Relationship Between Nurses' Decision-Making Style and Their Disaster Response Competencies

Fatemeh Aliakbari, MSN, PhD; Masoumeh Ghaedamini, MSN; Fatemeh Deris, MS; Reza Masoudi, MSN, PhD

ABSTRACT

Nurses are the first respondents to the critical situations and therefore must be able to effectively manage the critical situations using their competencies. Given that the decision-making style under the stressful critical situations is an important component of the care process in these situations, this study was conducted with the aim of determining the relationship between decision-making style and nurses' disaster response competencies.

This descriptive, analytical study was conducted in Shahr-e Kord city in 2018. A total of 300 nurses were selected from Ayatollah Kashani and Hajar hospitals by multistage sampling and from the Emergency Medical Services Center by the census method. Data were collected using the Disaster Nursing Competence Assessment and the decision-making style questionnaires and analyzed with SPSS 21 (IBM Corp, Armonk, NY).

Most of the nurses used the intuitive decision-making style and the total score of disaster nursing competencies was 162.58 ± 22.70. Pearson's correlation coefficient indicated that there was a positive relation between decision-making style and nurses' disaster response competencies.

The results show that decision-making style affects nurses' competencies for disaster response and provides evidence for the development of educational policies in disaster nursing education.

Key Words: competence, decision-making style, disaster, nurse

During recent years, the number and intensity of disasters have increased dramatically across the world. According to the statistics of Centre for Research on the Epidemiology of Disasters (CRED) in 2019, 348 natural disasters occurred around the world, of which 141 disasters occurred in Asia. These disasters affected approximately 69 million people worldwide and led to the death of 11 804 people.[1-3] Iran is located in the central region of Asia and is geographically one of the most susceptible geographical areas to disasters. The Global Assessment Report (GAR) in reducing disaster risk in 2016 showed that Asia was the most affected continent by natural disasters, both in terms of death (72%) and affected people (60%) and Iran's risk rate in 8 out of 10 in terms of facing with the natural hazards. Earthquake, floods, droughts, and war are the most significant unexpected incidents and may lead to substantial mortality rate, economic damage, and victim's population in Iran.[4,5]

According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) report, 1900 cities were affected on April 9 at 8:00 UTC in Iran and only in Shiraz flash floods, at least 20 died and 94 were injured; besides that, the emergency situation was declared in Dezful, Khuzestan Province, southwest Iran.[6]

Disasters have a widespread health impact on the affected community, and nurses are among the first health care workers providing care to the victims. It is therefore essential that nurses are adequately prepared and have the necessary competencies to effectively respond to disasters.[7,8]

Morality and damage rates are minimized by accurate and timely response to disasters.[9,10] The nurses are expected to be adequately experienced and have the necessary skills to be able to effectively manage disaster-related, critical situations, using their competencies.[11] The roles of nurses during disasters include responding to critical situations, hazard detection, providing nursing care to the victims, managing the health team, reducing or eliminating the injuries and morality, developing the health care policies, and exploring and collaborating with other organizations.[12,13]

Currently, the concept of disaster nursing competencies has no standard and integrated definition, but some have defined it as the nurses' ability in specific situations and as a combination of knowledge, skills,

and behaviors required to be ready to carry out a job or special task for responding to disasters.[14] One of the comparably more important competencies for nurses, especially nurse leaders, in disasters is decision-making.[15,16] Veenema et al. concluded that nurse leadership competencies in highly ambiguous situations were incorporated in the allocation of scarce resources (eg, space, staff, supplies) and decision-making for disaster management, such as evacuation and patient transfers.[17]

The decision-making style under stressful critical situations is an important and influential component of the care process in these situations. The decision-making style represents the method or pattern of habit that a person adopts when making decisions and is based on the level of information or method of receiving and analyzing information.[18] In other words, every person's decision-making style is his/her personality approach to understanding and responding to the decision-making process. By understanding these styles, we are able to understand people's different decisions under the same conditions.[19] In 1979, Harren proposed 3 decision-making styles, namely, *rational*, *intuitive*, and *dependent*. Intuition-based decision-making is mostly based on our consciousness. Unplanned and unexpected situations are often resolved by using this type of decision-making.[20,21]

Also, Scott and Bruce (1995) pointed out that prior theorizing and empirical research were only dealing with the structure of the decision, and not the decision maker's personality. They identified 4 decision styles from earlier research and defined them as *rational*, *intuitive*, *dependent*, and *spontaneous*.[22]

Decision-making in the nursing profession is one of the basic concepts; if decisions are made early and correctly, they can improve the quality of care, accelerate the treatment process, reduce the treatment costs, and provide patient safety.[23,24] Therefore, knowledge about the relationship between decision-making styles and the nurses' disaster response competencies can help formulate an appropriate solution to select empowered nurses to attend the disaster teams, maintain and improve the nurses' disaster response competencies, and be used as the foundation for developing disaster nursing leadership educational programs.[17]

A literature review had revealed that no study has yet been conducted on the relationship between nurses' decision-making style and their disaster response competencies. Therefore, the aim of the current study was to investigate this relationship.

