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## A cross-sectional study of prevalence and predictors of psychological distress during COVID-19 pandemic among the Indian population

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### Abstract

**Objective:** To assess the prevalence of psychological distress and identify the predictors and factors associated with the distress during the onset of the COVID-19 pandemic among the Indian population.

**Materials and methods:** An online cross-sectional study with a semi-structured questionnaire was used to assess the psychological distress using the General Health Questionnaire (GHQ-12) among Indians. Descriptive statistics and the prevalence of psychological distress were calculated. A chi-square test was done to find the association between the independent variables and psychological distress. Factors that are significantly associated with psychological distress were further analysed using multiple logistic regression analysis to identify the predictors.

**Results:** 846 responses were obtained with a mean age of 32 years ( $32.45 \pm 11.44$ ). 35% (n=290) had significant psychological distress with a mean GHQ-12 score of 2.37. Factors associated were age ( $p=0.002$ ), family members having COVID-19 symptoms ( $p=0.017$ ), lockdown distress ( $p=0.0001$ ), source of health information ( $p=0.041$ ), perception that information by social media increased fear ( $p=0.0001$ ), the likelihood of family contracting COVID-19 ( $p=0.022$ ), the pattern of food consumption ( $p=0.0001$ ) and worry about financial burden during lockdown ( $p=0.0001$ ). By logistic regression analysis, we found increased odds of developing psychological distress among the participants aged less than 40 years ( $OR=1.49$ ,  $C.I.=1-2.249$ ,  $p=0.050$ ); people who felt distressed due to the lockdown situation ( $OR=2.31$ ,  $C.I.=1.694-3.162$ ,  $p=0.0001$ ); individuals whose fear increased due to social media information ( $OR=1.55$ ,  $C.I.=1.144-2.113$ ,  $p=0.005$ ) and participants whose food pattern increased during the lockdown period ( $OR=1.41$ ,  $C.I.=1.035-1.923$ ,  $p=0.029$ ).

**Conclusion:** Nearly a third of the participants were in a state of psychological distress which transcended topographical barriers with factors such as being less than 40 years of age, accessing health information through social media, a pattern of food consumption being increased and being in the lockdown situation as predictors of psychological distress.

### Keywords

COVID-19, pandemic, mental health, social media, healthcare workers, misinfodemics

## INTRODUCTION

Pandemics have been a phenomenon throughout the history of humankind with the last one being the Spanish flu which happened a century ago. This was long before the origins of modern psychiatry as a science and a clinical specialty. In view of that, modern psychiatry did not have much of an opportunity to view such significant phenomenon through its clinical and scientific lens. Infectious outbreaks are more common in the developing world than the developed world and so there has not been much research in this area. (Huremović D, 2019). Preparatory measures for such outbreaks focus on rapid quarantine, vaccines, researching and developing antiviral treatments and economic concerns but rarely do they address the mental health consequences (Ferguson et al., 2006; Reina, 2008). The World Health Organization (WHO) declared the COVID-19 outbreak as a global health emergency on 31 January 2020 and subsequently declared it as a pandemic on 11 February 2020 (WHO, 2020). The infections can be transmitted between individuals via close contact and some of them could even develop fatal respiratory diseases like acute respiratory distress syndrome and acute respiratory failure and ending up in intensive care (Huang et al., 2020; Wang et al., 2020).

Outbreaks of infectious disease like COVID-19 is associated with psychological distress (Bao et al., 2020). The distress usually has its origins in media misinformation that preys on the uncertainty and doubts people feel. This metamorphoses into panic which can reduce the coping resources of people (Vivian Kapil, V., 2020). There will be a mental health crisis in countries with a high COVID-19 case load and which, in turn, would necessitate psychosocial crisis interventions (Dong and Bouey, 2020). Lack of knowledge about COVID-19 and the overwhelming nature of news might culminate in anxiety in the public (Shigemura et al., 2020) which via social media can quickly spread like a forest fire. This is termed a misinfodemic. The rapid transmission of this virus will increase the chances of psychological distress in different sub-populations. This is not limited to healthcare workers alone, which could be due to quarantine measures, a predominantly negative news portrayal, a growing number of people infected and affected by the deaths all around the globe (Li et al., 2020). Being away from loved ones, restriction of freedom and the boredom of the lockdown can all have varying impacts (Brooks et al., 2020). Lockdown could have varied impacts on different age groups for instance, parents may find it difficult to engage their children at home all day and this could itself be a source of stress. Older people and households with elders would become distressed as they are highly

vulnerable to the COVID-19 infection. Lockdown measures had both psychological (Sharma et al., 2020; Roy et al., 2020; Rahul Krishana et al., 2020; Chakraborty and Chatterjee, 2020) and financial ramifications (Bezerra et al., 2020). Lockdown measures could also have given rise to unhealthy eating patterns, stress related eating and there could be links between the presence of depressive symptoms and weight gain (Fernandez-Rio et al., 2020). Even though there is medical interest with regard to a pandemic, there have not been many efforts to study the various factors underlying worry about infection and subsequent behavioural responses (Goodwin et al., 2011). Previous research on Avian influenza H5N1 transmission (Lau et al., 2008) and on psychological responses to severe acute respiratory syndrome (SARS) (Blendon et al., 2004) revealed that risk perceptions of infection to be a predictor of a range of preventive behaviours.

