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Mental health status of healthcare workers in COVID-19 vs non-COVID-19 units: findings from Shariati Hospital, Tehran

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ABSTRACT

This cross-sectional study compared the mental health status of healthcare workers in COVID-19 and non-COVID-19 wards at Shariati Hospital, Tehran, Iran. A total of 250 healthcare workers were selected via systematic random sampling and completed the 28-item General Health Questionnaire (GHQ-28). Data were analyzed using descriptive and inferential statistics in SPSS 24.0. Participants had a mean age of 35.5 years (SD = 8.28) and included 52.6% females and 47.4% males. Based on a GHQ score >23, 63 (53.3%) of staff in COVID-19 wards and 51 (44.7%) in non-COVID-19 wards were suspected of having some degree of mental health disorder. Independent t-test results indicated that healthcare workers in COVID-19 wards experienced significantly higher levels of general mental health problems ($t = 4.20$, $P<0.001$), anxiety ($t = 5.55$, $P<0.001$), and somatic symptoms ($t = 4.09$, $P<0.001$) compared to their counterparts in non-COVID-19 wards. The study highlights a relatively high prevalence of mental health disorders among hospital staff, particularly those working in COVID-19 units. Early identification of at-risk personnel, implementation of targeted interventions, and provision of counseling and psychological support are essential to safeguard the mental well-being and performance of healthcare workers during the ongoing pandemic.

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1. INTRODUCTION

A disease known as COVID-19 is highly contagious and caused by an infectious virus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In March 2020, the WHO declared the disease a global pandemic due to its rapid spread. Despite the fact that this virus appeared at the end of 2019 and spread quickly, it has had harmful global effects. More than 167 million people have been infected, and at least three million have died due to this virus [1]. Many countries in the world are suffering from the devastating effects of this disease on their economic, social, and healthcare systems [2].

Several public health interventions are available, including the use of masks, traffic restrictions, social distancing, home quarantine, and pharmaceutical interventions, and recently the production of more than 58 anti-coronavirus vaccines, some of which are more than 90% effective against COVID-19, has helped to a great extent in the rapid containment of the epidemic [3], [4]. There are many symptoms associated with a coronavirus infection, including cough, shortness of breath, fever, and breathing

difficulties. As it becomes more severe, it can result in severe acute respiratory syndrome, pneumonia, kidney failure, and even death if left untreated. In addition, this disease can cause secondary infections, which puts more burden on healthcare staff in different places [5].

Healthcare providers are at the frontline of screening and treating this disease. Published studies from various countries show that a significant percentage of healthcare workers, especially at the beginning of the epidemic, have been infected with the COVID-19 virus, which has caused an increase in psychological distress among them [6]. Moreover, healthcare providers are faced with an extremely large workload, which puts them at a higher risk of infection, pollution, overtime, frustration, discrimination, isolation, and job burnout [7]. The presence of various sources of stress, such as fear of contracting the coronavirus, lack of facilities, continuous changes in the workplace, insomnia, fear of transmitting the virus to family members, and family responsibilities, may affect their mental health [8].

Several studies have estimated the high prevalence of psychological distress as COVID-19 spread. According to the results of these studies, about 50% of healthcare workers exposed to COVID-19 experienced symptoms of anxiety and depression [7], [9], [10]. According to a national survey conducted in China, 54% of healthcare providers reported medium to severe mental health effects resulting from the COVID-19 outbreak, 29% reported anxiety symptoms, and 17% reported depressive symptoms [11]. As a result of the COVID-19 pandemic, Huang and Zhao [12] reported high levels of anxiety and stress among healthcare workers. In a study of 1257 health professionals in 34 Chinese hospitals, Lai *et al*. [13] evaluated the mental health of staff exposed to COVID-19. The study found that 50.4% of staff had symptoms of depression, 71.5% had psychological distress, 34% had insomnia, and 44.6% had symptoms of anxiety.

