



Original Article

Assessment of the mental health and associated factors among healthcare workers in Iran during COVID-19 pandemic

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Objectives: Several studies show that the new coronavirus (COVID-19) has jeopardized the health dimensions of healthcare workers. The present study was designed to evaluate the mental health and determined factors of healthcare providers in Iran during the COVID-19 pandemic.

Methods: This cross-sectional analytical research was conducted in three hospitals, in Tehran. The questionnaires, including the General Health Questionnaire (GHQ-12), and Kessler Psychological Distress Scale (K10), with demographic/job characteristics questions, were implemented to collect data.

Results: Results show that 31% of the total population was at risk for psychiatric disorders (36% nurses and 13% physicians). Female, front-line, and married healthcare workers showed the highest prevalence rate of mental health disorders. In addition, elderly healthcare workers, front-line, married, and female participants demonstrated a high level of distress, respectively.

Conclusion: Results from this study decree further monitoring and psychosocial interventions for healthcare workers during the viral pandemic to preserve healthcare workers from long-term mental health disorders impacts.

Keywords: COVID-19; healthcare workers; Iran; mental health; SARS-CoV-2.

As its outbreak in China in December 2019, coronavirus disease (COVID-19) has spread in the world and has become a global pandemic on March 11, 2020. Based on data from the National Health Commission of China, although more than 84,000 patients have been infected with COVID-19, over 78,000 patients have recovered and were discharged from the medical centers.^[1] The disease has multiple symptoms, including fever, pulmonary and respiratory dysfunction, physical weakness, and intestinal infections.^[1,2] Concerning Iran, the first patients were announced by the Health Ministry in Qom

city on February 19. According to the official statistics, a total of 1,206,373 infected cases with 54,814 deaths has been reported on December 29, 2020.^[3]

In the following of health protection measures, many countries around the world implemented quarantine operations and preventive measures which these types of drastic actions make and also extend psychosocial issues among the population.^[4] According to the research, the viruses' outbreak led to many psychological and mental problems such as distress,

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fear, depression, anxiety, insomnia, and somatic symptoms. [5-8] Not only has the virus (COVID-19) an impact on the psychological health of individuals and families but it also has a more severe impact on the health status of healthcare workers on the front-line who are directly participated in the diagnosis, treatment, and care of patients with COVID-19. Besides, mental health problems are relatively common in the health and medical environments,[9,10] which are not surprising because health-care professionals must work in stressful places, hospitals, and clinics, where are overwhelmed with excessive physical and mental problems of the patients.^[8,11-13]

Several studies show that the new COVID-19 has jeopardized the health dimensions of healthcare workers.^[6,14] Some studies with the focus on the virus outbreak (SARS, 2003) show that the medical team and staff experienced a high level of psychosocial symptoms such as anxiety, distress, and nervousness.^[15,16] Other studies found that health-care employees worried about the infecting of their family and relatives.^[17] Besides, they expressed feeling uncertainty, social stigma, and thinking of job resignation.^[18] Healthcare workers, especially health professionals, are at a high risk for COVID-19. Their susceptibility to diseases has many implications for health-care organizations. Their morbidity and mortality can cause severe crises in health-care personnel shortages. To put it another way, as these professionals are always frontline for any case and are contacting clients mostly, they have the potential to infect families and others.^[19,20] Regard to Iran, an increase in the number of confirmed cases, and a shortage of personal protective equipment, overwhelming workload, extensive media coverage, feelings of being inadequately supported, and a lack of specific drugs could all lead to the additional psychological pressure of health-care employees.

The virus outbreak was more rapid than expected in Iran, and all 31 provinces had been infected on March 5, 2020.^[2] Since the virus (COVID-19) has been spread in Iran, the government took many measures in the different domains including supplying free medical services to the patients suffering from clinical symptoms of the COVID-19, equipping hospitals and health centers with all requirements, designating selected hospitals to COVID-19 patients, expanding the number of ambulances and specific protective cloths for health-care staffs, distributing of health packages in the country, launching psychological call centers, providing disinfectants in public places such as subway, and providing stress management protocols in the media.^[2] However, evidence-based assessments and psychosocial interventions to promote the mental health of healthcare workers are ignored in the current time.

