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**DISASTER  
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**M E D I C I N E J O U R N A L**

## **Evaluation of anxiety and professional competence of prehospital emergency medical personnel in COVID-19 pandemics**

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**EVALUATION OF ANXIETY AND PROFESSIONAL COMPETENCE OF  
PREHOSPITAL EMERGENCY MEDICAL PERSONNEL IN COVID-19  
PANDEMICS**

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**ABSTRACT**

**INTRODUCTION:** Emergency medical services (EMS) are an important part of the health care system. Decision-making is the most important part of their profession because they often have to make quick decisions and act on them despite critical situations. They are often the first to deal with a Coronavirus disease 2019 (COVID-19) patient and experience severe physical, mental, or moral stress. The aim of this study was to investigate the level of anxiety and professional competence of prehospital emergency medical personnel in the COVID-19 epidemics.

**MATERIAL AND METHODS:** This descriptive-analytical study was performed in 2021. A total of 200 prehospital emergency medical personnel were included in the study. Sampling method was census using a valid questionnaire of Corona Anxiety Scale and professional competence. Data analysis was performed using SPSS statistical software version 21 via descriptive statistics and analytical tests.

**RESULTS:** Mean and standard deviation of professional competence and anxiety of emergency medical staff were reported as  $82.37 \pm 65.13$  and  $98.17 \pm 11.11$ , respectively. The results of the study on the relationship between the scores of the studied variables showed a significant relationship so that the level of anxiety with competence was remarkably related ( $p < 0.05$ ).

**CONCLUSIONS:** The stress and anxiety of the COVID-19 epidemic might have adverse effects on the professional competence of prehospital emergency medical personnel as well as their mental health. Applying strategies to reduce anxiety and attending disaster-related courses could help the quality of EMS by improving professional competence.

**KEY WORDS:** anxiety; professional competence; COVID-19; prehospital emergency medical personnel

## INTRODUCTION

Emergency medical personnel receive specialized training to be first-aid workers in dealing with patients in critical condition. Prehospital emergencies are an important and key part of the health care system in society [1]. The important part of its activity is due to the exposure of a wide range of patients with life-threatening situations. The prompt and timely action of the emergency medical team leads to the prevention of disability and the saving of lives. Emergency medical services (EMS) are a key component of health care delivery, contributing significantly to the reduction of out-of-hospital mortality. In Iran, prehospital emergency medical personnel consist of nurses, emergency medical technicians (EMTs), emergency medical experts, and other relevant academic disciplines (operating room and anesthesia technicians). In addition, a prehospital emergency medical school has been established in nearly a decade in Iran. Therefore, approximately half of the human resources employed in EMS are nurses. Personnel with different grades and disciplines, such as nursing and medical emergencies, are all within the scope of this study and are considered as a professional collection of out-of-hospital EMS. The duties of each prehospital emergency medical

personnel are clearly defined and they act in decision-making based on guidelines and available resources [3].

Given the high importance of the medical emergency profession in the health system, it is important to examine the factors influencing the performance, job satisfaction, and reducing errors [4]. Due to dealing with patients with life-threatening, unconscious, or even death status, prehospital emergency medical personnel are facing daily stress [5]. Prehospital emergency medical personnel are exposed to a variety of stressors and unpredictable threats. As a result, they experience high levels of stress and suffer from chronic stress [6]. Studies have shown that 22% of prehospital emergency medical personnel experience stress-related complications and are more prone to anxiety, irritability, social isolation, sleep disturbance, job dissatisfaction, burnout, post-traumatic stress disorder (PTSD), high-risk behaviors, psychological problems, depression, and medical errors [7]. Stress has significant negative consequences for individuals, including reduced productivity and services, health problems, absenteeism from work, leaving work, and using drugs and psychotropic substances that might severely threaten their mental health [8].

Coronavirus, which has been prevalent in China since late 2019, is a terrifying and highly contagious disease. This virus has become a major crisis in many countries and has severely reduced both labor force and personal protection resources [9]. COVID-19 is a life-threatening virus in people with lung problems such as bronchitis, people with internal diseases, and especially people with weakened immune systems, the elderly, children, and pregnant women. By isolating infected people and using personal protective equipment, N95 mask, and medical gown for people in contact with the virus might be limited. COVID-19 disease is an emerging disease that is now becoming a major health challenge and concern worldwide. The outbreak of COVID-19 has become a worrying international public health emergency [10]. The number of COVID-19 cases and the resulting mortality rate are rising rapidly. COVID-19 is a serious threat to global health and the economy which has raised widespread concerns around the world [11]. Research shows that there is an urgent need for prehospital nurses and emergency staff to be prepared and professionally qualified [12]. In the time of crisis and emergencies, the first referral centers for the injured are hospitals and emergency centers. Emergency medical personnel are often the first to deal with COVID-19 cases and experience severe physical, mental, or moral stress [13]. They also may have doubts about their abilities or priorities, sometimes they may be overwhelmed by the fear of disease and prefer individual interests to collective interests, and be unable to make the right

