Nursing Students' Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency

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Abstract

Purpose: This study aims to provide basic data to improve disaster nursing competency by identifying nursing students' disaster awareness, disaster preparedness, and disaster nursing competency and confirming the relationship among them. **Research design, data, and methodology**: The subjects of this study were 310 students attending the Department of Nursing at E University in Gyeonggi-do, and the data was collected from April 13 to May 24, 2023. **Results**: Disaster awareness averaged 72.91±7.46 points, disaster preparedness averaged 2.82±2.81 points, and disaster nursing competency averaged 44.11±10.76 points. Disaster preparedness and disaster nursing competency were significantly higher in subjects with disaster nursing education experience than in those without experience. Disaster awareness showed a significant positive correlation with disaster preparedness (r=.20, p <.001), and also with disaster nursing competency (r=.37, p <.001). Disaster preparedness showed a significant positive correlation with disaster nursing competency (r=.49, p <.001). It was found that the disaster nursing competency was high when the disaster awareness (B=0.472, p<.001), and the disaster preparedness (B=1.561, p<.001) was high. **Conclusions**: The results show it is possible to improve students' disaster nursing competency by strengthening education on disaster awareness and disaster preparedness. Thus, specific efforts and future research are needed to develop disaster nursing education.

Keywords : Nursing Student, Disaster Awareness, Disaster Preparedness, Disaster Nursing Competency

JEL Classification Code : D70, I10, I20, I21

1. Introduction

1.1. Necessities of Research

A disaster is something that causes or can cause damage to the lives or bodies of citizens, property, and the nation (Korea Ministry of Government Legislation, 2019). It occurs suddenly without warning and causes economic loss, serious environmental damage, psychological trauma of survivors, and many injuries and deaths (Pietrzak et al., 2012; Williams et al., 2008). Social disasters such as the collapse of Sampoong Department Store in 1995, the Daegu subway arson disaster in 2003, the Sewol Ferry disaster in 2014, and the October 29 disaster in 2022 (Park, 2017), as well as natural disasters the Great Turkiye Earthquake in 2022, and the Osong Underpass disaster in 2023 are occurring at an unspecified time. In addition, since the first outbreak of coronavirus disease 2019(COVID-19), a respiratory infectious disease caused by a new type of coronavirus (SARS-CoV-2), in December 2019, it had spread around the world following MERS in 2015 and the pandemic crisis continued for three years.

When a disaster occurs, various experts become active to overcome the disaster, and among them, nurses, who make up the largest proportion of the health workforce, play an important role in disaster management as practical resources that can respond effectively and quickly (Usher & Mayner, 2011; Said & Chiang, 2020). It is essential for nurses to acquire knowledge and skills to respond to disaster situations, and it is necessary for nursing students to cultivate basic competencies in disaster nursing (Jennings-Sanders et al., 2005).

Disaster nursing means providing professional nursing to help people who are unable to solve problems on their own due to environmental changes caused by a disaster (Kim et al., 2017). The recently changed disaster environment requires not only general nursing activities but also professional disaster nursing capabilities that can respond to integrated and diverse needs that can handle psychological and mental health issues of patients after disasters (Kim et al., 2017).

International Council of Nurses stated that all nurses should have disaster nursing competencies or core competencies of disaster nursing in order to prepare for disasters and respond appropriately to disaster situations (International Council of Nurses, 2019). However, despite the importance of disaster nursing competencies being emphasized, most nurses are not yet sufficiently prepared for interventions to respond to disasters (Labrague et al., 2018).

In order for nurses to perform their professional roles in disaster situations, it is important to have a correct perception of the disaster (Kim et al., 2017). If repeated and continuous disaster nursing education is implemented, nursing students will be able to respond confidently to disaster situations without panicking, thereby increasing their disaster nursing competency (Kwon et al., 2019). Therefore, disaster nursing education is required for nursing students who will become nurses (Jung et al., 2018; Lee et al., 2013).

In the case of Korea, most of the emergency and disaster nursing courses are major electives, and the contents are focused on emergency nursing (Lee et al., 2013), and limited to practical application (Han et al., 2019). Therefore, in order for nurses to demonstrate their professional capabilities when a disaster occurs, they must systematically receive theoretical and practical education on disaster nursing starting from the nursing curriculum (Jennings-Sanders et al., 2005; Yang, 2018; Lee et al., 2013).

Accordingly, this study aims to provide basic data necessary for nursing education to improve disaster nursing competency to respond to disasters by identifying nursing students' disaster awareness, disaster preparedness, and disaster nursing capabilities, and confirming the relationship among them.

2. Research Methods and Materials

2.1. Research Design

This study is a cross-sectional, descriptive research study to confirm nursing students' disaster awareness, disaster preparedness, and disaster nursing competency, and to determine the impact of disaster awareness and disaster preparedness on disaster nursing competency.

2.2. Research Subjects

The subjects of this study were 310 freshmen to senior students attending the Department of Nursing at E University in Gyeonggi-do, and they voluntarily agreed to the study after hearing an explanation of the study. The G*power 3.1 program was used to calculate the number of survey subjects, and as a result of calculation with an effect size of 0.15, significance level of 0.05, and power of 0.95, the minimally required sample number was 107 people. Considering the non-response dropout rate of 10%, the sample size was set to 118 people. 310 questionnaires were distributed and collected, and data from 304 people were analyzed, excluding 6 of the 310 that had no response or incomplete responses.

