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Original Research Article

Psychological impact of COVID-19 lock-down on college students across India: a cross sectional study

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ABSTRACT

Background: Following the COVID-19 outbreak, Indian Government has imposed lock-down to contain its spread. This has resulted in psychological distress in people. College students, known to have an active social life, are also vulnerable to this. Objectives were to assess the prevalence and severity of core symptoms of depression, anxiety and stress in college students across India during the Lock-down; to estimate the impact of lock-down on time spent on their routine activities, domestic violence, eating habits and sleep pattern; to analyze the impact of various factors and the mental health status.
Methods: A semi-structured questionnaire also containing the 21 items of depression anxiety and stress scale (DASS21) was circulated through social media. College students from different states across India participated. Study period was from April 2020 to May 2020. The responses collected were analyzed using chi squared test and logistic regression.
Results: Total 53.1%, 37.2% and 24.3% had symptoms of depression, anxiety and stress respectively, with varying severities (n=727). Significant associations of the negative emotional states with decreased time spent with their family and friends and its effects; increased incidence of domestic violence; increased sleep duration; disturbed sleep; financial crisis, etc. were found (p value<0.05).
Conclusions: COVID-19 is building psychological distress among vulnerable college students, as they are forced to stay home, along with worsening financial situations, lifestyle changes, family situations and time spent on various activities. Psychological interventions are recommended.

Keywords: College students, COVID-19, DASS21, Lock-down, Mental health, Psychological distress

INTRODUCTION

On 31 December 2019, China reported few cases of pneumonia in people linked with the Huanan seafood market in Wuhan, Hubei Province.[1] Health authorities of China established association of the cases with a novel corona virus, 2019-nCoV, on 7 January 2020.[2] And the virus rapidly spread from a single city to many countries, after which, world health organization declared COVID-19 - a pandemic on 11 March 2020.[3]

With no other effective proven methods of containing the spread, voluntary and enforced quarantine, social distancing, the strategy of maintaining a safe distance from people, isolation of households, towns, or cities are being the important strategies.[4,5] Understanding the seriousness of the pandemic, on 24 March 2020, the

Honorable prime minister announced a lock-down period of 21 days and enforced Section 144 of Cr PC. all over the country.[6] But even after the 21 days of lock-down period, the infection is not contained and hence the lock-down is prolonged further.[7] Following this, the social lives of people are severely affected as many of the school, colleges, universities, restaurants, cafe, etc. were closed. Such isolation strategies in an attempt to contain the pandemic, could also lead to development of psychological distress, loneliness, anxiety, depression, panic states, economic troubles and extreme mental stress.[8-10] College students, known to have an active social life are one of the groups that are vulnerable to psychological distress. Hence studying the impact of lock-down on the mental health of this group of people is needed. The objectives of the study were to assess the prevalence and severity of core symptoms of depression, anxiety and stress in college students across India during the lock-down; to estimate the impact of lock-down on time spent on their routine activities, domestic violence, eating habits and sleep pattern; to analyze the impact of various factors and the mental health status.

METHODS

A cross-sectional study was conducted among the college students from various streams. Students who were willing to participate, who had access to internet and social media and who were able to understand English were included.

A semi-structured questionnaire was prepared and it included questions about demography, the time spent on routine activities, domestic violence, eating habits, sleep pattern and mass media during the period of lock-down and also the 21 items of the DASS 21 Scale. DASS 21 is a scale used for assessing the symptoms of negative emotional states of depression, anxiety and stress and widely used in epidemiological studies. The scale is a reliable and valid tool to assess the psychological distress in both clinical and non-clinical population.[11,12]

The questionnaire was uploaded in SurveyHeart app, a free app for conducting surveys and the web link to the questionnaire was generated and was circulated in the social media like Whatsapp, first to the groups containing college students in our contact and the participants were encouraged to share it to other college students they knew of. It was an internet-based survey and consent was obtained from the participants. The survey was conducted adhering to the ethical principles for medical research involving human subjects of WMA Declaration of Helsinki, 2013.

The study period was from April 2020 to May 2020. Data entry and analysis was done using SPSS Statistical software version 22. Data was presented as frequency tables and the associations of the emotional states with other responses were assessed using chi squared test and p value<0.05 was considered statistically significant. Those found significant by univariate analysis was further analyzed using logistic regression and adjusted odds ratio with 95% CI and p value was calculated.

