

Analysis of Earthquake and Tsunami Disaster Preparedness of University Students

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Abstract: Disaster and Environmental Knowledge course is one of important efforts to improve university students' disaster preparedness, but unfortunately not all of students would like to participate in this course. This research aimed to determine the differences of earthquake and tsunami disaster preparedness among students. This comparative study applied cross ssectional design. Proportionate stratified random sampling was used with 196 total sample divided into two groups. Those who participated in the course was 94 respondents and those who did not participate in it was 102 respondents. The data were collected using existing questionnaire. This research was analyzed by chi square test. The result showed that the preparedness of those who participated in the course was in very ready category (94,7%), while those who did not participate in it was in ready and almost ready category (56,9%). Chi square test results p-value = 0,000 ($\alpha = 0,05$) which meant that there were differences of earthquake and tsunami disaster preparedness on Syiah Kuala University students. In conclusion, the curriculum-based disaster education program was effective to improve disaster preparedness. It is recommended to Syiah Kuala Universty to carry out disaster simulation more frequent also students will more upgrade the knowledge related disaster.

1 INTRODUCTION

Disaster can damage or destroy the normal functioning of people's lives (Veenema, 2007). It can cause a negative impact on life as it can cause loss of life, damage to the surrounding environment, damage or loss of property, and non-material or psychological damage (BNPB, 2010). The main factor that caused many casualties in disaster event was due to the lack of knowledge and preparedness of the community (Satria and Sari, 2017).

One of the efforts to reduce disaster risk is by increasing capacity through training and education. It is contained in the Sendai Framework for Disaster Risk Reduction / SFDRR (2015-2030) that emphasize the importance of disaster preparedness education. Disaster education is one of the important things in improving disaster preparedness (Nugroho, 2016). Through disaster education, students are able to anticipate and carry out disaster management appropriately (Yuwanto, 2014). Disaster preparedness education can also provide information and ability to save themselves and life during or after an emergency during a disaster (UNESCO, 2010).

To improve disaster preparedness, the Government has very important roles and responsibilities in disaster risk reduction efforts, especially in community education related to disasters, provision of public facilities, facilities and infrastructure for emergencies. In view of this, in September 2017 the Government has launched a disaster resilient education in 2030 by issuing regulations of the Minister of Education and Culture, Minister of Technology Research & Higher Education, and ministries / institutions on disaster education. The Minister of Education and Culture together with the Disaster Education Consortium has ratified policies and regulations regarding disaster safe education units by compiling academic texts and draft of The Minister of Education and Culture related to the Disaster Safe Education Unit in the 2017 Magelang declaration (Amri, 2017).

In addition to the Government, university or college also play a very important role in disaster risk reduction to improve disaster preparedness, because it has enormous potential as a source of knowledge, dissemination of knowledge/information about disasters to the community. Syiah Kuala

University as one of the universities in Aceh has integrated disaster education into the education curriculum in 2016, it is a general course on Disaster and Environmental Knowledge. This course aims to provide insight and introduction to the basic principles of disaster risk reduction and its linkages with potentially disastrous environmental conditions (UPT MKU Unsyiah, 2016).

Therefore it is important to know how disaster preparedness is for students who take part in the Disaster and Environmental Knowledge Course with students who do not participate in it to find out the effectiveness of the implementation of the education curriculum on Disaster and Environmental Knowledge MKU in disaster risk reduction. The parameters used to determine earthquake and tsunami disaster preparedness at Syiah Kuala University students are by using parameters consisting of Knowledge and Attitude (KA), Plans for Emergency Planning (EP), Disaster Warning Systems (Warning System/WS) Resource Mobilization Capacity (RMC) (LIPI-UNESCO / ISDR, 2006).

2 METHODS

This study included a comparative descriptive study conducted on May 13th to 25th, 2018 at Syiah Kuala University. The sample in this study were 196 students consisting of two groups. The group that participated in the Disaster and Environment

Knowledge Course is 94 students and the group that did not participate in it is 102 students who were selected using the proportionate stratified random sampling technique.