2.3. Variables

2.3.1. Disaster Awareness

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Disaster awareness refers to the degree of understanding of disasters and awareness of safety management in disaster situations (Lee et al., 2016).

2.3.2. Disaster Preparedness

It is a continuous process that requires regular review and revision based on environmental changes, personnel changes, and new information and technology in a stage which planning and preparation take priority in terms of disaster management (World Health Organization, & International Council of Nurses, 2009).

2.3.3. Disaster Nursing Competency

Disaster nursing means effectively performing nursing by utilizing the knowledge and skills necessary to save the lives of those affected by a disaster. It is divided into four categories: prevention and mitigation competency, preparedness competency, response competency, and recovery and rehabilitation competency (World Health Organization & International Council of Nurses, 2009).

2.4. Tools

2.4.1. General Characteristics and Disaster-related Characteristics

These characteristics include gender, age, grade, religion, disaster experience, disaster nursing education experience, and desired type of disaster nursing education. The types of disaster experience were asked to indicate specific situations such as typhoons, floods, earthquakes, fires, and infectious disease outbreaks. Regarding of disaster nursing education experience, the type of disaster nursing education, time of receiving education, and satisfaction with education were asked.

2.4.2. Disaster Awareness

Disaster awareness is a tool developed by Lee et al. (2016) to measure disaster awareness of nursing students. It consists of 20 questions; 8 questions on disaster responsibility; 6 questions on disaster prevention, disaster response, and recovery; and 6 questions on causes of disasters. Each item was scored on a 5-point Likert scale. A higher total score means higher awareness of disasters, and the scores range from 20 to 100. In a study by Seo and Suh (2018), Cronbach' α value was .74 and in this study, it was .789.

2.4.3. Disaster Awareness

Disaster preparedness was measured by a tool that Kang (2022) modified and supplemented after Kim (2015) modified and adapted from the disaster preparedness measurement tool for nursing students developed by Schmidt et al. (2011). This tool consists of 15 questions, and

each question is given a score of 1 for 'Yes' and 0 for 'No' and 'I don't know'. A higher total score indicates a higher degree of disaster preparedness, and the score ranges from 0 to 15. In a study by Kang (2022), the Cronbach' α value was .76 and in this study, it was .783.

2.4.4. Disaster Nursing Competency

Disaster nursing competency was measured by a tool revised and supplemented suitably for nursing students by Seo and Suh (2018) after Ahn and Kim (2013) revised and supplemented the tool developed by Roh (2010) to measure core performance competency in disaster nursing. This tool consists of 15 questions, and each item was scored on a 5-point Likert. A higher total score indicates a higher level of disaster nursing core performance ability (disaster nursing competency), and the score ranges from 15 to 75. In the study by Ahn and Kim (2013), the Cronbach' α value was .90, and in the study by Seo and Suh (2018), the Cronbach' α value was .95. In this study, it was .938.

2.5. Data Collection

Data collection was conducted from April 13 2023 to May 24 2023. Data were collected for each grade, and for ethical consideration of the research subjects, a structured survey was conducted after obtaining written voluntary consent to the purpose, procedures, and participation of this study before conducting the survey. In addition, it was explained that there were no disadvantages for answering before the survey, and that the research could be withdrawn or refused at any time during the research without disadvantage. The survey data were processed anonymously, and it was fully explained that the collected data will be guaranteed and they would not be used for any other purposes.

2.6. Data Analysis

The data of this study were processed with descriptive statistics using the SPSS 29.0 WIN program and analyzed as follows.

1. Frequency and percentage of general characteristics was analyzed by frequency analysis.

2. The difference in disaster awareness, disaster preparedness, and disaster nursing capacity according to general characteristics and disaster-related characteristics was analyzed by t-test, one-way ANOVA, and Bonferroni post hoc test.

3. The correlation among disaster awareness, disaster preparedness, and disaster nursing competency was analyzed by Pearson's correlation coefficients.

4. The effect of general characteristics, disaster-related characteristics, disaster awareness, and disaster

preparedness on disaster nursing competency was analyzed by multiple regression analysis.

5.   The reliability of the tool was tested by Cronbach's α value.

6.   The significance level of all analyzes was set at 0.05.

3. Results

3.1. General Characteristics

The general characteristics of the study subjects are shown in Table 1. The average age was 20.95 years old and ranged from 18 to 35. Dividing the age into three groups, 88 people (28.9%) were 18 to 19 years old, 124 people (40.8%) were 20 to 21 years old, and 92 people (30.3%) were above 22. By gender, 53 people (17.4%) were male and 251 people (82.6%) were female. By grade, 80 people (26.3%) were freshmen, 78 people (25.7%) were sophomores, 72 people (23.7%) were juniors, and 74 people (24.3%) were seniors. 32.2% of the subjects had religion, followed by Christianity at 60 people (19.7%), Catholicism at 26 people (8.6%), and Buddhism at 12 people (3.9%).

