

Original Research

Development of a Community-Based Disaster Preparedness Module: Enhancing Resilience and Response Capabilities

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ABSTRACT

Background: Disaster preparedness is one of the important aspects in reducing the negative impacts of disasters, especially in areas prone to natural disasters. This study aims to develop a community-based disaster preparedness module that can improve community resilience and response capabilities to disaster threats. This module is designed to provide practical guidance in preparedness efforts, as well as build the capacity of local communities. **Methods:** This study uses a research and development design with quantitative and qualitative approaches. The population in this study was the community in disaster-prone areas in Genilangit Village, Poncol District, Magetan Regency. The sample consisted of 120 respondents selected using purposive sampling techniques, with the criteria of the community who had been involved in disaster mitigation activities. The main variable in this study was community preparedness before and after the implementation of the module. The data collection instrument used a questionnaire to measure preparedness and in-depth interviews to gain qualitative insights into the implementation of the module. Quantitative data were analyzed using paired descriptive statistics to see the difference in preparedness before and after the module intervention. While qualitative data were analyzed using thematic analysis techniques. **Results:** The results of this study indicate that the implementation of the module significantly increased the level of community preparedness in terms of knowledge, attitudes, and skills related to disaster mitigation. **Conclusion:** These findings indicate that this module can be an effective tool in increasing community resilience in disaster-prone areas.

Keywords: Disaster planning; community-based module; development; resilience

1. INTRODUCTION

Natural disasters are one of the major challenges faced by various countries, including Indonesia, which is located in the Pacific Ring of Fire. Indonesia often experiences natural disasters such as earthquakes, floods, landslides, and volcanic eruptions.⁽¹⁾ Data from the National Disaster Management Agency (BNPB) shows that more than 2,500 disasters occur each year in Indonesia, causing economic losses, fatalities, and infrastructure damage. The impact of disasters not only affects the economy, but also causes severe social disruption and requires a long time to recover.⁽²⁾ Therefore, community preparedness for disasters is a very important component in reducing disaster risk. One strategic effort to

improve preparedness is through the development of a disaster preparedness module. This module can be used as a practical guide to build community capacity in dealing with emergency situations, mitigating risks, and accelerating the post-disaster recovery process. The main problem faced in various disaster-prone areas is the lack of public understanding and awareness of disaster mitigation and how to behave when a disaster occurs. A study conducted by BNPB in 2021 showed that more than 60% of people in disaster-prone areas do not have basic knowledge of disaster preparedness. This results in high numbers of victims and losses due to disasters that could actually be reduced through better preparedness. Communities often rely entirely on government assistance and do not have the capacity to act quickly and effectively when a disaster strikes.

The chronology of this problem begins with the unpreparedness of the community in dealing with disasters. For example, when floods hit several areas in Central Java in 2020, thousands of people were trapped without adequate access to emergency assistance due to their lack of knowledge about evacuation and mitigation measures that should be taken before, during, and after a disaster. This problem is exacerbated by the lack of systematic and ongoing training or education provided to the community.⁽³⁻⁶⁾

Efforts that need to be made to overcome this problem are increasing community capacity in disaster preparedness through community-based programs. A community-based approach is believed to be more effective because it involves active community participation in identifying risks, making preparedness plans, and conducting regular emergency response exercises. With direct community involvement, disaster mitigation efforts become more sustainable and relevant to local needs. One important step is the development of a disaster preparedness module based on the local context, culture, and capacity of the local community. This module serves as a practical guide for the community to understand the steps to be taken in an emergency situation and build long-term resilience.⁽⁷⁻⁹⁾

This research offers innovation by developing a disaster preparedness module based on active community participation. This module not only focuses on theoretical aspects, but also on practical training and disaster simulations involving all elements of society, from children to adults. The development of this module also considers relevant local wisdom in disaster mitigation, making it more easily accepted by the

community. In addition, this approach emphasizes the importance of collaboration between the community, local government, and non-governmental organizations in building a comprehensive and integrated preparedness system. With this module, it is hoped that communities in disaster-prone areas will have better knowledge about how to prepare themselves, protect assets, and respond quickly and appropriately when a disaster strikes.

This research is important because it provides a concrete solution to the problem of the lack of community preparedness for disasters. The results of this study are expected to serve as a guideline for policy makers, community organizations, and other related parties in designing more effective and sustainable disaster preparedness programs.

