

Research Article

# Depression during COVID-19 Pandemic in India: Findings from an Online Survey

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## A B S T R A C T

**Introduction:** Unprecedented crisis of COVID-19 pandemic has generated uncertainties in minds of people thereby impacting their mental health. Global evidence supports trend of symptoms of depression among general population during the pandemic.

**Material and Method:** It was a cross-sectional study conducted between April 15 and May 01, 2020. Data were collected using pre-structured questionnaire that was circulated through a web-based link via messages and mails. Depressive symptoms were assessed using Patient Health Questionnaire-9 (PHQ-9). Data were analyzed using SPSS version 23.

**Result:** Out of the total 500 telephonic contacts who were sent the survey link, 478 had (95.6%) responded. There were 114 (23.8%), 64 (13.4%), 40 (8.4%) and 29 (6.1%) participants who were classified as having mild, moderate, moderately severe and severe depression respectively. Female gender, religion, education status, unemployment and professional occupation, income less than Rs. 20000 and more than Rs. 40000, 'scare for coronavirus infection' were found to be significantly associated with severity of depression ( $p < 0.05$ ). Adjusted analysis revealed that age was protective factor where as those who were scared from coronavirus infection were found to be two times more at risk of having symptoms of depression. Increasing family income was also associated with presence of depressive symptoms.

**Conclusions:** The proportion of participants with depressive symptoms was 51.7%. There is a need for assessing psychosocial impact of COVID-19 among populations and communities in varied settings over a long period of time.

**Keywords:** SARS-CoV-2, Psychosocial Impact, PHQ-9

## Introduction

The entire world is currently battling with Coronavirus Disease (COVID-19) caused by Severe Acute Respiratory

Syndrome Coronavirus -2 (SARS-CoV-2). Unprecedented crisis of COVID-19 pandemic has generated uncertainties in minds of people thereby impacting their mental health.

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It is well known that public health emergencies tend to affect the health, safety and well being of individuals and communities. And these effects translate into long lasting psychosocial consequences among the affected populations.<sup>1</sup> Though life-threatening viral infection may not result in trauma, a criteria required for diagnosis of Post-Traumatic Stress Disorder, but depressive and anxiety disorders, still may supervene.<sup>1,2</sup>

Global evidence supports rising trend of symptoms of depression, anxiety and stress related to COVID-19 among general population resulting from stressors such as life disruption due to nationwide lockdowns, fears of illness and economic loss, stress of social isolation and worry about health of self and loved ones.<sup>3-8</sup> Human beings are social creatures and being isolated from the love, support and contact of family and friends for long period of time, can trigger depression or aggravate the existing symptoms.

COVID-19 pandemic has resulted in population undertaking restricted mobility and social contacts. Little is known about status of mental health of general population during COVID-19 pandemic. Therefore, the present study was undertaken to assess the presence of depressive symptoms among general population in Delhi.

## Material and Methods

**Study settings and study participants:** It was a cross-sectional study conducted between April 15 and May 01, 2020. Data were collected through a pre-structured questionnaire, which was circulated through a web-based link via messages and mails. The study participants included all individuals aged 15 years and above and were telephonic contacts of the investigators.

**Exclusion Criteria:** All the telephonic contacts who were less than <15 years or the telephone numbers which were invalid were excluded from the study.

**Sample Size and Sampling:** Taking 14% as the proportion of people in India with some or other mental health morbidity,<sup>9</sup> sample size was calculated as 186 with precision of 95% and 5% alpha error. However, the survey link was shared with 500 telephonic contacts of the investigators.

**Study Tool:** A self-administered questionnaire was designed that contained items to collect demographic details of the participants, their mental status during COVID-19 pandemic in India and Patient Health Questionnaire-9 (PHQ-9).<sup>10</sup> PHQ-9 is an instrument which aids in making criteria based diagnoses of depressive and other mental disorders commonly encountered in primary care. It scores each of the nine DSM IV criteria for depression as "0" (not at all) to "3" (nearly every day) and thus, overall score ranges from 0 to 27. The total score is interpreted as follows:

Total Score	Interpretation
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

**Study Methods:** The data were collected using online platform. Participant information sheet and consent form were also included in the survey link. The contacted participants would only participate in the survey if they gave consent to participate. The survey lasted for 5 minutes only (average 4-6 minutes). All the responses were marked mandatory for submission of the form. This ensured completeness of data.

