



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Archives of Psychiatric Nursing

journal homepage: [www.elsevier.com/locate/apnu](http://www.elsevier.com/locate/apnu)

## The burden & contributing factors of psychological distress across India during the COVID pandemic

Sasmita Panigrahi<sup>a,\*</sup>, Sujata Mohapatra<sup>a</sup>, Asha P. Shetty<sup>a</sup>, Renju Sussane Baby<sup>a</sup>, Arvind Kumar Singh<sup>b</sup>

<sup>a</sup> College of Nursing, All India Institute of Medical Sciences, Bhubneswar, India

<sup>b</sup> Department of Community Medicine & Family Medicine, All India Institute of Medical Sciences, Bhubneswar, India

## ARTICLE INFO

## Keywords:

COVID-19  
SARS-Cov2  
India  
Mental health  
Psychological distress  
Lock down

## ABSTRACT

The unprecedented COVID-19 pandemic spread rapidly and engulfing the entire world, forcing people to stay home, muting the hustle and bustle of modern world with tide of fear for contracting disease and death. This brutal disease has infected millions of people worldwide, many lost their job, world economies have ravaged and many more uncountable consequences.

**Objective:** To assess the psychological distress due to COVID-19 outbreak and to determine contributing factors towards psychological distress.

**Method:** A cross-sectional survey was conducted between 12th May to 20th June 2020 & 1537 valid responses were received. Modified K10 scale was used to assess psychological distress. Binary logistic regression analysis was used to determine extent of relationship between the contributing factors and psychological distress scale by estimating the odds of having significant stress with  $P \leq 0.05$ .

**Result:** A total of 1537 valid responses were obtained. The overall psychological distress score was  $19.79 \pm .75$  which implies mild psychological distress. Analysis of degree of psychological distress revealed 815 (53.0%) with no psychological distress, 385 (25.0%) mild, 194 (12.6%) moderate and 143 respondents (9.3%) had severe degree of psychological distress. Females psychological distress was 1.448 times as compared to male ( $CI$  0.191–10.986). The odds of having significant psychological distress for above 60 years as compared to 16–30 years. Shop owner & business man had more stress in compared to professionals (OR 1.176,  $CI$  0.058–2.362). As compared to married, the psychological distress was 13.203 times higher among divorcee/separated (0.786–221.787) and 3.629 times higher among unmarried (0.376–35.054).

**Conclusion:** This study showed 39.2% of the subject had psychological distress which is quite high. So, government and other policy makers have to develop strategy to relieve psychological distress among Indian population.

## Introduction

In last two decades several infectious diseases have shaken the human civilisation by various viral outbreaks like Avian influenza in the year 2000s, the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002, the H1N1 in 2009 to 2010, the Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012, Zika virus epidemics in 2015 and now COVID-19 in 2019 (Cascella et al., 2019). It is spreading like a forest fire in the forest of mankind. This deadly outbreak was emerged from Wuhan, China in December 2019 (C. Wang et al., 2020; Y.

Wang et al., 2020) and disseminated its seed to each & every corner of the world. As of 2nd Aug 2020, 17,628,109 number of confirmed cases has been identified globally with 680,354 death whereas 1,757,393 confirmed cases and 1,149,460 death in India ([www.who.int](http://www.who.int), 2020).

Initially, the new virus was termed 2019-nCoV, later it was renamed as SARS-CoV-2 virus due to its similarity with the virus of SARS outbreak (SARS-CoVs). SARS-CoV-2 is a beta coronavirus and belongs to the *Coronaviridae* family (Cascella et al., 2019; Lee et al., 2007; Ko et al., 2006). The most common symptoms of COVID-19 are fever (>90%), malaise & dry cough (80%), shortness of breath (20%), and 15% of

\* Corresponding author.

E-mail addresses: [nurs\\_sasmita@aiimsbhubaneswar.edu.in](mailto:nurs_sasmita@aiimsbhubaneswar.edu.in) (S. Panigrahi), [nurs\\_sujata@aiimsbhubaneswar.edu.in](mailto:nurs_sujata@aiimsbhubaneswar.edu.in) (S. Mohapatra), [nurs\\_asha@aiimsbhubaneswar.edu.in](mailto:nurs_asha@aiimsbhubaneswar.edu.in) (A.P. Shetty), [nurs\\_renju@aiimsbhubaneswar.edu.in](mailto:nurs_renju@aiimsbhubaneswar.edu.in) (R.S. Baby), [arvindcmfm@aiimsbhubaneswar.edu.in](mailto:arvindcmfm@aiimsbhubaneswar.edu.in) (A.K. Singh).

<https://doi.org/10.1016/j.apnu.2021.10.003>

Received 22 January 2021; Received in revised form 23 August 2021; Accepted 18 October 2021

Available online 22 October 2021

0883-9417/© 2021 Elsevier Inc. All rights reserved.

people had respiratory distress (Abdulmohsen et al., 2020). Most of the affected peoples are asymptomatic to mild symptom who recover without special treatment but the outcome is worse among elderly people and having comorbid medical conditions like diabetes, hypertension, kidney disease and cancer (Lu et al., 2020; C. Wang et al., 2020; Y. Wang et al., 2020). The virus is transmitted from human to human through droplet infection and further, 80% of transmission occurs from pre or asymptomatic individual. Thus, home confinement is considered as the powerful weapon to contain the spread of this deadly disease (Casella et al., 2019). In India, the first COVID-19 positive case was identified on 30th January 2020 from Kerala. To contain the spread of COVID-19 pandemic, Govt of India has implemented many preventive strategies like universal screening of international passenger, mandatory quarantine for passengers arriving from COVID-19 affected country, suspension of international travel, Janata curfew, nation-wide lockdown, temporary closure of educational Institution and public awareness through mass media (Hui et al., 2020). But due to the exponential spread of COVID-19, both live and livelihood has devastated. Many people had either lost their job or got a fraction of their salaries specifically in airlines, hotels, restaurant, retailer, malls etc.

