

Assessing the Preparedness of Diploma III Nursing Students for Tsunami and Earthquake Disasters in Aceh

Hermansyah^{1*}, Helly Susanti²

ABSTRACT

OBJECTIVE: This study aimed to evaluate the disaster knowledge and preparedness levels among Diploma III Nursing students in Aceh Province regarding earthquakes and tsunamis.

METHODOLOGY: This cross-sectional quantitative study involved 443 fourth-semester, second-year nursing students from four Diploma III Nursing institutions in Banda Aceh Municipality and one in Aceh Besar Regency, selected through non-probability sampling. Data was collected over six months, from September 2022 to February 2023, through interviews using a questionnaire based on the LIPI-UNESCO/ISDR framework. This framework assesses five disaster preparedness parameters: preparedness plans, disaster warning systems, resource mobilization, preparedness policies and guidelines, and emergency response plans. Pearson's correlation coefficients (r), with $\alpha = 0.05$ and a 95% Confidence Interval, were used for data analysis.

RESULTS: Most Diploma III Nursing students demonstrated a "fairly good" level of disaster knowledge regarding earthquakes and tsunamis (62.9%). However, their disaster preparedness was rated as "unprepared" (45.5%). The analysis of the five disaster preparedness components revealed that preparedness plans were rated as "unprepared" (55.2%), disaster warning systems as "ready" (66.5%), resource mobilization as "unprepared" (43.7%), preparedness policy and guidelines as "unprepared" (34.4%), and emergency response plans as "unprepared" (27.8%). A significant positive correlation was found between disaster knowledge and preparedness ($p < 0.05$).

CONCLUSION: The readiness of Diploma III Nursing students can be enhanced through structured and ongoing disaster education and active participation in disaster simulations and drills. Developing and implementing a disaster nursing curriculum is essential for improving the preparedness of students who will serve in disaster-prone areas.

KEYWORDS: Diploma III nursing students, knowledge, disaster preparedness, earthquakes, tsunamis

INTRODUCTION

Indonesia is highly prone to disasters, resulting in significant economic and human losses. Therefore, adequate preparedness measures are essential to minimize these impacts¹. Since natural hazards are inherently unpredictable, preparedness becomes key to reducing disaster risks². As disasters can sometimes occur, healthcare staff and institutions must be prepared to manage these events³.

Preparedness represents a new paradigm in disaster management. To reduce casualties, property losses, and psychological impacts, communities must enhance their preparedness⁴. Effective disaster preparation preserves the health and welfare of those involved, ultimately increasing the resilience of individuals and the broader community⁵.

Nurses represent the largest healthcare profession, surpassing other health professions in number. Hasan et al.⁶ stated that nurses must be adequately prepared to respond effectively to disasters as

frontline health caregivers. The World Health Organization and the International Council of Nurses recognize nurses' critical role in disaster preparedness and response⁷. While the readiness of nurse practitioners and registered nurses has been documented, the disaster preparedness of student nurses remains relatively unknown⁵. Khairina I 2022⁸ highlighted the lack of information regarding factors affecting nurse preparedness in hospitals, emphasizing the importance of identifying the key predictors of nurse readiness for disasters. Hasan MK 2021⁶ further stressed the need to assess nurses' disaster management capacity to determine their level of preparedness.

Nurses consistently play a critical role in disaster response, and strong nursing skills are essential for handling such events. As integral healthcare team members, nurses must be prepared to face disaster situations and improve the effectiveness of community health promotion systems by gaining expertise in addressing crucial problems. Nurses who have received disaster training are expected to perform more effectively and adapt better when disasters occur⁹.