METHODS

This correlational descriptive-analytical study was conducted in 2018 on 300 clinical nurses who worked in Ayatollah Kashani and Hajar teaching hospitals and Emergency Medical Services Center in Shahr-e Kord. The Iranian Nursing Society Review Board approved the study protocol (AHD-207-IRB-1396). We used systematic random sampling, and a total of 300 nurses were selected from a list of 812 nurses employed in Ayatollah Kashani and Hajar teaching hospitals and Emergency Medical Services Center. We first calculated the sampling interval by dividing the total number of nurses in the population (total nurses employed in Shahr-e Kord, n = 812) by the number of samples we assumed to be sufficient (n = 335). In this case, the sampling is 2.42(σ3). We then select a number between 1 and the sampling interval from the random number table. Nurse no. 3 was assigned as the first nurse. We then counted down the list starting with household no. 3 and selected each third nurse. For example, the second selected household was 3 + 3, or no. 7. It should be noted that when we reached the end of the list, we selected an adequate number of nurses.

The inclusion criteria included being employed and having at least 1 year of clinical experience. The exclusion criteria included lack of volunteering to participate or not filling out the questionnaire. The questionnaire was administered to 335 nurses, and a total of 300 completed questionnaires were returned.

After clarifying the study purposes and obtaining the written consent from the nurses to participate in the study, the nurses were allowed adequate time to complete the competence assessment in disaster response and the decision-making style questionnaires (paper-pen method) until the completion of their shifts. Moreover, the researcher reminded them that their participation in the study would be voluntary and their information would be kept confidential.

The disaster nursing competence assessment questionnaire designed by Aliakbari et al. for the Iranians was used in this study. This questionnaire consists of 2 parts. The first part addresses the demographic information and the second part consists of 50 questions, 44 of which rated on a 5-point Likert scale from very high (5) to very low (1), assess the management competency (questions 1-12), specific personal competencies (13-21) and technical competencies (22-44) and 6 of which (45-50), rated on a 4-point Likert scale from rarely (1) to always (4) assess the level of ethical and legal competencies of nurses in disaster response.[15] The minimum and maximum attainable scores in all domains are 50 and 244, respectively; obtaining a higher-than-average score indicates the optimality of nurses' disaster response competencies. This questionnaire is a valid and reliable tool. The validity of the tool has already been investigated and approved by Ali Akbari et al. The internal consistency by Cronbach's α coefficient has been reported to be higher than 0.88 for all subscales of the questionnaire and 0.96 for the whole scale.[25] The test-retest method was also used to assess the reliability of the questionnaire. For this purpose, the questionnaire was twice administered to 20 nurses (not included in the main study) with a 2-week interval. The correlation coefficient

TABLE 1

Descriptive Indexes of the Decision-Making Styles Score	
Decision-Making Styles	**Mean ± Standard Deviation**
Rational	18.7 ± 2.82
Intuitive	19.09 ± 2.44
Dependent	16.90 ± 2.61
Avoidance	13.61 ± 3.80
Immediate	13.0 ± 3.65

TABLE 2

Descriptive Indexes of Nurses' Competence in Disaster Response in Different Domains			
Nurses' Competency Areas in Responding to the Disaster	**Mean ± Standard Deviation**	**Minimum**	**Maximum**
Management	38.19 ± 7.10	17	60
Personal	30.91 ± 5.23	16	45
Technical	60.12 ± 20.73	33	109
Ethical and legal	29.29 ± 2.97	11	24
Overall score	162.58 ± 22.70	89	238

between the 2 administrations in all subscales of the questionnaire was higher than 0.9.

