Evaluation of Perceived Stress and Mental Health of Health Defenders in Military and Civilian Hospitals Infected with Corona Virus (COVID 19)

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Abstract

Background: Considering the prevalence of coronavirus and its effect on mental health and increasing perceived stress, the aim of this study was to investigate the perceived stress and mental health of health defenders in military and civilian hospitals involved in treating patients with COVID 19.

Methods: The present study was a descriptive cross-sectional study. The available sampling method was done by sending online questionnaires of demographic characteristics, Goldberg general health and perceived stress (PSS). 323 health advocates were involved with virus patients. Through descriptive statistics, independent mean test, univariate analysis of variance and chi-square test were analyzed using SPSS 25 version.

Results: the frequency of symptoms of mental disorder in military hospital staff (61.1%) and civilian hospital staff (50.7%) which indicates a significant difference between the two groups of employees ($P < 0.05$); But there is no significant difference between the two groups in perceived stress.

Conclusion: Considering the stressful period of COVID 19 pandemic, to reduce and prevent the psychological effects of this pandemic such as burnout, mental health problems, symptoms of persistent stress, providing psychological resilience interventions for treatment staff on the front lines of the crisis is one of the highest priorities during this epidemic.

Introduction

In late 2019, the city of Wuhan in China published a report of a new pneumonia caused by the Corona virus (COVID 19). The virus spread rapidly and became a pandemic. The coronavirus pandemic (COVID 19) has placed a heavy burden on governments, organizations, and individuals, especially the medical staff. (1) In the face of this critical situation, front-line medical staff who work directly and closely in the diagnosis, treatment and care of patients with coronavirus (COVID 19) are at high risk for mental illness and other mental health disorders. (2) Although research has shown that people with higher education, especially in the field of health and treatment, have better and more understanding and information, and having this health literacy acts as a protector of their mental health, (3, 4) but an increasing number of confirmed and suspicious cases, high workload, lack of personal protective equipment, extensive media coverage, lack of access to certain drugs and feeling of insufficient support can play a role in exacerbating stress in the medical staff. (5-8)

On the other hand, the necessary preventive measures are taken to prevent the spread of this pandemic, such as quarantine and social distance in all countries. (9, 10) The general public has been asked to observe social distance and experience telecommuting if possible during the pandemic, and at the same time health care workers should continue to work as in the past but with greater care. (11- 14) In this regard, studies have shown that those in the medical staff who are afraid of infecting their family members, friends and colleagues are skeptical of what they are doing because they feel they are labeled

by society as being able to carry virus. (5) Also, high level of stress, anxiety, and depressive symptoms are reported, which can have long-term psychological consequences. (6, 15)

These constant challenges and unprecedented anxiety and stress, along with the fear of personal security, are no different from what is seen in Battlefield conditions when caregivers experience high levels of anxiety and stress at the same time as long-term conditions and uncertainty about the duration of the illness, all of which are accompanied by reduced ability to control the situation, therefore they are at risk for stress and burnout. (16)

Also, facing death every day and due to the financial problems of governments and countries, deciding which patient to survive and which one to separate the device causes a challenging situation in the medical staff. This challenging situation causes the treatment staff to feel guilty, helpless and depressed, which eventually leads to common mental disorders such as stress, depression and post-traumatic stress disorder (PTSD). (17)

Stress is the body's response to harmful stimuli, and is a common physical and psychological phenomenon. Stressors are stimuli that cause stress and their types include physical, chemical, biological, social, psychological, cultural and so on. The types of stressors are related to each other, meaning that one type of stressors can combine with another type of stress source to form a compound stressors.(18) The corona virus pandemic (COVID 19) is an important source of stress and can be considered as a compound source of stress because it has disrupted the internal mental balance of more people, which will occur as an external psychological reaction.

Particularly based on previous experience with pandemics or the spread of viruses, it has been observed that treatment staff in hospitals that care for confirmed or suspected patients have been found to be more at risk of negative psychological stress than the general population. (19, 20) For example, the results of a study showed that in the fight against the sudden onset of acute respiratory syndrome in the early stages of the epidemic, psychological distress including fear and anxiety appeared immediately among medical staff, but depression, psychosomatic symptoms and post-traumatic stress disorder symptoms began later, continued and had profound effects. (21, 22) The experience of medical staff in responding to SARS showed that its effects on the mental health of treatment staff were not only short-term, but also long-term. (22, 23) A psychological study has shown the rates of depression, anxiety, insomnia [16] and stress symptoms in medical staff involved in the prevention and control of coronary heart disease were 50.7%, 44.7%, 36.1% and 73.4%, respectively. (24-26) In addition, studies have shown that the psychological stress scores of the treatment staff are generally higher in isolated wards. (27) A study examining the mental health of 230 medical staff at a COVID-19 Infectious Diseases Hospital found that the prevalence of anxiety and stress among medical staff was high, with particular attention to the mental health of female nurses. (26, 28) Another study of 180 medical staff in China found that stress was negatively correlated with sleep quality and self-efficacy (26, 29) and Trauma is more common among nurses who are not in the front line than nurses who are in the front line. (12) Another

