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Responding to Crisis: An Analysis of Psychological Reactions to the COVID-19 Pandemic through Web Survey

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Abstract

This study investigates the psychological impact of SARS-CoV-2 on pandemic-related anxiety, health, resilience, and psychological distress in 262 participants who were measured on COVID anxiety scale, health resilience stress questionnaire, and Kessler Psychological Distress through a web-based survey using Google Forms. Data collection was done from May 8th to May 12th, 2020, utilizing snowball sampling via social media platforms. Results revealed the participants were experiencing relatively low anxiety levels due to COVID-19, with only a minority indicating moderate to high anxiety. While most reported high resilience, a notable segment scored lower on health. Also, negative correlations emerged between resilience and COVID-19 anxiety, while positive correlations linked psychological distress to COVID-19 anxiety. Health displayed a significant positive correlation with resilience and an inversely significant correlation with psychological distress. Unexpectedly, no significant associations were found between psychological variables and COVID-19-related epidemiological variables, indicating multifaceted influences on psychological responses beyond immediate pandemic data. Additional scrutiny demonstrated no significant psychological variations between regions with differing pandemic intensities and living conditions. The findings underscore the intricate nature of psychological responses, shaped by individual and contextual factors.

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Introduction

The novel coronavirus (COVID-19) originated in Wuhan; China in 2019 was one of the most life-threatening diseases in mankind's history, resulting in the global pandemic 2020. Countries have made several efforts to control the spread through vaccination campaigns and public health measures. Despite that, the COVID-19 pandemic has not only posed a threat to physical health but also profoundly impacted mental well-being. In India, the pandemic has led to numerous mental health challenges, including fear and anxiety, social isolation, economic distress, and limited access to mental health services. Studies have indicated a rise in the prevalence of mental health disorders in India since the onset of the pandemic. Research consistently demonstrates a high prevalence

of anxiety symptoms during the pandemic. Studies have shown that a significant portion of the general population experiences anxiety and related psychological distress as a result of the pandemic.[1] Prevalence rates varied across populations and countries, indicating a substantial impact on mental health. During the initial course of COVID-19 disease spread, people started experiencing a mental phenomenon which was referred as *COVID-19* anxiety. It usually encompassed worries about infection, health concerns, uncertainties about the future, and the social and economic impacts of the pandemic.

Many factors contribute to COVID-19 anxiety such as fear of infection, concerns about personal health and the health of loved ones, uncertainties surrounding the virus, social isolation, economic stress, and information overload from various media sources have been identified as significant contributors.[2,3] w These factors intensified anxiety and influenced individual responses to the pandemic. Frontline healthcare workers, individuals with pre-existing mental health conditions, those with a history of trauma, and individuals facing socio-economic challenges were at higher risk for COVID-19 anxiety.[1] These groups may experience heightened anxiety due to their unique circumstances and increased exposure to pandemic-related stressors. A survey conducted during the early stages of COVID-19 reported a high prevalence of stress, anxiety, and depression among the Indian population.[4] It was identified that females, individuals aged below 35 years, history of medical or psychiatric illness, and those who had personal contact with persons with COVID-19 were significantly associated with the presence of depression, anxiety, and stress during the COVID-19 pandemic.[5] Studies have found a strong association between fear of infection and psychological symptoms in the Indian population.[6]

As this is not the first time that India has gone through an infectious pandemic rather it had faced several infectious disease outbreaks in the past such as the third Bubonic Plague Outbreak (1896-1906), Asiatic Cholera Outbreak (1817–24), Spanish Flu Pandemic (1918–20), Chikungunya Outbreak (2006), Nipah Virus Outbreak (2018–2019). But the present-day populace never had any lived experiences of the infectious disease outbreaks which had killed many as most of them occurred either centuries ago or the recent outbreaks of diseases were assumed to be not very deadly and effective treatment options were available. But, in the case of COVID-19, the extensive media coverage of COVID-19-related deaths and the graphic images can exacerbate the anxiety. Frequent exposure to distressing information about the pandemic through various media channels might lead to increased fear and anxiety about mortality.[7] The uncertain nature of the pandemic and the lack of control over the virus's spread and outcomes can also contribute to death anxiety. The fear of becoming infected, the unpredictability of the disease's course, and concerns about the effectiveness of preventive measures will intensify anxiety surrounding mortality.[8]

