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NURSES' PERCEPTION OF DISASTER PREPAREDNESS IN BANDUNG

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ABSTRACT
Indonesia as an archipelagic country has various natural and non-natural disasters, the preparedness of health workers, especially nurses, influences disaster management, where nurses have the largest number during disaster management. Objective to identify nurses' perceptions of nurse preparedness in the pre-disaster, disaster, and post-disaster phases in the Bandung City area. The type of research used is descriptive quantitative survey research. The population is all nurses in the West Java region who are adults. The sampling technique used in this study uses convenience sampling. Respondents were nurses in Bandung, a total of 287 people. Data was collected by filling out a questionnaire using Google Forms. The data obtained was then analyzed univariately using descriptive analysis through frequencies and percentages. The results showed that most (80.5%) of disaster education and training was lacking, and a small proportion (19.5%) were good. More than half (54.7%) of knowledge and information about disasters needs to be improved, and almost half (45.3%) is good. Handling of bioterrorism and emergency response Most (61.3%) are poor, and almost half (38.7%) are good. Nurses' response during a disaster was more than half (51.2%) poor, and almost half (48.8%) were good. During the disaster evaluation, more than half (51.2%) were poor, and almost half (48.8%) were good. Overall, the perception of disaster preparedness is more than half (50.4%) poor, and almost half (49.6%) is good. Nurses' perceptions of disaster preparedness in some aspects are still lacking, and some are good.

Keywords: disaster; nurse; perception; preparedness

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INTRODUCTION

Indonesia is an archipelagic country located at the confluence of four tectonic plates, namely the Asian Continental Plate, the Australian Continental Plate, the Indian Ocean Plate and the Pacific Ocean, and there is a volcanic belt. Volcanic eruptions, earthquakes, tsunamis, floods and landslides also add to the potential for disasters that arise in Indonesia. Therefore, Indonesia often experiences various disasters. Hence it is referred to as a disaster supermarket. West Java Province also has tectonic plates and volcanic belts, so disaster events often occur, both natural disasters and unnatural disasters. Natural disasters occur, such as floods, volcanic eruptions, fires and earthquakes, and unnatural disasters, such as terrorism and water, soil and air pollution by factory waste (National Disaster Management Authority, 2022).

The Indonesian Disaster Data and Information Management Database (DIBI) totaled 24,969 incidents, with 5,060,778 fatalities and 4,400,809 houses affected, and 19,169 damaged public

facilities spread throughout Indonesia (National Disaster Management Authority, 2022). In the province of West Java, disaster events have the highest risk of disaster hazards (Apriadi et al., 2022). The latest disaster that occurred in West Java was an earthquake in the Cianjur district with a magnitude of 5.6, which caused 321 fatalities, 73,874 refugees, 27,434 houses heavily damaged infrastructure, 13,070 moderately damaged and 22,124 houses lightly damaged, so a total of 62,628 houses were damaged (Muhari, 2022).

Bandung City, the capital of West Java province, has a high potential for natural and non-natural disasters. The predicted natural disaster potential in Bandung is the Lembang fault. The Lembang Fault can cause an earthquake with a maximum magnitude of 6.8 M (National Disaster Management Authority, 2022). The impact of the earthquake can cause damage to infrastructure and casualties. When a disaster occurs, various parties jump in to assist in disaster management led by BNPB at the national level. Nursing staff are health workers with the largest proportion, 40.5% of the other health workers (Ministry of Health RI, 2022). The personnel who go to the disaster are called volunteers. The health workers in the disaster area consist of various disciplines, including a nurse (Muhari, 2022). Nurses are health workers with the largest number of volunteers who go to help in disaster areas. Nurses have an important role in disaster management to reduce the negative impact of disasters and simultaneously improve survivors' quality of life.

In disaster management, there are 4 (four) stages/fields of work disaster management including the stages of prevention and mitigation, preparedness, emergency response, and recovery (Triutomo, Widjaja, Siswanto, & Yohannes, 2011). At each stage of disaster management, nurses contribute to helping cope with disasters that occur. The role of nurses is involved in every phase of the disaster, including the pre-disaster, disaster and post-disaster phases (Firouzkouhi, Kako, Abdollahimohammad, Balouchi, & Farzi, 2021). The role of nurses is so significant in disaster management. Therefore, clear information is needed about nurses' preparedness in disasters, especially those in the province of West Java.

