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Original Article

The prevalence of depression and anxiety in nurses caring for covid-19 patients in Saudi Arabia: a single center experience

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Abstract

Background: Healthcare workers in direct contact with confirmed COVID-19 patients often face a negative impact on psychological health. This study aims to examine the prevalence of anxiety and depression among nurses caring for COVID-19 patients.

Methods: A cross-sectional survey was conducted during the COVID-19 pandemic from January 2022 to April 2022 at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia. The prevalence of depression and anxiety was assessed using the Patient Health Questionnaire (PHQ-9), and the Generalized Anxiety Disorder-7 (GAD-7) questionnaire. Kruskal–Wallis's test was used to compare the total scores of the PHQ-9 and GAD-7 with respect to demographic characteristics. P<0.05 was considered statistically significant.

Results: A total of 123 nurses were included in the study. Most of them were females (69.92%), aged 30–39 years (45.53%), had a bachelor's degree in nursing (75.61%), and had more than ten years of experience (3830.89%). The depression and anxiety prevalence in the study was 78.1% and 72.4%, respectively. Nurses aged 30–39 years were significantly associated with depressive symptoms. Female nurses showed significantly higher scores for depression and anxiety than males 74.42% and 67.45%, respectively.

Conclusion: The findings suggest that nurses are at risk for developing depression and anxiety. Therefore, regular mental health screening is necessary for nurses, particularly during a pandemic.

Keywords: Depression, Anxiety, Healthcare workers, COVID-19, Pandemic, Saudi Arabia

Background

In March 2020, the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) a pandemic [1]. The disease affected over 600 million people worldwide and caused over 6 million deaths. Saudi Arabia reported over 800,000 cases and 9000 deaths [2]. Pandemics present unique challenges to healthcare providers, as the treatment course is often unknown, social isolation is required following symptom onset, and frontline healthcare providers are concerned not only with their patients' safety but also their own and family members' health. Furthermore, many healthcare providers are suddenly required to engage in unfamiliar activities in stressful settings, such as high-risk, high-intensity units, which are likely to be associated with higher levels of psychological distress. These characteristics of an outbreak diminish the availability of social support, such as assistance from coworkers and families, which is believed to mitigate the detrimental effects of stress [3]. Healthcare providers are expected to work long hours under extreme stress in pandemic situations. When treating sick patients, they are at risk of becoming infected. They are also exposed to fake news and rumors, which increases their anxiety. Working in such an environment increases the risk of various psychological and mental illnesses as well as physical and emotional distress [4]. Globally, several populations have experienced a negative impact on psychological health related to the pandemic [5]. Among them, frontline healthcare workers are at high risk because of direct exposure to patients and increased workload [5]. Infectious disease outbreaks are known to have a psychological impact on healthcare workers and the general population [6].

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In Al Thobaity and Alshammari's study [7], it was found that depression and anxiety are among the most common issues nurses face when dealing with COVID-19 patients. The psychological reactions of healthcare providers to COVID-19 are complex. According to a review of 44 studies [8], severe anxiety symptoms were reported in 45% of healthcare workers. Additionally, depressive symptoms were reported to be ranging from 27.5%–50.7% [8]. Individual and work-related features, such as the level of exposure to infected patients, are considered risk factors for negative psychological states. In a study of 502 healthcare providers working in direct contact with confirmed cases of COVID-19, 51.4% reported having anxiety, with 25.1% having mild, 11% having moderate, and 15.3% having severe anxiety.

The prevalence of depression among healthcare workers during the COVID-19 outbreak was found to be moderate to very severe [6]. The poor infectivity and mortality rate put incredible pressure on all medical teams [8]. The source of anxiety among nurses varies between fear of susceptibility to infection and the possibility of death [8]. Nurses are mainly concerned with spreading the infection to vulnerable family members, such as the elderly, immunocompromised, and young children [8]. Nursing workload, fear of infection, and poor family relationships were associated with a higher risk of depressive symptoms. Nurses working in high- and low-risk COVID-19 areas showed a higher level of depression than those working in middle-risk COVID-19 areas. The city of residence and type of hospital also influence the risk of depression; a higher risk was observed among those working in general tertiary hospitals [9]. We believe that as the pandemic worsens and the number of cases increases exponentially, the psychological impact and actual pressure faced by healthcare professionals in each country will also increase [8]. This study aimed to determine the prevalence of anxiety and depressive symptoms among nurses and to evaluate the depression and anxiety levels among nurses caring for confirmed cases of COVID-19 at King Faisal Specialist Hospital and Research Centre Riyadh.