Table 1: General Characteristics

Division	Categories	n (%)
Age	18~19	88(28.9)
	20~21	124(40.8)
	Above 22	92(30.3)
Gender	Male	53(17.4)
	Female	251(82.6)
Grade	Freshmen	80(26.3)
	Sophomores	78(25.7)
	Juniors	72(23.7)
	Seniors	74(24.3)
Religion	Christian	60(19.7)
	Catholic	26(8.6)
	Buddhism	12(3.9)
	None	206(67.8)

3.2. Disaster-related Characteristics

Table 2 shows the disaster-related characteristics of the study subjects. There were 126 subjects (41.4%) with disaster experience, and 178 subjects (58.6%) without disaster experience. The types of experienced disasters were classified into three types: natural disasters (typhoons, floods, avalanches, earthquakes), man-made disasters (fires,

traffic accidents), and infectious disease disasters. 80 subjects (43.2%) had experience with natural disasters, 79 subjects (42.7%) had experience with infectious disease disasters, and 26 subjects (14.1%) had experience with human-made disasters. 87 subjects (28.6%) had experienced disaster nursing education, and 217 subjects (71.4%) had not. Out of 87 subjects, 46 subjects (41.1%) received the education during middle and high school, 42 subjects (37.5%) did while attending the university, and 24 subjects (21.4%) did during other times. For the type of disaster nursing education, curriculum education was the most common with 58 subjects (65.2%), and 31 subjects (34.8%) got field training including the other. For the satisfaction with disaster nursing education, there were 267 subjects (87.8%) who had no training experience or did not answer the question. Among those who had education experience, 34 subjects (11.2%) were dissatisfied, and 3 subjects (1.0%) were satisfied with the education.

Table 2: Disaster-related Characteristics

Division	Categories	n (%)
Disaster experience	Have	126(41.4)
	None	178(58.6)
Type of experienced disaster * (n=126)	Natural disasters	80(43.2)
	Man-made disasters	26(14.1)
	Infectious disease disasters	79(42.7)
Disaster nursing education experience	Have	87(28.6)
	None	217(71.4)
Time of receiving disaster nursing education *	Middle and high school period	46(41.1)
	While attending the university	42(37.5)
	Other times	24(21.4)
Type of disaster nursing education * (n=87)	Curriculum education	58(65.2)
	Field training, etc.	31(34.8)
Satisfaction with disaster nursing education	No response	267(87.8)
	Dissatisfied	34(11.2)
	Satisfied	3(1.0)

Note: * Multiple responses questions

3.3. Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency

Tables 3 shows the disaster awareness, disaster preparedness, and disaster nursing competency of the subjects. The average of disaster awareness was 72.91±7.46 points, the average of disaster preparedness was 2.82±2.81 points, and the average of disaster nursing competency was 44.11±10.76 points.

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Table 3: Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency

Variables	M±SD	Min	Max	Range
Disaster awareness	72.91±7.46	47	100	20~100
Disaster preparedness	2.82±2.81	0	15	0~15
Disaster nursing competency	44.11±10.76	16	75	15~75

3.3.1. Disaster Awareness

Table 4 shows the scores of five sub-categories of disaster awareness, and the average of disaster awareness was 3.65 ± 0.37 points out of 5. 'Awareness of disaster management responsibility and management subjects' was the highest at 4.34±0.52 points, followed by 'Awareness of safety and disaster management activities' at 3.81±0.60 points. 'Awareness of legislative, administrative, and judicial aspects for disaster management' scored the least with 3.16±0.76 points.

Table 4: Disaster Awareness

Sub-categories	M±SD
Awareness of disaster management responsibility and management subjects	4.34±0.52
Awareness of legislative, administrative, and judicial aspects for disaster management	3.16±0.76
Awareness of disaster prevention preparedness, response, and recovery	3.28±0.75
Awareness of safety accidents and disaster causes	3.50±0.62
Awareness of safety and disaster management activities	3.81±0.60
Total	3.65±0.37

3.3.2. Disaster Preparedness

Table 5 shows the scores of 15 questions of disaster preparedness, and the average of disaster preparedness was 0.19±0.19 points out of 2. Looking at each question, the question 'Have you ever heard of a Go bag (disaster survival backpack)?' was the highest at 0.34±0.48 points, followed by the question 'Does the nursing education include 'disaster planning'?' at 0.33±0.47 points. The question which scored the least were the question 'Have you prepared a personal shelter at your school?' and 'Do you know what the disaster plan is at your current school?' at 0.05±0.22 points.

Table 5: Disaster Preparedness

Number	Question	M±SD
1	Have you ever talked with colleagues or faculty about how to respond to a disaster?	0.15±0.36
2	Were you educated about disasters by a professor in your university?	0.28±0.45
3	Have you ever discussed with your colleagues or faculty what you would do in a disaster if there is no faculty?	0.12±0.32
4	Do you have a personal disaster preparedness plan?	0.32±0.47
5	Does the nursing education include 'disaster planning'?	0.33±0.47
6	Have you ever received training from faculty about alternative teaching locations in the event of a disaster?	0.08±0.27
7	Do you know what the disaster plan is at your current school?	0.05±0.22
8	Have you ever heard of a Go bag (disaster survival backpack)?	0.34±0.48
9	Do you have recommended disaster preparedness supplies? (Backpack, food, water, clothing, flashlight, first aid kit, matches, etc.)	0.21±0.41
10	In case you need to evacuate during a disaster, do you always have the necessary items packaged and ready? (ex: military gear)	0.06±0.24
11	Do you always maintain an emergency contact system in preparation for disaster situations?	0.26±0.44
12	Have you ever practiced disaster evacuation at home (residential residence, dormitory, etc.)?	0.30±0.46
13	Have you ever practiced disaster evacuation in your classroom?	0.13±0.33
14	Have you prepared a personal shelter at your school? (residential site, dormitory, etc.)?	0.14±0.35
15	Has your school set up a private shelter?	0.05±0.22
	Total	0.19±0.19

3.3.3. Disaster Nursing Competency

Table 6 shows the scores for each item of disaster nursing competency of research subjects, and the average disaster nursing competency was 2.94±0.72 points out of 5. Looking at each question, the question with the highest score was 'I know about the duties of medical staff during a disaster', which scored 3.63 ± 0.83 points. The question 'I know general coping skills during a disaster' was the second highest with 3.54±0.81 points, and the question 'I know my school's disaster-related guidelines' scored the least with 2.29±1.04 points.

