

IMPROVING NEW STUDENTS' DISASTER PREPAREDNESS THROUGH HEALTH EDUCATION AND SIMULATION USING THE CAMPUS DISASTER SCENARIO BOOK

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ABSTRACT

Padang is an area with a very high risk of earthquakes and tsunamis. The campus environment, as a public space with a high density of occupants, faces the same risk. New students are a vulnerable group because they are not yet familiar with the campus environment, evacuation routes, or emergency-response procedures. This community service activity aims to improve new students' knowledge and disaster preparedness through health education combined with demonstration and simulation using the video material of the Campus Disaster Scenario Book. The activity was carried out using lecture and demonstration methods, attended by 33 new students of the Diploma III Nursing Study Program of Baiturrahmah Nursing Academy. Evaluation was conducted on knowledge (pretest–posttest) and evacuation-practice skills. The evaluation results showed that health education combined with demonstration and simulation using the Campus Disaster Scenario Book was able to improve new students' disaster-preparedness knowledge. The number of participants in the good knowledge category increased from 8 (24.2%) before the activity to 29 (87.9%) afterward. Conversely, the poor knowledge category, which initially comprised 7 participants (21.2%), was no longer found after the intervention. The mean knowledge score also increased from 61.8 to 86.7. In the practice evaluation, more than 90% of participants were able to follow the evacuation route and reach the assembly point according to procedure. This health-education and simulation activity was proven effective in improving new students' disaster preparedness and is recommended for integration into new-student orientation.

Keywords: *Disaster preparedness; Educational video and demonstration; Simulation; New students.*

INTRODUCTION

Indonesia is one of the countries with the highest level of disaster vulnerability in the world because of its position at the meeting point of three major tectonic plates and along the Pacific Ring of Fire (Susanti et al., 2020) This configuration triggers high seismic activity, numerous active volcanoes, and earthquake sources from active faults and subduction zones (Natasya and Rizkiyana, 2023) his geographical condition places most of Indonesia's territory under the threat of earthquakes, tsunamis, and volcanic eruptions. Many independent sources consistently state the same tectonic explanation and associate it with the recurring disaster patterns in Indonesia (Nasution et al., 2020) Law Number 24 of 2007 concerning Disaster Management affirms that disaster-management efforts focus not only on emergency response but also on the pre-disaster stage, particularly preparedness, as the key to reducing casualties (Kusumastuti et al., 2026)

Indonesian studies have repeatedly linked these tectonic conditions to building damage, fatalities, and the need for disaster mitigation (Irwandi, 2022a)

Padang is an area with a very high risk of earthquakes and tsunamis because it is located in a coastal area and close to a plate subduction zone (Irwandi, 2022b) The campus environment, as a public space with a high density of occupants, faces the same risk. When a disaster occurs, the speed and accuracy of the actions of campus occupants greatly determine safety.

New students are a vulnerable group because they are not yet familiar with the campus environment, evacuation routes, or emergency-response procedures (Altizer, Ma et al., 2018). New students often do not yet understand what to do in an emergency; studies emphasize that they rarely think about personal safety and find it difficult to

absorb emergency information because of "information overload" (Hayanga et al., 2025) Many students do not know the location of shelters/assembly points or evacuation routes, and this knowledge is considered a simple but crucial foundation of safety (Carvalhais et al., 2023a)

This condition can cause panic and increase the risk of injury if a disaster occurs early in the academic period. The main risk is not only the disaster hazard itself, but also the low initial preparedness of new students (Altizer, Ma et al., 2018), therefore, new students need to be equipped with disaster-preparedness knowledge and skills from an early stage.

New-student orientation activities generally do not yet include structured disaster-preparedness training. Disaster material, when delivered, tends to be theoretical and lacks practice, so that the understanding formed is less lasting and difficult to apply in real situations. In fact, preparedness is not merely knowledge but also a skill that can only be formed through modeling and direct practice. This gap between the need for preparedness and the limitations of educational methods is what drives the need for an approach that combines knowledge delivery with practice (Carvalhais et al., 2023b) Inferentially, preparedness is not only about knowing information but also requires structured practice so that emergency responses can be carried out correctly (Yoshida et al., 2021)

SOne effective approach to meet this need is health education that combines lecture and demonstration methods (Altizer, Ma et al., 2018; Carvalhais et al., 2023a) The lecture method serves to convey basic knowledge about disasters and preparedness, while demonstration and simulation reinforce understanding through modeling and direct practice, so that the material is easier to understand and remember (Notoatmodjo, 2020).

This combination is in line with the principle of experiential learning, namely that knowledge is formed and retained better when participants directly experience and practice what they learn (Kolb, 2015).