Several previous studies have revealed information about preparedness in the territory of Indonesia. Research conducted in Pekan Baru revealed the knowledge and attitudes of nurses in dealing with flooding at the Rumbai Health Center, with a total of 42 respondents, with the results of the research showing that the preparedness of nurses was mostly at a moderate level (Setiawati, Utami, & Sabrian, 2020). Other research has revealed the perceptions of Indonesian nurses regarding disaster preparedness with a total sample of 1341 from all regions of Indonesia, with the research results showing that the understanding of preparedness is still low (Martono, Satino, Nursalam, Efendi, & Bushy, 2019). However, this research needs to specifically explain how preparedness of nurses in the West Java region. Very little reveals the preparedness of nurses in dealing with disasters in the West Java region, such as research that examines the relationship between individual characteristics and the preparedness of puskesmas nurses in dealing with flood disasters only in the Bandung Regency area (Septiana, 2019). Thus, to determine the preparedness of nursing staff in dealing with disasters, research is needed that has a broader scope, covering all areas in West Java province so that nurses' readiness to deal with various disasters in West Java can be known as well as the factors that influence nurse preparedness regarding disaster management. Thus, this research aimed to explore nurses' perception of disaster preparedness in Bandung.

METHOD

This research was conducted with a quantitative descriptive design with a survey approach. In this study, the researchers distributed questionnaires regarding disaster preparedness to nurses working in educational institutions, hospitals and community health centres in Bandung. Convenience sampling was used in the data collection process, and informed consent and Google forms were given to nurses to participate in this study. The research procedure is as follows. The research aims, and methods were explained to the nursing organizations for permission to collect data. Someone from an institutional nursing organization distributed a link to the questionnaire via Google form to the respondents. Researchers collect data and analyze data. Respondents in this study were nurses who worked in educational institutions, hospitals and health centers in the city of Bandung. They were informed about the purpose of the study and informed consent. The number of respondents who participated in this study was 287 nurses.

The questionnaire was adopted from the Disaster Preparedness Evaluation Tool for Nurses-The Korean Version **(**DPET-K) (Han & Chun, 2021). The instrument consists of three stages of a disaster: pre-disaster preparedness, mitigation and response, and evaluation. Each item responds to a 6-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, and 6 = strongly agree, with higher scores representing higher disaster preparedness). For the preparedness category, there are two categories, namely poor (if less than the median) and good (if more than the median). The translation is as follows: First, the instrument is translated from English into Indonesian by a linguist. Second, researchers reviewed the draft translation instrument to ensure accuracy and conformity with Indonesian. Third. Experienced university nurse specialists were asked to confirm the translated instrument. The seven experts carried out content validity and reached an agreement of 80. The Cronbach's alpha values of the preliminary survey of this study were between 0.94 and 0.96(Han & Chun, 2021).Data was collected using Google form. Then the statistical tests used for analyzing Nurses' Perception of Disaster Preparedness were a descriptive statistical test using the median, frequency and percentage, chi-square with significance level of 95%.

RESULTS

Table 1 shows that the majority of respondents work in hospitals (93.7%), Most (77.0) of nurses are female, Most are less than 29 years old (41.1%), Most have the last Diploma 3 education in nurses (57.1%), more than half are married (66.6%), Most of the nurses have work experience less than or equal to 5 years (37.6%), more than half participate in disaster Education and Training (68.6%), more half of the respondents received disaster preparedness training at work (49.8%).