RESULTS

A total of 727 responses were collected. All the participants were between 17 to 25 years of age and the mean age was 20.19 years. Majority were females 490 (67.4%) and 391 (53.8%) pursued MBBS and the rest pursued other courses like B.E., BDS., B.Sc., B.Com., B.A., etc. The participants belong to 8 states of the country with maximum representation from Tamil Nadu 701 (96.4%) (Table 1).

Table 1: Background characteristics.

Particulars	Frequency, N (%)
Sex	
Male	490 (67.4)
Female	237 (32.6)
Place of residence	
Tamil Nadu	701 (96.4)
Kerala	11 (1.5)
New Delhi	6 (0.9)
Karnataka	3 (0.4)
Uttar Pradesh	2 (0.3)
Bihar	2 (0.3)
Gujarat	1(0.1)
Andhra Pradesh	1 (0.1)
Course of study	
MBBS	391 (53.8)
BE	162 (22.3)
B.Sc.	58 (8)
BDS	30 (4.1)
B.Com	26 (3.6)
Others	60 (8.2)

Total 664 (91.3%) didn't develop any symptoms like fever or cough in the past one month however, 63 (8.7%) developed symptoms. Of them, 39 (61.9%) had isolated themselves and 40 (63.49%) were scared that it could be due to the COVID-19 infection. 458 (63%) had said that they were scared whenever they heard the news about the increasing cases of COVID-19.

In this period of lock-down, 597 (82.1%) participants reported that the time spent with their family has increased, 234 (32.2%) felt that the time spent with their family made them happy but 152 (20.9%) had reported that the quarrels and fights in their family are more than usual and 36 (5%) had said that there is increased incidence of domestic violence in their family. 548 (75.4%) had felt that the time spent with friends is reduced in the lock-down. (Table 2, 3)

Total 304 (41.8%) had responded that the frequency and amount of food they consume has increased in this period of lock-down, and 351 (48.3%) said that they feel the

need to reduce the amount of food consumed considering their health and increasing body weight. However, 121 (16.6%) had responded that their financial situation is stopping them from getting food during this period of lock-down.

Out of the participants, 497 (68.4%) had said that their sleep duration has increased in this period of lock-down and 402 (55.3%) had said that they sleep more in the night; only 469 (64.5%) had said that they have a good, sound and continuous sleep. 338 (46.5%) had said that they have an increased urge to go out of their home soon after the lock-down ends. (Table 2 and 5)

Table 2: Responses for questions regarding the current situations.

S. no	Particulars		Frequency, N (%)
1	Fever/cough in past one month	Yes	63 (8.7)
		No	664 (91.3)
2	Self-isolation (n=63) following the symptoms	Yes	39 (61.9)
		No	24 (38.1)
3	Fear on hearing news about corona	Yes	458 (63)
		No	269 (37)
4	Quarrel and fight in family	No quarrels	148 (20.4)
		Increased	152 (20.9)
		Decreased	92 (12.7)
		Same as before	335 (46.1)
5	Domestic violence	No domestic violence	486 (66.9)
		Increased	36 (5)
		Decreased	111 (15.3)
		Same as before	94 (12.9)
6	Frequency of amount of food consumed	No change	289 (39.8)
		Increased	304 (41.8)
		Decreased	134 (18.4)
7	Financial crises	Yes	121 (16.6)
		No	606 (83.4)
8	Need to reduce the amount of food	Yes	351 (48.3)
		No	376 (51.7)
9	Urge to get out of home soon after lock down	Yes	338 (46.5)
		No	389 (53.5)

Table 3: Time Spent on various activities in this period of lockdown.

Particulars	Frequency n (%)			
	I Don't usually do this at all	More than usual	Less than usual	Same as usual
Time spent with family	-	597 (82.1)	29 (4.0)	101 (13.9)
Time spent with friends	-	548 (75.4)	91 (12.5)	88 (12.1)
Time spent on watching television	159 (21.9)	281 (38.7)	95 (13)	192 (26.4)
Time spent on talking over phone	78 (10.7)	280 (38.5)	192 (26.4)	177 (24.4)
Time spent on watching videos	11 (1.5)	485 (66.7)	63 (8.7)	168 (23.1)
Time spent on playing video games	314 (43.2)	259 (35.6)	64 (8.8)	90 (12.4)
Time spent on reading books	167 (23.0)	145 (19.9)	252 (34.7)	163 (22.4)
Time spent on playing musical instruments	586 (80.6)	59 (8.1)	32 (4.4)	50 (6.9)
Time spent on arts and crafts	380 (52.3)	156 (21.5)	88 (12)	103 (14.2)
Time spent on writing works like poetry	294 (40.4)	178 (24.5)	118 (16.2)	137 (18.9)
Time spent on social media	30 (4.1)	414 (57.0)	97 (13.3)	186 (25.6)
Time spent on physical activities	82 (11.3)	194 (26.6)	268 (36.9)	183 (25.2)

