The Mental Health of Female Physicians and Nurses in Oman during the COVID-19 Pandemic

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ABSTRACT

Objectives: We sought to assess the impact of the COVID-19 pandemic on female doctors and nurses' mental health in Oman. *Methods*: We conducted a cross-sectional, web-based survey of 402 female doctors and nurses recruited from several health facilities in Oman. We used the Generalized Anxiety Disorder (GAD-7) scale, the Perceived Stress Scale (PSS-10), the WHO-5 Well-Being Index (WHO-5), and the Sleep Quality Scale to determine the prevalence rates of anxiety, stress, well-being, and sleep quality. *Results:* A total of 231 (57.5%) Omanis and 171 (42.5%) non-Omanis participated in this study. Of the total 402 participants, 28.4% were physicians and 71.6% were nurses. One in four (27.9%) participants reported caring for COVID-19 patients. One in four (27.9%) had moderate to severe anxiety. A higher proportion of Omanis (32.0%) had moderate to severe anxiety than non-Omanis (22.2%). Six in 10 (60.7%) scored at or above the mean on the PSS-10. Doctors and nurses who cared for COVID-19 patients reported higher levels of stress than those who did not. Almost half (45.3%) of the participants scored 50% or less on the well-being scale. A higher proportion of Omanis and those who cared for COVID-19 cases scored ≤ 50. Four in 10 (39.3%) had poor sleep quality; this was particularly prevalent among Omanis. A multiple regression analysis revealed that anxiety, stress, and well-being were significant predictors of poor sleep quality. *Conclusions:* The COVID-19 pandemic is having a significant effect on the mental health of health care workers in Oman. In this study, nurses, Omanis, and frontline health care workers were the most impacted by the global health crisis. Urgent psychological, social, and administrative interventions and support should be implemented to mitigate mental health risks in these groups.

With the emergence of the COVID-19 pandemic, an increasing number of people experience psychological distress and symptoms of mental illness.[1] Health care workers (HCWs) have been identified as populations at risk for psychological distress during the current COVID-19 pandemic. Several factors have contributed to the increased risk of mental health problems among HCWs[2–4] including uncertainty, abrupt changes in the work environment, fear of infection, high death rates among patients, shortages of medical supplies (including personal protective equipment), physical fatigue due to long working hours, and worries about transmitting the infection to their loved ones.[2–6] Additionally, HCWs are under tremendous pressure to make quick and efficient diagnoses, the constant threat of self-isolation due to possible infection, staff shortages, and lack of organizational support.[7,8] During global health crises, including COVID-19, sleep disturbance is common.[9,10] For example, it is difficult for anxious individuals to fall asleep, and they may wake up several times during the night.[11]

Previous studies have shown that the prevalence rate of mental health issues such as anxiety, stress, and depression during the COVID-19 pandemic and other global health crises appeared to be higher among female HCWs than males and more frequently in nurses than doctors, reflecting important gender and occupational differences.[12–17] In Gulf Cooperation Council countries, studies have indicated that health crises, including MERS and COVID-19, imposed significant levels of anxiety and stress on HCWs, especially those who cared for infected patients. Fear of infection and transmitting the infection to family members and significant others were the key concerns of these HCWs.[18,19]

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Our study examines mental health issues and sleep quality during the COVID-19 pandemic in a group of female doctors and nurses in Oman. This is the first study to examine the impact of the COVID-19 pandemic on the mental health of female HCWs in Oman and the Arab world.

METHODS

This study was conducted following the protocol approved by the research ethics committee at the Royal Hospital, Muscat, Oman. Access to the study website were not given to the participants who did not gave their consent.

We conducted a cross-sectional, web-based survey of HCWs from different governorates in the country during the first two weeks of April 2020. A link to the survey was sent via email and WhatsApp to HCWs in several health care facilities, including primary health centers, polyclinics, and secondary and tertiary care hospitals.

We employed four standardized measures to collect data on anxiety, stress, well-being, and sleep quality in our study.

