

Evaluation of the factors predicting nurses' attitude to phase of preparedness to respond to disasters

Evaluación de los factores que predicen la actitud de las enfermeras en la fase de preparación para responder a los desastres

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Abstract

Abstract: Introduction: human life and property have always faced unpredicted and deadly crises throughout the history. Iran ranks sixth in terms of occurrence of natural disasters.

Objective: This research was conducted to evaluate the factors predicting the nurses' attitudes to phase of preparedness to respond to disaster.

Methodology: This cross-sectional research was conducted on 384 nurses working in educational centres of Rasht in 2016-2017. A researcher-developed questionnaire was used to collect data. The research tool included three sections of demographic characteristics, knowledge, and attitude of nurses with regard to preparedness to respond to disaster. The collected data were analyzed using descriptive and inferential statistics such as Spearman correlation coefficient and logistic regression analysis through SPSS 21 software ($p < 0.05$).

Results: The research results revealed a positive relationship between knowledge and attitude and the knowledge score was considered as a predictor of attitude (OR = 1.638, $p = 0.00001$). In addition, employment history (OR = 1.072 and $p = 0.024$) and having kit of items needed in disaster (OR = 20.746 and $p = 0.004$) were considered as predictors of desirable attitude.

Conclusion: The present research revealed that increasing the knowledge level of nurses, having a kit of items required in disasters, and increasing their employment history can increase their attitude, leading to their improved practice in providing effective response to disasters.

Keywords: attitude, disasters, nurse, predictive factors.

Resumen

Resumen: Introducción: la vida y la propiedad humanas siempre han enfrentado crisis imprevistas y mortales a lo largo de la historia. Irán ocupa el sexto lugar en términos de ocurrencia de desastres naturales.

Objetivo: esta investigación se realizó para evaluar los factores que predicen las actitudes de las enfermeras en la fase de preparación para responder al desastre.

Metodología: esta investigación transversal se realizó en 384 enfermeras que trabajan en centros educativos de Rasht en 2016-2017. Se utilizó un cuestionario desarrollado por un investigador para recopilar datos. La herramienta de investigación incluyó tres secciones de características demográficas, conocimiento y actitud de las enfermeras con respecto a la preparación para responder al desastre. Los datos recopilados se analizaron mediante estadísticas descriptivas e inferenciales, como el coeficiente de correlación de Spearman y el análisis de regresión logística a través del software SPSS 21 ($p < 0.05$).

Resultados: Los resultados de la investigación revelaron una relación positiva entre el conocimiento y la actitud, y la puntuación del conocimiento se consideró un predictor de actitud (OR = 1,638, $p = 0,00001$). Además, el historial de empleo (OR = 1.072 y $p = 0.024$) y tener el kit de artículos necesarios en el desastre (OR = 20.746 y $p = 0.004$) se consideraron factores predictivos de la actitud deseable.

Conclusión: la presente investigación reveló que aumentar el nivel de conocimiento de las enfermeras, tener un conjunto de artículos requeridos en desastres y aumentar su historial de empleo puede aumentar su actitud, lo que lleva a su práctica mejorada para brindar una respuesta efectiva a los desastres.

Palabras clave: Actitud, desastres, enfermera, factores predictivos.

In general, the crisis refers to a sudden (more severe than a normal), surprising and threatening event caused naturally or by human and it imposes hardships on the human community, so that fundamental and extraordinary measures should be taken to eliminate them¹. Global disaster reports have announced 60% increase in incidents and disasters over the past decade. Moreover, the rate of deaths has increased from 600,000 to more than 1.200.000 in world². Comparing the world's continents in terms of natural and abnormal disasters suggests that the Asia continent ranks first among the five continents³, so that 335 natural disasters in world were reported in this continent in 2009. In this regard, Asia accounted for 40.3% of the total crises, and about 89.1% of deaths and 38.5% of total economic losses⁴. With a population of over 70 million people, Iran faces with several natural and human-made crises⁵.

As natural disasters affect the health and well-being of the community, providing appropriate health services is considered as a major factor in survival and reducing mortality and well-being in stages after these incidents and the need to adopt quick and proper decisions and implement the operations, the theoretical and fundamental principles have created a knowledge titled crisis (disaster) management⁶. Crisis management represents a process in which managers find preparedness to cope with the crisis and they respond appropriately and help service providers and people in providing the service, if it occurs⁷. The four main components of crisis management include: reducing the damage, preparedness, emergency response (responsibility), and recovery¹. Since the key to success in any crisis is having appropriate preparedness, this stage has particular importance. In fact, major crises and disasters are controlled successfully through well-developed plans. Hospitals and health care teams are responsible for unpredicted incidents. The public health competence required for effective and efficient response to a crisis involves a set of knowledge, skills, and abilities, described by team members. Competencies are also a combination of measurable and visible skills of knowledge, behavioral performance, and attitudes of people required to enhance the employees' practice and organizational success. In short, competence is beyond knowledge or attitude. It describes the behavior of workforce⁸.

