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Can we predict who will be more anxious and depressed in the COVID-19 ward?

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ABSTRACT

Objective: Hospitalized patients with COVID-19 are at high risk for anxiety and depression, but most studies about mental health during the pandemic included the general public, healthcare workers, and students. We aimed to explore the anxiety and depression levels, prevalence and predictors in patients hospitalized with COVID-19.
Methods: In this cross-sectional, exploratory study, sociodemographic and clinical features of 281 patients with confirmed COVID-19 were explored. Patients underwent a comprehensive psychiatric assessment and the Hospital Anxiety and Depression Scale (HADS) was administered through a telephonic interview.
Results: The mean age of the participants was 55.0 ± 14.9 years. One hundred forty-three (50.9%) patients were male, and 138 (49.1%) were female. Ninety-eight (34.9%) patients had significant levels of anxiety and 118 (42.0%) had significant levels of depression. Female gender, staying alone in a hospital room, early days of hospital stay, and any lifetime psychiatric disorder was associated with symptoms of anxiety. Being over 50 years of age, staying alone in a hospital room, and NSAID use before the week of hospital admission were associated with symptoms of depression. Anxiety and depression levels were lower when family members who tested positive for COVID-19 stayed in the same hospital room during treatment.
Conclusion: Women, patients >50 years, patients who used NSAIDs before hospital admission, and those with lifetime psychiatric disorders may be at risk for anxiety and depressive symptoms in the COVID-19 ward. Allowing family members with COVID-19 to stay in the same hospital room may be associated with lower anxiety and depression levels.

1. Introduction

The new coronavirus was first identified in Wuhan, China, in December 2019. It causes severe acute respiratory distress (severe acute respiratory syndrome) and was named SARS-CoV-2 by the International Virus Taxonomy Board. It has spread rapidly all over the world, and the World Health Organization (WHO) named the disease caused by this virus as COVID-19 [1]. SARS-CoV-2 spreads from person to person through droplets and contact. Although the genetics of the virus, the clinical features, and diagnosis of the disease have been well established, there is currently no definite treatment or vaccination [2]. Both infected and uninfected populations may be susceptible to the mental health impact of COVID-19: widespread anxiety and depression, and the effects of social isolation [3].

People infected by SARS-CoV-2 have to remove themselves from social environments. The concerns of people who are infected by the virus include fears about the outcome of the disease and their risk of being stigmatized which negatively affect their social behaviors. Mental health problems such as stress responses (inability to sleep, increased irritability, more fear than expected), and increased alcohol and cigarette consumption have been reported in affected people [4]. The emotional responses of infected patients most likely to include extreme

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fear and uncertainty. Increased risk-for-health behaviors, anxiety, depression, somatization, and traumatic memories of severe illness have been suggested to be present in these cases [5]. Even patients who survived COVID-19 may have ongoing psychiatric problems. A study in Milano where 402 adults with COVID-19 screened one month after hospital discharge, 28% of patients self-rated above the threshold for PTSD, 31% for depression, 42% for anxiety, 20% for OC symptoms, and 40% for insomnia. More than half of participants were found in the pathological range for at least one clinical dimension and having a positive previous psychiatric diagnosis was a significant risk factor for increased scores of psychopathological measures [6].

Anxiety and depression are the most common mental health problems in the general population globally [7]. Some essential links have been suggested between anxiety, depression and the emergence of viral diseases [8]. Among mild COVID-19 cases in FangCang Hospital in Wuhan, Hubei, China, being female and having colleagues with COVID-19 was associated with anxiety, and having family members with COVID-19 was associated with depression. In the meantime, the resilience scores were inversely associated with both anxiety and depression scores [9]. Anxiety and depression in hospitalized patients may cause treatment noncompliance, anger, frustration, increased length of hospital stay and suicidal ideas. Therefore, psychiatric consultation should be sought [10].