We used the decision-making questionnaire of Bruce-Scott to assess the nurses' decision-making style. This questionnaire consists of 25 questions that addresses 5 decision-making styles: rational, intuitive, dependent, avoidance, and immediate. Each style is measured by 5 questions that are rated on a 5-point Likert scale. Minimum and maximum possible scores on each style are 5 and 25, respectively, with higher scores indicating the dominance of the style in question. Hadizadeh Moghadam in 2008 studied the validity of this questionnaire in Iran and confirmed its content validity.[26] Zare et al. in 2012 have obtained the reliability of the questionnaire calculating the Cornbrash's alpha coefficient for the whole scale of 0.75.[27] In the current study, the Cornbrash's alpha coefficient was used to estimate the reliability of the tool and the result was 0.7. Data were analyzed by SPSS version 21 (IBM Corp, Armonk, NY) using descriptive (including frequency, percentage, mean, and standard deviation) and analytical statistical tests (including independent t-test, 1-way analysis of variance [ANOVA], Tukey's post hoc test, and Pearson's correlation coefficient).

RESULTS

We investigated the relationship between the decision-making style and the nurses' disaster response competencies. Among 300 nurses participating in this study, 258 were female (86%), 246 were married (82%), 278 had bachelor's degrees (92.7%), 64 worked in the infectious heart and internal wards (22.9%), 195 had no disaster-related in-service training (65%) provided by the hospital for nurses in crisis preparedness, 222 had no participation in the some type of simulation training exercise (74%) provided by the Nursing System Organizations or the Nursing Scientific Association and are trade and scientific organizations, and 261 had no experience of working in disasters (87%). The age range of the participants was 23 to 55 years (mean: 62.34 ± 5), and the mean (± standard deviation) of their work experience was 9.96 ± 6.41 years. The dominant decision-making style in the studied samples was the intuitive style with the mean (± standard deviation) of 19.09 ± 2.44 (Table 1). The mean

and standard deviation of our participants' disaster response competencies in different domains are shown in Table 2.

The results of independent-t test showed that the mean scores of disaster response competencies were significantly higher in the male nurses than in the female ones ($P < 0.001$, t = 478.4), but there was no significant difference in dominant decision-making style between male and female nurses ($P < 0.05$).

The mean score of the nurses' disaster response competencies was significantly higher in the nurses with master's degrees than in the nurses with bachelor's degrees ($P < 0.01$, t = -2.611), but there was no significant difference in dominant decision-making style between the 2 groups ($P < 0.05$).

The mean score of competencies was significantly higher in the nurses with the disaster-related in service-training experience than those without such training ($P < 0.001$), but there was no significant difference in dominant decision-making style between the 2 groups ($P < 0.05$).

The mean score of nurses' disaster response competencies was significantly higher in the nurses with the maneuver participation experience ($P = 0.001$, t = -7124), but there was no significant difference in dominant decision-making style between the 2 groups ($P < 0.05$).

There was no significant difference in terms of the dominant decision-making style between nurses with and without history of participation in disaster ($P < 0.05$).

There was a significant direct relationship of age and work experience with competence in our participants ($P < 0.01$), so that as age and length of experience increased, their disaster competencies became higher. However, there was no significant linear relationship between the age and work experience with the dominant decision-making style ($P < 0.05$).

We used Pearson's correlation coefficient to study the relationship between decision-making style and nurses' competencies in responding to disaster, and the results showed that there was

TABLE 3

Relationship Between the Dominant Decision-Making Style Score and the Overall Score of the Nurses' Competence Disaster		
	The Dominant Style of Decision-Making (Intuitive)	
Variables	The correlation coefficient (r)	P value
Competency of nurses in disaster response	0.138	*0.017

*$P < 0.05$

a direct significant relationship between the dominant decision-making style score (intuitive) and overall scores of nurses' disaster response competencies ($P < 0.05$).

As the intuitive decision-making style score increased, the overall scores of disaster response competencies increased (Table 3).

DISCUSSION

All decisions, including those made under stressful critical situations, need thorough consideration. Taking into account these styles, we are more likely to understand people's different decisions under the same conditions, and these decisions may influence a whole chain of future studies.[16] Decision-making in the nursing profession is one of the basic concepts; if decisions are made early and correctly, they can improve the quality of care, accelerate the treatment process, reduce the treatment costs, and provide patient safety.[28]

Knowledge about the relationship between decision-making styles and the nurses' disaster response competencies can help formulate an appropriate solution to select empowered nurses to attend the disaster teams. Moreover, taking into account this relationship is important to maintain and improve the nurses' disaster response competencies and prepare nurses for critical situations[29]; the current study showed that the intuitive decision-making style was the dominant style, followed by rational, dependent, immediate, and avoidance styles.