Among the studies conducted in this regard, we can refer to the study of Ling Jiang et al under the title of knowledge and attitude and the level of skill in nursing practice in providing service during storm in Chinese nurses. The results of the mentioned research showed that there was not a positive relationship between knowledge and attitude or between knowledge and practice, but there was a positive relationship between nurses' attitudes and

their practice⁹. In addition, Tahereh Soltani et al examined the knowledge and attitude and practice in disaster management among nurses in Yazd city and they did not show a positive relationship between knowledge and attitude¹⁰. Thus, factors affecting attitude from the nurses' viewpoint should be taken into consideration. As Iran is one of the seven most vulnerable countries in world and given the fact that the Gilan province is one of the disaster-prone provinces of Iran, and as few similar studies have been conducted in Iran and no similar study has been conducted in Gilan province in this regard, this research was conducted to evaluate the factors predicting the nurses' attitude to phase of preparedness to respond to disasters in 2016-2017.

The current research was analytical and cross-sectional study. The research population included 384 nurses of health centers of hospitals in Rasht city. They were selected by using stratified sampling. Samples were selected in proportional to each hospital and in each unit. The sample size was estimated based on the preliminary studies conducted by Fatema Abdulalim et al.¹¹ and Samayela Ayiba et al.² and Ling Jiang et al⁹, so that total number of nurses was 1696 and the sample size was determined 384 with ratio of 22.6%. Poursina Hospital included 4 subjects (21%), Heshmat Hospital included 53 subjects (14%), Shafa Hospital included 47 subjects (12.5%), Razi included 76 subjects (20%), Amir al-Momenin Hospital included 22 subjects (6%), Al Zahra hospital included 29 subjects (6.6%), 17Shahrivar Hospital included 42 subjects (11%) and Velayat Hospital included 27 subjects (7%). The questionnaires were randomly distributed in all units of each hospital based on its demographic distribution (number of nurses to the total number of hospital nurses) in different shifts and within a one-week time interval and they were filled out with presence of the researcher in the research environment. Then, they were collected and analyzed. The research inclusion criteria included nurses working in educational centers of Rasht who were willing to complete the questionnaire and exclusion criteria included lack of willingness continue to complete the questionnaire after announcing the consent to complete the questionnaire and inappropriate psychological status of the person completed the questionnaire.

The data collection tool included researcher-developed questionnaire. It included three sections of 1-Demographic characteristics 2-examining the knowledge 3-and examining the attitudes in nurses. Demographic characteristics included the first five questions on age, gender, type of hospital, level of education, employment history, and year of employment, and job position and some question on disaster to examine the 1- personal history of an

individual in coping with disasters. 2. Type of educational courses completed with regard to disasters management 3. Having a kit of items required during the disasters 4. Presence of hospital disaster committee, and 5- being member of hospital disaster committee

The knowledge section included 11 questions, determined by questions 1 to 11 of the questionnaire. The Attitudes section included 33 questions, examined by answers of strongly agree, agree, disagree, strongly disagree, and no idea. It included the questions 1 to 33 of the questionnaire, scored based on a 5-point Likert scale, ranging from strongly agree (5), agree (4), no idea (3), disagree (2), and strongly disagree (1). The question 12 was scored due to the content of the question (strongly disagree 5 to strongly agree 10). To determine the scientific reliability, the views of 10 faculty members of Nursing and Midwifery School of Shahid Beheshti of Rasht were used. After collecting the views and suggestions of the professors and making the necessary reforms, the final questionnaire was developed. The reliability of the questionnaire was examined by completing the questionnaire by 20 nurses. After two weeks, the questionnaires were re-completed by the same nurses. After approving the research project at the Research and Technology Deputy of Faculty of Nursing and Technology in Gilan University of Medical Sciences and after coordinating with the nursing offices of all hospitals and taking the consent of samples, the questionnaire was distributed among the research subjects. They had 20 minutes to answer the questions. After collecting the data, they were analyzed using descriptive and inferential statistics and relevant statistical tests. Variables such as age, education level, employment history and type of hospital were analyzed using Kruskal-Wallis test and the variables of gender and job position were analyzed using Mann-Whitney test. To examine the predictor factors with regard to nurses' attitude, LR and backward logistic regression model was used and all the variables with $P > 0.1$ in the ANOVA analysis, were included into model. Among them, the variables of knowledge and employment history and having the kit of items required during the disaster were finally included into model. The data were analyzed by using SPSS 21 software and significance level was considered $p < 0.05$. This study was approved by the Ethics Committee with the code of GUMS.REC.1395.227.

