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Depression, anxiety, and stress and socio-demographic correlates among general Indian public during COVID-19

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Abstract

Background: The severe outbreak of COVID-19 has affected the mental health of Indians.

Aim: The objective of this article was to find the prevalence rates of depression, anxiety and stress and their socio-demographic correlates among Indian population during the lockdown to contain the spread of COVID-19.

Methods: A cross-sectional survey was conducted using an electronic questionnaire. A total of 354 participants were recruited through convenience sampling. Depression, anxiety and stress were measured using Depression Anxiety Stress Scale (DASS-21), a 21-item self-reported questionnaire.

Results: In total, 25%, 28% and 11.6% of the participants were moderate to extremely severely depressed, anxious and stressed, respectively. Binary logistic regressions indicated employment status (odds ratio (OR) = 1.91; 95% confidence interval (CI): 1.072–3.418) and binge drinking (OR = 2.03; 95% CI: 1.045–3.945) were significantly associated with depressive symptoms; gender (OR = 2.17; 95% CI: 1.317–3.589), employment status (OR = 1.77; 95% CI: 1.002–3.141) and binge drinking (OR = 2.62; 95% CI: 1.361–5.048) were significantly associated with anxiety symptoms; and binge drinking (OR = 3.42; 95% CI: 1.544–7.583) was significantly associated with stress symptoms.

Conclusion: Depression, anxiety and stress among Indian population during the lockdown were prevalent. Along with other measures to contain the spread of COVID-19, mental health of citizens needs the urgent attention of the Indian government and mental health experts. Further large-scale studies should be conducted on different professions and communities such as health care professionals and migrant workers and incorporate other mental health indicators.

Keywords

Depression, anxiety, stress, COVID-19, lockdown, India

Introduction

Several studies have been conducted on the mental health of people during situations such as lockdown, isolation and quarantine to contain the spread of pandemics. They showed that when people are restricted to a certain kind of environment, their mental health gets adversely affected. For example, Sprang and Silman (2013) found that 25% of quarantined or isolated parents and 30% of isolated or quarantined children had posttraumatic stress disorder. Another study conducted during the Middle East respiratory syndrome (MERS) epidemic by Jeong and colleagues (2016) reported 7.6% of 1,656 patients in Korea exhibited anxiety symptoms and 16.6% of them showed feelings of anger during the isolation period. Similar results were found in the Canadian population who were placed into quarantine during the severe acute respiratory syndrome (SARS) outbreak of 2003 (Reynolds et al., 2008). During epidemics, the mental health of health care professionals is worst affected as they are the frontline soldiers at these critical times. Although there is a dearth of research on how the lockdown situation has impacted mental health, some researchers have stepped forward to examine this. For example, Lai et al. (2020) in their cross-sectional study on health care professionals in China found one in two participants reported depressive symptoms, more than two in five reported anxiety, one in three reported insomnia, and almost three in four were distressed.

Ground situation in India during the lockdown

Almost the entire world is in a state of paralysis due to the severe outbreak of COVID-19. More than 200 countries and territories reported confirmed corona-positive cases

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(Worldometer, 2020). India reported its first case of coronavirus on 30 January 2020 (Reid, 2020). Taking a precautionary measure, India announced 'Janta Curfew' or lockdown from 7 am to 9 pm on 22 March 2020 where people were urged to stay inside their homes (Chandna & Basu, 2020). However, during this period, the number of confirmed positive cases of COVID-19 reached around 500. Therefore, to contain the spread of fatal COVID-19, complete lockdown was announced for 21 days, that is, from 24 March 2020 to 14 April 2020 (*ET Online*, 2020). So, what does this lockdown mean? Lockdown is an action when there are restrictions on assembly but essential services are available (*GK Today*, 2020). Due to this lockdown, people are prohibited from going out, except for emergencies like to buy only necessary groceries or medical supplies.

Several reports during the lockdown suggest that mental illness is on the rise since the outbreak of this malignant virus. Experts from the Psychiatric Society of Goa reported anxiety, depression, stress and other mental health issues were common during the lockdown (PTI, 2020). A recent survey conducted by the Indian Psychiatry Society indicates 20% rise in patients suffering from mental illness (Lolwal, 2020). Like all other non-essential establishments, liquor and wine shops were remained to be closed. Those used to alcohol consumption experienced withdrawal symptoms. Suicide rates too were on the rise especially among those addicted to alcohol or other substance due to non-availability following lockdown (ABP News Bureau, 2020). A 32-year-old individual from Kerala jumped into the river and committed suicide as he was experiencing alcohol withdrawal symptoms. Following this incident, Excise Department was directed to provide alcohol on doctor's prescription (*Times Now*, 2020). The lockdown situation distressed general public. To the authors' knowledge, no original research has been conducted on the effect of lockdown on mental health of Indian population. To address the current gap in the literature, this article aims to estimate the prevalence of depression, anxiety and stress among Indian public during the lockdown to contain the spread of COVID-19. It further aims to examine the socio-demographic correlates of depression, anxiety and stress.