decisions [14]. They also need moral courage and professional competence to escape the stress and tension caused by this global crisis, as well as to strengthen their decision-making power. Moreover, in critical situations such as the outbreak of COVID-19 disease, in addition to stress and anxiety, the burden of responsibility of this group of health care workers has increased, which itself requires the professional competence to provide care [15].

Professional competence refers to the ability to solve complex problems using a combination of knowledge, attitude and practical skills [16]. The need to provide quality care to patients by emergency medical personnel has made the concept of their clinical competence as one of the key issues in educational and clinical centers. Furthermore, the various factors such as a rapid change in health monitoring systems, the need to provide safe and cost-effective services, promoting the public awareness on health-related issues and increasing the expectation of receiving appropriate quality services, along with the willingness of health service providers to employ skilled labor, the clinical competence of health-related professionals has become increasingly important [17]. In order to maintain care standards, it is necessary to know the methods of development and promotion of clinical competence of prehospital emergency medical personnel. The results of various studies have shown that maintaining and improving the quality of patient care and increasing the capabilities and clinical competence of prehospital emergency medical personnel, is at the top of the plans of managers of EMS centers. To achieve this goal, one of the most fundamental missions of managers is to continuously assess their competence. However, there is still disagreement about the exact meaning of achieving clinical competence. However, the competence includes a wide range of preparations in various dimensions of cognitive, emotional, value, psychomotor and skills in the use of different technologies. Therefore, due to the importance of professional competence and the level of anxiety to provide care in the COVID-19 crisis situation, the research team decided to investigate the level of anxiety and professional competence of prehospital emergency medical personnel in the COVID-19 epidemics.

## **MATERIAL AND METHODS**

### **Study design**

This is a descriptive cross-sectional study conducted in 2021 with the aim of assessing the level of anxiety and professional competence of prehospital emergency medical personnel of urban, road, and urban emergency care units in facing the COVID-19 pandemic. The sampling method was available by sampling and inclusion criteria included a willingness to collaborate on the study, one-year of operational experience in emergency medical bases, and

operational presence from the beginning of the period of outbreak of COVID-19 to the time of performing the study.

### **Methods of measurements**

Corona Disease Anxiety Scale (CDAS) and professional competency assessment questionnaire in biological crises were used to collect data.

#### *Corona Disease Anxiety Scale (CDAS) Questionnaire:*

This tool has been developed and validated to measure anxiety caused by the outbreak of Coronavirus in Iran. The final version of this tool has 18 items and 2 components (agents). Items 1 to 9 measure psychological symptoms and items 10 to 18 measure physical symptoms. This scale is made in the Likert scale (never = 0, sometimes = 1, most of the time = 2 and always = 3). The reliability of this tool was obtained using Cronbach's alpha method for the first factor of alpha 0.879, the second factor of alpha 0.861, and the total alpha of the questionnaire 0.919 [11]. The value of  $\lambda$ -2 Guttman was obtained for the whole questionnaire as  $\lambda$ -2 = 0.922 and Cronbach's alpha coefficient for psychological symptoms as  $\alpha$  = 0.879), and physical symptoms as  $\alpha$  = 0.861 [12]. Research data of Alipour et al. (2020) [18] have a suitable fit with the two-factor model. Standard score tables will be drawn and the range of scores of the questionnaire agents and the total score of coronary anxiety severity were divided into three domains of non-anxiety or mild, moderate and severe based on standard T scores.

#### *Professional Competency Assessment Questionnaire in Biological Crises:*

This researcher-made questionnaire was prepared based on the competencies extracted from World Health Organization (WHO) and other sources to participate in biological crises and was used after confirming its validity and reliability. Content validation method was conducted with the opinion of ten faculty members and experts in the field of prehospital emergencies including health specialists in disasters and emergencies, emergency medicine specialists as well as emergency medical experts. The results showed that all questions are of CVI = 0.71 and CVR = 0.67. The reliability of the questionnaire questions was calculated after a preliminary implementation on 20 prehospital emergency operatives using Cronbach's alpha test calculated as 0.73. After obtaining the agreement and coordination with the relevant authorities, they referred to qualified individuals for sampling. After explaining the objectives of the research and obtaining their written consent for the participation of prehospital emergency medical personnel, the questionnaires were distributed among the

studied samples and filled out as a self-report. The researcher provided the necessary information on how to fill out the questionnaires and provided the researchers with their telephone numbers for asking possible questions. The time for returning the questionnaires was also coordinated with them.