The research results with regard to frequency of demographic variables including age, type of hospital, job position, employment history and having background knowledge on disasters showed that the highest percentage of participants (56.9%) had age 30-40 years. the results also showed that 53.8% of participants had an employment history of 5-10 years, and

99% of them had nursing job status and only 1% had position higher than nursing. The results revealed that the highest number of nurses (21.9%) was working in Poursina Hospital and the lowest number of nurses (6.5%) was working in Amir al-Momenin Hospital. Moreover, 88.3% of them stated that they did not have kit of items required during disasters and only 11.7% of nurses had it. In addition, 90.1% of them were not members of Disaster Committee (Table 1).

Table 1. Frequency distribution of the nurses of included into model in the ANOVA analysis of attitude and knowledge

Variable		Number (%)	mean	SD
Age group	Younger than 30 years	120(31.3)	32.61	5.86
	30-40 years	218 (56.9)		
	Older than 40 years	45 (11.7)		
Employment history	Below 5 years	74(19.3)	9.79	5.39
	5 to 10 years	206(53.8)		
	Over 10 years	103(26.9)		
Job position	nurse	379(99)		
	Supervisor	4(1)		
Hospital type	Shafa	47(12.3)		
	Heshmat	53(13.8)		
	17 Shahrivar	42(11)		
	Razi	76(19.8)		
	Velayat	27(7)		
	Amir Olmomenin	25(6.5)		
	Alzahra	29(7.6)		
	Poursina	84(21.9)		
Having kit of items required during disaster □	yes	45(11.7)		
	no	338 (88.3)		
Presence of disaster committee at hospital	yes	362(94.5)		
	no	21(5.5)		

Based on the results of (Table 2), correlation between knowledge score and attitude and controlling the individual and occupational variables in the research subjects in relation to the preparedness to respond to disasters is high, and there is relationship between knowledge score and the attitude both quantitatively and qualitatively, so that with increasing the level of knowledge, attitude improves. The Spearman's correlation coefficient of knowledge and attitude was $r = -0.253$ and $p < 0.0001$, indicating a direct, positive and weak correlation between the knowledge score and the attitude of the nurses in relation to the stage of preparedness to show response to disasters. With increasing knowledge level from poor to moderate and high level, the percentage of desirable attitude increased by 59.3, 84 and 96.3%, respectively (Table 2).

Table 2. The level of correlation between knowledge score and attitude and controlling the individual and job variables in research subjects with regard to the stage of preparedness in showing response to disasters

	Relatively desirable attitude		Desirable		Total		Spearman's correlation coefficient
	n	%	n	%	n	%	
Knowledge attitude	22	70.40	32	59.3	54	100	
	44	16	231	84	275	100	
	2	70.3	52	96.3	54	100	
	68	80.17	315	82.8	383	100	

In multivariate analysis of examining the relationship between knowledge and attitude of nurses on preparedness in disasters with controlling the demographic variables, logistic regression model through LR and backward regression method was used. In this model, all variables with $p < 0.1$ in the ANOVA analysis of attitude and knowledge were entered the model (Table 3). The results of the final model show that with the control of individual, social, and job demographic variables, the knowledge score is considered as a predictor of attitude, so that by increasing the score of knowledge, the attitude of the desirable attitude increases by 1.638 times. In addition to the knowledge score, employment history with $P = 0.024$ and having a kit of items required during disaster with $p = 0.004$ are considered as predictors of desirable attitude, so that with increasing employment history and having a kit of items required during the disasters, the odds of desirable attitude increase by 1.07 and 20.7 times (Table 3).

Table 3. Regression coefficients and relative odds of predictive factors related to attitudes based on logistic regression model

Model	Variables studied	Regression coefficient	SD	Significance level	Relative odds	95% confidence interval	
						min	max
Primary model	Knowledge score	0.506	0.085	0	1.658	1.402	1.96
	Hospital type	0.02	0.059	0.737	1.02	0.908	1.146
	age	-0.029	0.039	0.455	0.971	0.9	1.408
	Employment history	0.092	0.045	0.04	1.097	0.004	1.198
	Job position	9.086	9824.484	0.999	8829.914	0	0
	Having kit of items required during disaster	2.994	1.061	0.005	19.968	2.497	159.688
	Presence of Disaster Committee in hospital	-0.590	0.713	0.408	0.554	0.137	2.24
	Constant value	-10.277	9824.484	0.999	0		
Final model	Knowledge score	0.493	0.083	0	1.638	1.393	1.926
	Employment history	0.069	0.031	0.024	1.072	1.009	1.138
	Having the kit of items required during disaster	3.032	1.056	0.004	20.746	2.616	164.519
	Constant value	-2.309	0.571	0	0.099		

