

## Preparedness of Nurses in Handling Disaster Victims in Sulawesi Tengah

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### ABSTRACT

As a disaster-prone province, Central Sulawesi requires preparedness in disaster management. The role of nurses in disaster preparedness cannot be separated. The purpose of this study was to examine the readiness of nurses in disaster management in Central Sulawesi. This type of survey research with a correlational approach was carried out at the Palu City Government Hospital from June to August 2022. The research sample was nurses who worked in the hospital emergency room. 85 nurses who met the selection criteria to participate in this study were obtained by simple random sampling technique. The nurse's preparedness variable in handling disaster victims was measured using the Disaster Preparedness Evaluation Tool (DPET) questionnaire which was distributed through the Google form. Data analysis used product-moment correlation analysis and Spearman rank. The preparedness of nurses in dealing with disaster victims is in a good category (72.6%). There is a significant relationship between age ( $p = 0.001$ ), length of work ( $p = 0.001$ ), and training ( $p = 0.001$ ) with the readiness of nurses in disaster management, while gender ( $p = 0.113$ ) and education ( $p = 0.927$ ) did not show a significant relationship. The preparedness of nurses in managing disaster victims is in the good range, and there is a correlation between nurses' preparedness in managing disaster victims and their age, length of employment, and training. Ongoing training in disaster management and practice with disaster victims should be given to nurses.

**Keyword:** Disaster victim management; Nurses; Preparedness.

### ABSTRAK

Sebagai provinsi rawan bencana, Sulawesi Tengah membutuhkan kesiapsiagaan dalam penanggulangan bencana. Peran perawat dalam kesiapsiagaan bencana tidak dapat dipisahkan. Tujuan penelitian ini untuk mengkaji kesiapan perawat dalam penanggulangan bencana di Sulawesi Tengah. Jenis penelitian survey dengan pendekatan korelasional dilaksanakan di RSUD Kota Palu pada bulan Juni sampai Agustus 2022. Sampel penelitian adalah perawat yang bekerja di IGD RSUD. 85 perawat yang memenuhi kriteria seleksi untuk berpartisipasi dalam penelitian ini diperoleh dengan teknik simple random sampling. Variabel kesiapsiagaan perawat dalam menangani korban bencana diukur dengan menggunakan kuesioner Alat Disaster Preparedness Evaluation Tool (DPET) yang dibagikan melalui Google form. Analisis data menggunakan analisis korelasi product moment dan rank Spearman. Kesiapan perawat dalam menghadapi korban bencana termasuk dalam kategori baik (72,6%). Ada hubungan yang signifikan antara usia ( $p = 0,001$ ), lama kerja ( $p = 0,001$ ), dan pelatihan ( $p = 0,001$ ) dengan kesiapan perawat dalam penanggulangan bencana, sedangkan jenis kelamin ( $p = 0,113$ ) dan pendidikan ( $p = 0,927$ ) tidak menunjukkan hubungan yang signifikan. Kesiapan perawat dalam menangani korban bencana berada pada kisaran yang baik, dan terdapat korelasi antara kesiapan perawat dalam menangani korban bencana dengan usia, lama kerja, dan pelatihan. Pelatihan berkelanjutan dalam manajemen bencana dan praktik dengan korban bencana harus diberikan kepada perawat.

**Kata Kunci:** Penanggulangan korban bencana; Perawat; Kesiapsiagaan

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## Introduction:

Indonesia is very vulnerable to disasters because it is recognized to be in the ring of fire area. (Bappenas, 2016 citation by Martono et al., 2019). Some disaster events that often hit Indonesia, namely volcanic eruptions, earthquakes, tsunamis, floods, and landslides are some of the disasters that can occur (BNPB, 2021). One of the disaster-prone locations is Central Sulawesi. This is caused by the Palu Koro Fault which is the longest fault on Sulawesi Island forming a northern structure stretching from Central Sulawesi to the Karimata Strait which often causes earthquakes, landslides, and floods (National Earthquake Study Center, 2017 in Hutabarat, L.E, Simanjuntak, P, Tampubolon, 2019). This disaster event has an impact in the form of damage to infrastructure which results in the hampering of social life, causing loss of life, damaging ecosystems, and causing homelessness (Prasojo et al., 2021).

In 2018, an earthquake, tsunami, and liquefaction hit Central Sulawesi, causing 3837 casualties, consisting of 2500 dead, 500 missing, 60 seriously injured/hospitalized, 320 lightly/outpatient injuries, and 457 refugees (Ministry of Health, 2019). Meanwhile, from 2019 to 2023, 262 disaster events in Central Sulawesi caused 14 deaths, 4 missing, 51 injured, and 63,998 victims (BNPB, 2021).

