Original Research

Sleep Disturbance and Anxiety among Nurses after the COVID-19 Pandemic: A Cross-Sectional Study

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Abstract

Background and Objective: The coronavirus disease 2019 (COVID-19) pandemic has had an obvious impact on the mental health of healthcare workers, including nurses who have been at the forefront of managing patients with COVID-19. This study aimed to assess the mental health of nurses who worked at Afzalipour Hospital in Kerman City, Iran, after the pandemic of COVID-19.

Materials and Methods: 400 nurses have been enrolled in a cross-section study. We used a questionnaire to collect demographic and occupational information and the General Health Questionnaire (GHQ) to assess mental health.

Results: 84% of nurses had problems related to mental health, with anxiety being the most common symptom followed by sleep disorder and depression. Social problems were also prevalent among the nurses. There was no statistically significant difference in mental health between men and women or across different age groups, education levels, or work experience in the COVID-19 ward. However, there was a significant difference in the mental health of nurses with different shift intervals and those working more than 15 shifts who had higher mental health scores. There was no statistically significant difference in mental health of night shift nurses and day shift nurses.

Conclusion: These findings highlight the need for interventions to promote mental health among nurses who have worked in the wards related to COVID-19.

Keywords: COVID-19; Mental health; Nurses; Shift work schedule; Anxiety; Sleep disorders; Depression

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Introduction

In December 2019, a new viral disease from the family of coronaviruses, called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first identified in Wuhan, China, and caused the disease known as coronavirus disease 2019 (COVID-19) (1-3). The pathogenicity, high mortality rate, and rapid transmission of the COVID-19 pandemic affected the mental health of people at all levels of society (4). This issue included not only patients but also health workers, children, families, students, and people in various professions. The risks and challenges caused by COVID-19 led to a complex and multifaceted psychological impact (5-7).

Since healthcare workers are on the front lines of fighting infectious diseases like COVID-19, they have been exposed to the virus more than anyone else. The findings of a study shows that the infection rate of medical workers during the COVID-19 pandemic was about 3.8%, and the main reason for that was encountering patients at the beginning of the pandemic without personal protective equipment (7). Based on the results obtained from previous studies during the SARS and Ebola pandemics, healthcare workers suffered from harmful psychological disorders such as fear and stigma that affected the quality of their work and services (6, 8).

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Nurses make up a significant percentage of healthcare system employees, and nursing is one of the hardest jobs with shift work. During the COVID-19 pandemic, several studies have been conducted on the mental health of nurses and healthcare professionals. According to a study conducted in 2019, nurses had poor general and mental health (9) and during the pandemic, symptoms of depression and anxiety were significantly more common among nursing students (10). This means that nurses and other healthcare professionals suffered from negative side effects such as depression, post-traumatic stress disorder (PTSD), stress, anxiety, sleep disorders, workplace burnout, self-doubt, and even suicidal thoughts during the pandemic (11).

Overall, the COVID-19 pandemic created unprecedented challenges for healthcare systems around the world. Patients with COVID-19 were cared for by healthcare workers, including nurses, who faced increased workloads, long working hours, and increased risk of exposure to the virus; these factors could affect their mental health and lead to anxiety, depression, and other mental problems. These problems were repeatedly assessed by treatment personnel during the pandemic, and the serious effects of the COVID-19 pandemic on their mental health have been proven.

The current study was conducted 3 years after the pandemic and in the conditions that the disease was under control by the personnel who served in the COVID-related departments. We aimed to investigate the long-term psychological and sleep effects of this pandemic on the clinical staff.

