

EFFECT OF DISASTER SIMULATION METHOD ON STUDENT DISASTER MANAGEMENT KNOWLEDGE AND SKILLS AT STIKes MAJAPAHIT MOJOKERTO

Atikah Fatmawati^{1*}, Anndy Prastya², Ika Suhartanti³, Fitria Wahyu Ariyanti⁴

^{1,2,3,4}Nursing Science Department, Sekolah Tinggi Ilmu Kesehatan Majapahit

Jl. Raya Gayaman KM. 02, Kec. Mojoanyar, Kab. Mojokerto - 61364

*e-mail: tikaners87@gmail.com

ABSTRACT

Keywords:

disaster
knowledge
simulation
skill
student

Preparedness education for disasters is important because nurses must adapt to any conditions. But the phenomenon shows that not many nurses have the readiness and qualified experience in disaster relief efforts. The right step in improving the ability of nurses is to provide disaster education early on to nursing students. This study aimed to determine the effect of disaster simulation method on disaster management knowledge and skills in students at STIKes Majapahit Mojokerto. The design of this study was a pre-experiment with one group post-test only design. The sample of this research was all 7th-semester students of the Nursing Undergraduate Study Program at STIKes Majapahit Mojokerto with 21 respondents. The independent variable is the intervention of the disaster simulation method and the dependent variable is the knowledge and skills of disaster management. This study used a measuring tool in the form of a questionnaire sheet that was adopted and modified from the DPET (Disaster Preparedness Evaluation Tool) questionnaire. Analysis of the data in this study used the analysis of the mean. The study found that the mean value of disaster management knowledge and skills were at 4.50 (SD: 1.12) and 4.29 (SD: 1.04). The mean value is included in the moderate category. The disaster simulation method provides the opportunity and experience for students to be able to directly apply the theories obtained in class to situations that are made as closely as possible with disaster conditions. The results of this study are expected to be a reference in the development of more attractive and interesting learning methods on the topic of disaster management so that in the long run it can improve the ability of nurses in their roles when disasters occur.

BACKGROUND

Indonesia is a country that has great potential for disasters, because of its geographical location which is in the environment of several plates of the earth. In addition, different community backgrounds, in terms of knowledge and preparedness for disasters, can also affect the handling when a disaster actually occurs. One of them is the readiness of nurses as one of the health workers who play a major role in disaster management. Therefore, it needs to be supported by an effective learning process, especially in the field of emergency nursing. To be able to carry out effective learning, a structured disaster manage-

ment curriculum needs to be formed. In one literature mentioned that disaster management training should exist in the basic education of nurses (Fung, Loke & Lai, 2008).

Education related to disaster preparedness is important because nurses must be able to adapt to any condition (Alim, Kawabata & Nakazawa, 2015). Seeing the various potential disaster threats that may occur, nurses are needed in greater numbers than other health workers (Baack & Alfred, 2013). Nurses are expected to be at the forefront of the vanguard in health services in disaster areas. However, the phenomenon in the field shows that there are not many nurses who have the readiness and experience that

are qualified in relief efforts in disaster conditions (Chapman & Arbon, 2008). This also happened in Indonesia. Nurse readiness in dealing with disasters is still relatively low (Martono et al., 2019).

The purpose of this is to encourage students to provide a proactive approach rather than a reactive approach to providing care (Ireland et al., 2006). The disaster preparedness program should be aligned with the existing curriculum in tertiary institutions, so that graduates of nursing degrees can carry out their roles according to their competence in the event of a disaster (Jose & Dufrene, 2014). It is also in line with the foundation of higher education in Indonesia, namely the Higher Education Tri Dharma which consists of education, research, and community service. After getting the theory and skills of disaster preparedness in the education setting, students are expected to be able to apply it to the community as a form of community service.

The involvement of nurses in disaster situations under the coordination line of the Minister of Health including in the technical health sub-unit has the responsibility in handling health due to disasters as human resources, one of the important roles of nurses is to do triage. This triage is carried out by trained and experienced health workers at the front medical post to determine the level of care needed by the victim. Several learning methods can be used to improve the ability of nurses related to triage in disaster conditions, including lectures, demonstrations, discussions, simulations, laboratories, field experience, brainstorming, debates, and symposiums (Sujarwo, 2015).

