Research Article

The Effect of Flood Disaster Mitigation Counselling on Medical Student Awareness to Implement SDGs Agenda in Higher Education

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Abstract.

Raising awareness and flood disaster mitigation among medical students has become an important aspect of advancing the Sustainable Development Goals (SDGs) in higher education. In Gorontalo, floods are a recurring disaster, with 32 incidents recorded between 2019 and 2022. This study aims to examine the impact of flood disaster mitigation counselling on the knowledge levels of medical students at Gorontalo State University. The research used a pre-experimental design using a one-group pretestposttest approach, where questionnaires were administered before and after the counselling sessions. The study 89 students, selected through proportionate stratified random sampling from a population of 113. Data were analyzed using the Wilcoxon test. Prior to counselling, most students had a moderate level of knowledge (77.53%), with fewer classified as good (13.48%) or poor (8.99%). Following the counselling, the majority reached a good knowledge level (69.66%), with the remainder classified as fair (30.34%). The statistical analysis indicated a significant improvement in knowledge after counselling (p-value = 0.000). These findings highlight the effectiveness of flood disaster mitigation counselling and underscore the need to integrate disaster management education and foster cross-sectoral cooperation in medical training.

Keywords: counselling, flood mitigation, knowledge

1. Introduction

Geographically, Indonesia is situated between the Pacific Ocean and the Indian Ocean, bordered by two continents, namely Asia and Australia. Geologically, Indonesia is located within the Pacific Ring of Fire, where three tectonic plates meet: the Indo-Australian, Eurasian, and Pacific. This geographical and geological context makes Indonesia highly susceptible to disasters such as earthquakes, floods, landslides, tsunamis, and volcanic eruptions .^{1,3}

Data from the Centre for Research on the Epidemiology of Disasters (CRED) indicates that in the year 2021, there were 432 natural disasters worldwide, resulting in a total of 10,492 deaths, affecting 101.8 million people, and causing financial losses of up to

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Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the ICORSIA 2024 Conference Committee.

How to cite this article: Muh. Nur Syukriani Yusuf, Zuhriana K. Yusuf, and Wira A. Putra, (2025), "The Effect of Flood Disaster Mitigation Counselling on Medical Student Awareness to Implement SDGs Agenda in Higher Education" in *The 4th International Conference on Rural Studies in Asia*, KnE Page 395 Social Sciences, pages 395–404. DOI 10.18502/kss.v10i10.18688 252 billion dollars. Among these disasters, the most frequent occurrence was floods, accounting for 223 incidents. CRED ranks Indonesia as the Asian country with the highest frequency of disasters, reporting 28 recorded disasters.²

Based on data from the National Disaster Management Agency (BNPB), in the year 2021, at least 5,402 natural disasters occurred in Indonesia. The three most frequent natural disasters were floods occurring 1,794 times, extreme weather 1,577 times, and landslides 1,321. These disasters in 2021 resulted in 728 deaths, 7.6 million people affected, 21,335 houses damaged, and 458 healthcare facilities destroyed.^{3,4}

The province of Gorontalo is susceptible to flood disasters. This vulnerability is due to the topographical layout of the land in Gorontalo, which resembles a bowl shape. Flood-prone areas in the Gorontalo province are present in all cities and regencies (Gorontalo Province Regional Medium-Term Development Plan, 2021). Data from the Central Statistics Agency in 2021 indicates that 259 villages/sub-districts in the Gorontalo province have been affected by floods in the past three years.⁵

Based on data from the National Disaster Management Agency (BNPB), there have been at least 32 flood disasters in Gorontalo Province from 2019 to April 2022. The BNPB's Disaster Risk Index (IRBI) for 2021 also categorized Gorontalo with a moderate disaster risk level, scoring 123.06.⁶

According to disaster information data released by BNPB, Gorontalo has experienced 166 instances of floods in the past 20 years, resulting in 32 deaths, affecting 101,345 people, damaging 1,652 houses, and causing damage to an area of 5,444 hectares.⁷

Therefore, due to the significant impact, disaster risk reduction measures are needed to address flood disasters. This can be achieved through disaster mitigation within the community. One way to accomplish this is by enhancing the public's knowledge about flood disaster mitigation. Flood disaster mitigation requires improving public knowledge through education.