Materials and Methods

This cross-sectional study was conducted from April to June 2023 [after World Health Organization (WHO) declared the end of the global health emergency of COVID-19 (12)] on nurses working in Afzalipour Hospital, Kerman City, Iran. This hospital was one of the primary centers for treating COVID-19 in the region and was at the forefront of managing patients with COVID-19. These nurses have served at least three months in the infectious, internal medicine, pulmonary, pediatric, and intensive care unit (ICU) departments and were taking care of patients with COVID-19. A total of 400 nurses were included in the study, and this number included almost all the nurses who worked in the COVID-19 department of this hospital. Nurses who had a history of psychiatric problems and those who were taking psychiatric or sleep-inducing drugs were excluded from the study. In addition, questionnaires with incomplete data were also excluded. Collected data included the following sections: data on demographic characteristics, job characteristics, and mental health using a self-administered questionnaire. The demographic characteristics included age, sex, and education level, while the job characteristics included work experience in the COVID-19 ward and shift intervals. In this study, a 28-item version of the Goldberg General Health Questionnaire (GHQ) was used to assess mental health. There are four levels of symptoms in the GHQ, each with seven questions: physical signs, anxiety symptoms, sleep problems, social functioning, and depression. Different methods can be used for scoring the GHQ-28. This questionnaire can be scored from 0 to 3 for each response with a total possible score ranging from 0 to 84. In this method, a total score of 23/24 is the threshold for the presence of distress; we used this method. The GHQ is widely used to assess mental health and has acceptable validity and reliability. The reliability of the Persian version of the questionnaire has been confirmed by various studies. The confidence coefficient for the entire questionnaire was 96% and Cronbach's alpha was 0.9 (13-15).

Calculation of sample size was based on the prevalence of depression among healthcare workers during the COVID-19 pandemic, reported as 50.4% with an error of 5% and a significance level of 5%. The calculated sample size was 399 (8). SPSS software (version 22, IBM Corporation, Armonk, NY, USA) was used for data analysis and descriptive statistics such as frequency tables, percentages, means, and standard deviations (SDs) were used. Independent t-tests and variance analyses based on the study measurement scale, objectives, and questions were included in the statistical analysis. To identify factors associated with poor mental health, data were analyzed by descriptive statistics, chi-square tests, and logistic regression analysis.

This research was approved by the Research Council of Kerman University of Medical Sciences with the code of ethics number IR.KMU.AH.REC.1401.241. All participants gave verbal informed consent to participate in the study.

Results

The study surveyed 400 nurses working at Afzalipour Hospital in Kerman City. Table 1

shows the demographic and job characteristics of nurses. 312 (78%) were women. Most of them (40%) were aged 22-30 years and 65.5% had a bachelor's degree. A total of 264 (66%) had experience of working in a COVID-19 ward. Most of them worked more than 15 shifts (45%) and 257 (64%) worked day shifts.

Table 1. Demographic and job characteristics of nurses working in Afzalipour Hospital, Kerman, Iran

Demographic characteristics		n (%)
Gender	Women	312 (78.0)
	Men	88 (22.0)
Age (year)	22-30	160 (40.0)
	31-40	143 (35.8)
	41-50	84 (21.0)
	More than 50	13 (3.3)
Educational level	Bachelor's degree	262 (65.5)
	Master's degree	100 (25.0)
	PhD	38 (9.5)
Type of department	COVID	136 (34.0)
	Non-COVID	264 (66.0)
Number of shifts	0-5	19 (4.8)
	6-10	126 (31.5)
	11-15	75 (18.8)
	More than 15	180 (45.0)
Work shift	Day	257 (64.3)
	Night	143 (35.8)

COVID: Coronavirus disease

Eighty-four percent of nurses reported having mental health problems, with anxiety being the most common symptom followed by sleep disorder and depression. Anxiety was reported by 67% of the participants. Sleep disorders were reported by 46% of participants, while depression was reported by 32% of participants.

Social problems were also prevalent among nurses, with social isolation being reported by 55% of participants and family conflicts by 44%.

The average mental health score was 31.99, in the mild range (23-40). Anxiety and sleep disturbance symptoms had the highest mean scores (86.8), and depression symptoms had the lowest mean scores (7.9) (Table 2).

Table 2. Average mental health and its components of nurses working in Afzalipour Hospital, Kerman, Iran

Mental health and its components	Mean ± SD
Physical symptoms	8.43 ± 3.54
Anxiety symptoms and sleep disturbances	8.86 ± 4.66
Social dysfunction	7.59 ± 1.68
Symptoms of depression	7.09 ± 4.16
General health	31.99 ± 10.03

SD: Standard deviation

Mental health mean scores were higher for women (32.42) than for men (30.46), but the difference was not statistically significant (P = 0.10). Mental health mean scores were highest among those aged 31-40 and 41-50 years (32.51) and lowest among those aged 22-30 (25.31) years, although this difference was not statistically significant (P = 0.69). Mean mental health scores were highest among Doctor of Philosophy (Ph.D.) holders (34.32) and lowest among master's degree holders (18.31), but the difference was not statistically significant (P = 0.64) (Table 3).