In the present study we sought to explore the associations between COVID-19 related anxiety and the various other participant characteristics and other measures such as health, resilience and psychological distress. Also, there were no previous Indian studies that directly compared the disease-related statistics such as the number of cases reported every day, total number cases reported, total number of deaths occurring in the participants' state with the outcomes of the study such as COVID-19 related anxiety, psychological distress, health and resilience. Hence, the study hypothesized that disease related statistics such as number of cases reported every day, total number cases reported, total number of deaths occurring in the participants' state of living would significantly predict the COVID-19 related anxiety, psychological distress, health and resilience.

Methods

Survey Description

The web-survey contained the description of study information and informed consent (including the confidentiality and data protection of the respondents), on agreeing the page was redirected to the data capture phase of the survey wherein the participants were asked to respond to the socio-demographic details and statements of all the measures of the study. It had a total of 35 statements across

all outcome measures of the study and it approximately 25 minutes took to complete the survey. All the outcome measures of the survey were used in its original language (English).

Recruitment of the Participants

The web-based survey link was shared to the participants over social media platforms. After completion of the survey, the participants were encouraged to share the survey to others. There were no incentives given to respondents. The data collection started on 8th May 2020 and ended on 12th May 2020.

Measures

- *COVID Anxiety Scale*[9] - This scale was used to measure an individual's anxiety level due to COVID-19 pandemic-related anxiety. It is a self-report measure. The CAS contains 5 items and it is rated on a 5-point scale from 0 (not at all) to 4 (nearly every day). The CAS has good internal consistency and is a reliable instrument with solid factorial and construct validity. The Cronbach's alpha coefficient ranges from 0.84 to 0.93. The closer the CAS score to 20, then it is interpreted as subjected is experiencing more anxiety due to COVID-19.
- *Health Resilience Stress Questionnaire*[10] - It is a self-administered measure that measures a person's ability to tolerate and cope with stress in relation to their health and takes only 2 to 5 minutes to complete. It consists of a series of questions that explores the individual's physical and emotional well being, coping mechanism and social support. The HRSQ score determines the level of risk (risk category: extreme, high, moderate, low) and this determines the level of care and follow-up that should be recommended. Only part-A (Resilience) and part-B (Health) was used in this study. The HRSQ has good test-retest reliability, internal consistency, construct validity.
- *Kessler Psychological Distress* [11] - It is a self-reported measure that measures psychological distress in individuals aged 16 and above. It is a 10 item questionnaire and each item is scored on a 5-point Likert scale, ranging from 1 (none of the time) to 5 (all of the time). The total score of an individual ranges from 10 (minimum score) to 50 (maximum score), with lower scores indicating lower psychological distress and higher scores indicating greater psychological distress. The K10 has good internal consistency and the Cronbach's alpha coefficient ranges from 0.85 to 0.93. The K10 has good construct validity and good concurrent validity. The closer the K10 score to 50, then it is interpreted as subjected is experiencing more psychological distress.

Study Design and Participants

In this cross-sectional prospective survey, a total of 262 people participated (as shown in Table 1): 139 participants were female, and 123 participants were male. Eight participants were from the Northern Zone, which includes states such as New Delhi and Haryana. Sixteen participants were from the North Eastern zone, which includes states like Assam, Manipur, and Sikkim. The Central zone had 23 participants, covering states such as Madhya Pradesh, Uttarakhand, and Uttar Pradesh. The Eastern zone was represented by 60 participants from states like Bihar, Jharkhand, and West Bengal. The Western zone had 35 participants from states like Goa, Gujarat, and Maharashtra. The Southern zone was the most heavily represented with 120 participants, covering states like Kerala, Tamil Nadu, Telangana, and Karnataka. The state distribution of the participants in this study is as follows: 61 participants from Karnataka, 48 from Bihar, 21 from Tamil Nadu, and 18 from Maharashtra and Uttar Pradesh each. There were 17 participants from Andhra Pradesh, 13 from Gujarat, 11 from Telangana, and 10 each from Kerala and West Bengal. Additionally, 7 participants were from Assam, 6 from Manipur, and 6 from Haryana. Four participants were from Goa, 3 from Madhya Pradesh, and 3 from Sikkim. Two participants were from Jharkhand, New Delhi, and Uttarakhand each. All the participants self-reported non-positive for COVID-19 at the time of response collection.