Simulations enable students to gain skills through repeated practice and management of emergencies without risking patients and students (Kaplan et al., 2012). In the simulation, students have the opportunity to practice their theories and skills so that they are expected to be ready when disasters occur. One study proves that learning methods with simulations have proven to be effective in developing trust in ethical reasoning and increasing the ethical readiness of students (Greco et al., 2019).

METHODS

The design of this study was a survey in one group post-test only design. This is because the measurement of knowledge and skills is only one time after the disaster simulation method. The research sample was all students enrolled in the 7th semester of the Nursing Undergraduate Study Program at STIKes Majapahit Mojokerto with 21 respondents,

and total sampling technique is used. The reason for the selection of respondents was because in 7th-semester students had completed the courses in Emergency Nursing, Critical Nursing, and Disaster Nursing. The simulation process is carried out for 2 days. On the first day, respondents were given material and theories about disaster, triage, and mitigation efforts. And the second day the respondents conducted a field practice in the form of a simulation of first aid efforts in disaster situations, both on land and water rescue. The simulation location was carried out in the Waduk Grojogan Plandaan, Jombang.

Ethical approval of the study was obtained from the Health Research Ethics Committee of the STIKes Majapahit Mojokerto (Letter number: 001/KEPK-SM/X/20).

The instrument used to measure disaster management knowledge and skills in students is the DPET (Disaster Preparedness Evaluation Tool) which has been translated into Indonesian in the domain of knowledge and skills. The knowledge domain consists of 13 statement items, and the skill domain consists of 11 statement items. The questionnaire uses a Likert scale with a value range of 1 (strongly disagree) to 6 (strongly agree). The original version of the questionnaire was aimed at nurses, but in this study, it was adjusted and modified according to the conditions of the nursing students. Data processing results of the questionnaire are then categorized according to the average value (mean). The mean value is 1-2.99 low category, the mean value is 3-4.99 moderate category, and the mean value is 5-6 high category (Rizqillah, 2019).

Data analysis using techniques to calculate the average value (mean) of the questionnaire data. Mean is a group explanation technique based on the group's average value. This means is obtained by adding up the data of all respondents in the group and then divided by the number of respondents in the group.

RESULTS

Demographic Characteristics of Respondents

This study involved 21 respondents with demographic data of respondents, namely gender, age, and experience of previous disasters.

Disaster Management Knowledge and Skills

Table 2 contains frequency distribution of disaster management knowledge and skills, table 3 contains perception data about the domain of disaster management knowledge and skills, and table 3

Table 1. Demographic Characteristics of Respondents

Characteristics	Frequency (<i>f</i>)	Percentage (%)
Sex :		
Male	1	4,8
Female	20	95,2
Aged (Years)	<i>Mean</i> : 21,9 (SD : 0,74)	
Experienced in previous disasters :		
Ever	3	14,3
Never	18	85,7

Table 2. Frequency Distribution of Disaster Management Knowledge and Skills

Domain	Frequency (<i>f</i>)	Percentage (%)
Knowledge about disaster management		
Low	0	0
Moderate	13	61,9
High	8	38,1
Skills about disaster management		
Low	3	14,4
Moderate	9	42,8
High	9	42,8

Table 3. Perception Data About the Domain of Disaster Management Knowledge and Skills

Domain	<i>Mean</i>	SD
Knowledge	4,50	1,12
Skills	4,29	1,04

Table 4. Perception Data About the Subdomain of Disaster Management Knowledge and Skills

Sub Domain	<i>Mean</i>	SD
Disaster Knowledge	4,42	1,07
Disaster Skills	4,40	1,10
Family Preparedness for a Disaster	4,42	1,01

contains perception data from the subdomain of disaster management management knowledge and skills.

Based on table 3 data it is found that the mean value of disaster management management knowledge is at 4.50 (SD: 1.12). In the disaster knowledge subdomain (table 4), it is found that the mean value is 4.42 (SD: 1.07). This can be broadly categorized as a moderate level of knowledge.

Based on table 3 data it is found that the mean value of disaster management management skills is 4.29 (SD: 1.04). In the disaster skills subdomain (table 4), it is obtained that the mean value is 4.40 (SD: 1.10). This can be broadly categorized as a moderate level of skill.