Relevant research has been conducted by Feliks regarding the influence of education on public knowledge in facing flood disasters. This study was conducted in the Permata Village of Boalemo Regency, Gorontalo Province, in 2019. The findings of this research indicate a notable impact on community knowledge before and after receiving educational outreach, resulting in an improvement from an initial level of moderate knowledge (54.12%) to a higher level of good knowledge (77.51%)⁸.

2. Research Methodology

This research was conducted at the Faculty of Medicine, Gorontalo State University. The research was carried out on October 21, 2022. The research employed a quantitative design using a pre-experimental approach with a One Group Pretest-Posttest Design. The participants in this research were students from the Faculty of Medicine at Gorontalo State University. These students had not yet taken any courses on disaster management, were not affiliated with any disaster-related organisations, and expressed their willingness to engage in the study. The total number of participants was 113 individuals.

The sampling technique used in this study was proportionate stratified random sampling. The sample size was 89 individuals. Data processing was carried out using the SPSS application. Subsequently, the data were presented in tabular form and accompanied by explanations. The Wilcoxon statistical test was employed to determine the impact between flood mitigation counseling and knowledge of flood mitigation.

3. Research Result and Discussion

3.1. Research Findings

TABLE 1: Distribution Based on Respondents' Knowledge Levels Before Attending Flood Disaster Mitigation Outreach at the Faculty of Medicine, Gorontalo State University.

No.	Knowledge (Pre-Test)	n	%
1.	Insufficient	8	8,99
2.	Adequate	69	77,53
3.	Good	12	13,48
	Total	89	100%

Source: Primary Data, 2022

 TABLE 2: Distribution Based on Respondents' Knowledge Levels After Attending Flood Disaster

 Mitigation Outreach at the Faculty of Medicine, Gorontalo State University.

No.	Knowledge (Pre-Test)	n	%
1.	Insufficient	0	0
2.	Adequate	27	30,34
3.	Good	62	69,66
	Total	89	100%

Source: Primary Data, 2022

Variable (Knowledge Level)	Mean (Minimum Maximum)	ho Value	
Before Outreach (n = 89)	9,54 (6 – 13)		
After Outreach (n = 89)	12,26 (9 – 15)	0,000	
Source: Primary Data, 2022			

 TABLE 3: Distribution of the Effect of Disaster Mitigation Outreach on Flood Disaster Knowledge

 Among Faculty of Medicine Students Using the Wilcoxon Statistical Test.

3.2. Knowledge Level of Faculty of Medicine Students Before Receiving Flood Disaster Mitigation Outreach

Based on the research conducted prior to the outreach, the findings revealed that the knowledge level of Faculty of Medicine students was categorized as follows: insufficient knowledge for eight respondents (8.99%), adequate knowledge for 69 respondents (77.53%), and good knowledge for 12 respondents (13.48%), with an overall average score of 9.54. This implies that the knowledge level of Faculty of Medicine students regarding flood disaster mitigation was still within the "adequate" category.

This study's results align with Tiurmaida's research on the impact of health education on students' knowledge of earthquake disaster preparedness. Before receiving health education, students' knowledge was categorized as "adequate", with an average score of 4.4. The researcher assumes that the average knowledge level of students before receiving the outreach was still "adequate" since students had not previously been exposed to information about flood disaster mitigation.9 This assumption is supported by Burnie D, who theoretically stated that individuals who have not been exposed to new knowledge tend to have lower knowledge levels than those who already possess such knowledge¹⁰