**Statistical Analysis:** The data were entered in Microsoft Excel 2007 and analyzed using SPSS version 23. Descriptive statistics were used to characterize the study population. Association between categorical variables was assessed using Chi Square test (or Fischer exact test). P-value <0.05 was considered as significant. The factors which were found to be associated with severity of depression with p-value <0.20 were entered into step forward logistic regression analysis. Adjusted odds ratio were calculated and independent predictors of presence of depression were found.

**Ethical considerations:** The study was approved by Institutional Ethics Committee of the research institution. Privacy and confidentiality of study participants were assured. The informed consent were obtained from the participants through online mode. For telephonic contacts between 15-18 years written assent was also obtained in addition to informed consent from their respective parents.

## Result

Out of the total 500 telephonic contacts who were sent the survey link, 478 (95.6%) had responded. There were 54.8% (n=262) males and 66.7% (n=319) Hindus. More than half of the respondents aged ≤30 years (n=252; 52.3%). A large proportion of participants were either having professional or postgraduate degree (n=259; 54.2%). There were 267 individuals (55.9%) who were professionals while 152 (31.8%) were unemployed. There were 18.3% (n=81) participants whose monthly income was less than Rs. 20000. More than half of the participants belonged to upper socio-economic status (n=248; 51.9%) according to Modified Kuppuswamy Scale. There were 114 (23.8%), 64 (13.4%), 40 (8.4%) and 29 (6.1%) participants who were classified as having mild, moderate, moderately severe and severe depression respectively (Table 1).

**Table I. Socio-demographic profile and severity of depression among study participants**

Variables	Total N=478 (%)
<b>Gender</b>	
Female	216 (45.2)
Male	262 (54.8)
<b>Religion</b>	
Hindu	319 (66.7)
Muslim	123 (25.7)
Christian	12 (2.5)
Sikh	11 (2.3)
Others	13 (2.7)
<b>Age (in years)</b>	
≤30	252 (52.3)
31-45	131 (27.6)
46-60	84 (17.8)
>60	11 (2.3)
<b>Education</b>	
Illiterate, Literate up to high school certificate	47 (9.8)
Higher secondary certificate	33 (6.9)
Graduate degree	139 (29.1)
Professional degree/ Post-graduate	259 (54.2)
<b>Occupation</b>	
Unemployed	152 (31.8)
Unskilled worker	7 (1.5)
Skilled worker	52 (10.9)
Professional	267 (55.9)
<b>Income (n=442)</b>	
≤20000	81 (18.3)
20001-40000	74 (16.7)
40001-60000	80 (18.1)
>60000	207 (46.8)
<b>Socio-economic status</b>	
Lower	9 (1.8)
Upper Lower	44 (9.2)
Lower Middle	40 (8.4)
Upper Middle	137 (28.7)
Upper	248 (51.9)
<b>Severity of Depression</b>	
Mild Depression	114 (23.8)
Moderate Depression	64 (13.4)
Moderately severe Depression	40 (8.4)
Severe Depression	29 (6.1)
None	231 (48.3)

**Table 2. Association of severity of symptoms of depression with socio-demographic profile of study participants and perception of fear about corona**