So that the simulation runs in a directed, safe, and easy-to-follow manner, this activity uses the Campus Disaster Scenario Book as a standard guide for campus disaster-simulation scenarios. The Campus Disaster Scenario Book is a product of research and development that has gone through the stages of needs analysis, compilation, expert validation, and trial.

It is a disaster-simulation scenario book specifically designed for the campus context and contains five relevant disaster scenarios, namely an earthquake during a lecture, a tsunami threat after an earthquake, a campus building fire, a mass-casualty incident, and self-evacuation to the assembly point. Each scenario is equipped with a situation description, learning objectives, role assignments, a phased implementation flow, key safety points, and an evaluation sheet, so that the course of the simulation becomes clear, structured, and can be repeated consistently.

With this standardized guide, facilitators and participants have the same reference in carrying out the exercise, so that the risk of confusion and procedural errors during the simulation can be minimized.

Based on this description, the team carried out a community service activity in the form of improving new students' disaster preparedness through health education and simulation using the Campus Disaster Scenario Book at Baiturrahmah Nursing Academy.

Problem Analysis

Based on the situational analysis, the problems faced by the partner are as follows:

1. The low level of new students' knowledge about disaster preparedness and campus emergency-response procedures.
2. New students are not yet familiar with campus evacuation routes and assembly points.
3. The suboptimal implementation of disaster-preparedness education activities for new students.

Problem Solution

Based on the identified problems, the team offers a solution in the form of a health-education activity using lecture and demonstration methods combined with simulation using the Campus Disaster Scenario Book. The educational-video method is used to convey basic knowledge about disaster preparedness, while demonstration and simulation reinforce understanding through the modeling and direct practice of evacuation procedures. This solution aims to improve new students' knowledge of disaster preparedness while equipping them with emergency-response and evacuation skills toward the assembly point, so that new students are better prepared to face disasters in the campus environment.

Solutions Offered

1. Health education on campus disaster risks and the importance of preparedness for new students.
2. Educational-video material on disaster preparedness, evacuation routes, and emergency-response procedures.
3. Demonstration of self-protection actions and evacuation procedures toward the assembly point.
4. Guided evacuation simulation using the Campus Disaster Scenario Book.
5. Evaluation of participants' knowledge before and after the activity and

assessment of evacuation practice.

Method of Implementation and

Evaluation

The activity was carried out using video-material and demonstration methods combined with simulation. The lecture method was replaced with video material used to deliver disaster-preparedness content, the demonstration method was used to model emergency-response actions and evacuation procedures, while the simulation was carried out so that participants directly practiced these actions using the Campus Disaster Scenario Book guide.

Time and Place: The activity was carried out in August 2025 on the campus of Baiturrahmah Nursing Academy, coinciding with the new-student orientation period.

Target Group: The target of the activity was 33 new students of the Diploma III Nursing Study Program of Baiturrahmah Nursing Academy.

The activity was carried out in three stages as follows.

Preparation Stage: Included coordination with the orientation committee, preparation of materials and media (Campus Disaster Scenario Book, presentation material, evacuation signage), and the development of pretest and posttest instruments.

Implementation Stage: Began with the pretest, continued with material delivery through lecture, demonstration of emergency-response actions and evacuation procedures, simulation practice by participants using the scenario book, and ended with the posttest.

Evaluation Stage: Evaluation was carried out on participants' knowledge (comparison of pretest and posttest) and evacuation-practice skills toward the assembly point.

Activity Material

1. Basic concepts of disasters and earthquake/tsunami risks in the campus environment.
2. Campus evacuation routes, signage, and assembly points.
3. Self-protection actions and emergency-response procedures.
4. Evacuation simulation using the Campus Disaster Scenario Book.

Evaluation Method: Knowledge was measured using pretest and posttest questionnaires, then categorized as good, sufficient, and poor. Practice skills were assessed using an observation sheet for the accuracy of evacuation to the assembly point. Data were analyzed descriptively.

Respondent Characteristics

Characteristic	Frekuensi (f)	Persentase (%)
Sex		
Male	6	18,2
Female	27	81,8
Age (years)		
17–18	22	66,7
19–20	9	27,3
>20	2	6,1

Table 1. Respondent characteristics

Based on Table 2, the number of participants in the good knowledge category increased from 8 (24.2%) before the activity to 29 (87.9%) afterward. Conversely, the poor knowledge category, which initially comprised 7 participants (21.2%), was no longer found after the intervention.

Results and Discussion

Implementation of the Activity

The activity was carried out according to plan and attended by 33 new students. The activity took place in a conducive atmosphere with

high participant involvement, especially in the demonstration and evacuation-simulation sessions using the Campus Disaster Scenario Book. Participants followed the entire series enthusiastically, from the video material and demonstration to the simulation practice.