Healthcare professionals, particularly nurses, should receive training in disaster prevention, and contingency plans must be developed to ensure faster

¹Bachelor of Applied Nursing Program, Aceh Health Polytechnic, Ministry of Health, Banda Aceh, Indonesia

²Health Training Center, Aceh Provincial Health Office, Banda Aceh, Indonesia

Correspondence: hermansyah.poltekkesaceh@ac.id
doi: 10.22442/jlumhs.2025.01332



access to services during emergencies. Given the inevitability of disasters, healthcare workers must be explicitly trained to meet the diverse needs of affected populations. Therefore, it is crucial to assess healthcare workers' knowledge, attitudes, and practices regarding disaster preparedness. In this regard, nursing students, as future skilled nurses, will play a vital role in disaster preparedness⁹.

Nurses' competence in emergency preparedness is developed through higher education, which provides the knowledge, skills, and attitudes necessary for handling emergencies caused by disasters¹⁰. Preparedness is closely linked to knowledge and attitude, making providing basic disaster education in schools essential². School nurses play a unique role in protecting and serving students during disasters¹¹. As agents of change, students need to possess good knowledge of disaster preparedness to promote positive changes in society¹. As future healthcare professionals, nursing students must acquire the necessary knowledge, skills, and attitudes to respond effectively to public health emergencies and disasters¹².

Several studies related to emergency preparedness indicate that the level of readiness among nurses remains very low, suggesting that education in higher education institutions is an effective method for increasing preparedness in the face of disasters¹⁰. The preparedness level of nursing students in responding to disasters is also inadequate¹². Students have long been among those most emotionally and physically affected by natural or man-made disasters; however, universities and colleges still lack effective disaster response and mitigation practices¹³.

Indonesia frequently experiences natural disasters, highlighting the importance of nursing competencies in disaster preparedness. However, particularly among general nurses, the factors influencing these competencies are poorly understood¹⁴. A significant relationship was found between the mean score of nursing competence in disaster response and students' history of participating in training exercises ($p < 0.001$). Students' competence in disaster situations is poor, and raising awareness about the current state of nurses' competencies is the first step toward improving their preparedness, as they are key members of the disaster health team¹⁵.

Aceh Province is highly vulnerable to earthquakes and tsunamis, underscoring the need for effective preparedness strategies among its residents. Past disasters have demonstrated the critical role that nursing schools play in enhancing disaster preparedness. Several studies have highlighted the significant contribution of educational institutions in improving disaster readiness. As future healthcare professionals, Diploma III Nursing students receive disaster preparedness training, which equips them to support themselves and their families, friends, and the broader community during emergencies. However, there remains a lack of evidence-based data

regarding the level of disaster preparedness among nursing students and the factors that most influence their readiness.

METHODOLOGY

Study Design

The study used a descriptive correlation design with a cross-sectional approach and was conducted over six months, from September 2022 to February 2023, through interviews using a questionnaire. The purpose was to assess the level of disaster knowledge and preparedness in facing earthquakes and tsunamis and to examine correlations among Aceh Province, Indonesia, nursing students.

Population and Sample

The study population consisted of 470 fourth-semester, second-year nursing students across public and private Diploma III Nursing programs of four Banda Aceh Municipality institutions and one Aceh Besar Regency. The inclusion criteria were students aged 19–21 who were actively enrolled, had completed theoretical and simulation-based disaster nursing courses, and were present during the study. A total of 443 nursing students (94.3%) who met the inclusion criteria were selected through non-probability sampling using the purposive sampling technique.

Instrument

Data were collected through guided interviews using a questionnaire based on the LIPI-UNESCO/ISDR framework guidelines for measuring community and school community preparedness¹⁶.

The questionnaire was prepared in Indonesian and included 29 statements: 15 items to assess disaster knowledge and 14 items to evaluate components of disaster preparedness. These components comprised preparedness plans (3 items), disaster warning systems (2 items), resource mobilization (2 items), preparedness policies and guidelines (4 items), and emergency response plans (3 items).

