

Prevalence and Severity of Depression, Anxiety and Stress among COVID-19 Patients in Gaza Strip during the Pandemic: A Prospective Study

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Abstract

Background: COVID-19 is a contagious illness that may cause severe physical symptoms and has been linked to mental health concerns. The purpose of this research was to assess the prevalence and severity of mental health issues in a hospitalized population of people with COVID-19.

Methods: This study was a descriptive prospective design. This study was conducted at a main center for COVID-19 inpatients, Turkish-Palestinian Friendship Hospital. The study was conducted during September 2020 to February 2021. Population of this study were COVID-19 patients admitted to Turkish-Palestinian Friendship Hospital. Participants who were intubated or admitted to intensive care unit (ICU) and patients who died during the follow up were excluded from the study. In addition, patients with history or current psychiatric illness were excluded.

Results: Among 1235 patients, there were 766 males (62%) and 469 females (38%). The mean age among study participants was 37 ± 14 years and ranged from 16 to 57 years. Depressive symptoms were seen in 97.2% of COVID-19 individuals. According to the depression, anxiety and stress Scale (DASS), 85.8 percent of respondents were severely depressed. Anxiety ranged from very severe (99.1%) to very severe (0.9%) throughout the board. The vast majority (97.1%) of patients were stressed. Research has discovered a significant link between depressive symptoms and how stressed out participants were (Coefficient: 0.33, P-value: 0.001). There was a statistically significant correlation between anxious feelings and reports of stress (Coefficient: 0.2, P-value: 0.04).

Conclusion: Hospitalized COVID-19 individuals were studied. One third of individuals smoked and had comorbidities such diabetes, hypertension, heart disease, lung illness, and others. Taste and smell loss were the most prevalent COVID-19 symptoms reported by all individuals. Some symptoms developed within days after diagnosis, whereas others came later in the illness and lasted longer. Female gender, older age, and comorbidities increased the intensity and duration of symptoms.

Keywords: COVID-19; Depression; Anxiety; Stress; DASS-21; Gaza Strip

Introduction

Depression, anxiety, and stress are common mental health conditions that affect individuals globally [1]. The COVID-19 pandemic has had a profound impact on mental health, with increasing rates of depression, anxiety, and stress being reported among individuals who have contracted the virus as well as those who have been affected by it indirectly [1,2]. The Gaza Strip, which is a small coastal enclave in the eastern Mediterranean, has been particularly affected by the COVID-19 pandemic due to several factors, including the ongoing conflict and limited healthcare resources [3].

The COVID-19 pandemic has affected nearly every aspect of life and has resulted in significant physical, economic, and psychological stress for individuals globally [4]. The fear of contracting the virus, as well as the physical and emotional toll of illness, has been shown to increase the risk of depression, anxiety, and stress [5]. Additionally, the quarantine measures implemented to slow the spread of the virus have resulted in social isolation and limited access to healthcare resources, exacerbating the impact of the pandemic on mental health [6].

By the end of 2021, Gaza Strip had 51,153 confirmed cases of COVID-19 with 551 total deaths. The active cases at the same time was 11,071 cases and 39,531 recovered cases [7]. Now, in Palestine, the total confirmed cases is 621,008 and a total deaths of 5,404 [8].

The Gaza Strip is one of the most densely populated areas in the world and has been particularly affected by the COVID-19 pandemic [9]. The ongoing conflict and limited healthcare resources have resulted in high levels of psychological distress, and the pandemic has only exacerbated these conditions [10]. The high prevalence of depression, anxiety, and stress among COVID-19 patients in the Gaza Strip highlights the need for targeted interventions to address these mental health concerns and support individuals who are suffering [11].

COVID-19 pandemic has had a profound impact on mental health globally, and the Gaza Strip has been particularly affected [12]. The current study aimed to assess the prevalence and severity of depression, anxiety, and stress among COVID-19 patients in the Gaza Strip during the pandemic. In addition, this study will provide important information about the impact of the pandemic on mental health in this region. The findings of this study will inform the development of targeted interventions to support individuals who are suffering and will contribute to the larger body of research on the impact of the COVID-19 pandemic on mental health.