Although there are numerous advancements of medical science & technology, still emerging & re-emerging infectious diseases are the major cause of morbidity & death across the globe (Asmundson & Taylor, 2020). Outbreak of infectious diseases not only cause physical problems but also poses superfluous psychosocial problems in comparison to other existing diseases (Qiu et al., 2020). Pandemic causes many psychological problems like panic disorder, depression & anxiety disorder (Kumar et al., 2020).

Psychological distress is an unpleasant objective state of depression & anxiety that have physical & psychological manifestations. The psychological problems are not only due to mortality & morbidities associated with the disease but it has many social & economical consequences. It is obvious that individuals psychological state will be altered due to unpredictability of COVID-19 outbreak, fast-spreading of disease, continuous flashing of COVID updates in mass media and social networking sites. However, the extent to which these factors are associated with psychological wellbeing during a pandemic is not clear. The previous study also explained that psychological wellbeing of individual users to be affected tremendously during this kind of pandemic outbreak. Therefore, in this current study investigators tries to understand the psychological impact of COVID 19 outbreak and identify potential factors that contribute to psychological distress among people during this devastating outbreak. Further, the study findings will help to alleviate mental health morbidities and help stakeholders to formulate guidelines to improve psychological wellbeing. We took this study intending to assess the psychological distress due to COVID-19 outbreak and determine contributing factors towards the psychological distress.

### Study design & procedure

A cross-sectional online survey was conducted to evaluate the psychological state of the public during this COVID-19 pandemic from 12th May to 20th June 2020. People above the age of 16 years and who could answer digitally were included to participate in this study. Since, the Govt of India declared countrywide lockdown from 25th March to 31st May 2020, so it was not possible to collect the data through direct interview. Therefore, subjects were invited to participate through online mode. The questionnaire was developed in the Google form and the link was shared among various groups in social media through WhatsApp and Facebook. The sample size was calculated to be 1536 by keeping 95% as confidence level, confidence limit of 5%, design effect of 4 and anticipated frequency of 50% in [Openepi.com](https://www.openepi.com) software. Quality control of data was achieved by daily checking the responses. By 20th June 2020, total 1540 responses were received, and thus further responses were deactivated in the Google form link.

### Study tool

The tool used for the study consisted of 3 sections. *Section A* was about personal information about participants, consisting of 12 questions like age, gender, education, occupation, monthly income, marital status, type of residence, travel history, Health care worker, quarantine, contact with COVID-19 positive patient and history of the co-morbid disease condition. *Section B* was a modified Kessler-10 scale (K-10) consisted of a 5-point rating scale that helps to quantify the psychological state of people during COVID-19 outbreak. Copyright permission was obtained from the primary author of Kessler-10 scale. The developed scale had 10 question statements with a total score of 50. Higher score indicates more degree of psychological distress. The respondents could be able to express their psychological state depending on how they feel about their psychological state ranging from 1 (None of the time), 2 (A little of the time), 3 (some of the time), 4 (Most of the time) and 5 (almost all of the time). The scoring system was also adopted from K-10 scale. The degree of psychological distress was labelled into 4 categories; no psychological distress (score 1–19), mild degree of psychological distress (score between 20 and 24), moderate degree of psychological distress (score between 25 and 29) and severe degree of psychological distress (score 30–50). The content of the developed tool was validated from experts of the concerned field and the reliability of the scale was established by using *Cronbach alpha* which was found to be 0.84. *Section C* consisted of 18 questions like fear of getting COVID-19 disease, lockdown, stigma, home quarantine, an insufficient supply of PPE & hand sanitizer, online education of children, child behaviour, compromise in meeting food need, continuous flashing of COVID-19 related news.

### Ethical consideration

Ethical permission was obtained from the Institute ethics committee of AIIMS Bhubaneswar to conduct the study vide letter no: T/IM-NF/Nursing/20/03. Since there was countrywide lockdown in India and a large geographical area to be covered, so questionnaires were developed in the Google form and administered to target population in social media. In the Google form, it was mentioned about the study and its purpose. It was also mentioned that participation in the study is purely voluntary and they are free to withdraw themselves from the study without giving any reason, confidentiality and anonymity of their response will be maintained.

### Data analysis

The data were organized and analysed by using IBM SPSS 20.0 software. Categorical data were analysed by frequency and percentage, degree of psychological distress was by the mean & SD. Binomial logistic regression analysis was used to evaluate predictors of psychological distress. The psychological distress scale was dichotomised into 2 categories; a score below 19 was designated as no distress and score above 19 was taken as psychological distress.

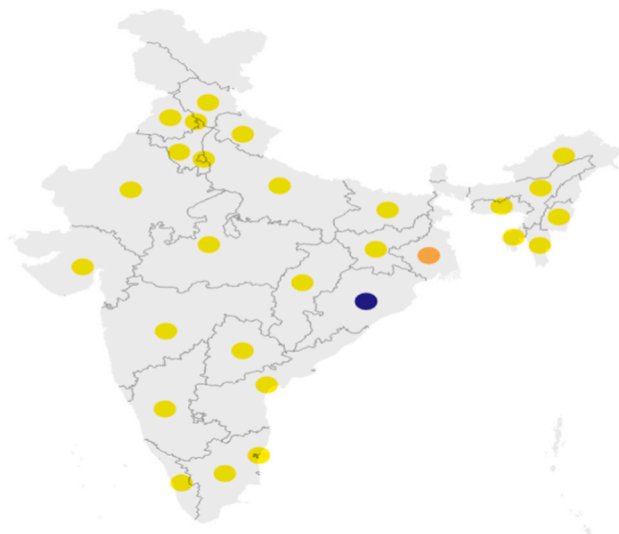
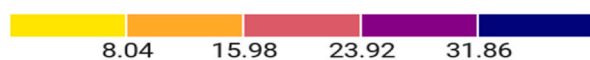
### Result

By 20th June, total 1540 responses were received and out of which 1537 participants had provided complete data regarding study variables. Responses were received from maximum states of India except for Andaman & Nicobar and Jammu & Kashmir. Maximum responses were from Odisha (39.8%), West Bengal (14.5%) and Kerala (7.7%) (Fig. 1).