India went into nationwide lockdown around late March 2020 even before the infection rates reached its peak. We wanted to examine the behavioural responses to the lockdown, such as patterns of food intake, substance use, and preventive measures undertaken (hand washing, wearing masks) in the wake of a pandemic and people's opinions about infection (spread of infection), and their sources of health information in the digital era. With the country in lockdown, and even before the infection rates reached their peak, identifying the prevalence of psychological distress in a diverse country like India would give us some insights into the factors that could be associated with predicting pandemic distress in the future.

## MATERIALS & METHODS

### *Setting and participants*

We conducted a web-based cross-sectional study among the general population in the states afflicted by COVID-19. Participants above 18 years of age, able to read, write, understand the English language and willing to participate in the study were included.

### *Procedure*

In view of adhering to government guidance on preventing the spread of COVID-19 through droplets or contact, and to immediately collect the responses, we conceived an online survey questionnaire and adopted data collection through an online platform. As online studies can also provide results similar to paper and pencil methods (MA and Fisher, 2002), we created a Google form containing a semi-structured questionnaire covering the demographic data, knowledge and concerns

about COVID-19, precautionary measures taken etc. It also contained a General Health Questionnaire (GHQ-12) to assess psychological distress.

Expedited ethics approval was obtained from the Institutional Ethics Committee (REF: IEC-NI/20/May/75/37 (COVID-19) of Sri Ramachandra Institute of Higher Education and Research (SRIHER), Chennai, India, that conforms to the principles embodied in the declaration of Helsinki.

As per the Indian Council of Medical Research (ICMR) national guidelines for the ethics committee reviewing biomedical and health research during the COVID-19 pandemic, we registered our study with the Clinical Trial Registry of India. Investigators underwent online training in the psychological care of patients with COVID-19, an initiative by the Indian government. The principal investigator also took part in a continuous professional development activity titled 'COVID-19 and mental health: caring for the public and ourselves' with the American Psychiatric Association before the initiation of the study.

We used a snowball sampling technique and Google forms were sent individually through electronic media (email and on social media) from 1-31 May 2020 to individuals above 18 years of age who had access to the internet. This took 5-8 minutes to complete and no reminders were given for participants. No personal identification information was collected to ensure anonymity and confidentiality. Participants were provided information about the purpose, basic information about the study, COVID-19 helpline numbers, and the contact details of the investigators to address any further queries regarding mental health or about the study. Participation was purely voluntary and included the right to withdraw from the study at any moment without providing any justification. The questionnaire also mentioned that withdrawal will not hamper any further approach to the investigators if they had any queries. At the end of the questionnaire, participants were also provided with health information regarding precautionary measures against COVID-19 and tips to take care of their mental health.

#### ***Instruments – General Health Questionnaire (GHQ – 12)***

The GHQ is a self-administered screening tool with good specificity, reliability, and high sensitivity (Endsley, Weobong and Nadkarni, 2017) and used to assess psychological distress in the general population (Doi and Minowa, 2003), cross-cultural settings (Donath, 2001). The GHQ created by David Goldberg in 1978 consists of 60 items and multiple versions are available. The GHQ-12

is the most popular due to its simplicity – it consists of 12 items, where the questions are phrased in both positive and negative directions. We followed the bi-modal scoring where total scores ranged from 0 to 12 and a cut-off score of 2 was taken as psychological distress (Endsley, Weobong and Nadkarni, 2017).

#### ***Statistical analysis***

All statistical analysis was performed using the Statistical Package for Social Science (SPSS Version 17) for Microsoft Windows. Descriptive statistics were presented as numbers and percentages and prevalence of psychological distress was also calculated. A chi-square test was done to find the association between the independent variables and the outcome measures (GHQ-12 scores) with odds ratio (OR) 95% confidence interval (CI). Factors which were significantly associated with psychological distress were analysed using multiple logistic regression analysis which could identify the factors that predicted the odds of developing psychological distress. A two-sided p value <0.05 was considered statistically significant.