Methods

Study design

This study was a descriptive prospective design. Since this study aimed to determine the prevalence of depression, anxiety and stress among COVID-19 patients admitted to the hospital, data was collected upon admission. Furthermore, this design allows to gather much data about participants and follow up patients.

Study setting

This study was conducted at a main center for COVID-19 inpatients, Turkish-Palestinian Friendship Hospital. This hospital was not operating until the health crisis of COVID-19 in Gaza Strip. The ministry of health decided to make the hospital special place for COVID-19 patients only as other hospitals are full of patients of other diseases. Now, after COVID-19 pandemic, Turkish-Palestinian Friendship Hospital is a specialized center for oncology patients in Gaza Strip. The study was conducted during September 2020 to February 2021.

Study population and sample

Population of this study were COVID-19 patients admitted to Turkish-Palestinian Friendship Hospital during September 2020 to February 2021. Three researchers collected data from patients as they were physicians working closely with these patients. Participants who were intubated or admitted to intensive care unit (ICU) and patients who died during the follow up were excluded from the study. In addition, patients with previous or current psychiatric disorders were excluded.

We used G-Power analysis to determine the sample size needed to detect a small-to-medium effect size of 0.25, with an alpha level of 0.05 and 80% statistical power. The analysis indicated that a minimum sample size of 828 participants would be required to achieve these parameters. This informed our decision to recruit a sample of at least 900 participants to account for potential dropouts and missing data. The G Power analysis ensured that our study had adequate power to detect the effect of interest and provided a strong basis for the inferential statistical tests performed on the data.

Study instruments

Study instrument was designed by study researchers based on the findings (signs and symptoms) of patients and based on literature published during the pandemic. It consisted of three domains:

1. Sociodemographic characteristics of patients such as age, gender, residency, education, marital status etc.,
2. Signs and symptoms of COVID-19, and
3. Depression, Anxiety and Stress Scale-21 (DASS-21) [13].

Data collection

Data was collected directly from patients and their records (for signs and symptoms) while they were admitted in the hospital. This was done by the physicians working closely with these patients.

Data analysis

After collecting data and entering data into the Statistical Package of Social Sciences (SPSS) software version 25, a frequency analysis was done to assure no missing data. In the case of missing data, a case-wise deletion was performed. Once data integrity was achieved, frequency analysis was done to present baseline characteristics variables. Continuous variables were presented as means and standard deviations while categorical variables were presented as frequency and percentages. A statistically significant relationship was assumed at a P value of less than 0.05.

Ethical consideration

An approved permission was gained from Ministry of Health in Gaza Strip to collect data from patients. Patients included in this study were consented to use their data for research purposes.

Results

The study included 1235 patients. Among them there were, 766 males (62%) and 469 females (38%). The mean age among study participants was 37 ± 14 years and ranged from 16 to 57 years. The median age was 39 years. Most of participants were from northern area (n = 713, 57.7%) and Gaza city (n = 376, 30.4%). Figure 1 shows geographical distribution of study participants.

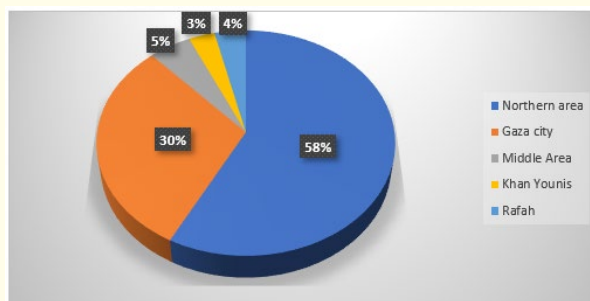


Figure 1: Geographical distribution of study participants.

More than half of study participants were married (n = 712, 57.6%) (Figure 2). In addition, about half of participants had a university degree (diploma and bachelor) (n = 602, 48.7%) (Figure 3).