The Generalized Anxiety Disorder (GAD-7) scale, a seven-item anxiety screening instrument based in part on the DSM-IV criteria for generalized anxiety disorder.[20] The GAD-7 asks participants about symptoms experienced in the previous two weeks. All items are rated on a four-point Likert scale (0 = not at all, 1 = several days, 2 = over half of the days, and 3 = nearly every day). The total scores are categorized into five levels of anxiety: minimal (0–4), mild (5–9), moderate (10–14), and severe (15–21). Scores of 10 or higher are indicative of GAD. The Cronbach's alpha for the GAD-7 in this study was 0.89.

The Perceived Stress Scale (PSS-10) is a 10-statement measure of stress that asks respondents about their thoughts and feelings over the last month.[21] All items are rated on a five-point Likert scale (0 = never, 1 = almost never, 2 = once in a while, 3 = often, and 4 = very often). The total score ranges from 0 to 40, with a higher score indicating a higher degree of stress. The Cronbach's alpha reliability in this study was 0.79.

The WHO Well-Being Index (WHO-5) is a five-item scale that assesses subjective well-being during the preceding two weeks. All items are rated on a six-point Likert scale (0 = at no time, 1 = some of the

time, 2 = less than half of the time, 3 = more than half of the time, 4 = most of the time, and 5 = all of the time). The total raw score ranges from 0 to 25, which is multiplied by four to produce a percentage score ranging from 0 (worst imaginable well-being) to 100 (best imaginable well-being). A score of ≤ 50 indicates negative well-being, while a score higher than the cut-off value signifies optimal well-being. The WHO-5 has been validated as a depression screening tool where a score of ≤ 50 indicates depression.[22] The Cronbach's alpha for the WHO-5 was 0.89.

The Sleep Quality Scale (SQS) is a new single-item measure of global sleep quality. It asks participants to think about their overall sleep quality during the past seven days. They are instructed to think about the number of hours they slept, ease of falling asleep, frequency of waking up at night (except for bathroom trips), frequency of waking up earlier than usual in the morning, and how refreshing their sleep was. The participants then are requested to rate their overall sleep quality on an 11-point scale ranging from 0 = terrible to 10 = excellent. Lower scores indicate poor sleep quality.[23]

The descriptive and inferential statistics reported in this study were performed using SPSS (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Statistical significance was set at 0.050. Descriptive statistics were used to provide information on HCWs demographic background and the study variables. Chi-square and independent-samples t-test were performed to compare differences between groups. Finally, a multiple linear regression analysis was conducted for sleep quality among HCWs using GAD-7, PSS-10, and WHO-5 as predictors.

RESULTS

The study recruited 402 female HCWs from several governmental hospitals and health centers in Oman. As presented in Table 1, 28.4% of the participants were physicians and 71.6% were nurses. Slightly more than half (57.5%) of the participants were Omani citizens. One-third (27.9%) of the HCWs cared for COVID-19 patients. The mean age of the participants was 36.4±6.7 years. The majority (77.3%) of the HCWs were married. The distribution of the participants among the four levels of GAD-7 was as follows: 32.6% experienced minimal anxiety, 39.6% mild anxiety, 18.9% moderate anxiety, and

Table 1: Sociodemographic characteristics of the participants.

Characteristics	Nationality				Full sample	
	Omani (n = 231)		Non-Omani (n = 171)			
	n	%	n	%	n	%
Job title						
Physicians	80	34.6	34	19.9	114	28.4
Nurses	151	65.4	137	80.1	288	71.6
Marital status						
Married	168	73.0	142	83.0	310	77.3
Single[a]	62	27.0	29	17.0	91	22.7
Contact with COVID-19 patients						
Yes	52	22.7	59	34.9	111	27.9
No	177	77.3	110	65.1	287	72.1

Note: N = 402. The total might not tally because of missing data.
[a]Includes never married, divorced, and widowed.

8.9% severe anxiety. The percentage of HCWs who scored ≥ 10 was 27.9%. As shown in Table 2, a chi-square test showed that a higher proportion of Omanis (32.0%) scored ≥ 10 on the anxiety scale (χ^2 = 4.710, p = 0.020) than non-Omanis (22.2%). No differences were found based on occupation (χ^2 = 0.190, p = 0.380) or contact with COVID-19 patients (χ^2 = 2.050, p = 0.090).