## **RESULTS**

We received a total of 846 valid completed responses from 21 states throughout India. 290 participants out of 846 which amounts to around 35% are in a state of psychological distress with their GHQ-12 scores above the cut-off. Most of the participants in the study were from southern states such as Tamil Nadu, Pondicherry, Kerala, Andhra Pradesh, Telangana, Karnataka, and with the majority of the responses from Tamil Nadu. The remaining responses from 16 states were categorised as the rest of India.

The mean age of the sample was 32 years ( $32.45 \pm 11.44$ ) where the majority of the participants were relatively younger. 79% (673) of the study sample were less than 40 years' old.

Mean GHQ-12 scores of the participants were 2.37 ( $2.43 \pm 2.91$ ) which is well above the cut-off scores for psychological distress indicating many people being in a state of psychological distress in the wake of the pandemic. The proportion of males and females were almost similar in our study. Doctors/healthcare workers constituted the majority of the participants who had higher mean distress scores. The majority of the participants had knowledge about the ways infection spreads. The predominant source of health information was through social media and mass media as reported by the participants and mean distress scores were high. More than half of the participants

reported that social media information increased their fears and the mean distress scores were also very high.

Participants were asked to give their opinion on: if the lockdown was making them feel distressed, information regarding the spread of infection via droplets, contaminated objects, airborne route and other routes. Also, if the information by social media about COVID-19 increased their fear, the likelihood of their family contracting COVID-19 and the perception of the current situation.

The majority of the participants reported that they undertook precautionary measures such as washing hands, use of hand sanitiser, wearing face masks, taking prophylactically hydroxychloroquine, avoiding people with COVID-19 symptoms and avoiding going out of home unless necessary during the lockdown. An incredibly overwhelming response from 85% of the participants' said we have to accept the situation and stay positive – their mean distress scores were slightly lower than participants who gave other responses. More than half said they were feeling distressed due to the lockdown and also distressed about the financial burden affecting the family.

All the demographic characteristics and percentage of responses can be seen in Table 1.

Association between various variables and distress scores were done along with calculation of odds ratio which are depicted in Table 2.

Chi-square test revealed there was significant association between age ( $p = 0.002$ ), family members having symptoms of COVID-19 ( $p = 0.017$ ), lockdown distress ( $p = 0.0001$ ), source of health information ( $p = 0.041$ ), perception that information by social media increased fear ( $p = 0.0001$ ), likelihood of family contracting COVID-19 ( $p = 0.022$ ), pattern of food consumption ( $p = 0.0001$ ), worry about financial burden during lockdown and psychological distress ( $p = 0.0001$ ).

Factors which showed a significant association with psychological distress such as age, family members having symptoms of COVID-19, lockdown distress, source of health information, perception that information by social media increased fear, likelihood of family contracting COVID-19, pattern of food consumption and worry about financial burden during lockdown were analysed using logistic regression analysis and odds ratio was calculated which can be seen in Table 3.

Individuals aged less than 40 years had 1.49 times the

increased odds of developing psychological distress. Participants who responded that they felt distressed due to the lockdown situation had 2.31 times the increased odds of developing psychological distress. Participants who felt that information from social media increased fear had 1.55 times the increased odds of developing psychological distress. Individuals whose pattern of food consumption increased during this period had 1.41 times the increased odds of developing psychological distress.

## DISCUSSION

Around 35% ( $n=290$ ) of the participants were in a state of psychological distress in the country even before the number of people infected with COVID-19 reached its peak in India. This shows the mental health impact of this pandemic even when the infection rates were lower. A study on the psychological impact of COVID-19 on the general public documented the role of COVID-19 as a risk factor to develop a potential psychiatric disorder among vulnerable individuals (Serafini et al., 2020). Many studies reported that various psychological problems faced by the general public were pervasive anxiety, frustration and boredom, disabling loneliness, poor resilience, specific and uncontrolled fears related to infection, and significant lifestyle changes. A study conducted among the people of Kashmir revealed that a high proportion of respondents had depression, anxiety, and stress-related problems during the COVID-19 pandemic (Sheikh Shoib et al., 2021).

The impact of COVID-19 pandemic has transcended topographical barriers and with the information age that we live in, the suffering faced by some people is quite palpable due to massive influence of social media and the internet. This is quite evident in our study where 290 participants are in a state of psychological distress with mean GHQ-12 scores above the cut-off value in various states of India with diverse socio-cultural beliefs.

