

Depression, Anxiety and Stress among health care workers during the COVID-19 pandemic in Jazan city, Kingdom of Saudi Arabia

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Abstract

Background: The mental health impact of a disease outbreak is usually neglected by pandemic management with costly consequences. Early evidence shows that health workers directly involved in the diagnosis, treatment, and care of patients with COVID-19 are at risk of developing mental health symptoms. Similar adverse psychological reactions were reported among healthcare workers in previous studies during the 2003 severe acute respiratory syndrome outbreak.

Objectives: to assess the prevalence and determinants of depression, anxiety, and stress among healthcare workers at Prince Mohammed bin Nasser Tertiary Hospital in Jazan City during the COVID-19 pandemic.

Methods: This was a cross-sectional study conducted among healthcare worker at Prince Mohammed bin Nasser Hospital. A total of 352 health workers were included in the study. Data was collected through a self-administered questionnaire pertaining to socio-demographic characteristics and the depression anxiety stress scale 21-item questionnaire. Descriptive statistics were calculated for study variables, including frequency and percentage for qualitative variables and the mean and standard deviation for quantitative variables. A chi-square test was used to compare categorical data. $P \leq 0.05$ was used as an indicator of statistically significant differences.

Results: A high proportion of mild depression and anxiety was observed among those who had chronic illness (25.7%) and for those who had insufficient personal protective equipment (16.9%). Those differences were statistically significant, with a high proportion of mild stress observed among 3.4% of those who experienced the death of a relative by COVID-19.

Conclusion: There was a considerable prevalence of depression, anxiety, and stress among healthcare workers during the COVID-19 pandemic, especially among those who experienced the death of a relative from COVID-19 and those who had a chronic disease.

Keywords: depression, anxiety, stress, healthcare worker, COVID-19, Jizan, Saudi Arabia

Introduction

COVID-19, a severe acute respiratory syndrome caused by coronavirus 2 (SARS-CoV-2), was first detected in Wuhan, China, in late 2019 and spread globally. The rapid spread of the virus, transmitted primarily by human-to-human contact, drove the World Health Organization to classify it as a pandemic in March 2020. Given the virus's mode of transmission, countermeasures have been imposed to break the chain of infection, including social distancing to minimize the spread from unknown sources, quarantining to safeguard against possible infection, and isolation to limit the spread from known sources. Notably, the effect of this pandemic was not limited to physical health but also affected psychological and social wellbeing, as well as the safety of surrounding environments. For instance, mounting evidence suggests a high prevalence of depression, anxiety, stress, and trauma affecting people placed under strict measures (1). A systematic review and meta regression was done from December 2019 to June 2020, with a total sample size of 2,238,021, and the result clearly demonstrated a high prevalence of stress, anxiety, and depression within frontline healthcare workers treating COVID-19 (2). A systematic review included 46 articles with a total sample size of 61,551 hospital staff members from January 2020 to February 2021. Anxiety prevalence among healthcare worker was 26% higher for a certain age group and for women (3). The results of 24 studies from China indicate that COVID-19 had a considerable impact on the psychological wellbeing of frontline hospital staff, and nurses experienced a higher adverse effect on mental health outcomes during the pandemic (4). A cross sectional online survey was sent as a Google form to various health care workers at different departments in the hospital and found that 17.3% had depression, 26% had anxiety and 17.3% had stress, with nurses reporting the highest depression, anxiety and stress (5) Social functioning was also severely affected by the pandemic because of social distancing. In this sense, a reduced social life, loss of social routine, loneliness due to isolation, and social boycotting due to the stigma of infection are some examples of impairment in social relationships during this unprecedented time. In observing the safety measures to contain the virus, the response to this new norm may have been unique to healthcare workers. When compared with the public, healthcare workers are highly susceptible to negative psychological effects by the risk of contact with infected patients. With the lack of evidence-based practices related to COVID-19 patient management, the infection had an unusual tendency to arouse fear and subsequent ineffective psychological and social response adaptation, threatening the optimal quality of life, (6) which reflects the importance of the present study aiming to assess the prevalence and determinants of anxiety, depression, and stress among healthcare workers and related factors in the Jazan region during the COVID-19 pandemic.