Data Pre-processing

The raw socio-demographic data which involves their current state of residence, was processed and grouped on the basis of zones using the administrative guidelines released based on the States

Reorganization Act, 1956.[12] The states of India have been grouped into six zones: Northern Zone, North Eastern Zone, Central Zone, Eastern Zone, Western Zone and Southern Zone. The COVID-19 related statistic such as number of cases reported, new cases reported, number of deaths was extracted retrospectively from various sources (including online COVID-19 statistic databases, published newspapers and media reports) when the analysis was performed. The spread intensity of COVID-19 was calculated using Mean ± SD of the total number of cases reported and the number of deaths occurring in every state during the time of the data collection period. The states with cases > 1 SD were labeled as high spreading regions whereas those with cases < 1 SD were labeled as low spread regions. All the other categorical (nominal) socio-demographic data was coded and used for the analysis.

Data Analysis

All the continuous data were initially subjected to assumption testing to assess its eligibility to test the hypothesis using parametric statistics. The assumption testing for normality revealed that the continuous data of the obtained measures were not normally distributed. However, the test for homogeneity of variances for all the grouping variables considered in the analysis were found to be satisfied.

Results

Participant Characteristics

From the total participants, about 196 (75%) participants were aged between 15 to 25 years, 43 (17%) participants were aged between 26 to 35 years, 14 (5%) participants were aged between 36 to 45 years, 8 (3%) participants were aged between 46 to 55 years and 1 (0.38%) participant was aged between 56 to 61 years. The educational qualifications of the participants are as follows: 35 (14%) participants have completed their higher secondary education, 6 (2%) participants have completed a diploma course, 111 (42%) participants have completed their undergraduate degree and 110 (42%) participants have completed their postgraduate degree. The participants' living conditions during COVID-19: 229 (87%) participants were living with their family, 15 (6%) participants were living in a shared accommodation and 18 (7%) participants were living alone during COVID-19 (Table 1).

Table 1: Participant characteristics

Variables	N (%)	Mean ± SD
Age	-	24.67176 ± 7.280313
15–25	196 (75%)	-
26–35	43 (17%)	-
36–45	14 (5%)	-
46–55	8 (3%)	-
56–61	1 (0.38%)	-
Educational Qualification	-	15.39313 ± 1.682121
Higher Secondary	35 (14%)	-
Diploma	6 (2%)	-
Undergraduate	111 (42%)	-
Postgraduate	110 (42%)	-
Living Condition During COVID-19		
With Family	229 (87%)	-
In a shared accommodation	15 (6%)	-
Alone	18 (7%)	-
Gender		
Males	123 (47%)	-
Females	139 (53%)	-
Zone of Living During COVID-19		
Northern Zone	8 (3%)	-
North-Eastern Zone	16 (6%)	-
Central Zone	23 (9%)	-
Eastern Zone	60 (23%)	-
Western Zone	35 (13%)	-
Southern Zone	120 (46%)	-

Score Ranges, Mean and Standard Deviations for COVID-19 Anxiety, Health, Resilience and Psychological Distress

The measures' mean and standard deviation are shown in Table 2. The quartiles were computed using the potential score ranges for each measure as no normative data was available for comparison.