The questionnaire uses a five-point Likert scale for response options, with scores: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, and Strongly Disagree = 1. Preparedness levels are classified into: Very Ready (80-100), Ready (65-79), Almost Ready (55-64), Less Ready (40-54), and Not Ready (0-39). For reliability and validity, this instrument was tested on 55 third-year nursing students with Cronbach's alpha values: disaster knowledge ($r = 0.952$), preparedness plan ($r = 0.936$), disaster warning system ($r = 0.924$), resource mobilization ($r = 0.901$), preparedness policies and guidelines ($r = 0.933$), and emergency response plan ($r = 0.956$). All disaster preparedness parameters demonstrated high reliability, indicating that this instrument is suitable for collecting research data for this study.

Data Analysis

Descriptive analysis was conducted to summarize the frequency and percentages of respondents based on categorical data. Numerical data was analyzed using Pearson's correlation coefficients (r), with $\alpha = 0.05$.

and a 95% confidence interval. Both types of data were analyzed using IBM SPSS statistical software.

RESULTS

Characteristics of Respondent

It was found that 31.82% were male and 68.17% were female. The students aged 19 to 21 enrolled in the Disaster Nursing Course during the second year, fourth semester.

The level of Disaster Knowledge and Disaster Preparedness

Table I shows the distribution of Diploma III Nursing students in Banda Aceh City across four institutions: Central Government, Local Government, Military, and Private in the City, while in Aceh Besar Regency, there was only one institution with Private in the District status. Of the 443 respondents, the highest percentage of nursing students was at the Local Government Nursing Academy (39.73%), while the fewest were at the Private in District Nursing Academy (9.25%).

The percentage of nursing students' disaster knowledge was highest at the Central Government Nursing Academy (63.8%) and lowest at the Private District Nursing Academy (43.4%); this indicates that nursing students at the Central Government Nursing Academy better understand disaster knowledge than those at the other four institutions.

In terms of disaster preparedness, which includes preparedness plans, disaster warning systems, resource mobilization, preparedness policy and guidelines, and emergency response plans, the highest preparedness was observed at the Military Nursing Academy, while the lowest was at the Private in District Nursing Academy; this suggests that the Military Nursing Academy students are better prepared for dealing with earthquake and tsunami disasters compared to students from the other institutions.

The total percentage of disaster knowledge and disaster preparedness among Diploma III Nursing students in dealing with earthquake and tsunami disasters can be seen in **Figure I** below.

Figure I illustrates that nearly 63.0% of Diploma III Nursing students across all institutions had disaster knowledge categorized as "quite good" in dealing with earthquakes and tsunamis. This result indicates that

Figure I: total percentage of disaster knowledge and preparedness level on earthquakes and tsunamis among Diploma III Nursing students

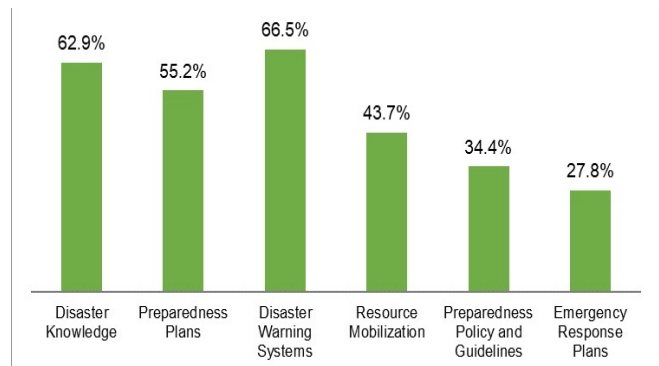


Table II: Analysis of Correlation between Disaster Knowledge and Disaster Preparedness Components in Diploma III Nursing Students

Disaster Preparedness Components	Disaster Knowledge	
	Pearson's r	p-value
Preparedness Plans	0.522	0.000
Disaster Warning Systems	0.455	0.000
Resource Mobilization	0.579	0.000
Preparedness Policy and Guidelines	0.519	0.000
Emergency Response Plans	0.527	0.000

while the disaster knowledge level is relatively high, it is not optimal. Efforts from nursing institutions and lecturers are still needed to enhance students' disaster knowledge, such as by providing teaching materials aligned with learning outcomes, improving lecture methods, and updating the disaster nursing curriculum.

