



Factors That Affect the Disaster Preparedness of Emergency Nurses in Public Health Center

Desi Holifatus Su'aida^{1*}; Dian Handayani¹; Suryanto¹

¹ Master of Nursing Program, Faculty of Medicine Brawijaya University, Indonesia

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ABSTRACT

Disasters can result in damage to infrastructure, material losses, and even death. Nurses have an important role in disaster management, especially those who work in the emergency room. This study aims to determine the relationship between the length of work, education level, disaster training, response phase, self-efficacy, infrastructure, and family support with disaster preparedness. This study used a cross-sectional design. The sample is 96 nurses, the sampling technique uses Total Sampling and the analysis uses the Spearman Rank test. The results of this study indicate that there is no relationship between length of service (p-Value = .148, r = .149), level of education (p-Value = .460, r = .076), response phase (p-Value = .410, r = -.085), whereas disaster training (p-Value = .009, r = .265), self efficacy (p-Value = .000, r = .702), infrastructure (p-Value = .000, r = .603), support families (p-Value = .003, r = .298) with disaster preparedness. There is no relationship between the length of work, level of education, and response phase with disaster preparedness. while disaster training, self-efficacy, infrastructure, and family support have a relationship with disaster preparedness. Health centers need to prepare infrastructure because they can be a supporting factor in increasing the readiness of nurses in disaster management.



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*) corresponding author

Desi Holifatus Su'aida., S.Kep, Ners

Master of Nursing Program, Faculty of
Medicine Brawijaya University
Jl. Veteran Malang East Java-Indonesia,
Postcode: 64145

Email: desyechy05@gmail.com;
desiholifatus@student.ub.ac.id

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ABSTRAK

Bencana dapat mengakibatkan kerusakan infrastruktur, kerugian material bahkan menyebabkan kematian. Perawat memiliki peran penting dalam manajemen bencana terutama yang bekerja di IGD. Penelitian ini bertujuan untuk mengetahui hubungan lama kerja, tingkat pendidikan, pelatihan bencana, fase respon, self efficacy, sarana prasarana dan dukungan keluarga dengan kesiapsiagaan bencana. Penelitian ini menggunakan desain cross sectional. Sampel sebanyak 96 Perawat, teknik sampling menggunakan Total Sampling dan analisis menggunakan uji Spearman Rank. Hasil penelitian ini menunjukkan tidak ada hubungan antara lama kerja (p Value = .148, r = .149), tingkat pendidikan (p Value = .460, r = .076), fase respon (p Value = .410, r = -.085), sedangkan pelatihan bencana (p Value = .009, r = .265), self efficacy (p Value = .000, r = .702), sarana prasarana (p Value = .000, r = .603), dukungan keluarga (p Value = .003, r = .298) ada hubungan dengan kesiapsiagaan bencana. Tidak terdapat hubungan lama kerja, tingkat pendidikan dan fase respon dengan kesiapsiagaan bencana sedangkan pelatihan bencana, self efficacy, sarana prasarana dan dukungan keluarga terdapat hubungan dengan kesiapsiagaan bencana. Puskesmas perlu mempersiapkan sarana prasarana karena dapat menjadi faktor pendukung dalam meningkatkan kesiapan perawat dalam manajemen bencana.



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INTRODUCTION

A disaster is an event that threatens life caused by various factors such as natural, non-natural, and human factors. Disasters can cause high death rates and injury rates, which can result in damage to infrastructure and for the community resulting in enormous economic losses (Tas et al., 2020). In 2017, 335 natural disasters affected more than 95.6 million people and killed more than 9,697 people (Setyawati et al., 2020). Indonesia every year the incidence of natural disasters will increase. According to the National Disaster Management Agency (BNPB) as many as 1,567 disaster events were recorded at the end of 2014 (BNPB, 2016). This figure increased to 2,342 disasters in 2016, which resulted in 522 deaths and 2,311 material damage (Setyawati et al., 2020). From January to March 2018, there were 513 disaster events were consisting of 182 tornadoes, 157 floods, 137 landslides, 15 forest fires, 10 floods and landslides, 3 earthquakes, 2 volcanic eruptions (BNPB, 2017).

Disasters can occur quickly without warning, efforts to reduce disaster risk have five priorities in disaster risk management, namely: understanding disaster risk, strengthening disaster risk management, investing in risk reduction, improving disaster preparedness, and rebuilding in terms of recovery, rehabilitation, and construction (Suriyanto *et al.*, 2019). Disaster preparedness is an activity carried out to predict the occurrence of disasters. Disaster management at the stage of disaster preparedness involves planning and preparation in dealing with disaster situations including carrying out capacity building, coordinating participants in organizations, individuals, and volunteers (Setyawati et al., 2020).