Despite females having relatively higher distress scores than males, it was not statistically significant. This is contrary to previous researches that found a higher psychological burden among women than men (Gao et al., 2020). The mean distress scores of both males and females were above the cut-off scores indicating that the mental health impact of the pandemic goes beyond gender. Even though females multitask between various roles, and more so in these changing times, and with the general prevalence of depression, anxiety being more among females (Steel et al., 2014), there was no association between gender and distress scores which shows that the mental health impact of the pandemic transcended demographics. These

**Table 1:** Demographic characteristics of study population (N= 846).

Variables	Groups	Frequency (%)	Mean $\pm$ SD of GHQ-12 scores
Gender	Male	416 (49.2%)	2.17 $\pm$ 2.69
	Female	430 (50.8%)	2.57 $\pm$ 3.10
Occupation	Doctors/healthcare workers	326 (38.5%)	2.71 $\pm$ 3.10
	Engineers	152 (18%)	2.41 $\pm$ 2.84
	Teachers	82 (9.7%)	1.55 $\pm$ 2.46
	Home makers	51 (6%)	2.43 $\pm$ 3.29
	Business/self-employed	83 (9.8%)	2.30 $\pm$ 3.07
	Students	67 (7.9%)	2.49 $\pm$ 2.70
	Others (legal, media, government employees)	85 (10.1%)	1.73 $\pm$ 2.10
	Higher secondary	16 (1.9%)	3.81 $\pm$ 3.63
	Bachelors/diploma	407 (48.1%)	2.23 $\pm$ 2.75
Education	Masters	401 (47.4%)	2.45 $\pm$ 2.98
	PhD	22 (2.6%)	2.45 $\pm$ 3.59
	Tamil Nadu	488 (57.6%)	2.42 $\pm$ 2.88
	Kerala	102 (12.1%)	2.04 $\pm$ 2.91
Residence	Pondicherry	67 (8%)	2.31 $\pm$ 2.95
	Andhra Pradesh & Telangana	42 (4.9%)	2.19 $\pm$ 3.03
	Karnataka	50 (5.9%)	2.18 $\pm$ 2.79
	Rest of India	97 (11.5%)	2.68 $\pm$ 3.03
Children less than 18 years of age in family	Yes	310 (36.6%)	2.68 $\pm$ 3.15
	No	536 (63.4%)	2.19 $\pm$ 2.74
Older adults more than 60 years of age in family	Yes	531 (62.8%)	2.56 $\pm$ 3.05
	No	315 (37.2%)	2.06 $\pm$ 2.63
Going out for work currently	Yes	244 (28.8%)	2.38 $\pm$ 2.82
	No	602 (71.2%)	2.37 $\pm$ 2.94
Is the lockdown making you feel distressed?	Very likely	97 (11.5%)	4.4 $\pm$ 3.76
	Somewhat likely	344 (40.7%)	2.72 $\pm$ 2.86
	Not very likely	251 (29.7%)	1.77 $\pm$ 2.53
	Not likely at all	154 (18.1%)	1.30 $\pm$ 2.10
Spread of infection via droplets route	Agree	737 (87.1%)	2.36 $\pm$ 2.90
	Disagree	28 (3.3%)	2.29 $\pm$ 3.16
	Don't know	81 (9.6%)	2.48 $\pm$ 2.89
Spread of infection via contaminated objects	Agree	738 (87.3%)	2.39 $\pm$ 2.91
	Disagree	46 (5.4%)	2.22 $\pm$ 2.98
	Don't know	62 (7.3%)	2.27 $\pm$ 2.79
Spread of infection via airborne route	Agree	334 (39.5%)	2.62 $\pm$ 3.05
	Disagree	325 (38.4%)	2.30 $\pm$ 2.92
	Don't know	187 (22.1%)	2.05 $\pm$ 2.58
Spread of infection via other routes	Agree	216 (25.5%)	2.41 $\pm$ 2.93
	Disagree	152 (18%)	2.38 $\pm$ 2.99
	Don't know	478 (56.5%)	2.35 $\pm$ 2.88
Main source of health information	Social media (WhatsApp/Facebook/Instagram/ Twitter/YouTube)	340 (40.2%)	2.69 $\pm$ 3.10
	Mass media (TV/radio/newspapers)	341 (40.3%)	2.23 $\pm$ 2.75
	Official sources (Governments/WHO/CDC/research articles)	144 (17%)	1.99 $\pm$ 2.72
	Family members/friends	21 (2.5%)	2.24 (3.14)
Information by social media about COVID-19 increased my fear	Yes	451 (53.3%)	2.81 $\pm$ 3.05
	No	395 (46.7%)	1.87 $\pm$ 2.66
Likelihood of family contracting COVID-19	Very likely	63 (7.5%)	2.98 $\pm$ 3.13
	Somewhat likely	209 (24.7%)	2.73 $\pm$ 3.02
	Not very likely	238 (28.1%)	2.17 $\pm$ 2.81



Continued Table 1: Demographic characteristics of study population (N= 846).

