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Original Research

Effectiveness of Using the Mobile Disaster Exercise Application on the Level of Disaster Response Knowledge Among Nursing Students

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ABSTRACT

Background: Disasters can occur anywhere and happen to anyone who can cause loss of life, psychological impacts, material loss and environmental damage. Everyone is expected to know the attitude they should take when a disaster occurs, including the role of nursing students. One way to increase disaster response knowledge is by using the Mobile Disaster Exercise Application. This research aims to describe the effectiveness of using the Mobile Disaster Exercise Application on disaster response knowledge of Among Nursing students.

Methods: This research is a quantitative research with a quasi-experiment type with a pretest-posttest with control group design. The sample for this research was 60 nursing students from the Surakarta Ministry of Health Polytechnic in the experimental group in the form of the Mobile Disaster Exercise Application and 58 people in the control group in the form of online lectures, then the data was processed using a paired sample t-tes.

Results: Health education through the Mobile Disaster Exercise Application media was effective in increasing disaster response knowledge among nursing students, obtained a mean of 19.83 with a value of p=0.000 (p<0.05). Meanwhile, in the control group in the form of online lectures, a mean of 16.59 was obtained with a value of p=0.000 (p<0.05).

Conclusion: The Mobile Disaster Exercise application is effective in increasing disaster response knowledge among Nursing Students.

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KEYWORDS
disaster; disaster application mobile; disaster exercise; knowledge

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INTRODUCTION

Disaster is a phenomenon that can occur in any part of the world and happen to anyone. According to Law no. 24 of 2007 concerning Disaster Management, "Disaster is an event or series of events that threatens and disrupts the life and livelihood of the community caused by natural factors and/or non-natural factors as well as human factors

resulting in human casualties, environmental damage, loss. property, and psychological impact." Central Java Province has many active volcanoes, which puts it at high risk of earthquake disasters due to volcanic eruptions, especially the city of Surakarta. The city of Surakarta has an earthquake risk in the high category with an earthquake risk index score of 21.60 (BNPB, 2021).

The large number of disaster incidents allows an increase in the number of victims, thus requiring a reliable disaster risk management and prevention system, especially the ability of medical personnel to handle disaster victims, one of which is nursing personnel (Hartono et al, 2021). Nursing's understanding and role regarding emergency preparedness is not yet well defined and provision is needed which can start from being a student (Dwitanta & Dahlia, 2020).

Disaster preparedness curricula in academic institutions around the world are still lacking and competencies have not been developed for students in health professions, especially in pandemic situations which limit learning activities (Achora & Kamanyire, 2016). The Covid-19 pandemic situation has increased people's addiction to using smartphones, which is marked by 160.23 million smartphone users in Indonesia and occupying the fourth largest position in the world. One of the functions of a smartphone is the use of Android-based applications (APJII, 2020).

Web-based learning expands nursing students' knowledge about basic life support during the COVID-19 pandemic (Harnanto & Sunarto, 2022). The Mobile Disaster Exercise application is an audio-visual based Educational Application type Android application to facilitate the dissemination of information. Based on the study conducted by Sukoco et al., (2020), using applications on smartphones can increase knowledge in nursing students.

A preliminary study conducted at the Surakarta Ministry of Health Polytechnic, Nursing Department, through the distribution of Google forms to 1st semester level 1 students on September 28 2021, obtained data that >80% of nursing students still had a low level of knowledge related to disaster response. The results of the preliminary study showed that most of the poll results were because they had never received material about disaster response.

MATERIALS AND METHOD

The type of research used in this research is a quantitative quasi-experimental type with a pretest-posttest with control group design. Research respondents were divided into intervention groups and control groups. The intervention group in this study was D4 nursing students level 1 semester 2 who were given health education using the Mobile Disaster Exercise application, while the control group was D4 nursing students level 1 semester 2 who were given the online lecture method. The research instrument used was a questionnaire.

Data collection was carried out on March 1-April 10 2022. Before being given the intervention, the two groups were required to do a pretest to determine their level of education regarding disaster response and after being given the intervention they were required to do a posttest to determine the effectiveness of the treatment given. Data collection is done online. The data in this study were normally distributed so that the test of differences between 2 paired groups carried out was the paired sample t-test. Then, to compare the averages of two unrelated groups, namely the experimental group and the control group, the independent sample t-test was used which was analyzed using a computer program. The ethical clearance of this research was published by the Health

Research Ethics Committee of the Regional General Hospital, dr. Moewardi, Central Java Province.

