

# Research Paper: Preparedness of Nurses for Crises and Disasters in Imam Khomeini and Social Security Hospitals of Saqqez



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## ABSTRACT

**Background:** Disasters outside of human control can severely affect public health. In addition, the lack of appropriate planning and preparedness to face disasters can exacerbate the problems emerging from disasters. The current study aimed to determine the preparedness of nurses in facing disasters.

**Materials and Methods:** This was a cross-sectional study conducted on 257 nurses of the Imam Khomeini and Tamin Ejtemaei hospitals of Saqqez in 2017 using the census method. Demographic forms and a questionnaire consisting of knowledge, attitude, and performance were used to collect data.

**Results:** In this study, there were 86(33.5%) men and 171(66.5%) women with the mean age of 33.9±7.3 years. The mean score of knowledge (36±11.9), attitude (65.3±11.02), performance (51.9±27.5), and preparedness (153.2±31.3) was higher than that of the average values. The result showed that knowledge was correlated with age (P=0.010). Also, there was a correlation of attitude with marriage (P=0.017) and performance with gender (P=0.0103) and management experience (P=0.002).

**Conclusion:** The result of the study showed that the score preparedness of the nurses was average, which was undesirable. It is recommended that the nurses should be provided continuous training to deal with disasters by creating an appropriate environment and motivating them to improve preparedness conditions.

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## 1. Introduction

Since the very beginning of creation, human beings have been suffering from various natural and human-made disasters and have incurred a lot of financial losses and fatalities. Today, despite scientific advances, incidents and disasters result in many casualties and financial losses for governments and nations [1]. Disasters and related incidents account for more than 90% of deaths in developing and less developed countries [2]. In 2010, 385 natural disasters occurred in 131 countries that resulted in around 300,000 casualties and affected more than 200,000 people worldwide; these disasters caused damage of about \$120 billion [3, 4].

The global incidence of disasters has increased by 60% over the past decade, which has led to a loss of 2 million people, 4.2 million injuries and displaced people, and 33 million unsheltered people and affected a total of 3 billion people [5, 6]. Iran, as one of the top ten most vulnerable countries in the world, is one of the most disaster-prone geographical areas, with almost 90% of its population exposed to natural hazards [7, 8]. It is the fourth country in Asia after India, China and Bangladesh and the sixth in the world in terms of being affected by natural disasters [9]. In recent years, in addition to floods, local storms, and mild earthquakes, a national disaster has also occurred every 10 years [10].

According to the Global Assessment Report on Disaster Risk Reduction, Iran's risk of natural disasters is eight out of ten, which is very high [11]. The World Health Organization defined incidents and disasters as a situation in which the local equipment and tools necessary to protect human lives have been destroyed due to natural or human-made disasters [2]. In another definition, unexpected disaster is considered as a situation in which the necessary equipment and facilities lose their normal functioning in the event of a natural and human-made disaster, and the community fails to meet the healthcare needs and demands [1].

Given that disasters affect health, well-being, and welfare of the community, the provision of timely and appropriate health services by hospitals and health centers, as the first units serving and responding to people, is the main cause of survival and death reduction in the aftermath of such incidents [12]. Therefore, hospitals should have a pre-designed operational program to cope effectively with disaster-induced emergencies. The absence of such a program will increase the disorder and confusion in the disaster management process [13]. Hospitals

lose their ability to provide appropriate health services if they are not prepared or damaged at times of disaster and subsequently, a secondary crisis occurs [9].

The study of Soltani et al. (2016) in Yazd hospitals showed that nurses' preparedness in the field of knowledge, attitude, and practice of coping with accidents and disasters was low [14]. Similarly, the study of Rahmati Najarkolaei (2016) in Nezami Hospital [15] and Ghanbari et al. (2011) in Razi Hospital in Tehran [16] showed that nurses' preparedness score against disasters and incidents in these two hospitals was moderate to low. Also, Hosseini Shokouh (2008) in a study examined the preparedness of hospitals and nurses and showed that 9.5% of the hospitals were good at disaster management, 28.6% were poor, and 61.9% were moderate [17]. Studies have shown that, despite the existence of guidelines in hospitals, nurses' preparedness is poor. This results in confusion and improper management at the time of disasters [14].