2. METHODS

2.1 Study Design

This research was conducted with a mixed approach, namely a combination of quantitative and qualitative. The study used a development research design with the aim of designing and testing the effectiveness of a community-based disaster preparedness module. This study follows the R&D model involving the following stages;^(10,11) 1). Analysis of community needs for disaster preparedness modules, 2). Development of modules based on the results of the analysis. 3). Trial of the module in community groups. 4). Evaluation of the effectiveness of the module through measurements before and after the intervention. 5). Revision and refinement of the module based on the results of the evaluation.

2.2 Population, Sample Size, and Sampling Technique

The population of this study was the entire community living in disaster-prone areas in Genilangit Village, Poncol District, Magetan Regency. This district was chosen because it has a high level of vulnerability to various natural disasters, including floods, landslides, and earthquakes. The sample in this study were community members in villages at high risk of disasters, with a total of 120 respondents. Respondents were selected based on certain criteria, namely: 1). Have lived in disaster-prone areas for more than 5 years. 2). Aged between 18–65 years. 3). Willing to participate in all stages of the research, including disaster training and simulation. The sample size was determined using the

purposive sampling method because of the specific criteria to be achieved, namely communities that have experience or high risk potential for disasters.⁽¹²⁾ The purposive sampling technique was used in this study to select individuals who have experience and involvement in disaster mitigation activities or are in areas with high risk for disasters.⁽¹³⁾ This technique is used to ensure that the developed module is relevant to the needs and characteristics of the target population.

2.3 Research Variables

The variables measured in this study include: Independent variables: Development and implementation of community-based disaster preparedness modules. Dependent variables: Level of community preparedness, measured from three main aspects: knowledge, attitudes, and skills related to disaster preparedness.

2.4 Research Instruments

The instruments used to collect data include: Questionnaires, used to measure the level of knowledge, attitudes, and skills of disaster preparedness before and after the module intervention. This questionnaire consists of closed questions and uses a 5-point Likert scale. In-depth interviews, used to obtain qualitative information about the community's experience in dealing with disasters, as well as their assessment of the modules that have been implemented. Observation, conducted during the implementation of the disaster simulation to directly assess the community's skills in responding to disaster situations. Documentation, recording of activities and results during the process of implementing the module and disaster simulation.

2.5 Data Processing and Data Analysis

The collected data were analyzed using quantitative and qualitative approaches.⁽¹⁴⁾ Quantitative analysis: Questionnaire data were analyzed using descriptive statistics to describe the profile of community preparedness before and after the implementation of the module. Furthermore, a paired t-test was conducted to determine significant differences between community preparedness before and after the module intervention. The level of significance was set at $p < 0.05$. Qualitative analysis: Data from in-depth interviews were analyzed using thematic analysis, where key themes related to community experiences and perceptions of the module were identified and categorized. The results of this

qualitative analysis were used to provide deeper insight into the effectiveness of the module and opportunities for improvement.

The research stages began with the collection of initial data through questionnaires and interviews, followed by the development of a module based on the results of the needs analysis. The module was then tested on community groups, and post-intervention data were collected using the same instrument. The disaster simulation process was also conducted to assess community skills in real situations. Evaluations were conducted based on quantitative and qualitative data, and the results were used to revise the module.

3. RESULTS

3.1 Community Needs Analysis for Module

The results of the community needs analysis for the community-based disaster preparedness module show several important findings that form the basis for developing the module. This research was conducted using questionnaires and in-depth interviews with 120 respondents living in disaster-prone areas. The following Table 1 is a presentation of the results of various aspects measured in the needs analysis.

Table 1 illustrates before the development of the module. The results of the questionnaire showed that the majority of respondents (around 70%) had a low level of knowledge about disaster preparedness measures. Community knowledge about evacuation procedures, emergency equipment preparation, and understanding of disaster risks in their residential environment is still limited. Only 20% of respondents know in detail the disaster mitigation steps, while the other 10% have no knowledge at all. The findings in the study, respondents when asked about the first steps to take during an earthquake, most respondents could not give the right answer. Only a small number mentioned the importance of finding a safe place, such as taking shelter under a table. The results of the study Table 1, also explain the needs analysis also revealed that the community's attitude towards disaster preparedness is mostly passive. As many as 65% of respondents think that disaster preparedness is the responsibility of the government or authorities, not a personal or community obligation. This indicates a high dependence on external assistance in emergency situations. In-depth interviews also revealed that many people feel less confident in taking preparedness measures, especially because they have

never received adequate disaster training or simulations. Several respondents stated that they felt they did not have the skills needed to act quickly when a disaster occurred.