### **Data analysis**

After returning the filled out questionnaires, data analysis was carried out by SPSS/21 via descriptive statistics including mean and standard deviation for quantitative and chi-square data, frequency and percentage for qualitative data and analytical tests were significant for all tests considered as 0.05%.

### **Ethical considerations**

After selecting the eligible participant, the researcher was introduced to them and the objectives of the study were elaborated for the participants. The informed consent was obtained from the subjects and they were assured that their information will remain confidential. The present study was approved by Ethical Committee Medical Sciences University of Shahrekord (Ethics code: IR.SKUMS.REC.1399.042).

## **RESULTS**

### **Characteristics of study subjects**

Findings of the study on the demographic characteristics of the studied samples showed that a total of 200 prehospital emergency medical personnel facing COVID-19 participated in this study. The age range of the participants was from 22 to 66 years old ( $33.42 \pm 7.14$ ). In terms of work experience, the participants had a history of 1 to 29 years ( $10.29 \pm 6.59$ ). The families of 52% of the participants were involved in COVID-19. Also, 52.5% of the samples were infected with COVID-19. In terms of participating in the exercise, the number of maneuvers varied from zero to forty. In terms of attending in crisis, it varied from zero to twenty. Moreover, in terms of the type of crisis participants attended, epidemic crises such as COVID-19 and floods had the highest and lowest rates of 38% and 8%, respectively. In terms of attendance in training courses, it ranged from zero to one hundred hours. In this study, 134 were married (67%), 124 (62%) had a bachelor's degree, 125 (62.5%) had experience in disaster-related training and 148 (74%) had experience in maneuvering. According to Table 1, the mean and standard deviation of professional competence and anxiety of prehospital emergency medical personnel were reported as  $37.82 \pm 13.65$  and  $17.98 \pm 11.11$ , respectively.

## **Main results**

Furthermore, there is no significant relationship between other professional functions and anxiety with the workplace ( $p > 0.05$ ). There is no statistically significant relationship between education level and mean professional performance score and anxiety ( $p > 0.05$ ). The results of the study on the relationship between receiving training with the mean score of occupational performance variables and anxiety indicate a significant relationship ( $p < 0.05$ ). The results of the study on the relationship between the experience of attending in crisis with the mean score of the variables of professional competence and anxiety revealed a significant relationship between all the studied variables with the history of participating in the crisis ( $p < 0.05$ ). Regarding the relationship between attendance in the maneuver and the average score of the variables of professional competence and anxiety, showed a significant relationship between all the variables studied with the history of participation in the crisis ( $p < 0.05$ ). Also, there was no statistically significant relationship between maneuver training and the mean score of the indicators ( $p > 0.05$ ). The results of independent t-test showed that the mean score of professional competence and anxiety in single employees were significantly higher than married employees being  $p < 0.05$ ,  $t = 0.41$  and  $p < 0.05$ ,  $t = 0.51$ , respectively. In addition, there was a significant relationship between the anxiety variable of the studied samples and COVID-19 symptoms. Anxiety levels were higher in people with COVID-19. But there was no statistically significant relationship between professional competence and COVID-19 symptoms (Tab. 2).

The results showed a significant relationship between the anxiety variable and family infection to COVID-19; as an individual with an infected member in his/her family experienced higher anxiety. Conversely, there was no significant relationship between the professional competence variable and family infection to COVID-19 (Tab. 3). Moreover, the findings indicated a significant relationship between anxiety and professional competence (Tab. 4).

