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RESEARCH ARTICLE

Nurses' Knowledge, Attitude, and Performance about Disaster Management: A Case of Iran

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Abstract:

Background:

Iran is a disaster-prone country in which many natural and man-made disasters happen every year. Because the health sector is vital due to its nature of treatment and rehabilitation of the injured after the disasters, all health care providers, especially hospital nurses, should be prepared to provide the services they need.

Objective:

The present study aimed to determine the level of knowledge, attitude, and performance of nurses about disaster management in teaching hospitals affiliated to Iran, Shiraz University of Medical Sciences in 2019.

Methods:

This cross-sectional and descriptive-analytical study was conducted on a sample of 230 nurses working in the teaching hospitals of Iran, Shiraz University of Medical Sciences, who were selected using the stratified sampling proportional to size and simple random sampling methods. The data were collected using a valid and reliable questionnaire containing 20 questions in three dimensions of knowledge, attitude, and performance. Then, the collected data were analyzed using SPSS 25.0 through independent samples t-test, ANOVA and Tukey tests at the significance level of 5%.

Results:

The results showed that the highest and lowest mean scores were related to the attitude (2.38 ± 0.19) and knowledge (1.70 ± 0.50) of the nurses, respectively. However, all three dimensions were at a moderate level. The results showed significant relationships between the mean score of performance and the gender, marital status, age, and work experience of the nurses. In addition, statistically significant relationships were found between the mean score of knowledge and their age and work experience ($p < 0.05$).

Conclusion:

According to the findings, the following suggestions can be made to increase the knowledge and performance of the nurses for being prepared in critical situations: reducing the duration and increasing the quality of training classes and workshops on disaster preparedness; providing some incentives for nurses, especially female, married, older, and more experienced ones to attend these classes; and improving the methods of training materials related to disaster management.

Keywords: Disaster management, Knowledge, Attitude, Performance, Nurses, Natural disasters.

Article History

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1. INTRODUCTION

Throughout history, human beings have always witnessed various natural and awesome disasters that have disrupted the

normal course of life and have resulted in human, financial, economic, and social losses, so that conventional sources could not respond to these needs. Unexpected events are categorized

as small and major disasters based on their size and number, as well as the volume of the population affected by them, which sometimes it can be difficult to restore conditions to their initial state [1]. The occurrence of natural disasters such as floods, earthquakes, hurricanes, etc. often has adverse effects on human societies and causes heavy casualties to their inhabitants. These events impose a wide range of economic and social burdens on countries by destroying community buildings and infrastructures [2].

The World Health Organization (WHO) has defined “disasters” as sudden ecological phenomena that require extra-organizational assistance. From the medical point of view, a “disaster” refers to an accident when the number of patients at a time reaches a point where more human and other resources are needed to treat and take care of the injured [1]. In order to identify and separate the disasters, it is better to categorize them and provide a basis for distinguishing them. According to Ansoff and McDonnell, disasters can be divided into three categories in terms of their occurrence:

1) The “creeping and gradual disasters”: They start from a system storm and gradually increase their scope and level due to the lack of attention and ignorance. Most of these disasters can begin from unknown and ambiguous points and show their signs at once. This form of disasters is usually chronic and, with a negative impact on social infrastructure, in combination with other types of disasters, exacerbates disaster situations. In this type of disasters, it takes time for small changes to lead gradually to fundamental results.

2) The “periodic disasters”: They depend on the circumstances of the regions. These disasters are familiar and, from the perspective of many managers, certain similarities can be found between them and other disasters that have occurred. These disasters occur at different historical times and are essentially not surprising. Predicting such disasters is relatively simpler, and historical experience is valuable for managing them.

3) The “sudden and unexpected disasters”: They appear at great speed and do not allow managers and people to respond in a timely manner. Sudden disasters are usually unprecedented and past experiences are not very effective in managing them [3].

On the other hand, “disaster management” refers to the process of reducing the risk of disasters using anti-crisis sources in an efficient and effective way. This process, in part of its duties as forecasting and prevention, will be able to provide appropriate training programs to increase public awareness of the dangers of natural disasters and make appropriate changes in people's behavior [4].