Table 6: Disaster Nursing Competency

Number	Question	M±SD
1	I know general coping skills during a disaster.	3.54±0.81
2	I can provide basic first aid during a disaster.	3.52±0.82
3	I know about the duties of medical staff during a disaster.	3.63±0.83
4	I know the duties performed as a nursing student when there is a shortage of medical staff during a disaster.	3.29±0.96
5	I know my school's disaster-related guidelines.	2.29±1.04
6	I can do the patient triage during a disaster.	2.91±1.05
7	I can perform nursing interventions according to patient triage during a disaster.	2.81±1.02
8	I can do the systemic assessment, monitoring, and report of patients during a disaster.	2.83±0.99
9	I know the procedures for documenting the nursing interventions during a disaster.	2.41±1.06
10	I know the procedures for conveying important patient information to other medical staff and work force during a disaster.	2.57±1.08
11	I can collect patients' necessary information and effectively share it with other health managers during a disaster.	2.80±1.02
12	I know who are the key partners sharing the disaster countermeasures.	2.60±1.04
13	I can provide all people related to a disaster with appropriate psychological supports.	3.04±0.96
14	I can provide health counseling/education regarding the long-term effects caused by a disaster for the subjects.	2.89±1.01
15	I can provide appropriate nursing for sensitive or vulnerable groups (the elderly, the pregnant, the disabled, etc.).	2.98±0.96
	Total	2.94±0.72

3.4. Differences in Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency according to the General Characteristics and Disaster-related Characteristics

Table 7 shows the differences in disaster awareness, disaster preparedness, and disaster nursing competency according to the general characteristics of the study subjects. Disaster awareness differed according to age (t=11.85, p =<.001), gender (t=-2.61, p =.010), and grade (F=2.78, p =.041). In terms of age, 18 to 19 years old was 76.06(±7.53), 20 to 21 years old was 71.81(±7.47), and above 22 was 71.4(±6.50). In terms of gender, female (73.42 (±6.93)) had a higher disaster awareness than male (70.51(±9.29)). In terms of grade, it was highest in the order of freshmen (74.63(±7.27)), sophomores (73.28(±9.43)), juniors (72.19(±5.83)), and seniors (71.38(±6.38)). There were no significant results in disaster awareness depending on religion. Also, there were no significant differences in disaster preparedness and disaster nursing competency according to the general characteristics.

Table 8 shows the differences in disaster awareness, disaster preparedness, and disaster nursing competency according to the disaster-related characteristics of the study subjects. Disaster preparedness had a difference depending on disaster nursing education experience (t=-3.11, p =.002). Disaster nursing competency differed depending on disaster nursing education experience (t=-3.45, p =<.001). In terms of disaster preparedness, the score of subjects who had disaster nursing education experience (3.60 (±3.39)) was significantly higher than that of the subjects who had not (2.50 (±2.49). In terms of disaster nursing competency, the score of subjects who had disaster nursing education experience (47.41(±10.24)) was higher than that of subjects who had not (42.78 (±10.70)). Among disaster-related characteristics, no significant results were found among variables depending on disaster experience, and no significant results were found in disaster awareness depending on disaster nursing education experience.

3.5. Relationship among Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency

Table 9 shows the results of analyzing the correlation among the main variables of this study using the Pearson correlation coefficient. Looking at the correlation among the three variables, disaster preparedness and disaster nursing competency showed the highest correlation at r=.49 (p <.001). Disaster awareness had a significant correlation with disaster preparedness (r=.20, p =<.001). Disaster awareness had a significant correlation with disaster nursing competency (r=.37, p =<.001).

Table 7: Differences in Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency According to the General Characteristics

Division	Categories	Disaster awareness			Disaster preparedness			Disaster nursing competency		
		M±SD	t/F	p	M±SD	t/F	p	M±SD	t/F	p
Age	18~19 [a]	76.06±7.53	11.85	<.001 (a> b,c)	3.09±3.06	0.61	.542	43.60±10.84	0.14	.869
	20~21 [b]	71.81±7.47			2.67±2.66			44.37±10.98		
	Above 22 [c]	71.40 ±6.5 0			2.75±2.7 6			44.24±10.4 8		
Gender	Male	70.51±9.29	-2.61	.010	3.19±3.51	1.06	.289	46.51±11.96	1.79	.074
	Female	73.42±6.93			2.74±2.64			43.60±10.44		
Grade	Freshmen [a]	74.63±7.27	2.78	.041 (a>d)	3.13±3.14	1.28	.281	42.50±10.91	2.35	.072
	Sophomores [b]	73.28±9.43			2.65±2.93			44.26±11.66		
	Juniors [c]	72.19±5.83			2.36±1.99			43.03±9.39		
	Seniors [d]	71.38±6.38			3.09±2.97			46.74±10.56		
Religion	Christian	73.48±7.58	1.09	.353	3.13±3.25	0.37	.776	43.40±11.92	0.33	.804
	Catholic	73.15±6.98			2.88±2.55			45.15±8.92		
	Buddhism	69.25±4.11			2.50±2.07			42.08±9.17		
	None	72.93±7.62			2.73±2.75			44.30±10.74		