Table 1.
Characteristics of respondents

Variable	Categories	f	%
Working place	Public health	4	1.4
	Hospital	269	93.7
	Educational institution	14	4.9
Gender	Male	66	23.0
	Female	221	77.0
Age (years)	<=29	118	41.1
	30-39	86	30.0
	40-49	72	25.1
	>= 50	11	3.8
Education	Diploma 3	164	57.1
	Diploma 4	2	.7
	Bachelor in Nursing (Ners)	109	38.0
	Master in Nursing	12	4.2
Marital status	Married	191	66.6
	Divorced	7	2.4
	Not married	89	31.0
Nursing experience (unit: year)	<= 5	108	37.6
	6-10	48	16.7
	11-15	50	17.4
	16-20	31	10.8
	21-25	29	10.1
	26-30	16	5.6
	>= 31	5	1.7
Participation disaster education and drills	Yes	197	68.6
	No	90	31.4
When respondent was educated about disaster preparedness	Program Diploma	86	30.0
	Undergraduate nursing program	51	17.8
	Drills in the workplace	143	49.8
	Continuing education courses	7	2.4

Table 2.
Frequency distribution of nurses' disaster preparedness (n = 287)

Phase	Factor	Categories	Frequency (f)	Percentage (%)
Prevention (pre-disaster stage)	Disaster education and training	Poor	231	80.5
		Good	56	19.5
	Disaster knowledge and information	Poor	139	54.7
		Good	115	45.3
	Bio-terrorism and emergency response	Poor	176	61.3
		Good	111	38.7
Mitigation (disaster stage)	Disaster response	Poor	147	51.2
		Good	140	48.8
Recovery (post-disaster stage)	Disaster evaluation	Poor	147	51.2
		Good	140	48.8
Preparedness		Poor	128	50,4
		Good	126	49,6

Table 2 reveals the preparedness of nurses in Bandung regarding disasters which include prevention, mitigation and recovery. At the pre-disaster stage, most of the respondents answered that they still lacked disaster education and training (80.5%), more than half of disaster knowledge and information (54.7%) were still lacking, regarding handling bio-terrorism and emergency response as well. more than half (61.3%) are still lacking. For mitigation at the disaster stage or disaster response, more than half (51.2%) are still lacking.

Likewise for recovery in the post disaster stage, more than half of disaster evaluation (51.2%) is still lacking. Overall, half of the respondents (50.4%) of respondents were not ready to face a disaster.

Table 3.
Correlation between age, education, nursing experience, participation disaster and disaster preparedness items

Age	Disaster education and training				Disaster knowledge and information				Bio-terrorism and emergency response			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
<=29	99	19	3.033	0.39	59	50	2.825	0.42	77	41	1.433	0.69
30-39	65	21			37	39			50	36		
40-49	57	15			39	23			42	30		
>= 50	10	1			4	3			7	4		
Age	Disaster response				Disaster evaluation				Disaster preparedness			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
<=29	61	57	0.742	0.86	55	63	5.152	0.16	56	53	3.139	0.37
30-39	41	45			41	45			33	43		
40-49	39	33			45	27			36	26		
>= 50	6	5			6	5			3	4		
Education	Disaster education and training				Disaster knowledge and information				Bio-terrorism and emergency response			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
D3	134	30	4.395	0.22	80	69	0.202	0.98	99	65	1.422	0.70
D4	2	0			1	1			2	0		
Bachelor	88	21			52	40			68	41		
Master	7	5			6	5			7	5		
Education	Disaster response				Disaster evaluation				Disaster preparedness			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
D3	82	82	0.279	0.96	83	81	4.300	0.23	75	74	2.082	0.56
D4	1	1			0	2			2	0		
Bachelor	58	51			60	49			46	46		
Master	6	6			4	8			5	6		
Nursing experience	Disaster education and training				Disaster knowledge and information				Bio-terrorism and emergency response			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
<= 5	91	17	4.059	0.67	50	48	2.575	0.86	70	38	4.157	0.66
6-10	38	10			26	20			29	19		
11-15	38	12			24	18			32	18		
16-20	22	9			14	14			14	17		
21-25	24	5			14	10			18	11		
26-30	14	2			8	3			10	6		
>= 31	4	1			3	2			3	2		
Nursing	Disaster response				Disaster evaluation				Disaster preparedness			
experience	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
<= 5	54	54	0.750	0.99	50	58	6.125	0.41	50	48	1.331	0.97
6-10	26	22			23	25			21	25		
11-15	27	23			27	23			21	21		
16-20	15	16			18	13			14	14		
21-25	15	14			18	11			14	10		
26-30	8	8			10	6			6	5		
>= 31	2	3			1	4			2	3		
Participation disaster	Disaster education and training				Disaster knowledge and information				Bio-terrorism and emergency response			
	Poor	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*
yes	152	45	4.437	0.03	92	80	0.329	0.57	122	75	0.097	0.76
No	79	11			47	35			54	36		
Participation	Disaster response				Disaster evaluation				Disaster preparedness			
disaster	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*	*Poor*	*Good*	*z*	*p*