Variables	Groups	Frequency (%)	Mean $\pm$ SD of GHQ-12 scores
Preventive measures undertaken (wash hands, use sanitiser, wearing masks)	Not likely at all	155 (18.3%)	2.08 $\pm$ 2.96
	Do not know	181 (21.4%)	2.25 $\pm$ 2.72
	Always	151 (17.8%)	2.13 $\pm$ 2.84
	Most of the time	484 (57.2%)	2.40 $\pm$ 2.93
	Sometimes	157 (18.6%)	2.51 $\pm$ 2.91
	Occasionally	45 (5.3%)	2.67 $\pm$ 3.08
	Never	9 (1.1%)	1.33 $\pm$ 2.23
Did you take Hydroxychloroquine prophylactically?	Yes	48 (5.7%)	2.50 $\pm$ 2.65
	No	798 (94.3%)	2.36 $\pm$ 2.92
Avoiding people with fever, cough, cold	Did not change	42 (5%)	2.40 $\pm$ 3.40
	Changed a little	117 (13.8%)	2.48 $\pm$ 3.15
	Moderately	212 (25.1%)	2.38 $\pm$ 2.99
	Very much	475 (56.1%)	2.34 $\pm$ 2.77
Avoiding going out of home unless necessary during lockdown	Did not change	17 (2%)	1.94 $\pm$ 2.35
	Changed a little	30 (3.6%)	3.07 $\pm$ 3.41
	Moderately	73 (8.6%)	1.90 $\pm$ 2.51
	Very much	726 (85.8%)	2.40 $\pm$ 2.93
Perception of current situation	Threat is exaggerated by media and government	36 (4.3%)	2.28 $\pm$ 3.03
	It will not be as bad as predicted	52 (6.1%)	2.56 $\pm$ 2.70
	We will all be completely powerless	40 (4.7%)	3.50 $\pm$ 3.58
	We will just have to accept it and stay positive	718 (84.9%)	2.30 $\pm$ 2.87
Are you feeling distressed that you are not able to drink alcohol or smoke cigarettes as frequently as you were using it earlier?	Very likely	7 (0.9%)	6.29 $\pm$ 5.05
	Somewhat likely	22 (2.6%)	1.82 $\pm$ 1.91
	Not very likely	34 (4%)	3.12 $\pm$ 3.63
	Not likely at all	84 (9.9%)	2.13 $\pm$ 2.48
	Do not know	10 (1.2%)	4.70 $\pm$ 4.78
	Not applicable	689 (81.4%)	2.31 $\pm$ 2.84
Pattern of alcohol consumption increased	Yes	7 (0.8%)	5.29 $\pm$ 4.88
	No	154 (18.2%)	2.66 $\pm$ 3.03
	Not applicable	685 (81%)	2.28 $\pm$ 2.84
Pattern of smoking increased	Yes	13 (1.6%)	3.69 $\pm$ 4.46
	No	133 (15.7%)	2.73 $\pm$ 3.17
	Not applicable	700 (82.7%)	2.28 $\pm$ 2.81
Pattern of food consumption	Yes	310 (36.6%)	3.04 $\pm$ 3.15
	No	536 (63.4%)	1.99 $\pm$ 2.68
Worried about financial burden you might add to your family because of lockdown	Very likely	221 (26%)	3.41 $\pm$ 3.35
	Somewhat likely	283 (33.5%)	2.18 $\pm$ 2.65
	Not very likely	169 (20%)	2.31 $\pm$ 2.79
	Not likely at all	141 (16.7%)	1.43 $\pm$ 2.37
	Do not know	32 (3.8%)	1.38 $\pm$ 2.42

findings resonate with an Indian study (Rehman et al., 2021) which showed equal amounts of stress, anxiety and depression scores in both genders where the lockdown situation and fear of getting infected with COVID-19 are pervasive and hence the distress is evident irrespective of gender.

Age-related studies to previous disasters indicates that older people and the elderly are particularly vulnerable to the negative psychological sequelae of critical situations, such as post-traumatic stress disorder (Jia et al., 2010).

