

## **Anxiety and Stress in Karachi: A Cross-Sectional Study on the Psychological Effects of the Covid-19 Pandemic**

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### **Abstract**

The COVID-19 pandemic has precipitated a global mental health crisis. This study aimed to investigate the prevalence of COVID-19-related stress and its psychological impact (anxiety and depression) on the residents of Karachi, Pakistan. A cross-sectional study was conducted over six months (February to July 2021). Data were collected from 306 COVID-19 patients admitted to Jinnah Postgraduate Medical Centre (JPMC), Karachi, using a structured questionnaire. The instrument measured stress (20 items) and psychological impact (9 items) on a 5-point Likert scale. Data were analyzed using Principal Component Analysis (PCA) and Linear Regression in SPSS version 16. The sample had a mean age of  $34.12 \pm 8.57$  years, was predominantly male (88.2%), married (82.4%), and employed (90.2%). PCA revealed that items related to anger (S12), fear of infecting family (S16), and depressed mood (S19) induced the highest stress. For psychological impact, the fear for family members' health (P4) was the most severe. Regression analysis showed a strong, significant relationship between COVID-19 stress and psychological impact ( $R = 0.855$ ,  $R^2 = 0.731$ ,  $p < .001$ ). The study concludes that the COVID-19 pandemic has inflicted severe psychological distress, including high levels of stress, anxiety, and depression, on the population of Karachi. These findings underscore an urgent need for public health interventions aimed at mitigating the mental health repercussions of the pandemic through targeted support systems and psychological first aid.

**Keywords:** COVID-19, Psychological, Stress, Anxiety, Depression, Pakistan, Mental Health

### **Introduction**

The COVID-19 pandemic, caused by the novel SARS-CoV-2 virus, has been more than a global physical health emergency; it has concurrently triggered a profound mental health crisis (Holmes et al., 2020). The constellation of public health measures—including lockdowns, quarantines, and social distancing—while necessary to curb viral transmission, have been significant catalysts for psychological distress, including anxiety, depression, and stress-related disorders globally (Galea et al., 2020). Research from the early epicenters of the pandemic highlighted its immediate psychological toll. In China, a nationwide survey found that approximately 35% of respondents

experienced psychological distress, with higher rates among women and younger adults (Qiu et al., 2020). Another study reported that 30% and 17% of their sample experienced anxiety and depressive symptoms, respectively (Wang et al., 2020). This distress was not confined to the general public; healthcare workers, in particular, faced immense psychological pressure, dealing with high infection risks, grueling workloads, and the fear of transmitting the virus to their families (Lai et al., 2020). The situation in Pakistan, and specifically in its largest metropolis, Karachi, presented a unique context. Characterized by a dense population, socioeconomic disparities, and a healthcare system under strain, the city was vulnerable to both the virus and its psychological fallout. Initial studies began to paint a concerning picture. For instance, healthcare workers in Karachi reported significant knowledge and good practices but concurrently experienced high levels of anxiety (Alwani et al., 2020). Furthermore, evidence suggested that women and students were disproportionately affected, showing higher rates of anxiety and depression due to the pandemic's social and economic disruptions (Asim et al., 2021; Ali et al., 2022). While these studies provided initial insights, a comprehensive assessment of the specific stressors and their direct psychological impact on a clinical population in Karachi was needed. This study aimed to fill this gap by quantitatively investigating the prevalence of COVID-19-specific stress and its correlation with anxiety and depression among patients in Karachi. The findings are critical for informing local mental health policies and crafting targeted psychological interventions during and beyond the pandemic.

## **Materials and Methods**

### **Research Design and Setting**

A quantitative, cross-sectional study was conducted over six months from February to July 2021. The study setting was the Jinnah Postgraduate Medical Centre (JPMC), a major tertiary care hospital in Karachi.

