

# Effects of COVID-19 Pandemic on Psychological Health

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## ABSTRACT

**Objective:** To understand the psychological impact of COVID-19 pandemic on the population of Karachi, Pakistan during the initial phases of the pandemic

**Methodology:** An online questionnaire-based survey was conducted; an online cross-sectional survey study design was used for this research. Study setting was Karachi from where the first case in Pakistan was reported. The study population included those living in Karachi during the pandemic. The number of participants in this study was 427. Assessment tools used to measure the psychological impact of COVID-19 pandemic were Impact of the Event Scale-Revised (IES-R) and DASS-21 scale using significance level of  $p < 0.05$ .

**Results:** Moderate level of depression, anxiety, and stress relating to COVID-19 pandemic was found in the population. Almost 62% respondents were suffering from mild to moderate levels of depression, 53% of the population were showing moderate levels of anxiety. Significant association was found between genders with: [depression (p-value, 0.007), anxiety (p-value, 0.02)]. Working in healthcare profession was association with anxiety (p-value, 0.05) and stress (p-value, <0.001). Testing for COVID-19 showed association with stress (p-value, 0.008). IES-R scale showed association with working in healthcare profession (p-value, <0.001), recently tested for COVID-19 (p-value, 0.001), having someone close testing positive (p-value, <0.001). Having COVID-19 like symptoms showed strong association to depression, anxiety, and stress as well with IES-R.

**Conclusion:** Majority of the population exhibited symptoms of depression, anxiety, and stress ranging from mild to moderate in severity. However, the stress levels and the overall psychological impact were found to be in normal ranges among majority of the study population.

**Key Words:** Anxiety, COVID-19, DASS, depression, IES-R, psychological effect, stress.

**How to cite:** Ansari RT, Ansari ZM, Shafique S, Jameel A, Hussian ST, Ahmed J. Effects of covid-19 pandemic on psychological health. *Ann Jinnah Sindh Med Uni.* 2023;9(1):3-9

DOI: 10.46663/ajsmu.v9i1.3-9

## INTRODUCTION

World Health Organization (WHO) first received reports of pneumonia-like illness from China in late December 2019<sup>1</sup>. This illness was officially named as COVID-19 by the WHO on 11<sup>th</sup> of February 2020. The first case of COVID-19 was reported in Pakistan on the 26<sup>th</sup> of February, 2020<sup>2</sup>. After the number of cases being reported in Pakistan started to escalate along with the mortality associate with COVID-19,

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the government enforced lockdown for the first time on 23<sup>rd</sup> March to control the spread of the infection. Since then, among the cities of Pakistan, Karachi has reported the highest number of cases<sup>3</sup>. Experts identified that global population was facing stresses on multiple fronts in the face of COVID-19 pandemic; a generalize state of fear among population due to the whole situation<sup>4</sup>; fear for the health and wellbeing of oneself and the loved ones; financial crisis due to lockdown as many people lost their jobs or were left without pay while offices and industries were shut down around the world<sup>5</sup>; panic due to shortage of food and protection supplies; and social isolation was forced on millions of people around the world. The pandemic also had a detrimental effect on healthcare facilities, social system, and economy<sup>6</sup>. People were facing job uncertainty; the incidence of domestic abuse also increased. Combine that with extensive news coverage on the pandemic and future uncertainty, it all culminated in adverse psychological health<sup>7-9</sup>.

Any health emergencies like a global pandemic are associated with significant consequences on the mental health of population<sup>10</sup>. Individuals suffer from psychological problems like fear, uncertainty, frustration, boredom, anger, and loneliness<sup>11</sup>. Mass quarantines, lockdowns and isolation measures imposed to control the spread of the disease tend to cause a generalized state of fear and anxiety in the community<sup>12</sup>. The studies conducted during the early phase of the pandemic relating to the effect on psychological health due to COVID-19 in China, showed moderate to severe psychological issues in more than half of the study population. Females and students were among those susceptible to mental health issues<sup>13</sup>. Higher levels of depression, anxiety, and stress were found to be associated with the presence of psycho-somatic symptoms<sup>14</sup>.