Telepsychiatry involves the use of electronic communication and information technologies to remotely provide clinical psychiatric care [11]. The rates of infection of healthcare providers increased as the number of COVID-19 cases increased worldwide. In feasible areas, there was a need to reduce the exposure of healthcare workers as much as possible while maintaining high-quality patient care. Robots were used to help nurses in China and Korea, and telepalliative medicine methods were implemented rapidly in the United States of America [12,13]. Remote consultations decrease the risk of asymptomatic physicians spreading the virus. Another advantage of telepsychiatry is that it minimizes the use of personal protective equipment (PPE), the shortage of which has become a significant problem in many countries during the pandemic.

Although face-to-face interviews have some advantages such as perceiving body language and gestures, psychiatry is a very suitable discipline for telemedicine during a pandemic because psychiatric examinations do not require physical touching. Telepsychiatry has often been used in outpatient settings, but it is very new for inpatients. Our patients with COVID-19 are isolated in hospital rooms, cannot see or touch their loved ones, and rarely interact with healthcare providers because they are dressed in PPE equipment. Anxiety and depression worsen with the social isolation of hospitalized patients, and telepsychiatry makes possible the opportunity to connect with patients and give them the support they need during this time [12].

The literature regarding the determination of depression and anxiety prevalence and predictors during a pandemic mostly included the general public, healthcare workers, and students [14–17]. Studies in patients hospitalized with COVID-19 are still very few, and these are preprint articles from China [9,10,18]. When the differences in consultation methods (teleconsultation, video consultation, in-person) and differences between cultures are considered, there is a great need for clinical studies in this area globally. In this study, we aimed to evaluate the anxiety and depression levels of patients hospitalized with COVID-19 at Bezmialem Vakıf University Hospital and to investigate the relationship between anxiety, depression, and sociodemographic variables.

2. Method

This descriptive quantitative cross-sectional, exploratory study was approved by the Ethics Committee of Bezmialem Vakıf University (54022451–050.05.04).

2.1. Setting and design

Patients were diagnosed with COVID-19 according to the guideline of the Turkish Ministry of Health. The telepsychiatric consultation care model for hospitalized patients with COVID-19 is new in our institution, which started with COVID-19 inpatient admission. We have an integrated clinical nurse team and a psychiatrist to provide patient-centered care. Nurses from the COVID-19 ward informed patients about the psychiatric assessment calls and the study, written consent was obtained from all patients who agreed to participate. The assigned psychiatrist worked from home during the study period. Nurses sent the cellphone numbers of patients to the psychiatrist weekly and updated it daily by checking the beds for patients who died or who were taken to the intensive care unit (ICU). The teleconsultation care service included an in-depth psychiatric evaluation by the psychiatrist and the administration of the Hospital Anxiety Depression Scale (HADS), and, if necessary, giving support, applying crisis intervention strategies, and/or pharmacotherapy.

2.2. Participants

Three hundred thirteen patients were hospitalized with COVID-19 infection at Bezmialem Vakıf University Hospital (Istanbul/Turkey) between March 24th, 2020, and May, 24th, 2020. The psychiatrist was informed that 11 patients were taken to ICU and six patients died during the study, and these patients were excluded. This information was based upon daily updates only; the total number of patient outcomes in our institution was not included because our interviews were cross-sectional and we did not know the changing status of patients who were called one or more weeks previously.

Five patients with Alzheimer's disease were excluded because they were not aware of their anxiety and depressive symptoms. Three patients with hearing disability and two patients with psychotic disorders required in-person interviews. Three patients could not speak Turkish, and two patients retracted their consent for the study. Thus, a total of 281 patients were included in the study (Fig. 1).

Patients who agreed to participate were called and asked about their sociodemographic and clinical information. These questions included their age, sex, marital status, number of children, age of their children (for the women in reproductive age group, presence of pregnancy), household, any family member with COVID-19, employment, financial status, history of smoking, admission symptoms, NSAID use, previous medical comorbidities, medications, length of hospital stay at the time of telephone interview, whether they stayed single or not, previous or present psychiatric disorders, and psychiatric symptoms. The patients underwent a comprehensive psychiatric assessment to evaluate their mood, anxiety, and suicidal risk. The Hospital Anxiety and Depression Scale (HADS) was administered through a telephonic interview. This route of delivery of the scale prevented older patients from having to complete online surveys, most of whom had visual disabilities or were unfamiliar with the internet and did not have a smartphone. Also, protected us against contamination from paper-based forms.