Anxiety and stress among nurses, physicians, and healthcare workers who are contacting patients directly can affect their health status, quality of life, and work performance [14]. A disruption in the mental health of healthcare workers may impair their intellectual ability and reasoning, as well as their ability to pay attention and coordinate their actions. The performance of problem-solvers is also affected by various emotions, such as anxiety and fear. It is possible that a decrease in the ability to solve problems can negatively impact the efficiency of the services provided to safeguard the health of people and society, as well as improve living conditions [10], [11]. Hence, recognizing the potential influence of the COVID-19 pandemic on mental health status, conducting a comparative analysis of the mental health disorders of healthcare professionals could provide valuable insights into this matter. This study aims to address the existing gap in research by comparing the mental health status of healthcare workers in both COVID-19 and non-COVID-19 wards at DR. Shariati Hospital in Tehran.

2. MATERIALS AND METHOD

2.1. Research design and sampling method

This comparative-descriptive study with a cross-sectional approach was conducted in 2021. The population in this study was healthcare professionals in Shariati Hospital. The sample size in this study was based on the mean and standard deviation obtained from the mental health status of staff in COVID-19 and non-COVID-19 wards in the study of Quchan *et al.* [15]. The required sample size with a 95% confidence level and 80% power was 223. To prevent the possibility of losing the sample, we collected a sample of 250 participants from COVID-19 and non-COVID-19 wards (each group comprised 125 participants). A list of all staff was prepared first, and then they were placed in different classes based on the type of job. Afterward, in proportion to the total number of people in each job class, research samples were selected using systematic random sampling. The inclusion criteria in this study were: informed written consent; at least three months of job experience at Shariati Hospital; and at least three months of job experience in COVID-19 wards. The exclusion criteria were: participants withdrawing from the study for any reason; participants submitting incomplete questionnaires; previous histories of psychological disorders such as stress, anxiety, and depression through self-report; and a history of taking psychiatric drugs through self-report.

2.2. Data collection tools

In order to collect the data required in this study, a demographic information form was used, including questions related to age, gender, level of education, occupation, work history, economic status, lifestyle, and history of activity in the COVID-19 ward. The mental health of employees was also assessed using the General Health Questionnaire (GHQ)-28 questionnaire. The questionnaire was developed as a screening tool by Goldberg in 1972 [16] to detect mild mental disorders in different circumstances. There are 60 items in the original GHQ and 30, 28, 20, and 12 items in the shorter versions. In this survey, the GHQ-28 questionnaire, consisting of four subscales (severe depression, somatic symptoms, social function, anxiety, and insomnia), was used.

Each subscale consists of seven questions that lie on a 4-point Likert-type scale. Questions 1_7 is related to somatic symptoms (headache, weakness, fatigue, feeling the need for strengthening medicine, low

body temperature), and anxiety symptoms are related to questions 8_14 (anxiety, insomnia, being under pressure, anger, and frustration), evaluating social function symptoms are related to questions 15_21 (feeling satisfied in performing tasks, feeling useful, getting pleasure from learning and conducting daily tasks), and finally, questions 22_28 are used to evaluate depressive symptoms (feelings of worthlessness, despair, thoughts of suicide, death wishes, and inability to do things). To sum up the scores, items A, B, C, and D are given 0 to 4 grades; in total, a grade of 23 or higher indicates pathological symptoms. The lowest and highest scores in this questionnaire are zero and 84, respectively [17], [18]. The findings of the WHO study indicate that the General Health Questionnaire can be used in various cultures and developing countries.

The GHQ-28 has the highest level of validity, sensitivity, and specificity compared to other versions [15]. Nazifi *et al.* [19] investigated and studied the validity, reliability, and factor structure of the GHQ-28 on 415 staff in Kerman hospitals. In this study, Cronbach's alpha coefficient for all subscales of the questionnaire was greater than 74%, indicating that the subscales have high internal consistency. Moreover, factor analysis with principal components identified four factors in the participants' answers, and these four factors explained 60% of the total variance of the questionnaire [19].