Psychological and behavioral responses to COVID-19 had been dramatic during the rising phase of the outbreak. Prevalence of moderate or severe anxiety were 4-5 times its normal levels<sup>15</sup>. Confusion about information reliability significantly fueled the public anxiety levels<sup>16</sup>. The psychological health and wellbeing of individuals is a significant concern and scarce information was available regarding this issue. In this study, we aimed to investigate the psychological issues relating to the COVID-19 pandemic and to understand the psychological impact of COVID-19 pandemic on the population of Karachi, Pakistan during the initial phases of the pandemic.

## METHODOLOGY

An online cross-sectional survey study design was used for this research. Study was conducted in Karachi from where the first case in Pakistan was reported. The population study included those living in Karachi during the pandemic. As the government took precautionary measures and advised the public to isolate at home, this survey was conducted electronically. Informed consents from the participants were taken electronically. Ethics approval was obtained from the Baqai Medical University Ethical Committee. This cross-sectional study was conducted at Baqai Medical University in July 2020. The Institutional Review Board of BMU approved this study by certifying it with IRB certificate No. Ref: BMU-EC/2020-04(OL).

Sample size was calculated using OpenEpi. A sample size of 384 participants was calculated with 50% anticipated percentage of psychological issues (not known), 95% confidence interval, and 5% margin of error. Sample size was increased to account for missing or incomplete responses. After that 427 participants

were recruited in the study. Non-probability snowball sampling technique was used for sample selection, initially the survey was triggered through immediate contacts, and they were requested to pass it forward.

Healthy adults of age 18 years and above were included. Individuals with history of pre-existing psychological illness and individuals above the age of 65 years were excluded. Tools used to assess the psychological impact of COVID-19 pandemic in the study were the Impact of the Event Scale-Revised (IES-R) and DASS-21 scale<sup>12</sup>. The questionnaire was launched on the Internet using Google Forms platform and disseminated to the online contacts. Responses were submitted on the Google Forms from where it was used for analysis. SPSS version 22 was used for data analysis. Sociodemographic characteristics, COVID-19 symptoms, and responses for both scales (IES-R and DASS) were stated as percentages. Chi-square test of association was used to demonstrate associations between sociodemographic characteristics, COVID-19 symptom with the subscales of the DASS as well as the IES-R score, with a significance level of  $p < 0.05$ .

## RESULTS

The sociodemographic characteristics showed that the majority of respondents were female (65.8%), between the ages of 18 to 24 years (40%), and were married (57.6%). Majority of the respondents were employed (73.5%), of whom (41.5%) were healthcare professionals. Twenty-eight percent respondents had taken a COVID-19 test. In (18.5%) respondents, someone close had tested positive for COVID-19. The symptoms most commonly presented amongst respondents were headache (44.7%), body ache (39%), sore throat (37.7%), fever (29.3%), cough (37.5%), chills (7.7%), difficulty in breathing (9%) and (32.3%) had been tested for COVID-19.

While measuring for depression, 27.2% respondents were showing normal levels of depression, 31.1% had mild, 31.1% had moderate, 3.3% had severe, and 7.3% had extremely severe levels of depression. Measuring for anxiety, 10.3% respondents showed normal levels of anxiety, 11.7% had mild, 52.9% had moderate, 14.1% had severe, and 11% had extremely severe levels of anxiety. While measuring for stress, 70% respondents showed normal levels of stress, 19.7% had mild, 4.9% had moderate, 2.3% had severe, and 4.2% had extremely severe levels of stress. On IES-R scale; 71.9% respondents had normal (0-23) psychological impact of COVID-19, while 14.5% had mild (24-32), 4.2% had moderate (33-36), and 9.4% had severe (>37) psychological impact.