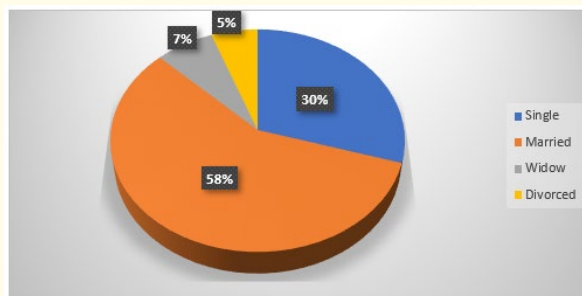


Figure 2: Marital status distribution of study participants.

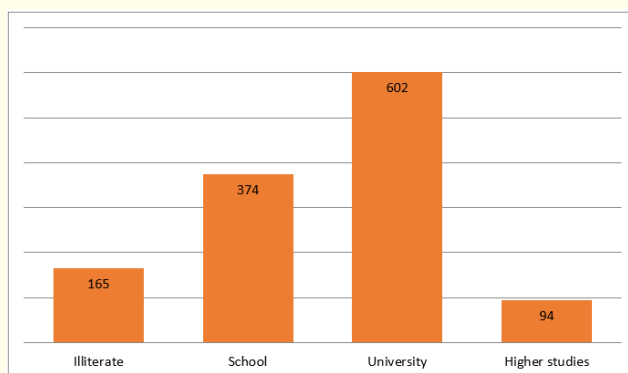


Figure 3: Educational level distribution of study participants.

The mean weight among study participants was 74.26 ± 19.91 kg with median weight of 75 kg. The mean height among study participants was 1.66 ± 0.43 meter with median height of 1.69 meter. The median body mass index among study participants was 26.21 kg/m^2 . The prevalence of obesity among study participants was 38.5%.

Among study participants, about one third were smokers (n = 406, 32.8%) and 15.7% had comorbid conditions (n = 194). Chronic conditions included diabetes mellitus, hypertension, cardiac disease, respiratory disease and others such as renal and rheumatologic diseases. Table 1 shows frequency of chronic conditions among study participants. Hence, some participants had more than one comorbid condition. And all of participants with chronic conditions are on chronic use of prescribed medications.

Comorbid condition	Frequency	Percent
Diabetes mellitus	68	5.5%
Hypertension	47	3.8%
Cardiovascular disease	46	3.7%
Asthma	79	6.4%
Chronic obstructive pulmonary disease	30	2.4%
Others	37	3%

Table 1: Comorbid conditions among study participants.

All participants in the current study exhibited some of COVID-19 symptoms. Some patients had one symptom only while others had more than one symptom at once. The onset and duration of symptoms varied among study participants. The most frequent symptoms were loss of taste (n = 1148, 92.9%) and loss of smell (n = 1037, 83.9%). Respiratory symptoms included shortness of breath among 283 participants (22.9%) and cough among 783 participants (63.4%). Non-respiratory symptoms such as diarrhea and abdominal pain were prevalent among 200 and 131 participants respectively. Figure 4 demonstrates signs and symptoms frequency among study participants.

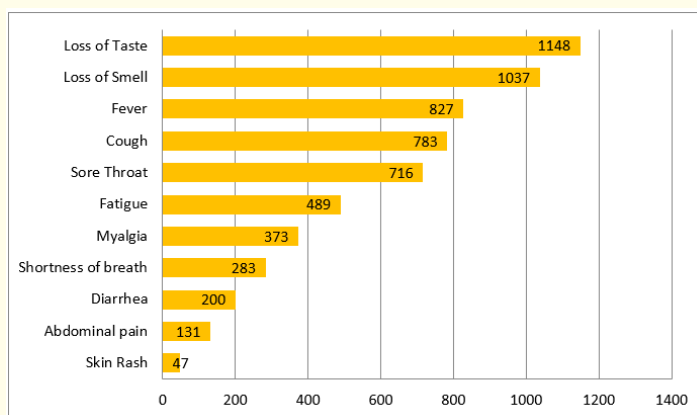


Figure 4: COVID-19 signs and symptoms among study participants.

Average subclass scores based on the overall score of the DASS-21 questionnaires on depression was 29.94 (SD = 8.25), anxiety was 31.53 (SD = 4.22), stress was 30.34 (SD = 5.95), and the perceived stress was 10.29 (SD = 3.17) (Figure 5).