Iran is one of the most seismically active countries in the world because it is located on the Alpine-Himalayan earthquake-prone strip and the active land region. This country has experienced more than 130 sever earthquakes with a magnitude of 7.5 Richter or greater in the past centuries. Other

natural disasters have also occurred with different effects on communities and environments in different regions of Iran over the past years. The most important of these disasters are drought, storms, flu epidemics, and plant pests [5]. In addition, this country has experienced many earthquakes due to its vastness, geographical location and climatic diversity, so that in the last decade, 950 earthquakes occurred in Iran and, as a result, 376 thousand people were killed and 533 thousand people were injured, additionally the Bam earthquake casualties should also be added to this statistic [6]. In general, it can be said that 90% of Iran's population is exposed to the dangers of large-scale earthquakes and floods. Moreover, Iran ranks fourth in Asia and sixth in the world in terms of natural disasters, and Iran's earthquake vulnerability is 1,000 times higher than that of the United States and 100 times higher than that of Japan. In addition to natural disasters, given its political geography and strategic location in the Middle East, Iran has always been affected by disasters in neighboring countries, and man-made disasters such as war, chemical, microbial and especially nuclear pollution have always threatened this country [7] so that about 60,000 people were poisoned by chemical gases in its imposed war, and in more than 95% of these injured people, chronic complications were occurred [8]. Therefore, taking appropriate measures to minimize the effects of these disasters is one of the priorities of Iran's health system [7].

During disasters, hospitals and health centers are among the first organizations whose optimal and timely health care services can play a vital role in reducing mortality and rescuing the injured. Effective management of hospitals and health centers also has a significant effect on the optimal performance of these organizations [9]. However, numerous experiences across the world, specifically in Iran, have proven that confusion and chaos are the most common problems that hospitals face when dealing with disasters [10]. In responding to disasters, nurses have a constant presence and a key role, and having nursing skills is vital and valuable for nurses when disasters occur. Therefore, it is necessary for nurses, as the vital members of the medical staff, to be prepared to deal with these conditions and to help increase the efficiency of the community health promotion system by improving their knowledge and awareness about dealing with critical conditions [11]. Nonetheless, the results of some domestic and international studies have shown the poor to moderate attitude, knowledge and performance of health care workers about disaster preparedness and disaster management [4, 12 - 14].

Given the fact that the researchers found only a few studies on nurses' knowledge, attitude, and performance about disaster management in Iran, the present study aimed to determine the level of knowledge, attitude, and performance of nurses about disaster management in teaching hospitals affiliated to Iran, Shiraz University of Medical Sciences in 2019.

2. METHODS

This cross-sectional and descriptive-analytical study was conducted on all nurses working in the teaching hospitals affiliated to Iran, Shiraz University of Medical Sciences, in 2019. The sample size was determined at 230 nurses, according

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to the results of the pilot study and using the following formula, assuming $\alpha = 0.05$, $\beta=0.2$, $d=0.7$, and, $=3.78$. The samples were selected using stratified sampling proportional to size (each hospital was considered as a stratum) and simple random sampling (according to the nurses' personnel codes) methods. The inclusion criteria of the study were having at least one year of work experience and being willing to participate in the research.

$$n = \left(\frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta} \right)^2}{d^2} \times \sigma^2 \right) \approx \frac{(1.96 + 0.85)^2}{0.70^2} \times (3.78)^2 = 230 \quad (1)$$

The study data were collected using a questionnaire with two parts. The first part aimed to determine the studied nurses' demographic characteristics via six questions about their age, sex, marital status, education level, work experience, and number of work shifts per week. The second part of the questionnaire had been designed to measure the nurses' attitude, knowledge, and performance about disaster management using 20 questions divided into three dimensions of knowledge (6 questions), attitude (11 questions), and performance (3 questions).

A 3-point scale was used to measure the mentioned variables, in which 1 referred to "disagree" or "no", 2 to "to some extent" or "no comment", and 3 to "agree" or "yes". Then, the mean scores of nurses' knowledge (1-1.67 = low, 1.67-2.5 = moderate, and 2.5-3 = high), attitude (1-1.73 = low, 1.73-2.45 = moderate, and 2.45-3 = high), and performance (1-1.33 = low, 1.33-2.33 = moderate, and 2.33-3 = high) were classified.

This questionnaire had been designed by Azadi *et al.* (2018) and its reliability and validity had been confirmed in

their study ($\alpha=0.73$) [12].

2.1. Statistical Analyses

The collected data were analyzed using SPSS 25.0 through independent samples t-test (between the studied nurses' knowledge, attitude, and performance and their sex, marital status, education level, and the number of work shifts per week), ANOVA (between the studied nurses' knowledge, attitude, and performance and their age and work experience), and Tukey tests. A p -value < 0.05 was considered to be significant.

2.2. Ethics

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Code: IR.SUMS.REC.1398.1396). Oral informed consent was obtained from all nurses participating in this study and all of them were assured of the confidentiality of their responses.

3. RESULTS

All questionnaires were completed and returned to the researchers. The results showed that most of the studied nurses were female (81.30%), married (51.30%), in the less than 30 years age group (46.95%), and had a bachelor's degree (95.22%), and work experience of less than five years (41.74%). In addition, most of them (68.26%) had more than six work shifts per week (Table 1).

Moreover, the results indicated that the highest and lowest mean scores were related to the studied nurses' attitude (2.38±0.19) and knowledge (1.70±0.50), respectively (Table 2). Nevertheless, all three dimensions were at the medium level (Table 2).