The Hospital Anxiety and Depression Scale (HADS).

HADS is a self-report scale that is used to measure anxiety and depression levels and severity in patients with physical illness. It has two subscales (HADS-A and HADS-D), which evaluate anxiety and depression separately. The validity and reliability study of the Turkish version of HADS was performed by Aydemir et al. The cut-off score was 10 for the anxiety subscale and 7 for the depression subscale in the Turkish version [19]. Cronbach alpha for the shortened version of HADS when administered on the telephone, was 0.85 in the study by Hedman et al. and there was no missing data. The short telephone-administered HADS correlated with the internet-administered Montgomery Åsberg Depression Rating Scale - Self-Rated (MADRS-S), ($r = 0.70$). It was concluded that providing self-report questionnaires over the telephone, in their full or shortened form, was a valid administration format for depressive

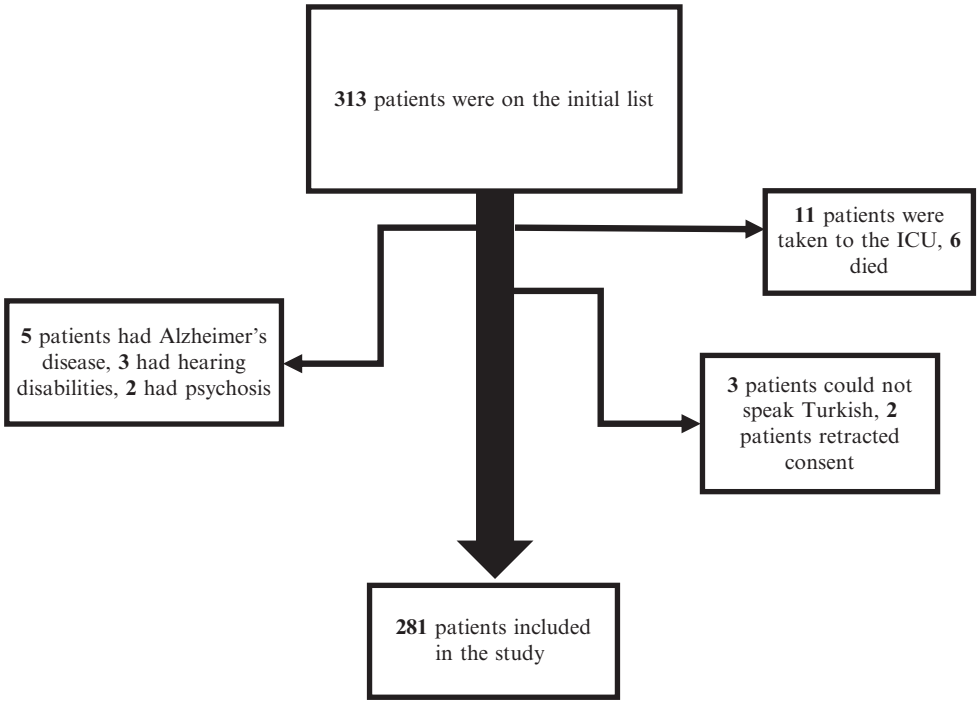

Fig. 1. Flowchart of excluded cases.

symptoms and reduces data loss [20].