Table 8: Differences in Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency According to the Disaster-related Characteristics

Division	Categories	Disaster awareness			Disaster preparedness			Disaster nursing competency		
		M±SD	t/F	p	M±SD	t/F	p	M±SD	t/F	p
Disaster experience	Have	72.48±7.46	0.85	.398	3.00±2.53	-0.96	.337	43.29±10.77	1.12	.263
	None	73.22±7.47			2.69±3.00			44.69±10.74		
Disaster nursing education experience	Have	73.66±7.90	-1.10	.274	3.60±3.39	-3.11	.002	47.41±10.24	-3.45	<.001
	None	72.62±7.28			2.50±2.49			42.78±10.70		

Table 9: Relationship Among Disaster Awareness, Disaster Preparedness, and Disaster Nursing Competency

Variables	Disaster awarenss	Disaster preparedness	Disaster nursing competency
	r (p)		
Disaster awareness	1		
Disaster preparedness	.20 (<.001)	1	
Disaster nursing competency	.37 (<.001)	.49 (<.001)	1

3.6. Influencing Factors on Disaster Nursing Competency

To figure out the variables influencing on disaster nursing competency, it was confirmed whether the gender, grade, and disaster nursing education experience, which were found to be significant in demographic variables, affect disaster nursing competency. Additionally, since it was confirmed that there is a correlation between disaster nursing competency, disaster awareness, and disaster preparedness, disaster awareness and disaster preparedness were included. Multiple regression analysis was conducted by setting disaster nursing competency as the dependent variable and setting gender, grade, disaster nursing education, disaster awareness, and disaster preparedness as the independent variables. The nominal variables (gender, grade, disaster nursing education) were treated as dummy variables.

As a result of the analysis, the multiple regression analysis model can be said to be suitable with F=25.32 (p <.001). Adjusted R^2= 0.36, showing an explanatory power of 36% for disaster nursing competency through multiple regression analysis. The Durbin-Watson statistic of the collected data was 2.06, with no autocorrelation of residuals, and the variance inflation factor (VIF) was 1.05 for gender, 1.48 for sophomores, 1.64 for juniors, 1.53 for seniors, and 1.20 for disaster nursing education experience, 1.10 for disaster awareness, and 1.10 for disaster preparedness, confirming that there was no problem with multicollinearity.

As a result of multiple regression analysis, it was confirmed that seniors and disaster nursing education experience did not significantly affect disaster nursing competency. Gender, grade (sophomores and seniors), disaster awareness, and disaster preparedness were confirmed to have a significant impact on disaster nursing

competency, as shown in Table 10.

In gender, as a result of analysis with male as the reference group, female had a significantly negative effect on disaster nursing competency with B=-2.862 (p =.033). Since the B sign was negative (-), it was found that female had lower disaster nursing competency than male by 2.862. In grade, as a result of analysis with freshmen as the reference group, sophomores and seniors had a significantly impact on disaster nursing competency by B=3.167 (p =.022) and B=5.215 (p <.001) respectively. Since the sign B was positive (+), it was found that sophomores and seniors had higher disaster nursing competency than freshmen by 2.862 and 5.215 respectively.

As a result of analyzing disaster awareness and disaster preparedness through multiple regression analysis, disaster awareness had a significant impact on disaster nursing competency, with B=0.472 (p <.001) and disaster preparedness did with B=1.561 (p <.001). Since the sign B is positive (+), when disaster awareness increased by 1, disaster nursing competency increased by 0.472, and when disaster preparedness increased by 1, disaster nursing competency increased by 1.561.

In order to determine which independent variables have more influence relatively on disaster nursing competency, it was compared by using standardized coefficient β value. It can be said that disaster preparedness has the relatively highest impact on disaster nursing competency, with β = 0.408.

Table 10: Influencing Factors on Disaster Nursing Competency

Division / Categories		Unstandardized coefficient		Standardized coefficient	t	p	TOL	VIF
		B	S.E.	β				
Gender (ref= male)		-2.862	1.334	-0.101	-2.15	.033	0.952	1.051
Grade	Sophomores	3.167	1.375	0.129	2.30	.022	0.676	1.479
	Juniors	2.122	1.485	0.084	1.43	.154	0.612	1.635
	Seniors	5.215	1.424	0.208	3.66	<.001	0.653	1.532
Disaster nursing education experience		1.875	1.200	0.079	1.56	.119	0.829	1.206
Disaster awareness		0.472	0.070	0.327	6.78	<.001	0.907	1.103
Disaster preparedness		1.561	0.185	0.408	8.46	<.001	0.909	1.100
F(p)		25.32 (<.001)						
adj.R^2		.36						
Durbin-Watson		2.063						