yes	101	96	.001	0.98	97	100	0.987	0.32	82	90	1.576	0.21
No	46	44			50	40			46	36		

Table 3 reveals that there is no correlation between age, education, nursing experience, participation in disaster with disaster education and training, disaster knowledge and information, bio-terrorism and emergency response, disaster response, disaster evaluation, and disaster preparedness, except for participation in disaster. education and training (p = 0.03).

Table 4.
Distribution of Disaster Preparedness of nurses (n = 287)
Scale of 1-6 with 1 = strongly disagree to 6 = strongly agree.

No	Items	*Mean*	*SD*
	Disaster education and training		
1.	I participate in one of the following educational activities on regular basis: continuing education classes, seminars, or conferences dealing with disaster preparedness	4.84	0.92
2.	I know who to contact (chain of command) in disaster situations in my community.	4.84	0.90
3.	I have participated in emergency plan drafting and emergency planning for disaster situations in my community.	4.15	1.31
4.	I participate in disaster drills or exercises at my workplace (clinic, hospital, etc.) on a regular basis.	4.70	0.96
	Disaster knowledge and information		
1.	I know the limits of my knowledge, skills, and authority as an RN to act in disaster situations, and I would know when I exceed them.	4.94	0.59
2.	I have a list of contacts in the medical or health community in which I practice. I know referral contacts in case of a disaster situation (health department, e.g.,).	4.49	1.01
3.	Finding relevant information about disaster preparedness related to my community needs is an obstacle to my level of preparedness	4.25	1.20
4.	I consider myself prepared for the management of disaster.	4.58	0.83
5.	I know where to find relevant research or information related to disaster preparedness and management to fill in gaps in my knowledge.	4.36	0.98
6.	I find that the research literature on disaster preparedness and management is easily accessible	4.47	0.94
7.	I find that the research literature on disaster preparedness is understandable	4.51	0.90
	Bio-terorism and emergency response		
1.	I am familiar with the local emergency response system for disasters	4.14	1.09
2.	In case of a bioterrorism/biological attack, I know how to use personal protective equipment.	4.44	1.07
3.	In a case of bioterrorism/biological attack I know how to perform isolation procedures so that I minimize the risks of community exposure.	4.48	1.04
4.	In case of a bioterrorism/biological attack I know how to execute decontamination procedures.	4.41	1.04
	Disaster response		
1.	I feel reasonably confident can treat patients independently without supervision of a physician in a disaster situation	4.01	1.24
2.	As an RN, I would feel reasonably confident in my abilities to be a member of a decontamination team	4.38	0.98
3.	I would feel confident working as a triage nurse practitioner, and setting up temporary clinics in disaster situations	4.34	1.02
4.	As an RN, I would feel confident in my abilities as a direct care provider and first responder in disaster situations	4.51	0.87
5.	As an RN, I would feel confident as a manager or coordinator of a shelter	4.24	1.04
	Disaster evaluation		
1.	I am familiar with psychological interventions, behavioral therapy, cognitive strategies, support groups and incident debriefing for patients who experience emotional or physical trauma	4.20	1.07
2.	I am familiar with what the scope of my role as a nurse practitioner in a post-disaster situation would be	4.54	0.86
3.	I would feel confident providing patient education on stress and abnormal	4.39	0.96

No	Items	*Mean*	*SD*
	functioning related to trauma		
4.	I participate in peer evaluation of skills on disaster preparedness and response.	4.42	0.97
5.	I would feel confident providing education on coping skills and training for patients who experience traumatic situations so they are able to manage themselves	4.41	0.99
6.	I am able to discern the signs and symptoms of acute stress disorder and post traumatic stress syndrome (PTSD).	4.21	1.01
7.	I feel confident managing (treating, evaluating) emotional outcomes for acute stress disorder or PTSD following disaster or trauma in a multi-disciplinary way such as referrals, and follow-ups and I know what to expect in ensuing months	4.27	0,88
8.	I am familiar with how to perform focused health assessment for PTSD	4.03	1.09

Table 4 shows that the 28 items on the DPET-K can be divided into five sub-categories, respectively (i) Disaster education and training, (ii) Disaster knowledge and information, (iii) Bio-terrorism and emergency response, (iv) Disaster response and (v) Disaster evaluation; the average score measured with a 6-point Likert scale was 4.13. The correlation among items in this part was 0.40 (Cronbach's alpha = 0.949).