Benner, in this regard, believes that the type of nurses' decision-making and judgment determines their clinical competence level; the more clinical competence level the nurses have, the higher their intuitive aspect of judgment and decision-making.[29]

In the current study, we observed that the nurses' competence in the disaster had a statistically significant relationship with age, education level, work experience, workplace, and disaster-related in-service training experience as well as participation in the maneuver; however, it had no statistically significant relationship with hospital wards. These results were in agreement with the results of Yuo et al. who reported a

statistically significant relationship between the nurses' disaster response competencies with age, work experience, disaster-related training experience, and participation in the maneuver experience.[30]

Kim and Park also conducted a study with the aim of investigating the effective factors on nurses' disaster response competencies; they reported that the participation in the disaster experience and the disaster-related knowledge had the greatest impact on the nurses' disaster response competencies,[31] which is consistent with our results. Rizany also considered the education level as one of the effective factors on the nurses' disaster response competencies.[32]

In this study, the maneuver participation experience was also significantly related to the nurses' disaster response competencies. Al Thobaity found that maneuvers were substantial and useful tools for gaining knowledge and skills to deal with disaster.[33]

The current study also indicated that there was no significant relationship between gender, age, education level, work experience, wards, disaster-related training maneuver and disaster participation experience, and the dominant decision-making style (intuitive) in the nurses ($P < 0.05$). According to the tool developer, the reason for not finding a significant relationship can be that the general decision-making styles are not influenced by demographic characteristics of individuals, but they can be influenced by their personality traits.[34] Therefore, the results of this study confirmed the view of Beliz Ülgen et al. regarding the interpersonal and personality nature of the general decision-making styles.[35]

Bahrami et al. concluded that, in Iranian context, a competent disaster nurse should have the decision-making ability, fast action, holistic view for decision-making, and critical thinking that are similar to the results of the current study.[15]

The results of this study are consistent with the results of Kashaninia et al. (2015), which showed there was no statistically significant relationship of gender and education level with intuitive decision-making style.[36]

In studies by Kashaninia et al. and Sadler-Smith, there was no significant difference between males and females in using the intuitive decision-making style.[36,37] Miller and Hill found no statistically significant difference in the score of the intuitive decision-making style of nurses working in different wards.[29] Few articles have so far addressed this subject so this study emphasizes a need for education in disaster management competence, especially in decision-making for nurses because today most of education otherwise are based on experience and routine rather than scientifically evaluated impact. One of the limitations of the present study is that the results were obtained in a specific setting, which necessitates conducting similar studies in other countries on nurses' competencies

and dominant decision-making styles. Future studies should also seek to identify and explain other factors effective on nurses' competencies.

CONCLUSION

The current study showed that the intuitive decision-making style was the most frequently used style among the nurses. There was a significant relationship between the decision-making style and the nurses' disaster response competencies. Education level, age, and work experience were among the factors contributing to nurses' disaster response competencies. Therefore, health planners should consider the factors that influence nurses' competencies, such as their education level, age, and work experience, in order to empower them in responding to disasters. Maintaining the nurses' disaster response competencies at an optimal level is of great importance for ensuring the high quality of nursing care delivered to victims of disasters and their families. Besides that, nurses must observe rules in disaster situations and take into account legal issues in decision-making in critical situations and comply with the rules related to providing care in disaster situations. We hope that this study will help guide future research on the underlying factors that affect nurses' disaster response competencies.

About the Authors

Community-Oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Islamic Republic of Iran (Dr Aliakbari, Ms Ghaedamini, Dr Masoudi); Department of Epidemiology and Biostatistics, School of Health, Shahrekord University of Medical Sciences, Shahrekord, Islamic Republic of Iran (Ms Deris).

Correspondence and reprint requests to Reza Masoudi, Community-Oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Islamic Republic of Iran (e-mail: masoodi1383@yahoo.com).

Author Contributions

FA and MG are both co-principal investigators of the study, responsible for all aspects of study design and data collection. RM contributed to all data-related components of the study and drafting the manuscript. FD contributed to the data collection/analysis and critical revisions for important intellectual content and administrative, technical and material support.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Ethical Considerations

This article was derived from a master thesis approved by the Ethics Committee of Shahrekord University of Medical Sciences (code: SKUMS.REC.1396.207). The objectives of the study, test methods, confidentiality of the participants' information, and voluntary participation in the study were explained to the study subjects, and they provided written consent to participate in the study.

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