### General characteristics of study population

The basic characteristics of study participants are depicted in [Table 1](#). Among 1537 respondents, 923 responses were obtained in May and 614 were in June 2020. About 57.8% were female, a majority (66%)

## [ India: State/UT wise participation ]



Map data: © OSM • Created with Datawrapper

Fig. 1. State/UT wise participation.

were belonging to the age group of 16–30 years, about 41.6% were graduate & post-graduate, 42.3% were unemployed, 61.5% were unmarried, 57.2% of the participants were from an urban area, 72.7% had no history of quarantine, only 21.3% were health care provider and only 3.5% of respondents had contact history with COVID-19 positive patient. Approximately 17% of respondents had comorbid disease conditions like hypertension, diabetes, high cholesterol, thyroid diseases, renal diseases, asthma, arthritis etc. (Table 1). (See Table 2.)

### Investigation of psychological distress during COVID 19 outbreak

The psychological distress of the general population during COVID-19 outbreak was determined by modified K10 scale. The overall score was calculated as  $19.79 \pm 6.75$  which shows mild psychological distress; among them, 815(53.0%) were found to be no psychological distress, 385 (25.0%) had mild degree of psychological distress, 194 (12.6%) participants had a moderate degree of psychological distress and 143 respondents (9.3%) had a severe degree of psychological distress (Fig. 2).

It was also determined that there was a difference in psychological distress from May than June 2020. The difference of mean psychological distress score from 1st week of data collection till the last week was 20.35, 19.66, 18.48, 17.73, 21.33, 20.14 respectively. It shows psychological distress is reducing gradually till the end of May and again it increased due to release of lockdown (Fig. 3).

### Analysis of related factors of psychological distress during the COVID-19 outbreak

Questions were asked to general population to identify the reason of their worries or psychological distress during COVID 19 outbreak, it reveals that only 44.2% of the people were having fear of getting disease, 49.4% were stressed due to lockdown, 71% of people were not having any problem with frequent hand washing & wearing of mask, 44.6% had compromise in financial, 39% had faced problem to meet

their food needs, 62.6% expressed that continuous COVID related news in mass media increases their stress level, nearly 69% of people worried due to non-availability of confirmed treatment & vaccine against COVID-19, 48.4% of partakers expressed that they were feeling safe in comparison to other country, 67.6% of participants revealed that, they will be stigmatised if they found COVID 19 positive, 32.5% disclosed that they were worried due to inadequate supply of mask, hand sanitizer, 64.8% replied that steps of government were inadequate for prevention and control of COVID-19 and only 4.7% of them were faced domestic violence during lock down period.

In binary logistic regression model, it was observed that, compared to male, females had 1.448 times psychological distress (*CI* 0.191–10.986). The odds of psychological distress increased with age, for 46–60 years *OR* 0.937 (*CI* 0.57–1.54) & >60 years *OR* 1.175 (*CI* 0.78–1.77). As compared with professionals, the psychological distress was 1.176 times (*CI* 0.058–2.362) higher among shop owner & business man. The psychological distress was 13.203 times higher among divorcee/separated (0.786–221.787) and 3.629 times higher among unmarried (*CI* 0.37–35.05). Lesser income group have comparatively less stress (*OR* 0.57, *CI* 0.35–0.93) than per capita income of Rs. >52,734. Compared to general people, health care providers had 1.508 times psychological distress (*CI* 1.124–2.023). Lockdown, wearing mask & frequent hand washing, compromise in meeting food need, mass media & stigma correlated with psychological distress (*OR* 2.627, *CI* 2.096–3.292, *OR* 1.301, *CI* 1.012–1.673, *OR* 1.455, *CI* 1.147–1.845, *OR* 1.307, *CI* 1.038–1.645, *OR* 1.469, *CI* 1.154–1.871) respectively.

### Discussion

Covid-19 has produced extensive distress and shaken the whole world. In comparison to physical symptoms of COVID-19, the mental health of public has affected to a great extent. It caused panic, fear, and stress among all strata of society (Ramasubramanian et al., 2020). Viral epidemics in the past like SARS also imposed great psychological impact on public and suggested need of social support and mental health support programme (Lee et al., 2007). Most of the countries have reported psychological distress amid COVID-19 pandemic. By late April 2020, mental health in the UK had deteriorated compared with pre-COVID-19 trends (Pierce et al., 2020).

In the present study, the mean psychological distress score was  $19.79 \pm 6.75$ , among them 815(53.0%) were found to be no psychological distress, 385(25.0%) had mild degree of psychological distress, 194 (12.6%) participants had moderate degree of psychological distress and 143 respondents (9.3%) had severe degree of psychological distress which is notable as compared with previous mental health of general public. This is supported by other study that has revealed an overall increase of mental distress; mean GHQ-12 score increased from 11.5 (95% *CI* 11.3–11.6) in 2018–19 to 12.6 (12.5–12.8) during COVID pandemic & lockdown (Pierce et al., 2020).

Around 47% of study population reported psychological distress which is similar to other studies which shows elevated levels of depression (43.3%), anxiety (45.4%), and PTSD symptoms (31.8%) (Liu et al., 2020). Unlikely, around 18.3% of Chinese population developed psychological health problems (Zhu et al., 2020). The higher rate of psychological distress among study participants may be partially attributable to the specific characteristics of our sample and pattern of increasing COVID vary from country to country.