Table 1. Distribution frequency Level of knowledge, attitudes and perceptions, availability resources, awareness and involvement public about preparedness disaster

Variables	Frequency	Percentage
Level of knowledge		
Tall	6	5%
Currently	30	25%
Low	84	70%
Attitudes and perceptions		
Active / positive	42	35%
Passive / negative	78	65%
Availability resources and facilities		
Own equipment / prepare equipment	36	30%
Don't have / don't have prepare equipment	84	70%
Awareness and engagement community in activity mitigation		
Involvement tall	18	15%
Involvement currently	24	20%
Involvement low	78	65%

The analysis results in Table 1 also show that there are limited resources available to the community for disaster preparedness. Only 30% of respondents stated that they had prepared emergency equipment, such as a first aid kit, spare food, or durable communication devices. Most people do not have this equipment, citing a lack of information about the importance of such equipment or economic constraints. In remote rural areas, limited access to disaster information and training is a major obstacle. Based on the research results, many respondents did not know how to make an evacuation plan or did not know the location of a safe evacuation site near their residence.

The level of community involvement in disaster mitigation activities in Table 1 is also relatively minimal. Only around 15% of respondents have been involved in disaster training or socialization held by the government or non-governmental organizations (NGOs). Most respondents stated that disaster mitigation activities are rarely carried out in their communities, and the information they receive is very limited. However, the interview results show that there is great potential to increase community involvement if given the right

opportunities and facilitation. The community shows interest in learning more about disasters, especially if the material presented is relevant to the local situation and accompanied by practical simulations.

3.2 Specific Needs for Preparedness Modules

From the analysis, several specific community needs that must be met by the disaster preparedness module are: 1). Easy-to-understand practical guides related to evacuation steps and emergency actions. 2). Disaster training and simulations involving all elements of society. 3). Information on local resources, such as evacuation locations and the use of simple emergency equipment. 4). Materials that integrate local wisdom and are relevant to the types of disasters that often occur in their area. 5). Emphasis on collective responsibility and how each individual in the community can contribute to disaster mitigation efforts.

2.3 Recommendations from the Results of the Needs Analysis

Based on these findings, the development of disaster preparedness modules needs to be focused on improving community knowledge, attitudes, and skills through: 1). Simple and applicable education, using easy-to-understand language and relevant examples. 2). Community-based simulations that involve active community participation in disaster preparedness exercises. 3). Provision of clear information on evacuation plans and provision of emergency equipment, adjusted to local resource conditions. The results of this needs analysis are an important basis for designing a module that is expected to improve community preparedness and encourage their active involvement in disaster mitigation efforts in the future.

3.4 Stages of the Module Development Process Based on Analysis Results

The process of developing a community-based disaster preparedness module is carried out in stages based on the results of the community needs analysis that have been presented previously. The results of this development stage include designing module content, expert validation, field trials, and final revision of the module. The following is a presentation of the results of each stage of module development:

3.5 Designing Module Content

Based on the results of the needs analysis, several important points were identified to be included in the

module content. This module is designed to provide practical guidance for the community on disaster preparedness, with a focus on real actions that can be taken before, during, and after a disaster. The module content is divided into four main parts: 1). Part 1: Introduction to Disaster Preparedness. Contains basic information about the most common disasters in the area, such as earthquakes, floods, and landslides, and the risks they pose. 2). Part 2: Planning and Preparedness. Includes practical guidance for creating a family evacuation plan, emergency equipment that needs to be prepared, and basic knowledge of signs of natural hazards. 3). Part 3: Emergency Response Simulation. Describes disaster simulation steps that can be carried out collectively by the community, including evacuation drills and the use of local resources. 4). Part 4: Local Wisdom and Community-Based Mitigation. Explains the important role of local wisdom in disaster mitigation and how to integrate traditional knowledge with modern steps in disaster management. Each section of the module is written using simple language and visual images that make it easier for the community to understand, especially for those with low levels of education.

3.6 Expert Validation

After the module is prepared, a validation process is carried out by experts, involving disaster experts, community education experts, and related officials from the Regional Disaster Management Agency (BPBD). Validation aims to ensure that the developed module meets disaster preparedness standards and is relevant to the local situation. The results of this validation process are 1). The experts provided positive input regarding the structure and content of the module, especially in the emergency response simulation section which is considered important in improving community skills. 2). Several recommendations for improvement were given, such as adding specific examples of disasters that have occurred in the area, as well as strengthening the section on community cooperation and collaboration with the local government in emergency situations. 3). From the validation results, the validity value of the module content reached an average of 90%, which indicates that the module is worthy of being tested in the next stage.