2.3. Research implementation

After having obtained the approval of the research proposal from the ethics committee, the researcher handed out questionnaires to participants. Before completing the research questionnaire, study participants were provided with sufficient information about the purpose of the study, especially regarding participants' confidentiality, to enable them to give informed consent. In all stages of the data collection, health guidelines related to the COVID-19 pandemic were followed.

2.4. Statistical analysis of data

The data collected through the survey were analyzed using descriptive and analytical statistics tests in SPSS 24.0 software. There are three types of statistical tests for descriptive statistics: standard deviation and mean (for continuous variables), frequency and percentage (for categorical variables), and inferential statistics (independent t-test). The significance level was set at $P<0.05$.

3. RESULTS

Among 250 study participants, 232 completed the research tools without errors. Of whom, 118 (50.9%) worked at least for three months continuously in the COVID-19 wards, and 114 (49.1%) participants worked in non-COVID-19 wards. The average age of the participants was 35.5±8.28 years in the age range of 23-57 years. In terms of gender, 47.4% of participants were male, and 52.6% were female. Other demographic information of the staff is presented in Table 1.

Table 1. Demographic information of participants

Variables		Shariati Hospital wards staff		
		COVID-19 (n = 118)	Non-COVID-19 (n = 114)	Total (n = 232)
Age (Mean±SD)		35.8±8.48	35.19±8.09	35.5±8.28
Gender: n (%)	Male	53(44.9)	57(50.0)	110(47.4)
	Female	65(55.1)	57(50.0)	122(52.6)
Marital status: n (%)	Married	75(59.3)	64(56.1)	87(37.5)
	Single	43(36.4)	44(38.6)	134(57.8)
	Widow	5(4.2)	6(5.3)	11(4.7)
Level of education: n (%)	Diploma	26(22.2)	25(21.9)	51(22.1)
	Bachelor	53(44.9)	65(57.0)	118(50.9)
	Master	22(18.6)	14(12.3)	36(15.5)
	Doctorate	17(14.4)	10(8.8)	27(11.6)
Work experience (Years): Mean (SD)		9.71±6.93	7.85±5.95	8.79±6.54
Economic status: n (%)	Poor	23(19.5)	20(17.5)	43(18.5)
	Middle	59(50.0)	60(52.6)	119(51.3)
	Good	36(30.5)	34(39.8)	70(30.2)
Life style: n (%)	Living alone	21(17.8)	38(33.3)	59(25.4)
	With family (mother and father)	25(21.20)	16(14.0)	41(17.7)
	With spouse and children	70(59.3)	58(50.9)	128(55.2)
	Friends and others	2(1.7)	2(1.8)	4(1.7)

According to the GHQ score (GHQ>23), 53.3% (n = 63) of staff in COVID-19 wards, and 44.7% (n = 51) of staff in non-COVID-19 wards were suspected to have some degree of mental health disorders. The average total score for mental health among the staff in COVID-19 and non-COVID-19 wards was 34.95 (11.75) and 26.95 (9.86), respectively. In terms of the status of mental health subscales, the highest average was related to anxiety symptoms at 9.11 (3.01) and then somatic symptoms at 8.85 (2.76). According to the results

of skewness and kurtosis tests, the distribution of the research data was normal and in the range of -2 to +2. In order to analyze the data, the independent parametric t-test was used. In this study, results indicated a significant difference in mental health ($t = 4.20$, $P<0.001$), anxiety symptoms ($t = 5.55$, $P<0.001$), and somatic symptoms ($t = 4.09$, $P<0.001$) between the two groups. The findings of the study revealed that the staff in COVID-19 wards were in a worse condition in terms of mental health status, anxiety symptoms, and somatic symptoms compared to their counterparts in non-COVID-19 wards. Further, the independent t-test showed no significant differences in depressive symptoms and social functions between these two groups ($P>0.05$), see Table 2.