RESULTS

1. Characteristics of Research Respondents

a. Characteristics of Respondents in Experimental group (Mobile Disaster Exercise Application)

1) Frequency of Gender Distribution

Table 1. Frequency of Gender Distribution

Gender	Frequency	Percentage (%)
Man	7	11.7
Woman	53	88.3
Total	**60**	**100**

Source: Primary Data 2022 (processed by computer program)

The majority of respondents were female. From total 60 participants, 53 people (88,3%) were female and 7 people (11.7%) were male (Table 1).

2) Frequency of Respondent Distribution Based on Volunteer Corps Participation

Table 2. Frequency of Volunteer Corps Participation Distribution

Volunteer Corps Participation	Frequency	Percentage (%)
No	16	26.7
Yes	44	73.3
Total	60	100

Source: Primary Data 2022 (processed by computer program)

The majority of respondents participate in volunteer corps. From total 60 respondents, 16 respondents did not participate in volunteer corps (26.7%), while 44 respondents (73.3%) participate (Table 2).

b. Characteristics of Respondents in Control Group (Online Lectures)

1) Frequency Distribution Based on Gender

Table 3. Frequency of Gender Distribution

Gender	Frequency	Percentage (%)
Man	6	10.3
Woman	52	89.7
Total	**60**	**100**

Source: Primary Data 2022 (processed by computer program)

The majority of respondents were female. From total 58 respondents, 6 respondents (10.3%) were male, while 52 respondents (89.7%) were female (Table 3).

2) Frequency Distribution Based on KSR Participation

Table 3. Frequency of Volunteer Corps Participation Distribution

Volunteer Corps Participation	Frequency	Percentage (%)

No	16	27.6
Yes	42	72.4
Total	**58**	**100**

Source: Primary Data 2022 (processed by computer program)

The majority of respondents participating in Volunteer Corps. From total 58 respondents, 16 respondents (27,6%) did not particpate in volunteer corps, while 42 respondents (72,4%) did (Table 4).

2. Univariate Analysis Results
   a. Frequency Distribution of Knowledge in Disaster Response of Experimental group (Mobile Disaster Exercise Application)

Table 4Frequency Distribution of Disaster Response Knowledge

Knowledge level	Pre-Test		Post-Test	
	n	Percentage (%)	n	Percentage (%)
Good	0	0	46	76.7
Fair	20	33.3	14	23.3
Poor	40	66.7	0	0
Total	60	100	60	100

Source: Primary Data 2022 (processed by computer program)

Knowledge level of respondents in experimental group before Mobile Disaster Exercise Application intervetion were at poor category. From total 60 people, 40 people (66.7%) were in the poor category and 20 people (33.3%) were in the fair category. After the Mobile Disaster Exercise Application intervention, 46 people (76.7%) were at good cathegory while 14 people (23.3%) were in the fair category (Table 5).

   b. Frequency Distribution of Disaster Response Knowledge of Control Group (Online Lecture)

Table 5Frequency Distribution of Disaster Response Knowledge

Knowledge level	Pre-Test		Post-Test	
	n	Percentage (%)	n	Percentage (%)
Good	1	1.7	11	19.0
Fair	8	13.8	47	81.0
Poor	49	84.5	0	0
Total	58	100	58	100

Source: Primary Data 2022 (processed by computer program)

Most of the respondents were in the poor category before intervention. From total 58 people, 49 people (84.5%) were in the poor category, 8 people (13.8) were in the fair category, and 1 person (1.7%) was in the good category. Then, after conducting online health education lectures, most of the participants were at good level of knowledge. A total of 11 people (19%) were included in the good category and 47 people (81.0%) were included in the fair category (Table 6).

3. Normality test

Table 6Kolmogorov-Smirnov Normality Test

Variable	P value	Distribution
Pre-Test Intervention Ex	0.081	Normal
Post Test Intervention Ex	0.187	Normal
Pre-Test Control Ex	0.096	Normal
Post-Test Control Ex	0.058	Normal

Source: Primary Data 2022 (processed using a computer program)

Kolmogorov-Smirnov normality test in the experimental group and control group in this study showed that the data was normally distributed because the $p_{value} > 0.05$ in the pre-test and post-test in the Mobile Disaster Exercise Application group and the online lecture group.

4. Bivariate Analysis Results

Based on normality test result, the data in this research was normally distributed. Therefore, Paired sample t-test was conducted to analyze to compare 2 paired groups data.

