ORIGINAL ARTICLE

Self Efficacy and Nurses' Disaster Competency in Disaster Preparedness Management

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ABSTRACT

Introduction: Natural disasters are catastrophic events with geological, and hydrological origins such as earthquakes, floods, hurricanes, landslides that can cause fatalities, property damage and social environmental disruption. The threat of geological disasters like tsunami and earthquakes as well as the threat of hydrometeorology, such as floods, landslides, hurricanes, and fires normally occur in Indonesia. Nurses have a role to play in educating the public and engaging in the crisis. This research aims to determine the relationship between nurses' self-efficacy and disaster preparedness management competency. **Method:** This research is a quantitative study with a cross-sectional approach. The population consisted of nurses who served in the Emergency Room at three disaster referral hospitals in Padang. According to the inclusion criteria, nurses who participated in this study were selected by the purposive sampling method as 1st level disaster nurses, as many as 60 nurses. The data collection was carried out from August to October 2020. **Results:** This research shows that there was a significant relationship between nurses' self-efficacy and disaster preparedness management with a p-value of 0.0001 and a strong relationship with a value of r = 0.673. There was a relationship between disaster management competencies and disaster preparedness management with a p-value of 0.0001, the strength of the relationship was moderate with a value of r = 0.473. **Conclusion:** The nurse is one of the resources responsible for disaster preparedness management in the community. Educating the nurses about disaster preparedness management increases the nurses' readiness. Nurses can take action in managing the disaster response.
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INTRODUCTION

Natural disasters or natural hazards are catastrophic events with atmospheric, geological, and hydrological origins such as droughts, earthquakes, floods, hurricanes, landslides that can cause fatalities, property damage and social environmental disruption. However, technology and science can currently predict when and how big a disaster will be. Disasters have an enormous impact on the fabric of people's lives, and therefore, this condition can lead to death, damage to infrastructure and facilities, injuries, suffering, and loss of livelihoods. From 1994 to 2013, the Emergency Event Database reported 6,873 cases of natural disasters globally; about 218 million people were affected in the last 20 years (1). EM-DAT has recorded 2007-2017, there have been 3,751 cases of natural hazards - and as many as 84.2% of them occurred due to weather changes, floods, and storms. The natural hazard events, 40.5% were flood events, 26.7% were storms, and 16.9% were other natural events. 95% of the total population is affected by natural hazards caused by weather (2).

The threat of geological disasters such as tsunami and earthquakes and the threat of hydrometeorology, such as floods, landslides, hurricanes, and fires, have occurred in Indonesia (3). During the disaster situations, nurses must assess needs and create a nursing care plan, which differ from the health care usually provided (4). The 2017 International Classification of Nursing Practices (INCP 3) standardizes nursing documentation in disaster areas. The data-based information can be used for planning and organizing nursing care, financial, patient outcomes, and policies (5).

The most recent disaster has lead to a change in disaster policies. Therefore, there is a need for nurses to improve their disaster competencies. Disaster nurses' competency is acquired through knowledge, skill, and attitude of disaster preparedness (6). Disaster Preparedness Evaluation Tools can measure knowledge, skills, and post-disaster management (7).

According to ICN, disaster competencies include

mitigation/prevention, preparedness, disaster response, and recovery. Furthermore, each of these phases has 8 domains, which measure and explain the competencies that nurses must possess in each phases (8). Disaster nursing aims to prepare communities for disasters, reduce the impact of damage, and assist communities in the recovery process.

Preparedness is an ongoing process that requires simultaneous review and revision due to environmental changes, staff changes, information, and new technologies. Subsequently, preparedness can build human resources ready to respond when needed. This phase requires the creation of a ready database, planning recruitment activities, and preparing training and simulations. Preparedness education is critical to reducing the barriers that can reduce disaster response. Disaster preparedness management includes planning, briefing, education, training, simulation, and evaluation (9).