Nurses are one of the possible first responders in a disaster, although nurses can have a role in all phases of disaster management, both in the preparedness phase, response phase, and during recovery (Putra et al., 2011). This is following the concept of the International Council of Nurses (ICN) where ICN recommends that a nurse must contribute to all stages of disaster management including prevention, preparedness, response, and rehabilitation/recovery (Park & Kim, 2020). In the preparedness phase, nurses have an important role as part of the disaster rescue team, especially nurses who work in emergency units both in hospitals and health centers. The level of preparedness of nurses determines the success of care during a disaster (Xu & Zeng, 2016).

Nurse preparedness is an important part of disaster management. The factors that influence nurse preparedness in disaster management are the length of work, education level, nurse participation in disaster training, nurse participation in the disaster management response phase, self-efficacy, availability of facilities and infrastructure, and family support (Park & Kim, 2020; Ilo et al., 2018). From this background, the researcher wants to know what factors affect disaster preparedness for emergency nurses at the Public Health Center.

METHOD

Characteristics of participants and research design

The characteristics of the respondents in this study were nurses who worked in the Emergency Room at 7 Public Health Centers in Sumenep Regency. This study used a cross-sectional design.

Sampling procedure

Data was collected using a questionnaire that was filled out indirectly. Questionnaires were given directly to nurses working in the Emergency Room. In the beginning, before filling out the questionnaire, the researcher explained in advance the aims and objectives of the study. After the respondent understands and is willing to participate, the respondent can immediately fill out the questionnaire. Sampling was carried out in the Emergency Installation of the Sumenep District Health Center in May-June 2021. This study has obtained ethical feasibility from RSUD DR. H. Slamet Martodirdjo Pamekasan with number No.070/052/432.603/KEP/2032. and research permits from 7 Public Health Center in Sumenep Regency.

Sample size, power, and precision

The population in this study were all nurses who worked in the Emergency Room at 7 Public Health Centers in Sumenep Regency. The sampling technique used total sampling with the number of nurses as many as 96 people. Nurse preparedness questionnaire using theory. Tichy et al (2009) translated by Putra (2020). There are 39 questions in the nurse preparedness questionnaire. Disaster Response Self-Efficacy Scale questionnaire to measure the self-efficacy of an emergency nurse related to disasters. There are 20 questions in the self-efficacy questionnaire (Li et al., 2017). The Health Sector Self-Assessment Tool for Disaster Risk Reduction questionnaire to assess facilities and infrastructure related to disaster management, there are ten questions developed by WHO (2010). The Questionnaire on the Frequency of Satisfaction with Social Support questionnaire to assess family support, there are nine questions developed by García-Martín et al (2016).

Questions about nurse preparedness focused on assessing the knowledge and skills of nursing practitioners regarding disaster or post-disaster preparation, response, and management. Nurse preparedness is influenced by several factors ranging from the length of work, a high level of education can affect the function of understanding, the value of a nurse in disaster preparedness, self-efficacy can increase disaster preparedness, disaster training can affect nurses' confidence when facing disasters, participation in the response phase, availability of facilities and infrastructure, and family support for nurses in disaster preparedness planning to encourage in times of disaster.

Size and covariates

The method used for data collection is by using a questionnaire. The assessment for the demographic questionnaire included length of service, education level, participation of nurses in the disaster management response phase, participation in disaster training. The nurse's preparedness questionnaire used a 6-point Likert scale (1= Strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree). Self-Efficacy uses a 5-point Likert scale (1= Very not confident, 2 = not confident, 3 = lacks confidence, 4 = confident, 5 = very confident). The infrastructure uses a 4-point Likert scale (1 = Strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree). Family support uses a Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = quite often, 5 = almost always, 6 = always).

Data analyzes

Respondent characteristics were analyzed using descriptive statistics. For the variables of the length of work, education level, disaster training, participation in the response phase, Self-Efficacy, infrastructure, and family support using the Spearman rank test. The significance level for the analysis was set at 0.05.

RESULTS AND DISCUSSION

Table 1
Characteristics of Respondents Based on Demographic Data

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	58	60.4%
Female	38	39.6%
Age		
< 25 years	5	5.2%
26-35 years	57	59.4%
36-45 years	28	29.2%
>45 years	6	6.2%
Length of working		
< 1 year	8	8.3%
2-5 years	30	31.2%
6-10 years	25	26.0%
> 10 years	33	34.4%
Marriage status		
Married	82	85.4%
Not married yet	14	14.6%
Education		
Diploma 3	36	37.5%
Bachelor of Nursing (Ners)	59	61.5%
Master of Nursing	1	1.0%
Origin of institution (Public Health Center)		
Lenteng	13	13.5%
Guluk-guluk	9	9.4%
Batuan	12	12.5%
Saronggi	14	14.6%
Kalianget	12	12.5%
Bluto	14	14.6%
Rubaru	22	22.9%
Training Experience		
0	61	63.5%
1	25	26.0%
2	7	7.3%
3	2	2.1%
6	1	1.0%
Response Phase Participation		
0	70	72.9%
1	20	20.8%
2	5	5.2%
3	1	1.0%

Based on the analysis in table 1, it can be interpreted that most of them are male, with an age range of 26-35 years, length of work > 10 years, the majority are married, the education of most respondents is Bachelor of Nursing. Most of the agencies come from the Rubaru Public Health Center.