Table 7Paired Sample T-Test Results

Knowledge Variable	n	Mean	Median (min-max)	Std. deviation	P value
Experimental group	60	8,10	Pre-test 12 (6.00-17.00) Post-Test 20 (15.00-24.00)	2,738 2,007	0,000
Control Group	58	4,965	Pre-test 11.50 (6.00-20.00) Post-Test 17 (12.00-21.00)	3,211 2,061	0,000

Source: Primary Data 2022 (processed using a computer program)

Research conducted on Nursing Students at the Surakarta Ministry of Health Polytechnic, both using the Mobile Disaster Exercise Application and using online lecture method, had a significant influence on students' knowledge. The mean of the experimental group has a significantly higher value (8.10), while the control group value is lower (4.965) with a p_{value} of 0.000. To compare the averages of the two unpaired groups, the independent samples t-test was used.

Table 8Independent Sample T-Test Results

Variable	Group	n	Mean	P value
Knowledge	Experimental group	60	19.93	0,000
	Control Group	58	16.59	

Source: Primary Data 2022 (processed using a computer program)

Based on the unpaired 2 group test, the results showed that the average value of the experimental group was 19.93, higher than the average value of the control group of 16.59. Therefore, this research shows significant difference between the knowledge of experimental and control group.

DISCUSSION

Based on the research conducted, in the experimental group (Mobile Disaster Exercise Application) and control (online lectures) for D4 nursing students level 1

semester 2, respondents were dominated by female, both in experimental group (88.3%) and in the control group (89.7%). Gender does not affect knowledge. These results are supported by research by Afifah (2018) which showed that there was no influence of gender on knowledge. This is because every gender, both male and female, have the same opportunity to gain knowledge. The experience of research respondents is that participation in Volunteer Corps has an influence on knowledge. Experience has an influence on a person's knowledge as proven by previous research by Rahmi et al. (2020) regarding the significant influence of experience on learning achievement. Experience is a learning process that has great potential to be remembered so that it greatly influences knowledge.

The data in this study were normally distributed so that the difference test between 2 paired groups carried out was a paired sample testt-test The result obtained was a p value of 0.000<0.05 in the online application and lecture group for level 1 nursing students in semester 2, thus showing significant results. Then, to compare the averages of two unrelated groups, the independent sample t-test was used and resulted a mean of 19.93 in the Mobile Disaster Exercise Application group and a mean of 16.59 in the online lecture group. The level of knowledge before the intervention in the form of the Mobile Disaster Exercise Application was 33.3% of respondents in the fair category and 66.7% of respondents in the good category and after the intervention the level of knowledge was 76.7% in the good category and 23.3% of respondents in the fair category . So the Mobile Disaster Exercise Application is effective for increasing knowledge.

Previous research by Kim & Suh (2018) showed that the Interactive Nursing Skills Application was effective to increase knowledge, self-efficacy, and performance skills of nursing students. Based on this research, respondents gave the impression that interesting content makes individuals re-open what they have previously opened in the application. Apart from that, the content on the smartphone application is more realistic and can be accessed anywhere and anytime. Bauman (2016) created Android-based learning media that contains scientific content to advance the clinical curriculum to equip students to practice in the future. Applications can be used as a complement to clinical education in addition to education using simulation methods.

The result was also in line with previous research by Sukoco et al. (2020) which concluded that there is a significant influence on knowledge of Basic Life Support among Nursing Students. The benefits of smartphones are also numerous. One of them is to provide information to increase knowledge because it is able to present knowledge in various forms. The form in question is in the form of writing, images, audio-visuals or videos which are designed to be as attractive as possible so that they are more popular in this increasingly developing era.

Apart from that, the system used is also quite good and makes it easy to access wherever smartphone users are. Android-based applications can be used by all groups, from the upper middle class to the lower middle class, especially the generation that is currently studying (Leksono & Nita, 2018). Apart from the advantages above, there are disadvantages to using this media. These disadvantages include the small display size and users who are less able to use the application may experience difficulties (Sukoco et al., 2020) . However, during the COVID-19 pandemic, students are facing many obstacles when learning basic lifesaving procedures. Therefore, we need learning methods and media that keep students safe, provide complete information, and are packaged online and interactively (Harnanto & Sunarto, 2022)**.**

CONCLUSION

The research respondents from Nursing students at level 1, semester 2 who met the criteria were 60 respondents in the experimental group in the form of the Mobile Disaster Exercise Application and 58 respondents in the control group in the form of online lectures, the majority of whom were female and based on KSR participation, the majority attended. In the Mobile Disaster Exercise Application experimental group, the average pre-test result was 11.83 and the average post-test score amounting to 19.93, an increase of 8.10 with a p value of both, namely 0.000. So the Mobile Disaster Exercise Application is effective for increasing knowledge.

It is recommended to utilize media in the form of applications to increase knowledge for students, nurses and the wider community with maximum control.

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