Serving as first responders, triage officers and care providers, coordinators of care and services, providers for information, and counselors (5). Nurses who are prepared for disasters when needed are characterized by their confidence, desire, and skills to face the emergency response. A person's passion and confidence describe the ability to achieve their goals and their behavior to achieve those goals. Several factors can be related to the effectiveness of nurses in recovering after a disaster occurs. These factors are self-efficacy, response efficacy, risk assessment, beliefs, and attitudes. In addition, self-efficacy can be related to nurses' perceptions of their own preparedness, and their level of confidence in disaster preparedness behavior (6). The self-efficacy of disaster nursing is an indication of competency (7). The results of research from Yu, Sim, and Qi in 2021 suggested that a nurse manager's knowledge of individual readiness in a disaster environment can be determined by self-efficacy (10).

One self-efficacy benefit was decreased stress levels and suffering felt by nurses when emergency response (9). This research aims to determine the relationship between self-efficacy and nurses' disaster competency in disaster preparedness management.

MATERIALS AND METHODS

This research was a descriptive-analytic study with a cross-sectional approach. The relationship between the independent variable such as nurses' self-efficacy in disasters, and disaster nursing competence and the dependent variable such as their perceptions of disaster preparedness were determined, which were measured simultaneously. The population consisted of all nurses serving in the Emergency Department of Padang Hospital, which served as a reference in the event of a disaster, and about 60 participated. The data collection instruments were questionnaires and demographics, 22 items of The Disaster Self-Efficacy Scale (DRES), 45 items of The Disaster Preparedness Evaluation Tools (DPET) ®, and 36 items of Disaster Competency Framework from the International Council of Nursing. This research was approved by the ethics committee. The articles involving human subjects received informed consent by M.Djamil Hospital ethics with number 211/ KEPK/2020. The instrument was translated into Indonesian and used the validity and reliability test values contained in the original. DPET questionnaire from Martono's research has translated to Indonesians with reliability test Cronbach's Alpha in every sub variable were 1) preparedness internal consistency reliability of 0.879, 2) mitigation and responses internal consistency reliability of 0.940, and 3) evaluation internal consistency reliability of 0.940 (11). Disaster Self-Efficacy Response has a content validity of 0.91 and Cronbach's Alpha coefficient of 0.912 (9). The nurses disaster competencies questionnaire had a Cronbach's Alpha coefficient of 0.936 (6).

For the process of data collection, respondents were given information about the research and informed consent through Microsoft Form. Although the questionnaire used Microsoft Form (not paper-based), the data collection process was offline in The Emergency Department of the three hospitals. The researcher came to the hospitals to give informed consent and wait for respondents to fill out the instrument.

If respondents agree to participate, they will mark their agreement on the consent form on the Microsoft form. After that, the respondents were asked to fill out the questionnaire independently. Statistical analysis using statistical software was performed using Pearson's correlation test.

The DPET instrument has been widely used by researchers to determine the level of preparedness of nurses in various countries (7)(11). The value of the mean DPET questionnaire was defined as a mean between 1.00 – 2.99 (weak level), 3.00 – 4.99 (moderate level), and 5.00- 6.00 (strong level) (12)(13). The Disaster Response Self-Efficacy Scale instrument is used to measure the self-efficacy scale of nurses against disasters (9).

RESULTS

In this research, the characteristics of the respondents were grouped into gender, age, education level, and clinical career as shown in table I. The results showed that 81.7% of respondents are women, about 72% are more than 30 years. Half of the respondents had a diploma in nursing. About 53.3% have a clinical career ladder as a 2nd level clinical nurse.

A career ladder means the level of competence to carry out accountable and ethical nursing care within the

Table I: Characteristic Respondent

Variable	Category	(f)	(%)
Gender	Male	11	18.3
	Female	49	81.7
Age	21-30 years	17	28
	≥31 years	43	72
Education Level	Nursing Diploma	30	50
	Undergraduate	5	8.3
	Registered Nurse	25	41.7
Clinical Career Ladder	1st Clinical Nurse	17	28.3
	2nd Clinical Nurse	32	53.3
	3rd Clinical Nurse	8	13.3
	4th Clinical Nurse	2	3.3
	Other	1	1.8

limits of authority. The career ladder program inspires and rewards nurses' clinical excellence (14). In this study, more than half of the respondents had a level 2 clinical nurse career path. Clinical nurses provide direct nursing care to clients as individuals, families, groups, and communities. Several competencies in 2nd clinical nurses, leadership principles in providing nursing care, collaborate between teams, and conduct studies on the incidence and risk of infection in patients (15).