4. Discussion

This study was conducted to figure out the relationship among disaster awareness, disaster preparedness, and disaster nursing competency of nursing students and to identify the impact of disaster awareness and disaster preparedness on disaster nursing competency, thereby presenting evidence needed for improvement to strengthen disaster nursing education. Accordingly, we would like to discuss the main research results. The average of disaster awareness score of the subjects of this study was 72.91 points being converted to a scale of 100, which was relatively higher than the average score of 66.57 points found in a study targeting Korean nurse cadets (Seo & Suh, 2018). Among the five sub-categories of disaster awareness, 'Awareness of disaster management responsibility and

management subjects' had the highest average rating of 4.34 points. In a study that figured out the level of disaster awareness among Korean nurse cadets (Seo & Suh, 2018) and another study that figured out the level of disaster awareness among nursing students (Kang, 2022), the average scores for 'Awareness of disaster management responsibility and management subjects' were 4.32 and 4.28 points respectively, which is similar to this study. This showed that nursing students were significantly aware that the responsibility and subject for safety and disaster management lies with individuals, local governments, non-governmental organizations, and the country. In contrast, 'awareness of legislative, administrative, and judicial aspects for disaster management' had the lowest average score of 3.16 points. In a study by Kang (2022), which investigated disaster awareness among nursing students,

'awareness of legislative, administrative, and judicial aspects for disaster management' among nursing students, 'awareness of legislative, administrative, and judicial aspects for disaster management' had the lowest average score of 3.14 points. This showed that nursing students recognized that the system (legislation, administration, and judiciary) of the country, which is the subject of disaster management, was poor. Therefore, it is believed that education on the country's role in disaster management and system operation is necessary to strengthen nursing students' disaster awareness.

When checking the level of disaster awareness according to general characteristics, this study found that, contrary to expectations, the disaster awareness of freshmen was significantly higher than that of seniors. The reason is that seniors go through in-depth major studies, clinical practice, and employment preparation courses, which leads them to think focusing on patient nursing and hospital-centered, and to view society from a relatively narrow perspective. On the other hand, freshmen have a shallow depth of major studies, so they have a relatively broader perspective on society compared to seniors. Therefore, it is believed that freshmen may have more interests in various social issues, including disasters, than seniors, thereby increasing their understanding of disasters and awareness of safety management in disaster situations.

The average of disaster preparedness was 2.82 points out of 15, which was similar to the average of 2.88 in a study by Kang (2022) which investigated the disaster preparedness of nursing students. Looking at the disaster preparedness score by questions, the question 'Have you ever heard of a Go bag (disaster survival backpack)?' had the highest average score of 0.34. This is thought because the opportunities to access information about survival have increased as disasters such as coronavirus infections, floods, and fires occurred frequently recently. On the other hand, the questions 'Do you know what the disaster plan is at your current school?' and 'Have you prepared a personal shelter at your school?' had the lowest average score of 0.05. Through this, it was confirmed that although nursing students have information on personal disaster preparations such as Go bag (disaster survival backpack), there is a lack of information on disaster plans of organizations such as schools and on disaster preparations such as shelters. As a result of examining disaster preparedness according to the disaster nursing education experience in this study, the disaster preparedness of subjects with experience of disaster education was significantly higher than that of subjects without experience. Therefore, it is believed that universities, as higher education institutions, should contribute to improving the level of disaster preparedness of nursing students by properly establishing disaster preparation plans and shelters and by telling them.

The average of disaster nursing competency of the subjects was 44.11 points out of 75, which was relatively low compared to the average score of 50.14 points found in a study by Seo and Suh (2018) targeting Korean nurse cadets. It is thought because the nurse cadets have more various experiences such as theoretical education, graphic training, simulation education, and field training from their second year than the subjects of this study do, considering the fact that the experience of disaster nursing education had a significant impact on disaster nursing competency in this study. Looking at the disaster nursing competency score by questions, the question 'I know about the duties of medical staff during a disaster' had the highest average score of 3.63. In a study by Seo and Suh (2018), the question 'I know about the duties of medical staff during a disaster' had the highest average score of 4.02, which was similar to the result of this study. In contrast, the question 'I know my school's disaster-related guidelines' had the lowest average score of 2.29. In the studies which measured the disaster nursing competency of nursing students, the average of the question 'I know my school's disaster-related guidelines' were 1.98(5-point scale), 2.81(5-point scale), 2.45(5-point scale) respectively, which had the lowest score (Ahn & Kim, 2013; Hong, 2020; Kang, 2022). Through this, not only in this study but also in previous studies, it was confirmed that nursing students have a lack of knowledge of schools' disaster-related guidelines. Therefore, schools should provide relevant education to ensure that nursing students are well-informed of disaster-related guidelines.

As a result of analyzing the correlation among the main variables of this study, a significant correlation was found among the three variables: disaster awareness, disaster preparedness, and disaster nursing competency. It was found that the higher disaster awareness was related to the disaster preparedness and disaster nursing competency and that the higher disaster preparedness was related to disaster nursing competency. On the other hand, in a study by Kang (2022) targeting nursing students and a study by Seo and Suh (2018) targeting nurse cadets, disaster preparedness showed a significant correlation with disaster nursing competency, but disaster awareness was found to have no significant correlation with disaster preparedness and disaster nursing competency, which was different from the results of this study. Since there is insufficient research on the relationship among disaster awareness, disaster preparedness, and disaster nursing competency targeting nursing students in Korea, there is a need to confirm the relationship among them through repeated research.

