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Factors associated with anxiety and depression among patients with Covid-19

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ABSTRACT

Background: The 2019 Coronavirus disease (COVID-19) has caused a global distress. However, its psychological impact on patients is unclear. We aim to determine the mental health status and explore related factors of anxiety and depression among patients with (COVID-19).

Methods and main outcome measures: This is a cross-sectional descriptive survey conducted among COVID-19 patients at the Mohammed VI University Hospital Centre in Marrakech over a period of four months. We assessed symptoms of depression and anxiety using the Arabic version of the Hospital Anxiety and Depression Scale (HADS) on admission. The significance threshold used for any data comparison test was the value of $p < 0.05$.

Results: A total of 103 participants were included. The average age was $44, 17 \pm 17, 19$ years. About 54.4% of the subjects were male. Of the 103 participants, 36.89% and 23.30% patients with COVID-19 had symptoms of anxiety or depression; respectively. The mean score of anxiety subscale and depression subscale for all patients was 6.45 ± 4.29 and 5.38 ± 4.47 , respectively. The bivariate analysis showed that age ($p=0, 0004$; $p=0, 0002$), oxygen saturation level ($p=0, 0003$; $p=0, 0059$), hospital stay ($p < 0, 0001$; $p < 0, 0001$) and family infection with SARS-CoV-2 ($p=0, 0094$; $p=0, 0023$) were associated with anxiety and depression respectively for COVID-19 patients. Moreover, gender ($p=0, 0119$) was associated with depression.

Conclusion: There is an increasing level of anxiety and depression in hospitalized patients with COVID-19. Mental concern and appropriate intervention remain an important part of clinical care for those who are at risk.

1. Introduction

In December 2019, a mysterious Coronavirus infection was reported in the Huanan Seafood Market, located in Wuhan State of Hubei Province in China. It was later confirmed to be an illness caused by a novel Coronavirus initially called 2019-nCoV and currently named SARS-CoV-2 [1]. Ever since COVID-19 has widely and rapidly spread across the globe. It has been declared a pandemic by the World Health Organization (WHO) on March 11, 2020 [2]. The pandemic has obliged many countries including Morocco to enforce strict control measures. This had a deep impact on the global economy and people's daily life and well-being. Consequently, this situation has caused increasing public panic and mental health stress. Mental health is becoming an issue that cannot be ignored, while trying to control the outbreak.

Because of the disease's high level of transmissibility, COVID-19

patients have to stay in isolated units, and while being treated in isolation they may experience both physical and psychological discomfort [3], which could result in mental health problems.

During the previous epidemics of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) [4]. Studies have shown that a majority of the infected inpatients experienced various mental disturbances. A range of mental problems, including insomnia, anxiety, depression, posttraumatic stress symptoms and even suicidality, have been reported [5,6]. These studies remind us that the mental health of patients with COVID-19 should not be ignored. However, recently-published researches on psychological impact of COVID-19 are mainly focus on the healthcare workers [7,8], and general public [9], who were worried about the risks of infection and protective measures, resulting in psychological distress. Mental health of the hospitalized patients with COVID-19 during the pandemic remains less known.

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To address this gap, we aimed to evaluate the mental health status and explore the prevalence and factors linked to anxiety and depression in hospitalized patients with COVID-19. In the hope that our findings will call attention to the mental health of patients with COVID-19, helping doctors to provide more appropriate treatment and psychological interventions.

2. Material and methods

2.1. Type, setting and period of study

This was a cross-sectional study, conducted at the Respiratory Department of the Arrazi Hospital of the Mohammed VI University Hospital Centre in Marrakech, Morocco, from March 13, 2020 to June 13, 2020.

2.2. Study population

Our study included patients with confirmed COVID-19. All patients were diagnosed with COVID-19 according to the World Health Organization interim guidance. We excluded subjects hospitalized in the intensive care unit (ICU) or suffering from severe psychotic disorders. The study sample was obtained by exhaustive recruitment.

2.3. Study design

Data were collected either through a questionnaire or by telephone interview. Verbal Informed consent was provided by subjects before study commencement. All information identifying the participants was kept confidential. By the end of this survey patients who reported mental health problems received help and were further evaluated by psychiatrists if so desired. Prior to discharge, 70 participants completed the questionnaire through a telephone application, while the remaining 33 preferred to complete the questionnaire by telephone call.

2.4. Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS) was developed by Zigmond and Sanith [10] to identify possible or probable anxiety and depression in patients in non-psychiatric clinical settings. Since its inception, the instrument has been widely used worldwide and has been translated into many languages. The Arabic version of the HADS has been used in various health care settings, both at primary and secondary care levels, in countries such as Saudi Arabia [11,12], Kuwait [13] and the United Arab Emirates [14]. In these countries, it has been shown to be a valid and reliable screening tool in primary care settings.