Knowledge being categorized as "adequate" is that a significant number of students have not received socialization about flood mitigation, have not participated in disaster simulations, and have not taken courses in disaster management. This assumption is supported by the theory of Notoadmojo, which states that education, information, and experience are among the factors that influence an individual's level of knowledge. Exposure to information is one of the factors that affect an individual's knowledge. Information can be obtained from various sources, including schools, classrooms, and reading materials from various mass media such as the Internet, books, magazines, and new.¹¹

Furthermore, another factor contributing to students' knowledge being categorized as "adequate" is the lack of experience among students in actively participating in disasterrelated activities, such as providing health check-ups for disaster-affected individuals or distributing logistics to flood-affected victims. According to Herdwiyanti and Sudaryono, personal experiences can influence an individual's knowledge and attitudes towards disaster preparedness. This notion is supported by the findings of Hawvina's research13 on the influence of disaster experience on students' readiness to face the threat of earthquakes and tsunamis, revealing that 89% of students were aware and prepared to confront the threat of earthquakes and tsunamis in the city of Banda Aceh.¹²

3.3. Knowledge Level of Faculty of Medicine Students After Receiving Flood Disaster Mitigation Outreach

Based on the research conducted after the outreach, the findings revealed that the knowledge level of Faculty of Medicine students was categorized as follows: insufficient knowledge for 0 respondents (0%), adequate knowledge for 27 respondents (30.34%), and good knowledge for 62 respondents (69.66%), with an overall average score of 12.26. This indicates that the knowledge level of Faculty of Medicine students has improved and shifted to the "good" category after receiving the outreach.

The researcher assumes that the media and method of delivering the materials were easily comprehensible by the respondents. This is evident from the knowledge outcomes where respondents indicated an understanding of essential practices, such as safeguarding important documents in waterproof bags, undertaking pre-flood mitigation actions like creating infiltration wells, and post-flood mitigation measures like cleaning the environment and public facilities. This assumption is supported by the theory of Notoatmojo, which suggests that messages conveyed to respondents should be tailored to their needs, group, or community, using easily understood language and employing media that capture respondents' attention effectively. ¹¹

The outreach proceeded smoothly, and the students appeared attentive during the session, displaying genuine interest in the presented videos. This indicates that the students were actively absorbing the outreach content, which directly contributed to enhancing their knowledge about flood disaster mitigation. According to Notoadmojo¹¹, health education is an application of education in the health field that can alter one's knowledge, understanding, opinions, attitudes, and perceptions while instilling new behaviours or habits. Similarly, Semiawan¹⁴ states that education significantly influences

the reception of provided information, and the source of information or ease of accessing information can accelerate the acquisition of new knowledge. The outcomes of this study align with the viewpoints of Masita Malahika, Sefty Rompas, and Jeavery Bawotang¹⁵, who suggest that the information obtained through health education is a key factor affecting public knowledge about disasters. The research highlights that prior to receiving health education, the community had limited awareness of flood disaster preparedness. However, after receiving health education, their knowledge about disaster preparedness increased.

Furthermore, the researcher assumes that the level of education among respondents currently pursuing higher education can influence the reception of the provided information. This is consistent with the theory presented by Notoatmodjo¹¹, which posits that the level of education influences an individual's reception of information and acquisition of knowledge. The findings of a study by Saputri on the influence of health education on increasing the knowledge of PMI sukrela corps students about cervical bone trauma at STIKES Hutama Abdi Tulungagung support this assumption. The study indicates that the media, information sources, and the respondents' level of education affect the reception of information on the topic of the outreach¹³.

The results above are supported by the theory proposed by Maulana, which asserts that education is a process to enable individuals to enhance self-control. Through education, individuals gain broader insights and information regarding the subject matter of the outreach, such as the improved knowledge of flood disaster mitigation among students after receiving the outreach. In line with the findings of Feliks⁸, it was observed that the knowledge level of the residents of Desa Permata, Gorontalo, about flood preparedness, increased from an average of 8.20 before the outreach to 11.57 after the outreach. This demonstrates a change in knowledge before and after the outreach. ¹⁴

Therefore, the researcher contends that the media and method of delivery, information sources, and educational level can influence an individual's knowledge. Providing appropriate disaster mitigation education about floods to students, these factors can lead to an enhancement in their knowledge.

