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Evaluation of mental health status and some related factors in nurses, midwives, and healthcare providers in hospitals and comprehensive health centers of Hormozgan province of Iran during the COVID-19

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Abstract

Introduction: According to the crucial role of healthcare personnel in providing quality services to clients and patients, maintaining and taking care of their mental health is greatly important during the COVID-19 pandemic.
Objectives: This study aimed to evaluate the health status of nurses, midwives and healthcare providers during the COVID-19 pandemic in Hormozgan province.
Subjects and Methods: This is a cross-sectional study with a descriptive-analytical approach in which a sample of 368 nurses, midwives, and healthcare providers of Hormozgan university of medical sciences in Iran was selected through simple randomization from May to November 2020. Data collection instrument was a questionnaire consisting of demographic characteristics and depression, anxiety, and stress scale (DASS-21). Data were analyzed using SPSS 22, Mann-Whitney U test and Kruskal-Wallis statistical tests, and Spearman's rank-ordering correlation coefficient.
Results: Out of 368 participants, 347 (94.3%) were female and 21 (5.7%) were male. There were 111 (30.2%) nurses, 209 (56.8%) midwives, and 48 (13%) healthcare providers.14.4% of the participants had a severe level of anxiety and 85.6% suffered from moderate to extremely severe depression. No correlation was found between gender and age with the psychological indicators of the research.
Conclusion: Results showed that the multiple stressors during the COVID-19 pandemic caused the incidence of emotional reactions, including depression, anxiety, and stress; further studies and essential intervention proceedings to address them as a health priority seem to be necessary.

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Introduction

In December 2019, Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (1), was found for the first time (2). Investigations showed that the cause of this disease is a new sort of virus from the family of coronaviruses, known as the "2019 novel coronavirus" (2019-nCoV) (3). The virus spread rapidly in China and beyond its borders, and in less than a few months, infected the entire world (4). On January 30, 2020, the World Health Organization (WHO) declared the novel coronavirus pandemic a public health emergency (5, 6). COVID-19 disease, caused by an RNA virus, mostly affects the respiratory system of the infected population and is spreading catastrophically and infecting a large percentage of the population and accounting for considerable deaths worldwide. It has challenged the world health (7), and already made major hygienic threats to public health all over the world (8,

Key point

Most participants suffered from moderate to extremely severe depression. Age and gender were not associated with mental health status.

9). According to global statistics, the COVID-19 mortality rate is 3.4% (10). Due to the pathogenicity property of this virus, the spread rate of that in the world, the extent and number of patients, the severity of its complications, especially acute respiratory syndrome, and its mortality rate, given that so far, no vaccine and no certain cure have been confirmed for this disease, it may endanger the mental health of people at different levels of society (11-13). Several issues during the COVID-19 disease pandemic become stressful for most service providers at the forefront of fighting off the disease. These can increase the risk of psychological disorders and anxiety among the medical staff rather than ordinary people. Some of these particular issues are the risk of infection with the disease, distance from family, worries about the carrier, intensive working shifts, observing patients' or families' suffering and pains, separation from family and difficulty of working compared to normal conditions, and lack of personal protective equipment (14). The study by Zhang et al showed that the mental pressure caused by COVID-19 disease affects people's overall health, sleep quality, and subsequent stress symptoms (15). A cross-sectional study of healthcare workers in China from February 10 to February 20, 2020, demonstrated that about 164 (32.3%) out of 512 staff had direct contact with patients infected with COVID-19, and the prevalence of anxiety was 12.5%. Of which 10.35% experienced mild anxiety, 1.36% moderate anxiety, and about 78% severe anxiety (14). Another study of hospital physicians and nurses in Wuhan, China, during the pandemic showed that these employees experience high levels of symptoms of depression (50.4%), anxiety (44.6%), insomnia (34%), and distress (71.5%). The results of the present study showed that people in direct contact with COVID-19 patients reported a higher rate of the above-mentioned psychological symptoms (16). Based on the previous studies during the severe acute respiratory syndrome (SARS) epidemic in Singapore, healthcare workers who were in contact with SARS patients reported significant levels of anxiety. More than half of them (56%) reported high work stress, and 53% reported work pressure (17). Another study was conducted in 2003 and assessed the level of anxiety in healthcare workers during the SARS pandemic in Hong Kong (18).This study showed that the sudden incidence of SARS induced anxiety immediately among medical staff, and they suffered from a higher degree of anxiety after direct contact with patients with SARS. It could severely affect the quality of their activities and services. Thus, considering the key role of the medical staff's healthcare in providing quality services to patients, caring for and maintaining their mental health is significant in contagious diseases such as COVID-19.