Discussion: Since attitude is the relatively permanent organizing of beliefs about an object or position, which prepares a person to react in a particular direction and is a state of preparedness to differentiate between stimuli or preparedness for a quick reaction to a particular stimulus¹² and as nurses are the largest subgroup of health system staff, their general understanding of disasters is important and their positive or negative attitude is effective in the level of their preparedness in disasters. The present study was conducted to evaluate the predictive factors related to attitude of nurses with regard to respond to disasters in 2016-2017. The results showed a positive relationship between knowledge and attitude and knowledge is considered as a positive predictor for desirable attitude. In addition to knowledge, employment history and having a kit of items required in disasters are also considered as positive predictors for the desirable attitude. Increased knowledge affects the attitude of people with regard to disasters, and as knowledge of people increases, the person would better understand the disasters and tries to eliminate the existing obstacles. Nurses, as the largest subgroup of health system staff, should have adequate information and knowledge and get preparedness to show respond to disasters. In fact, nurses require adequate knowledge and skills to achieve the appropriate quality and attitude in order manage the disaster. The majority of nurses (97%) do not have adequate knowledge of the stage of disaster preparedness, so the researchers recommended that education to be provided for nurses in this regard¹³.

Nazrabadi et al also reported that lack of knowledge and preparedness were factor involved in creating the emotional pressures in performing their duties in such difficult conditions and the World Health Organization considers preparedness and trained personnel as one of the factors involved in reducing the rate of injuries caused by disasters⁶. Khankeh et al reported that trained staff is one of the factors facilitating the provision of health services, leading to increased competence in health system staff in responding to disasters. Thus, the most important issue that should always be considered by health services providers in order to reduce the complications of disasters is development of a training program for staff to perform their duties in this area. Bartly et al also reported that educating and training of health staff was a major component of disaster preparedness⁶. Several educational strategies can be used for disaster education, including lecture, seminar, distance education or Internet, background experiences, databases or computer-aided learning and formal discussions, which enhance the nurses' knowledge and skills¹³ and as attitude plays major role in developing the behavior of individuals in relation to the environment, people with positive behavior are willing to behave positively with regard to environment. In fact, attitude plays the mediating role in the relationship between information received and our responding to that information¹⁴.

More employment history is associated with more experience which is effective in the control of the disaster.

The experiences of people can be major factor, which is effective in nurses' ability in responding to disasters, if they have up-to-date knowledge and skills, they can act more effectively and with higher self-esteem and less mistakes^{9,13}. Moreover, having kits containing items required in disasters can be associated with positive attitude of nurses in disasters and make them have better and higher preparedness. Having a kit containing items required in disasters at work setting or at home means that the nurse has a better understanding of disasters and positive attitude towards disasters, so they can help their families or their compatriots during disasters. Results of our study were not in line with those of research conducted by Ling Jiang. In his study, Jiang examined the knowledge and attitude and skill level and practice of nurses in storms in 4 hospitals in China. He did not find a positive relationship between knowledge and attitude. In addition, contrary to our study, the employment history was reported as predictive of a desirable attitude, so that with an increase in employment history, deniable attitude increases by 1.7 times. Jiang reported that nurses with a mean age of 5-10 years had a higher attitude and with an increase in employment history, desirable attitude decreases⁹. The reason for this disagreement might be due the fact that most of nurses with more employment history have more experience and knowledge on disaster as Iran is one of the disaster-prone country.

In this regard, Soltani et al did not found a positive relationship between knowledge and attitude in a study entitled examining the knowledge, attitude, and practice of nurses in management of disasters in Yazd city¹⁰. In addition, other predictors such as age and employment history did not show positive relationship with attitude. In their study entitled "The role of nurse in emergency preparedness in the Zarya region of northern Nigeria", Samaya Ayuba reported that 55% of nurses strongly supported the need to have adequate supplies of emergency facilities and equipment. Fema also stated that nurses should have kits of disasters at work place and their cars². The results of our research are in line with their results, increasing their attitudes towards disaster preparedness. In his study entitled "examining the knowledge and attitude of emergency nurses and medical staff in eastern coastal areas of hospitals in Malaysia, Limodin reported that none of the demographic variables affected the attitude¹⁵. In his study entitled "perception and attitudes of emergency medical students on crisis management preparedness," Alrezini stated that knowledge should be included in these students' curriculum, and knowledge was reported as predictor of positive attitude. In his study, he reported that the knowledge of students was poor to moderate level¹⁶⁻²³.

Conclusions

The research results suggest that there is a positive relationship between knowledge and attitude and knowledge is considered as a positive predictor for the desirable attitude. In addition to knowledge, employment history and the kit containing items required in disasters were also reported as positive predictor of desirable attitude. In order to enhance the nurses' attitude, required in management and control of crises and disasters, their knowledge should be increased by holding operational manoeuvres and preparing the pamphlets and educational brochures on disasters at hospitals.

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