

## The Disaster Preparedness and Professional Quality of Life among Nurses in Emergency Rooms of Regional Emergency Medical Center

Min-Hee Lee and Kye-Ha Kim<sup>†</sup>

### Abstract

The purpose of this study was to investigate the disaster preparedness and professional quality of life among nurses in emergency departments. The participants in this study were 56 nurses in emergency departments in two cities. The data were collected by questionnaires survey from January to August 2016. All statistical analyses were performed using SPSS ver. 23.0 program. Participants' disaster preparedness was different according to position ( $t=-2.32, p=.004$ ), type of working ( $t=-2.32, p=.004$ ), and frequency of traumatic events ( $F=5.26, p=.009$ ). There were significant differences by gender ( $t=2.88, p=.006$ ), desire for continuous work in the emergency room ( $t=2.95, p=.005$ ), and job satisfaction ( $F=10.81, p < .001$ ) in compassion satisfaction. Burnout was different according to gender ( $t=-2.05, p=.045$ ), choice of an emergency department ( $t=-2.37, p=.021$ ), desire for continuous work in the emergency room ( $t=-2.31, p=.025$ ), and job satisfaction ( $F=11.99, p < .001$ ). Disaster preparedness and compassion satisfaction had positively significant correlations. Compassion satisfaction of nurses in emergency department was an important variable that should be considered to improve their disaster preparedness.

**Keywords:** Disasters, Emergency service, Hospital, Compassion fatigue, Burnout

### 1. Introduction

Disaster is often a complex physical, social, economic, or political event that does not conform to a defined form, or can not determine clear boundaries. It is also considered as something that can harm people's life, body, property and the nation<sup>[1]</sup>. According to the National Security Agency<sup>[2]</sup>, the number of accident casualties caused by natural disasters in recent 10 years is 270 people and 3,718 in fire. Despite the fact that the death toll and the disappearance were counted except for the injured people, it shows that it gives a lot of life damage. In recent years, dozens and hundreds of accident casualties have been caused by large-scale social disasters such infectious disease of Mers, fire accident in Uijeongbu apartment, collision accident on Yeongjong bridge in Incheon, and sinking of Sewol ferry, and as the scale of these disasters becomes bigger, the scale of damage becomes more serious.

Disasters that pose a threat to many lives can appear at any time, in any form, to an unspecified number of people. Most disasters affect public health, which leads to a surge in medical demand, especially for medical personnel. Thus the disaster preparedness of medical personnel should be thoroughly prepared and flexible so that they can respond effectively to disasters<sup>[3]</sup>. Furthermore, nurses should be able to clearly recognize the value and validity of their role from disaster themselves in order to protect nursing personnel from disaster threats and to be effective in nursing activities, either personally or collectively, in the event of a disaster<sup>[4-6]</sup>. Chapman and Arbon<sup>[7]</sup> reported that although nurses are more confident about disaster preparedness when they are well prepared for a disaster, but the lack of experience in disaster situations causes stress and fear of disaster preparedness. Therefore, in order to systematically prepare and train the nursing personnel who play a pivotal role in the medical response, first, their current condition is diagnosed. Next, education and training based on them should be conducted, and related research activities also should be actively carried out.

To protect the lives of the people in disasters, the Ministry of Health and Welfare<sup>[8]</sup> expanded the regional

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Department of nursing, Chosun University, Gwangju

<sup>†</sup>Corresponding author : kyeaha@chosun.ac.kr

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emergency medical center to strengthen the emergency medical support system so that it can provide prompt dispatch and medical support in times of disaster. To respond appropriately to medical needs in the event of a disaster, the emergency medical center shall provide on-site disaster medical support teams consisting of doctors, nurses, emergency relief personnel, and administrators to conduct on-site emergency medical support activities. However, despite these efforts, although there are studies on the trauma of people who experienced disasters and disaster awareness of nursing college students<sup>[9,10]</sup>, there is a lack of disaster-related studies on emergency room nurses<sup>[11]</sup>.