Table 1. Demographic characteristics of the studied nurses (n=230).

Demographic Characteristics		Frequency (%)
Sex	Male	43 (18.70)
	Female	187 (81.30)
Marital status	Single	112 (48.70)
	Married	118 (51.30)
Age (year)	<30	108 (46.95)
	30-40	83 (36.09)
	>40	39 (16.96)
Education level	Bachelor's degree	219 (95.22)
	Master's degree	11 (4.78)
Work experience (year)	<5	96 (41.74)
	5-15	91 (39.56)
	>15	43 (18.70)
Number of work shifts per week	≤6	73 (31.74)
	>6	157 (68.26)

Table 2. Means and standard deviations of the studied nurses' knowledge, attitude, and performance about disaster management.

Variable	Mean	Standard Deviation (SD)
Knowledge	1.70	0.50

(Table 4) *contd.....*

Variable	Mean	Standard Deviation (SD)
Attitude	2.38	0.19
Performance	1.89	0.60

Table 3. The relationships between the studied nurses' knowledge, attitude, and performance about disaster management and their demographic characteristics.

Variable	Knowledge			Attitude			Performance			
	Mean ± SD	statistics	P-value	Mean ± SD	statistics	P-value	Mean ± SD	statistics	P-value	
Sex	Male	1.81±0.48	t=1.57	0.12	2.36±0.16	t=-0.79	0.43	2.05±0.49	t=2.24	0.03
	Female	1.67±0.5			2.39±0.20			5.58±1.58		
Marital status	Single	1.75±0.50	t=1.60	0.11	2.39±0.29	t=0.07	0.95	1.98±0.61	t=2.04	0.04
	Married	1.64±0.48			2.39±0.17			1.82±0.58		
Education level	Bachelor's degree	1.70±0.50	-0.09	0.93	2.38±0.19	t=-1.65	0.10	1.90±0.60	t=1.29	0.20
	Master's degree	1.71±0.57			2.48±0.20			1.67±0.56		
Number of shifts per week	≤6	1.62±0.46	t=-1.71	0.11	2.38±0.14	t=-0.56	0.69	1.92±0.62	t=0.48	0.63
	>6	1.74±0.51			2.39±0.22			1.88±0.59		
Age (year)	1) <30	1.83±0.46	F=8.29	P (1,2) < 0.001 P (1,3)=0.47	2.39±0.21	F=0.77	0.46	2.05±0.57	F=8.07	<0.001 P (1,2)=0.004 P (1,3)=0.003
	2) 30-40	1.56±0.52			2.39±0.18			1.78±0.62		
	3) >40	1.62±0.46			2.35±0.19			1.69±0.55		
Work experience (year)	1) <5	1.85±0.45	F=8.71	P (1,2) < 0.001 P (1,3)=0.03	2.39±0.21	F=0.07	0.94	2.11±0.56	F=11.35	<0.001 P (1,2) < 0.001 P (1,3)=0.001
	2) 5-15	1.57±0.53			2.38±0.20			1.75±0.60		
	3) >15	1.62±0.46			2.38±0.14			1.72±0.56		

Also, the results revealed significant relationships between the mean score of performance, and sex ($p=0.03$) and marital status ($p=0.04$), so that the mean score of performance were higher in male and single nurses. Furthermore, the studied nurses' knowledge and performance had significant relationships with their age and work experience ($p<0.001$), so that the mean scores of knowledge and performance were higher in the nurses whose age was under 30 years and had less than five years of work experience (Table 3).

4. DISCUSSION

Due to the nature of the activities and its role in the treatment and rehabilitation of the injured after the disasters, the health sector is a vital part of society. Therefore, all health service providers, particularly hospitals, need to be prepared to provide services at the time of disasters. It is also important to conduct studies on the unexpected disasters because their results help reduce the probability of repeating past mistakes and increase the ability to respond to the disasters [15]. The present study aimed to determine the level of knowledge, attitude, and performance of nurses about disaster management in teaching hospitals affiliated to Iran, Shiraz University of Medical Sciences in 2019.

The results showed that the highest mean score was related to the studied nurses' attitude. Accordingly, the nurses had a positive attitude towards the need for disaster preparedness and understood the necessity of educational programs in this field in the hospitals. These results are consistent with those of the studies conducted by Azadi *et al.* (2018) [12] and Jiang *et al.* (2015) [16], but not with those obtained by Soltani *et al.* (2016) [17]. The inconsistency between the results of this study and those of the research by Soltani *et al.* (2016) [17] can be attributed to the differences in climatic conditions in Yazd and

Shiraz in terms of the incidence of disasters, which has affected the need of nurses to have training programs for disaster management in hospitals.