Older disaster victims usually show lower stress, anxiety, and depression symptoms than younger participants, and this trend may be explained by their greater life experience, previous disaster exposure or by having to face fewer life responsibilities (Ngo, 2001). However, in our results we have observed the increase in psychological consequences among a younger age group. But this might be due to the fact that majority of our study population are below 40 years old and hence the contradictory result. Future studies should explore the psychological impact of the COVID-19 pandemic in a larger sample of the older

**Table 2:** Association between independent variables and psychological distress.

Variable	Subgroup	Distress N (%)	No distress N (%)	OR	95% CI for odds		P value
					Lower	Upper	
Age	<40 years	248 (36.8)	425 (63.2)	1.82	1.243	2.665	0.002
	>40 years	42 (24.3)	131 (75.7)				
Gender	Male	155 (36)	275 (64)	1.17	0.883	1.559	0.271
	Female	135 (32.5)	281 (67.5)				
Education	Up to under graduation	142 (33.6)	281 (66.4)	0.93	0.707	1.247	0.664
	Up to post graduation	148 (35)	275 (65)				
Occupation	Doctors/health care workers	122 (37.4)	204 (62.6)	1.25	0.938	1.675	0.127
	Others	168 (32.3)	352 (67.7)				
Children <18 years of age in family	Yes	118 (38.1)	192 (61.9)	1.3	0.971	1.742	0.078
	No	172 (32.1)	364 (67.9)				
Older adults >60 years of age in family	Yes	193 (36.3)	338 (63.7)	1.28	0.953	1.728	0.100
	No	97 (30.8)	218 (69.2)				
Going out for work currently	Yes	82 (33.6)	162 (66.4)	0.95	0.700	1.313	0.793
	No	208 (34.6)	394 (65.4)				
Residence	Tamil Nadu State	176 (36.1)	312 (63.9)	1.2	0.904	1.612	0.201
	Rest of India	114 (31.8)	244 (68.2)				
Family members having symptoms of COVID-19	Yes	9 (64.3)	5 (35.7)	3.53	1.172	10.631	0.017
	No	281 (33.8)	551 (66.2)				
Distress due to lockdown	Yes	198 (44.9)	243 (55.1)	2.77	2.056	3.737	0.0001
	No	92 (22.7)	313 (77.3)				
Infection spreads via droplet	Agree	249 (33.8)	488 (66.2)	0.84	0.558	1.283	0.432
	Disagree	41 (37.6)	68 (62.4)				
Infection spreads via contact contaminated objects	Agree	252 (34.1)	486 (65.9)	0.95	0.626	1.458	0.832
	Disagree	38 (35.2)	70 (64.8)				
Infection spreads via airborne	Agree	123 (36.8)	211 (63.2)	1.20	0.902	1.608	0.207
	Disagree	167 (32.6)	345 (67.4)				
Infection spreads via other routes	Agree	74 (34.3)	142 (65.7)	0.99	0.721	1.383	0.994
	Disagree	216 (34.3)	414 (65.7)				
Source of health Information	Social media	130 (38.3)	209 (61.7)	1.34	1.011	1.799	0.041
	Others	160 (31.6)	347 (68.4)				
Information by social media increased my fear	Yes	185 (41)	266 (59)	1.92	1.435	2.571	0.0001
	No	105 (26.6)	290 (73.4)				
Likelihood of family contracting COVID-19	Likely	108 (39.7)	164 (60.3)	1.41	1.051	1.914	0.022
	Not likely	182 (31.7)	392 (68.3)				
Precautionary measures taken	Yes	272 (34.3)	520 (65.7)	1.04	0.583	1.877	0.880
	No	18 (33.3)	36 (66.7)				
Hydroxychloroquine tablets taken Prophylactically	Yes	18 (37.5)	30 (62.5)	1.16	0.635	2.119	0.628
	No	272 (34.1)	526 (65.9)				
Avoiding people with Fever	Yes	238 (34.6)	449 (65.4)	1.09	0.756	1.574	0.643
	No	52 (32.7)	107 (67.3)				
Avoiding going out of home unless necessary	Yes	270 (33.8)	529 (66.2)	0.68	0.379	1.251	0.219
	No	20 (42.6)	27 (57.4)				
Distress that you aren't able to smoke cigarettes/drink alcohol as frequently as you were using it earlier	Yes	9 (31)	20 (69)	0.85	0.386	1.910	0.708
	No/not applicable	281 (34.4)	536 (65.6)				
Pattern of drinking alcohol increased	Yes	4 (57.1)	3 (42.9)	2.57	0.573	11.579	0.201
	No/not applicable	286 (34.1)	553 (65.9)				
Pattern of smoking increased	Yes	5 (38.5)	8 (61.5)	1.20	0.390	3.707	0.749
	No/not applicable	285 (34.2)	548 (65.8)				
Pattern of food consumption increased	Yes	132 (42.6)	178 (57.4)	1.77	1.325	2.375	0.0001
	No/not applicable	158 (29.5)	378 (70.5)				
Worried about financial burden during lockdown	Yes	201 (39.9)	303 (60.1)	1.88	1.397	2.546	0.0001
	No/not applicable	89 (26)	253 (74)				

