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**Original Article**

# The Influence of Flood Disaster Management Education on The Level Of Knowledge Nurses at Limboto Barat Community Health Center

**Pipin Yunus[1], Hamna Vonny Lasanuddin[2], Sri Vidyanti S. Moha[3]**
[1] Muhammadiyah University of Gorontalo, pipinyunus@umgo.ac.id
[2] Muhammadiyah University of Gorontalo, hamnavonnylasnuddin@gmail.com
[3] Muhammadiyah University of Gorontalo, vidyantimoha99@gmail.com
(pipinyunus@umgo.ac.id, 081355745116)

***ABSTRACT***

Nurses' knowledge of flood disaster management is crucial to ensure effective preparedness and response, thereby reducing disaster-related risks. This study aimed to examine the effect of flood disaster management education on the knowledge level of nurses at the Limboto Barat Community Health Center. A quasi-experimental design with a one-group pretest–posttest approach was used. Twenty nurses were recruited using purposive sampling. Educational intervention consisted of two 90-minute sessions delivered through lectures, discussions, and visual media. Knowledge was measured using a validated questionnaire (Cronbach's $\alpha = 0.82$). Data were analyzed using paired sample t-test. Results showed a significant improvement in knowledge after the intervention (mean pretest = 11.10, posttest = 13.55; $p < 0.001$). The proportion of nurses with good knowledge increased from 20.0% to 50.0%. Although the findings indicate that education can effectively improve disaster management knowledge, the small sample size (n = 20) and absence of a control group limit the generalizability of the results. Future studies with larger and more diverse samples are recommended.

***Keywords :*** Education, Knowledge, Flood Disaster Management

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## INTRODUCTION

Floods are among the most frequent and destructive natural disasters worldwide, causing severe health, social, and economic impacts[25,27]. In Indonesia, floods remain one of the most recurrent disasters, with Gorontalo Province categorized as highly vulnerable [5]. These recurring events highlight the urgent need for effective disaster preparedness, particularly in primary health centers (Puskesmas), where nurses play a pivotal role as frontline healthcare providers[4,8].

Nurses' responsibilities extend beyond clinical care to encompass health education, emergency coordination, and community resilience building[22]. However, evidence indicates that many nurses lack adequate disaster-specific knowledge and structured training, limiting their ability to respond effectively in flood emergencies[12,24]. Recent findings emphasize that both in Indonesia and globally, disaster preparedness among nurses remains suboptimal, and flood-related readiness requires targeted interventions[3,19].

Educational interventions such as simulation, role-play, video-based learning, and digital platforms have been shown to significantly enhance disaster preparedness and self-efficacy among health professionals and students[15,26]. In addition, community-based and context-specific disaster education programs have demonstrated effectiveness in improving local preparedness for floods and other hazards[17,21].

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Despite these advances, studies specifically examining the influence of flood disaster management education on the knowledge of nurses working in Indonesian community health centers remain scarce[20]. Most available research has focused on hospital-based nurses, students, or community groups rather than practicing nurses in primary healthcare facilities[13]. Addressing this gap is essential to strengthen disaster resilience and ensure effective emergency responses in flood-prone areas such as Limboto Barat[7].

## METHODS

This study used a quasi-experimental one-group pretest–posttest design. Twenty nurses were recruited using purposive sampling based on inclusion criteria: (1) employed at the Limboto Barat Community Health Center, (2) had not received prior disaster training, and (3) provided informed consent. Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Gorontalo (No. 032/KEPK/III/2021).

**Intervention:** The educational program consisted of two 90-minute sessions delivered over two consecutive days using lectures, group discussions, and visual media (PowerPoint and video). The content covered disaster concepts, flood risk factors, emergency response protocols, and nurses' roles during disaster phases.

**Instrument and analysis:** Knowledge was assessed using a 20-item multiple-choice questionnaire validated by experts (Cronbach's $\alpha = 0.82$). Data were analyzed using paired sample t-test to compare mean pretest and posttest scores, with significance set at $p < 0.05$.

## RESULTS

### 1. Respondent Characteristics

Table 1. Characteristics of respondents in this study are described starting from gender, age, length of service, education

| Respondent Characteristics | Frequency | Percentage (%) |
|---|---|---|
| Gender | | |
| Male | 4 | 20,2 |
| Female | 16 | 80,0 |
| Age | | |
| 26-35 Years | 8 | 40,0 |
| 35-45 Years | 9 | 45,0 |

| | | |
|---|---|---|
| 45-55 Years | 3 | 15,0 |
| Length of Work | | |
| 1-3 Months | 2 | 10,0 |
| 1-3 Years | 6 | 30,0 |
| 15-20 Years | 12 | 60,0 |
| Education | | |
| D-III Nursing | 12 | 60,0 |
| S1 Nursing/nurse | 8 | 40,0 |

As shown in Table 1, most respondents were female (80.0%), aged 35–45 years (45.0%), had 15–20 years of work experience (60.0%), and held a Diploma III in Nursing (60.0%). These characteristics indicate that the respondents were predominantly experienced nurses.