Methodology

Study design and participants

This study was a cross-sectional survey that used convenience sampling. Data were collected through electronic means. Link to the survey was posted on various social media platforms and circulated through emails and instant messaging applications. Data collection was conducted from 4 April 2020, that is, 2 weeks after the first lockdown was announced in India. Data collection went on till 14 April 2020.[1] The survey was in English language only. Hence, no translation and back translation was required. All the ethical procedures were adhered to during this study. All the participants were over 18 years and from different parts of the country. Informed consent was obtained prior to start of the survey. No identifying information was asked from any of the participants. They were informed to withdraw from the study any time if they do not wish to participate. At the end of the survey, participants were provided national and regional helpline numbers of mental health professionals and counsellors. Participants were informed about the purpose of the study. Out of 377 participants 360 agreed to participate in the survey. Of these 360 participants, 6 reported their current state of residence other than an Indian state. Hence, they were excluded from the data for analysis. Final sample size was 354 with a response rate of 93.9%.

Measures

Demographics. Demographics included gender, age, marital status, state of residence, education level, employment status and family income of the participants.

Binge drinking and substance use. Binge drinking was measured using a single time, 'in the last 30 days, on how many days did you have 4 (if participants were female) or 5 (if participants were male) or more drinks of any form of alcohol in a row'. The responses ranged from I never drink and 0 to 30 days. Similarly substance use was measured using a single item, 'in the last 30 days, which of the following substances have you used'. The responses ranged from marijuana/cannabis, cocaine, methamphetamine, inhalants, 3,4-methylenedioxy-methamphetamine (MDMA, ecstasy), other club drugs, I have used one or more of the mentioned drugs but not in last 30 days, and I never do drugs. Participants were given the freedom to mark as many responses as possible.

Depression, anxiety and stress. Mental health of the participants was assessed using Depression Anxiety Stress Scale (DASS-21). It is a modified version of 42-item self-reported DASS. It contains 21 items to measure 3 negative emotional states. Three subscales containing seven items each measure depression, anxiety and stress in the participants (Henry & Crawford, 2005). These items include, for example, for depression: 'I found it difficult to work up the initiative to do things'; for anxiety: 'I experienced trembling'; and for stress: 'I tended to over-react to situations'. Responses ranged from 0 to 3 with 0 indicating 'did not apply to me at all'; 1 indicating 'applied to me to some degree, or some of the time'; 2 indicating 'applied to me to a considerable degree or a good part of time'; and 3 indicating 'applied to me very much or most of the time'. The scores range from minimum of 0 to maximum of 63. Higher sore indicated greater level of depression, anxiety and stress. The scale

asks the participants to respond how they felt over the last week. It was slightly modified to last 3 weeks to fulfil the objective of the study. DASS-21 has been used in several studies conducted in India and has high internal consistency (Meena et al., 2015; Rao & Ramesh, 2015). Cronbach's alpha for DASS-21 for this study was .952.

Data analysis

Data were analysed using IBM SPSS Statistics 23.0. All the data were coded in SPSS and invalid data were removed. We run descriptive statistics, means and frequency distribution for information. First, the association between independent and dependent variables was determined using Pearson's chi-square test. In addition, we ran separate bivariate logistic regression analysis to evaluate the degree of association between socio-demographics and depression, anxiety and stress. The significance level was obtained with p-value $< .05$ and confidence interval (CI) of 95%.

Results

Demographics

In total, 171 (48.3%) participants were females and 183 (51.7%) were males. None was identified as transgender in this study. Majority of the participants belonged to 18–25 years age group (54.2%) followed by 26–30 years (34.2%), 31–40 years (9.3%) and 41–50 years (1.4%). Only three participants were above 51 years. Participants belonged to different states of the country. Seventy-six (21.5%) participants were residing in Delhi, 60 (16.9%) in Bihar, 29 (8.2%) each in Maharashtra and Uttar Pradesh, 19 (5.4%) in Karnataka and 16 (4.5%) in Gujarat at the time of filling the survey. Seventeen (4.8%) were invalid responses. More than four in five participants (83.9%) were unmarried. Only 53 (15%) were married, 4 were separated/divorced and 1 widow/widower. All the demographics of the participants are presented in Table 1.