**Table 1: Association with Depression**

Variable		Normal (0-7)		Mild (8-9)		Moderate (10-14)		Severe (15-19)		Extremely Severe (+20)		p-value
		N	%	N	%	N	%	N	%	N	%	
Gender	Male	55	37.7	38	26	41	28.1	2	1.4	10	6.8	0.007**
	Female	61	21.7	95	33.8	92	32.7	12	4.3	21	7.5	
Employment Status	Employed	24	7.7	38	12.1	163	52.1	49	15.7	39	12.5	0.01*
	Unemployed	20	17.5	12	10.5	63	55.3	11	9.6	8	7	
Chills	Yes	3	9.1	9	27.3	13	39.4	1	3	7	21.2	0.05*
	No	113	28.7	124	31.5	120	30.5	13	3.3	24	6.1	
Headache	Yes	40	20.9	63	33	62	32.5	7	3.7	19	9.9	0.05*
	No	76	32.2	70	29.7	71	30.1	7	3	12	5.1	
Cough	Yes	37	23.1	48	30	47	29.4	5	3.1	23	14.4	0.001**
	No	79	29.6	85	31.8	86	32.2	9	3.4	8	3	
Difficulty in Breathing	Yes	6	15.8	8	21.1	14	36.8	1	2.6	9	23.7	0.001**
	No	110	28.3	125	32.1	119	30.6	13	3.3	22	5.7	

\*Significant at p<0.05, \*\*Highly Significant at p<0.01

**Table 2: Association with Anxiety**

Variable		Normal (0-7)		Mild (8-9)		Moderate (10-14)		Severe (15-19)		Extremely Severe (+20)		p-value
		N	%	N	%	N	%	N	%	N	%	
Gender	Male	24	16.4	20	13.7	71	48.6	18	12.3	13	8.9	0.02*
	Female	20	7.1	30	10.7	155	55.2	42	14.9	34	12.1	
Employment Status	Employed	24	7.7	38	12.1	163	52.1	49	15.7	39	12.5	0.01*
	Unemployed	20	17.5	12	10.5	63	55.3	11	9.6	8	7	
Healthcare Professional	Yes	12	6.8	26	14.7	88	49.7	26	1.7	25	14.1	0.05*
	No	32	12.8	24	9.6	138	55.2	34	13.6	22	8.8	
Someone close tested positive for COVID-19	Yes	4	5.1	7	8.9	40	50.6	19	24.1	9	11.4	0.03*
	No	40	11.5	43	12.4	186	53.4	41	11.8	38	10.9	
Chills	Yes	1	3	5	15.2	12	36.4	7	21.2	8	24.2	0.02*
	No	43	10.9	45	11.4	214	54.3	53	13.5	39	9.9	
Cough	Yes	12	7.5	17	10.6	81	50.6	24	15	26	16.3	0.06
	No	32	12	33	12.4	145	54.3	36	13.5	21	7.9	
Difficulty in Breathing	Yes	3	7.6	4	10.5	16	42.1	4	10.5	11	28.9	0.008**
	No	41	10.5	46	11.8	210	54	56	14.4	36	9.3	

\*Significant at p<0.05, \*\*Highly Significant at p<0.01

Table 1 shows the association of DASS subscale ‘Depression’ with the demographic and health related variables. Here, depression showed strong association with gender (p-value 0.007), and employment (p-value 0.04). The Depression subscale was strongly associated with COVID-19 symptom; cough (p-value <0.001), headache (p-value 0.05), fever (p-value <0.001), chills (p-value 0.005), and difficulty in breathing (p-value 0.001).

Table 2 shows the association of DASS subscale ‘Anxiety’ with the demographic and health related variables. Here, anxiety showed strong association with demographic variables of gender (p-value 0.02), employment (p-value 0.03), healthcare profession (p-value 0.05), and having someone close testing positive (p-value 0.03). Anxiety was found to be strongly associated with COVID-19 symptoms like cough (p-value 0.06), chills (p-value 0.02), and difficulty in breathing (p-value 0.008).