Due to prolonged stay insides the houses, so many participants reported that time spent following activities is more than usual: watching television 281 (38.7%), talking over Phone 280 (38.5%), watching videos 485 (66.7%), playing video games 259 (35.6%), and social media 414 (57%), and that the time spent on following activities is

lesser that usual: reading books 252 (34.7%) and physical activities 268 (36.9%) (Table 3). Out of the participants, 386 (53.1%) were depressed, 270 (37.2%) were anxious and 177 (24.3%) were stressed with varying severity (Table 4). The mean scores of depression, anxiety and stress subscales of the DASS21 scale were 11.93, 6.97 and 10.64 respectively.

Table 4: Negative emotional states of the participants.

Particulars		Frequency, N (%)
Depression	Normal	341 (46.9)
	Mild	111 (15.2)
	Moderate	143 (19.7)
	Severe	66 (9.1)
	Extremely severe	66 (9.1)
Anxiety	Normal	457 (62.8)
	Mild	58 (8)
	Moderate	117 (16.1)
	Severe	45 (6.2)
	Extremely severe	50 (6.9)
Stress	Normal	550 (75.7)
	Mild	63 (8.6)
	Moderate	62 (8.5)
	Severe	37 (5.1)
	Extremely severe	15 (2.1)

A significant association was found between depression, anxiety and stress and among students, who had the symptoms of cough and fever in the past one month; who felt that the time spent with their family irritated them; who faced financial crisis in getting food during this lock-down; those who slept more in the day time; those who had a disturbed sleep pattern; who had an increased urge to go out of their houses soon after the lock-down ends; who had spent more time than usual in social media; and who spent lesser time than usual on physical activities (p value<0.05).

News about COVID-19 on mass media was found to be associated with depression and anxiety. (p value<0.05). Participants who reported an increased in the incidence of domestic violence in their family were found to have a statistically significant association with anxiety and stress. (p value<0.05). Depression was found to have statistically significant association with decreased time spent with family and friends, reduced time spent on reading books, writing poems and increased sleep duration and time spent on video games. (p value<0.05). (Table 5).

No significant associations of gender, frequency of quarrels and fights in their family, eating habits and the time spent on: watching television; using mobile phone for talking to their family and friends; watching videos or movies; arts and crafts; musical instruments with the negative emotional states were found.

Those values that were found significant by chi squared analysis were analyzed using logistic regression and depression was found to have significant associations with the presence of symptoms like cough and fever during the lock-down (p value=0.039); Effect of the time spent with family (p value=0.001); Time spent with friends (p value=0.002); The pattern of sleep (p value=0.000); time spent on physical activities (p value=0.017); and the increasing urge to get out of home soon after the lockdown (p value=0.000) (Table 6).

Anxiety was found to have statistically significant associations with the fear following the exposure to News about the increasing cases of COVID-19 (p value=0.000); Increased incidence of domestic violence (p value=0.001); increased day time sleep (p value=0.002); financial crisis in their family (p value=0.045); and the increasing urge to get out of home soon after the lock-down ends (p value=0.005) (Table 7).

Table 5: Associations of the negative emotional states with various factors.

Particulars	N (%)	Depression		Anxiety		Stress	
		N (%)	P value	N (%)	P value	N (%)	P value
Cough or fever in the past one month							
Present	63 (7.3)	44 (69.8)	0.005	31 (49.2)	0.038	26 (41.3)	0.001
Absent	664 (91.3)	342 (51.5)		239 (36.0)		151 (22.7)	
News about covid-19							
Scared me	458 (63)	256 (55.9)	0.048	207 (45.2)	0.000	121 (26.4)	0.089
Doesn't affect me	269 (37)	130 (48.3)		63 (23.4)		56 (20.8)	
Time spent with family							
Increased	597 (82.1)	306 (51.3)	0.033	223 (37.4)	0.798	145 (24.3)	0.937
Decreased or same as before	130 (17.9)	80 (61.5)		47 (36.2)		32 (24.6)	
Time spent with family made you							
Sad and irritated or doesn't affect me	234 (32.2)	156 (66.7)	0.000	99 (42.3)	0.047	83 (35.5)	0.000
Happy	493 (67.8)	230 (46.7)		171 (34.7)		94 (19.1)	

Continued.