According to Dominguez-Gomez and Rutledge<sup>[12]</sup>, the emergency room (ER) is a department that provides primary care and nursing care for emergency patients in extreme stress situations such as life threatening, illness or accidents, abuse or rape. Therefore, it is very likely that secondary traumatic stress will occur in nurses in the ER. In the case of the professional who performs the job of helping others, it is possible to experience secondary traumatic stress during the course of work by contacting the subject who experienced the trauma<sup>[13]</sup>. They may also experience burnout due to work itself or work environment. On the other hand, it is true that some satisfaction can be derived in helping others, in the case of compassion fatigue that the nurses experience, since the nurse puts distance to the subject in order to escape from the pain caused by compassion, both compassion ability and objective viewpoint can be lost. It can result in a negative impact on mental and physical health as well as on the performance of nursing care<sup>[14]</sup>. In this respect, in order to perform effective nursing work in relation to balance of work and personal life, job characteristics, work environment, etc., management of compassion, exhaustion, and secondary traumatic stress is important. However, in the nursing area, such studies are lacking compared to other areas. In particular, to improve ability for transition to an immediate and efficient response in disaster situation, the nurses working in the ER of regional emergency medical center, they should understand the level of professional quality of life including disaster preparedness, compassion, burnout, and traumatic stress on the preferential basis. Thus, this study are conducted to investigate the level of disaster preparedness and quality of professional life, targeting the nurses working in the ER

of regional emergency medical center, and to analyze the relationship between these variables.

## 2. Methods

### 2.1. Study Design

This study was a descriptive study (cross-sectional survey) to determine the level of disaster preparedness and professional quality of life for ER nurses in regional emergency medical centers.

### 2.2. Participants

The subjects of this study were 56 nurses working in ER of emergency medical center in two regions in Korea. The specific criteria for selection were the ability to communicate, understand the content of the questionnaire, and voluntarily agree to participate in this study. Also, two more factors such as emergency work experience of more than 6 months and experience with trauma events (first contact with trauma victims, providing emergency services to rescue, nurse and manage them) were considered.

### 2.3. Measures

Disaster Preparedness Questionnaire for Nurses (DPQ-N)<sup>[15]</sup> was used. The approval of the use of the tool developer was obtained by telephone and e-mail. This tool consists of the 50 questions of 9 areas (basic concepts related to disaster management, major resource acquisition, disaster emergency nursing, mental/psychological problems, chemical, biological, and radiological nuclear explosives, epidemiological investigation/quarantine, communication, personal preparation, legal/ethical issues). Each question was measured on a 5 point Likert scale ranging from 1 point (not ready at all) to 5 point (highly prepared). The measurable score ranges from 50 to 250, and the higher the score, the better prepared for disaster preparedness. The reliability of Cronbach's alpha was .97 in the study of Ahn et al.<sup>[15]</sup>, and the reliability of this study was .98.

Korea Version 5 (2009) of the Professional Quality of Life Scale was used to assess the quality of life of the subjects. It was produced by Stamm<sup>[14]</sup>, a developer of the origin tool, and it was also posted on the official website of the professional quality of life ([www.proqol.org](http://www.proqol.org)). This tool consists of 10 questions for each of the three domains (compassion satisfaction, burnout, and

secondary traumatic stress). This tool is freely available for use even if it is not modified or supplemented. For each question, it is measured on a 5 point Likert scale ranging from 1 point (not at all) to 5 point (very often). The measurable score in each domain ranged from 10 to 50, which means that the higher the score, the higher the level of compassion satisfaction, burnout, and secondary traumatic stress. In a study by Stamm<sup>[14]</sup>, Cronbach's alpha of the instrument, was as follows; compassion satisfaction (.88), exhaustion (.75), and secondary traumatic stress (.81). The results of this study were compassion satisfaction (.93), exhaustion (.71), and secondary traumatic stress (.91).

#### 2.4. Data Collection and Ethical Consideration

This study was conducted after the approval of the Institutional Review Board (IRB) of C University to ensure ethics. The data collection period was from January to August 2016. Prior to the data collection, the permission for data collection was gotten from the nursing director and the nursing managers of the hospital with the emergency medical center. In the approval process, explanations about the study purpose and procedure were also provided. As the next step, the details regarding the purpose of this study, the process of participation and the freedom to withdraw at any time during your participation were explained to the subjects. Then, the procedure of agreement to data collection and questionnaire data collection were done. In addition, the questionnaire was treated as an anonymous name, and it was precisely suggested that personal information will not be used except for research purposes. After receiving all the explanations, the questionnaire was distributed to only those who agreed to participate, and the senior researcher's contact information was provided to them for questions about the questionnaire or case of problem.

#### 2.5. Data Analysis

Data were analyzed using the SPSS 23.0 version program as follows. The descriptive statistics were used to examine general characteristics, work related characteristics, the level of disaster preparedness, and professional quality of life. Independent t-test and one-way ANOVA were used to assess the level of disaster preparedness and professional quality of life according to general characteristics and work-related characteristics

of the subjects, and post-test was conducted with the Scheffe' test. Pearson correlation coefficients were used to determine the relationship between the subject's disaster preparedness status and the quality of professional life.

