

Original Research Article

Impact of the COVID-19 pandemic on the mental health of people

Mehak Agarwal^{1*}, Prithvi Ravi¹, Chitra A. Ramesh², Judson J. Neslin²

¹Department of Medical Research, AVM Medical, ENT Research Foundation, Chennai, Tamil Nadu, India

²Department of Medical Research, Institute of Community Medicine, Madras Medical College, Chennai, Tamil Nadu, India

Received: 12 December 2020

Revised: 14 January 2021

Accepted: 01 February 2021

*Correspondence:

Dr. Mehak Agarwal,

E-mail: mehakagarwal96@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: We conducted this survey to determine the impact of covid-19 on the mental health of people during the pandemic and period of lockdown. We evaluated certain factors such as sleep changes, anxiety, mood swings, irritability, inability to concentrate, smoking and alcohol consumption changes.

Methods: A cross-sectional study was conducted. We conducted an online questionnaire and circulated it via various social media platforms to record and evaluate responses of people. SPSS 16 version software and Microsoft excel sheet were used.

Results: According to the results, people suffered from negative symptoms such as stress, fear, changes in smoking habits, changes in alcohol consumption, mood swings, inability to concentrate, sleep disturbances. Most people also started new coping mechanisms to help their psychological symptoms.

Conclusions: An association between mental health and the outbreak of a pandemic was noticed. People experiencing these should get help and practice relaxation methods to prevent progression of their symptoms.

Keywords: COVID-19, Lockdown, Mental health, Pandemic, Psychological impact

INTRODUCTION

Coronavirus disease (COVID-19) is a viral respiratory infection caused by a member of the coronavirus family called as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). A significant concern for coronavirus affecting humans was first raised at the beginning of the 21st century (the year 2002-2003) with the epidemic of severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) in 2012.¹ Now, the outbreak of COVID -19 has again caused global concern. The first case was identified in December 2019 in Wuhan, China.² In March 2020, the world health organisation (WHO) announced COVID-19 as a pandemic.²

As of September 2020, the total number of cases worldwide was around 31.3 million, out of which 21.5 million recovered and 965,000 deaths have been reported. Although unlike SARS and MERS, COVID 19 has a low mortality rate of nearly 3%, its rate of transmission is very high. Respiratory secretions are the main means of spread.³ Some of the commonest symptoms patients usually present with are fever, dry cough, fatigue, myalgia, sore throat, diarrhoea, loss of smell and taste, conjunctivitis. Coronavirus infection can vary from being a mild flu-like illness to a very severe infection causing pneumonia, acute respiratory distress syndrome, cardiovascular complications, venous thromboembolism, cytokine storm reaction, stroke, secondary infections, acute liver and kidney injury and septic shock.³

Infectious diseases causing a pandemic is a constant challenge for global public health. The new COVID-19 infection has been the focus of attention of scientists, healthcare workers, government officials and the general population since March 2020. As soon as the pandemic was announced the government took steps to control its spread by imposing a lockdown nationwide. The pandemic has caused disruptions in everyone's routine life leading to stress and psychological disruption. Past pandemic in 2003 caused due to SARS has a documented effect on the mental health of people leading to insomnia, stress, anxiety, depression and post-traumatic stress disorder.⁴ Due to this, our main concern is the impact of this pandemic and the subsequent lockdown on the mental health of people. Because of the infectious nature of this disease, physical health becomes the main focus of attention of the people, and mental health tends to be overlooked. A balance between mental and physical health is required for our well being, and this can help improve immunity and reduce stress and subsequent mental illnesses.

Objective

The purpose of this study is to determine the impact of the ongoing COVID-19 pandemic on the mental health of people, focusing on symptoms such as depression, anxiety, stress, mood swings, irritability, difficulty in concentrating and sleep disturbances.

Justification

Surveys help determine characteristics of a targeted large group population and hence make conclusions. Mental health plays a significant role in our day to day living, and the changes in everyone's lives in the past few months have been massively affected by this pandemic. Hence this survey was conducted to assess the impact of COVID-19 on the psychological health of people.