Variables	Depression Severity				Chi square	P-value
	None	Mild	Moderate	Severe		
<b>Gender (N=478)</b>						
Female (n=216)	94 (43.5)	47 (21.8)	42 (19.4)	33 (15.3)	13.59	0.004*
Male (n=262)	137 (52.3)	67 (25.6)	22 (8.4)	36 (13.7)		
<b>Religion (N=478)</b>						
Hindu (n=319)	167 (52.4)	79 (24.8)	36 (11.3)	37 (11.6)	12.07	0.007*
Muslim (n=123)	47 (38.2)	28 (22.8)	25 (20.3)	23 (18.7)	11.63	0.009*
Christian (n=12)	3 (25.0)	6 (50.0)	1 (8.3)	2 (16.7)	5.19	0.158
Sikh (n=11)	7 (63.6)	0 (0)	1 (9.1)	3 (27.3)	4.67	0.197
Others (n=13)	7 (53.8)	1 (7.7)	1 (7.7)	4 (30.8)	4.34	0.227
<b>Age (in years) (N=478)</b>						
≤30 (n=252)	113 (44.8)	67 (26.6)	34 (13.5)	38 (15.1)	3.17	0.366
31-45 (n=131)	64 (48.9)	30 (22.9)	19 (14.5)	18 (13.7)	0.31	0.959
46-60 (n=84)	50 (59.5)	13(15.5)	11 (13.1)	10 (11.9)	6.10	0.107
>60 (n=11)	4 (36.4)	4 (36.4)	0 (0)	3 (27.3)	3.87	0.276
<b>Education (N=478)</b>						
Illiterate, Literate up to high school certificate (n=47)	17 (36.2)	5 (10.6)	7 (14.9)	18 (38.3)	26.06	0.000*
Higher secondary certificate (n=33)	14 (42.4)	7 (21.2)	6 (18.2)	6 (18.2)	1.31	0.726
Graduate degree (n=139)	61 (43.9)	40 (28.8)	25 (18.0)	13 (9.4)	9.40	0.024*
Professional degree/ Post-graduate (n=259)	139 (53.7)	62 (23.9)	26 (10.0)	32 (12.4)	9.77	0.021*
<b>Occupation (N=478)</b>						
Unemployed (n=152)	53 (34.9)	37 (24.3)	27 (17.8)	35 (23.0)	22.96	<0.001*
Unskilled worker (n= 7)	4 (57.1)	0 (0)	0 (0.0)	3 (42.9)	6.74	0.081
Skilled worker (n=52)	20 (38.5)	13 (25.0)	11 (21.2)	8 (15.4)	3.87	0.276
Professional (n=267)	154 (57.7)	64 (24.0)	26 (9.7)	23 (8.6)	31.17	<0.001*
<b>Income (N=442)</b>						
≤20000 (n=81)	28 (34.6)	20 (24.7)	17 (21.0)	16 (19.8)	10.03	0.02*
20001-40000 (n=74)	32 (43.2)	17 (23.0)	12 (16.2)	13 (17.6)	1.43	0.70
40001-60000 (n=80)	36 (45.0)	11 (13.8)	13 (16.3)	20 (25.0)	10.4	0.01*
>60000 (n=207)	117 (46.5)	55 (26.6)	15 (7.2)	20 (9.7)	25.85	<0.001*
<b>Socioeconomic status (N=478)</b>						
Lower (n=9)	2 (22.2)	2 (22.2)	2 (22.2)	3 (33.3)	4.108	0.25
Upper Lower (n=44)	21 (47.7)	9 (20.5)	7 (15.9)	7 (15.9)	0.541	0.91
Lower Middle (n=40)	12 (30.0)	8 (20.0)	8 (20.0)	12 (30.0)	12.06	0.007*
Upper Middle (n=137)	52 (38.0)	37 (27.0)	23 (16.8)	25 (18.2)	8.668	0.034*
Upper (n=248)	144 (58.1)	58 (23.4)	24 (9.7)	22 (8.9)	26.52	0.001*

Are you scared too much of Coronavirus infection? (N=478)						
More than half days (n=34)	6 (17.6)	6 (17.6)	10 (29.4)	12 (35.3)	25.77	<0.001*
Nearly everyday (n=77)	17 (22.1)	16 (20.8)	20 (26.0)	24 (31.2)	42.11	<0.001*
Several days (n=129)	54 (41.9)	41 (31.8)	17 (13.2)	17 (13.2)	6.63	0.094
Not at all (n=238)	154 (64.7)	51 (21.4)	17 (7.1)	16 (6.7)	60.83	<0.001*

\*p-value <0.05

**Table 3. Adjusted association of socio-demographic factors with symptoms of depression**

Variables	Odds Ratio (95% CI)	P-value
Gender	1.08 (0.7-1.69)	0.72
Religion	1.38 (0.81-2.35)	0.24
Age	0.97 (0.95-0.98)	0.001*
Education	1.15 (0.99-1.35)	0.07
Occupation	0.96 (0.9-1.01)	0.12
Family Monthly Income	-	0.031*
Scare from Coronavirus infection	2.21 (1.41-3.45)	0.001*