Binge drinking and substance use

Those who reported binge drinking on 1–30 days in the last 30 days were considered as binge drinkers. Binge drinking was reported by 53 (15%) of the participants. Out of the participants who reported binge drinking, 22 were females and 31 were males. Majority of the binge drinkers were students. Substance use in the last 30 days was reported by very less number of participants. Only 26 (7.3%) participants reported one or more substance use in the last 30 days. Out of the participants who reported substance use, 12 were females and 14 were males.

Table 1. Demographics of the participants.

Variables	*n* (%)
Gender	
Male	183 (48.3%)
Female	171 (48.3%)
Age	
18–25 years	192 (54.2%)
26–30 years	121 (34.2%)
31–40 years	33 (9.3%)
41 years and above	8 (2.3%)
Marital status	
Married	53 (15%)
Unmarried	301 (85%)
Current state of residence	
Andhra Pradesh	2 (0.6%)
Assam	3 (0.8%)
Bihar	60 (16.9%)
Chhattisgarh	1 (0.3%)
Delhi	76 (21.5%)
Gujarat	16 (4.5%)
Haryana	14 (14.0%)
Jammu and Kashmir	6 (1.6%)
Jharkhand	6 (1.6%)
Karnataka	19 (5.4%)
Kerala	10 (2.8%)
Madhya Pradesh	8 (2.3%)
Maharashtra	29 (8.2%)
Manipur	1 (0.3%)
Nagaland	5 (1.4%)
Odhisa	1 (0.3%)
Punjab	14 (14.0%)
Rajasthan	13 (3.7%)
Sikkim	1 (0.3%)
Tamil Nadu	3 (0.8%)
Telangana	6 (1.6%)
Uttar Pradesh	29 (8.2%)
Uttarakhand	12 (3.4%)
West Bengal	2 (0.6%)
Invalid responses	17 (4.8%)
Family monthly income	
Less than Rs. 20,000 per month	58 (16.4%)
More than Rs. 20,000 per month	296 (83.6%)
Employment status	
Employed	140 (39.5%)
Unemployed	214 (60.5%)
Education level	
Graduation and above	325 (91.8%)
Below graduation	29 (8.2%)
Binge drinking	
Yes	53 (15%)
No	301 (85%)
Substance use	
Yes	26 (7.3%)
No	328 (92.7%)

Table 2. Percentage distribution of demographics and depression, anxiety and stress.

Variables	Depression		Anxiety		Stress	
	No *n* (%)	Yes *n*(%)	No *n* (%)	Yes *n*(%)	No *n* (%)	Yes *n*(%)
Gender						
Male	133 (72.7%)	50 (27.3%)	119 (65%)	64 (35%)	163 (89.1%)	20 (10.9%)
Female	132 (77.2%)	39 (22.8%)	136 (79.5%)	35 (20.5%)	150 (87.7%)	21 (12.3%)
Age						
18–30 years	235 (75.1%)	78 (24.9%)	224 (71.6%)	89 (28.4%)	276 (88.2%)	37 (11.8%)
More than 30 years	30 (73.2%)	11 (26.8%)	31 (75.6%)	10 (24.4%)	37 (90.2%)	4 (9.8%)
Marital status						
Married	41 (77.4%)	12 (22.6%)	38 (71.7%)	15 (28.3%)	47 (88.7%)	6 (11.3%)
Unmarried	224 (74.4%)	77 (25.6%)	217 (72.1%)	84 (27.9%)	226 (88.4%)	35 (11.6%)
Family monthly income						
Less than Rs. 20,000 per month	43 (74.1%)	15 (25.9%)	42 (72.4%)	16 (27.6%)	53 (91.4%)	5 (8.6%)
More than Rs. 20,000 per month	222 (75%)	74 (25%)	213 (72%)	83 (28%)	260 (87.8%)	36 (12.2%)
Employment status						
Employed	113 (80.7%)	27 (19.3%)	109 (77.9%)	31 (22.1%)	126 (90%)	14 (10%)
Unemployed	152 (71%)	62 (29%)	146 (68.2%)	68 (31.8%)	187 (87.4%)	27 (12.6%)
Education level						
Graduation and above	224 (75.1%)	81 (24.9%)	238 (73.2%)	87 (26.8%)	290 (89.2%)	35 (10.8%)
Below graduation	21 (72.4%)	8 (27.6%)	17 (58.6%)	12 (41.4%)	23 (79.3%)	6 (20.7%)
Binge drinking						
Yes	33 (62.3%)	20 (37.7%)	28 (52.8%)	25 (47.2%)	40 (75.5%)	13 (24.5%)
No	232 (77.1%)	69 (22.9%)	227 (75.4%)	74 (24.6%)	273 (90.7%)	28 (9.3%)
Substance use						
Yes	18 (69.2%)	8 (30.8%)	15 (57.7%)	11 (42.3%)	22 (84.6%)	4 (15.4%)
No	247 (75.3%)	81 (24.7%)	240 (73.2%)	88 (26.8%)	291 (88.7%)	37 (11.3%)