### **Participants and Sampling**

A sample of 306 COVID-19 patients admitted to the isolation ward at JPMC was recruited. Convenience sampling was used. Inclusion criteria included a confirmed COVID-19 diagnosis and willingness to participate. Individuals not diagnosed with COVID-19 were excluded.

### **Instrument and Data Collection**

Data were collected using a structured questionnaire adapted from Balkhi et al. (2020). The questionnaire had three sections:

- **Section A:** Socio-demographic information (age, gender, marital status, education, employment status).
- **Section B:** A 20-item scale measuring stress due to COVID-19 (e.g., fear of infection, exhaustion, irritability, sleep troubles).
- **Section C:** A 9-item scale measuring psychological impact, focusing on anxiety and depression (e.g., fear of leaving home, fear for family's health, daily anxiety).

A 5-point Likert scale was used for Sections B and C (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely). Data were collected via telephone, email, and post to maintain safety protocols.

## Data Analysis

Data were analyzed using SPSS version 16. Descriptive statistics (frequencies, means, standard deviations) were computed for socio-demographic variables. Principal Component Analysis (PCA) was used to identify underlying factors within the stress and psychological impact scales. Linear regression analysis was applied to determine the relationship between COVID-19 stress (independent variable) and psychological impact (dependent variable). A p-value of <0.05 was considered statistically significant.

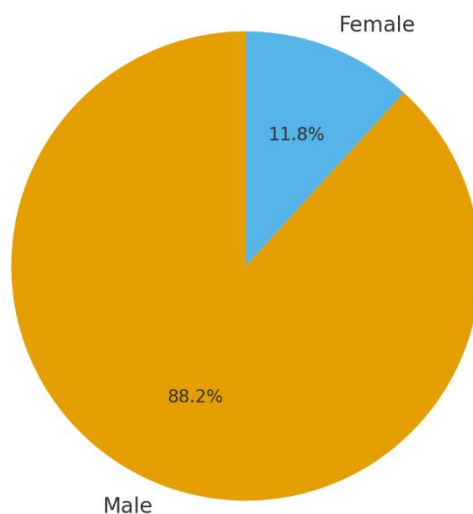
## Results

### Socio-Demographic Characteristics

The study comprised 306 participants with a mean age of 34.12 years ( $\pm 8.57$ ). The majority were male (88.2%), married (82.4%), employed (90.2%), and had an undergraduate level of education (54.9%). Detailed demographics are presented in Table 1 and Figure 1.

**Table 1: Socio-demographic Characteristics of Participants (N=306)**

<i>Variable</i>	<i>Category</i>	<i>n (%)</i>	<i>Mean <math>\pm</math> SD</i>
<i>Age</i>	(Range: 22-56 yrs)	306 (100%)	34.12 $\pm$ 8.57
<i>Gender</i>	Male	270 (88.2%)	13.46 $\pm$ 17.14
	Female	36 (11.8%)	10.75 $\pm$ 15.43
<i>Employment</i>	Employed	276 (90.2%)	13.36 $\pm$ 17.06
	Unemployed	30 (9.8%)	11.10 $\pm$ 15.96
<i>Marital Status</i>	Married	252 (82.4%)	13.35 $\pm$ 17.08
	Unmarried	54 (17.6%)	12.16 $\pm$ 16.42
<i>Education</i>	Undergraduate	168 (54.9%)	12.96 $\pm$ 16.78
	Graduate	138 (45.1%)	13.36 $\pm$ 17.20



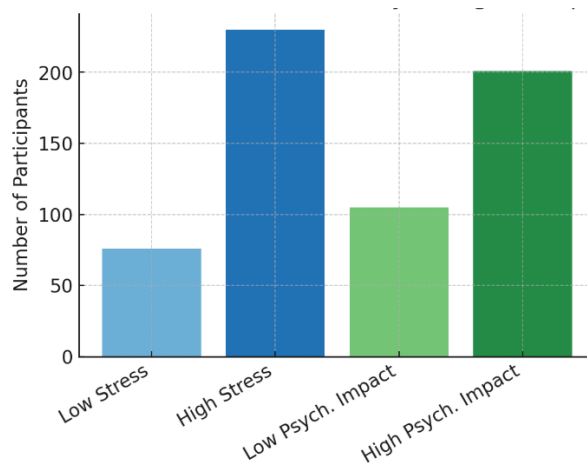
**Figure 1.** Gender distribution of COVID-19 patients included in the study (N=306).