Table 2: Score ranges, mean and standard deviations for the measures

Measure	*Potential Score Range*	*Participant Range Scores*	*Mean (SD)*	*1st Quartile N (%)*	*2nd Quartile N (%)*	*3rd Quartile N (%)*	*4th Quartile N (%)*
COVID-19 Anxiety	0–20	0–17	2.076 (2.944)	223	27	9	3
Health	6–30	6–30	20.713 (4.302)	5	82	124	51
Resilience	14–70	14–69	50.812 (8.638)	5	31	162	64
Psychological Distress	10–50	10–50	22.824 (8.411)	125	86	43	8

COVID anxiety scale (COVID-19 Anxiety)

The overall COVID-19 anxiety scores ranged from 0–17 with a mean ± SD score of 2.076 ± 2.944. Only about 4.5% of the participants had their scores between 3rd and 4th quartiles, indicative of moderate to high anxiety due to COVID-19.

Health stress resilience questionnaire (Health and Resilience)

- For health, the participant's scores ranged from 6–30 with a mean ± SD score of 20.713 ± 4.302. Around 33.20% of participants had a score between 1st and 2nd quartiles indicative of low health.
- For resilience, the participant's scores ranged from 14–69 with a mean ± SD score of 50.812 ± 8.638. We found that only 13.74% of the participants scored between 1st and 2nd quartiles, indicative of low resilience.

Kessler's psychological distress scale (Psychological Distress)

Kessler's psychological distress scale scores ranged from 10–50 with a mean ± SD score of 22.824 ± 8.411. Only about 19.4% of the participants had their scores between 3rd and 4th quartiles, indicative of moderate to high psychological distress COVID-19 pandemic.

Correlation between COVID-19 Anxiety, Health, Resilience and Psychological Distress and Other COVID-19 Disease related Statistics

The results (Table 3) shows that resilience had a significant negative correlation with COVID-19 anxiety, r = -.176, p < 0.01. The health had a significant positive correlation with resilience, r = .420, p < 0.01. The psychological distress had a significant positive correlation with COVID-19 anxiety, r = .457,

Table 3: Pearson correlation for the various measures used in the study

		CAS	RES	Health	K10	TCC	CCSD	AC	TD	DSD
CAS	Pearson Coeff.	-								
RES	Pearson Coeff.	-.176**	-							
Health	Pearson Coeff.	-.090	.420**	-						
K10	Pearson Coeff.	.457**	-.366**	-.252**	-					
TCC	Pearson Coeff.	-.021	-.019	.010	-.025	-				
CCSD	Pearson Coeff.	-.030	.011	.012	-.010	.968**	-			
AC	Pearson Coeff.	-.021	-.009	.008	-.022	.997**	.973**	-		
TD	Pearson Coeff.	-.037	-.060	-.008	-.028	.929**	.840**	.923**	-	
DSD	Pearson Coeff.	-.030	-.040	-.010	-.023	.940**	.870**	.940**	.985**	-

**. Correlation is significant at the 0.01 level (2-tailed). CAS: COVID-19 Anxiety Scale, RES: Resilience, K10: Kessler Psychological Distress Scale, TCC: Total Confirmed Cases, CCSD: Confirmed Cases on that Specific Day, AC: Active Cases, TD: Total Deaths, DSD: Deaths on that Specific Day

$p < 0.01$. Furthermore, psychological distress had a significant negative correlation with resilience, $r = -.366$, $p < 0.01$; and health, $r = -.252$, $p < 0.01$. Contrary to our hypothesis, we did not see any relationship between the measures (COVID-19 Anxiety, Health, Resilience and Psychological Distress) and the COVID-19 related statistics (no. of cases reported, active cases, no. of deaths etc.,).

Differences in COVID-19 anxiety, health, resilience and psychological distress

The entire descriptive statistic of this analysis is illustrated in Figures 1-3 under its respective grouping variable.

- ***Based on spread intensity***

The independent sample t-test analysis indicated that there were no significant differences in COVID-19 anxiety between high-spread regions (1.9200 ± 2.75465) and low-spread regions (2.1390 ± 3.02177), $t(260) = 0.544$, $p = 0.587$. Similarly, there were no significant differences in resilience between high-spread regions (49.7333 ± 10.00720) and low-spread regions (51.2460 ± 8.01299), $t(260) = 1.283$, $p = 0.201$. Likewise, no significant differences were observed in health between high-spread regions (20.6800 ± 3.82792) and low-spread regions (20.7273 ± 4.48839), $t(260) = 0.080$, $p = 0.936$. The analysis also showed no significant differences in psychological distress between high-spread regions (22.1067 ± 7.75394) and low-spread regions (23.1123 ± 8.66418), $t(260) = 0.874$, $p = 0.383$.