### 3. Results

#### 3.1. General Characteristics and Work-related Characteristics

The average age of the subjects was 29.68 years and over half (57.1%) were below 30 years of age. By gender, 80.4% of the subjects were women, and 69.6% were married. 61.8% of the subjects did not have a religion, and as a final educational background, the most (83.9%) of the total subjects graduated from 4-year university.

The general nurses were 92.9% of the total subjects and the working type was 92.9% in 3 shift work. The average career experience in the emergency room was 30.55 months, the percentage of those who worked more than three years was the highest at 35.7%. The average number of night workdays per month was 6.17 days, and less than 8 days accounted for 85.7%. The average number of subjects who experienced trauma events was 11.10 times and less than 5 times was the most. In the case of emergency room selection, 89.3% of the respondents selected emergency room work by another person, and 30.4% of them answered that they would like to continue working in the emergency room. In addition, the experience of disaster was 16.1% and 46.4% was dissatisfied with this job (Table 1).

**Table 1.** General characteristics and work-related characteristics

(N=56)

Characteristics	Categories	n(%)	M±SD
Age (year)	<30	32(57.1)	
	30~39	20(35.7)	29.68±6.24
	≥40	4(7.1)	
Gender	Male	11(19.6)	
	Female	45(80.4)	
Marital status	Married	39(69.6)	
	Single	17(30.4)	
Religion	Yes	27(48.2)	
	No	29(51.8)	

Education	College	5(8.9)	30.55±21.41
	Bachelor's degree	47(83.9)	
	≥Master's degree	4(7.1)	
Position	Staff nurse	52(92.9)	6.17±2.21
	≥Charge nurse	4(7.1)	
Type of working	Three shift	52(92.9)	11.10±15.97
	Two shift or fixed work	4(7.1)	
Length of career as a ER nurse (year)	<1	11(19.6)	30.55±21.41
	1≤~<2	12(21.4)	
	2≤~<3	13(23.2)	
	≥3	20(35.7)	
Days of night duty	<8	48(85.7)	6.17±2.21
	≥8	8(14.3)	
Frequency of traumatic events/month	<5	30(53.6)	11.10±15.97
	5-9	2(3.6)	
	≥10	24(42.9)	
Disaster experiences	Yes	9(16.1)	11.10±15.97
	No	47(83.9)	
Choice of ER	Myself	6(10.7)	11.10±15.97
	By others	50(89.3)	
Desire of continuous work in ER	Yes	17(30.4)	11.10±15.97
	No	39(69.6)	
Job satisfaction	Satisfaction	10(17.9)	11.10±15.97
	Moderately	20(35.7)	
	Dissatisfaction	26(46.4)	

ER: Emergency room

### 3.2. Disaster Preparedness and Professional Quality of Life

The average level of the subjects' disaster preparedness status was 3.01 out of the measurable range from 1 to 5. The level of professional quality of life was reported to be in the range of 10 ~ 50 for each domain, the results were as follows; compassion satisfaction (average 30.89), burnout (average 28.79) and secondary traumatic stress (average 26.57) (Table 2).

**Table 2.** Disaster preparedness and professional quality of life (N=56)

Variables	M±SD	Range
Disaster preparedness	3.01±0.53	1.98-4.62
Compassion satisfaction	30.89±5.87	10-45
Burnout	28.79±4.50	16-45
Secondary trauma	26.57±6.17	10-47

### 3.3. Disaster Preparedness by General Characteristics and Work-related Characteristics

There was a statistically significant difference in the disaster preparedness by the position of the subject ( $t = -2.32, p = .004$ ), type of work ( $t = -2.32, p = .004$ ) and

**Table 3.** Disaster preparedness by general characteristics and work-related characteristics (N=56)

Characteristics	Categories	M±SD	t or F	p (Scheffe)
Age (year)	<30	2.96±.50	2.55	.088
	30~39	2.98±.57		
	≥40	3.58±.33		
Gender	Male	3.19±.71	1.23	.223
	Female	2.97±.48		
Marital status	Married	3.04±.48	0.50	.620
	Single	2.96±.65		
Religion	Yes	3.00±.48	-0.11	.910
	No	3.02±.58		
Education	College	3.04±.56	1.64	.204
	Bachelor's degree	2.97±.53		
	≥Master's degree	3.47±.43		
Position	Staff nurse	2.97±.52	-2.32	.024
	≥Charge nurse	3.59±.32		
Type of working	Three shift	2.97±.52	-2.32	.024
	Two shift or fixed work	3.59±.32		
Length of career as a ER nurse (year)	<1	3.07±.38	0.13	.942
	1≤~<2	3.03±.51		
	2≤~<3	3.04±.42		
	≥3	2.96±.69		
Days of night duty	<8	3.02±.54	0.36	.722
	≥8	2.95±.51		
Frequency of traumatic events/month	<5	2.85±.48	5.26	.008 (a<c)
	5-9	2.57±.18		
	≥10	3.25±.52		
Disaster experiences	Yes	3.19±.56	1.11	.270
	No	2.98±.52		
Choice of ER	Myself	3.27±.56	1.28	.207
	By others	2.98±.53		
Desire of continuous work in ER	Yes	3.02±.53	0.09	.931
	No	3.01±.54		
Job satisfaction	Satisfaction	3.09±.66	0.57	.568
	Moderately	3.08±.41		
	Dissatisfaction	2.93±.57		

