COVID-19 and the Mental Health of Frontline Nurses: A Cross-sectional Study in Southwestern Iran

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Abstract

Background: Nurses, as frontline health workers, are exposed to the risks of adverse mental health outcomes due to their direct contact with COVID-19 patients.

Objectives: The present study aimed to investigate the mental health of frontline nurses in Behbahan, southwestern Iran.

Methods: In this web-based cross-sectional study, data from 173 frontline nurses were collected in 3 COVID-19 referral hospitals in Behbahan, southwestern Iran. This study included demographic information and General Health Questionnaire (GHQ-28). Logistic regression analysis was used to examine the variables affecting mental health.

Results: The present study included 173 frontline nurses (nurses and nurse assistants), 71.7% of whom were female and 28.3% of whom were male. Further, 76.3% of frontline nurses were suspected of poor mental health, and 23.7% were mentally healthy. The results of the multivariable logistic regression model showed that female participants had poorer mental health than men (odds ratio [OR], 2.51; 95% CI, 1.16 - 5.41; P = 0.01). The mental health of nurses with a history of COVID-19 infection was poorer than that of nurses without a history of COVID-19 infection (OR, 3.3; 95% CI, 1.42 - 7.53; P = 0.006).

Conclusions: The findings of our study showed that female nurses with a history of COVID-19 were more at risk for poor mental health. These groups need more attention and support in epidemics.

Keywords: Iran, COVID-19, Mental Health, Nurses

1. Background

The international community is concerned about COVID-19 (Coronavirus disease 2019) and its long-term consequences. Different areas of life, such as global markets, industries, agriculture, economy, human health, health care, etc, are being affected by COVID-19 (1). In the meantime, we have witnessed many psychosomatic and psychological problems among different groups of people, COVID-19 patients, and health care workers (2). In this regard, the World Health Organization (WHO) and International Mental Health Associations have warned that the current COVID-19 pandemic will lead to a severe increase of stress-related conditions and mental health issues worldwide (3).

Anxiety, uncertainty, feelings of fear, loneliness, stress, and depression have been reported in the general population worldwide after the outbreak of COVID-19 (4); on the other hand, emerging reports have been documented an increase in anxiety-related symptoms, stress, and depression, particularly among vulnerable people (i.e., economically/socially disadvantaged people and chronically/mentally ill populations) (5, 6). Even among suspected patients and those with COVID-19, in addition to the physical pain, they suffer from mental pressure (such as depression, anxiety, insomnia, and hopelessness), which can reduce adherence to treatment and might invoke aggression and suicide (7). The outbreak of the COVID-19 pandemic has increased concerns about the mental health of Iranians. In this regard, the prevalence and severity of psychiatric disorders in COVID-19 patients have been widely studied (8). Meanwhile, health professionals are no exception to this rule, and during an epidemic, they are more at risk of adverse mental health outcomes (7, 9-11).

Among health professionals, nurses, as frontline health workers, are exposed to many risks, including

occupational hazards and mental pressures, due to their direct contact with COVID-19 patients. Even nurses' past experiences in dealing with SARS indicate many problems, including feelings of anger, guilt, fear of death, loneliness, physical disorders, uncertainty, and mismanagement of information [12]. The results of a study in Iran showed that nurses who cared for COVID-19 patients experienced many psychological problems [11]. A recent study in China on 1257 frontline health workers showed that nurses were at greater risk of depression, anxiety, distress, and insomnia than other health professionals [13]. The results of another study in Spain showed that more than half of the nurses had poor mental health, which was higher than other health workers [14]. Due to the seriousness of COVID-19 and prolonged exposure with patients, mental challenges among nurses can affect their physical and mental health and reduce their efficiency [15].

2. Objectives

The present study was aimed to investigate the mental health of frontline nurses in Behbahan, southwestern Iran, using the General Health Questionnaire (GHQ-28).

3. Methods

In this web-based cross-sectional study, 173 frontline nurses (nurses and nurse assistants) working in COVID-19 referral hospitals (ie, Shahidzadeh, Farideh Behbahani, and Shahid Mostafa Khomeini hospitals in Behbahan) were studied to investigate mental health, and factors affecting them.

Inclusion criteria included frontline nurses (nurses and nurse assistants) working in the above 3 hospitals, age over 18 years, and signed informed consent to participate in the study.

Finally, out of 180 nurses who filled in the questionnaire, 7 questionnaires were excluded from the study due to incomplete completion of the questionnaire (failure to complete more than one-third of the questionnaire questions), and a total of 173 nurses who met the inclusion criteria were included in the study in an accessible manner. In this study, to collect the data, a 2-part questionnaire (including demographic information and GHQ-28) was used and shared from November 20 to December 10, 2020, with the cooperation of all 3 hospitals among the nurses of COVID-19 wards. Demographic information in this questionnaire included age, gender, level of education, marital status, and work experience. Participants were also asked about their history of COVID-19 infection (yes, no); this information was recorded as a variable in the research.

