

# Anxiety and coping strategies among COVID-19 patients in Medina, Saudi Arabia

Shumukh Mohammed Alhejaili  
Osama Madani Kiram  
Duoaa Seddiq Abdoh  
Sami Abdo Radman Al-Dubai

Joint Program of Preventive Medicine Post Graduate Studies, Ministry of Health, Al-Madinah 41311, Saudi Arabia.

## Corresponding author:

Shumukh Mohammed Alhejaili  
Joint Program of Preventive Medicine Post Graduate Studies, Ministry of Health,  
Al-Madinah 41311,  
Saudi Arabia  
Mobile: 00966530199500  
Email: shomookhma@gmail.com

Received: December 2021; Accepted: January 2022; Published: February 1, 2022.

Citation: Shumukh Mohammed Alhejaili et al. Anxiety and coping strategies among COVID-19 patients in Medina, Saudi Arabia. *World Family Medicine*. 2022; 20(2): 93-100 DOI: 10.5742/MEWFM.2022.95250

## Abstract

**Background:** Infectious disease outbreaks cause significant psychosocial problems. Studies have found that any coronavirus-infected individuals, such those with Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and coronavirus disease 2019 (COVID-19), may exhibit depression, anxiety, post-traumatic stress, and other neuropsychiatric syndromes. Therefore, this study aimed to measure the anxiety levels and different coping strategies of COVID-19 patients in Saudi Arabia.

**Methods:** This observational, analytical, cross-sectional study included 297 COVID-19 patients evaluated between April and May 2020 in Al-Madinah, Saudi Arabia. The data were collected from patients directly via telephone calls using a questionnaire. Anxiety and coping strategies were measured using a translated and validated version of the Generalized Anxiety Disorder Scale and Brief Coping Orientation to Problems Experienced scale.

**Results:** Most of the participants were male (64.6%), and more than half (59.6%) were Saudi. The mean age was  $35 \pm 10.6$  years (range, 17–63 years). The frequency of patients with moderate to severe anxiety (score > 10) was 55.9%, and the most frequently used coping strategy was religion ( $7.20 \pm 1.35$ ). Anxiety was significantly associated with self-blame, venting, denial, and active coping in the final multivariable analysis.

**Conclusion:** Moderate to severe anxiety was experienced by 55.9% of COVID-19 patients, and anxiety was associated with self-blame, venting, denial, and active coping. Therefore, increasing awareness of the effects of COVID-19 on mental health, and patient education on healthy coping mechanisms for anxiety management are recommended for the Saudi Arabian population.

**Key words:** anxiety, coping, COVID-19, infectious diseases, patients, Saudi Arabia

### Abbreviations

COVID-19, coronavirus disease 2019; GAD-7, Generalized Anxiety Disorder Scale; COPE, Coping Orientation to Problems Experienced; BMI, body mass index

## Introduction

Coronavirus disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization on March 11, 2020. By April 17, 2020, approximately 2,214,861 confirmed COVID-19 cases had been reported worldwide. Overall, 7,142 cases have been reported in Saudi Arabia with 1,226 cases in Al-Madinah alone [1]. COVID-19 is caused by severe acute respiratory syndrome coronavirus 2, a member of the coronavirus family [2]. As previously reported, infectious disease outbreaks significantly cause psychosocial problems [3]. Individuals infected with coronaviruses, such as those causing Severe Acute Respiratory Syndrome, Middle East Respiratory Syndrome, and COVID-19 may experience depression, anxiety, posttraumatic stress, and other neuropsychiatric syndromes [4]. In Saudi Arabia, numerous restrictions have been implemented due to the COVID-19 outbreak, and these limitations, especially curfews, can impact the mental health of the population. In addition, many people are isolated since they cannot attend schools, mosques, or shops. Worldwide, as the crisis has progressed, there has been an increase in reported psychological impacts from the public, medical staff, and patients in many countries. A systematic review regarding the impact of a COVID-19 pandemic on mental health among the general population in China, Spain, Italy, Iran, USA, Turkey, Nepal, and Denmark reported anxiety scores of 6.33%–50.9% [5]. Only a few studies have been published concentrating on the psychological effects of the disease, especially in Saudi Arabia and the Middle East. In a recent study, Alkhamees et al. investigated the psychological impact of the COVID-19 pandemic on the general population in Saudi Arabia. Of the participants, 23.6% reported having moderate to severe anxiety [6].