Meanwhile, approximately 46.0% of Diploma III Nursing students were categorized as "not ready" regarding disaster preparedness. Specifically, preparedness plans, resource mobilization, preparedness policy and guidelines, and emergency response plans were in the "not ready" category, whereas disaster warning systems were categorized as "ready." These findings highlight the need to increase nursing students' skill capacity through

Table I: Number of Respondents and Percentage of Disaster Knowledge and Preparedness based on Diploma III Nursing Institutions (n=443)

Institutional Ownership of Diploma III Nursing Program	Number of Student	Disaster Knowledge	Preparedness plans	Disaster warning systems	Resource mobilization	Preparedness policy and guidelines	Emergency response plans
Central Government	102	63.8	27.8	10.1	19.3	22.7	47.8
Local Government	176	46.6	24.6	8.7	15.0	21.7	37.2
Military	55	55.0	62.0	15.2	28.2	43.0	80.1
Private in City	69	49.3	14.4	4.8	8.5	12.3	23.9
Private in District	41	43.4	12.0	4.2	8.2	12.0	17.0

practical simulations in laboratories and field drills as part of their clinical practice experiences.

Correlation Between Disaster Knowledge and Disaster Preparedness

Table II presents the Pearson's correlation coefficients (r) and p -values for the relationship between disaster knowledge and various aspects of disaster preparedness among Diploma III Nursing students. The correlation analysis provides insights into how disaster knowledge relates to different disaster preparedness components.

According to the correlation test, the results revealed that the p -value was < 0.05 , indicating that all components of disaster preparedness were significantly positively related to nursing students' disaster knowledge. Specifically, in sequential order, resource mobilization, emergency response plans, preparedness plans, preparedness policy and guidelines, and disaster warning systems significantly and positively impacted disaster knowledge, respectively.

DISCUSSION

Disaster Knowledge

It can be seen that nearly 63% of nursing students' disaster knowledge falls into the "quite good" category. However, their disaster preparedness for earthquakes and tsunamis was categorized as "not ready." Although nursing students demonstrated a good understanding of various natural disasters, such as the causes and characteristics of earthquakes and appropriate actions to take during an earthquake at school, there were significant gaps in their knowledge about non-natural disasters. Specifically, their understanding of social and political unrest, tsunami causation, and appropriate responses to tsunami warnings was lacking.

Previous research supports the connection between disaster knowledge and preparedness. For instance, Riviwanto M 2021¹⁷ found that families with children with disabilities had a readiness level of 42.2%. Suryadi T 2021¹⁸ reported a link between public knowledge and disaster preparedness attitudes in Lambung Village, Banda Aceh, highlighting the need for improved public education on disaster preparedness.

This study aligns with findings from Fatin M 2020¹⁹ which indicated that nurses in Dhaka city had moderate levels of disaster management knowledge. Similarly, Fauziyah ARS 2022²⁰ found that enhancing knowledge significantly improved preparedness for landslides. Developing effective learning tools and standards, such as those used in school-based disaster management education, can also improve nursing students' preparedness. Hermansyah 2023²¹ emphasized that such education benefits the students and equips them to assist others during disasters.

The importance of nursing knowledge in disaster management extends to all phases of the disaster management cycle, including policy formation,

planning, and mitigation. Comprehensive disaster preparedness activities must be grounded in a thorough understanding of various disaster types, their impacts, and appropriate responses. Continuous education and skill development for prospective nurses, especially in disaster-prone areas, are crucial for enhancing overall preparedness and resilience.

Preparedness Plans

It was found to be in the "not ready" category (55.2%). This result highlights several gaps in students' understanding of essential preparations before an earthquake or tsunami, including knowledge about the necessary equipment and items to save and the availability of evacuation or rescue tools in schools. It revealed a significant positive relationship between disaster knowledge and disaster preparedness plans ($r = 0.522$, $p = 0.000$). This indicates that a higher level of disaster knowledge is associated with better preparedness planning, and the strength of this relationship is moderate.

