Burden of Depression, Anxiety and Stress; The Psychiatric Burden in COVID-19 Patients at a Tertiary Care Hospital in Pakistan

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ABSTRACT

Objective: To assess the levels of depression, anxiety and stress in patients diagnosed with COVID-19.
Study Design: Cross-sectional study.
***Place and Duration of Study*:** COVID isolation ward of PNS Shifa Hospital, Karachi Pakistan, from May to Jun 2020.
Methodology: A total of 110 patients whose COVID-19 PCR tests were positive were selected. They had a history of at least one-week admission to the hospital, and all of them were stable or had mild symptoms. Depression, Anxiety and Stress scale (DASS 21) was administered to all the patients through a video call.
Results: The study revealed that 30 (27.3%) of the COVID-19 patients had depressive features, whereas 37 (33.6%) were found to be anxious, and 13 (11.8%) were under stress during this time. Depressive features were more common in the female gender affecting 9 (56.2%) out of 16 females (p=0.011) and unemployed patients affecting 12 (54.5%) out of 22 unemployed patients (p=0.006). Anxiety was more common in the female gender affecting 11 (68.7%) out of 16 females and married patients, affecting 26 (27.6%) out of 94 married patients (p=0.01). Stress was found to be more in females, affecting 8 (50%) out of 16 females (p=0.01).
Conclusion: This study showed that the diagnosis of COVID-19 can lead to psychological effects, and patients should be monitored for depression, anxiety and stress.

Keyword: Anxiety, Depression, Stress.

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INTRODUCTION

The diagnosis of COVID-19 is associated with severe psychological pressures, including fear, apprehensiveness, isolation, abandonment and social stigmatization. Studies over the last six months have established the psychiatric burden of COVID-19 directly on the patients and in-directly on the general public and health care workers who directly deal with such patients.[1,2] Zhang *et al*, showed an increased prevalence of depression (29.2%) in COVID-19 infected patients compared to the individuals under quarantine (p=0.016). However, there was no difference in anxiety between the groups.[3] Another study on COVID patients showed a higher level of depression and anxiety than the general population.[4] Most psychiatric symptoms are an indirect effect of the virus due to mental trauma. However, it may be attributed to specific neuroinflammatory changes by the virus, affecting neurotrans-mission in the brain.[5] A study revealed that the overall prevalence of anxiety and depressive symptoms in public were 35.1% and 20.1%, respectively.[6] A longitudinal study in China involving 1738 respondents showed stress, anxiety, and depression in 8.1%, 28.8%, and 16.5%, respectively.[7] Lima *et al,* established that the COVID-19 epidemic has psychiatric effects on health-care workers.[8] In the past, after the SARS and Ebola epidemics, it was seen that patients' mental health was affected not only during the acute phase of illness but also in the long term. A study on Ebola survivors and health care workers in Sierra Leone showed high levels of anxiety, phobia, paranoia and obsessionality in them.[9] A research looking into the long-term effects of SARS in Hong Kong with Ninety subjects showed that Post-SARS cumulative incidence of DSM-IV psychiatric disorders was 58.9%. One-fourth of the patients had post-traumatic stress disorder (PTSD), and 15.6% had depressive disorders.[10]

The rationale of this study was to assess the psychiatric effects of COVID-19 in patients who have the illness in the Pakistani population. We hypothesized that patients would have higher anxiety, depression, and stress levels.

METHODOLOGY

The study was conducted at the COVID Isolation ward of PNS Shifa hospital Karachi Pakistan, from

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May to June 2020. The WHO sample size calculator calculated the sample size with a confidence interval of 95%. It was found to be 110 based on a Chinese study which showed higher levels of depression, anxiety and stress in patients with COVID-19.[4] Subjects were enrolled on the study after informed consent of the patients and ethical approval from the ethical committee of PNS Shifa hospital.

Inclusion Criteria: Patients of COVID-19 PCR positive test, who had a history of at least one-week admission to the hospital, were included in the study.