Depression, anxiety and stress

The scores obtained on each of the three subscales of DASS-21 were summed and multiplied by 2. Sum scores ranged from 0 to 126, and for each subscale it ranged from 0 to 42. Sum scores of 0–9 for depression, 0–7 for anxiety and 0–14 for stress were considered as normal. Sum scores of 14–20 for depression, 10–14 for anxiety and 19–25 for stress were considered as moderate. Finally, sum scores of 21–27 for depression, 15–19 for anxiety and 26–33 for stress were considered as severe. Any scores above these were considered as extremely severe. The average score of DASS-21 for this study was 8.39 for depression subscale, 6.53 for anxiety subscale and 8.83 for stress subscale. Scores obtained on these three subscales were dichotomized. Those falling in moderately, severely and extremely severely depressed, anxious and stressed categories were considered as depressed, anxious and stressed, respectively. Others were considered as not depressed, not anxious and not stressed. Almost one-fourth (25.1%) of the participants were depressed, 99 (28%) were anxious and 41 (11.6%) were stressed over the last 3 weeks. Percentage distribution of demographics and depression, anxiety and stress are presented in Table 2.

Socio-demographic correlates of depression, anxiety and stress

Binary logistic regressions were conducted to determine the socio-demographics associated with depression, anxiety and stress. Binary logistic regressions indicated employment status and binge drinking were associated with depression; gender, employment status and binge drinking were associated with anxiety; and only binge drinking was associated with stress. Those who were employed (odds ratio (OR) = 1.91; 95% CI: 1.072–3.418) and were binge drinkers (OR = 2.03; 95% CI: 1.045–3.945) were likely to be two times more depressed than unemployed and non-binge drinkers. Males (OR = 2.17; 95% CI: 1.317–3.589), employed (OR = 1.77; 95% CI: 1.002–3.141) and binge drinkers (OR = 2.62; 95% CI: 1.361–5.048) were more than two times likely to be anxious than females, unemployed and non-binge drinkers. Finally, binge drinkers (OR = 3.42; 95% CI: 1.544–7.583) were more than three times likely to be stressed (see Table 3).

Discussion

This study was conducted to estimate prevalence of depression, anxiety and stress and examine their

Table 3. Results of binary logistic regression estimating the odds ratio of depression, anxiety and stress.

Variables	Depression		Anxiety		Stress	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Gender						
Male	1.26	0.767–2.076	2.17*	1.317–3.589	0.83	0.420–1.626
Female	1.00		1.00		1.00	
Age						
18–30 years	0.746	0.317–1.757	1.41	0.583–3.418	1.37	0.386–4.557
Above 30 years	1.00		1.00		1.00	
Marital status						
Married	1.002	0.452–2.224	1.65	0.768–3.563	1.31	0.460–3.704
Unmarried	1.00		1.00		1.00	
Family monthly income						
Less than Rs. 20,000 per month	1.1	0.556–2.161	1.21	0.615–2.397	1.39	0.494–3.891
More than Rs. 20,000 per month	1.00		1.00		1.00	
Employment status						
Employed	1.914*	1.072–3.418	1.77*	1.002–3.141	1.25	0.572–2.717
Unemployed	1.00		1.00		1.00	
Education level						
Graduation and above	1.16	0.472–2.840	0.72	0.306–1.681	0.51	0.178–1.432
Below graduation	1.00		1.00		1.00	
Binge drinking						
Yes	2.03*	1.045–3.945	2.62*	1.361–5.048	3.42*	1.544–7.583
No	1.00		1.00		1.00	
Substance use						
Yes	0.95	0.368–2.475	1.258	0.502–3.151	0.73	0.211–2.524
No	1.00		1.00		1.00	