To address this gap, the present study aimed to assess mental health status of healthcare workers, including nurses and physicians who are treating patients with COVID-19. This assessment of mental health can provide an understanding of the burden of medial workers and can be used as crucial facts to improve the mental wellness of healthcare workers. Finally, to be indicated vividly, the present study was designed to

What is presently known on this subject?

- Several studies show that the infectious diseases will jeopardize the health dimensions of healthcare workers. Hence, the mental health concerns are relatively widespread in medical environments, which are not surprising because healthcare professionals must work in stressful places.

What does this article add to the existing knowledge?

- In this study, the mental health problems of healthcare workers in the era of the new global health problem (COVID-19 pandemic) were evaluated. Elderly healthcare workers, front-line nurses, married, and female participants demonstrated a high level of distress in this Ara.

What are the implications for practice?

- Psychosocial intervention to improve the mental well-being of health-care workers exposed to COVID-19 needs must be introduced instantly, particularly with female and front-line health-care professionals.

evaluate the mental health and determined factors (including marital status, gender, working position, job experience, wards, and occupation) of health-care providers in Iran during the COVID-19 pandemic.

Materials and Method

Procedure

This study was conducted as a cross-sectional analytical research in three hospitals (Shohaday Tajrish, Shahid Moddares, and Masih Daneshvari), which are allocated for patients with COVID-19 in Tehran, the capital of Iran. The questionnaires, including the General Health Questionnaire (GHQ-12), and Kessler Psychological Distress Scale (K10), with demographic/job characteristics questions, were implemented to collect data. Those mental health dimensions that were included in this study are somatic symptom, anxiety, social dysfunction, and depression. After receiving permission to perform the study from the hospital authorities, all healthcare workers were asked to participate in this study. The researchers distributed a total of 625 survey questionnaires, among them 521 cases (the rate of 83%) were returned. In addition, all participants were aware of the study's aims, and they incorporated it by self-consent.

Data Collection

The first part of the questionnaire was allocated to demographic and job-related features. This information includes marital status (single or married), age, gender, working position (front-line, healthcare workers who directly provide essential service and treatment with patients or second-line, healthcare workers who are working with the family of patients and in the official divisions), job experience (years), type of job (nurse, physician, and official staff who are working in the official section and not directly connecting with patients), and ward of the hospital (general and surgical such as intensive care unit and critical care unit).

Mental health (including somatic symptoms, anxiety and insomnia, social dysfunction, and depression) status of this study was assessed using the 12-item General Health Questionnaire (GHQ-12, Goldberg and Williams, 1988), and Kessler psycho-

logical distress scale (K10) which are reliable and vastly used instruments for evaluation of mental health status. Each item in the GHQ-12 is rated on a 4-point scale (0=less than usual, 1=no more than usual, 2=rather more than usual, and 3=much more than usual). The threshold for case classification (i.e., poor mental health) selected in this study was the GHQ-12 score of ≥ 4 .^[21] In this study, the valid Farsi (Persian language) format of the GHQ-12 was applied and consists of 12 items, each one assessing the severity of a mental problem in four dimensions (somatic symptom, anxiety, social dysfunction, and depression) over the past few weeks.^[22] Furthermore, the Iranian version of K-10 (with a 5-point scale, 1=none of the time, 2=a little of the time, 3=some of the time, 4=most of the time, and 5=all of the time) was used to distress dimension.^[23]

Data Analysis

Instead of random-sampling, the whole employees in all wards of the hospital (total population) were studied in this research. Analyzing the data of this study was accomplished by SPSS v.20 software (Armonk, NY: IBM Corp). General characteristics and job-related features were indicated as mean (standard deviation) range and percentage. To internal consistency reliability of the GHQ and K-10 questionnaires Cronbach's alpha was applied and confirmed at 0.87 and 0.91, respectively. The primary relationship between variables was assessed by t-test, analysis of variance (ANOVA) analyses; in addition, multivariate logistic regression test was performed to estimate the relationship between the prevalence of mental health disorders (MHDs) and independent variables in a multivariate context.