Across gender, men show a decreasing trend from mild (348), moderate (196), severe (45) and very severe (5), as same follows in case of women; mild (535), moderate (305), severe (44) and very severe (7). On contrary to this gender-based findings, female shows increasing degree of psychological distress from normal (46.8%), through mild (55%) to severe (57.8%) distress; whereas male shows decreasing trend normal (53.2%), through mild (45.0%) to severe (42.2%) distress levels of psychological distress as revealed by a cross-sectional study conducted in Saudi Arabia (Al-Hanawi et al., 2020).

**Table 1**  
Binary logistic regression model determining predictors of psychological distress.

| Characteristics                        | Frequency (%) | No psychological distress (N%) | Psychological distress | OR     | 95% CI |         | P-value |
|--|---------------|--------------------------------|------------------------|--------|--------|---------|---------|
|  |               |                                |                        |        | Lower  | Upper   |         |
| <i>Gender</i>                          |               |                                |                        |        |        |         |         |
| Male                                   | 644 (41.9%)   | 344(22.38%)                    | 300 (19.51%)           | Ref    |        |         |         |
| Female                                 | 889 (57.8%)   | 469 (30.51%)                   | 420 (27.32%)           | 1.448  | 0.191  | 10.986  | 0.720   |
| Other                                  | 4 (0.3%)      | 2 (0.13%)                      | 2 (0.13%)              | 1.636  | 0.216  | 12.386  | 0.633   |
| <i>Age</i>                             |               |                                |                        |        |        |         |         |
| 16-30 years                            | 1015 (66%)    | 537 (34.94%)                   | 478 (31.09%)           | Ref    |        |         |         |
| 31-45 years                            | 318 (20.7%)   | 173 (11.26%)                   | 145 (9.44%)            | 0.292  | 0.107  | 0.795   | 0.016   |
| 46-60 years                            | 178 (11.6%)   | 90 (5.85%)                     | 88 (5.73%)             | 0.937  | 0.570  | 1.540   | 0.797   |
| Above 60 years                         | 26 (1.7%)     | 15 (0.97%)                     | 11(0.72%)              | 1.175  | 0.780  | 1.770   | 0.441   |
| <i>Education</i>                       |               |                                |                        |        |        |         |         |
| Professional degree                    | 604 (39.3%)   | 346 (22.51%)                   | 258 (16.79%)           | 1.137  | 0.885  | 1.462   | 0.314   |
| Graduate or postgraduate               | 640 (41.6%)   | 354 (23.03%)                   | 286 (18.61%)           | 1.802  | 1.263  | 2.570   | 0.001   |
| Intermediate, post high school diploma | 247 (16.1%)   | 103 (6.7%)                     | 144 (9.37%)            | 3.368  | 1.466  | 7.738   | 0.004   |
| Up to secondary education              | 46 (3.0%)     | 12 (0.78%)                     | 34 (2.21%)             | Ref    |        |         |         |
| <i>Occupation</i>                      |               |                                |                        |        |        |         |         |
| Unemployed                             | 650 (42.3%)   | 305 (19.84%)                   | 345 (22.45%)           | 0.668  | 0.400  | 1.117   | 0.124   |
| Unskilled worker                       | 52 (3.4%)     | 18 (1.17%)                     | 34 (2.21%)             | 0.999  | 0.477  | 2.092   | 0.999   |
| Semiskilled worker                     | 34 (2.2%)     | 17 (1.11%)                     | 1717 (1.11%)           | 0.531  | 0.296  | 0.950   | 0.033   |
| Skilled worker                         | 69 (4.5%)     | 45 (2.93%)                     | 24 (1.56%)             | 0.822  | 0.621  | 1.086   | 0.168   |
| Professional                           | 626 (40.7%)   | 369 (24.01%)                   | 257 (16.72%)           | Ref    |        |         |         |
| Clerical/shop owner/farm/business      | 106 (6.9%)    | 61(3.96%)                      | 45 (2.93%)             | 1.176  | 0.585  | 2.362   | 0.650   |
| <i>Marital status</i>                  |               |                                |                        |        |        |         |         |
| Married                                | 574 (37.3%)   | 319 (20.75%)                   | 255 (16.58%)           | Ref    |        |         |         |
| Unmarried                              | 945 (61.5%)   | 489 (31.85%)                   | 456 (29.67%)           | 3.629  | 0.376  | 35.054  | 0.265   |
| Widowed                                | 12 (0.8%)     | 2 (0.12%)                      | 10 (0.65%)             | 5.743  | 0.578  | 57.097  | 0.136   |
| Divorcee/separated                     | 6 (0.4%)      | 5 (0.32%)                      | 1(0.06%)               | 13.203 | 0.786  | 221.787 | 0.073   |
| <i>Monthly family income</i>           |               |                                |                        |        |        |         |         |
| ≤2640                                  | 173 (11.3%)   | 92 (5.98%)                     | 81(5.27%)              | 0.579  | 0.358  | 0.935   | 0.026   |
| 2641-7886                              | 146 (9.5%)    | 95 (6.18%)                     | 51(3.32%)              | 1.098  | 0.706  | 1.707   | 0.678   |
| 7887-13,160                            | 184 (12.0%)   | 95 (6.18%)                     | 89 (5.79%)             | 1.123  | 0.720  | 1.752   | 0.610   |
| 13,161-19,758                          | 185 (12.0%)   | 94 (6.11%)                     | 91 (5.92%)             | 1.776  | 1.129  | 2.795   | 0.013   |
| 19,759-26,354                          | 166 (10.8%)   | 74 (4.81%)                     | 92 (5.98%)             | 1.326  | 0.879  | 2.000   | 0.178   |
| 26,355-52,733                          | 268 (17.4%)   | 145 (9.43%)                    | 123 (8.01%)            | 1.530  | 1.039  | 2.252   | 0.031   |
| ≥52,734                                | 415 (27%)     | 220 (14.31%)                   | 195 (12.69%)           | Ref    |        |         |         |
| <i>Habitation</i>                      |               |                                |                        |        |        |         |         |
| Rural                                  | 658 (42.8%)   | 328 (21.34%)                   | 330 (21.47%)           | 0.845  | 0.677  | 1.057   | 0.140   |
| Urban                                  | 879 (57.2%)   | 487 (31.68%)                   | 392 (25.51%)           | Ref    |        |         |         |
| <i>Travel history</i>                  |               |                                |                        |        |        |         |         |
| Yes                                    | 359 (23.4%)   | 186 (12.10%)                   | 173 (11.25%)           | 1.002  | 0.763  | 1.316   | 0.987   |
| No                                     | 1178 (76.6%)  | 629 (40.92%)                   | 549 (35.72%)           | Ref    |        |         |         |
| <i>Quarantine status</i>               |               |                                |                        |        |        |         |         |
| Yes                                    | 420 (27.3%)   | 217 (14.12%)                   | 203 (13.20%)           | 0.984  | 0.757  | 1.280   | 0.906   |
| No                                     | 1117 (72.7%)  | 598 (38.91%)                   | 519 (33.77%)           | Ref    |        |         |         |
| <i>Contact history</i>                 |               |                                |                        |        |        |         |         |
| Yes                                    | 54 (3.5%)     | 33 (2.15%)                     | 21 (1.37%)             | 1.337  | 0.710  | 2.519   | 0.368   |
| No                                     | 1483 (96.5%)  | 782 (50.88%)                   | 701 (45.60%)           | Ref    |        |         |         |
| <i>HCW</i>                             |               |                                |                        |        |        |         |         |
| Yes                                    | 327 (21.3%)   | 205 (13.34%)                   | 122 (7.94%)            | 1.508  | 1.124  | 2.023   | 0.006   |
| No                                     | 1210 (78.7%)  | 610 (39.69%)                   | 600 (39.03%)           | Ref    |        |         |         |
| <i>Co-morbidity</i>                    |               |                                |                        |        |        |         |         |
| Yes                                    | 262 (17%)     | 94 (6.11%)                     | 168 (10.93%)           | 0.371  | 0.269  | 0.510   | 0.000   |
| No                                     | 1275 (83%)    | 721 (46.91%)                   | 554 (36.04%)           | Ref    |        |         |         |

