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Community Preparedness in Dealing with Tsunami Disasters in Coastal Areas

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Table I. Characteristics of Respondents by Agen (n = 284)

N	Minimum	Maximum	Mean	Std. Deviation
284	17	60	41.73	12.797

Table II. Characteristics of Respondents by Gender and Distance of Residence from the Beach

Characteristic	Amount	%
Gender		
Men	159	56.0
Women	125	44.0
Distance of residence		
< 500 m	154	54.2
500 - 1500 m	112	39.4
> 1500 m	18	6.3

Table III. Preparedness of Knowledge and Attitude Parameters about Disaster

Criteria Parameters	Amount	%
Poor	2	0,7
Sufficient	45	15.8
Good	237	83.5
Total	284	100.0

Table IV. Preparedness of the Parameters of the Family Disaster Preparedness Plan

Criteria Parameter	Amount	%
Poor	29	10.2
Sufficient	187	65.8
Good	68	23.9
Total	284	100.0

Table V. Preparedness of Disaster Warning Parameters

Criteria Parameter	Amount	%
Poor	4	1.4
Sufficient	16	5.6
Good	264	93.0
Total	284	100.0

Table VI. Preparedness of Resource Mobilization Parameters

Criteria parameter	Amount	%
Poor	5	1.8
Sufficient	78	27.5
Good	201	70.8
Total	284	100.0

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ABSTRACT

Introduction: Lampung is located on the Sumatran fault line, namely the Semangko Fault which was formed by the collision of two continental plates, namely the Indo-Australian and Eurasian. This topography and landscape makes Lampung a disaster-prone area. The eruption of Mount Krakatau on August 26, 1883, caused a 41-meter wave height tsunami and killed 36,500 people, and the 6.5 Richter Scale Liwa earthquakes on February 15, 1994, caused 300 fatalities (BNBP, 2012). Tsunami in the Sunda Strait on December 22, 2018, also caused 429 deaths. The high number of victims due to the tsunami illustrates the insufficient level of community preparedness. The purpose of the study was to determine the level of community preparedness in dealing with the tsunami.

Methods: Descriptive research design used was survey method. The research population was 1,056 households in Kunjir and Waymuli villages, with 290 samples were taken by cluster random sampling. The (survey?) instrument was based on LIPI-NESCO/ISDR 2006. Data were processed to obtain a frequency distribution.

Results: The results showed that the level of community preparedness from the aspect of knowledge and attitudes, early warning system, and resource mobilization were mostly in the good category, while the planning aspect in dealing with disasters was mostly in the sufficient level. It is concluded that the level of community preparedness is good.

Conclusion: The level of community preparedness is in the good category. The research recommendation is that the community should get assistance in planning for the tsunami disaster to reduce the number of victims in the event of another tsunami.

Keywords: preparedness, disaster, safe community

Introduction

Lampung Province is located on the Sumatran fault line known as the Semangko Fault which stretches from Lampung to Aceh. The Semangko Fault is formed by the collision of two continental plates, namely the Indo-Australian and Eurasian. The collision of these two continental plates resulted in regionally forming a volcanic cluster that extends from the northern tip of the island of Sumatra to the East Nusa Tenggara Archipelago.

The topography and landscape conditions are such that Lampung Province is a disaster-prone area (8). A terrible natural disaster that has occurred is the eruption of Mount Krakatau on August 26, 1883, which caused a tsunami with a wave height of up to 41 meters and killed around 36,500 people (19). In addition, there was also the Liwa Earthquake on February 15, 1994, with a magnitude of 6.5 on the Richter Scale which devastated the city of Liwa and its surroundings, killing about 300 people (3) (24).

Lampung Province, which is located in the southern part of Sumatra Island, has a complex nature that makes Lampung Province one of the areas with high potential for disasters. The Indonesian Disaster Risk Index (IRBI) for Lampung Province has a score of 153 with a high-risk class, while South Lampung Regency has an IRBI score of 187 with a high-risk class (2) (22).

Lampung Province is directly bordered by the open sea in the west and by the Indian Ocean in the southwest, in the south by the Sunda Strait, in the southeast and east by the Java Sea, causing Lampung to be at risk of experiencing a Tsunami disaster. This condition causes some areas of Lampung Province to be at high risk for tsunami natural disasters, both due to earthquakes and volcanic eruptions.

