Babali Nursing Research
2021, Vol. 2, No. 1, 40-48
https://doi.org/10.37363/bnr.2021.2146

Original Research

Community Preparedness to Reduce Risk Disaster of Tsunami

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Article Info

Article history:
Received:
14 January 2021
Accepted:
30 March 2021

Keywords:
community, disaster, preparedness, Tsunami

Abstract

Introduction: Kebumen is one of the districts that has a high level of disaster vulnerability in Central Java. Most of area is lowland and village located in a coastal area and close to the beach so that it has a tsunami disaster. This research is to describe level of knowledge, attitude, disaster plan, emergency disaster, early warning system, mobilization of resources in a tsunami disaster.

Methods: This study is a descriptive study with 98 respondents were all members of the community. The sampling technique used purposed sampling with 50 questionnaires, and analysis determine the proportion based on the categories of good, adequate and insufficient.

Results: The level of knowledge and attitudes of the disaster community is in the bad category (51%), level of family policies is in the moderate category (52%), level of emergency response plans is in the moderate category (72.4%), and level of the warning system bad category (56.1%). Meanwhile, the level of resource mobility was in the bad category (71.4%).

Conclusion: The results of community preparedness in Kebumen in the face of tsunami disaster based on 5 parameters were found that the community wasn't ready.

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INTRODUCTION

Indonesia is a country that has thousands of large and small islands. It is located between four tectonic plates, namely the Asian Continent, Australian Continent, Indian Ocean and Pacific Ocean [1]. In the southern and eastern parts of Indonesia there is a volcanic belt (volcanic arc) that extends from the islands of Sumatra-Java-South Sulawesi, the sides of which are volcanic mountains and lowlands consisting mostly of swamps. It can be seen that Indonesia has a lot of potential for disaster such as volcanic eruptions, earthquakes, tsunami, flood and landslides [2], [3].

Disaster can not be predicted when they occur, either suddenly or slowly. Some types of disasters are almost impossible to predict when and where they will occur and their magnitude, such as earthquakes. But there are disasters that can be predicted before including floods, landslides, droughts, volcanic eruptions, tsunami, and weather anomalies [4]. The research that has been done focuses more on emergency response and the phase after a disaster occurs. Disaster also has an impact on both life and material losses. These losses occur due to a lack of vigilance and readiness to face threats of danger. To minimize the losses above, disaster risk reduction efforts are needed [5].

This is of particular concern to various sectors in the field of disaster preparedness, both from government and non-government agencies to reduce or anticipate the impact of the tsunami [6]. Preparedness is a disaster risk reduction strategy by means of preventing the impact of disasters and is measured using parameters; knowledge, attitudes, plans, emergency response, early warning system and mobility of resources [7], [8].

Kebumen is one of the districts that has a high level of disaster vulnerability. Some areas are coastal and hilly areas, while most of them are lowlands. There are 12 districts in the southern coastal region prone to the impact of earthquakes and tsunami. Therefore, researchers are interested in conducting research to determine community preparedness in reducing the risk of a tsunami disaster in Kebumen.

METHODS

This research method uses descriptive method with cross sectional approach, the way of collecting data using a questionnaire. Sample taken were 98 respondents with criteria of Kebumen residents aged 12-45 years old who were carried out in March – April 2020. Instrument used a questionnaire with 50 questions according to LIPI's preparedness indicators. Validity test is less than p.05, which means that the question is valid and the reliability test is 0.984. Data was collected door to door, the researcher explained the aims and objectives of the study to the respondents, after agree by subject, and filling in the informed consent, the respondent filled out a questionnaire that had been prepared. The data was collected by giving questionnaires and questionnaires to the research subjects. The data obtained is then analysed according to the category and given a score on the knowledge and attitude, policy, emergency response plan, early warning system and mobilization of resources. It has passed the ethics of KEPK STIKes

Muhammadiyah Gombong with ethical exemption No 011.6/II.3.AU/F/KEPK/I/2020. Analysis data used descriptive method to determine the level of community preparedness of disaster with SPPS 25 for windows.