2.3. Statistical analysis

All statistical analyses were performed using the IBM Statistical Package for the Social Sciences (SPSS) for Windows version 20.0 (SPSS Inc., Chicago, Illinois, USA) program. In descriptive statistics, categorical variables were reported as numbers and percentages. Continuous data were presented as mean ± standard deviation (Mean ± SD). Variables were checked for the assumption of normal distribution using histogram, skewness and kurtosis in addition to the Kolmogorov-Smirnov test. In the univariate analysis either Mann-Whitney *U* test, Kruskal-Wallis test or Spearman correlation tests were used to explore HADS-A, HADS-D scores and related factors. We did not adjust significance for multiple comparisons because the study is exploratory in nature. Two dependent variables were included in each group comparison: HADS-A and HADS-D, thus the significance level was planned to be adjusted to 0.025. Multivariate regression analysis was performed to identify the contribution of each factor associated with anxiety and depression separately. Therefore, correlates that showed statistical significance at a *p*-value of less than 0.05 in the univariate analysis were selected for entry into the regression analysis. As age and age of children were highly correlated variables only age was included in the regression to avoid multicollinearity. A post-hoc Tukey test was applied when there is a statistically significant difference in the Kruskal-Wallis test to determine which groups form the difference. A p-value $<.05$ was considered significant.

3. Results

Of the 281 patients included in the study, 143 (50.9%) were male, and 138 (49.1%) were female. The sociodemographic characteristics of participants are shown in Table 1. The mean age was 55.0 ± 14.9 (range, 18–90) years. The mean number of children of the patients was 2.7 ± 2.1. The mean age of the children was 24.9 ± 15.2 (range, 0–64) years. None of the female patients was pregnant.

Regarding employment status, 37.4% of patients were housewives, 28.8% were employed, 2.8% were unemployed, 28.5% were retired, and 2.5% were in the 'other' category. The 'other' category comprised students and people who had to be on annual leave and did not know if they would lose their jobs due to their employers going bust. Most of the participants were from low and middle-income groups (44.5% and 45.9%, respectively). Twenty-two (7.8%) participants had a high income, and five (1.8%) were below the poverty line. Sixty (21.4%) patients were smokers, and the mean pack-years for the smokers was 28.2 ± 28.4 (range, 1–160).

Ninety-eight (34.9%) patients had significant levels of anxiety and 118 (42.0%) had significant levels of depression. The mean HADS-A score was 8.7 ± 5.4, and the mean HADS-D score was 7.4 ± 5.6.

The clinical features of participants are shown in Table 2. Nearly half (49.5%; $n = 139$) of the patients with COVID-19 had medical comorbidities, the most common of which were hypertension and diabetes. One hundred forty-two (50.5%) patients had no medical comorbidities. The most common medications used were antihypertensives, followed by antidiabetics and anticoagulants. The median length of hospital stay at the time of the call was 7 (mean: 8.0 ± 6.2; range, 1 to 60) days.

Forty-nine patients had a self-reported psychiatric diagnosis and used at least one psychotropic drug during their life. The most common psychiatric medication used was selective serotonin reuptake inhibitors ($n = 26$), followed by hypnotics and anxiolytics. Patients who had past psychiatric disorders were using a treatment for a median of 2 years (mean: 5.2 ± 5.1 years; min: 0-max: 19 years). Around one-quarter ($n = 67$, 23.5%) of patients had lifetime psychiatric disorders established clinically according to ICD-10. 28 had a major depressive disorder, 10 had a panic disorder, seven had a generalized anxiety disorder, four had primary insomnia, three had a functional neurologic disorder, two had bipolar disorder in remission, two had specific phobias, two had fibromyalgia, three had persistent complex bereavement disorder, and two had personality disorders. There was one person for each of post-traumatic stress disorder, organic mental disorder, irritable bowel syndrome, and psychogenic pruritus diagnoses.

Female patients and patients aged over 50 years had more anxiety and depression symptoms than males and patients younger than 50 years (Table 2). Employment status had a significant association with

Table 1
Sociodemographic and clinical features of participants.