3.7 Field Trial

The validated module was tested in two villages in Magetan Regency, namely (Genilangit Village, Poncol District and Gonggang Village, Poncol District) which are

disaster-prone areas. The trial involved 60 participants from each village, consisting of various age groups and professions, to ensure that the module could be widely applied in the community. The trial process lasted for two weeks, with training involving disaster simulations, group discussions, and self-evaluations. The results of the field trial showed several important findings (Table 2).

Based on Tables 1, 2, 3, and 4 are the results of the research on the implementation of disaster preparedness module-based training that has been tested on 120 participants from two disaster-prone villages in Poncol District, Magetan Regency. The effectiveness evaluation module was carried out by comparing the pre-test and post-test values using the Paired Sample T-Test. Based on the results of the SPSS analysis, the average pre-test value was 50.30 (SD = 12.00) and the average post-test value was 82.50 (SD = 10.50), which showed an average increase in knowledge of 32.20 points. The t-test results showed a t-count value = 32.07 with df = 119 and a significance value (Sig. 2-tailed) = 0.000, which is smaller than the significance level of 0.05. Thus, there is a statistically significant difference between the pre-test and post-test values. These results indicate that training using the module is effective in increasing disaster preparedness knowledge among the training participants.

Table 2. Paired samples statistics

Pair	Mean	N	Std. Deviation	Std. Error Mean
Pre-test	50.30	120	12.00	1.096
Post-test	82.50	120	10.50	0.958

Table 3. Paired samples correlations

Pair	N	Correlation	Sig.
Pre-test & post-test	120	0.615*	0.000

Based on the results of the analysis of table 3, it shows that there is a fairly strong and significant positive relationship between the pre-test and post-test scores. This could mean that after the intervention, training, or program was carried out, there was a consistent increase in results in the participants. The correlation of 0.615 shows that the higher a person's pre-test score, the higher their post-test score tends to be—although this is not a cause-and-effect relationship, just a correlation.

3.8 Participant Feedback

Positive feedback: “participants stated that the module was very relevant to their needs, especially the section explaining practical steps in dealing with disasters. They also appreciated the use of simple language and the presence of visualizations that made it easier to understand”. However, there were several constructive inputs from participants regarding this trial, such as: 1). The need for more frequent and scheduled simulation exercises, so that people are more accustomed to and do not forget emergency response steps. 2). Additional information on how to coordinate with rescue teams or authorities during a disaster, especially in situations where access to information is very limited.

3.9 Module Revision

Based on the results of the field trial and feedback from participants, several parts of the module were revised to improve the effectiveness and acceptability of the module by the community. Some of the improvements made include: 1) Adding real cases of disasters that have occurred in the area to improve the local context. 2) Simplifying some technical instructions

that were found to be too complicated for some participants, especially regarding the use of emergency equipment. 3) Increasing the focus on community cooperation and the role of each community member in disaster situations to strengthen the sense of collective responsibility. The revised module was then prepared for wider dissemination to other communities in disaster-prone areas and used as a reference in community-based disaster mitigation programs.

The results of the module development process stage showed that the community-based disaster preparedness module designed in a participatory manner and based on local needs analysis was able to effectively improve community knowledge, attitudes, and skills in dealing with disasters. With expert validation and feedback from the field trial, this module has undergone a comprehensive revision and is ready to be applied more widely to improve community resilience to disasters. This module not only serves as a technical guide but also as an educational tool that can be integrated into daily community activities, so that disaster preparedness becomes an integral part of community life.