### Prevalence of Stress and Psychological Impact

Frequency distribution revealed that 75% of the participants reported high levels of COVID-19-related stress, while 65.6% reported high levels of psychological impact (anxiety and depression) (Table 2 & Figure 2).

**Table 2: Frequency Distribution of Stress and Psychological Impact**

<i>Variable</i>	<i>Low Level</i>	<i>High Level</i>
<i>Stress</i>	76.5 (25%)	229.5 (75%)
<i>Psychological Impact</i>	105 (34.3%)	201 (65.6%)



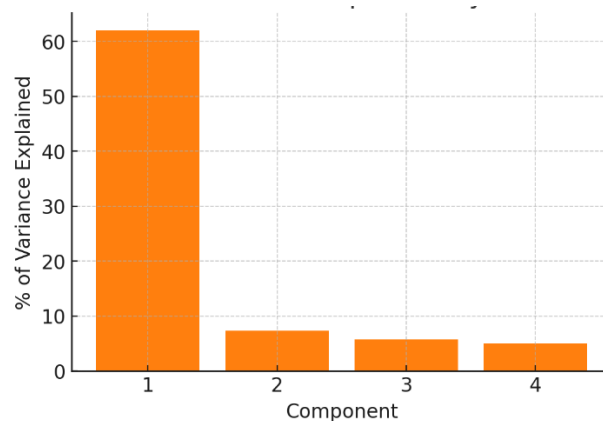
**Figure 2.** Prevalence of high and low levels of stress and psychological impact among participants.

### Principal Component Analysis (PCA)

- **COVID-19 Stress:** PCA of the 20 stress items extracted 4 components explaining 80.22% of the total variance. The highest loading items indicating severe stress were: "Felt irritated/angry on self or others" (S12), "Afraid to go home because of fear of infecting family" (S16), and "Depressed mood - feeling low most part of the day" (S19). The component "Anxiety when dealing with febrile patients" (S9) showed the least stress. The total variance explained is shown in Table 3.
- **Psychological Impact:** PCA for the 9 psychological impact items showed that "I fear for the health of my family members" (P4) had the strongest impact. The component "I feel the situation is not as bad as it is being portrayed" (P9) had the least impact. One component explained 76.385% of the total variance (Table 4).

**Table 3: Total Variance Explained for COVID-19 Stress (PCA)**

<i>Component</i>	<i>Initial Eigenvalues</i>	<i>Extraction Sums of Squared Loadings</i>		<i>% of Variance</i>	<i>Cumulative %</i>	
	<i>% of Variance</i>	<i>Cumulative %</i>	<i>Total</i>			
1	12.423	62.114	62.114	12.423	62.114	62.114
2	1.475	7.373	69.488	1.475	7.373	69.488
3	1.141	5.703	75.190	1.141	5.703	75.190
4	1.006	5.030	80.220	1.006	5.030	80.220

**Figure 3.** Percentage of variance explained by the four PCA components of COVID-19 stress items.**Regression Analysis**

Linear regression analysis established a highly significant positive relationship between COVID-19 stress and psychological impact. The regression model was significant ( $F(1,304) = 825.725$ ,  $p < .001$ ), with an  $R$  value of 0.855 and an  $R^2$  of 0.731, indicating that 73.1% of the variance in psychological impact was explained by COVID-19 stress. The beta coefficient ( $\beta = 0.855$ ,  $p < .001$ ) confirms a strong positive effect (Tables 5 & 6).