study found that physicians and dentists around the world experience anxiety and fear at work after the outbreak of the coronavirus. (26, 30)

Based on these findings and many other recent findings, health care providers who are at the forefront of the pandemic in the long run show stronger psychological stress that leads to negative emotional distress, and therefore their mental health should be given special attention by managers and officials with the aim of purposeful intervention to control the psychological crisis in these people. (31, 32) Therefore, the present study aims to Perceived psychological stress and mental health of health advocates were performed in military and civilian hospitals involved in the treatment of patients with COVID in 19 countries.

Methods

This study was a descriptive cross-sectional study that was conducted in 2020 in the period of May 2020 to September 2020. The research sampling method was available. Given that the size of the community of health advocates involved with the Corona virus (COVID 19) was unknown, using the Cochran's formula with 95% confidence and a probability of employee stress of 0.50 and an error of 5.5%, the minimum sample size sufficient for the study were identified at 320 people. It should be noted that the present study was performed on 323 mental health advocates. Through the available sampling method and according to the inclusion criteria, 175 employees of military medical centers of the Islamic Republic of Iran and 148 employees of civilian medical centers were surveyed by sending online research questionnaires.

Inclusion criteria: employment in military and civilian medical centers and hospitals involved in the field of corona treatment (COVID 19) (including all general and specialist physicians, nurses, paramedics, laboratory and radiology staff) who were willing to participate in research and have worked in the field of corona treatment for more than a month.

Exclusion criteria: unwillingness to participate in research and lack of therapeutic activity in the field of corona treatment (COVID 19).

It should be noted that this project was approved by the Vice Chancellor for Research and Technology of the Army University of Medical Sciences of the Islamic Republic of Iran with the code of ethics IR.AJAUMS.REC.1399.068 on 7 June 2020. consideration the right of choice and authority of the participants to participate in the project, confidentiality of the personal information of the participants, giving a code to each of the participants, providing necessary information on how to implement the research plan were the most important ethical issues considered in this research.

In this study, the following tools were used to collect the required data:

- **Researcher-made demographic information questionnaire.** This questionnaire contained questions that were designed to collect information such as age, sex, education, occupation, degree, duration of

COVID-related services, type of hospital (military or civilian), history of COVID infection. (COVID 19).

- **General Health Questionnaire (GHQ-28)**: The General Health Questionnaire was developed by Goldberg in 1972 and was designed to identify mental disorders in different settings. The questions of the questionnaire examine the mental state of the person in the last month. This questionnaire was assessed on four areas of psychological functions as follows:
- Physical condition, 2- Anxiety and feeling of psychological turmoil, 3- Social dysfunction and 4- Depression. In this study, a standardized form of 28 questions was used and the answers were coded as Likert scoring. In Iran, the validity coefficient of the 28-item questionnaire of general health items is estimated to be 0.78 and Cronbach's alpha is estimated to be 0.97. (12)

-Perceived Stress Scale (PSS): This scale was developed in 1983 by Cohen et al and has three versions of 4, 10 and 14 items that measure the general stress perceived in the past month. It is used to measure thoughts and feelings about stressful events, control, overcoming, coping with stress and experienced stress. This scale also examines the risk factors in behavioral disorders and shows the process of stressful relationships [13]. In Iran, Cronbach's alpha is 0.74 and its validity is 0.63. (14)

In this study, to descriptively study demographic variables from Statistical indicators such as frequency, percentage, mean, standard deviation, independent mean test (t-test), univariate analysis of variance (ANOVA) and chi-square test is used. It should be noted that data analysis was performed using SPSS software version 25.