Exclusion Criteria: Patients of psychiatric illness and severe symptoms of illness, including dyspnoea were excluded from the study.

A simple random sampling technique selected the patients, and those who fulfilled the inclusion criteria were asked on the phone by a member of the Psychiatry Department to participate in the study. All the participants were informed that the study was independent of their scheduled treatment, and all data would be handled confidentially. Assessment tools consisted of a data form (including age, gender, educational level, occupational status and marital status). Depression, anxiety and stress were assessed using the depression, anxiety and stress scale 21 (DASS 21). This quantitative scale measures the patient's emotional state on the lines of depression, anxiety, and perceived stress through 21 questions (7 questions each) which are answered on five severity levels.[11] The total scores help demarcate mild, moderate, severe and extremely severe levels of depression, anxiety and stress. The score achieved on each scale is multiplied by 2 for the final score. A doctor administered the scale and contacted these patients through a video call.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Quantitative variables were summarized as mean ± SD and qualitative variables were summarized as frequency and percentages. Chi-square test was applied to find out the association. The *p*-value lower than or up to 0.05 was considered as significant.

RESULTS

The total number of subjects was 110, 94 (85.5%) were males, and 16 (14.5%) were females. The patients were allocated to two age groups 18-40 and 41-60 years old. 71 (64.5%) patients belonged to the 18-40 group, and 39 (35.5%) belonged to the 41-60 age group. The mean age was 37.4 ± 8.5 years. DASS 21 scores for depression were high in 30 (27.3%) patients. Within the scores for depression, it was seen that 13 (11.8%) of patients were found to be mildly depressed, 15 (13.6%) were moderately depressed, and 02 (1.8%) patients had scores within the severe range. The scores for anxiety revealed a total of 37 (33.6%) patients to be anxious, out of which 20 (18.2%), 12 (10.9%) and 05 (4.5%) were found to be mild, moderate and severely anxious, respectively. On the stress scale, it was seen that 13 (11.8%) patients were stressed. Among them, 2 (1.8%), 4 (3.6%) and 7 (6.4%) were mild, moderate and severely stressed, respectively. Table-I showed the correlation of different factors with depressive features. The *p*-value was less than 0.05 in the case of gender (p=0.011) and employment status (p=0.006), showing these features to be more in females and the

Table-I: Demographics of patients with different levels of depression severity.

Patient Characteristics	Number of Samples with DASS (Depression) Scores According to Severity				Mean Total Dass Score ± SD	*p*-value
	Normal n (%) (0-9)	Mild n (%) (10-13)	Moderate n (%) (14-20)	Severe n (%) (21-27)		
Gender						
Male	73 (66.3%)	10 (9.0%)	09 (8.1%)	02 (1.8%)	6.8 ± 3.5	0.011
Female	07 (6.3%)	03 (2.7%)	06 (5.4%)	00 (0%)	8.5 ± 3.6	
Age						
18-40 years	52 (47.2%)	9 (8.1%)	9 (8.1%)	01 (0.9%)	6.7 ± 3.1	0.929
41-60 years	28 (25.4%)	04 (3.6%)	06 (5.4%)	01 (0.9%)	7.7 ± 4.1	
SD ± Mean					37.4 ± 8.5	
Marital Status						
Single	11 (10%)	00 (0.0%)	05 (4.5%)	00 (0.0%)	7.7 ± 2.2	0.077
Married	69 (62.7%)	13 (11.8%)	10 (9.0%)	02 (1.8%)	6.9 ± 3.7	
Occupational Status						
Employed	70 (63.6%)	07 (6.3%)	09 (8.1%)	02 (1.8%)	6.8 ± 3.5	0.006
Unemployed	10 (9.0%)	06 (5.4%)	06 (5.4%)	00 (0.0%)	8.0 ± 3.6	
Educational Status						
Uneducated	13 (11.8%)	06 (5.4%)	04 (3.6%)	00 (0.0%)	8.2 ± 4.4	0.076
Educated	67 (60.9%)	07 (6.3%)	11 (10%)	02 (1.8%)	6.7 ± 3.2	

unemployed. Similarly, Table-II showed a significant correlation between anxiety with gender (p=0.01) and marital status (p=0.01), showing more occurrence in females and married patients. Regarding the relation of stress scores with different factors, it was significant only in the female gender, who were more affected than males (p=0.001), as shown in Table-III.