METHODS

A cross-sectional descriptive study with the help of a structured questionnaire was prepared. The study was approved by the head of the ethics committee at our hospital. The survey was circulated among the public

with the help of social media. People of all age groups from India answered the survey. This study was conducted in the months of August and September in the year 2020. A total of 575 responses were collected. The questions in the survey were based on general lifestyle, smoking habits, alcohol consumption, weight changes, sleep pattern and sleep disturbances, stress and anxiety level, fear, mood swings, difficulty concentrating, financial stress, relaxation techniques to cope with the stress. The questionnaire was in English.

Data was fed into an excel sheet, and statistical analysis was done using SPSS 16 version. The data was statistically analysed. Descriptive analysis was done to analyse the frequency and percentage of participants involved. Chi-square test was used to determine the association between different factors and results were interpreted. The survey was anonymous, and respondents identify was kept confidential.

Inclusion criteria

Indians of all age groups who read and understand English language were included.

Exclusion criteria

People from other countries, other languages, incomplete questionnaires.

RESULTS

Demographics

Gender

A total of 575 participants took the survey, out of which 322 (56%) were females, and 253 (44%) were males.

Age

246 of the total participants that answered this survey were 18-30 years of age (42.8%), 236 were 30-50 years of age (41%), 85 were more than 50 years old (14.8%) and eight were less than 18 years old (1.4%).

Table 1: Summarizing the frequency and percentage values of various factors included in the study.

Variable	Sub groups	Frequency	Percentage
Gender	Female	322	56.0
	Male	253	44.0
Age (years)	<18	8	1.4
	>50	85	14.8
	18-30	246	42.8
	30-50	236	41.0
Smoking	No	484	84.2
	Occasionally	33	5.7
	Yes	58	10.1

Continued.

Variable	Sub groups	Frequency	Percentage
Smoking change	Not applicable	484	84.2
	Decreased	46	8.0
	Increased	21	3.7
	No change	24	4.2
Alcohol	No	290	50.4
	Occasionally	270	47.0
	Regularly	15	2.6
Alcohol change	Not applicable	290	50.4
	Decreased	144	25.0
	Increased	24	4.2
	No change	117	20.3
Stress caused due to no alcohol		175	30.4
	No	385	67.0
	Yes	15	2.6
Sleep change	No change	331	57.6
	Yes- lack of sleep	155	27.0
	Yes- oversleep	89	15.5
Mood swing	No	297	51.7
	Yes	278	48.3
Inability to concentrate on work	No	267	46.4
	Sometimes	177	30.8
	Yes	131	22.8
Financial stress	No	402	69.9
	Yes	173	30.1
Any family member affected by covid	No	507	88.2
	Yes	68	11.8
Adapting relaxing methods	No	243	42.3
	Yes	332	57.7
Fear/anxiety	Mild	160	27.8
	Strong	415	72.2

Lifestyle changes noticed in the participants

Changes in smoking habits

Out of 575 participants, 484 are non-smokers. Of the remaining 91, 33 smoke occasional and 58 smoke regularly. 4.69% of the occasional smokers and 3.3% of the regular smokers noticed a decrease in their smoking habits. 0.34% of the occasional smokers and 3.3% of the regular smokers experienced an increase in their smoking habits. 0.69% of the occasional smokers and 3.47% of the regular smokers did not notice any change in their smoking habits post lockdown/ after COVID-19 pandemic. Thus an association was seen between smoking habits and smoking changes [p value=0.000 (p<0.05)] (Table 2).

Changes in alcohol consumption and stress due to unavailability of alcohol

144 (25%) participants decreased their consumption of alcohol, of which 23.83% consumed alcohol occasionally, and 1.22% regularly drank alcohol. 24 (4.2%) increased the consumption of alcohol, of which 3.30% consumed alcohol occasionally, and 0.87% consumed alcohol regularly. 117 (20.3%) had no change. The unavailability of alcohol caused stress to only 2.09% of the occasional drinkers and 0.52% of regular drinkers. There is an association between alcohol consumption and changes in alcohol consumption post pandemic [p value =0.000 (p<0.05)] and stress due to unavailability of alcohol [p value=0.000 (p<0.05)] (Table 3).