Data collection in this study was conducted using LIPI standard questionnaire which was developed based on the concept of disaster preparedness by LIPI/UNESCO-ISDR (2006). The questionnaire used consists of two parts: demographic data and statements in the form of a Likert scale about earthquake and tsunami disaster preparedness.

Data was processed by editing, coding, transferring and tabulating. Data analysis consists of univariate and bivariate analysis. Univariate analysis is used to find out the frequency distribution of the research variables. Bivariate analysis is used to find out the difference in preparedness of earthquake and tsunami disasters. The research approval was obtained from the Institutional Review Board (IRB) of the Faculty of Nursing of Syiah Kuala University which aims to protect and ensure the confidentiality of respondents.

3 FINDINGS

3.1 Demographic characteristics

Demographic characteristics of the study participants are described in Table 1.

Table 1: Demographic Data of the participants (N=196).

Demographic Data	Participated in the course, F(%)	Did not participate in the course, F(%)
Age:		
18 years old	49(52,1)	0(0)
19 years old	30(31,9)	6(5,9)
20 years old	15(16,0)	30(29,4)
21 years old	0(0)	42(41,2)
22 years old	0(0)	22(21,6)
23 years old	0(0)	2(2,0)
Gender:		
Male	22(23,4)	34(33,3)
Female	72(76,6)	68(66,7)
Faculty:		
Economic & Business	27(28,7)	42(41,2)
Veterinary	18(19,1)	16(15,7)
Law	30(31,9)	22(21,6)
Social & Political Sciences	19(20,2)	22(21,6)
Semester:		
II	74(78,7)	0(0)
IV	19(20,2)	0(0)
VI	1(1,1)	54(52,9)
VIII	0(0)	48(47,1)

Table 1 shows that the majority of students who participated in the Disaster and Environment Course were aged 18 years (52.1%), female (76.6%), from the Faculty of Law (31.9 %), and identified as second semester students (78.7%). Students who did

not participate the course were generally identified as 21 years old (41.2%), female (66.7%), from the Faculty of Economics and Business (41.2%), and in the sixth semester of their study program (54.9%).

Table 2: Earthquake and tsunami disaster preparedness of university students.

Earthquake and tsunami disaster preparedness	Participated in the course		Did not participate in the course	
	f	%	f	%
Very ready	89	94,7	44	43,1
Ready and almost ready	5	5,3	58	56,9
Less ready	0	0	0	0

Table 3: The differences of earthquake and tsunami preparedness on Syiah Kuala University students

Participation in the Course	Earthquake and Tsunami Disaster Preparedness						<i>p- value</i>
	Very ready		Ready & Almost ready		Total		
	f	%	f	%	f	%	
Participated	89	94,7%	5	29,7%	94	100%	0,000
Did not participate	44	43,1%	58	56,9%	102	100%	

Table 4: Disaster preparedness.

Parameter		Participated in the course		Did not participate in the course	
		f	%	f	%
Knowledge & Attitude	Very ready	94	100	51	50,0
	Ready and almost ready	0	0	51	50,0
	Less ready	0	0	0	0
	Not ready	0	0	0	0
Emergency planning	Very ready	70	74,5	44	43,1
	Ready and almost ready	24	25,5	58	56,9
	Less ready	0	0	0	0
	Not ready	0	0	0	0
Warning system	Very ready	57	60,6	44	40,2
	Ready and almost ready	33	39,4	61	59,8
	Less ready	0	0	0	0
	Not ready	0	0	0	0
Resources mobilization	Very ready	65	69,1	31	30,4
	Ready	17	18,1	29	28,4
	Almost ready	9	9,6	26	25,5
	Less ready	3	3,2	16	15,7

3.2 Students' Earthquake and Tsunami Disaster Preparedness

Students' preparedness were classified into four categories based on their index values: (1) very ready, for index values from 80 to 100%; (2) ready, for index values from 65 to 79%; (3) almost ready, for index values from 55 to 64%; (4) less ready, for

index values from 40 to 54%; (5) not ready, for index values less than 39%. The proportion of students in each category is summarized in Table 2.