Sociodemographic features	n	%
Sex		
Female	138	49.1
Male	143	50.9
Age (years)		
18–50	104	37
51–90	177	63
Marital status		
Married	220	78.3
Single	23	8.2
Divorced	11	3.9
Widoved	27	9.6
Children		
No	33	11.7
Yes	248	88.3
Household		
Family	222	79.0
Partner	38	13.5
Roommate	4	1.4
Dormitory	2	0.7
Alone	15	5.3
Employment		
Employed	81	28.8
Unemployed	8	2.8
Retired	80	28.5
Housewife	105	37.4
Other	7	2.5
Smoking history		
Yes	60	21.4
No	221	78.6

Clinical features	n	%
Admission symptoms		
Cough and/or sputum	102	36.2
Fever	53	18.8
Sore throat, loss of taste and smell	31	11.0
Gastrointestinal upset	36	12.8
Difficulty breathing	22	7.8
Myalgia	37	13.1
Family member with COVID-19		
Yes	105	37.4
No other case in the family	176	62.6
Any medical comorbidity		
Yes	139	49.5
No	142	50.5
Past medical history*		
Hypertension	48	34.5
Diabetes mellitus	18	12.9
Coronary heart disease	17	12.2
COPD and asthma	19	13.6
Cancer	12	8.6
NSAIDs		
Yes	65	23.1
No	216	76.9
Psychiatric Comorbidity		
Yes	67	23.8
No	214	76.2

NSAIDs: Non-steroidal anti-inflammatory drugs.
* Percentages show the ratio of the presented disease only within the patients who have medical comorbidity.

anxiety and depression symptoms, whereas the financial situation did not. In a posthoc analysis, housewives had higher mean HADS-A and HADS-D scores than employed patients (Tukey test; $p = .06$ and $p = .01$, respectively). In our hospital, due to an exponentially increasing number of cases and a limited number of isolated hospital beds available, family members who were tested and found positive for SARS-CoV-2 were allowed to stay in the same room, if they agreed. Thirty-six patients stayed with a family member, and the mean HADS-A and HADS-D scores

Table 2
Comparison of anxiety and depression scores on different variables.

	HADS-A score (mean ± SD)	p	HADS-D score (mean ± SD)	p
Sex				
Female	9.9 ± 5.5	**< 0.001**	8.3 ± 5.7	**< 0.01**
Male	7.5 ± 5.1		6.4 ± 5.4	
Age (years)				
≤50	7.7 ± 5.7	**< 0.01**	5.9 ± 5.4	**< 0.001**
>50	9.2 ± 5.2		8.2 ± 5.5	
Marital status				
Married	8.6 ± 5.3	**0.43**	7.2 ± 5.3	**0.32**
Single	7.6 ± 5.7		6.7 ± 6.7	
Widowed	9.8 ± 5.1		9.1 ± 6.0	
Divorced	9.0 ± 7.3		7.3 ± 6.5	
Employment				
Employed	7.6 ± 5.4	**0.04**	5.7 ± 5.1	**0.01**
Unemployed	7.7 ± 6.3		7.5 ± 6.8	
Retired	7.7 ± 6.3		7.4 ± 5.1	
Housewife	9.7 ± 5.6		8.4 ± 5.8	
Other	11.8 ± 5.6		11.0 ± 7.3	
Household				
Family	8.6 ± 5.3	**0.07**	7.2 ± 5.6	**0.08**
Partner	9.2 ± 5.4		8.8 ± 5.7	
Roommate	2.5 ± 1.2		2.0 ± 1.8	
Dormitory	12.5 ± 6.3		10.0 ± 2.8	
Alone	10.0 ± 6.3		7.5 ± 5.3	
A family member with COVID-19				
Yes	8.3 ± 5.4	**0.37**	6.9 ± 5.4	**0.34**
No	8.9 ± 5.4		7.7 ± 5.7	
Hospital room				
Single	9.0 ± 5.5	**0.03**	7.7 ± 5.7	**0.01**
With spouse	6.7 ± 4.6		4.9 ± 4.0	
NSAID use before COVID-19				
Yes	9.9 ± 5.0	**0.02**	9.4 ± 5.3	**< 0.001**
No	8.3 ± 5.5		6.7 ± 5.5	
Smoking				
Yes	8.2 ± 5.6	**0.39**	6.7 ± 5.6	**0.28**
No	8.8 ± 5.3		7.5 ± 5.6	
Chronic medical disease				
Yes	9.4 ± 5.5	**0.09**	8.0 ± 5.3	**0.11**
No	8.3 ± 5.3		7.1 ± 5.7	
Lifetime psychiatric disorder				
Yes	11.0 ± 5.4	**< 0.001**	8.7 ± 5.8	**0.02**
No	7.9 ± 5.2		6.9 ± 5.5	