Table 2: Association between smoking habits before Covid-19 pandemic and changes in smoking habits after Covid-19 pandemic.

Variable	Observation	No	Occasional	Yes	P value
Smoking change	Decreased	0 (0%)	27 (4.69%)	19 (3.3%)	0.000 (p<0.05)
	Increased	0 (0%)	2 (0.34%)	19 (3.3%)	
	No change	0 (0%)	4 (0.69%)	20 (3.47%)	

Table 3: Association between alcohol consumption habits before covid-19 pandemic and changes in alcohol consumption habits after covid-19 pandemic.

	Variable	Observation	No	Occasionally	Regularly	P value
Alcohol	Alcohol change	Decreased	0	137 (23.83%)	7 (1.22%)	0.000 (p<0.05)
		Increased	0	19 (3.30%)	5 (0.87%)	
		No change	0	114 (19.83%)	3 (0.52%)	
	Alcohol stress	No	120 (20.87%)	253 (44%)	12 (2.09%)	0.000 (p<0.05)
		Yes	0	12 (2.09%)	3 (0.52%)	

Table 4: Association between sleep cycle and sleep disturbances caused due to the pandemic.

	Variable	Observation	<6 hours	>8 hours	6-8 hours	P value
Sleep	Sleep change	No change	27 (4.70%)	48 (8.35%)	256 (44.52%)	0.000 (p<0.05)
		Yes- lack of sleep	59 (10.26%)	6 (1.04%)	90 (15.65%)	
		Yes- oversleep	7 (1.22%)	22 (3.83%)	60 (10.43%)	

Sleep changes

331 (57.6%) participants had no changes in the sleep pattern or total hours of sleep, 155 (27%) experienced a lack of sleep and 89 (15.5%) were oversleeping. Of all the participants that slept for less than 6 hours during the lockdown, 4.7% had no changes in the sleep cycle, 10.26% were suffering from lack of sleep, and 1.22% were oversleeping. 44.52% of the people who slept for 6-8 hours had no changes, 15.65% of them had lack of sleep, and 10.43% of these people were oversleeping. Of all the participants that slept for more than 8 hours, 8.35% of the participants had no sleep changes, 1.04% had a lack of sleep, and 3.83% were oversleeping. Thus we found an association between sleep and sleep disturbances during the pandemic [p value =0.000 (p<0.05)] (Table 4).

Psychological aspects

Mood swings and irritability

297 (51.7%) participants did not experience mood swings and irritability, while 278 (48.3%) participants experienced mood swings and irritability. Mood swings were noticed more in females: 35.82%. 18-30 aged participants also experienced the most mood swings. Mood swings were noticed in both people who smoked and non-smokers. Most people from the 6-8 hours of sleep range were found to have mood swings: 31.13%. We also found that being affected by covid also led to mood swings in 7.65% of the people.

Table 5: Association between mood swings in people during the pandemic and certain other variables.

	Variable	Observation	Yes (%)	No (%)	P value
Mood swings	Gender	Male	72 (12.52)	181 (31.47)	0.000 (p<0.05)
		Female	206 (35.82)	116 (20.17)	
	Age	<18	6 (1.04)	2 (0.34)	0.000 (p<0.05)
		>50	18 (3.13)	67 (11.65)	
		18-30	140 (24.34)	106 (18.43)	
		30-50	114 (19.82)	122 (21.21)	
	Smoking	No	249 (43.30)	235 (40.87)	0.000 (p<0.05)
		Occasionally	16 (2.78)	17 (2.96)	
		Yes	13 (2.26)	45 (7.83)	
	Sleep	<6 hours	69 (12)	24 (4.17)	0.000 (p<0.05)
		>8 hours	30 (5.22)	46 (8)	
		6-8 hours	179 (31.13)	227 (39.48)	
	Family affected by covid	Yes	44 (7.65)	24 (4.17)	0.004 (p<0.05)
		No	234 (40.69)	273 (47.47)	

Thus an association was found between mood swings with gender [p=0.000 (p<0.05)], age [p=0.000 (p<0.05)],

smoking habits [p=0.000 (p<0.05)], sleep [p=0.000 (p<0.05)] and being infected by covid [p=0.004 (p<0.05)] (Table 5).