In this study, as a result of multiple regression analysis to identify variables affecting disaster nursing competency, gender and grade (sophomores and seniors) showed significant results among the general characteristics. In gender, male had higher disaster nursing competency than

female, which is thought to be related to the fact that men with military service obligations serve in the military during a disaster. In grade, sophomores, juniors, and seniors have higher disaster nursing competency than freshmen do, but as a result of multiple regression analysis by grade, it was not significant in that disaster nursing competency of juniors was higher than that of freshmen, so interpretation should be cautious. Both disaster awareness and disaster preparedness significantly affect disaster nursing competency, and disaster preparedness had a greater impact on disaster nursing competency than disaster awareness did. Therefore, it is believed that disaster nursing competency will be strengthened if disaster awareness and disaster preparedness are improved. Since nursing students can be used as part of the nursing workforce in the event of a disaster (Al Thobaity et al., 2017), disaster nursing education and disaster preparation training programs suitable for nursing students should be developed and systematically implemented from the undergraduate level.

34 subjects who experienced disaster nursing education expressed dissatisfied with education, saying, "It is a theory-oriented lecture," and "It seems difficult to apply in practice." In addition, many students expressed the opinions such as 'practice-oriented education that can be applied in real situations' as disaster nursing education. In this way, we suggest that through the studies on disaster nursing education methods desired by nursing students, they can be reflected in the development of disaster nursing education programs. If the results of the research are reflected in the educational method, participation and satisfaction are expected to increase, and effective disaster nursing education can be achieved accordingly.

The limitations of this study are as follows.

1.   The characteristics of various disaster situations cannot be taken into account because the disaster preparedness measurement tools are focused on schools' disaster preparedness rather than individuals'.

2.   It can be difficult to generalize the research results since data was collected in limited regions.

Through this study, we confirmed the relationship among nursing students' disaster awareness, disaster preparedness, and disaster nursing competency, and found that disaster awareness and disaster preparedness affect disaster nursing competency. Accordingly, it is significant in that this study provides basic data necessary for strengthening education to improve disaster nursing competency for nursing students to respond to disasters.

5. Conclusion and Recommendations

This study is a descriptive research study to identify nursing students' disaster awareness, disaster preparedness,

and disaster nursing competency, the relationship among them and factors affecting disaster nursing competency, and through this, it is aimed to provide supporting data to strengthen disaster nursing education in the future. This study collected data through a survey targeting 310 nursing students attending the Department of Nursing at E University in Gyeonggi-do from April 13, 2023 to May 24, 2023, and analyzed the data from 304 students. The results obtained through this study are as follows.

1.   Disaster awareness showed an average of 72.91 ($\pm$7.46) out of a total score of 100. The average for each sub-category was 3.65 ($\pm$0.37) points.

2.   Disaster preparedness showed an average of 2.82 ($\pm$2.81) out of a total score of 15. The average for each question was 0.19 ($\pm$0.19) points.

3.   Disaster nursing competency showed an average of 44.11 ($\pm$10.76) out of a total score of 75. The average for each question was 2.94 ($\pm$0.72) points.

4.   There was a significant correlation among the three variables: disaster awareness, disaster preparedness, and disaster nursing competency.

5.   As a result of multiple regression analysis, it was found that among general characteristics, gender and grade (sophomores and seniors) had significant impacts on disaster nursing competency.

6.   As a result of multiple regression analysis, it was found that both disaster awareness and disaster preparedness had significant impacts on disaster nursing competency.

Through this study, disaster awareness, disaster preparedness, and disaster nursing competency have a significant correlation with each other. Additionally, it was found that disaster awareness and disaster preparedness affect disaster nursing competency. Based on these research results, we need to develop and supplement disaster nursing education programs that can improve nursing students' disaster awareness, disaster preparedness, and disaster nursing competency.

Based on the above research results, we propose in-depth studies on specific disaster nursing education contents and teaching methods to strengthen nursing students' disaster nursing competency.

References

Ahn, E. K., & Kim, S. K. (2013). Disaster Experience, Perception and Core Competencies on Disaster Nursing of Nursing Students. *Journal of Digital Convergence, 11*(6), 257-267. doi: https://doi.org/10.14400/JDPM.2013.11.6.257

Al Thobaity, A., Plummer, V., & Williams, B. (2017). What are the most common domains of the core competencies of disaster nursing? *A scoping review. International emergency nursing, 31,* 64–71. doi:

HM. PARK, TH. KIM, JY. KIM, JE. KIM, JE. KIM, GE. PARK, JW. BAEK, YJ. SHIN, JY. KIM, YM. KIM / Journal of Wellbeing Management and Applied Psychology Vol 6 No 4 (2023)51-61

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https://doi.org/10.1016/j.ienj.2016.10.003

Han, S. J., Cho, C. M., Lee, Y. R., Nagasaka, K., Izummune, M., Lee, S. B., & Lee, J. H. (2019). A Content Analysis of Disaster Nursing Education in Korean and Japanese Universities. *Journal of Korean Academy of Community Health Nursing, 30*(3), 307-323. doi: https://doi.org/10.12799/jkachn.2019.30.3.307

Hong, J. Y. (2020). A Study on Disaster Nursing Core Competencies of Nursing College Students. *The Journal of the Convergence on Culture Technology (JCCT), 6*(2), 199-205. doi: https://doi.org/10.17703/JCCT.2020.6.2.199

International Council of Nurses. (2019). Core Competencies in disaster nursing version 2.0. Geneva: International Council of Nurses; 16 p.