Materials and Methods

Study design, setting, and participants

This work was a cross-sectional study, conducted for healthcare workers at Prince Mohammed bin Nasser Tertiary Hospital in the Jazan region of Saudi Arabia. Jazan is located in the southwest of Saudi Arabia and north of Yemen. It has a population of 1.5 million people. The study was conducted from December 2021 to April 2022 at Prince Mohammed bin Nasser Hospital. The participants were healthcare workers who spoke English and were available during the data collection period.

Sampling strategy

The minimum required sample size was calculated using the following formula, $n = Z^2 p(1-P)/D^2$, where n (calculated sample size) = 345, Z (the 95% confidence level) = 1.96, p (assumed prevalence in the population) = 50%, and $d = 0.05$.

Data was collected after getting ethical approval from the Jazan Ministry of Health research ethics committee. To prevent COVID-19 transmission to the data collectors, we used an electronic web-based questionnaire (Google form) in English. Those who could not speak and understanding English were excluded from the sample. Data was collected through emails and sent to the selected sample virtually through the hospital director to all healthcare workers.

Data collection tool

A pilot study involving 30 healthcare workers who were not included in the survey was conducted to make sure the questions and scale items were clear and understood and to determine how long it would take to complete the questionnaire. Data was collected through a self-administered questionnaire that included two parts as follows: a) the first part included demographic characteristics and other factors associated with depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak, and b) the second part included the validated English version of the 21-item depression anxiety stress scale (DASS), which indicated acceptable internal consistency with Cronbach's alpha being 0.959 (7). Each of the three DASS-21 scales contained seven items divided into subscales with similar content. The depression scale assessed dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The anxiety scale assessed autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxiety. The stress scale was sensitive to levels of chronic non-specific arousal. It assessed difficulty to relax, nervous arousal, impatience, irritability, and over-reactiveness. Scores for depression, anxiety, and stress were calculated by summing the scores for the relevant items with cut-off scores for conventional severity labels (i.e., normal, moderate, severe) (8).

Statistical analysis

Data was collected, entered, and coded and then analyzed and tabulated using the Statistical Package for Social Science (SPSS version 24, IB, Chicago, USA). Descriptive statistics used were frequencies and percentages for the categorical data, means, and standard deviations for the quantitative data. A chi-squared test was used to compare categorical data, and $P \leq 0.05$ was used as an indicator of statistically significant differences.

Ethical consideration

The study was approved by the IRB committee of the Jazan Hospital (H-10-Z-068) and the Ministry of Health in Saudi Arabia (IRB number.2191). Signed informed consent was obtained from all participants, and confidentiality and privacy were insured.

Results

Table 1 shows that a total of 352 healthcare workers participated in the current study. There were 275 (78.1%) aged 20–29 years, while 77 (21.9%) were aged 30 years and above. A gender majority of 261 (74.1%) were females, 337 (95.7%) were Saudi, and 236 (67%) were single. The majority of the studied sample were from applied medical science, representing 229 (65.1%) including those in lab work, radiography, nursing, social work, health education, public health, nutrition, physiotherapy, and medical information, with 44 (12.5%) physicians and 79 (22.4%) administrators. Looking at how long they had been working in healthcare, 299 (84.9%) reported fewer than five years and 27 (7.7%) reported more than 10 years. Thirty-five (9.9%) from the studied sample had a chronic disease, and the majority of the studied sample, 260 (73.9%), worked in a COVID-19 designated hospital. Eighty-nine (25.3%) had relatives die from COVID-19, and 337 (95.7%) had sufficient personal protective equipment. The DASS 21-item scale did not find severe or extremely severe depression. A high proportion of mild depression was observed among those who had a chronic disease (25.7%), those who experienced the death of a relative from COVID-19 (16.9%), and those who had insufficient personal protective equipment (26.7%). These differences are statistically significant ($P \leq 0.05$). Factors of age, gender, job title, working duration, COVID-19 designated hospitals, and access to sufficient protective equipment were not significantly associated with depression among the study sample.