Results

A total of 521 questionnaires were completed by all participants. Data regarding the prevalence of mental disorders

in terms of marital status, age, working position (front-line and second-line), job experience, wards, and occupation are presented in Table 1. Considering the current situation (during COVID-19), about 31% of the total population was at risk for psychiatric disorders. Regarding the gender variable, the prevalence rate of mental disorders in female healthcare workers was higher than male participants (30% in males and 49% in females). The findings show that the mental disorders in married participants (53.98%) were higher than singles (22.05%). With the rising age of people and job experience, the prevalence of mental disorders has increased. Front-line healthcare workers are the risk of mental disorder more than second-line (44% in front-line and 31% in second-line). Besides, surgical healthcare workers (with 45%) have experienced the prevalence of psychiatric disorders more than general workers (with 29%). Finally, according to the frequency of participated cases, the prevalence of psychiatric disorders was higher among nurses (36%) than physicians (13%) (Table 1).

The T-independent and one-way ANOVA tests were applied to discover the statistical relationship between demographic variables with the general health dimensions (Table 2). Furthermore, to present precise information on the health status of participants, all mean and standard deviation of health dimensions were described. The results show that respondents demonstrate a moderate rate of mental health disorder in all dimensions. To be precise, female (mean=47.04), front-line (mean=46.93) married (mean=44.04) healthcare workers showed the highest prevalence rate of MHDs, respectively. Furthermore, elderly healthcare workers (>44), front-line, married, and female participants demonstrated a high level of distress, respectively (27.66, 26.14, 25.19, 24.55). The result, as presented in Table 2, shows that the statistical association

Table 1. Demographic and occupational characteristics

Characteristic (independent variables)	n=521	Sample size	Suspected cases	Prevalence
Gender	Male	232	71	30.60
	Female	289	143	49.48
Marital status	Single	195	43	22.05
	Married	326	176	53.98
Age	22-32	176	23	13.6
	33-43	234	51	21.79
	>44	111	41	36.93
Working position	Front-line	285	126	44.21
	Second-line	236	74	31.35
Job experience	0-5	75	11	14.66
	6-11	266	71	26.69
	>11	180	62	34.44
Wards	General	316	94	29.74
	Surgical	205	94	45.85
Occupation	Physician	170	24	13.71
	Nurse	351	127	36.18

Table 2. The mean and SD of the mental health (dependent variable) dimensions (n=521)

Variable	n	General health Mean±SD	Somatic Symptom Mean±SD	Anxiety Mean±SD	Social dysfunction Mean±SD	Depression Mean±SD	Distress Mean±SD	p-value
Gender								
Male	232	40.03±3.61	8.51±0.97	10.54±0.78	8.11±1.16	12.87±0.98	18.54±0.96	0.008
Female	289	47.04±3.89	10.11±1.23	11.86±1.34	9.76±0.95	15.31±0.81	24.55±1.09	
Marital status								
Single	195	36.8±0.89	8.14±0.61	10.21±0.87	8.21±0.51	10.24±1.12	17.21±0.77	0.001
Married	326	44.78±1.54	9.81±0.86	13.15±1.9	9.21±0.97	13.61±1.22	25.19±1.12	
Age								
22–32	176	33.18±0.69	8.11±0.72	8.21±1.01	8.14±0.63	8.72±0.97	14.76±0.98	0.020
33–43	234	38.24±1.41	8.87±0.65	9.89±0.87	9.14±0.96	10.34±1.21	18.98±0.73	
>44	111	43.79±1.64	9.54±0.83	11.42±1.71	9.22±0.77	13.61±1.1	27.66±1.06	
Working position								
Front-line	285	46.93±2.43	9.62±0.87	11.95±1.23	10.13±0.78	15.23±1.6	26.14±1.23	0.001
Second-line	236	38.77±1.65	8.98±0.67	10.33±0.89	9.02±0.65	10.44±0.98	22.43±1.04	
Job experience								
0–5	75	35.22±0.87	8.78±0.77	9.01±0.78	8.32±0.65	9.11±0.70	17.54±0.56	0.04
6–11	266	40.95±1.45	9.54±0.80	10.34±1.23	9.93±0.80	11.14±0.96	19.55±0.97	
>11	180	43.88±2.11	9.87±0.84	9.91±1.22	10.12±0.96	13.98±2.16	24.44±1.66	
Wards								
General	316	38.91±1.54	9.35±0.78	10.78±0.88	8.24±0.56	10.54±1.56	19.21±1.76	0.010
Surgical	205	42.84±1.23	9.21±0.87	10.94±0.94	9.77±0.76	12.92±1.54	25.5±1.03	
Occupation								
Physician	170	33.42±0.88	8.21±0.76	9.11±0.86	7.98±0.56	10.12±1.02	17.16±0.88	0.001
Nurse	351	43.77±0.84	9.03±0.77	12.54±0.99	9.09±0.67	14.11±1.04	24.55±1.67	