**Table 3: Association with Stress**

Variable		Normal (0-7)		Mild (8-9)		Moderate (10-14)		Severe (15-19)		Extremely Severe (+20)		p-value
		N	%	N	%	N	%	N	%	N	%	
Employment Status	Employed	197	62.9	77	24.6	17	5.4	7	2.2	15	4.8	0.001**
	Unemployed	97	85.1	7	6.1	4	3.5	3	2.6	3	2.6	
Healthcare Professional	Yes	90	50.8	62	35	7	4	8	4.5	10	5.6	0.001**
	No	204	81.6	22	8.8	14	5.6	2	0.8	8	3.2	
Recently Been Tested for COVID-19	Yes	68	56.7	35	29.2	7	5.8	5	4.2	5	4.2	0.008**
	No	226	73.6	49	16	14	4.6	5	1.6	13	4.2	
Someone Close Tested Positive for COVID-19	Yes	40	50.6	28	35.4	4	5.1	2	2.5	5	6.3	0.001**
	No	254	73	56	16.1	17	4.9	8	2.3	13	3.6	
Fever	Yes	71	56.8	38	30.4	5	4	4	3.2	7	5.6	0.003**
	No	223	73.8	46	15.2	16	5.3	6	2	11	3.6	
Chills	Yes	10	30.3	14	42.4	3	9.1	4	12.1	2	6.1	0.001**
	No	284	72.1	70	17.8	18	4.6	6	1.5	16	4.1	
Headache	Yes	117	61.3	45	23.6	12	6.3	6	3.1	11	5.8	0.04*
	No	177	75	39	45	9	3.8	4	1.7	7	3	
Body Ache	Yes	99	59.6	46	27.7	7	4.2	7	4.2	7	4.2	0.002**
	No	195	74.7	38	14.6	14	5.4	3	1.1	11	4.2	
Sore Throat	Yes	102	63.4	42	26.1	5	3.1	5	3.1	7	4.3	0.06
	No	192	72.2	42	15.8	16	6	5	1.9	11	4.1	
Cough	Yes	85	53.1	44	27.5	11	6.9	6	3.8	14	8.8	0.001**
	No	209	78.3	40	15	10	3.7	4	1.5	4	1.5	
Difficulty in Breathing	Yes	20	52.6	5	13.2	6	15.8	2	5.3	5	13.2	0.001**
	No	274	70.4	79	20.3	15	3.9	8	2.1	13	3.3	

\*Significant at p<0.05, \*\*Highly Significant at p<0.01

Table 3 shows the association of DASS subscales ‘Stress’ with the demographic and health related variables. Here, stress showed strong association with demographic variables of employment (p-value 0.02), healthcare profession (p-value <0.001), recently tested for COVID-19 (p-value 0.008), and having someone close testing positive (p-value 0.01). Depression subscale was strongly associated with COVID-19 symptoms of cough (p-value <0.001), headache (p-value 0.04), body ache (p-value 0.002), sore throat (p-value 0.06), fever (p-value 0.003), chills (p-value <0.001), and difficulty in breathing (p-value <0.001).

Table 4 shows the association of IES-R scale with demographic and health related variables. No association was found between demographic variables and IES-R scale except with those working in healthcare profession (p-value <0.001). In health-related variables, recently tested for COVID-19 (p-value 0.001) and having someone close testing positive (p-value <0.001) were significantly associated. IES-R scale was strongly associated with COVID-19 symptom of cough (p-value 0.04), headache (p-value 0.03), body ache (p-value

<0.001), sore throat (p-value <0.001), fever (p-value 0.001), and chills (p-value 0.03).

## DISCUSSION

This study aimed to investigate the psychological health status of the public during the COVID-19 pandemic. In spite of the overall result showing stable psychological impact due to the event (pandemic), a significant amount of depression and anxiety was still observed among the study population. Study findings suggest that with respect to immediate psychological impact of COVID-19 pandemic, the population of Karachi showed mild to moderate levels of psychological problems during the first month of the pandemic. Majority of the population was exhibiting symptoms of depression, anxiety, and stress ranging from mild to moderate in severity<sup>12</sup>. Almost 62% respondents were suffering from mild to moderate levels of depression, while 53% of the population were showing moderate levels of anxiety. However, the stress level and the overall psychological impact were found to be in normal ranges among the majority of