To our knowledge, no previous studies have been conducted to measure anxiety among COVID-19 patients in the Saudi population; therefore, this study aimed to measure the anxiety level and different coping responses of COVID-19 patients in Medina, Saudi Arabia in 2020.

## Materials and Methods

### Study design, settings, and participants

This observational, analytical, cross-sectional study was conducted from April 2020 to May 2020 by the Al-Madinah public health administration. Patients who tested positive for COVID-19, registered, and were followed-up by public health administration in Al-Madinah were included. Initially, the total number of patients was obtained from the official Ministry of Health website. Once the total number of patients was confirmed, a random sample was obtained, and the sample size was calculated accordingly. Non-Arabic speakers and severely ill patients (intensive care unit patients) were excluded from the study. A total of 589 patients were asked to participate in the study and 297 responded, resulting in a response rate of 50%. Non-responders were defined as people who refused to participate and did not answer calls after 2 days.

### Study instruments and data collection procedure

The data were collected from patients directly via telephone call from qualified healthcare workers at the public health administration call center. The workers were trained by the researcher on how to complete the questionnaire to ensure complete confidentiality and validity.

The questionnaire was in Google format and consisted of two parts. The first section contained sociodemographic data (age, sex, education, residence, monthly income, nationality, marital status) and a brief medical history (smoking history, chronic disease, and signs and symptoms of COVID-19). The second section contained a translated and validated version of the Generalized Anxiety Disorder Scale (GAD-7). The GAD-7 is a seven-item scale frequently used as a diagnostic self-reporting scale for screening, diagnosis, and severity assessment of anxiety disorders. Individuals answered the questions according to the previous 2 weeks, and the responses ranged from 0 (not at all sure) to 3 (nearly every day). The scores ranged from 0–21 for each item. Scores of 5–9, 10–14, and  $\geq 15$  were taken as the cutoff points for mild, moderate, and severe anxiety, respectively. Cronbach's alpha for the Arabic version was 0.95 [7]. The second section also contained a Brief Coping Orientation to Problems Experienced (COPE) scale, an abbreviated version of the COPE Inventory Scale. This scale is most frequently used in healthcare settings to determine how patients react emotionally to a difficult situation. It comprises 14 coping strategies: self-distraction, active coping, denial, substance use, the use of emotional support, the use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Responses ranged from 1 (I have not been doing this at all) to 4 (I have been doing this a lot). Total scores ranged from 2–8 for each coping style, with higher scores indicating a higher tendency to implement the corresponding coping style. In the Arabic version of the Brief COPE scale, Cronbach's alpha ranged from 0.23–0.7 [8].

### Ethics approval of research

Ethical approval was obtained from the Ethics Committee of the Directorate of Health in Al-Madinah. The objectives and benefits of the study were explained to the participants, and oral consent was obtained via telephone from all participants before beginning data collection. First, the data collector read the consent form to the participant, answered any questions that the participant might have, and then registered the consent by participant number, time, and date. The privacy and confidentiality of all participants was ensured.

### Data analysis

Responses from the Google form were transferred to Microsoft Excel. After coding and data cleaning, the data were imported into SPSS software (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) for the analysis. Qualitative variables are presented as frequencies and percentages, whereas quantitative variables are expressed as mean and standard deviation.

An independent t-test was used to estimate the difference between the two groups, and the analysis of variance was applied for three or more groups. The correlation between coping strategies and the GAD-7 score was measured. A multiple linear regression analysis was used to determine the predictors of anxiety among COVID-19 patients. Statistical significance was set at  $p < 0.01$ .