Table 2 illustrates anxiety among healthcare workers according to their demographic characteristics. Among the recruited sample, a high proportion of mild anxiety was observed among those who had a chronic disease nine respondents 25.7% those who had a relative die from COVID-19 (15 respondents; 16.9%), and those who had insufficient personal protective equipment (four respondents; 26.7%) These differences are statistically significant ($P \leq 0.05$) in the collection result of mild, moderate, severe, and very severe depression because of their small number.

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Table 1: Depression in relation to sociodemographic characteristics among studied sample

Sociodemographic characteristics Total(N=352)	Normal	Mild depression	Moderate depression	P value Δ
Age (years) 20-29 (N= 275) 30 and above (N= 77)	253(92.0%) 68(88.3%)	17(6.2%) 5(6.5%)	5(1.8%) 4(5.2%)	0.249
Gender Males (N=91) Females (N=261)	81(89%) 240(92%)	7(7.7%) 15(5.7%)	3(3.3%) 6(2.3%)	0.692
Marital: Single (N=236) Married(N=116)	219(92.8%) 102(87.9%)	13(5.5%) 9(7.81%)	4(1.7%) 5(4.3%)	0.233
Nationality: Saudi (N=337) Non Saudi (N=15)	307(91.1%) 14(93.3%)	22(6.5%) 0(0.0%)	8(2.4%) 1(6.7%)	0.364
Job title: Physician (N=44) Applied medical sciences *(N=229) Administrator (N=79)	32(72.7%) 213(93.0%) 76(96.2%)	7(15.9%) 13(5.7%) 2(2.5%)	5(11.4%) 3(1.3%) 1(1.3%)	0.000
Working experience(years) Less than 5 years (N=299) 5-9 years (N=26) 10 years and above (N=27)	276(92.3%) 20(76.9%) 25(92.6%)	17(5.7%) 4(15.4%) 1(3.7%)	6(2.0%) 2(7.7%) 1(3.7%)	0.103
Having chronic disease:** Yes (N=35) No (N=317)	28(80.0%) 293(92.4%)	4(11.4%) 18(5.7%)	3(8.6%) 6(1.9%)	0.021
Working in Covid-19 designated hospital Yes (N=260) No(N=92)	240(92.3%) 81(88.0%)	14(5.4%) 8(8.7%)	6(2.3%) 3(3.3%)	0.456
Death of relatives due to Covid-19 Yes (N=89) N (N=263)	74(83.1%) 247(93.9%)	9(10.1%) 13(4.9%)	6(6.7%) 3(1.1%)	0.003
Having sufficient personal protective equipment: Yes (N=337) No (N=15)	307(91.1%) 14(93.3)	22(6.5%) 0(0.0%)	8(2.4%) 1(6.7%)	0.364
Total (N=352)	321(91.2%)	22(6.2%)	9(2.6%)	

*Applied medical science: lab worker, radiographer, pharmacist, Nurse, social worker. Health educator, public health, , medical informatics, physiotherapist, nutrition,

** chronic disease: Diabetes, hypertension, Bronchial asthma

Δ Pearson chi square

Table 2: Anxiety in relation to sociodemographic characteristics in studied sample

Sociodemographic characteristics Total (N=352)	Studied samples N (%)		P value §
	Normal	Anxiety	
Age (years) 20-29 (N=275) 30 and above (N=77)	250(90.9%) 66(85.7%)	25(9.1%) 11(14.3%)	.184
Gender Males (N=91) Females (N=261)	83(91.2%) 233(89.3%)	8(8.8%) 28(10.7%)	0.600
Marital status : Single (N=236) Married (N=116)	217(91.9%) 99(85.3%)	19(8.1%) 17(14.7%)	0.055
Nationality: Saudi (N=337) Non Saudi (N=15)	302(89.6%) 14(93.3%)	35(10.4%) 1(6.7%)	0.642
Job title: Physician (N=44) Applied medical sciences* (N=229) Administrator (N=79)	38(86.4%) 203(88.6%) 75(94.9%)	6(13.6%) 26(11.4%) 4(5.1%)	0.205
Working experience(years) Less than 5 years (N=299) 5-9 years. (N=26) 10 years and above. (N=27)	270(90.3%) 23(88.5%) 23(85.2%)	29(9.7%) 3(11.5%) 4(14.8%)	0.684
Having chronic disease:** Yes (N=35) No (N=317)	26(74.3%) 290(91.5%)	9(25.7%) 27(8.5%)	0.001
Working in covid 19 designated hospital Yes (N=260) No (N=92)	238(91.5%) 78(84.8%)	22(8.5%) 14(15.2%)	0.066
Death of relatives due to covid 19 Yes (N=89) No (N=263)	74(83.1%) 242(92.0%)	15(16.9%) 21(8.0%)	0.017
Having sufficient personal protective equipment: Yes (N=337) No(N=15)	305(90.5%) 11(73.3%)	32(9.5%) 4(26.7%)	0.032
Total (N=352)	316(89.8%)	36(10.2%)	