Methods

Study design and setting

Data for this study were collected via a cross-sectional survey during the COVID-19 pandemic from January 2022 to April 2022 at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia.

Inclusion and exclusion criteria

All nurses involved in the directed care of confirmed cases of COVID-19 for more than two hours at King Faisal Specialist Hospital and Research Center in Riyadh City were included in the study. However, nurses who did not work with confirmed cases of COVID-19, nurses who did not spend more than two hours with confirmed cases of COVID-19 patients, not nurses, missing data were excluded from the study.

Recruitment

Convenience sampling and RedCap were used to recruit participants. An online survey was mailed to all nurses who were working or had worked with confirmed COVID-19 cases in the East wing at King Faisal Specialist Hospital and Research Center Riyadh, arranged in collaboration with the internal communication channels of the hospital. The questionnaire link: https://redcap.kfshrc.edu.sa/surveys/?s=RA7NKLJC7P

Sample size

The sample size was calculated using Raosoft software [10]; it was estimated at the 90% confidence level with an estimated 50% response distribution and a margin of error of 7%. The minimum required sample size was 138.

Study tool

The English version of the questionnaire, containing the following three components, was disseminated among the nurses:

1. Sociodemographic characteristics, including age, gender, education level, years of experience, medical history, nationality, and residency.
2. The Patient Health Questionnaire-9 (PHQ-9) an English version of the tool was used in the study and this tool is a widely used and valid tool for detecting depressive symptoms, comprises nine items rated on a Likert scale from 0 (not experienced at all) to 3 (experienced nearly daily). These items detect depressive symptoms that have occurred during the last two weeks. The maximum total score is 27; the total score is classified as mild (5–9), moderate (10–14), moderately severe (15–19), or severe (20–27). The scale's internal consistency was indicated by a Cronbach's alpha of 0.89 [11]. The diagnostic validity of the PHQ-9 has been established in studies involving eight primary care and seven obstetric clinics [12]. The internal reliability of the PHQ-9 was excellent, with a Cronbach's α of 0.89 in the PHQ Primary Care Study and 0.86 in the PHQ Ob-Gyn Study. Test-retest reliability of the PHQ-9 was also excellent [12].
3. The Generalized Anxiety Disorder-7 (GAD-7) questionnaire is a valid tool for detecting anxiety, comprising seven items rated on a Likert scale. The maximum total score is 21; the total score is classified as mild (5–9), moderate (10–14), or severe (15–21). Internal consistency was evaluated using Cronbach's alpha $\alpha = 0.95$ [3]. The diagnostic validity of the GAD-7 was established in studies involving 15 primary care clinics in the United States from November 2004 to June 2005 [3]. The tool has good reliability as well as criterion, construct, factorial, and procedural validity [3].

Statistical analysis

The principal investigator collected the questionnaires. The data were entered into a password-protected Excel database for management and storage. Double data entry was performed to ensure data accuracy. The investigator extracted data from the questionnaires to examine the two outcomes of interest: depression and anxiety levels. Statistical analysis was performed using SPSS version 23.0 (SPSS Inc., Chicago, IL, USA).

We calculated the percentages and frequencies of all nominal variables for the PHQ-9 and GAD-7 items. In addition, the mean, median, and standard deviation ranges of the PHQ-9 and GAD-7 total scores were calculated. Furthermore, the non-parametric Kruskal–Wallis's test was used to compare the total scores of the PHQ-9 and GAD-7 with respect to demographic characteristics.

Results

Socio-demographic characteristics of study participants

One- hundred and twenty-three nurses responded to the survey. The sociodemographic characteristics of the sample are shown in Table 1. The majority of the respondents were female (86; 69.92%), and aged 30–39 years (56; 45.53%). Most respondents held a bachelor's degree in nursing (93; 75.61%); 57 (46.34%) nurses were from Saudi Arabia, and most lived in private houses outside the hospital premises (88; 71.54%). The majority of the nurses had over 10 years of experience (38; 30.89%).