GHQ-28 is a popular self-assessment questionnaire employed to monitor and screen people at risk for psychiatric disorders. This questionnaire consists of 28 items and 4 scales, which each scale contains 7 items. Items can be categorized as follows: (1) items 1 - 7: Physical symptoms; (2) items 8 - 14: Anxiety and insomnia symptoms; (3) items 15 - 21: Social functioning; and (4) items 22 - 28: Depression. The scoring of this questionnaire is based on a Likert scale [never (0), sometimes (1), most of the time (2), almost always (3)]. The total score of the 4 subscales ranges from 0 to 84. The cut point for the test is considered to be 23. In other words, the study group was categorized into with and without psychological distress using a GHQ-28 cut-off of 23 ($\leq$ 23: Without a mental disorder, > 23: With a mental disorder) [16-19]. The validity and reliability of this questionnaire have already been confirmed in Iran [20-22]. In addition, in the current study, the reliability of this questionnaire was approved by the Cronbach α (0.81).

This study was approved by the Ethics Committee of Behbahan Faculty of Medical Sciences, Behbahan, Iran (code: IR.BHN.REC.1399.022).

3.1. Statistical Analysis

Categorical variables were summarized as counts and percentages. The χ^2 test was used to test the differences among the groups. We used univariate and multivariate logistic regression methods to adjust for the effects of independent variables. First, all independent variables were entered into the univariate logistic regression model, and variables with a P value of less than 0.2 were entered into the multivariable logistic regression model. The final model was achieved using a backward selection approach. A P value of less than 0.05 was considered significant. All analyses in this study were performed using SPSS version 26 (SPSS Inc, Chicago, Ill, USA).

4. Results

The present study included 173 frontline nurses (nurses and nurse assistants), most of whom (124) were women (71.7%), and 112 (64.7%) of the participants were married. The data also showed that 132 (76.3%) had a bachelor's degree, 66 (38.2%) had work experience of less than 5 years, and 79 (38.5%) had a history of COVID-19 infection. A total of 76.3% of frontline nurses were suspected of poor mental health. We used the chi-square test to compare the differences between the groups for mental health (score $\leq$ 23, score > 23). In 2 groups related to mental health, there was a significant difference between gender, level of education, and history of COVID-19 infection (Table 1).

The mean general health score was 9.49 $\pm$ 31.56. Among the 4 GHQ-28 scales, the higher and lower scores

Table 1. Demographic Characteristics of Frontline Nurses

Variables	Mental Health			
	No. (%)	With a Mental Disorder Score > 23	Without a Mental Disorder Score ≤ 23	P Value
Overall	173	132 (76.3)	41 (23.7)	-
Age				0.431
18 - 25	18 (10.4)	15 (83.3)	3 (16.7)	
26 - 35	92 (53.2)	70 (76.1)	22 (23.9)	
36 - 45	51 (29.5)	40 (78.3)	11 (21.7)	
46 - 80	12 (6.9)	7 (58.3)	5 (41.7)	
Gender				0.037
Male	49 (28.3)	32 (65.3)	17 (34.7)	
Female	124 (71.7)	100 (80.6)	24 (19.4)	
Marital status				0.369
Single	61 (35.3)	49 (80.3)	12 (19.7)	
Married	112 (64.7)	83 (74.1)	29 (25.9)	
Education				0.04
Associate degree	30 (17.3)	25 (83.3)	5 (16.7)	
Bachelor's degree	132 (76.3)	102 (77.3)	30 22.7)	
Master's degree/ doctorate	11 (6.4)	5 (45.5)	6 (54.5)	
Work experience				0.75
Less than 5 years	66 (38.2)	50 (75.8)	16 (24.2)	
5 to 10 years	41 (23.7)	33 (80.1)	8 (19.1)	
More than 10 years	66 (38.2)	49 (74.2)	17 (25.8)	
History of COVID-19 infection				0.007
Yes	69 (38.5)	60 (86.9)	9 (13.1)	
No	104 (61.5)	72 (69.2)	72 (20.8)	

were related to social dysfunction and depression, respectively (Table 2).

In the univariate model, variables of gender, level of education, and history of COVID-19 infection were among the factors associated with patients' mental health (P < 0.2). The results of the multivariable logistic regression model showed that the variables of gender and history of infection were significant (P < 0.05). Additionally, female nurses had poorer mental health than male nurses (OR, 2.51; 95% CI, 1.16 - 5.41; P = 0.012), and the mental health of nurses with COVID-19 was lower than that of nurses without COVID-19 (OR, 3.3; 95% CI, 1.42 - 7.53; P = 0.006; Table 3).

5. Discussion

The findings of the present study showed that 76.3% of frontline nurses were suspected of poor mental health; this rate was significantly higher in our study than in previous mental health surveys done on Iranian nurses under non-COVID-19 conditions (in the study by Dehvan et al, it was 57.35%, and in the study by Taghinejad et al, it was 43.2%) (23, 24).