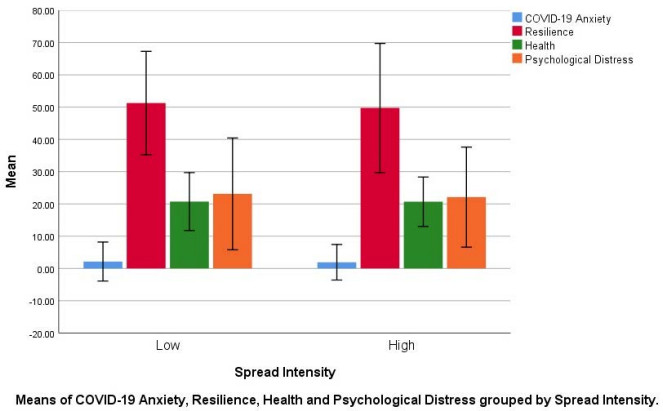

Figure 1: Means of the measures grouped based on Spread Intensity

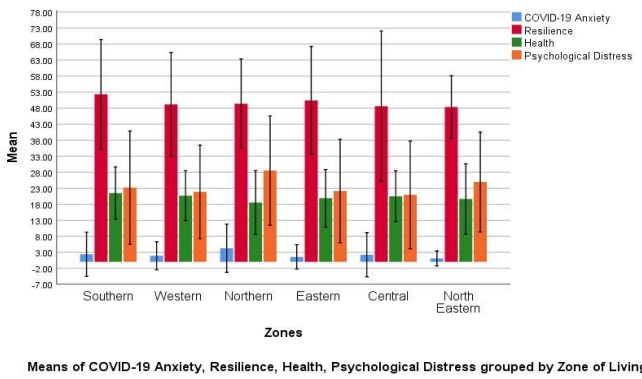

Figure 2: Means of the measures grouped based on Zone of Living during pandemic

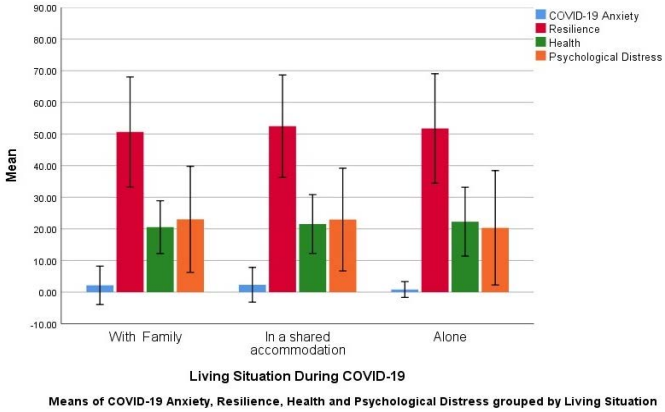

Figure 3: Means of the measures grouped based on Living condition

- ***Based on zone of living***

The one-way ANOVA results revealed there were no significant differences between zone of living and health [$F (5, 256) = 1.640$, $p = .150$]; psychological distress [$F (5, 256) = 1.402$, $p = .224$]. However, there were near marginal yet not significant differences were observed in COVID-19 anxiety [$F (5, 256) = 1.929$, $p = .090$] and resilience [$F (5, 256) = 1.402$, $p = .224$].

- ***Based on living condition***

The one-way ANOVA results revealed no significant differences between living conditions (with family, in shared accommodation and alone) and COVID-19 anxiety, $F (2, 259) = 1.758$, $p = .174$. The same trend was observed in health [$F (2, 259) = 422$, $p = .656$], resilience [$F (2, 259) = 1.663$, $p = .192$] and psychological distress [$F (2, 259) = .847$, $p = .430$].