Table 1: Frequencies and Percentage of demographics characteristics (n=123)

Variable	Categories	N	%
Gender	Male	37	30.08
	Female	86	69.92
Age Groups	18–29	31	25.20
	30–39	56	45.53
	40–49	26	21.14
	50+	10	8.13
Educational Levels	Diploma in Nursing	21	17.07
	Bachelors in Nursing	93	75.61
	Master's degree	9	7.32
Nationality	Saudi Arabia	57	46.34
	India	17	13.82
	Philippine	20	16.26
	Pakistan	2	1.63
	Jordan	3	2.44
	Other	24	19.51
Residency	Hospital housing	35	28.46
	Outside housing	88	71.54
Years of Experience	1-3	29	23.58
	4-6	30	24.39
	7-10	26	21.14
	10+	38	30.89

The nurses who presented with depressive disorder obtained a mean score of 10.1 (SD 6.16) (Table 2). The number (percentage) of nurses with minimal, mild, moderate, moderately severe, and severe depression were 27 (21.95%), 32 (26.02%), 41 (33.33%), 10 (8.13%), and 13 (10.57%), respectively. Moreover, the nurses who presented with anxiety disorder obtained a mean score of 8.13 (SD 5.46) (Table 2). The number (percentage) of nurses with minimal, mild, moderate, and severe anxiety levels were 34 (27.64%), 41 (33.33%), 33 (26.83%), and 15 (12.2%), respectively.

Table 2: depression and anxiety among nurses (n=123)

Statistics	**PHQ-9 scores**	**GAD-7 scores**
Observation	123	123
Mean (Standard Deviation)	10.11 (6.17)	8.14 (5.47)
Median	10	8
Interquartile Range	6-13	3-12
Minimum -Maximum	1-27	0-12

Differences in depression level based on sociodemographic characteristics

Several sociodemographic variables were significantly associated with depression (Table 3). The chi-square test showed a significant association between depressive symptoms and gender: 25 (29.07%) female nurses reported mild depression while 19 (51.35%) male nurses reported moderate depression (p = 0.001). Furthermore, among nurses aged 30–39 years, 19 (33.93%) demonstrated mild depression (p = 0.084). Among nurses with a bachelor's degree, 36 (38.71%) had moderate depression (p = 0.577). Among Saudi nurses, 25 (43.86%) showed moderate depression (p = 0.247). Among nurses living in private houses, 29 (32.95%) reported moderate depression (p = 0.076). Fifteen (50%) nurses with experience ranging from 4–6 years demonstrated moderate depression (p = 0.438).

Differences in anxiety based on sociodemographic characteristics

Several sociodemographic variables were significantly associated with anxiety (Table 4). Female nurses were more anxious than males: 27 female (31.4%) and 14 male nurses (37.84%) reported mild anxiety (p = 0.319). Among nurses aged 30–39 years, 24 (42.86%) reported mild anxiety (p = 0.003). Among nurses with a bachelor's degree, 30 (32.26%) had mild anxiety (p= 0.206). Among Saudi nurses, 22 (38.6%) demonstrated moderate anxiety (p = 0.003). Among nurses living in private houses, 28 (31.82%) displayed mild anxiety (p = 0.003). Among nurses with over 10 years of experience, 16 (42.11%) demonstrated mild anxiety (p = 0.049).

Depression and anxiety based on demographic characteristics

The Wilcoxon signed-rank test revealed a statistically significant difference in the mean depression score between nurses living in hospital housing and private housing (p = 0.0246; Table 5 and Table 6), indicating that nurses' housing situation had a significant effect on depression scores. The Kruskal–Wallis's test revealed that the individuals' median depression scores were not the same across age groups (p = 0.0138) and nationality (p=0.0016), which suggests a statistically significant difference in median scores between two or more age groups, as well as nationality. Furthermore, the Wilcoxon signed-rank test revealed a statistically significant difference in the mean anxiety score between nurses living in hospital housing and private housing (p = 0.0001). This indicates that nurses' housing situations significantly affected anxiety scores. The Kruskal–Wallis's test revealed that the individuals' median anxiety scores were not the same across age groups (p = 0.0014) and nationality (p=0.0001), which suggests a statistically significant difference in median scores between two or more age groups, as well as nationality.

Discussion

It is crucial to evaluate mental health conditions among nurses owing to the potential impact of mental health on their health and the quality of patient care. To the best of our knowledge, no study in Saudi Arabia has examined the prevalence of depression and anxiety in nurses.