DISCUSSION

Disaster education and training for disaster prevention are very meaningful in reducing disasters that occur. Disaster education is an effort for cost-effective disaster risk management (Torani, Majd, Maroufi, Dowlati, & Sheikhi, 2019). The education and training will increase nurses' knowledge in carrying out rescue actions during a disaster. In addition, previuos study showed that education applications in education and training by augmented reality (AR) learning tools were effective in motivating team knowledge (Lu, Lin, Tan, & Liu, 2022). Table 2 showed the pre-disaster stage. Most respondents answered that their disaster education and training needed improvement (80.5%). This will impact their skills when helping disaster victims; the less education and training they have, the more difficult it is for nurses to take appropriate actions when a disaster occurs.

Information about disasters and disaster knowledge also plays a role in preparing nurses for disasters that might occur. The results of the study showed that more than half (54.7%) of disaster knowledge and information was lacking. This finding was consistent with Alrazeeni (Alrazeeni, 2015) who reported that respondents had weakly to moderate knowledge of disaster preparation management. In addition, a previous study metioned that nurses were not sufficiently prepared to face disasters and lack confidence in dealing with disasters effectively (Tas & Cakir, 2022). This means that half of the respondents need help understanding information and knowledge about disasters. It will pose a risk to nursing preparedness in dealing with disasters if allowed. Even though disasters tend to increase every year and nurses need to be more aware of UpToDate disaster information.

Management of disasters caused by bioterrorism is currently increasing along with changes in the condition of society and the existing political situation. Terrorism that occurred, especially in big cities like Bandung, was reported to have occurred, namely, a suicide bombing which caused several people to become victims. This study shows that more than half of them (61.3%) are still lacking in handling bioterrorism and emergency response. This condition is very vulnerable to the occurrence of many victims considering the bioterrorism that is carried out can even cause more victims, such as victims of the Bali bombing etc.

The response to a disaster from a nurse is also very important because the speed and accuracy of handling the impact of a disaster a helper are important, such as determining victim priority when conducting triage in the field, disaster stage or disaster response in this study, more than half (51.2%) are still lacking. Nurses who had no disaster response experience also appeared

to be less prepared to disaster (Rizqillah & Suna, 2018). This shows that half of the nurse's response when a disaster occurs is still lacking; this will have an impact on the success of handling victims.

Post-disaster evaluation is carried out to assess whether or not the actions taken have been good. This study shows that in recovery in the post-disaster stage, more than half (51.2%) still lack disaster evaluation. Evaluating the effectiveness of disaster preparedness and disaster drills enhanced disaster preparedness capabilities (Alim, Kawabata, & Nakazawa, 2015). This has an impact on improving subsequent disaster management; if the evaluation is carried out properly, then the handling of disasters that may occur will be even better.

Preparedness is a series of activities to anticipate disasters through organizing and appropriate and efficient steps (National Disaster Management Authority, 2023). This study shows that half of the respondents (50.4%) were not ready to face disasters. This finding was consistent with those of Martono et al (Martono et al., 2019) who reported that Nurses' preparedness of disasters were still low. This can have an impact on handling intra-disaster situations where there is a possibility that disaster management can be less than optimal. Therefore, serious efforts are needed from various parties to be able to improve disaster preparedness even better.

CONCLUSION

Nurses' perceptions of disaster preparedness in some aspects are still lacking, and some are good. Several aspects of disaster management still need improvement and increasing. Therefore, it is necessary to socialize and increase efforts to improve nurses' abilities in disaster preparedness management. It is necessary to involve various parties to improve the ability of nurses in disaster preparedness.

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