Jennings-Sanders, A., Frisch, N., & Wing, S. (2005). Nursing students' perceptions about disaster nursing. *Disaster Management & Response, 3*(3), 80-85. doi: https://doi.org/10.1016/j.dmr.2005.04.001

Jung, E. Y., Kim, H. W., & Joe, S. Y. (2018). Current State of Disaster Education in Undergraduate Nursing Programs in South Korea. *Korean Journal of Military Nursing Research, 36*(2), 106-119. doi: 10.31148/kjmnr.2018.36.2.106

Kang, J. S. (2022). Relationship between Nursing Students' Awareness of Disaster, Preparedness for Disaster, Willingness to Participate in Disaster Response, and Disaster Nursing Competency, Master's thesis, Pusan National University). Retrieved from https://m.riss.kr/link?id=T16165814

Kim, H. J. (2015). A Study on Disaster Preparedness, Core Competencies and Educational Needs on Disaster Nursing of Nursing Students. *Journal of the Korea Academia-Industrial cooperation Society, 16*(11), 7447-7455. doi: 10.5762/KAIS.2015.16.11.7447

Kim, M. S., Kim, S. Y., Park, B. H., & Choi, Y. J. (2017). The Effect of Disaster Awareness of Social Service Employees on Disaster Attitude. *Crisisonomy, 13*(3), 93-111. doi: 10.14251/crisisonomy.2017.13.3.93

Korea Ministry of Government Legislation. (2019). Misfortune and the safety supervision basic law. http://www.law.go.kr

Kwon, Y. S., Choi, E. Y., Park, S. J., & Park, S. Y. (2019). Content Analysis on the Disaster Crisis and Countermeasures Recognized by Nursing Students. *The Journal of Korean Nursing Research, 3*(3), 49-59. doi: 10.34089/jknr.2019.3.3.49

Labrague, L. J., Hammad, K., Gloe, D. S., McEnroe-Petitte, D. M., Fronda, D. C., Obeidat, A. A., ... & Mirafuentes, E. C. (2018). Disaster preparedness among nurses: a systematic review of literature. *International nursing review, 65*(1), 41-53. doi: https://doi.org/10.1111/inr.12369

Lee, Y. R., Han, S. J., & Cho, C. M. (2016). Disaster Experience, Perception and Perceived Stress of Nursing Students. *Korean Journal of Stress Research, 24*(4), 237-242. doi: 10.17547/kjsr.2016.24.4.237

Lee, Y. R., Lee. M. H., & Park, S. K. (2013). Development of the Disaster Nursing Competency Scale for Nursing students. *Journal of The Korean Society of Disaster Information, 9*(4), 511-520.

Milbrath, G., Snyder, A., & Martin, M. (2020). Interdisciplinary disaster preparedness: Study abroad in Saint Kitts and Nevis. *Health Emergency and Disaster Nursing, 7*(1), 55-62. doi: https://doi.org/10.24298/hedn.2018-0008

Park, A. S. (2017). The Effect of Disaster Awareness, Attitude, Preparedness on the Basic Competencies of Disaster Nursing among Nursing Students. *Journal of The Korean Data Analysis Society (JKDAS), 19*(3), 1625-1636. doi: 10.37727/jkdas.2017.19.3.1625

Pietrzak, R. H., Tracy, M., Galea, S., Kilpatrick, D. G., Ruggiero, K. J., Hamblen, J. L., ... & Norris, F. H. (2012). Resilience in the face of disaster: prevalence and longitudinal course of mental disorders following hurricane Ike. *PLoS One, 7*(6), e38964. doi: https://doi.org/10.1371/journal.pone.0038964

Roh, J. Y. (2010). Nurse's perception and core competencies on disaster nursing, Master's thesis, Yonsei University. Retrieved from https://m.riss.kr/link?id=T12191412

Said, N. B., & Chiang, V. C. (2020). The knowledge, skill competencies, and psychological preparedness of nurses for disasters: a systematic review. *International emergency nursing, 48*, 100806. doi: https://doi.org/10.1016/j.ienj.2019.100806

Schmidt, C. K., Davis, J. M., Sanders, J. L., Chapman, L. A., Cisco, M. C., & Hady, A. R. (2011). Exploring nursing students' level of preparedness for disaster response. *Nursing education perspectives, 32*(6), 380-383. doi: https://doi.org/10.5480/1536-5026-32.6.380

Seo, S. H., & Suh, E. Y. (2018). Disaster Perception, Disaster Preparedness, and Disaster Nursing Competency among Korea Armed Forces Nursing Academy Cadet. *Korean Journal of Military Nursing Research, 36*(1), 61-70. doi: 10.31148/kjmnr.2018.36.1.61

Usher, K., & Mayner, L. (2011). Disaster nursing: A descriptive survey of Australian undergraduate nursing curricula. *Australasian Emergency Nursing Journal, 14*(2), 75-80. doi: https://doi.org/10.1016/j.aenj.2011.02.005

Williams, J., Nocera, M., & Casteel, C. (2008). The effectiveness of disaster training for health care workers: a systematic review. *Annals of emergency medicine, 52*(3), 211-222. doi: https://doi.org/10.1016/j.annemergmed.2007.09.030

World Health Organization, & International Council of Nurses. (2009). ICN Framework of disaster nursing competencies (Vol.1): Publications Coordinator, ICN.

Yang, S. A. (2018). Convergence Analysis of the Factors Influencing Core Competencies on Disaster Nursing among Nursing Students. *Journal of Convergence for Information Technology, 8*(3), 39-51. doi: 10.22156/CS4SMB.2018.8.3.039