ER: Emergency room

number of experience of trauma event ( $F = 5.26, p = .009$ ). As a result of the post-test, the subjects who experienced more than 10 times a month showed higher levels of disaster preparedness status than the subjects who experienced less than 5 times. (Table 3).

#### 3.4. Compassion Satisfaction by General Characteristics and Work-related Characteristics

Table 4 presents that the level of professional quality of life according to general characteristics and work-related characteristics. Compassion satisfaction was significantly different according to gender ( $t = 2.88, p = .006$ ), job satisfaction ( $F = 10.81, p < .001$ ) and desire for continuous work in the emergency room ( $t = 2.95, p = .005$ ). As a result of the post-test, job satisfaction was higher in the subjects who responded that they were

satisfied with job than those who responded with normal or unsatisfied.

#### 3.5. Burnout by General Characteristics and Work-related Characteristics

There were significant differences according to gender ( $t = -2.05, p = .045$ ) in the burnout according to general characteristics of the subjects, and emergency room selection ( $t = -2.37, p = .021$ ), desire for continuous work in the emergency room ( $T = -2.31, p = .025$ ) and job satisfaction ( $F = 11.99, p < .001$ ), respectively. As a result of the post-test, the subjects who were unsatisfied with job were reported to be more exhausted than those who were normal or satisfied. At last, there was no significant difference in secondary traumatic stress according to any characteristics (Table 5).

**Table 4.** Compassion satisfaction by general characteristics and work-related characteristics (N=56)

Characteristics	Categories	Compassion satisfaction		
		M±SD	t or F	p (Scheffe)
Gender	Male	35.18±6.49	2.88	.006
	Female	29.84±5.27		
Choice of ER	Myself	35.17±4.45	1.93	.058
	By others	30.38±5.84		
Hope of continuous working in ER	Yes	34.18±4.77	2.95	.005
	No	29.46±5.76		
Work satisfaction	Satisfaction <sup>a</sup>	36.90±4.41	10.81	<.001 (a>b>c)
	Moderate <sup>b</sup>	31.35±4.02		
	Dissatisfaction <sup>c</sup>	28.23±5.88		

ER: Emergency room

**Table 5.** Burnout by general characteristics and work-related characteristics (N=56)

Characteristics	Categories	Burn out		
		M±SD	t or F	p (Scheffe)
Gender	Male	26.36±5.01	-2.05	.045
	Female	29.38±4.22		
Choice of ER	Myself	24.83±4.88	-2.37	.021
	By others	29.26±4.26		
Desire of continuous work in ER	Yes	26.76±4.05	-2.31	.025
	No	29.67±4.44		
Job satisfaction	Satisfaction <sup>a</sup>	24.50±4.62	11.99	<.001 (a,b<c)
	Moderate <sup>b</sup>	27.85±3.05		
	Dissatisfaction <sup>c</sup>	31.15±3.99		

ER: Emergency room

**Table 6.** Correlations with disaster preparedness and professional quality of life (N=56)

	Disaster preparedness	Compassion satisfaction	Burnout	Secondary trauma
Disaster preparedness	1			
Compassion satisfaction	.42 (.001)	1		
Burnout	-.24 (.070)	-.54 ( $<.001$ )	1	
Secondary trauma	.24 (.070)	.27 (.043)	.51 ( $<.001$ )	1

### 3.6. Correlations with Disaster Preparedness and Professional Quality of Life

The disaster preparedness status of the subjects was positively correlated with compassion satisfaction ( $r = .42, p = .001$ ) (Table 6).

