




Android-Based Application (SiBen) to Improving Readiness towards Hurricane In Lubuklinggau

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Article info	Abstract
<p>Article history: Received: August 15th, 2021 Revised: August 22th, 2021 Accepted: September 20th, 2021</p> <hr/> <p>Corresponden author: SapondraWijaya Nursing Program, Health Polytechnic of Palembang. Jl. Ismail Marzuki No.5341, Sekip Jaya, Kec. Kemuning, Kota Palembang, Sumatera Selatan 30114</p> <p>E-mail: ondra@poltekkespalembang.ac.id</p> <p>DOI: https://doi.org/10.35654/ijnhs.v4i5.495</p>	<p>Abstract. Introduction: One disaster-prone country in the world is Indonesia. Communities have to be ready for disasters. To strengthen the community's readiness to deal with disasters, knowledge must be increased. Better educational methods are needed to convey material, one of which is by utilizing technology. Objective: The study aimed to construct and test the effect of SiBen disaster education to improve the readiness toward hurricanes in the community of Lubuklinggau, South Sumatra, Indonesia. Method: Research and Development (R & R&D) with experimental tests, pre-test, and post-test were applied in this study. A total of 40 people were given three meetings within two weeks. Results: As the result, the participants have shown progression of readiness ($t = 3.168$, $p < 0.002$). The findings indicated that the SiBen Application effectively improved the readiness of the community toward the hurricane. It is hoped that this application can be widely used to improve the readiness of the whole community. Recommendation: For further researchers are expected to be able to develop this application by adding online simulations together and adding other types of disasters</p> <p>Keywords: Disaster Readiness, Disaster Simulation, Android</p>
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INTRODUCTION

Indonesia is known as "The supermarket of disasters" because all types of disasters exist in Indonesia. This situation makes Indonesia must be ready to deal with the disaster, especially in South Sumatra.

Lubuklinggau is a city surrounded by hills in South Sumatra, making it an area easily formed by hurricanes. Almost every year, there are hurricanes, floods, landslides, and forest fires. Two districts are at high risk of hurricane, West Lubuklinggau and North Lubuklinggau (1). On a massive scale, the hurricane will disrupt all activities of citizens, from government, economy, and education paralyzed. It can even cause casualties if hurricanes come suddenly.

To minimizing the impact of disasters, one of the essential things is preparing human resources. Three critical factors that must be done are prevention, mitigation, and preparedness to prepare the community to face the disaster (2). Lack of knowledge about disaster response is one of the causes of nurses' inadequacy in disaster situations(3). Knowledge of disaster preparedness and mitigation has an essential role in reducing high risks due to the impact of disasters, so learning about natural disasters needs to be taught early on(4). Lack of educational media makes their knowledge about dangerous situations is less (5).

Readiness is a significant problem in disaster management, logistical, and community aspects as the first responder in providing an emergency response (6). We need to strengthen public education and awareness in disaster risk reduction (7). Readiness is a sign that the community is willing to take any action to help when a disaster occurs, one of which is influenced by behavioral intention. Behavior intention is a decision to behave in a certain way(8). Readiness is crucial, including community preparedness in facing disasters in the emergency response phase.

Simulation is one technique for giving material, including simulation on a table or what is known as the "Table Top Simulation." Table Top Simulation is an indoor simulation that can test the preparedness of various elements related to disaster management by analyzing reactions from training participants through solving disaster scenarios(9). In other words, the simulation is done more simply.

Table Top Simulation is very useful and practical as a teaching tool that can increase preparedness in responding to disasters(10). Perry also said that there was an increase in the knowledge and response of civilian participants to disasters(11).

In recent years, there has been a very rapid increase in technology, which impacts the way education is carried out. Mastery of technology is crucial to improving education quality, one of which is using Android-based applications as learning media (4).

Currently, the game is one part of the life of modern society, from children to adults. The game developer began to lead into educational games. In addition to getting entertainment in playing the game, players also bring added value in knowledge(12). Game applications, or called Edu-games, can increase interest in learning(13). Android-based games can be used to advance understanding in disaster mitigation(14).