The sociodemographic factors that contributing to psychological stress differed widely between studies. In this present study, younger adults were less likely to develop psychological distress (OR < 1) as compared to age >60 years (OR 1.175, CI 0.780–1.770). It may be due to younger people are more exposed to smart phone & social medias. In contrary, studies reveal that people 40 years old or below had an increased risk of anxiety than those above 40 years old (Rehman et al., 2020). In respect to gender, females had a higher risk of anxiety than males which supported by a Chinese study which reveals females had 3.01 times anxiety than males (Y. Wang et al., 2020; Rehman et al., 2020). Our study determined the psychological distress is high among

intermediate group in comparison to secondary education (OR = 3.368, 95% CI 1.466–7.738), and decreases with increase of education which is supported by a study conducted by Wang Y et al. which reveals master degrees had a less depression risk compared to bachelor's degree. Our study also identified factors like marital status, contact with COVID patient & travel history to/from COVID affected area were correlated with psychological distress. This may be due to direct contact with COVID patient difficult to balance professional, personal & family life (Aksoy & Kocak, 2020; Zhu et al., 2020; Al-Hanawi et al., 2020).

Stigma causes more stress (OR = 1.469, 95% CI 1.154–1.871) as previous studies reported stigma and the uncertainty about the

**Table 2**  
Binary logistic regression model of psychological distress related factors of general public during COVID 19 outbreak.