Particulars	N (%)	Depression		Anxiety		Stress	
		N (%)	P value	N (%)	P value	N (%)	P value
Incidence of domestic violence							
Increased or same as before	130 (17.9)	74 (56.9)	0.334	67 (51.5)	0.000	42 (32.3)	0.02
Decreased or never occurs in our family	597 (82.1)	312 (52.3)		203 (34.0)		135 (22.6)	
Time spent with friends							
Decreased	548 (75.4)	312 (56.9)	0.000	205 (37.4)	0.792	142 (25.9)	0.085
Increased or same as before	179 (24.6)	74 (41.3)		65 (36.3)		35 (19.6)	
Sleep duration							
Increased	497 (68.4)	283 (56.9)	0.002	186 (37.4)	0.815	127 (25.6)	0.265
Decreased or same as before	230 (31.6)	103 (44.8)		84 (36.5)		50 (21.7)	
Day or night sleep							
Night	402 (55.3)	185 (46.0)	0.000	120 (29.9)	0.000	66 (16.4)	0.000
Day	325 (44.7)	201 (61.8)		150 (46.2)		111 (34.2)	
Sleep pattern							
Disturbed	258 (35.5)	165 (64.0)	0.000	116 (45.0)	0.001	89 (34.5)	0.000
Continuous	469 (64.5)	221 (47.1)		154 (32.8)		88 (18.8)	
Financial issue being an obstacle for getting food							
Yes	121 (16.6)	75 (62.0)	0.032	61 (50.4)	0.001	42 (34.7)	0.004
No	606 (83.4)	311 (51.3)		209 (34.5)		135 (22.3)	
Time spent on video games							
Increased or same as before	349 (48.0)	199 (57.0)	0.042	140 (40.1)	0.111	91 (26.1)	0.297
Decreased or never do at all	378 (52.0)	187 (49.5)		130 (34.4)		86 (22.8)	
Time spent on reading books							
Increased or same as before	308 (42.4)	147 (47.7)	0.013	109 (35.4)	0.403	67 (21.8)	0.162
Decreased or never do at all	419 (57.6)	239 (57.0)		161 (38.4)		110 (26.3)	
Time spent on writing poems, stories							
Increased or same as before	315 (43.3)	147 (46.7)	0.002	123 (39.0)	0.352	73 (23.2)	0.52
Decreased or never do at all	412 (56.7)	239 (58.0)		147 (35.7)		104 (25.2)	
Time spent on social media							
Increased or same as before	414 (56.9)	249 (60.1)	0.000	178 (43.0)	0.000	119 (28.7)	0.001
Decreased or never do it at all	313 (43.1)	137 (43.8)		92 (29.4)		58 (18.5)	
Time spent on physical activities							
Decreased or never do it at all	377 (51.9)	170 (45.1)	0.000	127 (33.7)	0.046	75 (19.9)	0.004
Increased or same as before	350 (48.1)	216 (61.7)		143 (40.9)		102 (29.1)	
Urge to get out of home:							
Increased	338 (46.5)	220 (65.1)	0.000	156 (46.2)	0.000	111 (32.8)	0.000
No such urge	389 (53.5)	166 (42.7)		114 (29.3)		66 (17.0)	

Table 6: Logistic regression and adjusted odd's ratio- depression.

Particulars (%)	Odd's Ratio	Adjusted Odd's Ratio	95% CI	P value
Cough and fever				
Present - 63 (7.3)	2.180	1.373	1.031-3.401	0.039
Absent - 664 (91.3)				
Fear of News reporting the increasing cases of COVID-19				
Present - 458 (63)	1.355	1.234	0.868-1.755	0.241
Absent - 269 (37)				
Time spent with family				
Increased - 597 (82.1)	1.522	1.538	0.957-2.470	0.075
Decreased - 130 (17.9)				
The effect of time spent with family				
Sad and irritated or doesn't affect me - 234 (32.2)	2.287	1.935	1.320-2.836	0.001
Happy - 493 (67.8)				
Time spent with friends				
Decreased - 548 (75.4)	1.876	1.848	1.260 - 2.712	0.002
Increased - 179 (24.6)				

Continued.