Researchers chose Siben based on Android because Android is the most widely used application system. Smartphone Android-based is widely used because affordable price, easy to develop, and based on open source(12). Estri et al. (2021) said that Android-based educational games could increase the knowledge and preparedness of high school students(15).

The selection of SiBen aims to make this game easy to disseminate due to the Android-based factor and convenience compared to other options such as games based on iOS or games with the Virtual Reality (VR) type. In VR-type games, several respondents stated that the situation they experienced was not realistic, one of which was due to a lack of experience using VR(16).

OBJECTIVE

The purpose of this research was to construct and test the SiBen application's effectiveness as media for disaster education to improve the readiness toward hurricanes in the Lubuklinggau community.

METHODS

Design

This research was a Research and Development (R&D) method. The R&D process includes five steps as follows: 1) Information collection, 2) Model design, 3) Expert validation

and revision, 4) Model testing, 5) Finished model(17).

Sample size and sampling technique

The population of this research was the communities in two high-risk districts to a hurricane in the Lubuklinggau, South Sumatera, Indonesia. The sampling technique used was random sampling by applying a cluster sampling pattern (area sampling) taken in areas affected by the hurricane in the two Districts with 40 people.

The instrument for data collection

The questionnaire was used to measure the readiness for a hurricane disaster. This questionnaire was taken from a questionnaire belonging to the *BNPB* of Lubuklinggau City. *BNPB* is an abbreviate of The National Agency for Disaster Countermeasure, the Indonesian board for natural disaster affairs. The questionnaire consisted of 15 items ranging from 0 to 100. The indicators of the questionnaire were (1) take action to minimize the impact of a hurricane, (2) report signs of a hurricane, (3) dare to act when a hurricane occurs, (4) be willing to help unknown people, (5) be willing to help opposite-sex people. The Cronbach's alpha value was 0.82.

The data were collected in November 2020 using a structured questionnaire. All participants were given information about the purposes and stages of this study and asked to fill informed consent form. The intervention group installed the SiBen application on their mobile phones. The first meeting was education using the Siben application. The next meeting is a simulation using the Siben application. The technical intervention was performed three meetings in 2 weeks. The intervention group was asked to play a simulation game once a day.

Data analysis

The data were analyzed using SPSS 25 software (IBM Incorporation, Chicago, IL, USA). The characteristics of respondents distributing the frequency and percentage. The analysis of the characteristics and variables in this study was performed homogeneity test with Levene's test. Moreover, the Shapiro Wilk test was applied to verify the variable's normality in a study. Meanwhile, the reliability of the instruments was analyzed using

Cronbach's α parameter. The effectiveness of the SiBen application was analyzed with Paired t-Test. The significance level was considered at $p < 0.05$.

Ethical consideration

This study was conducted according to the Declaration of Helsinki guidance. The ethical approval was issued by the ethics committee of Health Polytechnic of Palembang number 481/KEPK/Adm2/X/2020. All participants were asked to write down the informed consent form and sign it voluntarily after receiving information about the study and their right to participate or not in the study. The researcher is convinced that their privacy and confidential information are highly secured.

STEP of SiBen Development Information Collection

In the first stage, we conducted interviews and a literature study. It can be concluded that good and continuous education and training are needed to improve the community's readiness in dealing with hurricane disasters. One of the good educations is to keep up with technological developments and at affordable costs. In the end, the program can be implemented sustainably.

Model Design

The results of the data were obtained from the collection of information for product construction. People need learning media that they can often see, easy to use, and people need training in hurricane disaster management. Researchers build application products tailored to the needs, namely SiagaBencana (SiBen) application, to improve community readiness in dealing with hurricane disasters.

Expert Validation

Table 1. Assessment based on expert validation

Expert	Score	Criteria
Disaster Manajemen Expert	97	Excellent
Emergency and Disaster Nursing Expert	94	Excellent
Information Technology Expert	90	Very Good
Average	93.6	

*ISO 9126

The results of the expert's assessment show that the average score is 94.6, which includes excellent and perfect criteria and does not need revision. Therefore, the "SiBen" Application is

relevant as educational media to improve community readiness in dealing with hurricane disasters.