## Results

A total of 297 COVID-19 patients were included in this study. Through the analysis, we found that 59.6% of the participants were Saudi. The majority of the patients were male (64.6%) and the mean age was  $35 \pm 10.6$  years (range 17–63). Regarding clinical characteristics, only 19% of patients had a chronic disease. Based on the body mass index (BMI), 24.6% overweight, 39.1% were normal, 78% had COVID-19 symptoms, and 38.7% had fever (as shown in Table 1).

### Anxiety among COVID-19 patients and associated factors

The mean anxiety score was  $11.6 \pm 5.0$  and the frequency of patients with moderate to severe anxiety (score  $> 10$ ) was 55.9%. Upon analysis, we found that there was a significant difference in anxiety scores between Saudi ( $11.1 \pm 4.6$ ) and non-Saudi patients ( $12.4 \pm 5.5$ ) ( $p < 0.001$ ), married ( $12.2 \pm 5.4$ ) and single patients ( $10.8 \pm 4.3$ ) ( $p < 0.001$ ), and patients presenting with different classifications of BMI, including underweight ( $11.8 \pm 5.2$ ), normal weight ( $10.8 \pm 3.9$ ), and overweight ( $12.8 \pm 6.1$ ) ( $p < 0.001$ ). In addition, we also found that there was a significant difference between patients who felt ashamed of the disease ( $15.4 \pm 6.7$ ) ( $p < 0.001$ ), patients who were afraid of how they were viewed by society ( $15.1 \pm 6.8$ ) ( $p < 0.001$ ), and those who were afraid of disease complications ( $15.2 \pm 5.8$ ) ( $p < 0.001$ ) (as shown in Table 2).

### Coping strategies and relationship to anxiety

The most frequently used coping strategy was religion ( $7.2 \pm 1.4$ ), followed by approach coping acceptance ( $6.5 \pm 1.7$ ). The least frequently used coping strategies were avoidant approach and substance use ( $2.0 \pm 0.2$ ). There was a significant positive correlation between anxiety and avoidant coping strategies, self-distraction, denial, venting, and self-blame ( $p < 0.001$ ). There were also significant positive correlations between anxiety and the following coping strategies: active coping, the use of informational support, positive reframing, emotional support, planning, and religion ( $p < 0.001$ ). The strongest correlation was observed in patients who used self-blame ( $r = 0.445$ ), and the weakest correlation was in patients who used religion as a coping strategy ( $r = 0.121$ ) (as shown in Table 3).

### Factors associated with anxiety in the multivariate analysis

All independent variables that were significantly associated with anxiety as per the univariate analysis were included in the multiple linear regression analysis. The final multivariable linear regression model found that anxiety was significantly associated with self-blame ( $p < 0.001$ ), venting ( $p < 0.001$ ), denial ( $p < 0.001$ ), and active coping ( $p < 0.001$ ). Also, it was significantly associated with feeling ashamed of the disease ( $p < 0.001$ ) and fear of complications ( $p < 0.001$ ) and was responsible for 37% of the variability in anxiety levels (as shown in Table 4).

Characteristic	Frequency	Percent (%)
<b>Sex</b>		
Male	192	64.6
Female	105	35.4
<b>Age</b>		
≤ 35	160	53.9
> 35	137	46.1
<b>Nationality</b>		
Saudi	177	59.6
Non-Saudi	120	40.4
<b>Marital status</b>		
Married	166	55.9
Single	131	44.1
<b>Occupation</b>		
Not employed	113	38.0
Government	69	23.2
Private	115	38.7
<b>Education</b>		
School	139	46.8
University	158	53.2
<b>Residence type</b>		
Apartment/villa	264	88.9
Dorms/workers residence	33	11.1
<b>Monthly income</b>		
< 5000	183	61.6
≥ 5000	114	38.4
<b>Cigarette smoking</b>		
Yes	52	17.5
No	245	82.5
<b>Shisha smoking</b>		
Yes	38	12.8
No	259	87.2
<b>Chronic diseases</b>		
Yes	57	19.2
No	240	80.8
<b>BMI</b>		
Underweight	105	35.4
Normal	116	39.1
Overweight	73	24.6
<b>COVID-19 symptom</b>		
Cough	43	14.5
Fever	115	38.7
SOB	22	7.4
URTI	51	17.2
Muscle pain	44	14.8
General fatigue	53	17.8
Change in smell or taste	56	18.9
Headache	63	21.2
No symptoms	63	21.2
<b>Feeling ashamed of the disease</b>		
Yes	30	10.1
No	267	89.9
<b>Fear of how society views me</b>		
Yes	31	10.4
No	266	89.6
<b>Fear of disease complications</b>		
Yes	69	23.2
No	228	76.8