In the current study, the lowest mean score was related to the studied nurse' knowledge. This implied that the nurses had little familiarity with disasters, their types and management as well as their role in disaster management. These results are similar to those of the research carried out by Soltani *et al.* (2016) [17], but not to the findings obtained by Azadi *et al.* (2018) [12]. The differences between these results might be due to the relatively higher familiarity of Ilam nurses with disasters and their management because of their greater presence in the related training courses and also their relatively higher awareness of the importance and necessity of holding such training courses.

The results of the present study showed significant relationships between the mean score of performance and the nurses' sex and marital status. Accordingly, the mean score of performance was higher among male and single nurses compared to female and married ones. These results indicated that male and single nurses were more likely to participate in the practical courses and disaster management maneuvers probably because of their less involvement in the family activities and having more leisure time for attending the hospital. Also, receiving new and updated training was more important for them. These results are consistent with those of the studies conducted by Azadi *et al.* (2018) [12] and Ahayalimudin *et al.* (2016) [18], but different from those obtained by Jiang *et al.* (2015) [16] that showed no significant relationship between performance and sex. This difference can be resulted from the number and type of disasters in the two countries, as well as differences in the type of cultures, the

degree of emphasis on the activities of each of the two sexes, and the extent of their involvement in occupational and family activities.

The current study results revealed significant relationships between the mean scores of knowledge and performance and the studied nurses' age. Accordingly, the mean scores of knowledge and performance were higher among the nurses aged below 30 years. This could be attributed to the fact that younger nurses are usually more willing to acquire new and up-to-date awareness and to increase their knowledge level in order to find more employment opportunities for themselves in the future. On the other hand, nurses with higher work experience are often busy and have a lot of responsibilities; consequently, they have less time to devote to attending such courses. As a result, younger nurses are more aware of the disasters and disaster management, and have better performance at the time of disasters. These results are in line with those of the research by Soltani *et al.* (2016) [17], but not with the findings obtained by Ahayalimudin *et al.* (2016) [18], Nofal *et al.* (2018) [19], Jiang *et al.* (2015) [16], Azadi *et al.* (2018) [12], and Imani *et al.* (2011) [4], which indicated no significant relationships between knowledge and performance, and the studied samples' age. This contradiction can be related to the differences in the mean age of the samples investigated in these studies.

The present study results demonstrated significant relationships between the mean scores of knowledge and performance, and the studied nurses' work experience. Accordingly, the nurses with less than five years of work experience had better knowledge and performance in comparison with the two other groups. Considering the fact that in the hospital wards, the workload is usually higher for the younger employees and nurses, so it is not far-fetched that these nurses need to participate more in disaster preparedness workshops and gain more knowledge and awareness. Indeed, because individuals with higher work experience have usually taken part in practical classes in previous years, they do not consider participating in new workshops with more up-to-date content as their job and education priorities because of their high job responsibilities. Therefore, they usually attend less in these workshops. These make nurses with less work experience both more aware of the disasters and disaster management, and better perform in this area. These results were in agreement with those of the studies conducted by Nofal *et al.* (2018) [19], and Soltani *et al.* (2016) [17]. However, the results of the present study were not similar to those of Jiang *et al.* (2003), Adenekan *et al.* (2016) [20], Sonneborn *et al.* (2018) [21], Imani *et al.* (2011) [4], and Azadi *et al.*'s (2018) [12] studies. Future studies are recommended to be conducted in order to clarify the reasons for this inconsistency.

In the present study, there were no significant relationships between the mean scores of knowledge, attitude, and performance and other studied nurses' demographic characteristics such as education level and number of shifts per week. Similar results were also obtained by Soltani *et al.* (2016) [17].

The present study, like other studies, had some limitations, including its cross-sectional design and the data collection only

using a questionnaire.

CONCLUSION

The results of the present study showed that the highest and lowest mean scores were, respectively, related to the studied nurses' attitude and knowledge about disaster management. However, all three dimensions were at a moderate level. Also, the results showed significant relationships between the mean score of performance and gender, marital status, age, and work experience as well as between the mean score of knowledge and their age and work experience.

According to the findings of the study and due to the need for nurses to be present at the time of disasters to play their professional and managerial roles, in order to increase their level of knowledge and performance for being prepared in critical situations, the following suggestions can be made: reducing the duration of training classes and workshops on disaster preparedness for nurses, especially for female and married ones, and increasing their quality; providing some incentives for nurses, especially for older and more experienced ones; holding more training classes and workshops on disaster management using new and up-to-date topics so that everyone can attend such workshops with regard to his/her work and leisure times; improving the methods of training materials related to disaster management using more interactive techniques; and applying creativity in planning the training courses, including the use of disaster management training applications or computer simulation techniques.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Code: IR.SUMS.REC.1398.1396).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all nurses participating in the study.

AVAILABILITY OF DATA AND MATERIALS

The data from this study will be made available by the corresponding author on request.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest, financial, or otherwise.

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