Table 3. Cross classification between PHQ-9 and demographic data (n=123)

Variable	Categories	Minimal Depression	Mild Depression	Moderate Depression	Moderately Severe Depression	Severe Depression	Total	p-value
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Gender	Male	5 (13.51)	7(18.92)	19(51.35)	6(16.22)	0(0)	37(30.08)	0.001*
	Female	22(25.58)	25(29.07)	22(25.58)	4(4.65)	13(15.12)	86(69.92)	
Age Groups	18–29	2(6.45)	5(16.13)	14(45.16)	4(12.9)	6(19.35)	31(25.20)	0.084
	30–39	11(19.64)	19(33.93)	17(30.36)	5(8.93)	4(7.14)	56(45.53)	
	40–49	9(34.62)	6(23.08)	8(30.77)	1(3.85)	2(7.69)	26(21.14)	
	50+	5(50)	2(20)	2(20)	0(0)	1(10)	10(8.13)	
Educational Levels	Diploma in Nursing	6(28.57)	7(33.33)	3(14.29)	2(9.52)	3(14.29)	21(17.07)	
	Bachelors in Nursing	18(19.35)	22(23.66)	36(38.71)	8(8.6)	9(9.68)	93(75.61)	0.577
	Master's degree	3(33.33)	3(33.33)	2(22.22)	0(0)	1(11.11)	9(7.32)	
Nationality	Saudi Arabia	6(10.53)	10(17.54)	25(43.86)	7(12.28)	9(15.79)	57(46.34)	0.247
	India	6(35.29)	5(29.41)	3(17.65)	1(5.88)	2(11.76)	17(13.82)	
	Philippines	4(20)	8(40)	6(30)	1(5)	1(5)	20(16.26)	
	Pakistan	0(0)	1(50)	1(50)	0(0)	0(0)	2(1.63)	
	Jordan	1(33.33)	1(33.33)	1(33.33)	0(0)	0(0)	3(2.44)	
	Others	10(41.67)	7(29.17)	5(20.83)	1(4.17)	1(4.17)	24(19.51)	
Residency	Hospital housing	12(34.29)	9(25.71)	12(34.29)	0(0)	2(5.71)	35(28.46)	0.076
	Private housing	15(17.05)	23(26.14)	29(32.95)	10(11.36)	11(12.5)	88(71.54)	
Years of Experience	1–3	5(17.24)	8(27.59)	9(31.03)	4(13.79)	3(10.34)	29(23.58)	0.438
	4–6	4(13.33)	6(20)	15(50)	2(6.67)	3(10)	30(24.39)	
	7–10	5(19.23)	8(30.77)	6(23.08)	3(11.54)	4(15.38)	26(21.14)	
	10+	13(34.21)	10(26.32)	11(28.95)	1(2.63)	3(7.89)	38(30.89)	

Therefore, this study is the first to evaluate the prevalence of depression and anxiety among nurses working at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, during the COVID-19 pandemic. Based on a cutoff value of 5, we found that depression and anxiety were highly prevalent among the nurses. These results are consistent with previous studies [1,6,9]. An Iranian study on 441 nurses during the COVID-19 pandemic reported a high prevalence of psychiatric symptoms, mainly depression and anxiety [13]. Additionally, research from Saudi Arabia has shown that, during the COVID-19 outbreak, nurses had higher depression and anxiety scores than other healthcare providers; furthermore, nurses had moderate to severe levels of depression and anxiety [14]. Another study on 3,228 nurses in Sichuan Province and Wuhan City during the COVID-19 outbreak reported a total prevalence of 34.3% and 18.1% for anxiety and depression, respectively, and a prevalence of 47.1% and 28.4%, respectively, among nurses who cared for COVID-19 patients [15]. Our results revealed a significant association between depression symptoms and nurses' gender. Women showed higher scores for depression and anxiety than men. Furthermore, nurses aged 30–39 years reported mild depression. Similar results were reported in Al Ateeq et al.'s study [6], which surveyed 502 healthcare providers during the COVID-19 pandemic and found that women had higher scores for depression and anxiety than men. Similarly, higher scores were reported by healthcare providers aged 30–39 years. In Zheng et al.'s study [16] they also found that perceived health status was related to age and gender among Chinese nurses. Our results also demonstrated a significant association between anxiety symptoms and nurses' age, region of origin, residence, and experience. Similarly, a previous study showed that depression and anxiety were significantly associated with work experience [17]. This study revealed that nurses' housing situation significantly affected depression, anxiety, and anxiety-depression levels. As Saudi nurses comprised almost half of the study sample, this result could be explained by cultural norms and differences in living conditions between Saudi and non-Saudi nurses. Most non-Saudi nurses are ex-pats who are likely to live alone and have families living in their home countries. Hence, they are less likely to worry about the risk of infecting their family members and loved ones than Saudi healthcare workers who live with their families and tend to have an active social life [18].