**Table 5: Regression Model Summary**

<i>Model</i>	<i>R</i>	<i>R<sup>2</sup></i>	<i>Adjusted R<sup>2</sup></i>	<i>Std. Error of the Estimate</i>
1	.855	.731	.730	.51959

**Table 6: Analysis of Variance (ANOVA) and Coefficients**

<i>Model</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
<i>Regression</i>	222.927	1	222.927	825.725	.000
<i>Residual</i>	82.073	304	.270		
<i>Total</i>	305.000	305			
	<i>Unstandardized B</i>	<i>Std. Error</i>	<i>Standardized Beta</i>	<i>t</i>	<i>Sig.</i>
<i>(Constant)</i>	-7.687E-16	.030		.000	1.000
<i>Stress</i>	.855	.030	.855	28.735	.000

## Discussion

This study provides compelling evidence of the severe psychological burden exerted by the COVID-19 pandemic on patients in Karachi, Pakistan. The findings align with the global literature confirming the pandemic as a major determinant of mental health disorders (Holmes et al., 2020; Wang et al., 2020). The high prevalence of stress (75%) and psychological impact (65.6%) in our sample underscores the acute nature of this crisis. The PCA results pinpoint specific, potent stressors: the fear of infecting one's family (S16) and the resulting feelings of anger (S12) and depression (S19). This resonates with studies on healthcare workers, where the fear of being a vector of transmission to loved ones was a paramount concern, leading to severe anxiety and moral distress (Lai et al., 2020; Jawed et al., 2020). Our study suggests this fear extends significantly to infected patients as well. The strongest psychological impact item was the fear for the health of family members (P4). This finding highlights the collectivistic nature of the society in Karachi, where concern for the family unit often supersedes individual worry, a factor that must be central to any localized mental health intervention (Asim et al., 2021). The robust positive correlation ( $R=0.855$ ) between COVID-19-related stress and broader psychological impact (anxiety and depression) confirms that the stressors specific to the pandemic are direct drivers of worsened mental health. This is consistent with a growing body of research worldwide that links pandemic-related stressors like isolation, fear of infection, and financial uncertainty to increased rates of anxiety and depression (Xiong et al., 2020). The high  $R^2$  value indicates that most of the variance in psychological distress in this population during the pandemic can be attributed to these specific COVID-19 stressors. While our sample was predominantly male, reflecting potential gendered access to healthcare or testing, studies specific to Pakistan suggest that women may bear a greater psychological burden from the pandemic due to increased domestic responsibilities and gender-based vulnerabilities (Asim et al., 2021; Rizwan et al., 2021). This indicates a need for targeted research and support for women.

## Limitations

This study has limitations. The use of a convenience sample from a single hospital limits the generalizability of the findings to the entire population of Karachi. The cross-sectional design captures a snapshot in time and cannot establish causality. The self-report nature of the questionnaire may also be subject to bias.

## Conclusion and Recommendations

This study concludes that the COVID-19 pandemic has resulted in clinically significant levels of stress, anxiety, and depression among patients in Karachi, driven primarily by fears related to the virus and its consequences for their families.

1. **Integration of Mental Health Services:** COVID-19 treatment protocols should include routine mental health screening and provide access to psychological first aid and counseling for patients.
2. **Public Awareness Campaigns:** Government and health authorities should launch campaigns to address mental health stigma and provide information on coping mechanisms and available support services.

3. **Support for Vulnerable Groups:** Targeted interventions are needed for groups identified as high-risk, including women, frontline health workers, and those who have lost family members.
4. **Telepsychiatry:** The expansion of telemedicine and helplines can provide accessible and safe mental health support, overcoming barriers to in-person care.
5. **Further Research:** Longitudinal studies are needed to track the long-term psychological sequelae of the pandemic and to evaluate the effectiveness of mental health interventions.

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