The HADS Anxiety and Depression subscales each include seven interrelated items. Each item is scored on a four-point scale ranging from 0 to 3, giving a maximum score of 21 for each subscale. Scores of 11 or more on any of the subscales are considered to indicate a significant "case" of psychiatric comorbidity; scores of 8–10 signify the presence of a "disorder". A score of 7 or less is considered normal [10]. In order to investigate the factors related to anxiety and depression among patients with COVID-19, anxiety and depression scores were compared between different variables.

2.5. Statistical analysis

Data were entered into Excel 2016 and analysed on Epi info version 7. Quantitative variables were expressed as average and standard deviation and qualitative variables as headcount and percentage. Mann whitney's non-parametric test was used to compare the quantitative variables. The Fischer exact test was used to compare the qualitative variables. For any statistical test used, the threshold of significance was the value of $p < 0.05$.

3. Results

3.1. Demographic characteristics

A total of 103 patients were enrolled in this study. The age of the study participants ranged from 16 to 90 years with an average age of 44.17 ± 17.19 years. About 54.4% of the subjects were male. Overall, 43.6% had a high school or higher educational level. Most participants were married (54.3%) and had a middle socioeconomic status (54.3%). Oxygen saturation is a key clinical index for the evaluation the severity of patients with COVID-19. In the present study, the mean oxygen saturation level was 94.54 ± 6.064 . 48.5% participants had oxygen saturation less than or equal to 95% at rest. Considering that other family members' infection may cause emotional distress to the participants, we also collected the infection status of family members. 28 participants (27.18%) had one or more family members infected. Demographic characteristics are listed in Table 1.

3.2. Psychosocial characteristics of the participants with COVID-19

With the reference to HADS, 38 (36.89%) and 24 (23.30%) participants presented symptoms of anxiety and depression, respectively. The mean score of anxiety subscale and depression subscale for all patients was 6.45 ± 4.29 and 5.38 ± 4.47 , respectively.

Factors associated with anxiety and depression among patients with COVID-19:

As shown in Table 2, anxiety and depression scores were significantly higher in those who are older ($\text{age} \geq 50$) ($p = 0.0004$; $p = 0.0002$), with lower oxygen saturation ($\leq 95\%$) ($p = 0.0003$; $p = 0.0059$), had a longer hospital stay (≥ 20 J) ($p < 0.0001$; $p < 0.0001$), and with an infected family member with SARS-CoV2 ($p = 0.0094$; $p = 0.0023$) respectively.

Additionally, the bivariate analysis showed that gender ($p = 0.0119$) was associated with depression for COVID-19 patients. Moreover, educational status, socioeconomic status and marital status were not statically correlated to higher anxiety and depression scores.

Table 1
Baseline demographic and clinical characteristic of patients with COVID-19.

	N	%
Gender		
Male	56	54.37
Female	47	45.63
Age (Years)		
<50	61	59.2
≥ 50	42	40.8
Marital Status		
Married	56	54.37
Single	38	36.89
Divorced	9	8.74
Education Status		
Uneducated	24	23.30
Primary	34	33.01
Secondary	23	22.33
University/master/doctorate	22	21.36
Oxygen saturation at rest		
<95%	50	48.5
$\geq 95\%$	53	51.4
Infection Status of family members		
Infected	28	27.18
Non-infected	75	72.82
Socioeconomic Status		
High	9	8.74
Middle	56	54.37
Low	38	36.89
Hospital Stay Duration (day)		
<20 days	54	52.42
≥ 20 days	49	47.58

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

	Anxiety score (mean \pm SD)	p	Depression score (mean \pm SD)	p
Gender				
Male	6.32 \pm 4.30	0.5127	4.35 \pm 4.27	0.0119
Female	6.61 \pm 4.47		6.61 \pm 4.43	
Age (Years)				
<50	5.08 \pm 4.01	0.0004	4.01 \pm 3.68	0.0002
\geq 50	8.45 \pm 4.11		7.38 \pm 4.80	
Marital Status				
Married	7.08 \pm 4.21	0.0800	8.33 \pm 3.67	0.500
Single	5.07 \pm 4.48		5.92 \pm 4.49	
Divorced	5.33 \pm 4.67		6.78 \pm 4.26	
Education Status				
Uneducated	6.54 \pm 4.37	0.7117	6.00 \pm 4.85	0.8154
Primary	5.88 \pm 4.08		5.61 \pm 4.63	
Secondary	6.86 \pm 4.65		4.82 \pm 3.65	
University/master/doctorate	6.81 \pm 4.67		4.95 \pm 4.74	
Oxygen saturation at rest				
<95%	8.20 \pm 4.33	0.0003	6.64 \pm 4.84	0.0059
\geq 95%	4.81 \pm 3.74		4.20 \pm 3.76	
Infection status of family members				
Infected	4.10 \pm 2.61	0.0094	8.21 \pm 5.12	0.0023
Non-infected	7.33 \pm 4.57		4.33 \pm 3.72	
Socioeconomic Status				
High	8.33 \pm 3.67	0.3500	6.44 \pm 5.17	0.7778
Middle	5.92 \pm 4.49		5.14 \pm 4.49	
Low	6.78 \pm 4.26		5.50 \pm 4.35	
Hospital Stay Duration (day)				
<20 days	3.77 \pm 3.29	<0.0001	3.24 \pm 3.97	<0.0001
\geq 20 days	9.40 \pm 3.39		7.75 \pm 3.76	