| Sl no | Contributing factor   | f (%)        | No psychological distress | Psychological distress | OR           | 95% CI       |              | P-value      |
|-------|---|--------------|---------------------------|------------------------|--------------|--------------|--------------|--------------|
|       |   |              |                           |                        |              | Lower        | Upper        |              |
| 1     | Fear of getting Covid-19 disease  |              |                           |                        |              |              |              |              |
|       | Yes   | 679 (44.2%)  | 306 (19.9%)               | 373 (24.3%)            | <b>1.507</b> | <b>1.197</b> | <b>1.897</b> | <b>0.000</b> |
|       | No  | 858 (55.8%)  | 509 (33.1%)               | 349 (22.7%)            | <b>Ref</b>   |              |              |              |
| 2     | Feeling stressed due to lockdown  |              |                           |                        |              |              |              |              |
|       | Yes   | 759 (49.4%)  | 293 (19.1%)               | 466 (30.3%)            | <b>2.627</b> | <b>2.096</b> | <b>3.292</b> | <b>0.000</b> |
|       | No  | 778 (50.6%)  | 522 (34%)                 | 256 (16.6%)            | <b>Ref</b>   |              |              |              |
| 3     | Worried for wearing mask & frequent hand washing                                |              |                           |                        |              |              |              |              |
|       | Yes   | 450 (29.3%)  | 190 (12.4%)               | 260 (17%)              | <b>1.301</b> | <b>1.012</b> | <b>1.673</b> | <b>0.087</b> |
|       | No  | 1087 (70.7%) | 625 (40.6)                | 462 (30%)              | <b>Ref</b>   |              |              |              |
| 4     | Worried as organization is not allowing work from home                          |              |                           |                        |              |              |              |              |
|       | Yes   | 228 (14.8%)  | 113 (7.3%)                | 115 (7.5%)             | 1.194        | 0.866        | 1.647        | 0.280        |
|       | No  | 1309 (85.1%) | 702 (45.7%)               | 607 (39.5%)            | <b>Ref</b>   |              |              |              |
| 5     | Worried due to home quarantine  |              |                           |                        |              |              |              |              |
|       | Yes   | 246 (16.0%)  | 99 (6.4%)                 | 147 (9.6%)             | 0.779        | 0.571        | 1.064        | 0.117        |
|       | No/NA   | 1291(84%)    | 716 (46.6%)               | 575 (37.4%)            | <b>Ref</b>   |              |              |              |
| 6     | Compromise of financial security  |              |                           |                        |              |              |              |              |
|       | Yes   | 686 (44.6%)  | 343 (22.3%)               | 343 (22.3%)            | 0.896        | 0.711        | 1.129        | 0.353        |
|       | No  | 851 (55.4%)  | 472(30.7%)                | 379 (24.7%)            | <b>Ref</b>   |              |              |              |
| 7     | Feel compromised in meeting food need   |              |                           |                        |              |              |              |              |
|       | Yes   | 599 (39%)    | 320 (20.8%)               | 279 (18.1%)            | <b>1.455</b> | 1.147        | 1.845        | 0.002        |
|       | No  | 938 (61%)    | 495 (32.3%)               | 443 (28.8%)            | <b>Ref</b>   |              |              |              |
| 8     | Awareness through mass media reduces stress                                     |              |                           |                        |              |              |              |              |
|       | Yes   | 959 (62.4%)  | 531 (34.5%)               | 428 (27.9%)            | <b>1.307</b> | 1.038        | 1.645        | 0.023        |
|       | No  | 578(37.6)    | 284 (18.5%)               | 294 (19.1%)            | <b>Ref</b>   |              |              |              |
| 9     | Stressed due to continuous COVID 19 related news                                |              |                           |                        |              |              |              |              |
|       | Yes   | 962 (62.6%)  | 445 (29%)                 | 517 (33.6%)            | 0.815        | 0.636        | 1.045        | 0.106        |
|       | No  | 575 (37.4%)  | 370 (24.1%)               | 205 (13.3%)            | <b>Ref</b>   |              |              |              |
| 10    | Think less risk in comparison to other country                                  |              |                           |                        |              |              |              |              |
|       | Yes   | 744 (48.4%)  | 368 (23.9%)               | 376 (24.5%)            | 0.839        | 0.670        | 1.051        | 0.126        |
|       | No  | 793 (51.6%)  | 447 (29.1%)               | 346 (22.5%)            | <b>Ref</b>   |              |              |              |
| 11    | Worried due to non availability of treatment                                    |              |                           |                        |              |              |              |              |
|       | Yes   | 1055 (68.6%) | 505 (32.8%)               | 550 (35.8%)            | 0.769        | 0.593        | 0.997        | 0.048        |
|       | No  | 482 (31.4%)  | 310 (20.2%)               | 172 (11.2%)            | <b>Ref</b>   |              |              |              |
| 12    | People will stigmatise if develop COVID 19                                      |              |                           |                        |              |              |              |              |
|       | Yes   | 1039 (67.6%) | 502 (32.7%)               | 537 (34.9%)            | <b>1.469</b> | <b>1.154</b> | <b>1.871</b> | <b>0.002</b> |
|       | No  | 498 (32.4%)  | 313 (20.4%)               | 185 (12%)              | <b>Ref</b>   |              |              |              |
| 13    | Feeling nervous as vulnerable for getting infection                             |              |                           |                        |              |              |              |              |
|       | Yes   | 569 (37%)    | 274 (17.8%)               | 295 (19.2%)            | 1.184        | 0.923        | 1.519        | 0.184        |
|       | No  | 968 (63%)    | 541 (35.2%)               | 427 (27.8%)            | <b>Ref</b>   |              |              |              |
| 14    | Inadequate supply of mask, hand sanitizer, hand wash solution                   |              |                           |                        |              |              |              |              |
|       | Yes   | 500 (32.5%)  | 230 (15%)                 | 270 (17.6)             | <b>1.442</b> | <b>1.123</b> | <b>1.850</b> | <b>0.004</b> |
|       | No  | 1037 (53.3%) | 585 (38%)                 | 452 (29.4)             | <b>Ref</b>   |              |              |              |
| 15    | Worried as steps of govt is inadequate towards control & prevention of COVID 19 |              |                           |                        |              |              |              |              |
|       | Yes   | 541 (35.2%)  | 246 (16%)                 | 295 (19.2%)            | 0.947        | 0.743        | 1.207        | 0.659        |
|       | No  | 996 (64.8%)  | 569 (37%)                 | 427 (27.8%)            | <b>Ref</b>   |              |              |              |
| 16    | Online education of child   |              |                           |                        |              |              |              |              |
|       | Yes   | 267 (17.4%)  | 143 (9.3%)                | 123 (8%)               | 0.634        | 0.411        | 0.979        | 0.040        |
|       | No  | 297 (19.3%)  | 190 (12.4%)               | 107 (7%)               | <b>Ref</b>   |              |              |              |
|       | Not applicable  | 973 (63.3%)  | 482 (31.4%)               | 491 (31.9%)            | 0.556        | 0.359        | 0.860        | 0.008        |
| 17    | Abnormal reaction of child  |              |                           |                        |              |              |              |              |
|       | Yes   | 251 (16.3%)  | 109 (7.1%)                | 142 (9.2%)             | <b>1.083</b> | <b>0.778</b> | <b>1.509</b> | <b>0.000</b> |
|       | No  | 324 (21.1%)  | 220 (14.3%)               | 104 (6.8%)             | <b>Ref</b>   |              |              |              |
|       | Not applicable  | 962 (62.6)   | 486 (31.6%)               | 476 (31%)              | 1.876        | 1.190        | 2.956        | 0.000        |
| 18    | Domestic violence   |              |                           |                        |              |              |              |              |
|       | Yes   | 72 (4.7%)    | 33 (2.1%)                 | 39 (2.6%)              | 0.862        | 0.504        | 1.475        | 0.588        |
|       | No  | 1465(95.3%)  | 782 (50.9%)               | 683 (44.4%)            | <b>Ref</b>   |              |              |              |

consequence of the infection are the two main causes of the negative feelings and thoughts among COVID-19 patients (Guo et al., 2020). Similar findings reported in Indonesia which mentioned the negative social stigma that arises in society is largely due to rejection due to fear of contracting COVID-19. Many people refuse to recover patients who return to their territory, reject the patient's family, reject health workers and all individuals who fall into the positive, suspicious and surveillance categories (Nursalam et al., 2020).