DISCUSSION

Our study showed a significant prevalence of depression, anxiety and stress among COVID-19 patients. Most of the patients who were depressed showed moderately depressive features, and depressive features were more existent in females and unemployed patients. Whereas most anxious patients showed mild anxiety features, anxiety features were more prevalent in females and married patients. Similarly, stressful features were also significantly prevalent in females. A cross-sectional study comparing the psychological distress caused by COVID-19 in positive patients and normal populations revealed a higher prevalence of depression (29.2%) in positive cases, which is similar to the finding of this study which shows

Table-II: Demographics of patients with different levels of anxiety severity.

Patient Characteristics	Number of Samples with DASS (Anxiety) Scores According to Severity				Mean total DASS Score ± SD	p-value
	Normal n (%) (0-7)	Mild n (%) (8-9)	Moderate n (%) (10-14)	Severe n (%) (15-19)		
Gender						
Male	68 (61.8%)	13 (11.8%)	09 (8.1%)	4 (3.6%)	8.5 ± 4.5	0.010
Female	05 (4.5%)	07 (6.3%)	03 (2.7%)	01 (0.9%)	12.5 ± 5.5	
Age group						
18-40 years	49 (44.5%)	14 (12.7%)	06 (5.4%)	02 (1.8%)	8.9 ± 4.7	0.408
41-60 years	24 (21.8%)	06 (5.4%)	06 (5.4%)	03 (2.7%)	9.0 ± 5.4	
SD ± Mean					37.4 ± 8.5	
Marital Status						
Single	05 (4.5%)	08 (7.2%)	03 (2.7%)	00 (0.0%)	11.2 ± 5.2	0.01
Married	68 (61.8%)	12 (10.9%)	09 (8.1%)	05 (4.5%)	8.7 ± 4.7	
Occupational Status						
Employed	63 (57.2%)	13 (11.8%)	08 (7.2%)	04 (3.6%)	8.5 ± 4.6	0.114
Unemployed	10 (9.0%)	07 (6.3%)	04 (3.6%)	01 (0.9%)	11.0 ± 5.3	
Educational Status						
Uneducated	13 (11.8%)	04 (3.6%)	03 (2.7%)	03 (2.7%)	10.0 ± 4.7	0.159
Educated	60 (54.5%)	16 (14.5%)	09 (8.1%)	02 (1.8%)	8.9 ± 4.8	

Table-III: Demographics of patients with different levels of Stress severity.

Patient Characteristics	Number of Samples with DASS(Stress) Scores According to Severity				Mean Total DASS Score ± SD	p-value
	Normal n (%) (0-9)	Mild n (%) (10-13)	Moderate n (%) (14-20)	Severe n (%) (21-27)		
Gender						
Male	89 (80.9%)	0.1 (0.9%)	02 (1.8%)	02 (1.8%)	7.9 ± 2.9	0.01
Female	08 (7.2%)	01 (0.9%)	02 (1.8%)	05 (4.5%)	11.0 ± 6.7	
Age						
18-40 years	60 (54.5%)	01 (0.9%)	05 (4.5%)	01 (0.9%)	8.3 ± 3.6	0.621
41-60 years	30 (27.2%)	01 (0.9%)	04 (3.6%)	01 (0.9%)	9.3 ± 5.6	
Mean ± SD					37.4 ± 8.5	
Marital status						
Single	14 (12.7%)	01 (0.9%)	01 (0.9%)	00 (0.0%)	8.5 ± 3.9	0.086
Married	83 (75.4%)	01 (0.9%)	03 (2.7%)	07 (6.3%)	9.6 ± 5.9	
Occupational Status						
Employed	80 (72.7%)	00 (0.0%)	02 (1.8%)	06 (5.4%)	9.1 ± 4.9	0.071
Unemployed	17 (5.4%)	02 (1.8%)	02 (1.8%)	01 (0.9%)	8.4 ± 3.8	
Educational Status						
Uneducated	20 (18.1%)	00 (0.0%)	01 (0.9%)	02 (1.8%)	8.7 ± 4.1	0.091
Educated	77 (70%)	02 (1.8%)	03 (2.7%)	05 (4.5%)	9.5 ± 5.7	