Difficulty concentrating

267 (46.4%) did not have any difficulty in concentration, 177 (30.8%) had difficulty in concentrating sometimes and, 131 (22.8%) were unable to concentrate on work/studies/ day to day activity. 18-30 aged participants were affected by the inability to concentrate. Females were unable to concentrate more than males: 14.08%. Majority of the people that slept for less than 6 hours had difficulty concentrating (6.78%), most people that slept well did not experience any difficulty concentrating on tasks. A

majority (23.48%) of non-alcoholics did not have any difficulty concentrating on tasks. 16.7% were unable to concentrate sometimes and, 10.26% experienced difficulty concentrating. 1.39% of the alcoholics were finding it difficult to concentrate. Majority of the people who occasionally consumed alcohol (21.91%) had no difficulty concentrating. Thus an association was found between inability to concentrate and gender [$p=0.001$ ($p<0.05$)], age [$p=0.000$ ($p<0.05$)], alcohol consumption habit [$p=0.03$ ($p<0.05$)] and sleep [$p=0.001$ ($p<0.05$)] (Table 6).

Table 6: Association between inability to concentrate during the pandemic and other variables.

Variable	Observation	No (%)	Sometimes (%)	Yes (%)	P value
Inability to concentrate	Gender	Male	139 (24.17)	64 (11.13)	0.001 ($p<0.05$)
		Female	128 (22.26)	81 (14.08)	
	Age (yrs)	<18	1 (0.17)	3 (0.52)	0.000 ($p<0.05$)
		>50	71 (12.34)	11 (1.91)	
		18-30	65 (11.3)	99 (17.21)	
		30-50	130 (22.6)	64 (11.13)	
	Alcohol	No	135 (23.48)	96 (16.70)	0.03 ($p<0.05$)
		Occasionally	126 (21.91)	80 (13.91)	
		Regularly	6 (1.04)	1 (0.17)	
	Sleep	<6 hours	32 (5.57)	22 (3.83)	0.000 ($p<0.05$)
		>8 hours	37 (6.43)	27 (4.70)	
		6-8 hours	198 (34.43)	128 (22.26)	

Table 7: Association between financial stress during the pandemic and other variables.

Variable	Observation	Yes (%)	No (%)	P value
Financial stress	Male	92 (16)	161 (28)	0.004 ($p<0.05$)
	Female	81 (14.08)	241 (41.91)	

Table 8: Association between fear due to covid-19 and sleep.

Variable	Observation	Yes (%)	No (%)	P value
Fear due to covid	<6 hours	44 (7.65)	49 (8.52)	0.04 ($p<0.05$)
	>8 hours	45 (7.83)	31 (5.39)	
	6-8 hours	5 (0.87)	158 (27.48)	

Table 9: Association between new relaxation techniques adapted and gender.

variable	Observation	Yes (%)	No (%)	P value
Other relaxation techniques	Male	129 (22.43)	124 (21.56)	0.004 ($p<0.05$)
	Female	203 (35.3)	119 (20.69)	

Financial stress

173 (30.1%) participants were stressed due to financial loss, while 402 (69.9%) were not affected by their financial status. Stress due to financial problems was more in males: 16% affected. An association was thus found between financial stress due to covid and gender [$p=0.004$ ($p<0.05$)] (Table 7).

Fear/anxiety

160 (27.8%) participants had a mild fear caused by COVID, 415 (72.2%) have a strong fear caused by it, with a mean of 5 from 1-10. We found an association between sleep changes and fear caused to covid [p value =0.05 ($p<0.05$)]. People that overslept (>8 hours) were also found to have increased fear of covid (7.83%), and majority of the people that slept well (6-8 hours) did not

face increased fear or anxiety (27.48%). An association was found between fear/anxiety caused by covid and sleep [$p=0.05$ ($p<0.05$)] (Table 8).