Lock down more likely to create significant psychological distress (OR = 2.627 95% CI 2.096–3.292). A similar phenomenon was observed where significantly higher levels of depression were observed ( $F_{1,1378} = 5.51, P = 0.019, \eta_p^2 = 0.004$ ) among those who were locked down. Due to lock down freedom was limited, people lost their job, educational

institution closed, basic requirement was compromised & people did not know how long the epidemic and lockdown would last. Such uncertainty may have influenced the increase in the levels of depression and perceived stress during lockdown (Zhu et al., 2020; Gan et al., 2020).

In addition to these above probable factors, fear of getting COVID-19 disease (OR = 1.507, 95% CI 1.197–1.897), unavailability of hand sanitizer and PPE including mask (OR = 1.442, 95% CI 1.123–1.850) and continuous wearing of mask (OR = 1.301, 95% CI 1.012–1.673) are more like to create psychological distress. Other possible factors include media coverage and misinformation about the COVID-19 outbreak in social media (Al-Hanawi et al., 2020). Other commonly reported contributing factors of psychological distress during COVID pandemic are compromised financial security, unverified voluminous information

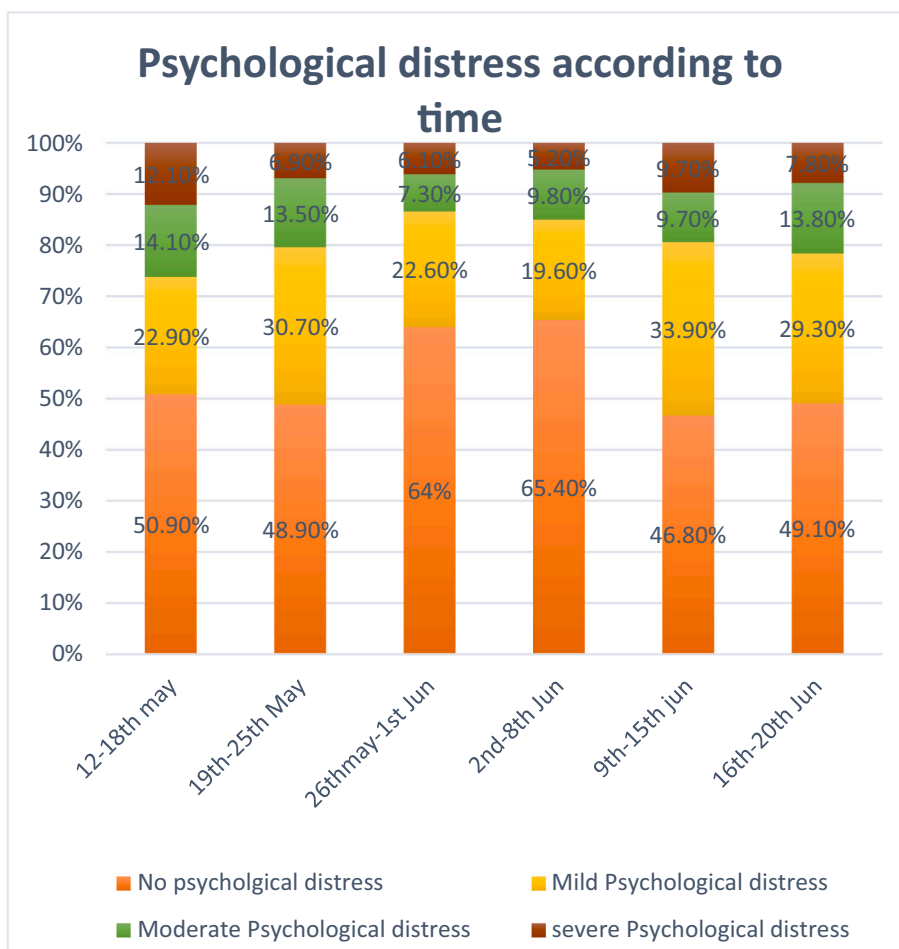


Fig. 2. Distribution of psychological distress according to time.

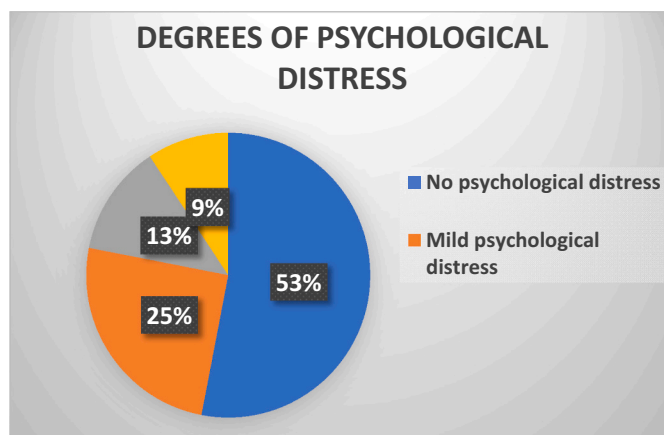


Fig. 3. Degrees of psychological distress.

in social media & mass media (Ramasubramanian et al., 2020) which is analogous to our study findings.

The results of this study generate comprehensive insight to contributing factors of psychological distress. Arguably psychological distress among public is not only pertaining to India, but certain factors lead to deteriorate psychological state in whole world. This study findings underlines the need of mental health assistance to vulnerable section of society like female, elderly, unemployed, businessman & shop owner, health care professionals etc.

**Limitation**

Although this study finding has made significant contributions that can be used by the government and other agencies to confront the adverse psychological impacts of Indian population during Covid-19 pandemic. Still here are some limitations of this study. Firstly, the researchers utilised online Google forms for collection of data that hindered the participation of a larger section of the population specifically those who do not have internet access and smart phone usage. Secondly, self-reported psychological state bias may substantially affect interpretation of our result. Thirdly, an equal number of responses were not obtained from each state and union territory and finally this is a cross-sectional study & follow-up were not done.