**Table 1.**  
Socio-demographic  
characteristics of  
participants

BMI, body mass index;  
COVID-19, coronavirus  
disease 2019; SOB,  
shortness of breath; URTI,  
upper respiratory tract  
infection

Table 2. Independent t-test and analysis of variance between all independent variables and anxiety

Variable	Mean (SD)	p value
<b>Sex</b>		
Male	11.7 (5.2)	0.673
Female	11.4 (4.7)	
<b>Age</b>		
≤ 35	11.6 (4.8)	0.855
> 35	11.5 (5.3)	
<b>Nationality</b>		
Saudi	11.1 (4.6)	< 0.001
Non-Saudi	12.4 (5.5)	
<b>Marital status</b>		
Married	12.2 (5.4)	< 0.001
Single	10.8 (4.3)	
<b>Occupation</b>		
Not employed	11.0 (4.4)	0.226
Government job	11.6 (4.9)	
Private job	12.1 (5.7)	
<b>Education</b>		
School	11.6 (5.1)	0.955
University	11.6 (4.9)	
<b>Residence type</b>		
Apartment/villa	11.7 (5.1)	0.334
Dorms/workers residence	10.8 (4.2)	
<b>Monthly income</b>		
< 5000	11.5 (5.0)	0.654
≥ 5000	11.8 (5.0)	
<b>Cigarette smoking</b>		
Yes	11.2 (4.1)	0.535
No	11.7 (5.2)	
<b>Shisha smoking</b>		
Yes	12.2 (6.1)	0.452
No	11.5 (4.9)	
<b>Chronic diseases</b>		
Yes	12.7 (5.8)	0.078
No	11.3 (4.8)	
<b>BMI</b>		
Underweight	11.8 (5.2)	< 0.001
Normal	10.8 (3.9)	
Overweight	12.8 (6.1)	
<b>COVID-19 symptoms</b>		
Yes	11.7 (5.2)	0.285
No	10.9 (4.1)	
<b>I feel ashamed of the disease</b>		
Yes	15.4 (6.7)	< 0.001
No	11.2 (4.6)	
<b>I am afraid of how society views me</b>		
Yes	15.1 (6.8)	< 0.001
No	11.2 (4.6)	
<b>I am afraid of disease complications</b>		
Yes	15.2 (5.8)	< 0.001
No	10.5 (4.2)	

BMI, body mass index; COVID-19, coronavirus disease 2019

**Table 3. Correlation between coping strategies and anxiety**

GAD coping strategy	r coefficient	p value
Self-distraction	0.200	< 0.001
Active coping	- 0.232	< 0.001
Denial	0.359	< 0.001
Substance use	0.080	0.167
Emotional support	0.242	< 0.001
Use of informational support	0.157	< 0.001
Behavioral disengagement	0.144	< 0.001
Venting	0.322	< 0.001
Positive reframing	0.205	< 0.001
Planning	0.259	< 0.001
Humor	0.103	0.075
Acceptance	0.111	< 0.001
Religion	0.121	< 0.001
Self-blame	0.445	< 0.001