RESULTS

Table 1 showed the respondents demographic characteristic according to gender, working status, educational background, and marital status (n = 98). Result showed that the majority of participants are male (56.1%), age 23-32 years old (42.9%), working (91.7%), the educational background is senior high school (61.2%) and married (59.2%).

Table 2 showed frequency distribution according to community preparedness consist of knowledge and attitude, policy, emergency response plan, early warning system and mobilization of resources.

Table 1
Respondents Demographic Characteristic

Variable	n	%	p-value
Gender			
Male	55	56.1	0.081
Female	43	43.9	
Age (years)			
12-22	34	34.7	
23-32	42	42.9	0.722
33-45	22	22.4	
Working Status			
Working	72	91.7	0.671
Didn't Working	26	8.3	
Educational Background			
Didn't go to school	9	9.1	
Elementary school	12	12.2	
Junior high school	10	10.2	0.418
Senior high school	60	61.2	
Academy/University	7	5.3	
Marital Status			
Married	58	59.2	0.818
Not Married	40	38.8	

Table 2
Frequency Distribution According to Community Preparedness

Variable	n	%	p-value
Knowledge and Attitude			
Good	7	7.1	0.001
Moderate	41	41.8	
Bad	50	51	
Policy			
Good	5	5.1	0.008
Moderate	51	52	
Bad	42	42.9	
Emergency Response Plan			
Good	26	26.5	0.154
Moderate	71	72.4	
Bad	1	1	
Early Warning System			
Good	9	9.2	0.202
Moderate	34	34.7	
Bad	55	56.1	
Mobilization of Resources			
Good	4	4.1	0.019
Moderate	24	24.5	
Bad	70	71.4	

DISCUSSION

The respondents' range of age was 23-32 years, where the age was included in the productive age. In accordance to the research that productive age is the age that plays the most role and has a dense activity and has good cognitive abilities, so that at this age, it affects the level of knowledge. There were 55 male respondents (56.1%), while there were 4 female respondents. Although the gender of male and female physiological differences, this is not a dominant factor in influencing one's preparedness in facing disaster hazards. Gender is something that is permanent and can not be used as an analytical tool to predict the reality of life [9], [10].

Based on the results, the knowledge and attitudes regarding disaster preparedness the majority is bad (50 respondents). The lowest knowledge is on the signs of tsunami, the impact caused by the tsunami and what are the criteria for buildings that are resistant to tsunami disasters [11], [12].

Knowledge is a major factor and a key to preparedness. The experience of the tsunami disaster in Aceh and Nias, when the sea water receded into the middle of the sea, many coastal residents ran to the beach to pick up fish that were stranded on the beach [13], [14]. They did not know that the receding sea water was a sign of a tsunami. As a result, most of them did not have time to escape when the massive tsunami waves hit the coast. The individuals who have better knowledge of disasters tend to have better preparedness than individuals who have less knowledge about disasters [15]. Knowledge is the result of knowing, and occurs after people perceive a certain object. Knowledge or cognitive is a very important domain for the formation of one's actions[16]. Knowledge is

a factor that will affect their attitude and concern for being ready and alert in anticipating disasters and being the main key to individual preparedness [17], [18].

Based on result about policy, it can be seen that the respondents who have moderate policy are 51 respondents (52%). All respondents said they were willing to follow the rules made by government in the event of a disaster. Meanwhile policies and guidelines constitute concrete efforts to carry out disaster preparedness activities [19]. Policy indicator with low scores are due to the fact that most of the heads of families have never received information on disaster preparedness and the heads of families have never attended seminars and course, or because of a lack of interest and understanding of this matter [20].

According to LIPI UNESCO ISDAR, policies that have a significant effect on household in the form of family agreement in dealing with disasters, namely the existence of discussions related to self-rescue actions and equipment needed for rescue policy in disaster [21]. In this case, respondent does not have any preparations for when a disaster strikes, family members should inform each other and discuss to prepare the necessary equipment when disaster occurs [13], [22].