Objectives

This study aimed to investigate the mental health status of healthcare workers in the Hormozgan Province of Iran during the COVID-19 pandemic. The results of this study prove helpful for improving the mental health of diligent workers at the front-line of fighting COVID-19.

Subjects and Methods

Study design

The present cross-sectional study adopted a descriptive-analytical approach and was conducted from May to November 2020 in Hormozgan. The research population consisted of nurses, midwives, and healthcare providers working in 13 states (public) hospitals, 108 rural centers, 61 urban centers, and 54 urban and rural centers affiliated with Hormozgan university of medical sciences. The sample size was estimated according to previous studies ($P=0.35$, 5% of error, 80% power, and effect size of d=0.07). The sample size was estimated through the following formula:

$$N = (z1-\alpha 2+z1-\beta)\ 2pqd2 \approx 364$$

To make up for the probable attrition rate, 10% was added to the above sample size, therefore the final sample size was 401. The data collection instrument consisted of two parts. The first part included demographic information such as age, education, the job, work experience, workplace, type of employment, and work shift. The second part included the depression, anxiety, and stress scale (DASS-21), designed by Lovibond. The short form assesses each of the psychological constructs of depression, anxiety, and stress with seven different phrases (21 phrases in total). The main version of this scale measures depression, anxiety, and stress with 42 questions (19). This questionnaire consists of 21 questions and a 4-part Likert scale used to score each phrase (3; very true for me, 2; significantly true for me, 1; somewhat true for me, 0; very untrue for me). In the subscales, questions No 21, 17, 16, 13, 10, 5, and 3 relate to depression. Questions No 20, 19, 15, 9, 7, 4, and 2) relate to anxiety. Questions No 18, 14, 12, 11, 8, 6, and 1 are related to stress. Since this questionnaire is the short form of the main 42-question scale, doubling the score of the following subscales is used.

Depression subscale

A score range from 0 to 9 was interpreted as normal, 10 to 13 as mild, and 14 to 20 as moderate. A score of 21-27 was taken as severe and more than 28 as extremely severe.

Anxiety subscale

A score range from 0 to 7 was interpreted as normal, 8 to 9 as mild, and 10 to14 as moderate. A score of 15-19 was interpreted as severe and a score of more than 20 as extremely severe.

Stress subscale

A score range from 0 to 14 was interpreted as normal, 15 to18 as mild, 19 to 25 as moderate, 26 to 33 as severe, and

more than 34 as extremely severe.

The validity and reliability of the instruments were tested in the Iranian population by Asghari Moghadam et al. The internal consistency coefficients of the three scales, depression, anxiety, and stress were respectively 0.93, 0.90, and 0.92. The test-retest correlation coefficients with a 3-week interval of the depression, anxiety, and stress scale were 0.84, 0.89, and 0.90. The internal correlation between the two implementations was estimated at 0.78, 0.87, and 0.80 (20).

In our study, Cronbach's alpha test was conducted to evaluate the reliability of the questionnaire. The estimated value was 0.919 for 21 items which indicated a high consistency between all items. The estimated alpha value was 0.879 for depression, 0.807 for anxiety, and 0.722 for stress. These all showed that the three scales had a satisfactory internal consistency (Table 1).