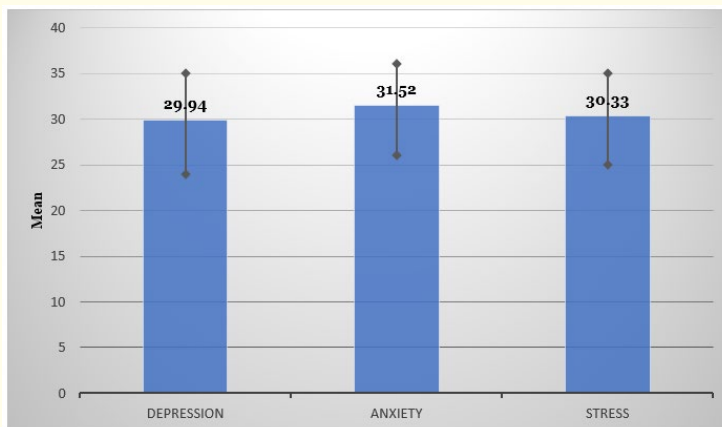


Figure 5: Mean of depression, anxiety and stress scores among hospitalized COVID-19 patients.

Overall, 97.2% of patients with COVID-19 had some degree of depression. Severity of depression, according to the DASS questionnaire, was 85.8%. All patients (100%) had severe (0.9%) and very severe (99.1%) anxiety. Regarding to stress levels, 97.1% of patients had some degree of stress. In the severity of stress category, 84.9% of patients had severe and very severe stress. In terms of perceived stress, 73.6% of patients had high levels and 22.6% had moderate levels (Figure 6).

There was a statistically significant relationship between female gender and the severity of depression among patients admitted with COVID-19 (P-value: 0.006). The highest prevalence of patients with severe and very severe depression was in the group of patients with middle and old age groups.

There was also a significant statistical association between education level and severity of depression (P-value: 0.001). The highest prevalence of patients with severe and very severe depression was observed in the group of patients with diploma or bachelor and illiteracy education. Being married in patients was associated with increased anxiety (P-value= 0.010). Having hypertension disease was statistically associated with stress (P-value < 0.001).

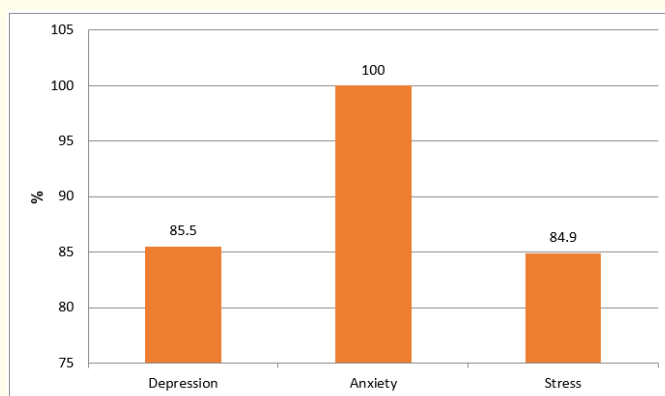


Figure 6: Prevalence of severe depression, anxiety and stress among hospitalized COVID-19 patients.

Discussion

The mean age of our research population was 37 years old (SD = 14 years). The majority of COVID-19 patients in hospitals were between the ages of 31 and 60 [14].

In our research, we found that the risk of depression was greatest among patients with a diploma and bachelor degree or less and those who were illiterate, followed by those with a higher university degree. While research on the correlation between income and education and depression is mixed, most studies find an adverse link between the two [15]. In addition, we found that those with a comorbid conditions especially hypertension were more likely to be sad than others. In the wake of the COVID-19 outbreak, people are worried about their capacity to satisfy basic requirements and about the stability of the economy. Depression and other mental health issues are common in this situation [16,17], particularly for those whose professions are especially vulnerable in the current economy. Managing current assets, paying attention to successful experiences abroad, and tapping into the power of social capital are all viable options [18,19].