Table 2 shows that 94.7% of students who participated in the Disaster and Environmental Knowledge Course were classified as very ready category in Earthquake and tsunami disaster preparedness, only 43.1% of students who did not participate the course were classified as very ready.

Further analysis indicates that the level of university students' preparedness in earthquake and tsunami disaster were significantly different between students who participated in the Disaster and Environmental Knowledge Course and those students who did not participate the course (Table 3)

3.2.1 Students' Earthquake and Tsunami Disaster Preparedness Based on Knowledge and Attitude Parameter

Students' preparedness toward earthquake and tsunami based on knowledge and attitude parameter are described in Table 4. Based on knowledge and attitude parameter, Table 4 shows that all (100%) of university students who participated in the Disaster and Environmental Knowledge Course were classified as very ready category in Earthquake and tsunami disaster preparedness, and only 50% of students who did not participate in the course were in very ready category.

3.2.2 Students' Earthquake and Tsunami Disaster Preparedness Based on Emergency Plan Parameter

Students' preparedness toward earthquake and tsunami based on emergency plan parameter are described in Table 4. Based on emergency plan parameter, Table 4 shows that 74.5% of university students who participated in the Disaster and Environmental Knowledge Course were in classified as very ready category in Earthquake and tsunami disaster preparedness, only 43.1% of students who did not participate in the course were in very ready category.

3.2.3 Students' Earthquake and Tsunami Disaster Preparedness Based on Warning System Parameter

Students' preparedness toward earthquake and tsunami based on warning system parameter are described in Table 4. Based on warning system parameter, Table 4 shows that 60.6% of university students who participated in the Disaster and Environmental Knowledge Course were in classified as very ready category in Earthquake and tsunami disaster preparedness, and 40.2% of students who did not participate in the course were in very ready category.

3.2.4 Students' Earthquake and Tsunami Disaster Preparedness Based on Resources Mobilization Parameter

Students' preparedness toward earthquake and tsunami based on resources mobilization parameter are described in Table 4. Based on resources mobilization parameter, Table 4 shows that 69.1% of university students who participated in the Disaster and Environmental Knowledge Course were in classified as very ready category in Earthquake and tsunami disaster preparedness, and 30.4% of students who did not participate in the course were in very ready category.

4 DISCUSSIONS

Preparedness is one part of the disaster management processes. Preparedness is one of activities or actions taken to anticipate disasters through organizing, effective and efficient steps before a disaster occurs (RI Law No.24 of 2007; Dodon, 2013). Improving preparedness is an important element of disaster risk reduction activities (LIPI-UNESCO/ISDR, 2006). Increasing capacity through training and education is considered as one of efforts to reduce disaster risk in the pre-disaster phase (BNPN, 2014).

Participation in the Disaster and Environmental Knowledge Course could provide insight and introduction to students about basic principles of disaster risk reduction and its linkages with environmental conditions that have the potential to be disastrous. Results of this study show that there were differences between university students who participated in the Disaster and Environment Knowledge Course and those who did not participate in the course. Students who participated in the course reported high proportion in very ready category as compared to those who did not participate in the course. The findings are inline with previous studies. Lestari (2017), for example, indicates that female students who participated in the Disaster and Environmental Knowledge Course had high proportion in very ready category in facing earthquake and tsunami disasters. Lestari involved 304 respondents in their study. Other study conducted by Sabri, Sari, Milfayetty and Dirhamsyah (2014) suggest that integrating disaster education into the curriculum on earthquake and tsunami disaster preparedness could provide positive effect on students' preparedness. Adiyoso and Kanegae (2013) assessed the effectiveness of the

impact of the implementation of disaster education in schools on students' preparedness in facing the tsunami disaster and found the influence of disaster education does not only affect students' knowledge related to disasters, critical awareness and disaster risk perception but also on preparedness.