Table 4. Paired samples test

Pair	Mean	Std. deviation	Std. error mean	95% CI of the difference	t	df	Sig. (2-tailed)
Post-test – Pre-test	32.20	11.00	1.004	30.21 to 34.19	32.07	119	0.000

4. DISCUSSION

This study aims to develop a community-based disaster preparedness module, focusing on increasing community resilience and response capacity to disasters. The development of this module is based on a participatory approach that involves the community in the entire research process, from needs analysis to testing and evaluation. The main findings of this study revealed that the module that is developed effectively can increase community awareness, understanding, and skills in dealing with disasters. The development of a community-based disaster preparedness module is a strategic step to increase community capacity in dealing with potential disasters.⁽¹⁴⁾ This module is designed by considering local characteristics, community needs, and existing resource potential, so that it is more relevant and applicable. Through this module, the community not

only gains theoretical knowledge about the types and risks of disasters, but also practical skills such as evacuation, use of emergency equipment, and coordination in groups.⁽¹⁵⁾ Thus, the development of a community-based module can be an effective educational tool to strengthen awareness, improve skills, and build community independence in disaster mitigation and preparedness efforts.⁽¹⁶⁾

The development of community-based disaster preparedness has long been recognized as an effective strategy in dealing with disaster threats. Several studies have shown that involving communities in disaster preparedness planning and training can increase community resilience and accelerate response when a disaster occurs.⁽¹⁷⁾ This study is consistent with these findings, where communities that participated in the module experienced significant improvements in understanding and preparedness for disasters.⁽¹⁸⁾

Shammin et al. (2022) explained that community-based training strengthens local adaptive capacity and creates collective resilience, which plays an important role in reducing the impact of disasters at the local level.⁽¹⁹⁾ The community-based disaster preparedness module plays an important role in improving community knowledge and attitudes towards disaster management. Through a participatory approach, this module helps communities understand the concept of disaster management, related policies, emergency response plans, early warning systems, and human resource mobilization.⁽¹⁹⁾ This is in line with the findings of Suparji et al. in the article "Drafting of Disaster Preparedness Modules Through Focus Group Discussion Approach" published in 2023. The study emphasized the importance of needs analysis through focus group discussions to produce effective modules that are in accordance with community conditions.⁽²⁰⁾ In addition, module-based training has also been shown to be effective in improving individual preparedness. Suardana and Mertha (2021) found that training with modules can improve student preparedness in facing natural disasters.⁽²¹⁾ Thus, the development and implementation of community-based disaster preparedness modules is a strategic step to build a resilient community that is ready to face various potential disasters.

The use of a participatory approach in this study plays an important role in increasing the relevance of the module to local needs. Flint and Blyth (2021) stated that community participation in the decision-making process is an important step in ensuring that the programs or policies designed are truly in accordance with the needs and characteristics of the community.⁽²²⁾ In the context of disasters, community participation can produce more effective solutions because the community better understands the risks they face and how best to deal with them.⁽²³⁾ The findings of this study support this theory, where modules developed through direct community involvement result in improved understanding and skills compared to the top-down approach usually carried out by the government or related institutions. The participatory approach in module development provides opportunities for stakeholders to actively contribute to the material preparation process.⁽²⁴⁾ Community participation, especially those who will use the module, ensures that the content produced is relevant, appropriate, and applicable in the local context. This approach also encourages a sense of ownership of the results developed, increasing the effectiveness of module

implementation in the field. Several studies have shown that participatory approaches not only improve the quality of teaching materials, but also strengthen community capacity in dealing with challenges relevant to the module topic, such as disaster mitigation or improving public health.⁽²⁵⁾

This module is designed to enhance community skills and awareness in three main aspects: (1) knowledge of disaster types, (2) preparedness measures before a disaster, and (3) rapid response when a disaster occurs. The trial results showed that communities involved in this program not only experienced increased knowledge of potential disaster hazards in their area, but were also better prepared to respond to the threat of an impending disaster.⁽²⁶⁾ Hoffmann and Blecha (2020) also emphasized the importance of community-based disaster education, which can reduce vulnerability and increase community capacity to respond appropriately to disaster risks.⁽²⁷⁾ In addition, the results of this study also indicated that significant skill improvements can be achieved through realistic disaster simulations.⁽²⁷⁾ Schumacher et al. explained that interactive simulations can be a very effective tool in building preparedness and improving rapid response during disasters. In the trial of this module, emergency evacuation simulations and rescue exercises were important components in improving participant skills.⁽²⁸⁾ Participants reported that the disaster simulation experience helped them feel more confident in dealing with a real disaster.^(9,28)

Improving community skills and awareness regarding disaster preparedness is a crucial aspect in disaster risk mitigation. According to research by Lassa et al. (2019), it is explained that a community-based approach is effective in increasing community capacity to deal with disasters.⁽¹⁾ This study highlights the importance of active community participation in planning and implementing disaster preparedness strategies, as well as the need for ongoing education to increase awareness and skills in dealing with emergency situations. Thus, community empowerment through training and education can improve disaster preparedness and response, reducing the negative impacts caused.⁽¹⁾ The use of learning modules has been proven effective in improving community skills and awareness regarding disaster preparedness.⁽²⁹⁾ Handayani et al. (2019) also explained that providing volcanic disaster teaching modules through Facebook social media can improve the preparedness of elementary school teachers in Sumber Wringin District,