Marriage has been shown to have a protective effect against stress and anxiety in a number of research investigations [20]. Research on the efficacy of common protective variables in this sector is warranted because of the ambiguity of the COVID-19 [10] environment. It seems that environmental and social variables have a significant influence in this. Further examination in other relevant research is necessary to accurately evaluate the association between marriage and anxiety and stress among COVID-19 patients due to the intricacy of the symptoms connected with this virus.

The significant prevalence of co-morbidities in the COVID-19 cohort was a key finding of our investigation. Diabetes mellitus (5.5%), hypertension (3.8%), cardiovascular disease (3.7%), asthma (6.4%), and more were the most common underlying disorders in our research. Hypertension, cardiovascular disease, smoking history, and diabetes have each been shown to have a significant prevalence among SARS-CoV-2 infected hospitalized patients in a comprehensive review and meta-analysis [21]. Our findings, along with those from previous research, show that the COVID-19 is linked to a similar set of underlying diseases. However, it is not feasible to compare the prevalence because of disparities in the number of populations investigated. Having a compromised immune system or low levels of physical strength are also risk factors for developing COVID-19 [22]. Due to the nature of the research at hand (evaluating COVID-19 patients for signs of depression, anxiety, and stress), this is a pressing concern. The interplay between mental and physical sickness is complex, making it a significant issue for contemporary medicine [23]. When we looked at the correlation between individuals' underlying ailments and their psychological problems, we found none.

Lim., *et al.* in South Korea reported the first tertiary transmission cases of COVID-19. They painted a picture of a healthy 54-year-old person with no record of ever having smoked or used illegal substances. He became depressed, insomniac, and suicidal while hospitalized, but therapy improved to his satisfaction in the end. The patient also felt stress from hearing about other people's responses to COVID-19 sufferers in the media. A psychiatrist was contacted, and the patient was prescribed medicine. Patients' psychological issues were attributed in part to their isolation due to their sickness [24]. There is evidence from a variety of sources that time spent in quarantine, for whatever cause, may have a bad impact emotionally. Long-term isolation, lack of knowledge, frustration, and social shame are some of the causes. Long-term detrimental repercussions are a concern, according to some specialists. The duration of quarantine should be kept to a minimum, and patients should be given accurate information, according to their recommendations [25].

However, the link between respiratory virus infections and subsequent mental problems is something that has been thought about in recent years. One research [26] found that those who tested positive for antibodies against influenza and coronavirus were also more likely to disclose a history of mood problems. Here, we look at the coronavirus-depression connection from a biological perspective. In order to draw firm conclusions in this area, it is necessary to do further research and account for the many aspects that impact this sector. Some scientific worldviews provide illustrations of this class of conceivable associations [27,28].

High levels of anxiety have been linked to psychological stress in other research, particularly in the context of isolating patients with COVID-19 illness for treatment [29]. All of the hospitalized, solitary individuals we studied showed signs of anxiety, and the majority of them had symptoms that ranged from very severe to very severe. Initial anxiety levels may be low, but there is always the chance that they may rise dramatically over the course of a few days [23]. It would appear that the use either of psychological and psychiatric counseling methods, in-person or via online hospital systems, can be an effective way to manage patients' clinical condition, given the prevalence and severity of anxiety symptoms in hospitalized and isolated patients, and the anticipation of anxiety disorders among hospitalized patients. Some studies have advised trying out different methods of stress relief, such progressive muscle relaxation [29].

Among the individuals analyzed, more than a third had a previous diagnosis of a mental illness. Patients with a history of mental health difficulties need careful attention to many facets of their psychiatric state [30]. All patients displayed anxiety and other mental

signs throughout hospitalization and after achieving clinical stability. Overall, 31.03 percent of the Iranian population suffers from a diagnosable mental health condition, according one review research [31]. Another research found that mental health issues occurred in 23.4% of the population. Anxiety and somatization syndrome were more common than other mental health issues [32]. One of the most notable shifts in the impact of mental illness, in years lived with disability, was seen in a research that looked at the frequency of 310 diseases and injuries in Iran and nearby countries between 1990 and 2015. (YLD). However, severe depressive illness is a significant contributor to young-onset dementia in Iran [33]. Another research out of Iran found that 54 percent of diabetics also struggle with depression. Patients who had acute maxillofacial trauma were shown to have a prevalence of 24% for depression and 32.5% for anxiety, according to a separate research [34]. Anxiety and sadness were also observed to be more common in this group than in the control group.