HADS-A: Hospital Anxiety and Depression Scale-Anxiety score; HADS-D: Hospital Anxiety and Depression Scale-Depression score; NSAID: Non-steroidal anti-inflammatory drugs. Adjusted $p < .025$ is considered significant and shown in bold.

of these patients were lower than the mean scores of patients who stayed alone in single rooms ($p = .03$ and $p = .01$, respectively).

Patients who used non-steroid anti-inflammatory drugs (NSAIDs) before their hospital admission had higher HADS-A and HADS-D scores than patients who did not.

A statistically significant correlation was found between patient age and HADS-D scores (Spearman's rho (r) = 0.222; $p = .01$) and between mean child age and HADS-D score ($r = 0.167$; p = .01). HADS-A and HADS-D scores were significantly correlated with each other ($r = 0.784$; $p = .01$).

As the days of hospital stay increased, HADS-A and HADS-D scores decreased ($r = -0.277$ for HADS-A and $r = -0.203$ for HADS-D respectively, p = .01).

Multiple linear regression analysis showed that female gender, staying alone in the hospital room, being on the first days in the hospital, and a lifetime history of psychiatric disorder was associated with symptoms of anxiety. (Table 3).

Table 3
Multivariate regression analysis of factors associated with anxiety symptoms. Coefficients.[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% CI	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	17.41	1.53		11.38	<0.001	14.40	20.43
Sex	−2.07	0.62	−0.19	−3.34	0.001	−3.29	−0.85
Single room	−2.01	0.92	−0.12	−2.18	0.03	−3.82	−0.20
Day of hospital stay	−0.13	0.05	−0.15	−2.59	0.01	−0.23	−0.03
Psychiatric comorbidity	−2.43	0.73	−0.19	−3.30	0.001	−3.87	−0.98

CI: Confidence Interval.
[a] Dependent Variable HADS-A: Hospital Anxiety and Depression Scale-Anxiety score.

The multivariate regression analysis in Table 4 shows that being over 50 years of age, staying alone in the hospital room, and NSAID use before the week of hospital admission were associated with symptoms of depression.

4. Discussion

The results of our study, which aimed to investigate the anxiety and depression levels of patients with COVID-19 infection, showed that 34.9% of patients had above threshold anxiety, and 42% had above threshold depression. Female gender, staying alone in a hospital room, being on the first days of the hospital stay, and a lifetime history of psychiatric disorder was associated with symptoms of anxiety. Being over 50 years of age, staying alone in a hospital room, and NSAID use before the week of hospital admission were associated with symptoms of depression. Anxiety and depression scores increased with age and decreased with prolonging days of hospital stay.

Our prevalence results of 34.9% of hospitalized patients with COVID-19 having anxiety symptoms was nearly the same as that stated in the study of Kong et al., but our depressive symptom rate (42%) was higher. Kong et al. also used HADS, and they found the prevalence of anxiety and depression symptoms in hospitalized patients with COVID-19 as 34.72% and 28.47%, respectively, during the epidemic in Wuhan, China [10]. Approximately 20.9% and 18.6% of the patients were reported to have anxiety (subthreshold anxiety and major anxiety) and depression (subthreshold depression and major depression) in the study of Zhang et al. [9]. Our sample was larger than the study of Kong et al. (281 vs. 144, respectively), and the mean age of their sample was 5 years younger than ours. Studies of both Kong and Zhang et al. used HADS with an online survey, though we administered HADS through a telephonic interview. Furthermore, transcultural differences between Chinese and Turkish people may be other factors that should be considered.