A series of disaster events in Central Sulawesi requires nurses to have good preparedness related to disasters so that disaster victims can be minimized. Nurses are a key pillar in the healthcare sector and will be at the forefront. They are the first to respond to every disaster emergency in the health sector (Said & Chiang, 2020). The important role of emergency department nurses in disaster management is crucial. They act as the frontline in identifying risks, planning responses, and participating in preparedness education and training. In addition, they are also involved in the recovery process with other disaster management teams (Al Harthi et al., 2020). To prepare for disaster victims, ER nurses must have in-depth knowledge of emergency preparedness, disaster simulation experience, an understanding of hospital disaster plans, a high level of education, previous disaster

response experience, and adequate disaster training (Khairina et al., 2022; Winarti & Gracya, 2023). All of these factors collectively improve their ability to respond effectively to disasters and reduce their impact on victims. For this reason, nurses need to have good preparedness in handling disaster victims.

However, research conducted by Martono et al., (2019) reported that Indonesian nurses are poorly prepared in facing disasters. Setyawati et al., (2020) also in their research said nurse preparedness in disaster management is in the medium category. Several studies have also reported nurse preparedness to be in the category of less to moderate in disaster management (Emaliyawati et al., 2021; Winarti & Gracya, 2023; Labrague & Hammad, 2023; Songwathana & Timalsina, 2021).

There have been many studies that assess the preparedness of nurses in disaster victim management in the world and Indonesia. However, in Central Sulawesi, especially in Palu City, this research has never been conducted. For this reason, through a crosssectional approach, this study aims to determine the preparedness of nurses in disaster victim management in Central Sulawesi.

## Methods:

This study uses a survey design and a correlational approach. The population is all emergency room nurses in Government Hospitals in Palu City, namely RSUD Undata, RSUD Madani, RS Bhayangkara, and RS DR. Sindhu Trisno, totaling 108 people. A total of 85 respondents who participated in the study met the criteria. The sample size was obtained by using the Slovin formula with a sampling error rate of 5%. The inclusion criteria were nurses who were in the emergency room and were in place at the time of the study and the exclusion criteria were respondents who did not complete the research process to the end. This research was conducted according to ethical guidelines and has received ethical approval from the ethics committee of the Poltekkes Kemenkes Palu with number 0072/KEPK-KPK/VI/2022. Participation in the study was voluntary and respondents were kept confidential.

Data were collected using questionnaires adapted from the Disaster Preparedness Evaluation Tool (DPET) and validity and reliability tests have been conducted to obtain Cronbach's alpha internal consistency reliability of 0.949. The questionnaire consists of 38 questions divided into 3 aspects, namely knowledge of 13 statement items (1-13), skills of 8 statement items (14-21), and disaster management of 17 statement items (22-38) using a 6-point Likert scale. The scoring system for selected questions uses the following criteria: 6 for 'strongly agree', 5 for 'agree', 4 for 'doubt/disagree', 3 for 'disagree', 2 for 'disagree', and 1 for 'strongly disagree'. The average total score is calculated based on all items. The preparedness category is determined from the average value which is divided into 3 parts, namely when the average value of  $1 \leq \bar{x} < 2$  is not enough,  $\geq 2-4$  enough, and  $\geq 4-6$  good. Data collection using an online questionnaire by compiling a list of potential respondents based on predetermined criteria and sample sizes. Before respondents take part in the study, respondents sign informed consent after the purpose of the study is explained by the researcher. Next, the researcher explained to respondents how to fill out the questionnaire. If the respondent already understands the researcher, then distribute the questionnaire in the form of an online Google form. Furthermore, researchers ensure that the Google form that has been filled out by respondents has been stored in the researcher's database. Then the researchers manage the data. Descriptive statistical tests were used to study nurse readiness in disaster management, and correlational analysis tests using product moment correlation and Spearman ratings were used to test the relationship between respondent characteristics and disaster victim preparedness. To test the relationship between age, duration of work, training, and nurse preparation in crisis management, product moment correlation was used because the data was in the form of interval and ratio scales. The correlation between gender, education, and nurses' readiness to cope was examined using Spearman rank correlation analysis because the data was in nominal and ordinal form. When the significance value of the

correlation is less than the significance level of 5% (p-value 0.05), it is claimed that there is a relationship. SPSS 16.0 is used to analyze data..

## Results:

A total of 85 (78.7%) respondents filled out the questionnaire and followed this study to the end. Meanwhile, as many as 23 (21.3%) were eliminated due to incomplete questionnaire filling and did not meet the inclusion criteria.