Most of the experience participating in disaster training does not participate in the training, while the experience of participating in the disaster response phase is mostly not involved in the response phase.

Table 2 shows the average length of service of respondents = 9.036 (SD = 6.6622), education level score with a mean value of 1.64 (SD = .505), disaster training has a mean value of .53 (SD = .917), participation in the response phase has mean value .34 (SD = .630), Self-Efficacy has a mean value of 81.35 (SD = 10.171), Facilities and infrastructure have a mean value of 50.31 (SD = 7.433), family support has a mean value of 30.56 (SD = 4.741), preparedness disaster has a mean value of 189.06 (SD = 22.095).

Based on the analysis in table 3, there is no relationship between length of work and disaster preparedness (p value = .148, r = .149), level of education and disaster preparedness (p value = .460, r = .076), participation in the response phase with preparedness disaster (p value = .410, r = -.085), Self Efficacy with disaster preparedness (p value = .000, r = .702), infrastructure with disaster preparedness (p value = .000, r = .603) and family support with disaster preparedness (p value = .003, r = .298).

DISCUSSION

The length of work is the period that employees do to their company, so they can have good experience in carrying out their work. The longer the nurse works, the higher the preparedness in disaster management will be. In this study, there was no relationship between the length of work and disaster preparedness for emergency nurses at the Sumenep district health center. In line with the research of Bakri et al, (2020) the results showed that there was no relationship between the length of work and disaster preparedness in emergency nurses. This could be because the work experience is undertaken may not play a role in supporting nurse preparedness. But that does not mean that the experience that nurses have had can always be used to carry out their duties. This is always influenced by changes and developments that are always happening. This is also supported by the opinion of Wahidah et al (2016), that nurses need to improve preparedness not only measured by the length of work but also focuses on several factors that can influence it, such as self-regulation and the atmosphere of health services. This study shows that there is no relationship between education level and disaster preparedness for emergency nurses at the Sumenep District Health Center. In line with the research of Fitriana et al., (2017) this can be caused because nurses who have a high level of education are not necessarily able to carry out disaster preparedness efforts properly. In carrying out disaster preparedness actions, the education factor is not the main thing because the educational factor can only affect individual knowledge, it is not the main factor in taking an action, therefore, in improving the preparedness of nurses in dealing with disasters, disaster training is needed and routine supervision is carried out so that Nurses who have a low level of education can learn to take preparedness actions in dealing with disasters. According to Widjanarko & Minnafiah (2018), there is no relationship between education level and preparedness because there is no education schedule regarding disaster training which is routinely carried out at the public health center. In this study, the highest level of education was S1 graduates, but if the nurse had never attended training and had never participated in a disaster before, the nurse would never be prepared to form a nurse. In

line with the research of Kapucu (2008), the formation of high disaster preparedness requires education programs about

disasters to ensure that they can take appropriate action and reduce vulnerability during a critical phase.

Table 2
Descriptive statistical variables are the length of work, education level, disaster training, participation in the response phase, self-efficacy, infrastructure, family support, and disaster preparedness.

Variables	Mean ± SD	Min	Max	CI 95%
Length of working	9.036 ± 6.6622	1	30	7.687-10.386
Education level	1.64 ± .505	1	3	1.53-1.74
Disaster training	.53 ± .917	0	6	.35-.72
Response phase participation	.34 ± .630	0	3	.22-.47
Self-efficacy	81.35 ± 10.171	36	100	79.29-83.42
Infrastructure	50.31 ± 7.433	26	60	48.81-51.82
Family support	30.56 ± 4.741	18	54	29.60-31.52
Disaster Preparedness	189.06 ± 22.095	128	219	184.59-193.54

Table 3
Analysis of Relationships Affecting Disaster Preparedness in Emergency Nurses at Public Health Center

Variables	N	Disaster Preparedness	
		P-value	R
Length of working	96	.148	.149
Education level	96	.460	.076
Disaster training	96	.009	.265**
Response phase participation	96	.410	-.085
Self-efficacy	96	.000	.702**
Infrastructure	96	.000	.603**
Family support	96	.003	.298**

This study shows that there is no relationship between participation in the response phase and disaster preparedness for emergency nurses at the Sumenep District Health Center. In line with research Septiana *et al.*, (2019), states that this can be influenced by individuals in understanding the task of a job having different periods and how the results of the work, differences in knowledge levels and skill levels. This is in line with the research of Hikmah *et al* (2021), that there is no relationship between participation in the disaster response phase and disaster preparedness because it is possible that participation in the disaster response phase can be influenced by several factors, including the length of involvement, differences in a person within a sufficient time limit in understanding the duties of a job and how the results of the work, as well as the level of skills possessed by nurses. Huriah & Farida's research, (2010) states that nurses who are not involved in the disaster response phase are due to the lack of preparation from the institution for disaster preparation.