Table 3. Average mental health and its components of nurses working in Afzalipour Hospital, Kerman, Iran

Demographic characteristics	Mean ± SD	P-value
Gender		0.10
Women	32.42 ± 9.97	
Men	30.46 ± 10.76	
Age (year)		0.69
20-30	31.25 ± 10.40	
31-40	32.15 ± 10.21	
41-50	32.51 ± 9.40	
More than 50	32.07 ± 7.31	
Educational level		0.64
Bachelor's degree	32.25 ± 10.91	
Master's degree	31.18 ± 6.91	
PhD	32.34 ± 10.67	

SD: Standard deviation

Nurses working in the departments related to COVID-19 had lower mental health than nurses who did not work in these departments, although this difference was not statistically significant (P = 0.29). The mean mental health score was highest for nurses working more than 15 shifts (72.34) and lowest for nurses working 0-5 shifts (25.73), with a statistically significant difference (P < 0.001) (Table 4).

Table 4. The average mental health based on job characteristics in nurses working in Afzalipour Hospital, Kerman, Iran

Job characteristics	Mean ± SD	P-value
Type of department		0.290
COVID	32.73 ± 10.07	
Non-COVID	31.61 ± 10.00	
Number of shifts		0.001
0-5	25.73 ± 8.40	
6-10	29.62 ± 5.52	
11-15	31.00 ± 10.25	
More than 15	34.72 ± 11.68	
Work shift		0.840
Day	31.92 ± 9.81	
Night	32.12 ± 10.44	

COVID: Coronavirus disease; SD: Standard deviation

Table 5. Logistic regression analysis of mental health based on job characteristics of nurses working in Afzalipour Hospital, Kerman, Iran

		B	SE	Wald	df	P-value	Exp(B)
Step 1	Sleep disturbance	-0.611	0.208	7.131	1	< 0.001	0.748
	Anxiety	-0.570	0.223	11.342	1	< 0.001	0.876
	Years of work	-0.117	0.439	17.011	1	0.300	0.970
	Gender	0.304	0.313	1.795	1	0.001	0.768
	Number of shifts	-0.127	0.309	3.493	1	< 0.001	0.237
	Educational level	0.012	0.102	1.091	1	0.102	0.312
	Type of department	0.340	0.211	2.050	1	0.003	0.451
	Work shift	0.203	0.298	4.710	1	< 0.001	0.512
	Constant	0.126	0.201	3.278	1	0.119	0.211

SE: Standard error; df: Degree of freedom

Mean mental health scores were higher for night shift nurses (32.12) than for day shift nurses (31.92), but the difference was not statistically significant (P = 0.84) (Table 4).

The obtained results show that the variables of sleep disturbance, anxiety, years of work, and number of shifts had an inverse and significant association with the variable of mental health in working nurses. The variables of years of work and educational level had no significant relationship with mental health. The association between gender, work shift, and type of department had a positive and significant relationship with the mental health of working nurses (Table 5).

Discussion

We conducted this study with the aim of investigating the mental health of nurses working in Afzalipour Hospital in Kerman City three years after the COVID-19 pandemic. The results of our study showed that most of the nurses working in Afzalipour Hospital were facing mental problems. Anxiety was reported as the most common symptom followed by sleep disorders. In our study, 84% of nurses had mental health problems. At the same time as the pandemic of COVID-19, many studies were conducted on the mental health of healthcare workers, all of which indicated unfavorable mental health status, anxiety, depression, and insomnia in this group (8, 16-18). The difference between this study and other studies is that after the end of the pandemic, we re-evaluated the mental health status of nurses who were involved in providing services to patients with COVID-19. A comparison of our findings with the results of studies conducted before the pandemic of COVID-19 on the mental health of nurses in this hospital and with a similar questionnaire shows that nurses' mental health status has dropped significantly (19, 20). In addition, taking into account that nurses who had a previous history of psychiatric problems or drug use were excluded from the study, it can be concluded that the COVID-19 pandemic is probably responsible for the poor mental health of nurses. The unpredictable nature of the disease, the constant change of clinical symptoms, worrying about the health of oneself and family members, and the stigma of working in the COVID-19 ward can be influential factors on this issue. It is important to recognize the mental health problems faced by healthcare professionals and to provide them with resources and support to manage their mental health and general well-being (21). In addition, according to this study, mental health problems continued for three years after the pandemic and after its control, and this issue indicates the need for timely and effective interventions in the treatment staff.