Model Testing

Table 2. Respondent Characteristic

Characteristic	Categories	Total	
		n	%
Age	18-30	28	70
	31-40	12	30
Gender	Males	22	55
	Females	18	45
Education levels	High School	30	75
	Bachelor	10	25
	Student	17	42.5
Profession	Employees	12	30
	Civil Servant	3	7.5
	Entrepreneur	8	20

Table 2 shows the characteristics of the respondents of this study. All the participants are a maximum of 40 years, which means the participants are in the productive of age. Both females and males are quiet balance, and also the participant is also well educated based on their education.

Table 3. Variable Value Results

Variable	Group	Pre-test	Post-test	Difference
		M ± SD	M ± SD	
Readiness	Exp	60.33 ± 7.691	89.00 ± 7.325	28.66 ± 0.569
		60.66 ± 7.669	83.6660 ± 8.262	-23.00 ± 0.593
	Con	60.66 ± 7.669	83.6660 ± 8.262	23.00 ± 0.593
		60.66 ± 7.669	83.6660 ± 8.262	23.00 ± 0.593

*Paired t-Test

Table 3 shows an increase of readiness before and after the intervention in the two groups and its significance by 0.000 statistically.

Finished Model

The model's result is a SiBen application based on android, as the output of method and media development for increasing the community's readiness to deal with hurricane disasters. The results of this study, first, the formation of the SiBen application, an Android-based game educational application. The minimum specification to run SiBen is Android version 5.0 with 60 MB of storage space.



Figure 1. SiagaBencana (SiBen) Application

DISCUSSION

The analysis of community readiness before and after treatment was an increase, which is similar to the theory that the purpose of health education is the occurrence of changes in knowledge, attitudes, and behavior of individuals, families, special groups, and society(18). The purpose of education and simulation using the SiBen application is to increase public knowledge in handling hurricane disasters.

The purpose of education is to change or improve feelings with actions that can be done, namely playing roles, direct experience, discussion, giving examples, or models(19). The results of this study can prove these objectives. There was an increase in public readiness for disaster management.

After the education and training in simulation using the SiBen application, there is a change in community readiness. The use of this indoor simulation method based on facts in the field is very effective in enhancing the knowledge and attitudes of the community in responding to disasters. Table Top Simulation is very useful and practical as a teaching tool that can increase readiness in responding to disasters (10). The use of this method is not a single method but is a sequence of mitigation activities to strengthen communities in responding to disasters which end with a field simulation method.

Based on test data statistically, there was a significant influence in the implementation of education and simulation use the application based on android to the community's readiness in responding to hurricane disasters (Table 3). Pate et al. (2016) said there was an increase in knowledge, confidence, and understanding of the roles and responsibilities of students after

being given training with tabletop simulation (20).

Research conducted by Istiqomah and Endang (2019) states that the use of android-based games in disaster mitigation, one of which is preparedness, is highly recommended(12). Another study said a significant increase in knowledge about disasters after being given education using Android-based games(15). The statement above is in line with the results of this study. There is an increase in preparedness after being given education using SiBen, an Android-based educational application.

To improve the quality of education, the quality of the materials must also be improved, including how the materials are delivered. Using applications can be an effective tool for disaster education because it displays the disaster information more interactively (21). Learning using an application as learning media can also improve critical thinking, creative thinking, and problem-solving skills (21).

All the participant is 40 years old maximal. The data show that our purpose of strengthening the community was in line with the subject. Where in that age people become the main people in the community and the productive of age.

The primary purpose of using this application is to help the community test their ability to deal with specific incidents, evaluate the knowledge and readiness of certain groups to work together and respond to emergencies, and discuss the roles, responsibilities, and anticipated activities, including plans, policies, and procedures. Perry (2004) said that after the simulation, there was an increase in the knowledge and response of civilian participants to disasters(11).

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