DISCUSSION

A person's knowledge is mostly obtained through the sense of hearing and the sense of sight (Notoatmodjo, 2014). In this study, respondents gained learning experience in the form of deepening disaster management material that had been previously obtained in the learning process in the course of Disaster Nursing. This has a role in the process of reviewing and recalling material that has been obtained and can increase understanding of previous material. The process is certainly more captured by the sense of hearing. Other learning experiences obtained by respondents from this study are listening and directly playing in conditions that are made as closely as pos-

sible to the actual disaster conditions. This process is more captured by the sense of sight. Studies conducted by Kamil, Utaya, Sumarmi, & Utomo, (2020) show that simulation methods can improve one's knowledge.

Disaster simulation methods are many kinds, ranging from using a tabletop, using a gadget game, and playing roles according to predetermined scenarios. In the simulation method, the technique used is to play a role in situations that are made as closely as possible to disaster conditions. The results show increased knowledge about the disaster in respondents (Tanwattana & Toyoda, 2018; Chiang, Ting, Chao, & Chen, 2020). Existing methods show that a person's capture ability simulation will be better because the person directly plays a role and witnesses the process of events that have been arranged in such a way that reflects real conditions. This is inversely proportional to the classical method where learning is only done in class with the main focus being on the teacher/lecturer. Boredom often arises in students when the learning method used is only monotonous and not varied. So it can be concluded that this disaster simulation method is very effective if it is applied to the learning process both at the elementary and secondary education levels, as well as the higher education level.

The concept of skill implies that a person must be able to do a task well and carefully. This is in accordance with the concept of learning with simulation methods that emphasize hearing, vision, and role play. With that process, someone will pay more attention to the material presented. To be able to achieve these objectives, the learning process requires methods that are quite interesting and attractive so that they can attract students' interest (Fatmawati, 2018). This is following the development of science and technology and the era where learning does not have to always be done in the room by just sitting in a chair and listening to the explanation of the teacher/lecturer. In the concept of skills, students must be allowed to try their assignments. In this disaster simulation, respondents are allowed to try directly how to evacuate disaster victims both on land and in water, as well as the initial handling techniques for disaster victims.

Another thing that can be observed is the value of the family preparedness sub-domain in facing disasters, which is a mean value of 4.42 (SD: 1.01). Family preparedness can be related to experience in experiencing disasters in the past. This can make someone more confident in facing disaster. In one study also showed that nurses will be more con-

fidant and comfortable working with other nurses who have previous disaster experience, so it is expected to provide more guidance (Brewer et al., 2020). This can also be categorized as a moderate level of readiness. The family as the smallest unit in society must understand what must be done before and during a disaster. Before a disaster occurs, families are expected to make mitigation efforts to minimize the number of victims due to disaster. Efforts that can be made include preparing a standby bag in the form of a diploma, land certificate, BPKB, marriage book, medicines, and a flashlight; so that when a disaster comes suddenly and must leave the house, the goods can be carried easily, study maps of flood-prone areas, learn safe locations and safe routes to evacuate in the event of a disaster, learn First Aid (First Aid for Accidents) to help yourself or the victim when there is an injury, place the house key in a place that is easily accessible and taken by all family members, write important telephone numbers such as the police number, PAM, PLN, PMI, and Hospital, and place the cellphone or communication device in a place that is easy to reach when saving yourself (Dewi, 2015; Saharullah, 2015).

Simulations enable students to gain skills through repeated practice and management of emergencies without risking patients and students (Kaplan et al., 2012). In the simulation, students have the opportunity to practice their theories and skills so that they are expected to be ready when disasters occur.

CONCLUSION

The study found that the mean value of disaster management knowledge and skills were included in the moderate category. This disaster simulation method provides the opportunity and experience for students to be able to directly apply the theories obtained in class to situations that are made as closely as possible with disaster conditions. The results of this study are expected to be a reference in the development of more attractive and interesting learning methods on the topic of disaster management so that in the long run it can improve the ability of nurses in their roles when disasters occur.

ACKNOWLEDGMENTS

The authors would like to thank the Faculty of Health Pesantren Tinggi Darul 'Ulum University for cooperation in implementing disaster simulations on students, as well as all respondents and other parties who have supported and facilitated the study.