New relaxation techniques

243 (42.3%) participants did not start a new relaxation technique or hobby to cope with their anxiety/stress, 332 (57.7%) practised new methods of relaxation. We noticed that females adapted to more coping methods to deal with their stress and anxiety: 35.3%. An association was found between adapting new relaxation techniques and gender [$p=0.004$ ($p<0.05$)] (Table 9).

DISCUSSION

We conducted this survey to determine the psychological impact of COVID-19 on people. We studied various aspects and compared them with other older surveys to help us conclude. Overall, we see factors such as mood swings, inability to concentrate, fear, stress, changes in sleep pattern, causing a lack of sleep or oversleeping due to the pandemic.

Increased stress can lead to changes in the lifestyle of people, leading to changes in the number of cigarettes smoked in a day. Hence this aspect was studied in our survey. According to a previous survey done in Australia in 2020, only a small portion of the participants reported a change in smoking/ tobacco consumption during the last few months.⁵ Overwhelmingly our survey also shows that smoking habits of people have not changed much, only 8% participants experienced a decrease in smoking habits and, 3.7% experienced increased smoking. The same study was done in Australia also shows a positive reduction in the amount of consumption of alcohol. Our study also determined that 25% of the participants reduced the amount of alcohol consumption. This can be due to the unavailability of alcohol during the lockdown due to the temporary restriction on all bars and liquor shops from functioning. Also, majority of the population (67%) agrees that the unavailability of alcohol and closing of bars has not led to any added stress. Only a minor part of the participants, 4.2% showed an increase in alcohol consumption. Thus, we can conclude that smoking and alcohol changes did not have a major impact on the mental health of people.

Sleep quality is easily affected by stress, anxiety, mood swings and fear, causing either insomnia or even oversleeping in some cases. Two studies, one done in India in 2020 and another in China show that majority of the people experienced trouble sleeping.^{6,7} Our study also shows that almost half of the participants 43% have sleep disturbances, out of which 27% experienced lack of sleep and 15.5% were oversleeping. Sleep disturbances can further cause mood swings, irritability and difficulty concentrating on tasks. Severe cases also suffer from depression.

The most common symptom of psychological disturbance is usually mood swings, irritability or anger. According to a review article published in June 2020, the COVID-19 pandemic has affected the mental health of people by causing moods swings, irritability, anger.⁸ By the analysis of our survey, 48.3% of the participants had mood swings and were irritable. Mood changes, irritability, sleep disturbances can cause difficulty in concentrating on work/studies and prevent us from doing day to day activities. A survey done to determine the impact of COVID-19 on college students shows that the vast majority of the students were unable to concentrate on their studies.⁹ According to our study, 53.6% participants (30.8% affected sometimes and 22.8% always) suffered from difficulty concentrating on their work/studies. This could be assumed to be due to fear of covid, working from home, online classes, increased screen time.

Financial worries can be another reason accounting for stress during this pandemic. The COVID-19 pandemic has a huge negative impact on the economy, leading to financial stress. According to previous surveys, half the participants were suffering from stress affecting their mental health due to financial problems.⁴ Our study estimated that only 30.1% were suffering from stress due to financial reasons; 69.9% were not affected.

The outbreak of a new disease causes anxiety and fear amongst people. Fear can be attributed to the rampant spread of the disease, false news about the infection, the chaos created by the pandemic, lockdown and the media, not understanding the disease, fear of acquiring the infection, being scared for one's family and friends. Many previous surveys have studied the impact of COVID-19 causing fear and anxiety in people.¹⁰ Analysis of our survey shows that most people have a strong fear of covid. Majority of the people have scored their fear either 7 or 8 out of 10 (72.2%).