Based on table II, the average of disaster self-efficacy score of nurses in hospitals in 2020 was 3.9008 and a standard deviation of 0.39542. The average disaster nursing competencies score was 4.9823 with a standard deviation of 0.47329, and the variable disaster preparedness management had an average of 4.5440 and a standard deviation of 0.43227. Using the DPET instrument, the average value of nurses in hospitals in Padang City was moderate (3.00-4.99).

The relationship between nurses' self-efficacy and disaster preparedness management is shown in table II. The relationship between nurses' self-efficacy in disaster preparedness management at Padang City hospital is strongly positive, 0.673. The p-value of 0.0001 is less than the alpha value of 0.05, indicating that the correlation between variables is significant. The higher the self-efficacy of nurses regarding disasters, the higher perception of nurses in disaster preparedness management.

The relationship between disaster nursing competency in disaster preparedness management is shown in table III, and it was reported that the relationship between

Table II: Mean, Standard Deviasion of Self-Efficacy, Disaster Nursing Competencies And Perception Of Nurses In Disaster Preparedness Management

Variable	N	Mean	SD
Self-Efficacy	60	3.9008	0.39542
Disaster Nursing Competencies	60	4.9823	0.47329
Disaster Preparedness Management	60	4.5440	0.43227

Table III: Relationship Self-Efficacy, Disaster Nursing Competencies and Perception of Nurses in Disaster Preparedness Management

Variable	Disaster Preparedness Management		
	N	r	P Value
Self Efficacy	60	0.673	0.0001
Disaster Nursing Competencies	60	0.473	

disaster nursing competence in disaster preparedness management in the Padang City hospital is moderate and positive 0.473. The p-value of 0.0001 is less than the alpha value of 0.05, indicating that the correlation between the variables is significant. The higher the nurse's perception of disaster nursing competence, the more it will increase their perception of a disaster.

DISCUSSION

Based on demographic results, half of the respondents have a diploma in nursing. This corresponds to ICN in 2019, which reported that there are three levels of nurses who have the responsibility to study and master disaster nursing, (1) nurse level 1; any nurse who has passed the First Cycle Nursing Diploma, which is organized in each region of the country. In Indonesia, any nurse who provides services to the community is a vocational nurse and a professional nurse. Vocational nurses have successfully completed the Diploma in Nursing program and passed the Nursing Diploma Level Nursing Competency Test (21). Meanwhile, professional nurses are registered nurses with minimal training as registered nurses. Therefore, based on these regulations, in Indonesia, nurses who are responsible for developing their abilities in the field of disaster nursing start from nurses with a minimum education of nursing diploma.
This research showed that 53.3% have a clinical career ladder as a 2nd level clinical nurse. Subu et al. in his reasearch in 2020, showed that the nursing profession needs to address the clinical career ladder after graduation in order to address these challenges (16). Nurses had a minimum education to learn and understand disaster nursing competencies. No nurses had a lower educational level than a nursing diploma. This is in line with Martono's research, which shows that the level of education can significantly improve the skills of nurses in disaster management (11).
The mean of disaster self-efficacy was 3,9008 (SD = 0,39542) and the mean of disaster nursing competency was 4,9823 (SD = 0,47329). The results showed a relationship between disaster nursing competency and disaster preparedness management as indicated by a p-value of 0.0001 ($p < 0.05$). The r-value indicates the strength of the relationship between the two variables using the Pearson correlation test, which was 0.473.
The relationship between disaster nursing competency and disaster preparedness management is moderate. This shows that the higher the nurses' understanding of disaster nursing competence, the more nurses' perception of disaster preparedness management will

increase.

The results showed a relationship between nurses' self-efficacy in disaster preparedness management as indicated by a p-value of 0.0001 ($p < 0.05$). The r-value indicates the strength of the relationship between the two variables on the Pearson correlation test, which was 0.673, meaning that the relationship between disaster nursing competence and nurses' perception of disaster preparedness is strong. This indicates that the higher the nurses' understanding of self-efficacy, the greater the nurses' perception of disaster preparedness management.

Confidence and willingness to respond to disasters were representative of disaster competency. Self-efficacy is an individual's belief in achieving certain behavioral goals, which is positively related to personal behavior abilities and behavioral outcomes. Disaster nursing self-efficacy can indicate disaster nursing competence (14). According to Wurjatmikos' research, it was reported that the higher the age, the higher the self-efficacy (17). This is in line with the study, which reported that 72% of respondents were more than 30 years old.