**Table 3:** Factors predicting of psychological distress.

Variables	B	OR	95% CI for odds		P value
			Lower	Upper	
Age	0.405	1.49	1.00	2.249	0.050
Family members having symptoms of COVID-19	0.828	2.28	0.733	7.145	0.154
Lockdown distress	0.839	2.31	1.694	3.162	0.0001
Information by social media increased Fear	0.441	1.55	1.144	2.113	0.005
Likelihood of family contracting COVID-19	0.002	1.00	0.724	1.387	0.989
Pattern of food consumption increased	0.344	1.41	1.035	1.923	0.029
Worried about financial burden	0.313	1.36	0.992	1.885	0.056

and elderly population, and whether younger and older participants recover differently from the psychological sequelae of the COVID-19 crisis.

There were differences in the GHQ-12 scores of doctors and other professionals. The differences attained statistical significance only when compared with teachers, others (media/banking/legal professionals/government employees). Doctors are fearful of their own health and their families, coupled with caring for colleagues, patients, quarantine of staff and redeploying staff for screening, shortages of necessary personal protective equipment – which is all emotionally difficult (Maunder et al., 2003; Nickell, 2004). There has also been increasing the feelings of stigmatisation during infectious outbreaks (Mitchell et al., 2002) and increasing instances of violence against doctors (Reddy et al., 2019) which could result in psychological issues (Hobbs, 1994).

Higher GHQ-12 scores were found in individuals who felt that information from social media increased their fear. Individuals whose main source of health information was from social media had higher distress scores when compared to individuals whose main source of health information was from other sources. This resonates with the various studies which show that misinfodemics related to the myriad of information outlets, through the digitalised world metamorphoses into an emotional contagion of fear and distress among people and paved the way for the first peak of the emotional epidemic curve (EEC) that was associated with inadequate communication, myths and fake news within the community and culminated in extreme behaviours (Ahmed et al., 2020; Gao et al., 2020; Goyal et al., 2020). Previous studies have shown information via social media networks increased distress among people in comparison to authentic sources like the WHO and Centers for Disease Control and Prevention etc. (Ahmed et al., 2020; Banerjee, 2020; Gao et al., 2020) which was also evident through low distress scores in people who sought information through government agencies. As COVID-19

raged through the physical world, it also kindled the viral misinformation which mutates, shifts swiftly and creates distress in the digital space. Hence, social media giants and governments would need to devise novel policies, without trespassing privacy, to defuse this modern ticking digital explosive called ‘misinfodemics’ and which has a catastrophic impact on humankind. Currently, vaccines have been made available across the globe but surprisingly we find a deviance in the acceptance of the vaccine among people. Misinfodemics leading to vaccine hesitancy could be sabotaging the vaccine roll out across the world. These novel problems warrant novel methods to tackle them, and complement traditional public outreach programmes and health education.

Higher distress scores were observed in individuals with children below 18 years old when compared to individuals who did not. This resonates with previous studies where high psychological distress was found among people with younger population probably due to the awareness regarding the vulnerability of contracting the infection easily and developing a more severe form of the illness (Blendon et al., 2004; Wang et al., 2020). There was a significant difference in the GHQ-12 scores for individuals who had adults over 60 years old in their families when compared to individuals who did not. This could be due to the difficulty in making them understand and adhere to the precautionary instructions given by the family members as they might be vulnerable to impaired cognitive function.

Individuals who reported that their pattern of food consumption increased had higher GHQ-12 scores when compared to individuals who did not. This could have been due to the tendency among some people to overeat in response to negative emotions like anxiety which is called emotional eating (Van Strien et al., 2007). Both hormonal influences and emotional brain networks tend to influence various aspects of one’s eating behaviour such as one’s food intake, choice of food and eating motives (hunger eating, desire to eat) (O’Connor et al., 2008; Dallman,



2010; Jastreboff et al., 2013).

Individuals who believed that the infection was airborne had higher distress scores when compared to others even though it was not statistically significant. Though the WHO report mentions that airborne transmission has not been reported (report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19), 16-24 February 2020) but there are some experts who continue to state that it could spread by air (Field, 1996; Lewis, 2020; National Academies of Sciences, 2020). This conflicting reports regarding airborne spread is the reason why there is increased distress in individuals.