Then an electronic version of the questionnaire was prepared due to the prevalence of the COVID-19. Accordingly, a public invitation was announced for participation in the study in all hospitals and centers of Hormozgan. The inclusion criteria were willingness to participate in the study and being a staff of Hormozgan university of medical sciences. The exclusion criteria were suffering from various emotional disorders (anxiety, depression, and stress) and receiving treatment, being off in long-term, and having part-time work conditions. The online questionnaire was sent to nurses, midwives, and healthcare providers through WhatsApp. In this study, a convenient sampling method was conducted. The virtual groups of urban healthcare providers and the internal hospital groups and colleagues were asked to fill out the questionnaire if they were satisfied. Totally, 368 medical staffs participated in this study.

Statistical analysis

The qualities variables described with a number (n), percentage (%), and quantities variables were described using mean and standard deviation (SD) and median and interquartile range (IQR). Since all quantities variables were not normal therefore the non-parametric tests were employed for analysis. To compare the score of depression, anxiety and stress in subgroups of variables as gender, city and shift Mann-Whitney U and for variables as job, ward and place of work Kruskal-Wallis tests were used. The correlation between age and background with psychological scales was analyzed by Spearman correlation coefficient. A *P* value less than 0.05 was considered statistically significant. All statistical analyses were conducted with IBM SPSS Statistics 22 software (IBM Corporation, Armonk, NY, USA).

Results

Out of 368 participants, 347 (94.3%) were females and 21 (5.7%) were males. One hundred and eleven people (30.2%) were nurses, 209 (56.8%) midwives, and 48 (13.0%) healthcare providers. The workplace for 178 (48.4%) people was in hospitals, 131 (35.9%) in clinics and 59 (16.0) in other places. Out of 368 participants, 59 (16%) worked in the maternity ward, 19 (5.2%) in the COVID-19 ward, 17 (4.6%) in the gynecology ward, 12 (3.3%) in the pediatric ward, and the rest in other wards.

The mean (±SD) score for depression was 23.03 ± 4.63 (range from 28 to 7), anxiety, 22.87 ± 4.06 (range from 21 to 7), stress 21.51 ± 5.00 (range from 52 to 7), and for total items was 67.03 ± 12.62 (range from 108 to 21; Table 2).

As demonstrated in Figure 1, the prevalence of anxiety and depression was more than stress among participants.

The results of the Kruskal-Wallis test showed that depression among midwives and healthcare providers was significantly more than among nurses ($P=0.02$). Furthermore, there was a significant difference between scores of depression in different wards ($P=0.01$; Table 3).

The results of the Kruskal-Wallis test showed that anxiety among midwives and healthcare providers was significantly more than among nurses ($P<0.001$). This situation among subjects with fixed shift significantly was more than among subjects with rotation shift ($P=0.002$). Although workers in another place of the province had more anxiety than people in Bandar-Abbas city, this difference was not significant ($P=0.085$; Table 4).

The mean of the stress score for midwives was significantly higher than for nurses and healthcare providers ($P=0.01$). While no significant difference was found between the mean of stress in the subgroups of other variables (Table 5).

The results of Spearman correlation coefficient indicated that statistically, there is no correlation between

Table 1. Reliability for the constructs

Construct	Cronbach's alpha	Number of items
Total	0.919	21
Depression	0.879	7
Anxiety	0.807	7
Stress	0.722	7

Table 2. Descriptive statistics analysis for scores of structures and total score of the questionnaire

Statistics	Depression	Anxiety	Stress	Total
Mean	23.03	22.87	21.51	67.41
Median	24.00	24.00	22.00	71.00
SD	4.63	4.06	4.99	12.63
Minimum	7.00	7.00	7.00	21.00
Maximum	28.00	28.00	59.00	108.00
Percentile 25	21.00	21.00	19.00	60.00
Percentile 75	27.00	26.00	25.00	77.00
IQR	6.00	5.00	6.00	7.00

SD, standard deviation; IQR, Interquartile range.