The mean score on the PSS-10 was 24.5±5.7. Using the mean score to divide the sample into high and low stress groups showed that 60.7% scored at or above the mean. An independent-samples t-test revealed that neither nationality nor occupation had a significant effect on stress scores (t (400) = 0.54, p = 0.590; t (400) = 0.56, p = 0.580, respectively). Nonetheless, caring for COVID-19 patients had a significant effect on stress (t (396) = 2.67, p < 0.001, d = 0.30).

Almost half (45.3%) of the physicians and nurses scored 50% or less on WHO-5. According to this

Table 2: Prevalence of anxiety, stress, well-being, and sleep quality by nationality.

Variables	Total n = 402 n (%)	Nationality*		χ^2	p-value
		Omani n = 231 n (%)	Non-Omani n = 171 n (%)		
GAD-7[a]					
Minimal-mild anxiety	290 (72.1)	157 (68.0)	133 (77.8)	4.710	0.020
Moderate-severe anxiety	112 (27.9)	74 (32.0)	38 (22.2)		
PSS-10[b]					
Low stress	187 (46.5)	108 (46.8)	79 (46.2)	0.012	0.500
High stress	215 (53.5)	123 (53.2)	92 (53.8)		
WHO-5[c]					
Suboptimal well-being	182 (45.3)	122 (52.8)	60 (35.1)	12.460	< 0.001
Optimal well-being	220 (54.7)	109 (47.2)	111 (64.9)		
SQS[d]					
Low sleep quality	158 (39.3)	113 (48.9)	45 (26.3)	21.040	< 0.001
High sleep quality	244 (60.7)	118 (51.1)	126 (73.7)		

Total might not tally because of missing cases.
GAD: Generalized Anxiety Disorder; PSS-10: Perceived Stress Scale; WHO-5: WHO Well-Being Index; SQS: Sleep Quality Scale.
[a]High on GAD defined as a score of 10 or higher.
[b]High on PSS-10 defined as a score of 25 or higher.
[c]High on WHO-5 defined as a score of 51 or higher.
[d]High on SQS defined as a score of 6 or higher.

cut-off value, a higher proportion of Omanis (52.8%), compared to non-Omanis (35.1%) scored ≤ 50 (χ^2 = 12.460, p < 0.001). Also, a higher proportion of HCWs who cared for COVID-19 patients (58.6%) scored ≤ 50 compared to those who did not (39.7%) (χ^2 = 11.480, p < 0.001). However, occupation was related to scores ≤ 50 on WHO-5 (χ^2 = 2.690, p = 0.060).

The mean score on the SQS was 5.9±2.1. Using the mean score to divide the sample into high- and low-quality sleep groups showed that 39.3% had poor sleep quality.

An independent-samples t-test revealed that nationality had a significant effect on sleep quality (t (400) = 4.64, p < 0.001, d = 0.48) with Omanis (5.5±2.2) having worse sleep quality compared to non-Omanis (6.5±1.7). The same test revealed no significant effect of occupation (t (400) = 1.31, p = 0.190) or caring for COVID-19 patients on sleep quality (t (396) = 1.26, p = 0.210).

Finally, we conducted a multiple linear regression analysis for sleep quality among HCWs using anxiety, stress, and well-being as predictors. The model explained 56.0% of the variance in the data (R^2 = 0.31). Anxiety, stress, and well-being significantly predicted sleep quality (β = -0.25, t (4.58), p < 0.001; β = -0.15, t (2.78), p < 0.001; β = 0.27, t (4.81), p < 0.001, respectively).

DISCUSSION

To the best of our knowledge, this is the first study that examined the mental health issues among female HCWs in Oman and probably the Arab world. The prevalence of generalized anxiety disorder was high. Specifically, one in four (27.9%) female HCWs had moderate to severe anxiety. One in three Omani HCWs compared to one in five non-Omanis had symptoms of generalized anxiety disorder.