This study's findings are consistent with previous research. Hermansyah 2023²¹ reported that disaster management education significantly improved preparedness among nursing students, showing a positive impact before and after educational interventions ($p = 0.002$). However, Mawarni I 2020⁴ found no significant effect of earthquake and tsunami preparedness on the anxiety levels of the community in Alue Naga Village, Banda Aceh ($p = 0.864$).

In a similar study by Riviwanto M 2021¹⁷, disaster preparedness plans for families with children with disabilities were categorized as "less prepared" (37.8%). The study emphasized the need for tailored information for these families, using methods such as engaging posters and TV commercials. It suggested local governments enhance disaster preparedness through training, seminars, and simulations, particularly for vulnerable populations.

The ultimate goal of preparedness planning is to produce a written document and foster ongoing collaboration between parties, ensuring that all stakeholders are ready to act when a disaster strikes.

Disaster Warning Systems

It was found to be in the "prepared" category (66.5%); this means that the respondents were well-versed in disaster warning systems, particularly in recognizing tsunami warning systems and knowing the appropriate actions to take upon hearing such warnings. It revealed that disaster knowledge was significantly related to the disaster warning systems ($r = 0.455$, $p = 0.000$). This indicates a moderate positive relationship between the two variables, meaning that as nursing students' disaster knowledge increases, their understanding of disaster warning systems also improves.

This finding is supported by Riviwanto M 2021¹⁷, who found that disaster warning systems for families with children with disabilities were categorized as unprepared, with a preparedness level of only 46.7%. This emphasizes the need for tailored interventions to

address gaps in understanding and applying disaster warning systems.

The ultimate goal of any early warning system is to create safer living conditions by informing communities in advance, allowing them to reduce vulnerability and avoid potential losses. Strengthening the technical and social dimensions of early warning systems will contribute to Indonesia's more resilient disaster management practices.

Resource Mobilization

It was categorized as "not ready" (43.7%). This lack of preparedness was attributed to the insufficient frequency of activities or training such as First Aid, Youth Red Cross, Scouting, evacuation exercises, simulations, and disaster lectures or meetings. The disaster knowledge was significantly related to resource mobilization ($r = 0.579$, $p = 0.000$). The positive and moderately strong relationship suggests that resource mobilization efforts are more likely to improve as disaster knowledge increases.

Previous studies support this finding, showing that resource mobilization is often unprepared in various contexts. For instance, Riviwanto M 2021¹⁷ found that families with children with disabilities were largely unprepared for disaster resource mobilization (82.2%). Resource mobilization involves organizing and deploying human, financial, and material resources to manage disasters effectively.

Simulation activities are critical in the preparedness phase, allowing nurses to practice their assigned duties and responsibilities in a disaster scenario. This helps improve their clinical readiness when disasters occur.

However, the lack of regular disaster training and simulation activities negatively impacts resource mobilization. At the same time, theoretical knowledge from books and the internet and practical, hands-on simulation experience are necessary for effective disaster response.

Preparedness Policy and Guidelines

It was categorized as unprepared (34.4%). This reflects the lack of sufficient policies and guidelines at the central, regional, and institutional levels and their inadequate socialization among students. Strengthening these policies is crucial to ensure that students are well-versed in disaster preparedness protocols.

The disaster knowledge significantly correlated with preparedness policy and guidelines ($r = 0.519$; $p = 0.000$), showing a moderately strong and positive relationship. As disaster knowledge improves, so does the understanding and application of preparedness policies and guidelines.