REFERENCES

- Alim, S., Kawabata, M. & Nakazawa, M. 2015. Evaluation of disaster preparedness training and disaster drill for nursing students. *Nurse Education Today*. Elsevier B.V., 35(1), pp. 25-31. doi: 10.1016/j.nedt.2014.04.016.
- Baack, S. & Alfred, D. 2013. Nurses' preparedness and perceived competence in managing disasters. *Journal of Nursing Scholarship*, 45(3), pp. 281-287. doi: 10.1111/jnu.12029.
- Brewer, C. A. et al. 2020. A feasibility study on disaster preparedness in regional and rural emergency departments in New South Wales: Nurses self-assessment of knowledge, skills and preparation for disaster management. *Australasian Emergency Care*. College of Emergency Nursing Australasia, 23(1), pp. 29-36. doi: 10.1016/j.auec.2019.12.005.
- Chapman, K. & Arbon, P. 2008. Are nurses ready?. Disaster preparedness in the acute setting. *Australasian Emergency Nursing Journal*, 11(3), pp. 135-144. doi: 10.1016/j.aenj.2008.04.002.
- Chiang, H.H. et al. 2020. Using tabletop exercises to evaluate nurses' clinical performance of hazardous materials disaster management: A cross-sectional study. *Nurse Education Today*, p. 104358. doi: <https://doi.org/10.1016/j.nedt.2020.104358>.
- Dewi, R. N. 2015. Kesiapsiagaan Sumber Daya Manusia Kesehatan Dalam Penanggulangan Masalah Kesehatan Akibat Bencana Banjir Di Provinsi DKI Jakarta. Universitas Indonesia.
- Fatmawati, A. 2018. Kajian Kompetensi Dosen Pendidikan Kesehatan?: Perspektif Mahasiswa. in *Prosiding seminar Nasional Hasil Penelitian dan Pengabdian Masyarakat Seri Ke-2*. Mojokerto: Sekolah Tinggi Ilmu Kesehatan Majapahit, pp. 31-36.
- Fung, O. W. M., Loke, A. Y. & Lai, C. K. Y. 2008. Disaster preparedness among Hong Kong nurses. *Journal of Advanced Nursing*, 62(6), pp. 698-703. doi: 10.1111/j.1365-2648.2008.04655.x.
- Greco, S. et al. 2019. Ethical Reasoning Debriefing in Disaster Simulations. *Journal of Professional Nursing*, 35(2), pp. 124-132. doi: <https://doi.org/10.1016/j.profnurs.2018.09.004>.
- Ireland, M. et al. 2006. Integrating Disaster Preparedness Into a Community Health Nursing Course: One School's Experience', *Disaster Management and Response*, 4(3), pp. 72-76. doi: 10.1016/j.dmr.2006.03.001.
- Jose, M. M. & Dufrene, C. 2014. Educational competencies and technologies for disaster preparedness in undergraduate nursing education: An integrative review. *Nurse Education Today*. Elsevier B.V., 34(4), pp. 543-551. doi: 10.1016/j.nedt.2013.07.021.
- Kamil, P. A. et al. 2020. Improving disaster knowledge within high school students through geographic literacy. *International Journal of Disaster Risk Reduction*, 43, p. 101411. doi: <https://doi.org/10.1016/j.ijdrr.2019.101411>.
- Kaplan, B. G. et al. 2012. Use of an emergency preparedness disaster simulation with undergraduate nursing Students. *Public Health Nursing*, 29(1), pp. 44-51. doi: 10.1111/j.1525-1446.2011.00960.x.
- Martono, M. et al. 2019. Indonesian nurses' perception of disaster management preparedness. *Chinese Journal of Traumatology - English Edition*. Elsevier Ltd, 22(1), pp. 41-46. doi: 10.1016/j.cjtee.2018.09.002.
- Notoatmodjo, S. 2014. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta.
- Rizqillah, A. F. 2019. Disaster preparedness: survey study pada mahasiswa keperawatan universitas harapan bangsa Purwokerto. *Medisains*, 16(3), p. 114. doi: 10.30595/medisains.v16i3.3120.
- Saharullah. 2015. Hubungan Pengetahuan, Sikap, Dan Tindakan Masyarakat Terhadap KKecamatan Tempe Kabupaten Wajo. Universitas Hasanuddin.
- Sujarwo. 2015. Model pendidikan sadar lingkungan masyarakat korban erupsi Merapi berbasis potensi lokal. *Cakrawala Pendidikan*, 34(1), pp. 12-23.
- Tanwattana, P. & Toyoda, Y. 2018. Contributions of gaming simulation in building community-based disaster risk management applying Japanese case to flood prone communities in Thailand upstream area. *International Journal of Disaster Risk Reduction*, 27, pp. 199-213. doi: <https://doi.org/10.1016/j.ijdrr.2017.10.007>.