Disaster emergency response is a series of activities that are carried out immediately at the time of a disaster to deal with the bad effects, which include activities to rescue and evacuate victims, property, fulfilment of basic needs, protection, management of refugees, rescue and restoration of infrastructure and facilities [23]. Based on the results, level emergency response plans regarding disaster preparedness was 71 respondents with sufficient categories. All respondents did not attend disaster preparedness training, so the community did not know the emergency response plan to be carried out in the event of tsunami. This is because they have to work or do something more important [24], [25]. However, this emergency response plan is an important part of preparedness, especially with regard to evacuation, rescue and rescue, so that disaster victims can be minimized.

The result showed that the Early Warning System (EWS) was categorized bad for 55 respondents (56.1%). EWS must use tools that reach the public at large and the disaster relief system must be implemented quickly so that the community can hear the warning sound in case of an earthquake. However, some people stated that in village there was no EWS. Only 9 respondents were aware of EWS [26], [27]. The public more often gets information through TV broadcasts, radio, and uses smartphone to get information about disaster, even government has not provided EWS equipment in the form of Handy Talky (HT) to distribute information about disasters and the community also does not participate in disaster training or simulation the community is not aware of the existing EWS [22]. Unlike the preparedness in the coastal area of Puring District, Kebumen Regency, most of the EWS are ready.

EWS in the coastal area consist of a traditional EWS and a technology based EWS. There are two alarm towers that are useful as an EWS, which is a technology based on EWS. It will sound if there are signs that a tsunami will occur. The traditional EWS still used by residents is “kentongan”.

In this conditions, the community needs to recognize the natural signs that a tsunami is about to occur, which seems to be the most effective warning for the community [13]. It includes warning signs and distribution of information about disaster. The community can take appropriate action, especially to reduce casualties [15], [17]. For this reason, training and simulation are needed, what to do when you hear a warning, where and how to save yourself within a certain time, according to the location where the community was at the time of the warning.

The result showed that parameters of resource mobility regarding community preparedness in reducing the risk of tsunami disasters as many as 70 respondents (71.4%) are said to be lacking. Resource mobilization is a crucial factor. The available resources, both human resources, as well as funding and essential infrastructure for emergencies are potentials that can support or otherwise become an obstacle in natural disaster preparedness [28].

Most people do not understand disaster knowledge and do not attend training and simulation, although this training is very useful for learning the right actions in dealing with disasters, so that people lack skills related to preparedness. According to data, only 5 respondents attended disaster preparedness training and only 3 respondents who understood the material of preparedness and who had a disaster preparedness pregnancy. If we look at the indicators used in the study, the lowest result is the mobility of resources. The low mobility of human resource in the study area is inseparable from the lack of socialization information related to disasters [29].

Lack of knowledge about rescue simulations, even some of the community has never conducted an evacuation simulation of a disaster, is a major factor in resource mobilization [12], [27]. Another factor also lies in the agencies competent with disaster issues that have not fully provided their roles, such as counselling and training. The ability to mobilize ready resources, both human resources who have been equipped with knowledge and skills during emergencies and other resources that can help such as relatives who are ready to help in the event of a disaster are factors that affect resource mobilization readiness.

CONCLUSION

The level of knowledge and attitudes of the community towards the tsunami disaster preparedness as low, policies as sufficient, emergency response plans as sufficient, early warning system is low and level of resource mobility in tsunami disaster preparedness as low too. It is hoped and suggested that government and other institutions will pay more attention to the importance of knowledge and attitudes, policies, emergency response plans, disaster early warning systems, mobility of community resources by disseminating disaster related signs of disasters, impacts due to tsunami disasters, building criteria, disaster resilience and an agreement on the division of tasks within the family to anticipate a disaster, as well as how to plan for emergency response when a disaster occurs by increasing education and socialization and training activities.

ACKNOWLEDGMENTS

We thank Dr Herniyatun, M.Kep. Sp.Mat., and Arnika Dwi Asti, M.Kep for the discussion, contribution and support this research.

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