Several studies underscore the importance of solid policy frameworks in disaster preparedness. Fatin M 2020¹⁹ pointed out that nurses in Dhaka City were not well-prepared for disaster management, emphasizing the need for well-developed plans and educational programs to enhance their disaster response capabilities. This aligns with the findings of Tanesab

JP 2020²², who highlighted that national and local disaster management authorities were less effective due to poor communication, coordination, and collaboration. Strengthening the role of the national disaster management authority to command, monitor, and synchronize policies with other institutions was recommended. Grimes A 2020⁵ stressed the potential of capacity-building programs for healthcare students and community members to enhance disaster resilience. Equipping these individuals with knowledge of disaster frameworks, risk mitigation, and psychological first aid can reduce the loss of life and property, business interruptions, and disaster recovery costs.

Emergency Response Plans

It was in the unprepared category (27.8%). This score reflects students' limited understanding of the importance of their educational institutions preparing backups or photocopies of critical documents to address earthquake and tsunami risks (21.4%). Additionally, school preparedness regarding evacuation plans and the provision of facilities to support emergency response plans remains inadequate.

There was a significant relationship between disaster knowledge and emergency response plans ($r = 0.527$; $p = 0.000$), demonstrating a moderately strong, positive correlation. This suggests that as disaster knowledge increases, so does preparedness in emergency response planning.

As healthcare providers, school nurses play a crucial role in school emergency preparedness, offering unique perspectives to optimize all phases of school emergency management²³. Although school emergencies are unpredictable, those involved in student care must be prepared to address the needs of students before, during, and after an event¹¹. Preparedness in schools aims to protect students and staff from harm, minimize disruption, and ensure the continuity of education, all while fostering a culture of safety¹⁵. Effective school emergency management requires training, preparation, and the implementation of best practices²⁴.

In Oman, Kamanyire JK 2021²⁵ found that most nursing students (78.4%) had experienced disasters at home and demonstrated moderate knowledge, skill, and confidence in post-disaster management. While they were willing to respond to disasters, their knowledge and self-efficacy needed improvement. Similarly, Hung MSY 2021¹² reported positive correlations between disaster knowledge and perceived ability but noted personal risk perceptions, disaster context, and organizational support concerns. This highlights the importance of incorporating disaster training into nursing curricula to build a competent workforce for future disaster response.

Hung et al. found that learner-centred education in disaster nursing courses enhanced student motivation and engagement, transforming passive students into proactive learners. This approach could be crucial in

preparing nursing students for real-life disaster situations by improving their confidence and competence²⁶.

In Indonesia, it was revealed that emergency nurses with prior disaster experience and training were better prepared for disaster response than those without such knowledge. This finding underscores the importance of combining disaster education with practical training²⁷.

In summary, nursing students' preparedness in responding to disasters depends on disaster education, field experience, and understanding of emergency procedures.

Comprehensive disaster education, including simulations and drills, is crucial in enhancing their readiness. Institutions should prioritize ongoing training to ensure students are well-equipped to handle disasters.

Students with specialized disaster preparedness training, such as early warning systems and evacuation plans, are more prepared for emergencies. A disaster education curriculum and frequent participation in disaster simulations can enhance preparedness, which is also influenced by institutional support and resource availability.

CONCLUSION

Nursing Diploma III students have a relatively good understanding of disaster knowledge (63%), but their disaster preparedness is still low (46%). Institutional and military backgrounds influence disaster knowledge and preparedness. Preparedness plans, warning systems, resource mobilization, policies, and emergency response plans significantly impact student preparedness. To improve preparedness, structured and ongoing disaster education and active participation in disaster simulations and drills are necessary. Further research should focus on developing and implementing a disaster nursing curriculum to improve student preparedness in disaster-prone areas.

ACKNOWLEDGMENT

We appreciate the support provided by the students and the Head of the Nursing Academies who were involved in this study.

Ethical permission: Health Research Ethics Commission, Aceh Health Polytechnic, Indonesia, ERC letter No. LB.02.03/010/2021.

Conflict of Interest: Authors declare no competing interests in the study.

Financial Disclosure / Grant Approval: This research received no external funding.

Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

AUTHOR CONTRIBUTION

Hermansyah: Contributed to study conceptualization, study design, data interpretation and analysis, first draft of the manuscript preparation, and revision.

Susanti H: Contributed to study conceptualization, data collection and data entry, final draft of the manuscript, and revision.

Both authors approved the final version of the manuscript.

REFERENCES

1. Pertiwi H, Zakiyah, Parulian I. Disaster preparedness knowledge of students at Universitas Binawan Jakarta. *Jurnal Kesehatan Saemakers PERDANA (JKSP)*. 2021; 4(2): 382-4. doi: 10.32524/jksp.v4i2.283.
2. Setiawan TH, Salim GH, Wimala M, Van Roy AF, Adiarto YLD. Development of knowledge and attitude measurement tools in disaster preparedness schools. *International J Disaster Manag*. 2020; 3(1): 53-62. doi: 10.24815/ijdm.v3i1.17298.
3. Unver V, Basak T, Tastan S, Kok G, Guvenc G, Demirtas A et al. Analysis of the effects of high-fidelity simulation on nursing students' perceptions of their preparedness for disasters. *Int Emerg Nurs*. 2018; 38: 3-9. doi: 10.1016/j.ienj.2018.03.002.
4. Mawarni I, Suryadi T, Pamungkas SR, Mutiawati VK. The effect of earthquakes and tsunamis preparedness on anxiety levels: A case study of Alue Naga Village, Banda Aceh. *Int J Disaster Manag*. 2020; 3(2): 48-57. doi: 10.24815/ijdm.v3i2.18720.
5. Grimes A, Sparke V, Rouen C, West C. Preparedness and resilience of student nurses in Northern Queensland Australia for disasters. *Int J Disaster Risk Reduction*. 2020; 48. doi: 10.1016/j.ijdrr.2020.101585.
6. Hasan MK, Younos TB, Farid ZI. Nurses' knowledge, skills and preparedness for disaster management of a megapolis. *Nurse Education Today*. 2021; 107: 105122. doi: 10.1016/j.nedt.2021.105122.
7. Nilsson J, Johansson E, Carlsson M, Leksell J, Lepp M, Lindholm C et al. Disaster nursing: Self-reported competence of nursing students and registered nurses, with focus on their readiness to manage violence, serious events and disasters. *Nurse Educ Pract*. 2015;1-7. ISSN: 1471-5953. doi: 10.1016/j.nepr.2015.09.012.
8. Khairina I, Nelwati, Maisa EA, Rahman D, Sanee A. Knowledge and skills as main predictors in nurse preparedness. *JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit)*. 2022; 11(3): 221-230. doi: 10.18196/jmmr.v11i3.16392.
9. Hershey SG, Aurelio BJC, Bautista RMC, Niel KR, Dichoso RA, Endaya SKV et al. Knowledge,