**Conclusion**

COVID-19 pandemic has created stress across all spheres of human life. This study shows 47% of the public had psychological distress which is quite high. This would help the mental health professionals and the policymakers to institute appropriate mental health efforts and solutions during this crisis period in order to bring normalcy within different strata of population.

**Recommendation**

Health authorities should develop mental health services and systems for public.

## Funding

The authors have not received any financial grant for research, authorship and publication of this research article.

## Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Acknowledgements

We would like to thank to our institution for permission and participants for their response.

## References

- Abdulmohsen, H., Rohaimi, A., & Otaibi, F. A. (2020). Novel SARS-CoV-2 outbreak and COVID-19 disease; a systemic review on the global pandemic. *7*(4), 491–501. <https://doi.org/10.1016/j.gendis.2020.06.004>
- Aksoy, Y. E., & Kocak, V. (2020). Psychological effects of nurses and midwives due to COVID-19 outbreak: The case of Turkey. *Archives of Psychiatric Nursing*, *34*(5), 427–433. <https://doi.org/10.1016/j.apnu.2020.07.011>
- Al-Hanawi, M. K., Mwale, M. L., Alshareef, N., Qattan, A., Angawi, K., Almubark, R., & Alsharqi, O. (2020). Psychological distress amongst health workers and the general public during the COVID-19 pandemic in Saudi Arabia. *Risk Management and Healthcare Policy*, *13*, 733–742. <https://doi.org/10.2147/RMHP.S264037>
- Asmundson, G. J. G., & Taylor, S. (2020). Coronaphobia: Fear and the 2019-nCoV outbreak. *Journal of Anxiety Disorders*, *70*, 102196. <https://doi.org/10.1016/j.janxdis.2020.102196>
- Cascella, M., et al. (2019). *Features, evaluation and treatment coronavirus (COVID-19)*. Stat Pearls Publishing LLC. <https://www.ncbi.nlm.nih.gov/books/NBK554776/> (PMID: 32150360).
- Gan, Y., et al. (2020). Immediate and delayed psychological effects of province-wide lockdown and personal quarantine during the COVID-19 outbreak in China. *Psychological Medicine*, *13*, 1–12. <https://doi.org/10.1017/S0033291720003116>
- Guo, Q., et al. (2020). Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study. *Brain, Behavior, and Immunity*, *88*, 17–27. <https://doi.org/10.1016/j.bbi.2020.05.038>
- Hui, D. S., et al. (2020). The continuing 2019-nCoV epidemic threat of novel Coronaviruses to global health — The latest 2019 novel coronavirus outbreak in Wuhan, China. *International Journal of Infectious Diseases*, *91*, 264–266. <https://doi.org/10.1016/j.ijid.2020.01.009>
- Ko, C. H., Yen, C. F., Yen, J. U., & Yang, M. J. (2006). Psychosocial impact among the public of the severe acute respiratory syndrome epidemic in Taiwan. *Psychiatry and Clinical Neurosciences*, *60*(4), 397–403. <https://doi.org/10.1111/j.1440-1819.2006.01522.x>
- Kumar, S. U., Kumar, D. T., Christopher, B. P., & Doss, C. G. P. (2020). The rise and impact of COVID-19 in India. *Frontiers in Medicine*, *7*, 250. <https://doi.org/10.3389/fmed.2020.00250>
- Lee, A. M., et al. (2007). Stress & psychological distress among SARS survivors 1 year after the outbreak. *Canadian Journal of Psychiatry*, *52*(4), 233. <https://doi.org/10.1177/070674370705200405>
- Liu, C. H., et al. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health. *Psychiatry Research*, *290*, Article 113172. <https://doi.org/10.1016/j.psychres.2020.113172>
- Lu, R., et al. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: Implications for virus origins and receptor binding. *Lancet*, *395*(10224), 565–574. [https://doi.org/10.1016/S0140-6736\(20\)30251-8](https://doi.org/10.1016/S0140-6736(20)30251-8)
- Nursalam, N., et al. (2020). Risk factors for psychological impact and social stigma among people facing covid-19: A systematic review. *Systematic Review in Pharmacy*, *11*(6), 1022–1028. <https://doi.org/10.31838/srp.2020.6.146>
- Pierce, M., et al. (2020). Mental health before and during the COVID-19 pandemic: A longitudinal probability sample survey of the UK population. *Lancet Psychiatry*, *7*(10), 883–892. [https://doi.org/10.1016/S2215-0366\(20\)30308-4](https://doi.org/10.1016/S2215-0366(20)30308-4) (Epub 2020 Jul 21).
- Qiu, J., et al. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *General Psychiatry*, *33*(2). <https://doi.org/10.1136/gpsych-2020-100213>
- Ramasubramanian, V., et al. (2020). State-wide survey of psychological distress among people of Tamil Nadu in the COVID-19 pandemic. *Indian Journal of Psychological Medicine*, *42*(4), 368–373. <https://doi.org/10.1177/2F0253717620935581>
- Rehman, U., et al. (2020). Depression, anxiety and stress among Indians in times of Covid-19 lockdown. *Community Mental Health Journal*. <https://doi.org/10.1007/s10597-020-00664-x>
- Wang, C., et al. (2020a). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research*, *17*(5), 1729. <https://doi.org/10.3390/ijerph17051729>
- Wang, Y., et al. (2020b). Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. *Psychology, Health & Medicine*. <https://doi.org/10.1080/13548506.2020.1746817>
- [www.who.int](http://www.who.int). (Accessed 14 August 2020).
- Zhu, Z., et al. (2020). The psychological status of people affected by the COVID-19 outbreak in China. *Journal of Psychiatric Research*, *129*, 1–7. <https://doi.org/10.1016/j.jpsychires.2020.05.026>