This study shows that there is a relationship between disaster training and disaster preparedness for emergency nurses at the Sumenep District Health Center. Unver *et al* (2018) stated that disaster training can have a positive impact on nurse preparedness. Providing short-term training in the form of simulations practically and systematically such as on-the-job, vestibule, demonstration, and example, and classroom methods can increase nurses' confidence and nurse competence in influencing disaster management preparedness. In research Rizqillah & Suna (2018), It was stated that nurses working in the emergency department and having attended previous disaster training could affect nurses' confidence when facing an upcoming disaster. Nurses who

have attended training at least once a year provide a good correlation to increase the competence and confidence of nurses in disaster management (Uhm *et al.*, 2020).

Self-efficacy is a self-assessment of the ability of competence in performing a task. Self-efficacy has an influence on a person's behavior when there is a problem and it is not controlled. This study shows that there is a relationship between self-efficacy and disaster preparedness for emergency nurses at the Sumenep District Health Center. Mastura & Syarif (2015) states that nurses who have high self-efficacy can have confidence in facing a difficult problem and are confident in their ability to solve problems. Self-efficacy can also be influenced by sources of efficacy itself, namely experiences for success, other individual experiences, verbal and physiological persuasion (Bandura, 1997). In conditions of a disaster crisis, nurses need good self-restraint to rise from the problems they face (Mariani, 2017).

Adequate facilities and infrastructure is one part related to preparedness in the disaster prevention and management system. This study shows that there is a relationship between infrastructure and disaster preparedness for emergency nurses at the Sumenep District Health Center. The findings in this study are in line with the findings Hammad *et al* (2012) stated that to support services during disaster response, the hospital disaster plan will be activated and backup support resources will be immediately distributed to support services in the ER, such as medical equipment, medicines, and additional personnel. With sufficient infrastructure, it shows an increase in the motivation of nurses to maximize the competencies they have in their clinical practice (Hannani *et al.*, 2016). The emergency department is the area most affected during the initial phase of the disaster response, therefore the availability of facilities and infrastructure must be met from the pre-disaster phase (Bayram *et al.*, 2013). The availability of facilities and infrastructure is very important in increasing the readiness of emergency room nurses during disaster management (Norazam, 2018).

Support can be defined as the perception, feeling that is supported or the availability of support from the family. Support can come from the closest people, family, partners, and friends. This study shows that there is a relationship between family support and disaster preparedness for emergency nurses at the Sumenep District Health Center. The findings in this study are in line with the findings Maeda *et al* (2018) that the support is given by families to nurses in disaster preparedness planning to encourage responding well during disasters. Full support from family, co-workers, and

direct supervisors can reduce pressure when working in full conditions, and can improve the quality of the work of nurses (Woodhead *et al.*, 2016).

LIMITATIONS TO THE STUDY

The limitations of this study are that there are still unexplored factors that can affect preparedness in dealing with disasters, including the level of knowledge, attitudes, disaster warning systems on preparedness, policies, and guidelines for preparedness. In this study also not all health centers were taken, from 30 health centers only 7 health centers took, which means the results of this study cannot be generalized to all emergency nurses in health centers throughout Sumenep Regency.

CONCLUSION AND RECOMMENDATIONS

There is no relationship between the length of work, level of education, participation in the response phase, and disaster preparedness for emergency nurses and there is a relationship between disaster training, self-efficacy, infrastructure, and family support in response to disaster preparedness for emergency nurses. In addition, the results of this study can be used as a basis for considering improving infrastructure, self-efficacy, and guidelines governing disaster education and training for health workers at the public health center. Infrastructure facilities need to be integrated into emergency nurses at the public health center as the spearhead of health services to support the readiness of health workers in dealing with disasters.

ETHICAL CONSIDERATION

This study was conducted following research ethical standards and all study protocols received ethical approval from RSUD DR. H. Slamet Martodirdjo Pamekasan with number No.070/052/432.603/KEP/2032.

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Conflict of Interest Statement

The authors declared no potential conflicts of interest for this article's research, authorship, and publication.

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