4. Discussion

For all we know this is the first study in the African continent to evaluate the mental health status and explore related factors to anxiety and depression among patients with COVID-19. Previous studies have interlinked mental health problems to patients with different diseases [15,16]. Furthermore it has been found that patients who were quarantined had higher levels of anxiety, depression and perceptions of stigma compared with those who were not [17].

During the SARS outbreak, Sheng et al. reported that approximately 35%–40% of the SARS patients had psychological symptoms in the acute phase [6]. Nonetheless, in a 3 months follow-up study, Cheng et al. found that 35% of the SARS survivors had anxiety and depression after discharge [18]. Since COVID-19 and SARS seem to share some similarities, it is necessary to identify COVID-19 patients with mental health problems in early stages so correct intervention can be provided.

Although studies about the mental health of inpatients with COVID-19 remain limited, it has been suggested that the novel Coronavirus disease can cause panic and stress in patients; especially those who are being treated in the isolation ward [19]. The results of the present study showed that majority of patients with COVID-19 experienced anxiety (36.89%) and depression (23.30%). Similar findings were reported in a study conducted by Kong et al. including 144 patients with confirmed Covid-19 where 34.72% and 28.47% participants had symptoms of depression or anxiety, respectively [20].

In a recent survey using both of the PHQ-9 and GAD-7 scales, high proportions of the participants had moderate or severe symptoms of depression (24.7%), anxiety (16.5%), and insomnia (21.1%) [21], which is similar to the result of our study. It was also reported in another survey that the prevalence of depression was 43.1% in clinically stable patients with COVID-19 [22].

We explored, in our study multiple factors related to the mental

health disturbances of patients with COVID-19. Bivariate analysis showed that older age is a contributing factor for anxiety and depression. Furthermore patients with lower oxygen saturation are more likely to be anxious and depressed. In fact previous research revealed that older patients are at increased risk with severe COVID-19 symptoms and death [23]. As expected these patients experienced more severe physical distress caused by the infection itself apart from the side effects of treatments.

According to Kong et al. patients with severe COVID-19 infection were at higher risk of anxiety [20]. Although the Moroccan management guideline for COVID-19 defined patients whose oxygen saturation at rest <92% as severe type patients; our findings suggest that oxygen saturation level lower than \leq 95% was correlated to higher scores of anxiety and depression respectively.

Another interesting finding was that patients with infected family members were more likely to present symptoms of anxiety and depression which can be explained by the pressure and guilt about the infection transmission to their love ones [22,24].

A growing body of evidence suggests that during multiple diseases, psychological disorders are associated with longer hospitalization [15, 25]. In prior study, longer hospital stay was a contributed factor of increased levels of anxiety and depression among COVID-19 patients. Indicating that patients who had longer disease duration might have a more pessimistic attitude regarding their illness [21]. Our result is also consistent with previous findings.

We also found that female patients were at higher risk of depression. This finding is in accordance with those of previous studies which demonstrated that females were more likely to develop mood disorders and stress-related mental illness including depression and anxiety [26]. This sex difference in mental diseases is likely due to genetics and sex steroid hormones [27].

Furthermore, in a study conducted by Kong et al. education background was another associated factor to the mental distress among infected patients with COVID-19 [20]. Meanwhile, according to our findings educational status, socioeconomic status and marital status were not statically correlated to higher anxiety and depression scores.

4.1. Study limitation

There were some limitations of our study. First, the data was only collected at admission. Thus, it didn't allow us to investigate the inferences or changes over time. Second, due to the restriction on contact with COVID-19 patients, we could not observe the patients mental health symptoms dynamically, and it was difficult to explore the causal relationships among the variables. Third, since we conducted the study in one isolation floor, sample size was small. A multicenter study with a larger number of participants is needed to further verify our results.

5. Conclusion

The results demonstrated that hospitalized patients with COVID-19 experienced anxiety and depression symptoms. More attention should be paid to these patient's mental health so psychological care and timely intervention can be provided. Related factors, including age, gender, oxygen saturation, hospital stay, and family infection with SARS-CoV2 can be useful to identify vulnerable patients who are more likely to develop mental disturbances during hospitalization.

Author agreement

All authors have seen and approved the final version of the manuscript being submitted. The article is the authors' original work. It has not received prior publication, and is not under consideration for publication elsewhere.

Declaration of competing interest

All authors declare no conflicts of interest in relation to the subject matter. We have no financial and personal relationships with other people or organizations that could inappropriately influence (bias) this work.

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