GAD, Generalized Anxiety Disorder Scale

**Table 4. Multiple linear regression analysis of predictors of anxiety among COVID-19 patients**

Independent variables	b	p value	95% Confidence interval	
			Lower	Upper
Self-blame	0.761	< 0.001	0.4	1.1
Venting	0.396	< 0.001	0.1	0.7
Denial	0.576	< 0.001	0.2	0.9
Active coping	-0.362	< 0.001	-0.1	-0.6
Feeling afraid of the complication of the disease	2.422	< 0.001	3.6	1.2
Feeling ashamed of the disease	2.077	< 0.001	3.8	0.4

COVID-19, coronavirus disease 2019

## Discussion

This study aimed to measure anxiety levels and coping mechanisms in COVID-19-experiencing individuals in Medina, Saudi Arabia in 2020. Our study results indicated that 55.9% of the infected individuals experienced moderate to severe anxiety. According to a cohort study conducted by Mazza et al. among survivors of COVID-19 after a 1-month follow-up from their hospitalization, 42% experienced anxiety [9]. In addition, two cross-sectional studies in China reported that the prevalence of anxiety among individuals who experienced COVID-19 was 15%, [10] and 20.9%, [11] respectively.

Few studies have been published on the prevalence of anxiety among COVID-19-experiencing individuals. Conversely, many published studies have been conducted on anxiety levels among the general population and healthcare workers. Systematic reviews and meta-analyses have reported an average 15.5% prevalence of anxiety among populations affected by the COVID-19 pandemic [12]. According to a study by Khademian et al., COVID-19 affects mental health leading to stress, anxiety, and depression [13]. In a study conducted by Zandifar et al., employing an online survey methodology, a significant number of respondents reported moderate to high levels of anxiety and depression following COVID-19 infection [14]. Another systematic review including studies from China, Spain, Italy, Iran, USA, Turkey, Nepal, and Denmark also reported a high rate of anxiety (6.33%–50.9%) among the general population [5]. In Saudi Arabia, two cross-sectional studies reported anxiety prevalence rates of 16.4% [15] and 23.6% [6] during the COVID-19 pandemic.

Notably, the current study found a significant difference in anxiety scores between married and single individuals, consistent with a previous study [14]. However, we did not find significant differences in anxiety levels between men and women. In contrast, previously published studies among COVID-19 patients found that anxiety levels were higher among women than men [9, 11].

Approach coping is associated with more supportive responses, better physical health outcomes, and more stable emotional responses than avoidant coping, which is mildly effective in managing anxiety. The current study found that religion was the most frequently used coping mechanism. People usually tend to practice more of their religious rituals in difficult life situations, especially if they are uncertain. This finding is consistent with those of a cross-sectional study conducted among university students in Pakistan during the COVID-19 pandemic [16].

The current study found that anxiety was associated with adopting self-blame, venting, and denial coping response, which is considered a part of the avoidant coping response. This response is associated with poor physical health among those with medical conditions and is also mildly effective in managing anxiety [17]. In addition, we found that anxiety levels were significantly associated with individuals who were feeling ashamed of the disease and

afraid of its complications. Such a result was expected, as the present study was conducted at the beginning of the pandemic when there was a lack of information about the COVID-19-causing virus virulence.

### Limitations of the study

The current study was conducted in one city in Saudi Arabia, limiting its generalizability to the entire population of the country. Another limitation was the method used for gathering the data. Owing to the COVID-19 pandemic, physical interviews with respondents were difficult, and interviews were instead conducted using phone calls. This data collection procedure was associated with difficulty in clarifying respondents' statements and sentiments. In addition, despite the large sample size, there was a low response rate, leading to a response bias. For example, respondents who perceived themselves as anxious were reluctant to participate in the study.

## Conclusion

This cross-sectional study found that 55.9% of COVID-19 patients had moderate to severe anxiety. Furthermore, most of the participants used religion as a coping response to their illness, and anxiety was associated with self-blame, venting, denial, and active coping. Therefore, the current study recommends increasing awareness in the Saudi Arabian population about the effects of COVID-19 on mental health and suggests education on healthy coping mechanisms for anxiety management. For example, awareness can be enhanced by sending teaching materials on public phones. Additionally, future studies should include similar research performed in different geographical settings and among diverse populations in Saudi Arabia.