A systematic review before COVID-19 presented the average of the reported depression prevalence in general medical and surgical inpatients as 12%, with a 95% prediction interval of 4% to 32%. In a recent review, in the past epidemics of SARS or MERS, the prevalence of depressed mood was found as 32.6% (95% CI: 24.7–40.9) and anxiety was 35.7% (95% CI: 27.6–44.2) during acute illness [3]. The prevalence of depressive symptoms we saw in our population with COVID-19 (42%) may be a bit higher than rates commonly seen for an acute disease in a general hospital but as so many contextual factors, it is difficult to judge [21].

Our study is the first to show that anxiety and depression levels are lower when family members who tested positive for the virus stayed in the same hospital room during treatment. It is known that isolation causes loneliness, anxiety, boredom, and frustration [3]. Isolation was associated with a higher level of depression during the SARS epidemic in Taiwan [22]. Ebola quarantine or even knowing someone quarantined was associated with anxiety and depression [23]. Individuals were often concerned about family members who were already infected, spreading the virus to other acquaintances, and death [3]. When affected and unaffected people were compared in the quarantine of SARS-CoV-2 pandemic, the anxiety and depression levels of affected people were higher [4]. Similarly, patients with confirmed MERS-CoV had psychiatric symptoms and diagnoses, while patients with suspected MERS-CoV did not after the quarantine [24]; thus, both isolation and being infected are associated with a higher incidence and severity of psychiatric symptoms.

For patients and families, admission to a hospital with COVID-19 may raise fears for survival. Due to infection control requirements and public health imperatives, patients may be separated from their families for prolonged periods. Families may not see or speak to their loved ones at all during admission, and in fatal cases, never again [25]. Social support was found to be associated with better mental health outcomes in hospitalized patients with COVID-19 [10]. Our intervention, that is, the hospitalization of affected family members together mainly came about because of bed limitations, but it could also be suggested to lower anxiety and depression levels by increasing social support. Moreover, more hospital rooms can be spared for other patients in need. There is a need for further contributions and experience of other institutions on this issue.

Patients aged over 50 years had higher depression levels than younger patients. The news and articles reporting that the infection is more likely to have greater effects on older people with comorbidities may have increased the depression levels of this age group [26]. During the COVID-19 pandemic, to prevent the transmission of illness, loneliness and social isolation increased, and that was associated with numerous negative physical and mental health outcomes in older adults [27]. Cardiovascular and kidney diseases, obesity and hypertension are significant risk factors for COVID-19 complications, besides cognitive and neurological disorders as well as depressive symptoms were found at a higher rate in the complicated COVID-19 cohort than the non-complicated group in a recent study [28]. Although for COVID-19 depressive symptoms were associated with a higher rate of

Table 4
Multivariate regression analysis of factors associated with depressive symptoms Coefficients[a]a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	9.39	2.03		4.63	<0.001	5.40	13.37
Sex	−1.28	0.66	−0.11	−1.95	0.05	−2.58	0.01
Single room	−3.04	0.96	−0.18	−3.17	0.002	−4.92	−1.15
Age	2.19	0.67	0.19	3.26	0.001	0.87	3.51
NSAIDs	−1.82	0.79	−0.14	−2.31	0.02	−3.37	−0.27

[a] Dependent Variable HADS-D: Hospital Anxiety and Depression Scale-Depression score.

complications than respiratory diseases and smoking, individuals with symptoms of depression may not seek help due to hopelessness, denial, stigma, embarrassment or their preference for self-reliance; therefore, telepsychiatric crisis intervention services may be beneficial [4,28].

In our study, females had higher anxiety and depression levels than males. The result, especially for anxiety, is consistent with many studies of hospitalized patients, healthcare workers, and the general public in the literature [2,10,18,29–31]. In a meta-analysis comparing women to men ratios for anxiety and depression, women who have anxiety alone or anxiety in combination with depression were higher than women who have depression alone when all compared to men [32].