Results

The number of participants in the present study was 323 health defender involved in the treatment of patients with coronavirus (COVID 19) in military and civilian medical centers, of which 140 (43.3%) were male and 183 (56.7%) were female; Also, in terms of age, 214 people were under 40 years old (66.3%) and 109 people were over 40 years old (33.7%). In terms of occupation, there were 31 physicians (9.56%), 186 nurses (57.6%), 39 paramedics (12.1%) and 67 others (laboratory, crew, etc.)(20.7%)

Of whom 283 (73.7%) had under 20 years of employment and 85 people (26.3%) had more than 20 years of employment. In terms of job variables, 9.6% were physicians, 57.6% were nurses, 12.1% were paramedics and 20.7% were

The extent of mental health disorders in military and civilian hospitals involved in the treatment of patients with coronavirus (COVID 19) was assessed by Chi-square test (x^2). The results showed that the frequency of symptoms of disorder in military hospital staff (61.1%) and in civilian hospital staff (50.7), indicates a significant difference between the two groups of staff (military and civilian hospitals) ($P<0.05$). In other words, the frequency of symptoms in military hospital staff is higher than civilian hospital staff. Also, 56.3% of the total subjects (in military and civilian hospital staff) were suspected of mental disorders and 43.7% were without mental disorders (Table 1).

Table 1:

Comparison of mental disorders of health defenders in military and civilian medical centers

Sig.	*d.f*	x^2	Total	Medical centers		Symptoms of general health		
				Civilian	**Military**			
0.05(*)	1	3.772	141	73	68	**Frequency**	without mental disorders	**Total score of Goldberg General Health**
			43.7	49.3	38.9	**Percent**		
			182	75	107	**Frequency**	with mental disorders	
			56.3	50.7	61.1	**Percent**		
			323	148	175	**Frequency**	Total	
			100	100	100	**Percent**		

(**) p-value 0.01 & (*) p-value 0.05

Table 2 shows a comparison of the symptoms of the general health level of health defenders in military and civilian medical centers.

Table 2:

Comparison of general health of health defenders in military and civilian medical centers

General health symptoms			Medical centers		Total	x^2	*d.f*	*Sig.*
			Military	Civilian				
physical symptoms	**Normal**	**Frequency**	88	89	177	725/7	3	081/0
		Percent	50.3	60.1	54.8			
	Mild	**Frequency**	62	33	95			
		Percent	35/4	22/3	29/4			
	Moderate	**Frequency**	19	19	38			
		Percent	10/9	12/8	11/8			
	Severe	**Frequency**	6	7	13			
		Percent	3/4	4/7	4/0			
anxiety, insomnia	**Normal**	**Frequency**	82	88	170	387/7	3	061/0
		Percent	46/9	59/5	52/6			
	Mild	**Frequency**	44	33	77			
		Percent	25/1	22/3	23/8			
	Moderate	**Frequency**	46	23	69			
		Percent	26/3	15/5	21/4			
	Severe	**Frequency**	3	4	7			
		Percent	177	277	272			
social dysfunction	**Normal**	**Frequency**	26	14	40	659/23	3	0/01(**)
		Percent	14/9	9/5	12/4			
	Mild	**Frequency**	57	82	139			
		Percent	32/6	55/4	43/0			
	Moderate	**Frequency**	84	39	123			
		Percent	48/0	26/4	38/1			
	Severe	**Frequency**			21			

			8	13				
		Percent	4/6	8/8	6/5			
depression	**Normal**	**Frequency**	145	125	270	034/1	3	793/0
		Percent	82/9	84/5	83/6			
	Mild	**Frequency**	20	14	34			
		Percent	11/4	9/5	10/5			
	Moderate	**Frequency**	6	7	13			
		Percent	3/4	4/7	4/0			
	Severe	**Frequency**	4	2	6			
		Percent	2/3	1/4	1/9			
total general health score	**Normal**	**Frequency**	68	73	141	028/10	3	0/02(*)
		Percent	38/9	49/3	43/7			
	Mild	**Frequency**	60	50	110			
		Percent	34/3	33/8	34/1			
	Moderate	**Frequency**	46	21	67			
		Percent	26/3	14/2	20/7			
	Severe	**Frequency**	1	4	5			
		Percent	0/6	2/7	1/5			

(**) p-value 0.01&(*)p-value 0.05

It shows that there is no significant difference between the two groups of staff (military and civilian hospitals) in the subscales of physical symptoms, anxiety, insomnia, and depression of the General Health Questionnaire (GHQ-28) (P >0.05), but in the subscales of social dysfunction and the total general health score (P <0.05), there is significant difference between the two groups of staff (military and civilian hospitals). In other words, the frequency of symptoms of mental disorders in military hospital staff is higher than civilian hospital staff.

