# A study on Prevalence and Determinants of Depression amongst Indian Population during Covid-19 Pandemic lockdown

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**Abstract :**

**Introduction :** Currently the world is experiencing pandemic due to novel corona virus. This pandemic has affected lives of all individuals in every possible way. **Objective :** In present study the objective was to assess prevalence of depression and factors responsible to affect mental health of an individual. **Methodology :** Study was carried out during lockdown in month of April 2020. Study was done using Google forms, and participants were enrolled using convenient sampling and snowball sampling method. Depression amongst participants was assessed using Patient Health Questionnaire-9. **Result :** Some form of depression was found in more than half of the participants, with almost 1 out of 5 participants having moderate to severe depression. Possible reasons for depression found were health status of family members and significant lifestyle change. However no statistical association was found between financial situation of participants during lockdown and depression. High proportions of participants are psychologically affected and may require personalized mental health care.

**Key Words :** Corona virus, Depression, Lockdown, SARS-CoV-2

## Introduction :

The world is currently experiencing a pandemic due to novel corona virus, SARS-CoV-2, and the disease it causes, Covid-19. The extent to which pandemic would affect health and well-being of individuals is uncertain.[1] With uncertainty comes fear, anxiety, depression.[1] First case of Covid-19 in India was reported on March 2020 and first lockdown started on 25th of March 2020. Corona virus has not only brought physical suffering but also psychological and other health problems.[2] Confirmed and suspected cases of the COVID-19 may experience fear of severe disease consequences and the contagion.[3] Consequently, they may experience loneliness, denial, anxiety, depression, insomnia, and despair, which may lower treatment adherence.[2,3] Further, strict quarantine and mandatory contact tracing policy by health authorities could cause societal rejection, financial loss, discrimination, and stigmatization.[4,5] Patients with chronic diseases (e.g.,

chronic renal failure, diabetes mellitus, and cardio-cerebrovascular diseases), however, also need medical follow-up in hospitals regularly. These patients may also have difficulties to obtain maintenance treatment.[2] There are severe disruptions of routines, separation from family members and friends, shortages of daily necessities, salary deduction, social isolation, and school closure. Abrupt changes to daily life are risk factors that can substantially affect mental health.[6,7] Faced with potential disease threat, people tend to develop avoidant behaviors (e.g., avoid contact with people who have pneumonia-like symptoms)[8] and obey social norms strictly (e.g., conformity).[9] According to stress theory [10] and perceived risk theory,[11] public health emergencies trigger more negative emotions and affect cognitive assessment as well.[12] The present study was planned with objective to assess mental health status of people residing in India during Covid-19 pandemic lockdown and factors affecting mental health of individual in such circumstances.

### Objectives of the study:

- To find out prevalence of depression amongst participants during lockdown situation in India due to Covid-19 Pandemic

- To find out determinants of depression amongst participants during lockdown

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- To assess statistical significance between determinants like health of family, lifestyle & financial situation and depression during lockdown

## Materials and Methods:

A cross sectional study was planned to assess depression amongst individuals residing in India during Covid-19 Pandemic lockdown. The study was started after seeking permission from Institutional Ethics Committee. The study was planned and conducted during extension of first lockdown during month of April 2020. Questionnaire was prepared which included questions related to socio-demographic profile of participants, health status of family members of participants, financial situation of participants during lockdown, lifestyle change of participants, questions related to assess depression, etc. To assess depression amongst participants, Questionnaire was developed using Patient Health Questionnaire-9 (PHQ-9).[13] Questionnaire was prepared as a Google form. Pre-testing of questionnaire was done amongst 10% of study participants. After finalization of questionnaire, Google form link was sent to participants. In Google form, consent of participants for participation in the study was obtained. Convenient sampling technique was used for enrolling participants for the study. Participants enrolled were contacted though use of various social media. Later these participants were asked to forward questionnaire to their contacts – following snowball technique of sampling, so more number of participants could be enrolled in the study.

Sample size: No specific study related to depression during lockdown was found, hence assuming 50% individuals suffering from depression, sample size was estimated at 384. Details are given below-

Sample size for prevalence study: $(1.96)^2$ x p x q / $L^2$ (p: 50; q: 100-p = 50; L: 10% of p i.e., 5)

Analysis of the study: Google form was used for the study. Data was directly collected in MS Excel. Analysis was performed using SPSS 20. Frequency, percentage, measures of central tendency, measures of dispersion, chi-square analysis was done. Depression was categorized based on PHQ-9 guidelines[13], which is given in Table 1.