### Acknowledgments:

The authors are grateful to Ebtehal Al-Sisi, Dalal Al-Shahrani, Fatemeh Al-Saadi, Sahar AL-Mahallawi, and Sukina Fal for their assistance in data collection.

## References

1. Coronavirus Disease 2019 (COVID-19). Centers for Disease Control and Prevention 2021. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>.
2. WHO Coronavirus (COVID-19) Dashboard 2021. Available from: <https://covid19.who.int>.
3. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry* 2020; 7:611-27.
4. Kumar S, Veldhuis A, Malhotra T. Neuropsychiatric and cognitive sequelae of COVID-19. *Front Psychol* 2021; 12:553.
5. Xiong J, Lipsitz O, Nasri F, Lui LM, Gill H, Phan L, et al. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *J Affect Disord* 2020; 277:55-64.
6. Alkhamees AA, Alrashed SA, Alzunaydi AA, Almohimeed AS, Aljohani MS. The psychological impact of COVID-19 pandemic on the general population of Saudi Arabia. *Compr Psychiatry* 2020; 102:152192.
7. Sawaya H, Atoui M, Hamadeh A, Zeinoun P, Nahas Z. Adaptation and initial validation of the Patient Health Questionnaire–9 (PHQ-9) and the Generalized Anxiety Disorder–7 Questionnaire (GAD-7) in an Arabic speaking Lebanese psychiatric outpatient sample. *J Psychiatr Res* 2016; 239:245-52.
8. Alghamdi M. Cross-cultural validation and psychometric properties of the Arabic Brief COPE in Saudi population. *Int Med J Malays* 2020; 75:502-9.
9. Mazza MG, De Lorenzo R, Conte C, Poletti S, Vai B, Bollettini I, et al. Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain Behav Immun* 2020; 89:594-600.
10. Zhang J, Lu H, Zeng H, Zhang S, Du Q, Jiang T, et al. The differential psychological distress of populations affected by the COVID-19 pandemic. *Brain Behav Immun* 2020; 87:49-50.
11. Zhang J, Yang Z, Wang X, Li J, Dong L, Wang F, et al. The relationship between resilience, anxiety, and depression among patients with mild symptoms of COVID-19 in China: a cross-sectional study. *J Clin Nurs* 2020; 29:4020-9.
12. Cénat JM, Blais-Rochette C, Kokou-Kpolou CK, Noorishad PG, Mukunzi JN, McIntee SE, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. *J Psychiatr Res* 2020; 26:113599.
13. Khademian F, Delavari S, Koohjani Z, Khademian Z. An investigation of depression, anxiety, and stress and its relating factors during COVID-19 pandemic in Iran. *BMC Public Health* 2021; 21:1-7.
14. Zandifar A, Badrfam R, Yazdani S, Arzaghi SM, Rahimi F, Ghasemi S, et al. Prevalence and severity of depression, anxiety, stress, and perceived stress in hospitalized patients with COVID-19. *J Diabetes Metab Disord* 2020; 19:1431-8.
15. Alamri HS, Algarni A, Shehata SF, Al Bshabshe A, Alshehri NN, ALAsiri AM, et al. Prevalence of depression, anxiety, and stress among the general population in Saudi Arabia during COVID-19 pandemic. *Int J Environ Res Public Health* 2020; 17:9183.
16. Salman M, Asif N, Mustafa ZU, Khan TM, Shehzadi N, Tahir H, et al. Psychological impairment and coping strategies during the COVID-19 pandemic among students in Pakistan: a cross-sectional analysis. *Disaster Med Public Health Prep* 2020; 22:1-7.
17. Eisenberg SA, Shen BJ, Schwarz ER, Mallon S. Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *J Behav Med* 2012; 35:253-61.