3.4. The Effect of Education on Flood Disaster Mitigation Knowledge among Medical Faculty Students

Based on the statistical test results using a pre-experiment with a one-group pre-test post-test design, it was found that the data did not follow a normal distribution. Therefore, a Wilcoxon statistical test was conducted, which revealed a significant difference in knowledge levels before and after the education session. The initial results before the education session showed that eight individuals had poor knowledge, 69 had moderate knowledge, and 12 had good knowledge, with an overall average score of 9.54. This indicates that most respondents had a moderate knowledge level (77.53%). After the education session, the results showed that no one had poor knowledge, 27 had moderate knowledge, and 62 had good knowledge, with an overall average score of 12.26. This suggests that most of the student's knowledge level was categorized as good (69.66%). The Wilcoxon test yielded a z-score of -7.615 and a p-value of 0.000 ($\alpha < 0.05$). These results indicate the rejection of the null hypothesis (H0) and the acceptance of the alternative hypothesis (H1). Based on these findings, it can be concluded that the education session has a significant effect on flood disaster mitigation knowledge among Medical Faculty students.

The results of this study are consistent with the findings of Feliks⁸ that "There is an effect of education on the level of community knowledge in facing flood disasters." Before receiving education, respondents with poor knowledge accounted for 26.7%, moderate knowledge for 70%, and good knowledge for 3.3%. After the education session, respondents with poor knowledge decreased to 0%, moderate knowledge decreased to 43.3%, and good knowledge increased to 56.7%. A p-value of 0.000 (α < 0.05) was obtained using the Wilcoxon test. In relevance to the study above, the research results among medical faculty students also show a change in knowledge level after receiving education about flood disaster mitigation.8 This finding aligns with Hikmawati's statement that health promotion is an effort to influence individuals and groups to adopt health-conducive behaviours.¹⁶

Furthermore, a study by Putro¹⁷ stated that after receiving health education, significant changes were observed among respondents regarding earthquake preparedness among students at SD no 7 Labuhan Haji, South Aceh. The results before the education session showed that 12 students were almost prepared (40%), and 18 were fully prepared (60%). After the education session, the results shifted to 7 students at the fully prepared level (23.3%) and 23 at the highly prepared level (76.7%). This demonstrates that the method of education is highly effective for conveying information or messages to students, pupils, or the community.

Many factors contribute to the success of an education session, ranging from the material's content and the use of aids (media) to the presenter's competence in delivering the Education. This aligns with Notoatmojo's statement that Education aims to shape the behaviour of individuals interested in behavioural change or innovation. ¹¹ According to Hayati, audiovisual media (videos) are a process that enhances knowledge by presenting both auditory and visual information. ¹⁴ This approach provides concrete evidence for what is being taught, allowing individuals to compare, understand, remember, and apply the information in their lives. The findings of this study also coincide with the research by Rohana , which showed that after health education using video methods, there was an increase in knowledge, with 78.7% of respondents having good knowledge and 21.3% having sufficient knowledge, while none had poor knowledge. ¹⁷

Based on the research findings and existing theories, it can be concluded that Education influences Knowledge of Flood Disaster Mitigation Among Medical Faculty Students.

4. Conclusion

- 1. The level of knowledge among Medical Faculty students at Universitas Negeri Gorontalo before receiving education was categorized as sufficient (77.53%).
- 2. The level of knowledge among Medical Faculty students at Universitas Negeri Gorontalo after receiving education was categorized as good (69.66%).

There is an Influence of Education on Knowledge of Flood Disaster Mitigation Among Medical Faculty Students with a p-value of 0.000 ($\alpha < 0.05$).

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