## Inclusion criteria for participants:

· Participant should be 18 years and above

- Currently residing in India

- Able to read and understand questions and options in English

- Should have smart phone

## Exclusion criteria for participants:

- Participant below 18 years

- Currently not residing in India

- Unable to read and understand questions and options in English

- Doesn't have smart phone

- Intellectually disabled

### Table 1: Categories of depression severity based on PHQ-9 guidelines

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

### Figure 1: Activities undertaken by participants to keep themselves motivated and engaged (Multiple responses allowed) (n=388)
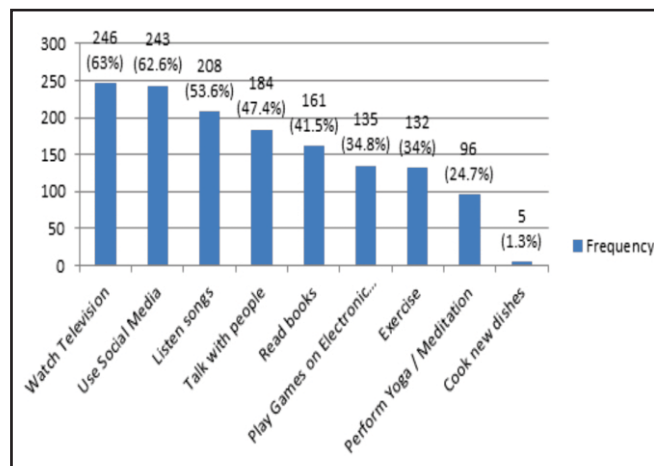
**Table 2 : Demographic characteristics of participants (n=388)**

| Category | Sub-category | Frequency (%) |
|---|---|---|
| Gender | Male | 217 (55.9%) |
| | Female | 171 (44.1%) |
| Residence | Rural | 55 (14.2%) |
| | Urban | 333 (85.8%) |
| Type of Family | Joint | 170 (43.8%) |
| | 3-generation | 80 (20.7%) |
| | Nuclear | 138 (35.5%) |
| Children <5 years in family | Yes | 78 (20.1%) |
| | No | 310 (79.9%) |
| Elders >60 years in Family | Yes | 172 (44.3%) |
| | No | 216 (55.7%) |
| Occupation | Employed in private sector | 136 (35.1%) |
| | Employed in public sector | 64 (16.5%) |
| | Business | 45 (11.6%) |
| | Retired | 18 (4.6%) |
| | Housemaker | 19 (4.9%) |
| | Student | 98 (25.3%) |
| | Unemployed | 8 (2.1%) |

**Table 3: Status of health of participants and their family members (n=388)**

| Category | Sub-category | | Frequency (%) |
|---|---|---|---|
| Family member suffering from chronic disease (n=210; 54.1%) | Sufficient stock of medicine available at home | Yes | 205 (97.6%) |
| | | No | 5 (2.4%) |
| Family member fallen sick during lockdown (n=73; 18.8%) | Received appropriate treatment consultation (n=65; 89.0%) | Received consultation through phone | 21 (32.3%) |
| | | Went to hospital | 27 (41.5%) |
| | | Self treatment | 17 (26.2%) |

**Table 4: Monetary income during lockdown of participant's family (n=388)**

| Income | Frequency (%) |
|---|---|
| Same as it was before lockdown | 204 (52.6%) |
| Half to less than same as it was before lockdown | 117 (30.1%) |
| Less than half as it was before lockdown | 67 (17.3%) |

**Table 5: Possible reasons for depression during lockdown amongst participants**

| Reason | | Frequency (%) | Statistical value (p-value) |
|---|---|---|---|
| Health of family members | Good | 371 (95.6%) | 23.738 (<0.001)* |
| | Poor | 17 (4.4%) | |
| Financial situation during lockdown | Same as it was before lockdown | 204 (52.6%) | 0.013 (0.849)# |
| | Half as it was before lockdown | 117 (30.1%) | |
| | Less than half as it was before lockdown | 67 (17.3%) | |
| Significant lifestyle change | Yes | 290 (74.7%) | 29.946 (<0.001)* |
| | No | 98 (25.3%) | |

*- Fischer's Exact Test; #- Goodman and Kruskal's gamma

**Statistical Analysis :** Due to Google form data entry was directly obtained in MS Excel 2007. Analysis was performed in Statistical Package for Social Science version 20.0 (IBM SPSS Statistics, New York, United States). Frequency, percentage, measures of central tendency, measures of dispersion and tests to assess statistical association like Chi-square, Fischer's Exact & Goodman and Kruskal's gamma test were done.