Table 1. Characteristics of Respondents Based on Age, Gender, Education, Length of Work, and Ever Attended Training

Characteristics of Respondents	f	%
Age (years):		
< 26	7	8,2
26-35	60	70,6
36-45	16	18,8
> 45	2	2,4
Gender:		
Male	37	43,5
Female	48	56,5
Education:		
D3	55	64,7
S1	28	32,9
S1 Nurses	2	2,4
Length of employment (years):		
< 6	30	35,3
6-15	45	52,9
16-25	9	10,6
> 25	1	1,2
Experiences with previous training in emergency		
No	46	54,1
Yes	39	45,9

Table 1 shows 70.6% of respondents aged 26-35 years, 56.5% are male, 64.7% graduated with a diploma in nursing, 52.9% worked 6-25 years and 54.1% received some training in disaster emergency skills.

Table 2. Distribution of Nurse Preparedness in Disaster Management

Category	f	%
Good	62	72,9
Enough	23	27,1
Not enough	0	0,0

Table 2 shows that 72.9% of respondents' preparedness is in a good category and there are no respondents who are lacking in disaster victim management in Central Sulawesi.

Table 3. Distribution of Nurse Knowledge

Category	f	%
Good	65	76,5
Enough	20	23,5
Not enough	0	0,0

Table 3 shows that 76.5% of respondents have good knowledge of disaster victim management, and none have poor knowledge.

Table 4. Distribution of Nurse Skills

Category	f	%
Good	66	77,6
Enough	19	22,4
Not enough	0	0,0

Table 4 shows that 77.6% of respondents have good skills in disaster victim management, and none have poor skills.

Table 5. Distribution of Nurse Disaster Management

Category	f	%
Good	60	70,6
Enough	25	29,4
Not enough	0	0,0

Table 5 shows that 70.6% of respondents have good management disaster of disaster victim management, and none have poor management disaster. Table 6 shows that based on the relationship between the characteristics of the respondents and the preparedness of nurses in disaster management in the category of age, length of work, and having attended training,

there is a significant relationship with each p-value of 0.001. However, for the category of gender and education, there is no significant relationship with p-values of 0.113 and 0.927

Table 6. Correlation Analysis Summary

Variable	Correlation Coefficient Value	P-value	Description
Age with preparedness	0,453	0,001	Significant
Gender with preparedness	0,173	0,113	Not significant
Education with preparedness	0,010	0,927	Not significant
Length of employment with preparedness	0,436	0,001	Significant
Experiences on previous training in an emergency with preparedness	0,414	0,001	Significant

### Discussion:

This study aims to determine the readiness of nurses to handle disaster victims in Central Sulawesi. The results showed that the overall readiness of nurses in disaster management in Central Sulawesi was mostly in the good category (72.6%). The results of these aspects show that nurse readiness is good in terms of knowledge (76.5%), skills (77.6%), and management (70.6%) in the good category. This means that nurses are ready to respond to disaster victims in Central Sulawesi.

Disasters that often occur in Central Sulawesi result in nurses, especially those who work in the emergency room, often exposed to disaster victims so that nurses already know how to handle them in the event of a disaster. In addition, based on the results of filling out the questionnaire, almost all respondents who filled out had attended disaster-related training. This finding is in line with research conducted by Duong, (2009) cited in (Martono et al., 2019) which reports that emergency preparedness and

confidence to respond in a disaster event can be directly influenced by previous disaster experience and training.

However, the results of this study are different from other existing studies. Research conducted by Martono et al., (2019) states that the preparedness and understanding of nurses in Indonesia about their role in dealing with disasters is still low. This is because most nurses have no experience in disaster management and no disaster planning program has been approved by medical centers at the primary level and hospitals, although most nurses have received disaster management training. Several other studies have also reported that nurses are adequately prepared and even poorly prepared in handling disaster victims (Duan et al., 2022; Wang et al., 2023; Ying et al., 2023). This is related to a lack of understanding, training, and education about disasters (Labrague & Hammad, 2023; Songwathana & Timalsina, 2021). Nurses' preparedness in facing disasters needs to be supported by nurses' competence in disaster management. Several competencies can improve nurses' preparedness in disaster management, namely by attending formal disaster training and disaster simulation education. So that nurses are expected to be ready for effective disaster management (Ihsan et al., 2022; Setyawati et al., 2020).

Although the results of the study show that nurse preparedness is in a good category, to maintain and improve the ability of nurse preparedness management to the ability to assist victims of disasters and other health problems, nurses are expected to continue to improve the competencies that can be obtained in training activities, such as first aid for disaster victims, disaster triage training, basic life support and handling infection cases for injured disaster victims. Of all these trainings are very important and become a necessity for nurses in preparing for disaster preparedness (Labrague & Hammad, 2023; Purnomo et al., 2021).