**Table 4: Association with IES-R**

Variable		Normal (0-23)		Mild (24-32)		Moderate (33-36)		Severe (37)		p-value
		N	%	N	%	N	%	N	%	
Healthcare Professional	Yes	117	66.1	28	15.8	4	2.3	28	15.8	0.001**
	No	190	76	34	13.6	14	5.6	12	4.8	
Recently Been Tested for COVID-19	Yes	70	58.3	23	19.2	8	6.7	19	15.8	0.001**
	No	237	77.2	39	12.7	10	3.3	21	6.8	
Someone Close Tested Positive for COVID-19	Yes	41	51.9	13	16.5	5	6.3	20	25.3	0.001**
	No	266	76.4	49	14.1	13	3.7	20	5.7	
Fever	Yes	75	60	22	17.6	11	8.8	17	13.6	0.001**
	No	232	76.8	40	13.2	7	2.3	23	7.6	
Chills	Yes	17	51.5	7	21.2	2	6.1	7	21.2	0.03*
	No	290	73.6	55	14	16	4.1	33	8.4	
Headache	Yes	124	64.9	35	18.3	10	5.2	22	11.5	0.04*
	No	183	77.5	27	11.4	8	3.4	18	7.6	
Body Ache	Yes	99	59.6	29	17.5	11	6.6	27	16.3	0.001**
	No	208	79.7	33	12.6	7	2.7	13	5	
Sore Throat	Yes	86	53.4	31	19.3	11	6.8	33	20.5	0.001**
	No	221	83.1	31	11.7	7	2.6	7	2.6	
Cough	Yes	104	65	28	17.5	11	6.9	17	10.6	0.04*
	No	203	76	34	12.7	7	2.6	23	8.6	

\*Significant at p<0.05, \*\*Highly Significant at p<0.01

the study population. The depression and anxiety levels measured by DASS-21 were higher than the stress levels measured by DASS-21 and the impact of the pandemic measured by IES-R. Nevertheless, it should be noted that almost 10% of the population reported psychological effects at pathological levels.

It is well known that medical emergencies like pandemics affect mental health negatively<sup>16,17</sup>. Evidence suggests that females are more prone to negative impact of pandemics, similarly psychological problems were found to be more prevalent among females<sup>12,18,19</sup>. In line with prior findings, in our study also, we found that psychological symptoms were more prevalent in females. However, in the higher ranges of stress levels, males were in higher percentage as compared to females. It is suggested that this increase in stress and anxiety symptoms in females may be due to being overburdened by round the clock childcare during lockdown and isolation<sup>18</sup>. Evidence from prior studies suggests that psychological impact and symptoms are more frequently observed in young ages<sup>12,20,21</sup>. However in present study, our findings revealed that psychological symptoms were prevalent indiscriminately among all age groups. Studies have reported that married people and those with children were more prone to psychological effects of pandemic<sup>22</sup>.

However, in our study, marital status or having children did not appear to be affecting the level of stress as almost equal percentage of respondents was distributed across the different levels of stress.

Similarly, healthcare professionals expressed higher levels of stress than non-healthcare professionals<sup>23,24</sup>. In line with the previous studies, findings suggested that people who exhibited higher levels of psychological issues, were those who had been tested for COVID-19, or whose relative or family member had been infected by COVID-19<sup>25</sup>. People showed higher psychological issues if they experienced COVID-19 like symptoms.

This study provided insight regarding the COVID-19 related psychopathology. Few limitations were faced during the research process. Firstly, the sample might not be representative as the survey was conducted online. The data might have been collected during a very stressful period owing to the marked change in circumstances with isolation and lockdown. Regardless of all these limitations, the current study improved our understanding of the impact of COVID-19 on mental health. Even though majority of respondents showed no significant impact of COVID-19 pandemic, our result revealed that a low percentage of population is at a high

risk of developing psychopathologies. More studies are needed to further investigate the psychological consequences of the pandemic on general public including a broader range of sociodemographic factors. There is a need for longitudinal and nationwide understanding of the psychological effects of COVID-19.

## CONCLUSION

Majority of the population exhibited symptoms of depression, anxiety, and stress ranging from mild to moderate in severity. However, the stress levels and the overall psychological impact were found to be in normal ranges among the majority of the study population. The significant feature identified here is that individuals are more likely to experience psychological effects if they had a close encounter with COVID-19 disease, whether being suspected of having the disease themselves or having a loved one getting infected.

**Conflict of interest:** The authors declare no conflict of interest.

**Authors' Contribution:** RTA: Conceived idea, designed study, collected data, and drafted manuscript; ZM: Contributed to data collection, analysis, interpretation, and result compilation; SS: Assisted in data collection and critically revised the manuscript; AJ: Helped in data collection; STH: Contributed to result interpretation and critically revised the manuscript; JA: Assisted in manuscript writing and proofreading.

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