**Results:**

A total of 388 responses from participants were obtained. Demographic characteristics of participants are shown in Table 2. Mean age of participants was 33.73 + 13.81. Mean number of members in the family of participants were 4.33 + 1.89.

Status of health of participants and their family members was initially inquired. Out of 388 participants, 371 (95.6%) participants answered that health status of their family members was good. Details about the other health related questions are shown in Table 3.

Out of all 388 participants, 158 (40.7%) participants replied that they constantly felt scared of getting corona virus infection. Amongst all participants, one or more family members working as a part of essential services (like nurse, doctor, pharmacist, police, etc.) was informed by 266 (68.5%) participants. Amongst these 266 participants, 191 (71.8%) participants informed that they were afraid for their family members to get corona virus infection due to increased risk of exposure as a part of providing essential services. Due to this fear of getting infection, 158 (40.7%) participants informed that they excessively used hand sanitizer or too frequently washed their hands even while at home. On inquiring about change in attitude of neighbours towards participants as one or more family members were working as a part of providing essential services, 37 (13.9%) participants out of 266 felt that attitude was negative towards them. Amongst these 37 participants, 23 (62.2%) further informed that they felt bad about such behaviour of neighbours.

On inquiring about financial situation, 100 (25.8%) participants informed that they themselves were the only earning member in their family. Family was suffering from financial crisis during lockdown was informed by 78 (20.1%) participants. Situation of monetary income during lockdown of participant's family is given in Table 4.

Amongst all participants, 181 (46.6%) participants informed that their family had one or more ongoing loan, amongst which 54 (29.8%) participants informed that they were not able to meet the payment of instalment of ongoing loan.

Increase of psychological stress due to difference of opinion at workplace with colleagues was informed by 40 (10.3%) participants. Difference of opinion leading to quarrels with family members was informed by 161 (41.5%) participants. Frequency of these quarrels or

difference of opinion as informed by participants was once a day 36 (22.4%), multiple times a day 21 (13.0%), once or twice a week 104 (64.6%). Most common reasons given by participants for quarrel were household work distribution like cleaning utensil, cooking, house cleaning, etc. (as maids were not coming for work) among 87 (54.0%), office work stress among 42 (26.1%), outside work like bringing daily required items amongst 17 (10.6%), taking care of kids 8 (5.0%) & giving to much advise to other family members 7 (4.3%).  Due to such quarrels, 99 (61.5%) participants felt increase in stress amongst family members.

On inquiring about significant change in lifestyle due to lockdown, 290 (74.7%) agreed to significant change in lifestyle. About information on exercise, 187 (48.2%) participants used to exercise regularly before lockdown, amongst which 132 (70.6%) participants were able to continue exercising even during lockdown at their home. Addiction to any substance was reported by 37 (9.5%) participants, amongst which tobacco 30 (81.1%) was most common addiction amongst participants followed by alcohol 7 (18.9%). Amongst the 37 participants having addiction, 22 (59.5%) reported of having problem in seeking substance of addiction during lockdown, while remaining managed to get the substance from somewhere. Change in bowel habits was reported by 74 (19.1%) participants.

Frequency of going out to obtain essential items like milk, vegetable, grocery and money was reduced as participants had fear of getting corona virus infection and also due to lockdown. To get milk 179 (46.1%) participants went daily, for groceries and vegetables 22 (5.7%) participants went daily. Problems in obtaining these basic essential items were informed by 102 (26.3%) participants. Difficulty in obtaining money from ATMs was reported by 32 (%) participants. Major reasons as described by participants for these problems were (multiple responses allowed)- family members not allowing to go outside because of fear of getting infection by 40 (39.2%), nearby shops closed by 64 (62.7%), insufficient stock in shops nearby among 7 (6.9%) and police not allowing to go to other areas by 44 (43.1%) participants.

Details of activities done in lockdown by participants to keep themselves motivated and engaged are given in Figure 1.