*Applied medical science: lab worker, radiographer, pharmacist, Nurse, social worker. Health educator, public health, medical informatics, physiotherapist, nutrition,

** chronic disease: Diabetes, hypertension, Bronchial asthma

§ Fisher exact test

Table 3: Stress in relation to sociodemographic characteristics in studied sample

Sociodemographic characteristics Total (N=352)	Normal	Mild stress	Moderate stress	P value ^Λ
Age (years) 20-29 (N=275) 30 and above (N=77)	270(98.2%) 74(96.1%)	3(1.1%) 2(2.6%)	2(0.7%) 1(1.3%)	0.544
Gender Males (N=91) Females (N=261)	88(96.7%) 256(98.1%)	1(1.1%) 4(1.5%)	2(2.2%) 1(0.4%)	0.258
Marital status : Single(N=236) Married (N=116)	232(98.3%) 112(96.6%)	2(0.8%) 3(2.6%)	2(0.8%) 1(0.9%)	0.432
Nationality: Saudi (N=337) Non Saudi (N=15)	330(97.9%) 14(93.3%)	4(1.2%) 1(6.7%)	3(0.9%) 0(0.0%)	0.202
Job title: Physician (N=44) Applied medical sciences*(N=229) Administrator N=79)	41(93.2%) 255(98.3%) 78(98.7%)	2(4.5%) 2(0.9%) 1(1.3%)	1(2.3%) 2(0.9%) 0(0.0%)	0.254
Working experience(years) Less than 5 years (N=299) 5-9 years(N=26) 10 years and above (N=27)	293(98.0%) 25(96.2%) 26(96.3%)	3(1.0%) 1(3.8%) 1(3.7%)	3(1.0%) 0(0.0%) 0(0.0%)	0.561
Having chronic disease** Yes (N=35) No N =317)	33(94.3%) 311(98.1%)	1(2.9%) 4(1.3%)	1(2.9%) 2(0.6%)	0.295
Working in Covid-19 designated hospital Yes (N=260) No(N=92)	255(98.1%) 89(96.7%)	3(1.2%) 2(2.2%)	2(0.8%) 1(1.1%)	0.744
Death of relatives due to Covid-19 Yes(N=89) No (N=263)	83(93.3%) 261(99.2%)	3(3.4%) 2(0.8%)	3(3.4%) 0(0.0%)	0.002
Having sufficient personal protective: Yes (N=337) No (N=15)	330(97.9%) 14(93.3%)	4(1.2%) 1(6.7%)	3(0.9%) 0(0.0%)	0.202
Total (N= 352)	344(97.7%)	5(1.4%)	3(0.9%)	

*Applied medical science: lab worker, radiographer, pharmacist, Nurse, social worker. Health educator, public health, , medical informatics, physiotherapist, nutrition.

** chronic disease: Diabetes, hypertension, Bronchial asthma.

^Λ Pearson chi square

Discussion

The objective of this study was to assess the prevalence of anxiety, depression, and stress and determine the factors associated with mental health among healthcare workers in Jazan City during the COVID-19 pandemic in 2021. The study was conducted from December 2021 to April 2022. The impact of COVID-19 on mental health is well documented in various countries among different populations, including health professionals. The prevalence of anxiety among all healthcare workers ranged from 22.2% to 33% in an umbrella review of 10 systematic reviews (9).

