develop mild anxiety than their elder counterpart. This result was similar to a previous study by Su *et al.*, 2017 in Taiwan during SARS outbreak and by Yeen Huang and Ning Zhao in Chinese population during this COVID-19 pandemic^[12]. The possible reasons may be ascertained to the better control of mental stress by a more mature and developed brain as well as the different anti-stress mechanisms to cope with this stressful situation by the elders.

We found a high impact of extended isolation on student's sleeping behavior/quality with 79% of students having a poor sleep quality. A more inclination towards female gender was also apparent with 48% of females getting affected with this, out of a total of 79%. Younger age group was also found to have more prevalence of poor sleep quality with a 53% of less than 20 years getting affected. Being continuously homebound, without any outdoor plays/activities and getting exposed to the news and talks related to COVID and its uncertainty has its own mental stress, which might be contributing the development of this high prevalence of different types of psychological problems. Poor sleep quality is a risk factor for many chronic diseases and their ultimate progression to different psychological problems including depression, anxiety and suicidal behavior^[13, 14, 15].

Supporting the above facts, in our study we also found that the amount of physical activity has been reduced in 58% of the students, which reflects the effect of isolation lockdown and shut down on the physical behavior of students.

The isolation measures taken by the government to contain the COVID-19 spread by enforcing strong measures like shutdown, lockdown, prohibition of public gathering has its own advantages during this type of pandemic. However, there is a lack of relevant research for the target intervention of public's psychology problems. This specifically applies more to the young student mass who are highly active for the outdoor activities during a normal time. Till now there are very few works done in this regard to find out the psychological burden in this target population. Keeping a view on this, we have conducted this research study to find the prevalence of different psychological problems in the young University students stratified by their demographic characteristics and also tried to explore any related influencing factor.

From our result we recommend that appropriate non pharmacological intervention should be given to this young mass in the form regular anti stress behaviors like involvement in some form of indoor exercise as well practicing meditation/ motivational talks regularly. This has been proved to be beneficial as reported in previous studies^[16]. Second, to restrict them from getting exposed to the amount of time they receive the COVID-19 information and focusing only on the highly necessary facts and data as well as avoidance of getting harmful rumors related to the pandemic. Third is to maintain a good balance on the above measures regularly for having a good sleep quality which can also be facilitated by restricting oneself from too much attention on the pandemic before going to bed.

Our study had several limitations. One of the major limitation was the small sample size for a cross sectional design. As the data and relevant analyses were derived from cross sectional design, so it is difficult to reach a causal inference. We used a web based survey method for avoiding the transmission of a possible infections. This made our sampling voluntary and web based, creating a possibility of selection bias. Lastly we could not get the data of student's

previous psychological status before the outbreak to get the real information of a new onset psychological problem during this pandemic.

Conclusion

In conclusion, our study identified that mental health burden is very high among young Indian student population during COVID-19 pandemic. These highly active group of population, with a complete home isolation and having a constant exposure to loads of information, talks and rumors of the pandemic are always at high risk for different sleep as well as psychological problems. In comparison to previous epidemics/pandemics where the target psychological guidelines were not available, this recent identification of a high prevalence of mental health burden during COVID-19 will guide the appropriate authority to formulate and implement different psychological well-being guidelines. The interventional guidelines thus can be given routinely as early as possible during this type of pandemic to prevent the consequences of different psychological hazards specifically in this type population.

Conflict of interests

The authors declare that there is no conflict of interests.

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