Recent Iranian research suggests a rising rate of mental health issues. However, a number of studies have shown that the incidence of sadness and anxiety among hospitalized patients increases throughout their stay owing to either acute or chronic illness. Our findings that 97.1% and 100% of hospitalized patients had sadness and anxiety, respectively, are in line with these findings [33,34].

A study by Rossely, *et al.* [35] looked at a sample of hospitalized patients and found that, compared to the general population, hospitalized patients have much higher rates of anxiety and sadness. It is crucial to pay attention to patients' mental health state in addition to their physical health, since our research shows that patients with COVID-19 have a high severity of depression, anxiety, and stress, as well as high levels of perceived stress.

Among a sample of hospitalized patients, IsHak, *et al.* found a prevalence of depression ranging from 5% to 60%, with an average of 33%. They recommended doing depression screenings on hospitalized patients. Notably, in our analysis, 97.1% of patients reported some degree of depression while hospitalized, and this was related with lower functional outcomes, worse physical health, and re-hospitalization [36]. Furthermore, the DASS severity of depression scale showed severe and very severe scores in 85.8% of them, showing a significant prevalence and severity of depression in patients. Considering the severity of COVID-19's adverse effects on patients' health, it stands to reason that screening for and treating depression in COVID-19 patients, as well as providing adequate post-discharge care, might have a positive impact on these individuals' physical well-being [36].

Post-traumatic stress disorder (PTSD) and depression were both linked to a significant loss in functional ability in a research by Zatzick, *et al.* that examined patients 12 months after the trauma incident. They stressed the need of acute therapies at the earliest feasible stages to provide patients the best chance of regaining their previous vocational abilities [37]. In light of the monetary challenges brought on by the COVID-19 epidemic, it would make sense for persons undergoing therapy for mental health illnesses to show improved productivity on the job.

Lee, *et al.* compared the physical and mental strain experienced by 79 and 96 patients at two hospitals, respectively, during and after the SARS pandemic. The stress levels of the outbreak group were greater than those of the control group. One year after the trial ended, patients in both groups still had elevated stress levels, according to the results of this test. Furthermore, they showed concerning levels of sadness, anxiety, and post-traumatic stress even a year after the epidemic [38]. Patients are worried that these protests will continue since the causal agent and epidemic circumstances are similar to those of SARS and COVID-19 (although many specialists believe that COVID-19 is more worrisome in terms of severity and scope than SARS [39]).

Among SARS patients who received treatment 30 months after the first epidemic, 58.9% had developed a mental illness over time, and 33.3% were now suffering from some kind of mental illness. The most frequent mental health problems were PTSD and its sequelae, depression. So, they called the SARS pandemic a "mental health disaster" and emphasized the need of preparing for the detection and

treatment of psychiatric illnesses in the event of future viral pandemics [40]. Our findings add to the growing body of research that suggests it is crucial to treat people with COVID-19 for mental health issues in order to effectively manage any potential psychiatric complications.

Clinically significant rates of sadness (17 - 43%) and anxiety (23 - 48%) were also recorded in patients, according to a review paper on the SARS epidemic. Patients were found to have a significant frequency of mental problems, and researchers stressed the need of prevention and follow-up [41].

Conclusion

All individuals with COVID-19 in our research showed significant rates of depression, anxiety and stress. More attention should be paid to the mental health of COVID-19 patients because of the high incidence and severity of these psychiatric diseases which could have future consequences. It would seem that health officials need a unified strategies for screening patients and handling associated problems.

Competing Interest

Authors declare that they have no competing interests.

Authors' Contribution

EK designed the study protocol and formulated study design. EK and AT prepared the study instruments. EK gained the ethical approval for the study. SM transformed the instruments into online form. OS, HT and AHK collected the data from patients. SM extracted data from the online form. AT and AA analyzed the data and wrote the first draft of the manuscript. EK revised the manuscript and supervised the overall work during the study. All authors approved the final draft of manuscript.

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Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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