Table 2. A comparison of mental health status between staff in COVID-19 and non-COVID-19 wards

Variables	A total number of staff (Mean±SD)	Staff in COVID-19-wards (Mean±SD)	Staff in non-COVID-19-wards (Mean±SD)	t-test
Mental health status	30.67±10.80	34.95±11.75	26.95 ±9.86	t=4.20**
Somatic symptoms	8.85±2.76	10.25±3.14	7.59±2.39	t=4.09**
Anxiety symptoms	9.11± 3.01	10.16±3.69	7.77±2.33	t=5.55**
Social functions	8.54±2.34	8.70±2.31	8.40±2.37	t=0.6
Severe depression	4.88±2.55	5.40±2.88	4.40±2.22	t=1.25

SD: Standard deviation; t: Independent samples t-test; **P≤0.05

4. DISCUSSION

This study aimed to compare the mental health status of staff working in COVID-19 wards with those working in non-COVID-19 wards at Shariati Hospital in 2022. Concerning the prevalence of mental health disorders (GHQ>23), the results indicated that 53% of employees in COVID-19 wards and 45% of those working in other wards were suspected of experiencing some level of mental health disorder. These findings are consistent with previous studies reporting that a large proportion of healthcare workers experienced psychological problems, particularly individuals who had direct contact with patients infected with COVID-19 [20]-[22]. Using the 12-item General Health Questionnaire (GHQ-12), a study conducted in Japan reported that 66% of healthcare workers in referral hospitals showed signs of mental health disorders [23]. Likewise, research carried out in Poland and India using the 28-item General Health Questionnaire (GHQ-28) found that 77% and 60.3% of medical students, respectively, experienced mental health disorders during the COVID-19 pandemic [24], [25]. Furthermore, a study in Iran employing the GHQ-28 indicated that 48.2% of staff working in COVID-19 referral hospitals suffered from mental health disorders [26]. Overall, the results of the present study suggest that during the COVID-19 pandemic, the prevalence of mental health disorders among healthcare staff was similar to reports from other countries and treatment centers in Iran, and remained relatively high and far from optimal conditions. Therefore, appropriate intervention strategies are necessary to improve the mental health status of healthcare workers, particularly those assigned to COVID-19 wards.

There is a lower severity of mental health disorders in the present study than in Quchan *et al.* [15] in Sabzevaz hospitals and Farokhnezhad *et al.* [27] in Bushehr Persian Gulf Martyrs Hospital. It seems that the severity of mental health disorders among medical staff has decreased due to reasons such as the reduction of the lethality of the disease, the universal vaccination program, and the increase in the level of knowledge and awareness of medical staff in dealing with the disease and patients compared to the beginning of the COVID-19 crisis. In terms of sub-scales of mental health status, the highest mean was related to anxiety symptoms, indicating that the incidence of anxiety and sleep disturbance during the COVID-19 pandemic is an important part of the mental health disorders of healthcare workers in hospitals. These findings were in line with those of Dastyar and Karimiankakolak [28], who reported that anxiety symptoms and sleep disturbance had the highest score among 110 nurses working in Imam Reza, Ahvaz Hospital. In two other studies in Nepal and Poland during the COVID-19 pandemic, anxiety and sleep disturbance were more severe among healthcare workers compared to other aspects of mental health [25], [29]. The results of the bivariate analysis showed that staff in COVID-19 wards were in worse condition in terms of somatic symptoms, anxiety, sleep disturbance, and total score of mental health compared to their peers in non-COVID-19 wards. The findings are in line with those of several previous studies in which the somatic symptoms of staff in COVID-19 wards were significantly higher than those of their peers in other wards [25], [30].

The higher intensity of somatic symptoms among the staff of the COVID-19 wards may be due to intensive work in stressful situations and the reaction caused by the increased activity of the autonomic nervous system. The hyperactivity of the autonomic nervous system does not affect health in the short term, but if it continues for a long time, it leads to fatigue, depression, and other adverse consequences in a person's health [31]-[33]. From the psychodynamic perspective, long-term emotional tensions in healthcare workers may lead to somatic symptoms and sleep disorders, which ultimately lead to disruptions in their job performance [25]. Working in COVID-19 wards and caring for COVID-19 patients can be one of the risk factors for causing anxiety and sleep disturbances, according to the present study.