Particulars (%)	Odd's Ratio	Adjusted Odd's Ratio	95% CI	P value
Sleep duration				
Increased - 497 (68.4)	1.631	1.584	1.101-2.279	0.013
Decreased-230 (31.6)				
Day or night time sleep				
Night-402 (55.3)	1.901	1.199	0.856-1.679	0.292
Day-325 (44.7)				
Pattern of sleep				
Disturbed-258 (35.5)	1.991	1.854	1.311-2.623	0.000
Continuous - 469 (64.5)				
Financial crisis				
Yes - 121 (16.6)	1.547	1.432	0.920-2.230	0.112
No - 606 (83.4%)				
Time spent on video games				
Increased or same as before-349 (48.0)	1.355	1.165	0.673-2.016	0.586
Decreased or never do at all-378 (52.0)				
Time spent on reading books				
Increased or same as before-308 (42.4)	1.454	1.090	0.780-1.524	0.813
Decreased or never do at all-419 (57.6)				
Time spent of creative writing				
Increased or same as before-315 (43.3)	1.579	1.251	0.896-1.746	0.188
Decreased or never do at all-412 (56.7)				
Time spent on social media				
Increased or same as before-414 (56.9)	1.939	1.390	0.990-1.951	0.057
Decreased or never do at all- 313 (43.1)				
Time spent on physical activities				
Decreased or never do at all-377 (51.9)	1.963	1.489	1.074-2.066	0.017
Increased or same as before-350 (48.1)				
Urge to get out of home soon after lock-down ends				
Increased-338 (46.5)	2.505	1.830	1.319 -2.539	0.000
No such urges-389 (53.5)				

Table 7: Logistic regression and adjusted odd's ratio- anxiety.

Particulars	Odd's ratio	Adjusted odd's ratio	95% CI	P value
Cough and fever				
Present-63 (7.3)	1.723	1.689	0.963-2.961	0.067
Absent-664 (91.3)				
Fear of News reporting increasing cases of COVID-19				
Present-458 (63)	2.697	2.705	1.867-3.921	0.000
Absent-269 (37)				
The effect of time spent with family				
Sad and irritated or doesn't affect me-234 (32.2)	1.381	1.416	0.967-2.032	0.059
Happy-493 (67.8)				
Incidence of domestic violence				
Increased-130 (17.9)	2.064	1.983	1.305-3.012	0.001
Decreased-597 (82.1)				
Day or night time sleep				
Night-402 (55.3)	2.014	1.719	1.229-2.404	0.002
Day-325 (44.7)				
Pattern of sleep				
Disturbed-258 (35.5)	1.671	1.307	0.933-1.831	0.120
Continuous-469 (64.5)				

Continued.

Particulars	Odd's ratio	Adjusted odd's ratio	95% CI	P value
Financial crisis				
Yes-121 (16.6)	1.931	1.549	1.009-2.377	0.045
No-606 (83.4)				
Time spent on social media				
Increased or same as before-414 (56.9)	10812	1.296	0.921-1.824	0.138
Decreased or never do at all-313 (43.1)				
Time spent on physical activities				
Decreased or never do at all-377 (51.9)	1.360	1.040	0.746-1.448	0.817
Increased or same as before-350 (48.1)				

Table 8: Logistic regression and adjusted odd's ratio- stress

Particulars (%)	Odd's ratio	Adjusted odd's ratio	95% CI	P value
Cough and fever				
Present-63 (7.3)	2.387	2.088	1.177 - 3.706	0.012
Absent - 664 (91.3)				
The effect of time spent with family				
Sad and irritated-234 (32.2)	2.333	1.896	1.302 - 2.760	0.001
Happy-493 (67.8)				
Incidence of domestic violence				
Increased-130 (17.9)	1.633	1.496	0.944 - 2.369	0.086
Decreased-597 (82.1)				
Day or night time sleep				
Night-402 (55.3)	2.641	2.041	1.400 - 2.975	0.000
Day-325 (44.7)				
Pattern of sleep				
Disturbed-258 (35.5)	2.280	1.851	1.280 - 2.677	0.001
Continuous-469 (64.5)				
Financial crisis				
Yes-121 (16.6)	1.855	1.525	0.961 - 2.419	0.073
No-606 (83.4)				
Time spent on social media				
Increased or same as before-414 (56.9)	1.774	1.365	0.927 - 2.011	0.115
Decreased or never do at all-313 (43.1)				
Time spent on physical activities				
Decreased or never do at all-377(51.9)	1.656	1.230	0.848 - 1.786	0.276
Increased or same as before-350 (48.1)				