SD: Standard deviation

is observed between the gender of healthcare workers with somatic symptoms, anxiety and social dysfunction, depression, and distress (Mental health dimensions in general) which means that female healthcare workers have experienced more mental disorders and pressures than males ($p < 0.05$). A significant association was discovered between both age and job experience with general health status. In other words, the rise in age and job experience of participants yielded to increase of psychiatric disorders ($p < 0.05$). The results also showed that other independent variables (working position, wards, occupation, and marital status) are associated with the mental health of healthcare workers ($p < 0.05$) (Table 2).

According to logistic regression analyses, the following results can be drawn:

- The greatest risk of mental disorders was related to the working position (first-line), as it is indicated that front-line healthcare workers were 3.171 times more at risk of MHDs than second-line.
- Female healthcare workers had a relative of mental disorder of 1.682 compared with males.
- The risk of mental disorders increases with job experience and age.

d. Married healthcare workers were 2.831 times more at risk of mental disorders compared to single.

e. Surgical healthcare workers were 1.855 times more at risk of mental disorders compared to general healthcare workers.

f. Finally, nurses had a relative of mental disorder of 1.985 compared with physicians (Table 3).

Discussion

The present study was designed to examine the mental health of healthcare workers and the factors that influence it in Iran during the COVID-19 pandemic. In addition, results present that MHDs are prevalent among healthcare workers in Iran, which means unhealthy symptoms such as depression, anxiety, and distress were widespread among healthcare workers. These results are approved by multiple studies in the other part of the world. Related studies show that an outbreak of infectious diseases causes psychological distress in medical staff progressively. Moreover, depression, psychophysiological symptoms, and post-traumatic stress symptoms can last over a prolonged duration, resulting in significant consequences.^[17] Epidemiological studies of MHDs in Iran report different rates between 11% and 24%.^[24,25] Results from this

Table 3. Multivariate logistic regression analyses of factors associated with mental health status

GHQ-12, K-10				
Variable (independent)	Multivariate			
	B	OR	95%CI	p-value
Gender				
Male	-	-	-	-
Female	0.472	1.682	(1.49–1.89)	<0.001
Marital status				
Single	-	-	-	-
Married	0.456	2.831	(1.80–3.87)	<0.001
Age	0.010	1.871	(1.31–2.45)	<0.001
Working position				
Front-line	0.872	3.171	(1.12–4.10)	
Second-line	-	-	-	-
Job Experience	0.231	1.94	(1.54–2.33)	<0.001
Wards				
General	-	-	-	-
Surgical	0.651	1.855	(0.96–2.75)	<0.001
Occupation				
Physician	-	-	-	-
Nurse	0.341	1.985	1.10–2.87	<0.003

GHQ: General health questionnaire.

study (prevalence of mental disorders with 31.5%) show that the prevalence of MHDs is higher than detected rates earlier. Multiple causes such as methods, tools, classification systems, and time could be involved to interpret the difference in the results. It can be noted that the current time (outbreak of COVID-19) has a significant role in MHDs prevalence among healthcare workers, who they are struggling with many crises of COVID-19 because they are battling in the front line of services.