Self-efficacy can be influenced by several aspects such as knowledge, attitude or behavior, and motivation. Nurses with high self-efficacy are confident in their abilities to carry out their duties, oriented to teamwork to achieve common goals (18).

Subsequently, disaster nurses' competencies can be achieved through the provision of education, and with the programmed, nurse preparedness in dealing with disasters can be improved (19). Education and preparedness are some of the domains in disaster nursing competence (20). Disaster preparedness education should be included in the nursing education curriculum to increase the need for nurses to respond to disasters. Disaster nursing requires basic knowledge and skills to enable nurses to apply the nursing practice in accordance with professional service standards in disaster situations (21). One of the significant differences in disaster nursing care is the focus of care from one patient to a number or group of patients (22).

Disaster nursing education can be used as the first step in policy development and capacity building for nurses (20). The risk increases when there is hesitation to respond due to a lack of knowledge. Even in Japan, England, Australia, and several countries in Europe, education regarding disaster nursing has started since nursing education in diploma, undergraduate, and postgraduate nursing (3). Besides formal education, disaster preparedness skills are also integrated through emergency nursing training and incorporated into a mandatory formal education curriculum.

According to the research by Alzahrani research in Saudi Arabia, three main types of training were identified as opportunities to develop skills of nurses in mass disasters. These three trainings include disaster education sessions in hospitals, emergency management in accordance with potential disasters in the region, and short training in disaster management (20). In the context of a potential disaster, disaster education can also be provided to disaster-prone individuals. According to the research by Shoji study it was reported that disaster education has a positive impact and the importance of studying earthquake response through disaster education programs (22).

The reseacrh finding describes the level of disaster preparedness of nurses in hospitals in padang, and the level 1 nurses' disaster preparednes. In addition, it can be seen that the nurse's self-efficacy relationship is an effort to increase disaster preparedness in the future. The limitation of this study is that it requires the participation of population of nurses from other areas in West Sumatra to describe the preparedness of nurses for disasters in West Sumatra.

CONCLUSION

Education training programs and disaster nursing competency can increase nurses' confidence, readiness, and willingness to participate and work together with other disaster teams when needed. Competence is closely related to predetermined standards or skills acquired through work experience, education, mentoring, and training. Subsequently, knowledge enables an individual to practice a profession as a job and a measure. Competencies describe the profession's expectations of a job and describe the general nursing practice, specific roles, and specific practices.

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REFERENCES

1. Tavan, H., Menati, W., Azadi, A., Sayehmiri, K., & Sahebi, A. (2016). Development and Validation of a Questionnaire to Measure Iranian Nurses' Knowledge , Attitude and Practice Regarding Disaster Preparedness. 10(8), 8–11. doi:10.7860/JCDR/2016/19894.8337
2. EM-DAT. Natural Disasater 2017 [Internet]. 2017. Available from: https://www.emdat.be/publications?page=2
3. B. N. P. B. (2018). Buku Saku; Tanggap Tangkas