Bondowoso Regency, in dealing with the potential eruption of Mount Raung.⁽³⁰⁾ In addition, research by Emiliyawati et al. (2023) found that tabletop disaster simulation methods were effective in increasing the preparedness of the Holtekamp Village community, Jayapura City, against the threat of tsunamis.⁽³¹⁾ These studies confirm that learning modules, both through social media and simulation methods, play an important role in increasing community knowledge and preparedness for disasters.

The evaluation and revision process carried out after the module trial showed that there were several areas that needed to be improved, such as increasing the number of practical training sessions and simplifying the language of the module. Thurlow et al. (2024) emphasized that repeated training is a key factor in strengthening community disaster preparedness. Feedback from trial participants also showed that first aid materials and simulations of the use of evacuation equipment needed to be improved so that participants could take more effective emergency actions before help arrived.⁽³²⁾ In addition, the evaluation showed that the use of technical terminology in the module was still a challenge for some community groups.⁽³³⁾ González-Sordé and Matamala (2024) stated that the use of simple and easy-to-understand language in preparedness materials is very important to increase public acceptance. In this study, simplifying the language and adding visual infographics helped improve participants' understanding, especially those with low levels of education.⁽³⁴⁾

From a theoretical perspective, this study reinforces the understanding that a community-based approach is essential in improving disaster preparedness. As stated by Twigg (2009) in the book *Characteristics of a Disaster-Resilient Community*, community resilience depends on the community's ability to identify risks and plan relevant and timely actions.⁽³⁰⁾ The participatory approach in developing this module also supports Freire's (1970) theory of participatory education, where communities are empowered through their active involvement in the learning process.⁽³³⁾

Practically, the results of this study provide guidance for policy makers and non-governmental organizations to implement more effective disaster preparedness programs. This module can be adapted and applied in various local contexts with adjustments to the specific disaster risks faced by each community.

Kelman et al. (2016) in *Progress in Disaster Science* underscore the importance of flexibility in implementing preparedness programs at the local level to ensure that the specific needs of the community can be better met.^(33,35)

This finding confirms that the use of systematically designed training modules can significantly improve community knowledge. An increase of 32.2 points in the post-test results is evidence that this module is effective in transferring important information related to disaster preparedness. The training design involving simulations, group discussions, and self-evaluations also contributed to this success. This is in line with the constructivist learning theory which states that active involvement of participants in the learning process can increase understanding in depth.⁽³⁶⁾ This study strengthens previous findings stating that interactive and participatory modules are effective in increasing community awareness and knowledge of disaster preparedness.^(36,37) In the context of disaster-prone communities, such as in Poncol, the existence of locally-based training modules that are easy to understand and applicable is very important to encourage behavioral change and build community resilience. Therefore, these results recommend the implementation of similar modules in other disaster-prone areas as part of a non-structural mitigation strategy.

5. CONCLUSION

The conclusion of this study found that the community-based disaster preparedness module significantly improved community knowledge, attitudes, and skills in dealing with disaster emergencies. The module developed through a participatory approach was proven effective in strengthening community resilience, with the results of the trial showing an increase in understanding and practical skills after the intervention. These results are in line with the research question which aims to evaluate the effectiveness of the module in improving community preparedness. In addition, this study provides theoretical contributions in terms of developing community-based modules that are tailored to local characteristics and the important role of repeated training to build better collective responses.

The recommendation is that although this study has shown positive results, the main limitation is the scope of the trial which is limited to a few specific communities, so further research is needed to ensure the

effectiveness of the module on a wider scale and in various geographical contexts. It is recommended that further research involve piloting the module in areas with different disaster risks and deepening the long-term impact of training on community preparedness. In addition, further development can include the integration of digital technology as a means of supporting more efficient module dissemination and independent training.

Ethical Approval

This study has obtained ethical approval from the Ethics Committee of the Health Polytechnic of the Ministry of Health of Surabaya, Indonesia with the number No. EA/2320/KEPK-Poltekkes_Sby/V/2023.

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Competing Interests

All the authors declare that there are no conflicts of interest.

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Underlying Data

The author has nothing to report.

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