CI: confidence interval.
*Statistically significant at p-value $< .05$.

socio-demographic correlates among Indian population during the lockdown. This study found that 25.1%, 28% and 11% of the participants were moderately to extremely severely depressed, anxious and depressed, respectively. Furthermore, binge drinking was significantly and positively associated with depression, anxiety and stress. Although the Union Ministry of Home Affairs imposed ban on alcohol sale, there was a huge demand for liquor during the lockdown. While few north-eastern Indian states allowed sale of liquor for a few hours every day (Khandekar, 2020), there was rise in illegal supply of alcohol at sky-rocketing prices in other states (Swamy, 2020). Therefore, alcohol availability was not a challenge for some. Individuals might have become frightened and failed to resist the emotional challenges experienced to tackle the lockdown. They might not be able to cope with negative emotional states and therefore resorted to some escaping mechanisms such as alcohol consumption. However, according to the World Health Organization (WHO) recommendation, alcohol consumption can increase the risk of catching COVID-19 (Feuer, 2020). Therefore, efforts of the government should be on limiting the access of alcohol during lockdown. Law enforcement authorities should keep a check on illegal sale of alcohol. There is a need of sensitizing people on adverse effects of alcohol consumption.

Currently, employed status was significantly associated with depression and anxiety. This could be attributed to the hundreds of thousands of jobs are being lost across the world. Some reports suggest that 136 million jobs in India are at risk post-COVID-19 free India (Das, 2020). There is speculation on pay cuts and freeze in hikes of employees as well. Uncertainty and insecurity of the future might have resulted in more depressive and anxiety symptoms. Further due to the travel ban, offices are shut and several employees are working from home. For many, shifts are rotational or flexible. This might have affected the engagement, work satisfaction and productivity of the employees. Unable to meet the deadlines/targets and work pressure might have made them depressed and anxious.

Only gender was found to be associated with anxiety wherein males were more likely to anxious. This finding is inconsistent with the National Mental Survey of India, 2016 which reported that females are more likely to be anxious than males (Gururaj et al., 2016). A possible explanation for this could be that mostly women manage both the household chores, such as baby-sitting, cooking, cleaning and laundry, and professional lives due to

socio-cultural norms that still predominate in many Indian families. Males in Indian families barely participate in household activities. However, due to the lockdown, domestic helpers are not available for support. As a result of this, the responsibilities are shared between both males and females. As males are not habitual to these situations, managing personal, professional and family life might have made them more anxious than females.

Limitations

Like every study, this study has some limitations as well. First, the study was cross-sectional in nature. Therefore, the results of this study cannot assign causal nature. Second, due to the lockdown situation in the country, the researchers could not go onto the field to collect data. They used electronic means to collect data through convenience sampling. Hence, the results of this study cannot be generalized to the entire population. Third, responses to the survey were self-reported. It may have resulted in reporting biases for social desirability which may have affected the results.

Future directions

Although the lockdown situation in India affected people from all spheres of life, this study was limited to the general public. Several incidents of the mass exodus of migrant workers and daily wage labourers from across the country to their hometowns were reported during the lockdown. This population was affected severely due to the lack of jobs and permanent shelter in the cities where they were working. Similarly doctors, nurses and other health care professionals were misbehaved and attacked by the public (A. Pandey, 2020; V. Pandey, 2020). Many who were living in rented houses were asked to vacate their apartments by their landlords. Staying away from their families and serving the nation at such a critical time may definitely impact the mental health of health care professionals. Researchers failed to collect data from these two communities and professions due to restrictions imposed. Researchers can conduct similar studies to understand the prevalence and impact of lockdown on migrant workers, health care professionals and those residing in shelter homes. Researchers can include other health indicators such as insomnia, suicide ideation, aggressive behaviour, attention-deficit hyperactivity disorder (ADHD), time management issues and eating disorders in their studies.

Conclusion

In this study on Indian population, many reported symptoms of depression, anxiety and stress. The Mental Healthcare Act, 2017 guaranteed right to mental health care to Indians. Addressing the mental health care needs of its citizens in these challenging times should be a top priority of Indian government. It is already making best of its effort to curb the spread of COVID-19 epidemic. Appropriate measures should be taken to promote the mental well-being of its citizens as well.

Conflict of interest

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Note

1. On 14 April 2020, Government of India extended the nationwide lockdown till 3 May 2020 (Hebbar, 2020). Data were collected till the first wave of the lockdown, that is, 14 April 2020 only.

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