\*p value <0.05

In response to question about 'Are you scared too much from Corona?', 238 respondents (49.8%) reported 'Not at all' while 34 (7.1%) individuals felt it 'More than half days', 77 (16.1%) individuals felt nearly everyday and 129 (27%) reported it 'On several days'. When asked subjectively 'Are you feeling depressed?', 72% (n=344) responded as 'No'.

Female gender, religion, education status, unemployment and professional occupation, income less than Rs. 20000 and more than Rs. 40000, 'scare for coronavirus infection' were found to be significantly associated with severity of depression (p<0.05). Age was not found to be significantly associated with severity of depression (Table 2).

As shown in Table 3, adjusted analysis revealed that age was protective factor with respect to severity of depression where as those who were scared from coronavirus infection were found to be two times more at risk of having symptoms of depression. Increasing family income was also associated with presence of depressive symptoms.

## Discussion

The present study revealed the presence of depressive symptoms across more than half of the respondents (51.7%) during the COVID-19 pandemic. The findings are alarmingly high when compared to 33.7% reported in systematic review of 14 studies by Salari et.al in July, 2020.<sup>8</sup> The reason for such contrasting findings could be due to difference in study tools used for diagnosing/ screening of depressive symptoms in these studies. Also, it is well known that resource limited settings impose greater psychological impact on the population due to apprehensions and anxiety among people regarding their own health systems' capability to

cope with pandemic situations. Nevertheless, findings in our study point to the need of identifying and examining mental health status of people in these unprecedented times.

Female gender was found to be significantly associated with severity of depression in the present study. This is in line with epidemiological evidence gathered elsewhere.<sup>11,12</sup> Participants with higher education status were found to have more severe forms of depression. Studies among Iranian and Chinese general population during COVID-19 outbreak showed similar findings.<sup>13,14</sup> This could be attributed to increased self awareness about their own health among individuals with higher education status. Greater access to information could also be responsible for depression among this group.

Even though ageing did not come as significant factor associated with depression in uni-variate analysis, it emerged as protective factor in adjusted analysis in the study. Aged population are at increased risk of mortality due to COVID-19, yet during pandemic younger age group respondents were found to experience more depressive symptoms in current study. The possible explanation for this paradoxical phenomenon could be over-concern of younger age group about the future consequences of their jobs or businesses resulting due to pandemic. This being an economically productive working force, is getting affected by redundancies and business closures.<sup>8,13</sup>

Scare about Coronavirus infection is surely contributory in exacerbating depressive symptoms. This is consistent with results of our study. Constantly watching or hearing

COVID-19 related news some of which is fabricated could be distressing to the mind and contribute in creating fears and anxieties among people. Therefore, it is suggested to practice health promoting behaviours and receiving updated and accurate information from authentic sources of information. Optimistic thoughts and positive attitude during COVID-19 pandemic times act as protective factors against depression.<sup>15</sup>

Strengths and limitations of study: There were several strengths of the study. The study tool was validated and sample included for analysis was more than estimated. Despite being an online survey, the response rate of the survey was fairly good. However, our research had few limitations also. The study was periodic and cross-sectional in nature. Periodicity reflects the psychological status of population in certain period of time and may not portray it with evolution of pandemic and consequent changes in surrounding environment. Therefore, there is need to assess the psychological impact of COVID-19 pandemic among people over a longer period of time. Secondly, there was selection bias as only contacts of the research investigators were approached for the survey.<sup>16</sup> This reflects in higher proportion of participants being of higher education status and engaged in professional occupations. This limits the generalizability of findings of the study.

Limitations notwithstanding, the research provides useful insight of the psychological status general population in the country during COVID-19 pandemic. The high proportion of participants reporting depressive symptoms is worrisome. The study findings imply the need for assessing psychosocial impact of COVID-19 among populations and communities in varied settings over a long period of time.

**Conflict of Interest:** None

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