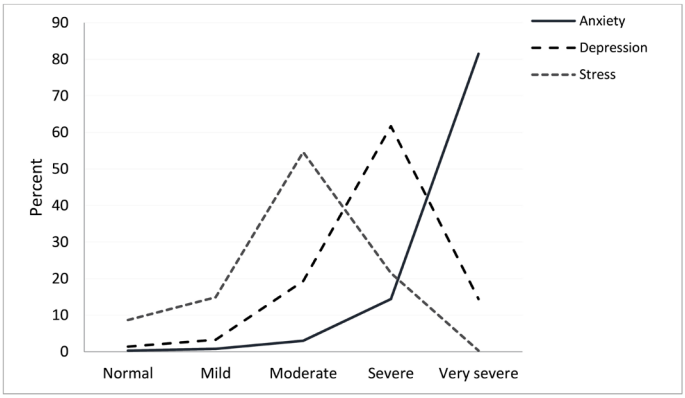

Figure 1. Comparison of the prevalence of anxiety, depression, and stress among participants

the background of responders and psychological Scales. The results of Spearman correlation coefficient indicated that statistically, there is no correlation between the age of responders and psychological scales (Table 6).

Discussion

This study aimed to investigate the mental health status and some of the effective factors in nurses, midwives, and healthcare providers in hospitals and comprehensive health centers of Hormozgan province. Results showed that out of 368 participations, 14.4% had severe anxiety 85.6% experienced moderate to extremely severe depression and 78.3% experienced moderate to extremely severe stress. The results of a study by Koh et al, that conducted during the SARS epidemic in Singapore showed that more than half of healthcare workers reported a 56% increase in work stress and a 53% increase in work pressure (17). In another study during the SARS epidemic in Hong Kong, healthcare workers suffered from higher levels of anxiety after direct contact with patients infected with SARS (18). According to a study of the mental health of medical personnel involved in the SARS virus pandemic in 2003, about 10% of individuals reported high levels of post-traumatic stress disorder (21). The study by Lai et al on physicians and nurses of a hospital in Wuhan, China, during the COVID-19 pandemic showed that healthcare workers

Table 3. Comparison of mean and median of the depression score for characteristics in the study

Characteristics	Group	No. (%)	Mean ± SD	Median (IQR)	*P* value
Gender	Male	21 (5.7)	22.29±5.59	23.00 (8)	0.644[a]
	Female	347 (94.3)	23.08±4.57	24.00 (6)	
Job	Nursing	111 (30.2)	21.90±4.75	22.00 (7)	0.02[b]
	Midwifery	209 (56.8)	23.72±4.30	25.00 (6)	
	Healthcare providers	48 (13)	22.66±5.29	24.50 (6)	
Ward	COVID-19	19 (10.8)	21.31±4.70	23.00 (7)	0.01[b]
	Internal	7 (4.0)	22.42±4.03	23.00 (7)	
	Surgery	9 (5.1)	22.22±4.73	25.00 (6)	
	Pediatric	12 (6.8)	19.83±4.28	19.00 (8)	
	Maternity	17 (9.7)	21.76±4.03	22.00 (7)	
	Obstetrics and gynecology	59 (33.5)	23.71±4.59	25.00 (6)	
	Neonatal	9 (5.1)	20.77±5.67	21.00 (7)	
	Special	19 (10.8)	21.36±5.31	21.00 (9)	
	Other	25 (14.2)	24.56±3.58	26.00 (6)	
Workplace	Hospital	178 (48.4)	22.55±4.64	23.00 (6)	0.087[b]
	Clinic	131 (35.6)	23.44±4.51	25.00 (6)	
	Other	59 (16.0)	23.55±4.76	25.00 (5)	
Shift	Fix	193 (52.4)	23.46±4.36	25.00 (6)	0.128[a]
	Rotation	175 (47.6)	22.56±4.86	23.00 (8)	
City	Bandar-Abbas	170 (46.2)	22.85±4.53	24.00 (7)	0.283[a]
	Other places	198 (53.8)	23.18±4.70	24.00 (6)	

SD; Standard deviation, IQR; Interquartile range.
[a] Mann-Whitney test; [b] Kruskal-Wallis test.