The results of this table also show that 177 health defender under study, both military and civilian (54.8%) had normal performance in terms of physical symptoms and 146 employees (45.2%) were suspected of not being in perfect physical health. A total of 170 military and civilian personnel under study (52.6%) had an anxiety and insomnia score lower than the cut-off point, indicating that they did not suffer from anxiety and insomnia, and 153 employees (47.4%) had a score higher than cut-off point which indicated they might have anxiety disorders and insomnia. 40 health advocates (12.4%) had normal functioning in terms of social functioning and 283 employees (87.6%) suspected of low social functioning. Similarly, 270 health workers (83.6%) did not have a diagnosis of depressive disorder due to the cut-off point, and 53 employees of the studied treatment (16.4%) suspected depression.

Table 3 shows the prevalence of mental disorders of health defenders according to demographic variables in military and civilian hospitals infected with the corona virus (COVID 19). It shows that there is no significant difference between the rate of mental disorders of health defenders in military and civilian hospitals involved in the treatment of patients with coronavirus (COVID 19) according to gender and job variables ($P < 0.05$), but there is a significant difference in age and occupation history variables ($P < 0.05$). In other words, the frequency of symptoms of the disorder in employees under 40 years of age and work experience less than 20 years is higher (Table 3).

Table 3:
Comparison of the level of mental disorders of health defenders according to demographic variables

Sig	*d.f*	x^2	Total	With disorder	Without disorder	demographic variables		
183/0	1	775/1	140	73	67	**Frequency**	Male	**Gender**
			43/3	22/6	20/7	**Percent**		
			183	109	74	**Frequency**	Female	
			56/7	33/7	22/9	**Percent**		
0/02(*)	1	110/6	214	131	83	**Frequency**	Under 40	**age**
			66/3	40/6	25/7	**Percent**		
			109	51	58	**Frequency**	Over 40	
			33/7	15/8	18/0	**Percent**		
0/04(*)	1	046/4	238	142	96	**Frequency**	Under 20 years	**occupational history**
			73/7	44/0	29/7	**Percent**		
			85	40	45	**Frequency**	Over 20 years	
			26/3	12/4	13/9	**Percent**		
469/0	3	534/2	31	20	11	**Frequency**	**Physician**	**Job**
			9/6	6/2	3/4	**Percent**		
			186	108	78	**Frequency**	**Nurse**	
			57/6	33/4	24/1	**Percent**		
			39	21	18	**Frequency**	**Paramedic**	
			12/1	6/5	5/6	**Percent**		
			67	33	34	**Frequency**	**Others**	
			20/7	10/2	10/5	**Percent**		

(**) p-value 0.01 & (*) p-value 0.05

Perceived stress levels of health defenders in military hospitals (mean perceived stress: 24.30) and civilian (mean perceived stress: 22.64) involved in the treatment of patients with coronavirus (COVID 19) with independent means test (t -test- Independent Samples Test), was reviewed. The results showed that there was no significant difference between the mean perceived stress of the two groups of staff (military and civilian hospitals) ($P < 0.05$). In other words, although the average perceived stress of military hospital staff is higher than that of civilian hospital staff, but this difference is not statistically significant.

Tables 4 and 5 show the mean perceived stress with respect to demographic variables in military and civilian hospitals infected with the corona virus (COVID 19).

Based on the results of Tables 4 and 5, the mean perceived stress of health defenders in military and civilian hospitals involved in the treatment of coronavirus (COVID 19) with respect to demographic variables by independent means (t-test) Independent Samples Test and one-variance analysis of variance (ANOVA) was evaluated. The results showed that there was no significant difference in age, job history and type of job (P <0.05), but there was a significant difference in gender (P <0.05). In other words, the average perceived stress of women is higher than men.