The findings of various studies in Iran and other countries showed that the anxiety index of staff who were in direct contact with patients with COVID-19 was at a higher level compared to their peers in other non-COVID-19 wards [15], [34]-[37]. The results of Tan *et al.* [38] study on medical staff in Singapore during the outbreak of COVID-19 showed that healthcare workers who were in close contact with patients infected with COVID-19 had a higher anxiety index than those who were not in contact with patients with COVID-19. People with anxiety disorders experience disproportionate levels of anxiety, which is their body's natural response to stress [39]. Anxiety disorders lead to excessive nervousness, fear, apprehension, worry, and somatic symptoms in a person [40]. During the COVID-19 pandemic, high levels of stress and mental health problems were common among frontline health professionals, and for this reason, studies have shown that the level of anxiety and stress among healthcare workers was higher than in the general population.

As found by Qi *et al.* [41] research in China, health professionals, especially those who were on the frontline of the treatment of COVID-19, had significantly higher rates of anxiety and symptoms of depression than their peers, which was consistent with the present study's findings. The higher level of anxiety in the health care staff of the COVID-19 wards, as reported in the other studies, may be due to reasons such as working long hours, fear of contracting the disease, and being afraid of spreading it to family members, insomnia, patient mortality, and lack of facilities and personal protection equipment [42], [43]. For this reason, the lack of identification and treatment of anxiety may affect the self-efficacy and job performance of health professionals, which eventually leads to post-traumatic stress disorder, depression, and suicide [44]. This study found no significant differences in social function and severe depression index between health professionals in COVID-19 and non-COVID-19 wards.

Previous studies have reported that psychological symptoms depend on the stage of the pandemic phase because medical staff may experience psychological adjustment following gradual learning and gaining rich clinical experience in treating and caring for COVID-19 patients [34], [45]. Previous studies have reported that frontline healthcare workers had higher rates of depression and anxiety [13], [15], [46], [47] but due to a reduction in the level of anxiety and stress, decisions to ease the preventive measures in countries, having passed the peak of the pandemic, and improving social interactions, social functions and the depression index of health professionals are less affected by the disease. In general, based on the findings of this research, the severity of mental health disorders among health professionals was less than in previous studies; however, the staff in the COVID-19 wards experienced more mental health disorders compared to their peers in non-COVID-19 wards. In addition, the overall prevalence of mental disorders among healthcare workers was relatively high. As mental health problems may have a negative impact on making decisions by healthcare providers [48], hospital officials are asked to identify healthcare staff at risk of mental illness, provide supportive psychological counseling, train coping strategies, and resolve job-related problems to promote the level of mental health by paying attention to their psychological needs, which are usually ignored.

This study has several limitations that should be acknowledged. This study collected data using a self-assessment tool, so some participants may not have answered all the questions honestly. A further limitation of this study is that it was conducted on healthcare workers in a hospital. This means that findings cannot be generalized to other healthcare workers in other hospitals.

5. CONCLUSION

Based on the present study, the prevalence of mental health disorders is relatively high among healthcare providers at Shariati Hospital, Tehran. Moreover, healthcare professionals had more severe forms of mental health disorders, anxiety, and somatic symptoms in COVID-19 wards compared to non-COVID-19 wards. As the incidence and severity of mental health disorders have adverse effects on the health and job performance of healthcare providers, it is essential to identify healthcare staff at risk of mental illness, assess the needs and problems of staff, and perform effective therapeutic interventions using appropriate psychological techniques and strategies.

ETHICAL APPROVAL

This study has been approved by the Tehran University of Medical Sciences Ethics Committee (ID: IR.TUMS.FNM.REC.1401.011).

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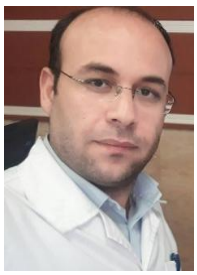

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