Nurses are at risk of infection due to close contact with patients and their families. On the other hand, the high risk of transmitting this disease to their own families and relatives causes great physical stress and emotional and mental pressures (25, 26). The public health crisis of COVID-19 or SARS has had a serious impact on health workers, especially frontline nurses, because the frontline nurses are the main health workers in dealing with public health emergencies, and their psychological well-being is vital to overcoming critical health conditions (27).

Even previous studies on nurses who provided care for SARS patients have shown that they are at greater risk of mental disorders, including anxiety, depression, panic, dis-

Table 2. Mean and SD of Nurse's General Health Score

Scores for GHQ-28 and Its Subscales	Mean $\pm$ SD	Minimum	Maximum
Somatic symptoms	8.05 $\pm$ 3.85	1	19
Anxiety/insomnia	7.68 $\pm$ 5.03	0	21
Social dysfunction	12.29 $\pm$ 2.92	4	20
Severe depression	3.55 $\pm$ 4.12	0	18
GHQ-28 total score	31.56 $\pm$ 9.49	15	59

Table 3. Results of Univariate and Multivariable Logistic Regression Analyses

Mental Health

Variables	Univariate		Multivariable	
	Odds Ratio (95% CI)	P Value	Odds Ratio (95% CI)	P Value
Age				
18 - 25	3.6 (0.66 - 7.34)	0.141	-	-
26 - 35	2.3 (0.66 - 5.33)	0.210	-	-
36 - 45	2.6 (0.69 - 9.6.2)	0.163	-	-
46 - 80	1	1	-	-
Gender				
Female	2.21 (1.06 - 4.63)	0.033	2.51 (1.16 - 5.41)	0.011
Male	1	1	1	1
Marital status				
Single	1.42 (0.67 - 3.1)	0.365	-	-
Married	1	1	-	-
Education				
Associate degree	2.21 (1.3 - 9.24)	0.042	-	-
Bachelor's degree	1.89 (1.2 - 7.52)		-	-
Master's degree/doctorate	1	1	-	-
Work experience				
Less than 5 years	1.08 (0.493 - 2.38)	0.756	-	-
5 to 10 years	1.43 (0.55 - 3.7)		-	-
More than 10 years	1	1	-	-
History of COVID-19 infection				
Yes	2.96 (1.3 - 6.69)	0.009	3.3 (1.42 - 7.53)	0.006
No	1	1	1	1

trust, delirium, post-traumatic stress, and even suicidal thoughts (28). A recent study in Oman on health workers showed that the COVID-19 outbreak had a significant impact on the mental health of health workers, including nurses; accordingly, frontline nurses and health workers were most affected by the global health crisis (29). Further, another study in China found that frontline nurses in COVID-19 wards had a higher rate of mental health problems.

Health professionals play an important role in managing a pandemic, especially nurses, as the biggest group of health workers who spend more time with patients than other health professionals and have an important role in the management and treatment of patients. According to the ethical reciprocity principle, hospitals have a reciprocal duty to health care staff, such as providing health facilities when caring for patients with a new illness, communicating with them to control infection, and providing per-

sonal protective equipment and psychological screening, as well as motivational and mental support and psychiatric counseling. As a result, psychological needs, especially in nurses who provide care for COVID-19 patients, require immediate attention (28).

The findings of the present study showed that female nurses had poorer mental health than male nurses. The results of a study in Pakistan on female health workers (doctors, nurses, etc.) showed that they were not eligible for quarantine after work and contact with COVID-19 patients due to their family and social responsibilities. This led to fear of virus transmission, severe frustration, and conflict between work and family commitment (18). The findings of other studies on frontline nurses in Iran, China, and Italy were also consistent with the results of the present study (11, 13, 30).

We further found that nurses with COVID-19 had poorer mental health than other nurses. In fact, nurses with COVID-19 may experience psychological problems due to fear of transmitting the virus to colleagues, patients, and family members (31).

5.1. Limitations and Strengths

Our study has some limitations. First, we only focused on frontline nurses, and it was conducted only in Behbahan, so the findings cannot be generalized to the entire nursing community. Also, conducting an online survey and limited observation on the eligibility of participants and self-report data gathering were other limitations of the study.

However, our study has some strengths. The major strength of this study was the description, evaluation, and recognition of factors affecting the mental health and stress levels of frontline nurses. In this study, using logistic regression, we found valuable new findings regarding the mental health of frontline nurses. Among them, we can mention the poorer mental health of female nurses than male nurses. Given the current situation and the high prevalence of COVID-19, these results can help policymakers to implement appropriate interventions to reduce the psychological effects of COVID-19 on nurses.

5.2. Conclusions

The findings of this study showed that a high percentage of frontline nurses were Suspected of poor mental health. Further, female nurses had poorer mental health than male nurses, and nurses with COVID-19 were at higher risk for poor mental health than nurses without COVID-19. In such a critical situation, it is better to pay more attention to this group of nurses, especially female nurses.

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