Unsurprisingly, stress levels were higher among HCWs who closely worked with COVID-19 patients. Likewise, the prevalence of suboptimal well-being was high among Omanis and HCWs who cared for COVID-19 patients. Poor sleep was common among Omani HCWs. It seems that Omani HCWs suffered more mental health issues during this international health crisis compared to non-Omanis. Moreover, HCWs who diagnosed, treated, and cared for COVID-19 patients reported a higher stress level, lower level of well-being, and

bad sleep quality. HCWs who treat COVID-19 patients are under increased stress and tend to experience high rates of psychiatric morbidity. A recent study of nurses and physicians involved in the care of COVID-19 patients reported a high incidence of stress, anxiety, insomnia, and distress, with higher levels of anxiety in females and nurses compared to males and physicians.[6] Compared to male HCWs, females reported more severe mental health symptoms across all measures, including the Patient Health Questionnaire, GAD-7, Insomnia Severity Index, and Impact of Event Scale-Revised. In addition, nurses had worse mental health outcomes compared to physicians.

Our study results confirmed the findings of previous studies during epidemics and recent studies worldwide during the COVID-19 pandemic that showed a higher level of stress and lower level of well-being among HCWs who cared for COVID-19 patients.[24–27] One of the most recent studies of HCWs in a tertiary infectious disease hospital for COVID-19 in China, showed a high incidence of anxiety and stress disorders among frontline medical staff,[28] with nurses having a higher incidence of anxiety than doctors.[29–31] A recent systematic review and meta-analysis found a pooled prevalence of 23.2% for anxiety and a pooled prevalence rate of 22.8% for depression. A subgroup analysis revealed that female HCWs exhibited higher rates of affective symptoms compared to male HCWs.[2]

In our study, female nurses had a lower level of well-being compared to female doctors. This might be because they tend to have prolonged close contact with patients, compared to doctors. While all HCWs were stressed during this international health crisis, our findings indicate that Omani HCWs, compared to non-Omanis, tend to have higher levels of anxiety and sleep disturbance and lower well-being. This could be attributed to a high level of fear of infection, particularly among their loved ones, and intimate knowledge of the impact of COVID-19 on Oman due to their vast social networks. Other factors predisposing to the increased anxiety and impaired sense of well-being in Omani female HCWs could be social life restrictions due to the crisis, pressure related to their dual roles at home and work, and lack of experience in dealing with big scale global crises.

Countries around the world are developing and implementing mental health care programs for

HCWs.[32] In Oman, there have been some efforts to provide psychological support for HCWs during the COVID-19 outbreak. For example, at the Royal Hospital, the biggest tertiary hospital in the country, the Oman Mental Health Support Network started to provide psychological support for all HCWs. The group is also working on designing interventions tailored to specific populations. Some of these interventions could be as simple as providing a rest area, care for basic physical needs such as food, leisure activities, and periodic visits to the rest area by a counselor. Moreover, supportive, positive messages to HCWs from health authorities had been broadcasted through social media.

Our study has several limitations. First, we only focused on female HCWs. Hence, future studies should address mental health issues among male HCWs and compare the prevalence rates of mental health conditions between men and women. The second limitation is related to the focus on only physicians and nurses. It would have been interesting to focus on the subspecialties with the highest psychological impact during the crisis, such as emergency room and intensive care unit workers. Third, this study is a cross-sectional study, which prevented us from identifying the causal relationship between the study variables. Forth, it would have been helpful to know the baseline anxiety and stress levels, well-being status, and sleep pattern before this crisis as a set point to compare to, since mood disorders, including GAD, are known to be more common in females.[33] Future longitudinal studies should be conducted to overcome these limitations and allow researchers to document the long-term impact of COVID-19 on HCWs in Oman.

CONCLUSION

The positive mental health and well-being of HCWs are crucial for a healthy workforce. This study showed that Oman's healthcare facilities should establish united intervention systems to increase HCWs knowledge of best methods to prevent and deal with mental health issues. Implementing Oman Mental Health Support Network services such as group stress-reduction activities, psychological support teams, and national hotline will improve the psychological well-being of HCWs especially those who work with COVID-19 patients.

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