Therefore, hospitals and healthcare centers, as active and important organizations in disaster management, should be prepared for incidents and disasters so that they can respond and provide healthcare appropriately and quickly [18]. The Zagros geological zone, which covers a large part of Kurdistan province and Saqqez city, is one of the most disaster-prone regions of the country. Hence, the present study was conducted to determine the preparedness of nurses in Imam Khomeini and Social Security Hospitals of Saqqez with regards to accidents and disasters.

## 2. Materials and Methods

This cross-sectional study was carried out in 2017 on 257 nurses working in the Imam Khomeini and Social Security Hospitals of Saqqez who were selected using the census method. The inclusion criteria included willingness to participate in the study, having at least high school diploma, and having at least 6 months of work experience as a nurse in one of the hospital wards. Data were collected using a demographic form and the Nurses' Disaster Preparedness Questionnaire, which included three parts of knowledge, attitude, and practice. The knowledge section has 20 questions that measured the information and knowledge of people regarding disasters and incidents; the correct answer is scored (4), and the incorrect answers were given no score. The scores ranged from 0 to 80.

The attitude section also contained 20 questions, whose scores ranged from very high (score 4) to very low (score 1); A higher score indicated a better attitude. The total

scores ranged from 20 to 80. The practice section contained questions about the hospital's functional situation regarding nursing staff's measures to deal with disasters. This section included 25 two-option questions with yes (4 points) and no (0 points) responses; The total scores ranged from 0 to 100. In total, a high score in this questionnaire means having appropriate knowledge, attitude and practice, or proper preparedness in dealing with crises and disasters.

The total score of this questionnaire varied from 20 to 260. To assess the preparedness level, a score of less than 70 represents poor level, 71 to 140 is moderate, 141 to 210 is moderate to high, and 211 or more is high level. The validity and reliability of this researcher-made questionnaire were confirmed in the study of Burhan Nejad [19]. The internal consistency of this questionnaire was 0.76 based on Cronbach's alpha coefficient. After explaining the research objectives to hospital officials and participants, the questionnaires were distributed anonymously, and the participants were assured of the confidentiality of the information. Data were analyzed

by SPSS software using descriptive statistics (mean, standard deviation, frequency, and percentage), Pearson's correlation, independent t-test and ANOVA. Significance was less than 0.05.

### 3. Results

In this study, a total of 257 nurses consisting of 86 men (33.5%) and 171 women (66.5%) with an average age of  $33.9 \pm 7.3$  years and an average work experience of  $10.10 \pm 7.4$  years participated. The majority of samples were married (181 people, 70.4%) and had a bachelor's degree (166 people, 64.6%). The results of the study showed that the mean score of knowledge, attitude, and practice was  $36.11 \pm 11.9$ ,  $65.3 \pm 11.02$ , and  $51.9 \pm 27.5$ , respectively, and the total score of preparedness was  $153.2 \pm 31$ . This indicates a moderate to high level of samples in all three items. Other demographic characteristics are presented in Table 1.

The results of Pearson's correlation test showed that knowledge had a direct and significant linear relation-

Table 1. Demographic profile table of the studied units by sex

Variables	Sex		P	Total
	Male (86 People)	Female (171 People)		
Mean age (years)	32.9±6.7	34.5±7.6	0.089	33.9±7.3
Mean work experience (years)	9.3±6.4	10.4±7.3	0.223	10.1±7.04
Crisis training hours	1.2±5.1	1.2±3.4	0.141	1.5±4.03
Marital status	Single	26(34.2%)	50(65.8%)	76(29.6%)
	Married	60(33.1%)	121(66.9%)	181(70.4%)
Education level	Diploma	10(22.2%)	35(77.8%)	45(17.5%)
	Associate degree	12(50%)	12(50%)	24(9.3%)
	BA	56(33.7%)	110(66.3%)	166(64.6%)
	MA	8(36.4%)	14(63.6%)	22(8.6%)
History of dealing with disaster	Yes	36(43.9%)	46(56.1%)	80(31.1%)
	No	50(28.6%)	125(71.4%)	175(68.1%)
History of membership in the disaster committee	Yes	16(53.3%)	14(46.7%)	30(11.7%)
	No	70(30.8%)	157(69.2%)	227(88.3%)
Management experience	Yes	20(50%)	20(50%)	40(15.6%)
	No	66(30.4%)	151(69.6%)	217(84.4%)