Association of stress with the presence of symptoms like cough and fever (p value=0.012); the time spent with family making the students sad and irritated (p value=0.001); increased incidence of domestic violence (p value=0.036); increased day time sleep (p value=0.000); the pattern of sleep (p value=0.001); and the increasing urge to get out of home soon after the lockdown ends (p value=0.002) (Table 8). Those participants who said that the time they spend with their family made them sad or irritated were found to be 1.935 times at a higher risk of developing depression than who said that the time spent with the family made them happy. Those who responded that the news about the increasing cases of COVID19 made them scared were 2.705 times at a higher risk of developing anxiety than who responded that didn't affect them. Those participants who said that the domestic violence was increased in their family in the Lock-down period were found to be 1.983 times at a higher risk of getting anxious that those who said that its reduced now. Those who had the symptoms of cough and fever during the lock-down period were 2.088 times at a higher risk of developing stress that who didn't have such symptoms. Those who slept more in the day time were 2.041 times at a higher risk of developing stress than those slept more during the night (Table 6-8).

DISCUSSION

Epidemics and pandemics aren't new to humans. Such diseases besides bringing loss to human lives also bring

many adverse impacts on individuals and the society. COVID-19 being one such pandemic, has terrifically affected the lives of people. And as a measure to contain it, governments are imposing lock-downs. And this study aimed at assessing the psychological impact of the lock-down on one of the vulnerable age groups across India, the college students, who are known to have an active social life.

In a study by Kazmi et al (n=1000) depression and stress levels were higher in males and anxiety in females.[13] But in our study, we found no association between gender and the negative emotional states. This could be due to the age group of people (17 to 25 years) we have analyzed is different from that of the other study (15 to 50 years).

As advised by the medical professionals, whenever one has the symptoms of fever and cough, one has to isolate oneself instead of themselves from others. And following this, 61.9% of those who had the symptoms in our study isolated themselves. But, in a study by Roy et al (n=662) in India, over 96% of the participants accepted to isolate themselves when they might get the symptoms.[14] This variation could be due to difference in the levels of awareness among them.

DASS 21 scale was used to assess the negative emotional symptoms and the mean scores of depression, anxiety and stress subscales were 11.93, 6.97 and 10.64 respectively. Whereas in the study by Wang et al (n=1738), in China, the mean scores were 6.25, 6.16, 7.76 for depression, anxiety and stress subscales respectively in their first survey.[15] Again this difference could be attributed to the age group of people we considered. College students in our survey were found to have comparatively higher scores, could be because they are not exposed to such long periods of stay inside their houses.

As warned by world health organization, continuous exposure news and reports about the outbreak could cause people to feel anxious or distressed. We found that the anxiety was more common in those who were scared on listening the news about COVID-19 cases and deaths (n=458) than in those who weren't affect by the news and updates. A solution to this could be seeking updates only at specific times during the day from health professionals and world health organization website and avoiding rumors.[16] Due to the lock-down, transportation facilities are suspended. And people who stayed away from their families for various purposes aren't capable of returning to their families. Such individuals are at higher risk of developing psychological distress. And our results are consistent with the study by Sood.[17] Depression and stress were more common in those who reported that the time they spend with their family makes them sad and irritated and those who said that the time they spend with their friends is now reduced.

As against the positive aspects of lock-down mentioned by Saha and Dutta, in our study 20.9% said that in this lock-down, quarrels and fights within family had increased and 46.1% said it was same as before.[18] This could be because the psychological distress doesn't find any other exit, but their own family members. But no associations were found with the negative emotional states and could be because of a care-free attitude of college students. A study by Jones and Isham suggested that in such periods of lock-down, domestic violence cases would increase.[19] In our study 5% participants that the domestic violence had increased in their family and this was associated with the anxiety and stress among the participants. Fear, panic and stress related to the incidents of domestic violence could be affecting the psychological wellbeing of the participants.