- attitude, and practices of nursing students on disaster preparedness. *Proceed Series Health Med Sci*. 2023; 2: 218. doi: 10.30595/pshms.v2i.218.
10. Oktabina RW, Khaira N, Desiana D, Nurhayati N, Hayati W, Fitri RD et al. Emergency preparedness for nursing in facing disaster in community. *J Keperawatan*. 2022; 1(2): 105-114. doi: 10.58774/jourkep.v1i2.13.
 11. Kalekas L. Disaster preparedness for school health services. In: Resha CA, Taliaferro VL, editors. *Legal resource for school health services*. Nashville, TN. 2017. p. 457-67.
 12. Hung MSY, Lam SKK, Chow MCM, Ng WWM, Pau OK. The effectiveness of disaster education for undergraduate nursing students' knowledge, willingness, and perceived ability: An evaluation study. *Int J Environ Res Public Health*. 2021; 18 (19): 10545. doi: 10.3390/ijerph181910545.
 13. Patel RK, Pamidimukkala A, Kermanshachi S, Etmnani-Ghasrodashti R. Disaster preparedness and awareness among university students: A structural equation analysis. *Int J Environ Res Public Health*. 2023; 20(5): 4447. doi: 10.3390/ijerph20054447.
 14. Winarti W, Gracya N. Exploring Nurses' Perceptions of Disaster Preparedness Competencies. *Nurse Media J Nurs*. 2023; 13(2): 236-245. doi: 10.14710/nmjn.v13i2.51936.
 15. Kaviani F, Aliakbari F, Farahmandnia H, Arbon P. Nursing Students' Competency to Attend Disaster Situations: A Study in Western Iran. *Disaster Med Public Health Prepared*. 2021; 16(5): 1-5. doi: 10.1017/dmp.2021.263.
 16. Hidayati D, Widayatun, Hartana P, Triyono, Kusumawati T. *Panduan mengukur kesiapsiagaan masyarakat dan komunitas sekolah*. Jakarta: LIPI Press; 2011. ISBN: 978-979-799-677-2.
 17. Riviwanto M, Darwel, Dwiyantri D, Juanda. The Preparedness Level of Families with Disabilities Children in Facing the Earthquake and Tsunami Disaster in Padang, West Sumatra. *Int J Disaster Manag*. 2021; 4(5): 61-70. doi: 10.24815/ijdm.v4i5.19323.
 18. Suryadi T, Zulfan, Kulsum. The Relationship between Knowledge and Attitudes about Community Disaster Preparedness in Lambung Village, Banda Aceh. *Int J Disaster Manag*. 2021; 4(1): 1-10. doi: 10.24815/ijdm.v4i5.19993.
 19. Fatin M, Sofia, Oktari RS. Earthquake and Tsunami Emergency Preparedness of Visually Disabled People. *Int J Disaster Manag*. 2020; 3 (1): 1-11. doi: 10.24815/ijdm.v3i1.15787.
 20. Fauziyah ARS, Sugandi D, Ruhimat M. The role of disaster knowledge in the preparedness of students in West Bandung Regency. *IOP Conf. Series: Earth and Environmental Science*. 2022; 1089: 012069. doi: 10.1088/1755-1315/1089/1/012069.
 21. Hermansyah, Muhammad, Nurhayati, Masyudi. Effectiveness of School-Based Disaster Management Education on Knowledge and Preparedness of D-III Nursing Study Program Students. *Jurnal Penelitian Pendidikan IPA*. 2023; 9: 945-952. doi: 10.29303/jppipa.v9iSpecialIssue.5933.
 22. Tanesab JP. Institutional Effectiveness and Inclusions: Public Perceptions on Indonesia's Disaster Management Authorities. *Int J Disaster Manag*. 2020; 3(2): 1-15. doi: 10.24815/ijdm.v3i2.17621.
 23. Davis-Alldritt L. Management of diabetes. In: Resha CA, Taliaferro VL, editors. *Legal resource for school health services*. Nashville, TN. 2017. p. 305-23.
 24. Trust for America's Health. *Ready or not? Protecting the public's health from diseases, disasters, and bioterrorism*. Washington DC; 2017.
 25. Kamanyire JK, Wesonga R, Achora S, Labrague LL, Alhabsi JAS, Malik A et al. Nursing Students' Perceived Disaster Preparedness and Response Pilot Study in Oman. *Sultan Qaboos University Med J*. 2021; 21(4): 621-625. doi: 10.18295/squmj.5.2021.074.
 26. Hung MSY, Lam SKK, Chow MCM. Nursing students' experiences and perceptions of learner-centred education in a disaster nursing course: A qualitative study. *Nurse Educ Pract*. 2020; 47. doi: 10.1016/j.nepr.2020.102829.
 27. Rizqillah AF, Suna J. Indonesian emergency nurses' preparedness to respond to disaster: A descriptive survey. *Australasian Emergency Care*. 2018; 21(2): 64-68. doi: 10.1016/j.aucec.2018.04.001.