Coping with the negative impact of COVID-19 on our mental health is essential as it can help prevent many long term psychological conditions such as depression, post-traumatic stress disorder, generalized anxiety disorder. According to a survey which was done on college students, most students coped with stress by practicing meditation, yoga, involving themselves in a new activity, starting a new hobby, listening to music.⁹ Some dealt with it by a negative mechanism, i.e. by avoiding news about covid. Our survey studied a very similar association. 57.7% of participants started new relaxation methods to deal with stress and anxiety.

As we can see, many psychological aspects such as anxiety, stress, fear of infection, mood swings, irritability, difficulty concentrating on tasks, sleep disturbances have progressively emerged as a result of the pandemic. According to the behavioural immune system theory, people develop these negative symptoms as a result of self-protection from infection.¹¹ Public health emergencies cause people to develop avoidant behaviour,

due to which they start avoiding people with the infection and obey strict social distancing norms. This can help them protect themselves from the infection, but at the same time develop long term negative emotions which can vary from a normal panic attack, hysteria to even suicidal intentions, and may reduce the immunity of people and cause a physiological imbalance.

CONCLUSION

Even though it is necessary to adhere to the social distancing and lockdown norms, raising mental health issues have been a matter of debate. The sample of participants studied in this study, experienced mood changes, fear of the infection, sleep disturbances, anxiety, difficulty concentrating and stress. These findings suggest that the COVID-19 pandemic may have severe mental health repercussions. These findings suggest that mental health interventions are necessary. These can be done with the help of online consultants, encouraging new relaxation techniques such as meditation, yoga and breathing exercises.

ACKNOWLEDGEMENTS

The authors acknowledge all the participants who answered the survey.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Silva Jr. FJGD, Sales JCES, Monteiro CFS, Costa APC, Campos LRB, Miranda PIG, et al. Impact of COVID-19 pandemic on mental health of young people and adults: a systematic review protocol of observational studies. *BMJ Open*. 2020;10:e039426.
2. Hsu CH, Lin HH, Wang CC, Jhang S. How to Defend COVID-19 in Taiwan? Talk about people's disease awareness, attitudes, behaviors and the impact of physical and mental health. *Int J Environ Res Public Health*. 2020;17:4694.
3. Cascella M, Rajnik M, Cuomo A, Dulebohn S, Napoli R. Features, evaluation, and treatment of coronavirus. In: *Stat Pearls*. Treasure Island (FL): StatPearls Publishing; 2020.
4. Newby JM, O'Moore K, Tang S, Christensen H, Faasse K. Acute mental health responses during the COVID-19 pandemic in Australia. *PLoS One*. 2020;15:e0236562.
5. Stanton R, To QG, Khalesi S, Williams SL, Alley SJ, Thwaite TL, et al. Depression, anxiety and stress during COVID-19: associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. *Int J Environ Res Public Health*. 2020;17:4065.
6. Kochhar AS, Bhasin R, Kochhar GK, Dadlani H, Mehta VV, Kaur R, et al. Lockdown of 1.3 billion people in India during Covid-19 pandemic: A survey of its impact on mental health. *Asian J Psychiatr*. 2020;54:102213.
7. Shi L, Lu ZA, Que JY, Huang XL, Liu L, Ran MS, et al. Prevalence of and Risk Factors Associated With Mental Health Symptoms Among the General Population in China During the Coronavirus Disease 2019 Pandemic. *JAMA Netw Open*. 2020;3:e2014053.
8. Serafini G, Parmigiani B, Amerio A, Aguglia A, Sher L, Amore M. The psychological impact of COVID-19 on the mental health in the general population. *QJM Int J Med*. 2020;113:531-7.
9. Son C, Hegde S, Smith A, Wang X, Sasangohar F. Effects of COVID-19 on college students' mental health in the United States: interview survey study. *J Med Internet Res*. 2020;22:e21279.
10. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int J Soc Psychiatr*. 2020;66:317-20.
11. Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active weibo users. *Int J Environ Res Public Health*. 2020;17:2032.

Cite this article as: Agarwal M, Ravi P, Ramesh CA, Neslin JJ. Impact of the COVID-19 pandemic on the mental health of people. *Int J Community Med Public Health* 2021;8:1305-11.