**2. Univariate Analysis**

Table 2.Level of knowledge of nurses before being given disaster management education

| Level of Knowledge | Frequency | Percentage (%) |
|---|---|---|
| Good | 4 | 20,0 |
| Enough | 9 | 45,0 |
| Not enough | 7 | 35,0 |
| Amount | 20 | 100 |

Table 3.Level of knowledge of nurses after being given disaster management education

| Level of Knowledge | Frequency | Percentage (%) |
|---|---|---|
| Good | 10 | 50,0 |
| Enough | 7 | 35,0 |
| Not enough | 3 | 15,0 |
| Amount | 20 | 100 |

Before the intervention, most respondents had moderate knowledge (45.0%), while only 20.0% had good knowledge. After the educational intervention, half of the respondents (50.0%) demonstrated good knowledge, and the proportion with low knowledge decreased from 35.0% to 15.0%. This shows a notable shift in the distribution of knowledge levels.

**3. Bivariate Analysis**

Table 4. The influence of disaster management education on nurses' knowledge

| Variables | N | *Mean* | SD | *P value* |
|---|---|---|---|---|
| Pretest and Posttest Knowledge | 20 | 5.182 | 19 | 0.000 |

There was a statistically significant increase in the mean knowledge score from 11.10 (SD = 2.1) to 13.55 (SD = 2.0) after the intervention ($p < 0.001$). Based on the paired sample *t*-test, the null hypothesis ($H_0$) was rejected and the alternative hypothesis ($H_a$) was accepted, indicating that flood disaster management education had a significant positive effect on nurses' knowledge.

However, these findings should be interpreted with caution because the sample size was relatively small (n = 20) and the study was conducted in a single setting, which limits the generalizability of the results to broader populations.

## DISCUSSION

**1. Nurses' knowledge before flood disaster management education**

Prior to the intervention, most nurses demonstrated only low to moderate levels of knowledge regarding disaster management. This finding underscores the urgent need for structured disaster education, particularly in preparing healthcare personnel to address flood-related risks, which are

expected to increase with climate change[2]. Similar outcomes have been reported in international literature. For example, Kalanlar (2018) found that disaster education programs improved nursing students' preparedness, while Shubayr (2024) emphasized that gaps in emergency nurses' knowledge could significantly hinder effective disaster response[14,24].

Nevertheless, several methodological limitations must be acknowledged. The study was conducted at a single site with a small sample size and lacked a control group. Moreover, potentially influential factors, such as prior disaster experience or previous training, were not examined. These weaknesses limit the generalizability of the findings. Systematic reviews further confirm that small-scale studies often overestimate the effectiveness of educational interventions[16,23]. Therefore, the present results should be interpreted with caution.

**2. Nurses' knowledge after flood disaster management education**

Following the intervention, the proportion of nurses with good knowledge increased considerably, suggesting that disaster education effectively enhances preparedness[19]. This is consistent with findings by Kim & Park (2022), who demonstrated that simulation-based training improved nursing students' readiness for flood response. Similarly, Al Khalaileh, Bond, & Alasad (2020) reported that educational programs strengthened both confidence and competence in disaster management, while Narvaez, Tolentino, & Guzman (2025) highlighted that contingency-based training plans enhanced overall nursing preparedness for diverse disaster scenarios[1,15,18].

However, improved knowledge does not necessarily translate into effective performance in real disaster settings. Other essential competencies such as practical skills, rapid decision-making, and psychological readiness also play a critical role[6,11]. Furthermore, post-test evaluations conducted immediately after the intervention do not capture long-term knowledge retention. Future research should therefore employ quasi-experimental or randomized controlled trial designs with larger and more diverse samples, while also incorporating longitudinal assessments[9].

In addition, several scholars emphasize the integration of disaster education into nursing curricula as a systematic strategy to strengthen preparedness[7]. Organizational factors, including managerial support and resource availability, have also been identified as key determinants of the successful implementation of disaster training programs[10,12].

## CONCLUSIONS

Flood disaster management education significantly improved the knowledge level of nurses at the Limboto Barat Community Health Center. This suggests that integrating structured disaster education into routine in-service training can strengthen nurses' preparedness for flood emergencies. However, the findings should be interpreted cautiously due to the small sample size and methodological limitations.

## SUGGESTION

Health authorities should provide regular disaster preparedness training for nurses in primary care settings, particularly in flood-prone areas. Further studies are recommended using larger and more diverse samples to confirm these findings and explore their impact on disaster response practices.

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