In our study, as the days of hospital stay increased, anxiety and depression scores decreased, which may have resulted from patients getting used to hospital staff or ward rules. In a prospective study using HADS scores, contact precautions were not associated with higher levels of depression or anxiety on hospital day three with respect to admission day in medical and surgical patients [33].

Some conceptual links between COVID-19, inflammation, depression, anxiety and trauma-related symptoms have been flagged by some authors. However, it is not clear that these symptoms seen in coronavirus outbreaks are associated with viral infection per se or the immune response against it [34].

Using NSAIDs before hospital admission was found to be associated with depressive symptoms. Some of these patients were using NSAIDs for rheumatologic or other inflammatory diseases; therefore, they already had a chronic disease along with pain, which could be the underlying cause of depressive symptoms. Moreover, like in some other clinical cohorts the most common co-morbid diseases accompanying COVID-19 were hypertension and diabetes mellitus in our study [35,36]. Virologic evidence shows that SARS-CoV-2 enters the lung, intestine, kidney, and blood vessel epithelial cells through the angiotensin-converting enzyme 2 (ACE-2) receptor [37]. In a Lancet article, it was hypothesized that treatments increasing ACE-2 receptors such as for diabetes and hypertension, and ibuprofen might cause more severe COVID symptoms [38]. Although this has yet to be confirmed, and we did not measure COVID symptom severity; if it is true, more severe symptoms might be associated with more severe depression.

Patients with confirmed COVID-19, those who are at high risk for the COVID-19 (including the elderly, people with suppressed immune systems, those living in residential settings: nursing or care homes), medical workers, and people with pre-existing medical, psychiatric or substance use problems are at high risk for depression and anxiety or other negative psychosocial outcomes [39]. In our study, having a lifetime psychiatric disorder was associated with higher depression and anxiety scores. Likewise, having a positive previous psychiatric diagnosis was a significant risk factor for increased scores of all psychopathological measures in the study of Mazza et al. [6]. Patients who are vulnerable to stress ordinarily use incompatible coping behaviors may have lower resilience levels, thus, patients who had psychiatric disorders before might be more likely to re-develop anxiety and depression during the COVID-19 outbreak. However, we should also keep in mind that some patients may experience post-traumatic growth and gain strength after the epidemic [9,40].

Most medical workers do not receive education regarding mental health assessments [39]. Our telepsychiatric interviews required efforts from nurses. Even though touching and even sitting down with a patient is not available via telemedicine, our model provided chart-based telepsychiatric services by a psychiatrist to all patients during the pandemic [12,29]. We did not aim to evaluate the satisfaction with the telepsychiatric care service within the context of the study. However, the hospital administration office, in their usual survey at the time of hospital discharge, noted the enormous gratitude felt by patients for the support they received. Telepsychiatry may still be a powerful tool that can promote excellent communication and high-quality care. Lastly, practicing in a new way, working remotely from home, not being with patients and team members has aroused feelings of guilt and problems of work-life balance and concentration for telepsychiatrists [12].

Among the limitations of our study, first was the cross-sectional design. The sample was from a single center and was not representative of patients with mild or very severe COVID-19. We did not consider other factors that might have confounded the outcomes, such as the clinical severity of the disease and the social support of friends. An interviewer was used for a self-report scale. In addition, there was no control group. Scores were analyzed within the group according to sociodemographic variables. However, the strengths of the study were its long duration (two months of the pandemic) and sample size [4].

5. Conclusion

Hospitalized patients with confirmed COVID-19 are at high risk for anxiety and depressive symptoms [41]. Women, patients >50 years, patients who used NSAIDs before hospital admission, and those with lifetime psychiatric disorders may be predicted to be at risk for anxiety and depressive symptoms in the COVID-19 ward. Determining the factors associated with anxiety and depression during this pandemic period can contribute to the early detection of patients who need psychiatric consultation. Allowing family members with confirmed COVID positivity to stay together in the same hospital room may be associated with lower anxiety and depression levels than when keeping them in isolated rooms.

Declaration of Competing Interest

Authors declare no conflict of interest.

The authors have no competing interests to report,

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