The study discovered that anxiety was the most prevalent mental health issue among nurses. This finding aligns with other studies that have reported high levels of anxiety among healthcare workers during the COVID-19 pandemic. One study examined the anxiety levels of nurses working in COVID-19 central hospitals compared to other centers and found that the COVID-19 pandemic caused high levels of anxiety (21). Another study showed that nurses had higher levels of anxiety related to COVID-19 than other occupational groups and were more exposed to mental health issues (16). This increased anxiety among nurses is likely due to their direct contact with patients with COVID-19. In crises, anxiety is a common feature that disrupts social and individual structures and makes people lose their sense of security (21, 22).

With a high prevalence of reported sleep disorders, sleep issues were found to be a significant problem among the nurses in this study.

This result is in line with other studies that have highlighted the effect of COVID-19 on sleep patterns and the prevalence of sleep disorders among frontline healthcare workers (23). Long work hours and unpredictable schedules can disrupt sleep cycles and exacerbate sleep issues in nurses. Constant exposure to stressful situations can also disrupt sleep patterns. The physical and mental health of nurses can be significantly impacted by sleep issues. Poor sleep can affect patient care because it can cause fatigue, poor concentration, and decreased job performance. Physical health issues like diabetes, obesity, and cardiovascular disease (CVD) are also at an increased risk due to it. Additionally, sleep issues can make mental health conditions like anxiety and depression worse, which has a detrimental effect on general well-being (23).

The present study's findings, which are in line with those of other studies linking social skills and mental health to nursing performance, revealed that nurses experienced social issues that might affect their interactions with patients and other people. Various studies have shown that nurses' social functioning is reduced during epidemics of diseases such as COVID-19 and Ebola and that poor mental health negatively impacts social competence and functioning (21-25). The COVID-19 pandemic has increased people's health responsibilities but decreased interpersonal relationships due to fear of contracting the disease and social distancing measures, which can lead to depression and anxiety (26). These findings suggest a direct relationship between mental health and nurses' social performance, which can have a significant impact on the quality of their relationships with patients and others (26).

There was no significant difference in the mental health status of men and women or across different age groups or education levels among the nurses of this study. This could be attributed to the high workload and stress that all nurses have been facing since the start of the pandemic, regardless of their sex, age, or educational background.

There was a significant difference in the mental health scores of nurses with different shift intervals. Those working more than 15 shifts had higher mental health scores compared to those working fewer shifts. This finding could be explained by the fact that nurses working more shifts may feel more competent and confident in managing patients with COVID-19, which could have a positive effect on their mental health.

In contrast, the difference in mental health between night-shift and day-shift nurses was not statistically significant. Although this finding conflicts with our previous knowledge about the effect of shift work on the quality of sleep and consequently mental health, in this particular case, it can be justified that the anxiety caused by exposure to coronavirus in the medical staff was very significant. This caused shiftwork, which usually harms mental health, not to influence nurses with different shift numbers differently. Sleep disturbance, anxiety, type of department, sex, and work shift were most related to the mental health of working nurses. This study had some limitations, including the reliance on self-reported measures of mental health and the fact that it was conducted in a single hospital.

Conclusion

This study provides valuable insights into the mental health of nurses working in hospitals three years after the COVID-19 pandemic and highlights the need for interventions to promote good mental health among nurses. Strategies should be implemented that focus on reducing anxiety, providing education and resources on sleep hygiene, implementing regular breaks and shift rotations, and promoting self-care practices that can help improve sleep quality and promote overall well-being among nurses. Further research is needed to explore the effectiveness of interventions aimed at improving nurses' mental health and their long-term impact.

Conflict of Interests

Authors have no conflict of interests.

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