This study indicated that 8.8% of respondents reported mild to moderate depression, while 10.2% had anxiety, which is lower than the international prevalence and much lower than in a previous study done in 2020, which revealed that depression and anxiety were prevalent (55.2% and 51.4%, respectively) among healthcare workers in the Saudi Ministry of Health during the first few months of the pandemic (10).

We found that the prevalence of depression among health practitioners in Jazan City during the study period was lower when compared to the general population during the first year of the pandemic (2020) among 942 adult participants, which was 25.1% (11).

Globally, a study conducted in Nepal 2020 among healthcare workers found that 37% had symptoms of depression and 23% experienced anxiety symptoms (12).

Another study was done in Turkey during 2020 that reported a prevalence of depression (77.6%) and anxiety (60.2%) among healthcare professionals (13).

Our findings are similar to those of a study conducted among the general population of China in 2019 in which the prevalence of anxiety and depression was approximately 8.3% and 14.6%, respectively (14).

We found that male participants had slightly higher mean scores for depression (11%) than females (8%), which is contrary to a study in Turkey and Iran (5,7). On the other hand, females had higher scores for anxiety (10.7%) than males (8.8%).

Healthcare workers aged 30 years and older had more psychiatric symptoms during the pandemic than those under 30 years of age regarding anxiety, depression, and stress, similar to the study of 502 healthcare providers in the Saudi Ministry of Health in 2020 (2).

In the present study, physicians were more affected than other healthcare professionals for all psychological symptoms, similar to findings in a Jordanian study during 2019 (8), while the nurses were the most affected for other studies done in Saudi Arabia, Turkey, and China (2,5,9). Married participants reported higher concern than non-married, which is a contrast to a study conducted in Jordan in 2019 (15).

Despite no strong evidence suggesting that sociodemographic factors make a difference in psychological responses (16), healthcare providers with less effective coping abilities are prone to developing higher concern, whereas those showing resilience are relatively less affected by the pandemic (8).

A history of previous psychiatric problems was also a predictor of higher maladaptive outcomes during the severe acute respiratory syndrome outbreak (17).

This current study revealed that participants who had been working for 5–9 years were more prone to depressive symptoms, while those who had more than 10 years of experience reported more anxiety symptoms. In contrast, a Turkish study revealed that both depression and anxiety were more frequent among participants with more than 10 years' experience (13).

It is worth noting that psychological responses were significantly increased among participants with chronic diseases. Anxiety was the most commonly encountered form, which is similar to other worldwide studies (18)(19). Health practitioners' knowledge that risk factors for the severe course of COVID-19 infection include old age, chronic obstructive pulmonary disease, hypertension, diabetes mellitus, and coronary artery disease (20) may have aggravated negative feelings and increased anxiety among health practitioners with chronic diseases.

Findings in this study revealed no relation between working at COVID-19 designated centers and developing psychological outcomes. Many factors may contribute to positive feelings, such as the emergence of effective vaccines during the study period and governmental support with resources for these centers.

Significant associations between psychological responses and the death of relatives due to COVID-19 were noted among participants, and these outcomes were thought to be higher among those who transmitted the infection to their families (21).

Our study reported that participants having insufficient personal protective equipment experienced more negative outcomes, particularly anxiety, as this predictor is the most common source of anxiety (21).

Conclusion and Recommendations

Healthcare practitioners being exposed to different levels of various psychological events during the pandemic, as shown in this study and other studies, necessitates the existence of specific strategies to mitigate the mental wellbeing of those working in frontline, triage, and quarantines services. Occupational health clinics, work burnout clinics, and active roles of screening for these psychological conditions could be helpful for reducing these mental disorders.

As noted, the availability of protective equipment played a significant role in reducing anxiety.

Furthermore, giving health practitioners priority in obtaining vaccinations may have contributed significantly to alleviating the severity of psychological symptoms.

Limitation

The main limitation is the use of only one health center, but it was one of the main centers dealing with the disease.

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