Table 4. Cross classification between GAD-7 and demographic data (n=123)

Variable	Categories	Minimal Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety	Total	p-value
		n (%)	n (%)	n (%)	n (%)	n (%)	
Gender	Male	6(16.22)	14(37.84)	12(32.43)	5(13.51)	37(30.08)	0.319
	Female	28(32.56)	27(31.4)	21(24.42)	10(11.63)	86(69.92)	
Age Groups	18–29	5(16.13)	6(19.35)	11(35.48)	9(29.03)	31(25.20)	0.003*
	30–39	14(25)	24(42.86)	14(25)	4(7.14)	56(45.53)	
	40–49	8(30.77)	8(30.77)	8(30.77)	2(7.69)	26(21.14)	
	50+	7(70)	3(0)	0(0)	0(0)	10(8.13)	
Educational Levels	Diploma in Nursing	8(38.1)	10(47.62)	2(9.52)	1(4.76)	21(17.07)	0.206
	Bachelors in Nursing	23(24.73)	30(32.26)	28(30.11)	12(12.9)	93(75.61)	
	Master's degree	3(33.33)	1(11.11)	3(33.33)	2(22.22)	9(7.32)	
Nationality	Saudi Arabia	8(14.04)	14(24.56)	22(38.6)	13(22.81)	57(46.34)	0.003*
	India	6(35.59)	6(35.29)	4(23.53)	1(5.88)	17(13.82)	
	Philippines	7(35)	8(40)	4(20)	1(5)	20(16.26)	
	Pakistan	0(0)	1(50)	1(50)	0(0)	2(1.63)	
	Jordan	0(0)	2(66.67)	1(33.33)	0(0)	3(2.44)	
	Others	13(54.17)	10(41.67)	1(4.17)	0(0)	24(19.51)	
Residency	Hospital housing	16(45.71)	13(37.14)	6(17.14)	0(0)	35(28.46)	0.003*
	Private housing	18(20.45)	28(31.82)	27(30.68)	15(17.05)	88(71.54)	
Years of Experience	1–3	9(31.03)	6(20.69)	6(20.69)	8(27.59)	29(23.58)	0.049*
	4–6	6(20)	8(26.67)	13(43.33)	3(10)	30(24.39)	
	7–10	6(23.08)	11(42.31)	7(26.92)	2(7.69)	26(21.14)	
	10+	13(34.21)	16(42.11)	7(18.42)	2(5.26)	38(30.89)	

Unsurprisingly, nurses reported significantly high scores for depression and anxiety. Nurses are at a higher risk of developing emotional distress, leading to depression and anxiety, due to work-related stress [1]. Risk factors, such as COVID-19-related stress and poor relationship with family, appeared to increase the risk of developing depression among Chinese nurses while working in high-risk COVID-19 wards, city of residence, and type of hospital also influenced the risk of depression [1]; furthermore, nursing workload and fear of infection increased the risk of anxiety [1]. A Saudi Arabian study found that a Middle Eastern nationality, divorced or widowed marital status, lack of physical activity, and smoking were risk factors for anxiety and depression among nursing staff [19]. In Dai et al.'s study [20] they found that nurses working night shifts report more depressive symptoms than those working day shifts only; the higher rates of depressive symptoms in nurses working night shifts might be associated with poorer sleep quality due to night shifts.

Additionally, nurses are considered frontline workers directly involved in treating patients with COVID-19, which may increase their fear of being infected and transmitting the infection to family members or others. These factors put nurses at risk for psychological and emotional problems [21]. Some limitations of this study must be noted. First, as this survey was conducted in a single center, the findings cannot be generalized to other centers that were more affected. Second, this study did not seek information on any mental health conditions that respondents may have had before the pandemic or respondents' experience of working during such a pandemic. Finally, the cross-sectional nature of this study precludes causal inferences. Longitudinal investigations on the long-term impact of pandemics on nurses' psychological health are warranted.

Conclusion

In this study, depression and anxiety symptoms were highly prevalent among nurses, which ranged from mild to severe. Therefore, more attention should be paid to the mental health of female nurses and those aged 30–39 years, as these groups showed high depression and anxiety levels. Furthermore, nurses' housing situation had a significant effect on depression and anxiety levels. In addition to advocating for solidarity, altruism, and social inclusion, promoting healthcare services as a humanitarian and national duty may help make it a more meaningful experience for nurses. Mental health screening should be conducted regularly for nurses, particularly during pandemic situations.