The role of nurses in disaster management not only reduces the morbidity and mortality of disaster victims during emergency response. Nurses can also play a role in preparing communities to prepare for disasters by

increasing resilience. According to the International Council of Nurses (ICN), disaster nurse competencies emerge in the mitigation, preparedness, relief, recovery, and rehabilitation phases. For example, in the preparedness phase, nurses need to assess the needs of the community, in the acute phase provide physical and mental care for victims, in the recovery phase, nurses play a role in restoring health service functions (Doondori & Paschalia, 2021).

Currently in Indonesia, especially in the city of Palu, Central Sulawesi, disaster events cannot be predicted, so the ability of nurses other health workers, and the community regarding disaster preparedness is needed so that this can be a special concern for all of us. It is expected that activities in disaster capacity should continue to be carried out regularly to prepare and maintain knowledge, disaster management, and nurses' skills in dealing with disaster victims. So it is necessary to prepare nurses actively and independently in managing disaster services both in the field and in the field of health services. Disaster simulation activities make exercises that must be routine, disaster simulations that look real. With exposure to disaster simulation activities, participation and activeness in participating in disaster simulation skills training, such as first aid for disaster victims, basic life support training, and disaster planning were presented. This is one of the factors that greatly affects the level of nurse competence in improving nurse preparedness in facing disasters by conducting real disaster simulations (Martono et al., 2019).

The results of further analysis using correlation analysis showed that based on 5 variables characteristic of respondents, 3 of them (age, length of work, and training) provided a significant relationship with nurse readiness in disaster management. This is indicated by a significance value (p-value) that is smaller than the significance level of 5%. Meanwhile, gender and education variables did not show any relationship with nurse preparedness in disaster management.

Age is one of the characteristics that has a relationship with nurses' readiness to face disaster victims with a p-value = 0.000. Age is a factor

that influences a person's behavior. This happens because with age, physical and psychological development develops and psychological development can increase maturity in thinking, to increase nurses' readiness in disaster management (Setiawati et al., 2020). This research is in line with the results of research conducted by Wahida and Fatmala which states that age is related to nurse preparedness in disaster management (Wahida & Fatmala, 2020). Other studies have also reported a significant relationship between age and nurses' preparedness in disaster management. This is because a person's age can affect a person's behavior in doing something (Al Fatih, 2019; Younos et al., 2021).

The results of this study also show that the length of work has a significant relationship with nurses' readiness to handle disaster victims. The results of this study are in line with research conducted by Lin et al., (2023) which states that there is a significant relationship between length of work and nurse preparedness in disaster management. The length of work can have the greatest influence on nurses' readiness to face disaster victims. The longer a nurse works, the more experience she gains, and can increase work productivity in the form of health service preparedness to anticipate disasters that will occur. Working time is synonymous with experience, the longer a person works, the longer his work period will be able to increase one experience to affect the knowledge and attitude of nurses in nurse preparedness in disaster victim management services (Wahida & Fatmala, 2020).

The next characteristic that has a relationship with nurses' readiness to deal with disaster victims is training (p-value = 0.000). This finding is in line with the results of research conducted by Said & Chiang, (2020) which reported that there is a relationship between training and nurse preparedness in disaster management. Other studies have also stated nurses with prior disaster training are associated with greater preparedness (Goniewicz et al., 2021; Kako & Hutton, 2023; Lin et al., 2023). Training attended by nurses can have a positive impact in increasing information and experience in improving nurses' preparedness in facing disasters and also in providing health

services in facing disaster victims (Kako & Hutton, 2023). This is in line with research conducted by Martono et al., (2019) which states that adequate knowledge about disaster preparedness is related to the fact that nurses have undergone disaster management training at their workplace, both carried out by hospitals and health education institutions.

In contrast to age, length of work, and training, gender and education characteristics do not have a significant relationship with nurse preparedness in disaster management. These results are in line with several studies reporting no association between gender and nurse preparedness (Lin et al., 2023; Wahida & Fatmala, 2020) and research conducted by Martono et al., (2019) which states that there is no relationship between education about knowledge and perceptions of preparedness in facing disasters.

The results of this study show the importance of disaster victim management training for nurses to improve knowledge, skills, and disaster management and hospitals need to prepare adequate equipment to support disaster victim management. So that nurses are said to be ready in terms of knowledge, skills, disaster management, and facilities and infrastructure when a disaster occurs. This study only assessed the preparedness of nurses in disaster victim management. However, it does not assess factors related to nurse preparedness in disaster management. So further research is needed to assess related factors in disaster victim management so that the hospital can take policies to improve nurse preparedness.

## Conclusions:

Nurses' preparedness in disaster management in Central Sulawesi is in the good category. To maintain and improve nurses' preparedness in disaster management, nurses need to be given ongoing training on disaster management and disaster management simulation training.

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