27.3% occurrence depression in COVID-19 patients. At the same time, anxiety levels were almost similar between patients (20.8%) and the normal population (19.6%).[3] However, this study shows a higher occurrence of anxiety which was 33.6% in COVID-19 patients. A systematic review based on 24 studies revealed that the vulnerability to psychological distress in different populations during COVID-19 pandemic could be attributable to various factors, including gender, social support, specific experiences with COVID-19 infection, length of isolation, and amount of exposure to the media.[11] A longi-tudinal study from China assessing subjects over four weeks found that stress levels remained high even after four weeks, and the highest psychological impact was seen in females and subjects with physical symptoms.[7] A Spanish study looking into the perception of threat from COVID-19 found that the pandemic has led to an increase in negative emotional signs, that is, sadness-depression, anxiety and anger-hostility.[12] A systematic review based on 62 studies found that an-xiety and depression were highest in patients with pre-existing illness (56%) or a COVID-19 infection (55%).

The risk was higher in females and people from lower socioeconomic status.[13] Bo *et al*, conducted a study on 730 stable patients with COVID-19 using the PTSD checklist- Civilian version (PCL-C) scale. They revealed a markedly high prevalence of post-traumatic stress symptoms (96.2%) in these patients.[14] It has been seen that epidemics lead to increased levels of stress. This was seen in the SARS epidemic of 2003. Stress was significantly higher in SARS patients than in healthy control subjects. Of SARS patients, 39% were infected health care workers; these individuals reported significantly more fatigue and worries about health than other patients.[15]

A study which assessed the long-term effects of the SARS epidemic showed that survivors were clinically diagnosed with PTSD (54.5%), depression (39%), pandemic disorder (32.5%) at 31 to 50 months post-infection, which was a marked increase from their pre-infection prevalence of any psychiatric diagnoses of just 3%.[16]

Similarly, a study on the psychiatric effects of the MERS virus revealed that 70.8% of positive patients showed psychological distress, and 41.7% received a psychiatric diagnosis.[17] Furthermore, a study in 2011 on 257 subjects showed that seropositivity for coronaviruses was associated with a history of mood disorders, and it suggested that coronavirus infections can cause mood disorders.[18] Furthermore, the pro-inflammatory effects of the virus, which involve the release of cytokines including Interleukin IL 1b and IL 6, may have a neuro-inflammatory effect leading to neuropsychiatric effects.[19] Currently, the morbidity and mortality of COVID-19 are low in Pakistan.[20] However, complacency can lead to a severe burden on the health resources of Pakistan.

CONCLUSION

This is one of the pioneer studies looking into the levels of emotional disturbance in patients with COVID-19 in Pakistan. This study showed that COVID-19 patients have significant anxiety, depression, and stress, especially in females, married patients and the unemployed. Higher scores on the DASS scale suggest these patients need regular monitoring and detailed psychiatric interviews to establish any worsening of symptoms further. Medical staff should focus on the psychological state of such patients, strengthen health education, and actively conduct psychological counselling. Adequate and timely psychological interventions could help reduce the psychosocial problems these may develop in the future.

Conflict of Interest: None.

Author's Contribution

MSK: Main author, NS:, MA: Data collection, SR: Supervision, AH:,HK: Statical analysis.

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