Food being an important need, there could be food related problems during the lock-down period. Financial situations might hinder people from getting food, or because of boredom, people might be overeating, which in turn would affect the mental wellbeing.[20] In our study, 304 (41.8%) said the frequency of food intake has increased in the lock-down and 351 (48.3%) said they feel a need to reduce the food intake, but these weren't associated with the negative emotional states, unlike the study by JA Fulkerson, et al and Liu, et al.[21,22] Where negative emotional symptoms were associated with health compromising eating habits. Also, over-eating was found to be associated with negative psychological experiences in a study by Acard et al.[23] But, 121 (16.6%) said that their financial situations are stopping them from getting food and this was found to have a strong association with anxiety, as Christodoulou et al suggested in their study about financial crisis and mental health.[24]

Total 497 (68.4%) said that their sleep duration is increased and but this was not associated with the negative emotional states in our study but disturbed sleep pattern (n=258) was associated with depression and stress, consistent with the study by Zhang et al in 2017.[25] Also, as in the study by Yujie decreased night time sleep was associated with depressive symptoms.[26] In our study 402 (55.3%) slept more in the day and this was found to be significantly associated with anxiety and stress.

In a study Saha and Dutta, in the period of lock-down people started indulging in new leisure activities like reading books, art, cooking, writing, learning musical instruments, etc.[18] But in our study we found that many people were reading less than usual in the lock-down, this could be due to unavailability of books, as most of the shops, libraries are closed. But the number of people involved in arts, crafts and writing more than usual were higher in number than those who did it lesser than or same as usual. These activities, besides acting as ways of relaxation, could also help the students spend time productively and explore their hidden talents.

Mobile phone use for longer time was found to be associated with insomnia and depression in a study by Amura et al among Japanese adolescents.[27] In our study,

majority of the participants reported that they are using their mobile phones more than usual in the lock-down period but increased phone usage for purposes like talking over phone, watching videos or movies weren't associated with the negative emotional states. In a study by Lemola et al depression was common in those who spent more time on video games.[28] This could be due to delayed bed time following involvement in video games. Though, in our study, the time spent on video games was reported to be more than usual by 48.0% of the participants, there was no significant association with the negative emotional states.

In a study by Liu Yi Lin and another by Labrague, the time spent on social media was related to depression, anxiety and stress.[29,30] But, in our study, there is no such association between social media and depression, anxiety and stress. This could be probably because the social media is helping to be in touch with their friends and being a place for some entertainment and relaxation. Also, we found no association between time spent on television and any of the negative emotional states.

Generally, an active physical life is known to improve mental health. But in this lock-down people's physical activities could be affected as gyms, play grounds, parks are all closed. In tune with the study by Strohle, reduced physical activities (n=377) had association with depression in our study.[31] Also, this could be because of being unable to play their favorite sport, following the lock-down.

Total 338 (46.5%) participants reported that they have a mental urge to get out of home soon after the lock down ends and depression, anxiety and stress symptoms were more common in them when compared to those didn't have such urges. Also, such urges to socialize like before, once the lock-down is lifted, might increase the chance of the spread of the infection, as in the studies by Dandekar and Barbastathis and Heuser et al. This brings the need of cautious relaxation of lock-down.[32,33]

Limitations

Since the study involved only the age group of 17 to 25 years and an educated group, the results cannot be generalized to other populations. Since this was an internet-based survey using DASS21 scale, this could not be superior to a professional psychiatrist's assessment of the psychological impact.

CONCLUSION

COVID-19 outbreak and the lock-down are building psychological distress among college students who are vulnerable, as they are forced to stay home, along with changes in food and sleep patterns, the fear of infection, family situations, lifestyle changes, worsening financial situations and reduced contact with their friends. Incidence of domestic violence was increased in a small group of the participants, suggesting the need of safety for women and children. It's disheartening that financial crisis is also affecting the accessibility of food in some families.

Financial crisis and incidence of domestic violence must be addressed before it could turn disastrous. Measures to prevent such psychological distress should be encouraged. Awareness about the infection is necessary but, a continuous stream of information and updates could potentially affect the mental health of the people. Continuous period of lock-down is also creating an urge in people to get out of the home soon after the lock-down ends. This again warns about the chances of infection, once the lock-down is lifted. People as they are asked to stay home, must also be advised to not be sedentary but to involve in some kind of physical activities. With such measures this period could be made productive and happy instead of getting mentally affected by the situations around. For those who are already affected psychologically, interventions must be carried out quickly to help them rehabilitate.

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