Tanggug Menghadapi Bencana (2018th ed.).
4. Noh JY, Oh EG, Lee WH, Choi M. Perception and Core Competencies of Disaster Nursing in South Korea. Journal of Nursing & Care, 2017;6(1):1–6. doi: 10.4172/2167-1168.1000383
5. ICN. Disaster Nursing; International Classification for Nursing Practice (ICNP) Catalogue [Internet]. International Classification for Nursing Practice (ICNP) Catalogue. 2017. Available from: https://www.icn.ch/sites/default/files/inline-files/ICNP_Catalogue_Disaster_Nursing.pdf
6. Park H, Kim J. Factors in fl uencing disaster nursing core competencies of emergency nurses. Appl Nurs Res [Internet]. 2017;37:1–5. doi:10.1016/j.apnr.2017.06.004
7. Sultan MAS, Mary PE, Grad HSAG. Emergency Nurses Readiness for Disaster Response-An Explorative Study. Am Res J Nurs [Internet]. 2017;4(1):1–10. Available from: https://www.arjonline.org/papers/arjn/v4-i1/1.pdf
8. ICN. International Council of Nurses Core Competencies in Disaster Nursing [Internet]. 2.0. Geneva, Switzerland; 2019. 16 p. Available from: https://www.icn.ch/sites/default/files/inline-files/ICN_Disaster-Comp-Report_WEB.pdf
9. Li H-Y, Bi R-X, Zhong Q-L. The Development and Psychometric Testing of a Disaster Response Self- Efficacy Scale among undergraduate Nursing Students. Nurse Educ Today [Internet]. 2017;59(July):16–20. doi:10.1016/j.nedt.2017.07.009
10. Yu J, Sim T, Qi W. Informal Social Support and Disaster Preparedness: Mediating Roles of Perceived Collective Efficacy and Self-Efficacy. Int J Disaster Risk Reduct [Internet]. 2022;68. doi:10.1016/j.ijdrr.2021.102734
11. Martono M, Satino S, Nursalam N, Efendi F, Bushy A. Indonesian nurses ' perception of disaster management preparedness. Chinese J Traumatol [Internet]. 2019;22(1):41–6. doi:10.1016/j.cjtee.2018.09.002
12. Al MA, Rn K, Dnsc EB, Emeritus C, Alasad JA. Jordanian nurses ' perceptions of their preparedness for disaster management. Int Emerg Nurs [Internet]. 2012;20(1):14–23. doi:10.1016/j.ienj.2011.01.001
13. Setyawati, Asih-Dewi, Yu-ying Lu Liu, Chieh-yu SL. Disaster Knowledge , Skill ,and reparedness Among Nurses in Bengkulu, Indonesia: A Descriptive Correlational Survey Study. J Emerg Nurs [Internet]. 2020;46(5):633–41. doi:10.1016/j.jen.2020.04.004
14. Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan no 40 Tahun 2017 Mengenai Pengembangan Jenjang Karir Profesional Perawat Klinis [Internet]. Jakarta; 2017. Available from: http://hukor.kemkes.go.id/uploads/produk_hukum/PMK_No._40_ttg_Pengembangan_Jenjang_Karir_Profesional_Perawat_Klinis_.pdf
15. Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan no 18 Tahun 2017 Mengenai Uji Kompetensi Tenaga Kesehatan [Internet]. Jakarta; 2017. Available from: https://peraturan.bpk.go.id/Home/Details/111996/permenkes-no-18-tahun-2017
16. Subu MA, Ismail R, Dias JM, Abraham MS. An Investigation of the Interests and Reasons of Diploma Nurses Undertake a RN-BSN Bridging Program in United Arab Emirates. Jurnal Keperawatan Padjadjaran 2020;8(2):159-173. doi: 10.24198/jkp.v8i2.1402
17. Wurjatmiko AT, Zuhriyah L, Fathoni M. Relationship Between Personal Self-Efficacy And Flood Disaster Preparedness of Indonesian Nurses. Public Heal Indoensia. 2018;4(1):25–30. doi: 10.36685/phi.v4i1.161
18. Laily Hidayati, Andri Setiya Wahyudi AT. Self-Efficacy of Instrument Nurse Earthquake Response in Nusa Tenggara Barat (NTB). Crit Med Surg Nurs J. 2019;8(1):41–44. doi: 10.20473/cmsnj.v8i1.12438
19. Georgino MM, Kress T, Alexander S, Beach M. Emergency Preparedness Education for Nurses. J Trauma Nurs. 2015;22(5):240–8. doi: 10.1097/JTN.0000000000000148
20. Duong K, Dip G, Nsg E. Disaster education and training of emergency nurses in South Australia. Australasian Emergency Nursing Journal 2009; 12(3):86–92. doi: 10.1016/j.aenj.2009.05.001
21. ICN. Framework of Disaster Nursing Competencies [Internet]. Genewa; 2009. Available from: http://www.apednn.org/doc/resourcespublications/ICN Framework of Disaster Nursing Competencies ICN 2009.pdf
22. Alzahrani F, Kyratsis Y. Emergency nurse disaster preparedness during mass gatherings : a cross-sectional survey of emergency nurses ' perceptions in hospitals in Mecca, Saudi Arabia. BMJ Open 2017;7(4):e013563. doi: 10.1136/bmjopen-2016-013563