Based on knowledge and attitude parameter, results of this study showed that there was a difference of knowledge and attitudes in facing earthquake and tsunami disaster between university students who participated in the Disaster and Environmental Knowledge Course and did not participate in the course. The proportions of students in very ready category were higher among students who participated in the Disaster and Environmental Knowledge Course compared to those not participated in the course. Dodon (2013) indicates that individuals who have better knowledge about disasters tend to have better preparedness compared to those who have less knowledge. Previous research conducted by Lestari (2017) also found that students who had participated in the Disaster and Environmental Knowledge Course showed a better knowledge and attitudes in facing earthquake and tsunami disasters. Firmansyah, Rasni and Rondhianto (2014) found that there was a positive relationship between knowledge with preparedness behavior in facing disasters among 183 students in their survey.

In term of emergency planning parameter, results of the study suggest that there was a difference among students who participated in the Disaster and Environmental Knowledge Course and those who did not participate in the course. Students who participated in the course had a higher proportion in very ready category compared to those who did not participate in the course. The results of this study were supported by Rahmawati (2016) about students' earthquake preparedness of SMP Siaga Bencana conducted on 186 students found that students' earthquake preparedness based on emergency plan parameters which were in very ready category (53%).

An emergency plan is a plan that is owned by an individual in facing an emergency due to a natural disaster. This plan is an important part of preparedness, especially regard to evacuation, relief and rescue, so that disaster victims can be minimized (Dodon, 2013 and LIPI-UNESCO/ISDR, 2006). Students who take part in the Disaster and Environment Knowledge Course have been equipped with knowledge about disasters, especially regarding evacuation, relief and rescue during a disaster so they have a very good emergency plan.

Based on warning system parameter, results of the study suggested students who participated in the Disaster and Environmental Knowledge Course had higher proportion in very ready category those who did not participate in the course. Disaster warning systems include warning signs and distribution of information about disasters. According to Gissing (2009) a good early warning system will reduce damage or loss experienced by the community/individual. Sutton and Tierney (2006) explained that good early warning systems is when people understand information from these early warning signs and know what to do (LIPI-UNESCO / ISDR, 2006 and Dodon, 2013). Most of the Syiah Kuala University students who participated in the Disaster and Environmental Knowledge Course are aware of the disaster warning signs and they know what to do when they hear the signs.

The results of this study are supported by previous research conducted by LIPI-UNESCO / ISDR (2006) about community disaster preparedness studies in anticipation of the earthquake and tsunami disaster in the city of Padang, obtained disaster warning systems of students in facing earthquake and tsunami in high/good category. The results of this study are also supported by research conducted by Rahmawati (2016) about students' earthquake preparedness of SMP Siaga Bencana conducted on 183 students, it found that students' earthquake disasters preparedness based on disaster warning system parameters were in the category of very prepared (58,06%).

In term of resource mobilization capacity parameter, the results of the study obtained that there was a difference between university students who take part in the Disaster and Environmental Knowledge Course and those who did not participate in the course. Students who participated in the course were in very ready category than those who did not participate in the course. Resource mobilization is a crucial factor. The available resources, both human resources and funding and essential infrastructure for emergencies are potential that can support or otherwise become obstacles to natural disaster preparedness (LIPI-UNESCO / ISDR (2006). Most of the university students in the surveyed university who participated in the Disaster and Environmental Knowledge course had participated in training/disaster simulations, so that their resource mobilization were in good category.

5 CONCLUSIONS

Based on the results and the discussion of this research, it can be concluded that there was a difference in the earthquake and tsunami disaster preparedness between university students who participated in the Disaster and Environment Knowledge Course and those who did not participate in the course. Students who take part in the course have a very ready/well prepared level of preparedness than those who did not participate in the course. It is suggested that university students should continue to maximize its role in disaster risk reduction and increase students preparedness with disaster risk management policies and guidelines through the curriculum of the Disaster and Environmental Knowledge Course as a compulsory subject for students and more often do disaster simulations so that students always ready to be alert when suddenly the earthquake and tsunami occur. Students should upgrade their knowledge related to disasters by attending disaster seminars/training to maintain and improve preparedness. Researchers should conduct further research related to disaster education relationship with disaster preparedness.

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