Knowledge Evaluation Results

The evaluation results showed that health education combined with demonstration and simulation using the Campus Disaster Scenario Book was able to improve new students’ disaster-preparedness knowledge. The distribution of knowledge categories before and after the activity is presented Table 2.

Table 2. Distribution of Participants’ Knowledge Categories Before and After the Activity

Knowledge Category	Before (f)	%	After (f)	%
Good	8	24,2	29	87,9
Sufficient	18	54,5	4	12,1
Poor	7	21,2	0	0
Total	33	100	33	100

Based on Table 2, the number of participants in the good knowledge category increased from 8 (24.2%) before the activity to 29 (87.9%) afterward. Conversely, the poor knowledge category, which initially comprised 7 participants (21.2%), was no longer found after the intervention.

Table 3. Participants’ Mean Knowledge Score

Knowledge Score	Before	After
mean	61,8	86,7

The participants’ mean knowledge score also increased from 61.8 before the activity to 86.7 afterward, or rose by 24.9 points. This increase shows that the target of improving

participants’ knowledge was achieved.

Practice Evaluation Results

In the practice evaluation, more than 90% of participants were able to follow the evacuation route and reach the assembly point according to procedure. This shows that participants not only understood the material theoretically but were also able to apply it in the form of correct evacuation actions.

Discussion

The improvement in participants’ knowledge and skills shows that the combination of the lecture method with video material and demonstration, together with simulation, is effective in improving new students’ disaster preparedness. The lecture provides a knowledge base, while demonstration and simulation reinforce understanding through direct experience so that the material is easier to understand and remember (Carvalhais et al., 2023a)

The use of the Campus Disaster Scenario Book as a simulation guide provides a standardized practice flow so that the activity runs in a directed and easy-to-follow manner. Introducing evacuation routes and assembly points through practice helps new students become familiar with the campus environment early; this can be understood as a way that helps new students recognize the campus more quickly and, inferentially, reduces the potential for panic during a disaster because they already have a picture of the actions to take (Yoshida et al., 2021) so that the potential for panic during a disaster can be reduced. This finding is in line with the principle of experience-based learning that emphasizes direct practice in forming skills (Kolb, 2015).

Faktor Pendukung dan Penghambat

Supporting and Inhibiting Factors

The implementation of the activity was supported by several factors. First, the high enthusiasm and participation of new students,

seen from participants' activeness during the lecture, demonstration, and evacuation-simulation practice sessions. This is inferentially in line with evidence that new students' preparedness requires orientation, routine drills, clear evacuation information, and structured practice (Carvalhais et al., 2023a)

Second, full support from the institution, namely the Director and the new-student orientation committee of Baiturrahmah Nursing Academy, who provided permission, time, and a venue. Third, the availability of adequate media and facilities, especially the Campus Disaster Scenario Book as a standardized simulation guide, as well as evacuation-route signage and assembly points in the campus environment. Fourth, the suitability of the method to the participants' characteristics; the combination of lecture, demonstration, and simulation made the material easy to understand and engaging for new students. Fifth, the readiness of the implementing team, which had prepared the materials, media, and evaluation instruments before the activity, so that the event ran according to the planned flow.

In addition to the supporting factors, there were several inhibiting factors. First, the limited implementation time because the activity was carried out amid a busy new-student orientation period, so that the duration of each session had to be arranged efficiently. Second, the fairly large number of participants at one time meant that the demonstration and practice-mentoring process required dividing into groups so that each participant received adequate attention. Third, the variation in participants' initial level of understanding of disaster material, so that some participants needed additional explanation during the practice session. Fourth, the limited time for repeating the simulation, whereas the formation of evacuation skills ideally requires repeated practice.

Conclusion and Recommendations

Conclusion

1. The health-education activity using video-material and demonstration methods combined with simulation using the Campus Disaster Scenario Book was carried out well and attended by 33 new students.
2. Participants' disaster-preparedness knowledge increased; the good knowledge category rose from 8 (24.2%) to 29 (87.9%), the poor category (7 participants/21.2%) was no longer found, and the mean score increased from 61.8 to 86.7.
3. More than 90% of participants were able to perform evacuation to the assembly point according to procedure, so that the activity was proven effective in improving new students' disaster preparedness.

Recommendations

1. Disaster-preparedness health-education and simulation activities need to be routinely integrated into new-student orientation.
2. Periodic practice and continued mentoring are needed so that participants' knowledge and skills are maintained.
3. The Campus Disaster Scenario Book media needs to continue to be used and developed according to campus conditions.

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