## **DISCUSSION**

According to the findings of the current study, high severity of anxiety was reported which is in agreement to the previous studies carried out on SARS and Ebola. However, most studies have been performed on nurses and no study has been found on prehospital emergency medical personnel, to our knowledge. In the study of Lai et al. [19], nurses, physicians, and other health care workers experienced high levels of anxiety symptoms during the onset of



COVID-19 disease in Wuhan, China (50.4%) which is consistent with the results of the present study. Also in Rahmanian et al. [20] study, he reported the level of anxiety among the treatment staff as 46.91% which is consistent with the current study. However, in Abedi et al. [21] study, there was a significant relationship between receiving training and the mean score of professional competence and anxiety variables ( $p < 0.05$ ) which is in agreement with the current study. Ghaedamini et al. [21] study reported higher level of professional competence for the people who experienced critical and stressful situations which is consistent with the present study. In Rahmati et al. [22] study, it is shown that anxiety following corona is not high but is consistently higher than the average and is higher among employees than students, which differs from the results obtained in the study. The Mutlu et al. [23] study reported moderate to severe anxiety in prehospital emergency personnel, which is more common among married people. Personnel with chronic diseases have more anxiety, which is consistent with the results of the above study. Vatankhah et al. [24] study reported that psychological factors affect the level of personnel anxiety, which is also consistent with the results of the current study. Faustino et al. [25] study shows that COVID-19 increases anxiety and endangers the mental health of prehospital emergency personnel. In the study of Taghilou and Jafarzadeh Gharajag [26] there is a significant relationship between the effect of COVID-19 on burnout and job and professional performance. Also, they reported the performance of professional competence is reduced by 20% and there is a significant inverse relationship between job anxiety and the practice of professional competence which is in line with the aforementioned study. There was an inverse relationship in both articles and high stress affected professional competence and they reported their competence as moderate. There was no significant relationship between the level of education and professional competence of nurses in response to disasters in the study of Nejadshafiee et al. [27] which is consistent with the present study. In Chen et al. [28] study, the type of exposure and the number of patients with a critical situation affect the level of professional competence of nurses, which is consistent with the findings of the above research. In the study of Slobodin et al. [29] it was reported that the level of cultural competence of nurses is also affected by COVID-19, which online training related to crisis management leads to an improvement in the level of competence of nurses involved. The results of Darminto and Sugandi study [30] show that COVID-19 leads to a decrease in the level of professional competence which is not consistent with the results of the above research.

### **Limitations of the study**

The limitations of this study were the working conditions of the prehospital emergency medical personnel, who were likely to be called up and assigned at any time. Therefore, it sometimes made them difficult to access. Thus, appointments were coordinated with participants as much as possible during leisure and non-working hours. Another limitation of the study was the possibility of transmission of COVID-19 between researchers and study participants. We tried to hold the meetings outdoors as much as possible and in accordance with the health instructions.

## **CONCLUSIONS**

Given that more than two years have passed since the coronavirus outbreak, the various treatments proposed for COVID-19 which are not effective enough and the virus is still mutating. It has put a lot of pressure on the health care providers, especially the prehospital emergency medical personnel. Accordingly, addressing the factors that might reduce the stress and anxiety of these employees is of great necessity and importance. Also, due to the fact that the post-COVID 19 period does not have a specific date and after more than two years, the mental health of prehospital emergency medical personnel has undergone many changes; The Ministry of Health should make decisions to improve the mental health of the country's health care providers. Thereupon, it is necessary to examine the mental health of prehospital emergency medical personnel so as to receive psychological interventions along with training of effective mechanisms and reduction of job stress and psychological strategies.

## **Conflict of interest**

.All authors declare no conflict of interest

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**Table 1.** Determining descriptive indicators of overall professional competence score and anxiety in the study samples

Max	Min	M ± SD	Variables
56	13	13.65 ± 37.82	Professional competence
46	0	11.11 ± 17.98	Anxiety

**Table 2.** Correlation coefficient between having COVID-19 symptoms with the mean score of professional competence and anxiety variables in the study samples

t	p	SD	M	Having COVID-19 Symptoms	
				Variables	
1.32–	0.54	8.61	36.96	Yes	Professional competence
		8.27	38.54	No	
2.91	0.02	11.41	20.47	Yes	Anxiety

**Table 3.** Correlation coefficient between marital status and the mean score of the variables of professional competence and anxiety in the study samples

t	p	SD	M	Having COVID-19 Symptoms	
				Variables	
3.66-	0.62	8.29	35.79	Yes	Professional competence
		8.08	40.03	No	
2.23	0.01	12.00	19.65	Yes	Anxiety
		9.81	16.18	No	

**Table 4.** Correlation coefficient between professional competence and anxiety variables in the study samples

Anxiety	Professional competence	Variables	
**0.323-	*1	Pearson Correlation	Professional competence
0	0	(Significant (2-tailed	
200	200	Number	
*1	**0.323-	Pearson Correlation	Anxiety
0	0	(Significant (2-tailed	
200	200	Number	

Correlation is significant at the 0.05 level (2-tailed); \*\*Correlation is significant at the 0.01 \* (level (2-tailed