Table 4. Comparison of mean and median of scores of anxieties for characteristics in the study

Characteristics	Categories	n (%)	Mean±SD	Median (IQR)	*P* value
Gender	Male	21 (5.7)	22.23±4.86	23.00 (7)	0.644[a]
	Female	347 (94.3)	22.09±4.01	24.00 (5)	
Job	Nursing	111 (30.2)	21.55±4.50	22.00 (6)	**<0.001**[b]
	Midwifery	209 (56.8)	23.72±4.28	25.00 (4)	
	Healthcare providers	48 (13)	22.66±5.29	24.50 (7)	
Ward	COVID-19	19 (10.8)	21.36±4.27	22.00 (4)	0.072[b]
	Internal	7 (4.0)	20.85±5.14	22.00 (10)	
	Surgery	9 (5.1)	21.88±4.04	22.00 (8)	
	Pediatric	12 (6.8)	20.25±5.02	20.50 (7)	
	Maternity	17 (9.7)	23.17±2.32	22.00 (4)	
	Obstetrics and gynecology	59 (33.5)	23.10±4.11	24.00 (4)	
	Neonatal	9 (5.1)	18.55±5.59	20.00 (10)	
	Special	19 (10.8)	21.73±4.48	23.00 (6)	
	Other	25 (14.2)	23.36±3.58	23.00 (6)	
Place of work	Hospital	178 (48.4)	22.19±4.27	23.00 (5)	0.005[b]
	Clinic	131 (35.6)	23.59±3.65	25.00 (5)	
	Other	59 (16.0)	23.28±3.96	24.00 (5)	
Shift	Fix	193 (52.4)	23.49±3.66	25.00 (5)	0.002[a]
	Rotation	175 (47.6)	22.17±4.35	23.00 (5)	
City	Bandar-Abbas	170 (46.2)	22.45±4.27	24.00 (6)	0.085[a]
	Other places	198 (53.8)	23.22±3.83	24.00 (5)	

SD; Standard deviation, IQR; Interquartile range.
[a] Mann-Whitney test; [b] Kruskal-Wallis test.

Table 5. Comparison of mean and median of scores of stresses for characteristics in the study

Characteristics	Categories	n (%)	Mean±SD	Median (IQR)	*P* value
Gender	Male	21 (5.7)	20.86.±5.73	23.00 (8)	0.926[a]
	Female	347 (94.3)	21.55±4.96	22.00 (6)	
Job	Nursing	111 (30.2)	20.49±4.66	21.00 (6)	<0.01[b]
	Midwifery	209 (56.8)	22.20±5.04	23.00 (6)	
	Healthcare providers	48 (13)	20.87±5.14	21.50 (7)	
Ward	COVID-19	19 (10.8)	19.73±4.94	20.00 (5)	0.293[b]
	Internal	7 (4.0)	20.42±4.82	20.00 (6)	
	Surgery	9 (5.1)	21.66±3.77	23.00 (5)	
	Pediatric	12 (6.8)	19.75±4.04	20.50 (7)	
	Maternity	17 (9.7)	21.17±3.41	22.00 (5)	
	Obstetrics and gynecology	59 (33.5)	22.67±6.55	22.00 (6)	
	Neonatal	9 (5.1)	18.88±6.29	21.00 (10)	
	Special	19 (10.8)	20.10±5.02	19.00 (8)	
	Other	25 (14.2)	22.04±3.80	23.00 (5)	
Place of work	Hospital	178 (48.4)	21.23±5.31	22.00 (6)	0.11[b]
	Clinic	131 (35.6)	21.64±4.65	22.00 (6)	
	Other	59 (16.0)	22.06±4.77	23.00 (5)	
Shift	Fix	193 (52.4)	21.81±4.40	23.00 (6)	0.090[a]
	Rotation	175 (47.6)	21.18±5.54	22.00 (7)	
City	Bandar-Abbas	170 (46.2)	21.25±4.68	22.00 (7)	0.475[a]
	Other places	198 (53.8)	21.73±5.25	22.00 (6)	

SD; Standard deviation, IQR; Interquartile range.
[a] Mann-Whitney test; [b] Kruskal-Wallis test.