## 4. Discussion

As a result of this study, the status of disaster preparedness varied according to the position of the subject. In other words, the status of disaster preparedness of nurse managers was better than that of staff nurses. This is similar to the results of a previous study<sup>[16]</sup> for public health center employees, showing that the disaster preparedness competency of people in higher position was better. In addition, a study<sup>[17]</sup> conducted in Hong Kong showed that working experience is related to the status of disaster preparedness. In general, considering the fact that the higher position workers have, more experience they have, it is presumed that the status of disaster preparedness of the subjects in higher position was better in this study. Subjects who experienced trauma events more than 10 times per month showed higher levels of disaster preparedness than those who experienced less than 5 traumatic events. In a previous study<sup>[18]</sup> of foreign country, it was reported that previous experience of trauma affects the status of disaster preparedness, and it can be seen that this study could support the previous study. In a survey<sup>[19]</sup> of adults in the Philippines and Thailand, one of the most disastrous countries, education was associated with disaster preparedness trends. And students who are educated about disaster nursing are more likely to be placed in disaster areas than those who are not<sup>[20]</sup>. Based on two results, in the future, realistic disaster preparedness education should be conducted for staff nurse with little trauma event experience.

Many countries including Korea and Japan have made huge effort such as introducing disaster preparedness manuals to medical institution workers in preparation for a disaster<sup>[21,22]</sup>. In the future, if governments do not focus only on the disaster countermeasures system, but continue to support disaster-related medical personnel, the workers will be better prepared for disaster.

According to the type of work, there was a difference in disaster preparedness status. The subjects who worked in two shifts or fixed work showed better disaster preparedness than those working in three shifts. Although there are few studies dealing with the relationship between these two variables, meaning that it is difficult to compare with this study, it seems that if workers work continuously for a long time, they can afford to be prepared for the situation with stability. Therefore, in case of a nurse working in three shifts, it is necessary to identify what is necessary for disaster preparedness and to make efforts to improve it.

In the professional quality of life, there were differences according to gender. Compassion satisfaction was higher in males than females, and burnout was higher in females. This is in the same line with the results of a study<sup>[23]</sup> targeting mental health professionals who participated in disaster supporting activities. These results show that there is a need to understand gender differences and to approach them at an individual level.

Those who wanted to work continuously in the ER had higher empathy satisfaction and lower burnout than those who did not. In addition, the nurses who were pushed to work in the ER by others showed more exhaustion than the nurses working in the ER by the voluntary.

As a matter of fact, if workers like their workplace, they hope to continue to work with a positive psychological state. But in the opposite case, it would be easy to feel exhausted. In the previous study<sup>[24]</sup>, it was

reported that the role conflict of the emergency room nurse was larger than that of the general ward nurse. Therefore, to cope with dissatisfaction with the workplace of emergency room nurses, the manager nurse needs to make efforts on improving the work based on interviews.

The subjects who answered that they were satisfied with the job had higher compassion satisfaction and lower burnout. This is consistent with the results of a study<sup>[25]</sup> conducted on Germans practitioners with a significant correlation between job satisfaction and burnout. ER nurses can easily experience burnout or traumatic stress because of different work environments from general wards. For example, unexpected violence can be often experienced in ER, and this causes to reduce job satisfaction and increase turnover intentions<sup>[26]</sup>. Thus, nursing managers should make efforts to improve job satisfaction such as improving the work environment and eliminating the cause of burnout.

In this study, there was no difference in secondary traumatic stress according to any characteristics. This is different from the result<sup>[23,27]</sup> that nurses who experienced disaster or trauma had higher trauma stress than those who did not. In addition, there is no agreement with the result<sup>[28]</sup> of a significant difference in the age or the final academic achievement of the ER nurses. Therefore, in the future, it is necessary to perform repeated research by expanding the subjects to emergency room nurses in other regions.

The disaster preparedness status of the subjects showed a significant positive correlation with compassion satisfaction of professional life. Compassion satisfaction means feeling pleasure in helping others. Therefore, if people have a positive attitude toward helping others, it can be assumed that they will be able to prepare for disasters in order to help others with difficulties. On the basis of this, compassion satisfaction should be considered as an important factor in seeking concrete measures to increase the emergency room nurses' disaster preparedness status. Also, it is necessary to develop education method so as to improve compassion satisfaction for emergency room nurses to be well prepared for disaster.

## 5. Conclusion

The purpose of this study was to investigate the ER

nurses' disaster preparedness and professional quality of life and to analyze the relationship between them. The result of this study shows that the disaster preparedness and compassion satisfaction have a significant positive correlation. Based on the results of this study, the following suggestions are made. First, this study was limited to the generalization of the results because it was conducted only for the nurses working at ER in two regions. Therefore, it is necessary to repeat the study with a larger number of subjects in the future. Second, it suggests a study to find out the related-variables continuously through in-depth interview with ER nurses in order to raise disaster preparedness status of nurses in regional emergency medical centers.

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