**Table 2.** Relationship between the scores of knowledge, attitude, practice and total scores (preparedness) of samples with demographic variables

Variables	Knowledge	Attitude	Performance	Total (Preparation)	Statistical Test	
Age	r=0.160	r=0.044	r=0.017	r=0.091	Pearson correlation	
The result of the statistical test	P=0.010	P=0.481	P=0.875	P=0.148		
Sex	Male	35.1±8.7	65.4±11.3	57.9±27.6	158.4±31.5	Independent t-test
	Female	36.5±13.3	65.3±10.9	48.9±26.9	150.6±31.02	
The result of the statistical test	P=0.314	P=0.903	P=0.0103	P=0.165		
Marital status	Single	36.32±12.5	62.78±9.76	50.94±25.34	150.05±28.83	Independent t-test
	Married	35.86±11.75	66.38±11.36	52.4±28.35	154.6±32.32	
The result of the statistical test	P=0.784	P=0.017	P=0.70	P=0.141		
History of dealing with the disaster	Has	35±12	65.82±13.65	56.6±27.8	157.4±36.2	Independent t-test
	Does not have	36.41±12	26.02±9.67	50.03±27.23	151.4±28.95	
The result of the statistical test	P=0.421	P=0.580	P=0.099	P=0.218		
Management experience	Has	36.8±11.92	66.6±10.55	64.4±24.83	167.8±30.04	Mann-Whitney U
	Does not have	35.85±11.98	65.08±1.11	49.67±27.35	150.6±30.91	
The result of the statistical test	P=0.646	P=0.426	P=0.002	P=0.022		
History of membership in the crisis committee	Has	32.53±10.9	66.4±11.1	64.53±24.7	163.4±36.65	Independent t-test
	Does not have	36.45±12.03	65.2±11.02	50.3±27.42	151.9±30.42	
The result of the statistical test	P=0.091	P=0.570	P=0.007	P=0.220		
Education level	Diploma	39.91±11.32	64.1±12.14	54.48±29.9	158.4±32.41	Analysis of variance
	Associate degree	34.66±10.43	68.7±10.82	56.33±28.8	159.7±38.36	
	BA	35.1±12.24	64.7±10.84	49.1±27.19	148.9±30.05	
	MA and above	36.36±11.63	68.72±9.33	63.63±18.75	168.7±23.7	
The result of the statistical test	P=0.103	P=0.139	P=0.079	P=0.110		

ship with age while the intensity of this relationship was very weak ( $P=0.00$ ;  $r=0.160$ ) (Table 2). This means that the knowledge score increased by increasing the age. There was no linear relationship between knowledge score and other variables ( $P<0.05$ ). Also, the results of t-test showed that there was a significant difference between attitudes among single and married nurses, indicating that married people had a better attitude than single subjects ( $P=0.017$ ).

For the normal distribution of variables, parametric tests of t-test and analysis of variance were used. The

results of statistical tests showed that the samples had a significantly different performance ( $P=0.103$ ) with respect to gender. The results of the independent t-test showed that the performance score based on the history of membership in the crisis committee ( $P=0.007$ ) and management history ( $P=0.002$ ) was significantly different. Accordingly, the male subjects and those with a history of management and membership in the hospital crisis committee showed better performance. Also, it was found that the total scores of knowledge, attitude, and practice, which measures the preparedness of the samples, had a significant difference only regarding the

history of management ( $P=0.022$ ). This indicates that the subjects with a history of management had better preparedness for crisis and disaster than others. There was no significant correlation between preparedness and other variables ( $P<0.05$ ).

#### 4. Discussion

The present research was conducted to assess the preparedness of nurses for incidents and disasters. The results of this study showed that the mean score of nurses' preparedness was moderate to high, which is far from the desired score. Among the three items measured for preparedness, the knowledge score was moderate to low, the practice score was moderate, and the attitude score was moderate to high. In consistence with the present research findings, Jourvand et al. [20] reported a moderate level of employee preparedness for disasters in a study conducted on 66 healthcare workers of Dehloran in 2012. They measured three items of knowledge, attitude, and practice and reported that knowledge and performance were at a weak level and attitude was at a good level.