Table 6. Correlation between background and age with psychological scales

Characteristics	Depression	Anxiety	Stress	Total
Background	-0.022 (.681)	-0.043(0.413)	-0.032(0.546)	-0.037(0.483)
Age	0.003(0.957)	-.008(.874)	-.006(.908)	-0.003(0.957)

experience a high degree of depression symptoms (50.4%) and anxiety (44.6%) (16) which is in line with the present findings. In another study conducted during the SARS epidemic in Hong Kong, nurses showed to suffer more anxiety after direct contact with SARS-infected patients (18), which is also consistent with the present findings. Moreover, Wu et al showed, about 10% of staff reported having high levels of post-traumatic stress disorder, which is consistent with the results of the present study too (21). Similarly, Nouroozi Kushali et al examined the general health and emotional reactions of nurses working in intensive care units of two hospitals affiliated with the Baqiyatallah university of medical sciences. The frequency of stress, anxiety, and depression in nurses were 33 %, 33.9 %, and 30.8 %, respectively (22). Among the causes of differences in the level of stress, anxiety, and depression of staff of different sections, it is noteworthy that nurses in COVID-19 ward are at risk of incidence of psychological disorders due to the nature of work, heavy protective clothing, N95 Mask, the risk of infection and contamination of others.

In the present study, no statistically significant correlation was found between gender and psychological indicators of the research. Sarboozi Hosein Abadi et al demonstrated that the anxiety and stress scores were higher in female nurses than in male nurses (23). According to a study of hospital physicians and nurses in Wuhan, China, during the spread of COVID-19, females who had direct contact with COVID-19 patients reported higher rates of stress and anxiety symptoms (14), which is inconsistent with the present findings. Cultural and demographic differences seem to be related to the contradictory results. In the present study, no relationship was found between age and psychological indicators. In their study, Sarboozi Hosein Abadi et al reported a statistically significant relationship between age and depression. The depression was higher in the group of 31-40 year-old participants (23). It seems that an increase in age is followed by a decrease in social connections due to less energy and a busy state of life. An increase in age is followed by an increase in physical problems, which is mutually related to psychological issues, which can justify the relationship between age and depression in the above-mentioned studies (24). In the present study, there was no statistically significant relationship between age and anxiety, which was consistent with the results of the study by Khamseh et al (25), and in conflict with the results of the study of Sarboozi Hosein Abadi et al (23). For a more precise evaluation of this conflict, more investigations seem to be required. One strength of the present research is the recognition of the staff at risk during the COVID-19 pandemic, whose mental health can be promoted through appropriate protocols. The aim can be to prevent the aggravation of their psychological problems.

Conclusion

The present findings showed that the level of anxiety, depression, and stress is average among the health staff who works in the COVID-19 places. Maintaining this staff's health requires effective planning by hospital managers to diagnose and treat the disease on time. The aim should be to think of the right strategies and techniques to promote their mental health.

Limitations of the study

This study was conducted on the medical staff of Hormozgan University of medical sciences, and these results may not be generalizable to all people. Individual, social, mental, and familial differences were some of the uncontrolled variables that might affect this research's results.

Authors' contribution

Conceptualization: Asiyeh Pormehr-Yabandeh, Elahe Zaremoghadam.
Data curation: Asiyeh Pormehr-Yabandeh and Elahe Zaremoghadam.
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Methodology: Hossein Heshmati.
Project administration: Asiyeh Pormehr-Yabandeh.
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Supervision: Hossein Heshmati.
Validation: Zakieh Ahmadi.
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Writing–review & editing: Hossein Heshmati, Hossein Mardanparvar, and Asiyeh Pormehr-Yabandeh.

Conflicts of interest

The authors declare no conflict of interest.

Ethical issues

The research was carried out in compliance with the principles outlined in the Declaration of Helsinki. This study resulted from the research with the ethical code (Ethical code #IR.HUMS.REC.1399.032), approved by the ethics committee of Hormozgan University of Medical Sciences, Bandar Abbas, Iran. Ethical issues (including plagiarism, data fabrication, and double publication) have been completely observed by the authors. Accordingly, written informed consent was taken from all participants before any intervention.

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