Psychiatric and psychotherapeutic interventions can be provided to help them cope with the COVID-19 pandemic. It is also crucial to meet healthcare providers' physical needs, including sufficient sleep, safe times, and places to rest. Finally, longitudinal research is needed to track nurses' mental health symptoms and develop evidence-based interventions.

Table 5: PHQ-9 scores and Demographic Characteristics (n=123)

Variable	Categories	Median	IQR		p-value	test
			Q25	Q75		
Gender	Male	10	8	12	0.2811	Mann-Whitney
	Female	9	4	13		
Age Groups	18–29	11	10	18	0.0138*	Kruskal Wallis
	30–39	9	6	11		
	40–49	8	4	12		
	50+	5	3	13		
Educational Levels	Diploma in Nursing	6	4	4	0.3369	Kruskal Wallis
	Bachelors in Nursing	7	10	13		
	Master's degree	9	3	10		
Nationality	Saudi Arabia	11	9	16	0.0016*	Kruskal Wallis
	India	8	3	11		
	Philippines	8	6	10.5		
	Pakistan	9.5	7	12		
	Jordan	9	3	10		
	Others	6	2.5	10.5		
Residency	Hospital housing	7	3	12	0.0246*	Mann-Whitney
	Private housing	10	7	14		
Years of Experience	1–3	10	7	14	0.3072	Kruskal Wallis
	4–6	10	8	11		
	7–10	9.5	7	15		
	10+	8	3	13		

Table 6: GAD-7 scores and demographic characteristics (n=123)

Variable	Categories	Median	IQR		p-value	test value
			Q1	Q3		
Gender	Male	9	7	12	0.0751	Mann-Whitney
	Female	7	2	11		
Age Groups	18–29	11	9	15	0.0014*	Kruskal Wallis
	30–39	7	4	10.5		
	40–49	7	3	12		
	50+	3	2	5		
Educational Levels	Diploma in Nursing	6	2	7	0.0518	Kruskal Wallis
	Bachelors in Nursing	9	5	12		
	Master's degree	10	2	12		
Nationality	Saudi Arabia	11	7	14	0.0001*	Kruskal Wallis
	India	7	3	10		
	Philippines	6	2	9.5		
	Pakistan	10.5	7	14		
	Jordan	9	7	11		
	Others	3	1.5	7		
Residency	Hospital housing	5	2	8	0.0001*	Mann-Whitney
	Private housing	9	5.5	13		
Years of Experience	1–3	9	3	16	0.2061	Kruskal Wallis
	4–6	10	7	12		
	7–10	7	5	11		
	10+	7	2	9		

Abbreviation

KFSH&RC-R: King Faisal Specialist Hospital and Research Center Riyadh; PHQ-9: Patient-Health Questionnaire; GAD7: Generalized Anxiety Disorder 7; SPSS: Statistical Package for the Social Sciences; WHO: World Health Organization; SARS: Severe Acute Respiratory Syndrome; MERS: Middle East Respiratory Syndrome; IRB: Institutional Review Board.

Declaration

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Availability of data and materials

Data will be available by emailing Nurseemad@gmail.com

Authors' contributions

Emad Hakami is the responsible author for the concept, design, literature search, data analysis, data acquisition, manuscript writing, editing, and reviewing. EBC has read and approved the final manuscript. Ahlam Alsomali is responsible for writing, editing, and reviewing the content of the manuscript. Mohammed Senitan is responsible for the manuscript review.

Ethics approval and consent to participate

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013), the ICH Harmonized Tripartite Good Clinical Practice Guidelines, the policies and guidelines of the Research Advisory Committee of the King Faisal Specialist Hospital and Research Center in Riyadh, and the laws of Saudi Arabia. Institutional Review Board (IRB) approval was acquired from the King Faisal Specialist Hospital and Research Center, Riyadh, before starting the study (Reference number 2221044 on March 14, 2022). Consent forms were signed by participants who agreed to participate in the study after they had read the research objectives. They were informed that they had the right to withdraw from the study at any time without any consequences. Data were analyzed anonymously and handled following the research board's enforced safeguards. Data were safe and were not revealed by anyone other than the investigators.

Consent for publication

Not applicable

Competing interest

The authors declare that they have no competing interests.

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