Table 4:
Comparison of the level of mean perceived stress of health defenders according to demographic variables

P	d.f	t	SD	M	Fre	demographic variables	
0/03(*)	321	2/137	8/305	22/38	140	**Male**	**Gender**
			8/702	24/43	183	**Female**	
0/07	321	1/713	8/737	24/15	214	**Under 40**	**Age**
			8/165	22/33	109	**Over 40**	
0/218	321	1/235	8/856	23/89	238	**Under 20 years**	**occupational history**
			7/714	22/55	85	**Over 20 years**	

(**) p-value 0.01 & (*) p-value 0.05

Table 5:

Comparison of the mean perceived stress of health defenders according to the job variable in military and civilian medical centers

P	d.f	F	Standard deviation SD	M	Fre	Job
736/0	319 3	424/0	8	25/16	31	**Physician**
			8/804	23/41	186	**Nurse**
			9/368	23/08	39	**paramedic**
			7/797	23/40	67	**other**
			8/579	23/54	323	**Total**

(**) p-value 0.01 & (*) p-value 0.05

Discussion And Conclusion

The aim of this study was to investigate the perceived stress and mental health of health defenders in military and civilian hospitals involved in the treatment of patients with coronavirus (COVID 19). The results of this study showed that the frequency of symptoms of disorder in military hospital staff is higher than the number of civilian hospital staff, which is consistent with the results of Jin Zhou et al. (33) and it could be due to more psychological problems in military personnel before the COVID epidemic, according to a study by Pan Xiao which showed that anxiety and depression were higher in military personnel than in civilian personnel that could be due to distance from home, the place of residence and being in more critical situations than civilian employees. (34) These results contradict the study by Liu who noted that military personnel are less likely to have psychological disorders than civilian personnel due to special training. (35)

On the other hand, the results of this study showed that the frequency of symptoms of disorder in employees with less than 20 years of work experience is higher, which is consistent with the study of Huang and Zhao, (36) which can be due to lower income and economic problems. Contrary to the results of the same study, which showed more psychological problems at older ages due to burnout and other responsibilities, it is probably due to the fact that in the above study, age was considered above 50 years, but in our study, old age It was based on 40 years. There was also no difference in the perceived stress of health advocates in military and civilian hospitals involved in the treatment of patients with coronavirus (COVID 19), which is consistent with the findings of Xing and Liu. (15, 16) It can be due to the increasing number of confirmed and suspected cases, high work pressure, lack of personal protective equipment, extensive media coverage, lack of access to certain drugs and lack of adequate support, and the above can lead to increased stress in the staff especially in the military treatment staff. (17-20)

Consequently, studies have shown that those who are afraid of infecting family members, friends, and co-workers are skeptical of what they are doing because they feel that they are labeled by community as virus carriers and also have high-level of stress, anxiety, and perceived depressive symptoms reported, which can have long-term psychological consequences. (17, 18, 21) Due to the fact that anxiety disorders are generally one of the most common disorders in military units (22) and also the addition of double pressure after COVID-19 to the military medical staff, has caused this group of medical staff to have a low level of mental health in social interaction and overall health score relative to civilian medical staff.

Given that the average perceived stress of military hospital staff is higher than that of civilian hospital staff, but this difference is not statistically significant, it may indicate that military staff, despite having more psychological problems than civilian hospital staff, due to Skills and training specific to the military environment have a perceived stress almost similar to that of civilian medical personnel. On the other hand, because this study was conducted early in the COVID 19 epidemic, it failed to show the perceived stress levels well in both groups, because the experience of medical staff in responding to SARS showed that its effects on medical staff mental health were not only short-lived but also has had long-term effects. (23, 24) The results show that the average perceived stress in female employees is higher than male employees, which can be related to the difference in physiological characteristics of the two sexes, which is different from the study of Pedroso. (37) Also, based on the results of this study, it was found

that the amount of perceived stress in different occupational occupations was the same, which is consistent with the study of Fernandez, (38) which may be related to the presence of these people in a similar situation in terms of stress. In this study, administrative staff and other departments not related to corona treatment were not included in the study.

This study, like other studies, had some limitations, including the fact that due to the timing of the study, i.e., about three months after the onset of the coronavirus 2019 pandemic, the long-term effects of this pandemic on psychological disorders were not yet evident. Of course, this limitation can be overcome by conducting continuous research. Information related to the mental health and perceived stress of military and civilian hospital staff in whom the study was conducted was not available in the time close to the pandemic for more accurate conclusions. Other factors, such as differences in budgets and facilities available in military and civilian hospitals, may have influenced the results of this study.

Finally, to reduce and prevent the psychological effects of this pandemic such as burnout, mental health problems, persistent stress syndrome on treatment staff in both military and civilian hospitals during the stressful period of Corona pandemic, there is need for support and intervention for appropriate psychology in the form of effective therapeutic models, including resilience strategies at the organizational and personal levels. As a result, providing psychological resilience interventions for the medical staff at the forefront of the crisis is one of the highest priorities during this epidemic.

Declarations

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