On inquiring about with whom participants interact (multiple responses allowed) when they feel sad, 151 (38.9%) told parents, 324 (83.5%) with spouse, 244 (62.9%) with friends, 1 (0.3%) with psychiatrist & 1 (0.3%) with spiritual leader. When asked about how participants felt when constant news and updates were received about corona on all platforms like social media, news, etc. 167 (%) felt sad/depressed, 117 (%) learnt new things from the updates, while 104 (%) were not affected in any way as they ignored them.

Based on Patient Health Questionnaire-9, level of depression amongst participants detected is as follows: Participants with nil or minimal depression 181 (46.6%), mild 122 (31.4%), moderate 54 (13.9%), moderately severe 15 (3.9%) and severe 16 (4.1%). Mean score for depression amongst participants was $6.11 + 5.595$. Statistical association between possible reasons for depression during lockdown like health of family members, financial situation & significant change in lifestyle and depression is given in Table 5.

Statistical association was obtained between depression and healthy of family members & significant lifestyle change. No statistical association was obtained between gender and depression [X2 value: 2.196 (p-value: 0.700)], type of family and depression [2.415 (0.966)], current residence and depression [3.000 (0.558)], ongoing loan and depression [3.361 (0.499)] & family member providing essential services and depression [3.802 (0.434)]. However, association was obtained between current occupation of participants and depression [42.800 (0.010)], inability to procure substance of addiction and depression [9.640 (0.047)] and quarrels or difference of opinion with family members and depression [38.245 (< 0.001)].

**Discussion:**

A total of 388 participants' response was obtained and hence all were included in the study. Minimum age was 22 and maximum age was 84 years. Almost quarter of patients had to rely on self treatment, while one-third could have only telephonic consultation for any health problem suffered during lockdown. Such problems may

lead to improper diagnosis and improper treatment. Fear of getting corona virus infection was present in almost in 40% participants. Hence this led to excessive use of hand sanitizers and washing hands even when not required. Due to this fear, less than half number of participants went out daily to get milk and other daily requirement items. Participants themselves or their family members providing essential services suffered from negative attitude of neighbours and society members towards them. This was reported by 14% participants. Such attitude may have affected mental health conditions of participants. Inability to get substance of addiction was statistically associated to depression. More than half of the participants reported some form of depression. Difference of opinion leading to quarrels amongst family members may have lead to increase in depression amongst participants which was also statistically significant.

A review article published in International Journal of Biological Science states that those working as a part of providing essential services are vulnerable population and are at increased risk of suffering from mental health conditions during covid-19 pandemic.[2] However in the present study, no such association was obtained between depression amongst participants whose family members (including themselves) were providing essential services during lockdown. A study done in China which is published in International Journal of Environmental Research and Public Health states that 16.5% participants had moderate to severe depressive symptoms,[14] while in present study 21.9% participants had moderate or severe depression which is more compared to the study done in China. In the study mentioned previously done in China, [14] poor self rated health status was significantly associated with higher level of depression. In present study also significant association was obtained between poorly rated health status of family member and depression. Unable to receive proper health facility for family members during such lockdown may have lead to depression amongst participants. Depression was more amongst participants who were employed especially those employed in public health sector. Possible reason may be due to involvement of public sector employees in providing essential health services and increased risk of

infection. However no statistical association was found between financial situation during lockdown and depression. Possible reason may have been less expenditure during lockdown which may have led to more savings. A study done in Hong Kong[6] using PHQ-9 questionnaire to assess depression during Corona virus pandemic 2020, showed 29.0% participants with mild depression, 12.8% having moderate, 6.20% having moderately severe and 0.8% having severe depression. In present study 31.4% participants had mild depression, 13.9% moderate, 3.9% moderately severe and 4.1% severe which is more than the study done in Hong Kong. A study done amongst ophthalmologist in India [15] had mean PHQ-9 score of 3.98 + 4.65, while present study which was among general population had mean PHQ-9 score of 6.11+ 5.595 which is almost 1.5 times more than the study amongst ophthalmologists.

## Conclusion:

More than half (53.4%) of the participants were assessed to have some level of depression, while around one-fifth (21.9%) had moderate to severe level of depression. Factors like health of family members during lockdown and significant lifestyle change were associated with depression. However financial situation during lockdown was not found to be associated with depression amongst participants. Other factors found which could affect mental health condition of participants were unavailability of substance addicted to, difference of opinion with family member resulting in quarrels and occupation of participants. Preparation should be made for large scale of population suffering from mental health problems for current pandemic and also for future similar circumstances.

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