Individuals who perceived that we will all be completely powerless had a higher psychological distress. Even though most of the participants had chosen to perceive this pandemic situation as something we have to accept and stay positive but the mean GHQ-12 scores of these participants seem to be higher which is contradictory to what they have answered. This variability may be explained by resigning acceptance (Nakamura and Orth, 2005) where the negative inner states of participants are manifested by higher GHQ-12 scores and avoidance behaviour. There are no significant GHQ-12 scores in participants exhibiting avoidance behaviour which could also mean that this avoidance could be a component of resigning acceptance and hence the participants were not distressed by this avoidance behaviour. Acceptance helps one experience fewer negative emotions and may protect an individual from developing depressive symptoms in response to stressors (Shallcross et al., 2010; Ford et al., 2018). It is also a form of accommodative coping (Brandtstädter, Wentura and Rothermund, 1999) when the situation cannot be changed and the emotional impact of an event can be changed through acceptance.

There was no significant difference in the GHQ-12 scores and precautionary methods group. If we had to inspect this data minutely, the individuals who are 'distressed' based on their GHQ-12 scores, have not followed this on with prioritising the precautionary advised measures. This brings up the pertinent question as how do people react in a pandemic? Do they panic or go into denial about the illness and with the data can we assume that the distressed people in our sample have not resorted to the basic precautionary measures out of denial? If that's the case, is the frequent agenda of infusing fear about the pandemic in the media reflected in people taking up precautionary measures or forcing them into denial and hence we do not get the desired results? Does this warrant a better approach to help people adhere to preventive behaviours? Health campaigners need to recognise these uncertainties

when attempting to promote particular behaviours during a pandemic and to modify their campaigns accordingly. Gaining insights into the emotional responses of the masses has implications not only for health policies but for economies too (Smith, 2006).

There was a significant difference in mean GHQ-12 scores between individuals who felt distressed by lockdown and individuals who did not. There were also higher distress scores among individuals who felt worried about financial burdens during lockdown. A multicentric study titled 'ECLB-COVID-19' found a significant impact of lockdown and social distancing on mental health and wellbeing (Ammar et al., 2020). With millions of people around the world in some form of a lockdown, we are privy to arguably the largest psychological experiment of our times. Many previous researches emphasise the presence of mental health issues due to a pandemic, but there has not been many which shed light on the 'side-effects' of a pandemic situation. There can be scenarios where people might only be afraid of acquiring the illness but they might also feel distressed by the consequences of a pandemic like the 'lockdown' situation. This might lead on to a secondary epidemic of burnouts and stress-related absenteeism in the latter half of 2020 or later. Much of the efforts by governments around the globe are targeted towards the 'physical' aspects of COVID-19 with very few addressing the 'psychological' aspects. In the battle against the COVID-19 pandemic, the world would need to build a defence system where psychological help would command as much precedence as treating those infected to avoid repercussions which might be beyond our comprehension. There needs to be future prospective studies eliminating selection bias and objectively assessing pre-existing psychiatric conditions to decipher if the findings could be elaborated on a larger scale.

## CONCLUSION

Nearly a third of the participants were in a state of psychological distress which transcended topographical barriers with factors such as being below 40 years old, accessing health information through social media, patterns of food consumption increasing and being in a lockdown situation as predictors of psychological distress. More novel methods of combating misinfodemics coupled with discerning psychological responses to such catastrophic situations in the form of resigned acceptance and denial would be absolutely necessary to forge strategies to vaccinate against the mental health impact of pandemics.

Combating such catastrophes in the future may have to

come from our own minds through robust large-scale studies in these unprecedented times.

## STRENGTHS

This study was conducted during the onset of the first wave of COVID-19 pandemic even before the infection rates spiked in the Indian subcontinent.

We have made humble baby steps in touching upon less explored areas such as misinfodemics, resigned acceptance, and denial which needs more robust study designs in a larger population to pin down these variables for psychological impact.

## LIMITATIONS

- It is a cross-sectional study and hence cannot infer causality.
- No estimation of socio-economic status was done which could have given more insights about the impact of lockdown situation and this pandemic as the underprivileged might have borne the brunt of this unprecedented inevitable situation.
- Objective assessment of pre-existing psychiatric conditions was not done.
- Selection bias due to sampling technique.
- Response rates for study were not calculated and hence information about non responders could not be obtained.

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## ETHICAL APPROVAL

Expedited ethics approval was obtained from Institutional Ethics Committee (REF: IEC-NI/20/May/75/37 (COVID-19) of Sri Ramachandra Institute of Higher Education and Research (SRIHER), Chennai, India which conformed to the principles embodied in the declaration of Helsinki.

As per Indian Council of Medical Research (ICMR) national guidelines for ethics committee reviewing biomedical and health research during COVID-19 pandemic, we registered our study with the Clinical Trial Registry of India.

## CONFLICT OF INTERESTS

None.

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## INFORMED CONSENT

As it was a web-based study, it was made clear that answering all the questions and pushing the 'submit' button would be taken as a sign of voluntary consent to share answers.

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