The present study is in line with previous reports from Italy, China, and Singapore, which approved a substantial proportion of MHDs, particularly among female and front-line healthcare workers.^[14,26,27] Furthermore, working in high-risk environments, interacting with infected patients, and being isolated reported as the common causes of MHDs.^[8,14,28] The results of studies indicate that COVID-19 has a significant impact on the psychological well-being of front-line hospital care workers due to risk factors including underlying organic illness, gender (female), concern about family, fear of infection, and lack of personal protective equipment.^[29] The present findings support previous results because healthcare workers in the first-line (working position), and Iranian female healthcare workers reported high prevalence rates of MHDs. It can be noted that working in the front-line due to the direct and frequent contact with patients, and long-hours work are the significant factors in the prevalence of MHDs, as reported in the previous studies.^[30–32]

The findings also show higher prevalence rates of MHDs in married participants than unmarried. The previous studies show that pandemic diseases not only affected individuals working in the medical environment, but they also had traumatic tolls in the family and friendship settings.^[28] Furthermore, some studies report that married people are usually worried about spreading disease among family members.^[33] Regard to marital status, previous studies report that reasons of MHDs may consist of loss of control, vulnerability feeling, concerns about self-health, the spread of the virus, and the health of family and relatives.^[14,33]

Results from the relationship between age, job experience, and MHDs are not compatible with previous reports during the SARS outbreak.^[30,31,34] Those reports showed high rates of MHDs prevalence among younger healthcare workers, while data from the present study in Iran show that elderly healthcare workers are more at risk of MHDs than younger. It could be explained in a way that the new COVID-19 has targeted elderly people and those who have defects in the body's immune system.

In addition, results demonstrated that the prevalence of MHDs among nurses is higher than physicians. Besides, surgical staff exposed high rates of MHDs prevalence than general staff. The previous studies on health-care employees have reported that mental health effects are associated to department and occupation, which confirm our findings.^[28,35] It could be due to having professional perspective about diversity in the en-

counter patterns of infectious diseases, which might be able to obtain some degree of convenience sense to manage the environment.^[36]

Conclusion

In general, healthcare workers reported high rates of symptoms of somatic symptoms, anxiety, social dysfunction, depression, and distress. The Iranian government has made various efforts, such as recruiting retired healthcare employees to reduce work intensity, adopting strict control, and provisional psychosocial interventions to decrease the pressure on the health-care staff. On the other hand, insufficient lifesaving and protective supplies and delayed decisive management have created a critical condition for healthcare workers, resulted in MHDs prevalence among health-care staff.

To sum-up, results from this study decree further monitoring psychosocial interventions for healthcare workers during the COVID-19 pandemic to preserve healthcare workers from long-term MHDs-related problems. Protecting and supporting healthcare workers are a key factors in public health to conquer infectious diseases, concerning the current situation (COVID-19) and psychosocial intervention to enhance the mental health of health-care providers encountered to COVID-19 needs to be performed instantly, particularly with female and front-line healthcare workers. In addition, trying to provide services to patients at home can be a way to reduce work stress and the psychological damage of health workers. [37,38] According to the result of this study, health promotion programs, hiring new employees even as a temporary job to cover permanent staff, providing high quality health equipment in the medical centers and hospitals could decrease the level of MHDs-related problems.

Limitations

Several limitations were involved in this study. First, the scope of the present study was limited in Tehran province with three hospitals (Shohaday Tajrish, Shaid Modares, and Masih Daneshvari) allocated to the COVID-19 patients. Second, this study was conducted as a cross-sectional study, and the researchers could not implement a longitudinal follow-up. Third, considering the response rate (83%), response bias could still be possible if the no respondents were either too stressed to respond or not at all stressed.

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jadi, Z. Shahini, V. Rashedi and A. Tavan supervised the findings of this work and helped gather information. All authors discussed the results and contributed to the final manuscript.

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