Discussion

The statistical results presented in this study provide valuable insights into the psychological impact of the COVID-19 pandemic on individuals. To enrich our understanding of these findings, it is essential to contextualize them within the broader landscape of psychological studies conducted during the pandemic. The negative correlation between resilience and COVID-19 anxiety aligns with two Chinese based studies, both of which found that higher resilience was associated with lower pandemic-related anxiety.[13,14] These studies underscore the importance of cultivating resilience to alleviate anxiety during crises. The positive correlation observed between psychological distress and COVID-19 anxiety resonates with the findings of one Iranian and Chinese based study,[15,16] who reported a similar relationship. These studies suggest that heightened anxiety about the pandemic is closely tied to increased psychological distress, reinforcing the need for targeted psychological support measures. The positive correlation between health and resilience was consistent in two similar research conducted, both of which demonstrated a connection between physical health and psychological well-being during the pandemic.[17,18] These studies highlight the bidirectional relationship between health and mental resilience.

The surprising lack of significant associations between the studied psychological measures and COVID-19 related data, such as the number of reported cases, active cases and deaths etc., raises important questions about the factors that contribute to individuals' psychological responses during a pandemic. One study found that psychological distress during the pandemic was not solely determined by infection rates.[19] This suggests that factors beyond the immediate pandemic data influence psychological responses. While these statistics provide valuable contextual information, they might not directly predict the complex emotional reactions that individuals experience. This underscores the role of individual and contextual factors that influence psychological well-being beyond mere exposure to COVID-19 and the intensity of its spread. The lack of significant differences in psychological variables between high-spread and low-spread regions is in line with the findings of previous research.[20,21] These studies demonstrate that the psychological impact of the pandemic is not solely dictated by the severity of the outbreak in a specific region, reflecting the global nature of the psychological challenges posed by the pandemic. The absence of significant differences in psychological variables across different living conditions aligns with findings of the published literature.[22,1] These studies suggest that psychological responses to the pandemic are not significantly influenced by one's immediate living situation, highlighting the universality of the psychological experience.

The cross-sectional design employed in this study captures a snapshot of participants' psychological states at a specific point in time. Longitudinal studies would offer a more dynamic understanding of how these psychological variables evolve over the course of the pandemic and its aftermath. The study relied on self-reported anxiety, health, resilience, and psychological distress measures. While these measures provide valuable subjective insights, they might be susceptible to response biases and varying interpretations. The other limitations could be it did not take the psychiatric co morbidity of the participants into consideration, majority of the participants are from the age group 15 to 25, and a small sample size hence findings cannot be generalized.

Conclusion

In conclusion, when juxtaposed with the results of existing research, this study's findings contribute to a more comprehensive understanding of the psychological impact of the COVID-19 pandemic. While consistent anxiety, resilience, and distress patterns emerge, the complex interplay between these variables and objective data underscores the multifaceted nature of psychological responses during crises. Moreover, the universal trends observed across different regions and living conditions emphasize the need for globally relevant psychological support strategies. As we continue to navigate the challenges of the pandemic, these insights serve as crucial guideposts for both research and practical interventions.

Future studies could incorporate more objective measures or a combination of methods for a comprehensive assessment. The study did not consider various contextual factors, such as government interventions, media exposure, or personal coping strategies, which could influence participants' psychological responses. Exploring these contextual variables could provide a deeper understanding of the intricacies of psychological reactions during a crisis. While the study identifies associations between psychological variables, it does not delve into the effectiveness of specific interventions aimed at mitigating COVID-19-related psychological distress. Future research could explore the efficacy of various interventions, such as online counseling, mindfulness practices, or support groups.

Ethical Considerations

The confidentiality and anonymity of the participants were assured for their responses. This study was conducted in accordance with the Helsinki Declaration and American Psychological Association guidelines on conducting research studies.

Data Availability

The data will be made available upon reasonable request to the corresponding author.

Author Contributions

MLC - Conceptualization, Methodology, Software, Formal analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project administration. *KK* - Validation, Resources, Supervision. *SN* - Software, Formal analysis, Data Curation, Writing – Original Draft, Writing – Review & Editing. *EVJ* - Validation, Investigation, Resources, Supervision. *MN* - Data Curation, Writing – Original Draft, Writing – Review & Editing.

Conflict of Interest

None.

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