In Jourvand et al. [20] research, all healthcare workers in various urban and rural areas and even those under high school diploma were included while only nurses participated in the present study. Their study was different from the present research in terms of the number of samples and preparedness measurement tool. Soltani et al. (2016) [14] assessed the knowledge, attitude, and practice of 220 nurses in Yazd with respect to natural disasters. They reported that the mean score of nurses' knowledge was moderate, the attitude and practice score was moderate to high, and the total score of knowledge, attitude and practice was moderate.

The total score was similar to that of the present research while there was little difference in the knowledge score. The difference in the knowledge score of Soltani's research with present research can be due to the difference in nurses' preparedness measurement tool. Also, the results of the present study were consistent with the study by Imani et al. (2011) [24] that reported the knowledge score of 250 nurses in Bandar Abbas to be at a moderate level. A series of studies showed poor preparedness of healthcare personnel. In a study conducted in Zanjan hospitals, the knowledge of 77% of managers and supervisors was at a weak level.

The results of the study by Fung et al. (2008) [21] in Hong Kong, Duong et al. (2009) [22] in Australia, and Katz et al. (2006) [23] in Hawaii showed that nurses have poor knowledge in disaster management due to the lack of proper

training. In a study by Langan and James (2005), cited by Soltani et al. [14], physicians' and nurses' information about unexpected incidents and disasters was insufficient.

Their knowledge was at an unacceptable level in this regard even when the majority of them had passed the courses on disaster management for doctors and nurses. In general, the results of the present research and the research carried out in this area showed that health care personnel are not well prepared for disasters and incidents. The reasons may include the indifference of authorities and nurses to incidents and disasters, the nurses' lack of motivation, and the Hospital Crisis Committee's failure to conduct proper training and exercise maneuvers. On the other hand, despite the importance of training in improving the level of knowledge and ability of nurses in dealing with incidents and disasters, the organizational structure and the responsibilities of the education department in the hospital are unclear. This leads to the lack of proper training in the field of disasters and incidents.

The other result of the present research showed a direct and significant relationship between knowledge and age. Accordingly, the score of knowledge increases with increasing age. The result is inconsistent with the results of Soltani et al. (2016) [14] and Imani et al. (2011) [24] who reported that there was no relationship between age and knowledge. It seems that the crisis and disaster knowledge becomes more important for nurses as their age increases. Thus, the older the nurses, the more likely they are to acquire knowledge in this field. In addition, the reason for the difference between the studies of Soltani et al. (2016) [14] and Imani et al. (2011) [24] with the present research can be related to the use of different measurement tools. In the study of Imani, the level of individuals' awareness was measured only in the area of disaster management.

The other result was the relationship between the variables of sex, membership record in hospital committee, and management history with practice item. It means that male nurses and those with longer management record as well as those with a history of membership in the crisis committee had better performance than other nurses. This result was consistent with the result of the study by Soltani et al. (2016) [14]. The better performance of men in this study can be attributed to the fact that the male participants were significantly more disaster-trained than women. Moreover, other factors include the high number of male members in the Hospital Disaster Committee and their greater history of management.

It seems that people with a history of management and members of the Disaster Committee are more likely to provide better performance than other people due to them being more associated with disasters and incidents. Also, the results of the study showed that the preparedness score, which is the total score of knowledge, attitude, and practice, was only related to the management history and had no relationship with other demographic variables. Regarding the fact that the main challenge in nurses' preparedness for incidents and disasters is management issues [25], nurses with a history of management have shown greater preparedness.

The results of the study showed that nurses did not have a good level of preparedness despite their critical position in helping victims of disasters and accidents. The reasons for moderate preparedness of nurses can be the low level of knowledge due to lack of proper training and low motivation of nurses to be prepared for incidents and disasters. Moreover, the lack of incentives, lack of space, equipment, and facilities to perform maneuvers, and unfavorable working atmosphere and environmental conditions were the other factors contributing to the moderate preparedness level of the nurses. We suggest that there is a requirement of 1. constant and continuous training for preparedness for disaster, 2. an appropriate training environment, and 3. appropriate incentives to nurses.

## 5. Conclusion

Considering the average readiness of nurses of Imam Khomeini and Ta'min-e Ejtema'i Hospitals in Saqqez, the need for training courses in preparation for Emergencies and disasters seems necessary.

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## Conflict of Interest

The authors declared no conflicts of interest.

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