The tsunami in the Sunda Strait that occurred on December 22, 2018, which had an impact on South Lampung Regency and around the Anyer coast, resulted in 429 deaths, 118 of whom were victims whose bodies were found in South Lampung (1). This condition illustrates that the community does not yet understand the safe community in a disaster situation.

Safe community in a system starting at the village level, Pustu, puskesmas to emergency services at hospitals (7). A safe community is a healthy and safe community situation through efforts to increase community preparedness and mitigation (care), quick response, and rehabilitation (cure) services carried out by and for the community with the support of the government.

The results of Tiurmaida Simandalahi's research, entitled the level of community knowledge about community-based disaster risk reduction in the disaster preparedness group in West Padang District, Padang City, it was found that most of the community's level of knowledge was in the sufficient category (20). Nanda Khoirunisa's research, which examines the level of knowledge about the earthquake and volcanic eruption of the community in Boyolali District, found that most of the community's knowledge was in the medium category with an index value of 52.9 (10).

According to Notoatmodjo (2014) states, good knowledge influences a person to behave. Good human behavior and become a culture must be based on good knowledge (3)(14). The results of the Donahue survey (2011) stated that more than 20% of leaders view that inadequate public education is the second biggest barrier that cities face to improve disaster preparedness in the community (6). A person's level of education will affect how a person has a good mindset, is able to respond to any information that is obtained wisely.

The results of this study are expected to be the basis for assisting district/city governments in developing a community-based safe community model in coastal areas in the effort of an emergency service system to create an alert village. Success in handling and evacuating when a tsunami occurs is highly dependent on the preparedness of the community and individuals

themselves (8). In general, this study aims to determine the level of community preparedness to face the tsunami disaster.

Material and Methods

This research is quantitative research with a descriptive design. The population in this research were all families (households) in Kunjir and Waymuli Villages, Rajabasa District, South Lampung Regency, totaling 1056 families. The number of samples is 290 families in Kunjir and Waymuli Villages, Rajabasa District, South Lampung Regency. Samples are taken using cluster random sampling method, where the sample is determined proportionally for each hamlet. There are 4 hamlets in Kunjir Village and 4 hamlets in Waymuli Village.

The variables in this study are community knowledge about tsunami preparedness with sub-variables 1) community knowledge and attitudes towards disasters, 2) knowledge about plans to respond to disaster conditions, 3) community knowledge about the early warning systems for tsunami disasters, 4) community knowledge on resource mobilization in dealing with the tsunami disaster. The research was conducted in July and August 2019 in Kunjir and Way Muli Villages, Rajabasa District, South Lampung Regency.

The data collection instrument in this study used individual and household preparedness questionnaires in anticipating natural disasters from LIPI-UNESCO/ISDR. Knowledge data collection was carried out using the paper-based test (PBT) method (10).

ETHICAL CLEARANCE

This study was approved by Research Ethics Committee, Poltekkes Kemenkes Tanjungkarang No. 064/EA/KEPK-TJK/IX/2019

Result

Overview of Research Place

Kunjir Village has an area of 705 hectares, consisting of 4 Hamlets and 10 RT. The total population of Kunjir village is 1,950 people with details of 1,041 men and 954 women with 565 families. Way Muli Village has an area of 483 hectares. The total population of Way Muli village is 1,429 people with details of 725 men and 707 women with 364 the heads of families.

Characteristics of Respondents

In table I, it can be explained that most of the respondents are 42 years old with the youngest being 17 years old and the oldest being 60 years old

In table II, it can be seen that most of the respondents are women and the distance from where they live to the beach is mostly less than 500 M.

Preparedness of the Knowledge and Attitude parameters

In table III, regarding Preparedness from the knowledge and attitude parameters about disasters, most of the respondents have knowledge and attitudes in the good category with a total of 83.5% of 284 respondents.

Preparedness of the Parameters of the Family Disaster Preparedness Plan

In table IV, it is known that most of the respondents in the category are sufficient in preparing all needs in the event of a disaster with a total of 65.8% of 284 respondents.

Preparedness of Disaster Warning Parameters

In table V, it can be explained that the preparedness of the disaster warning parameters was found that most had understood the early warning signs of the tsunami with a percentage of 93% of 284 respondents.

Preparedness of Parameters for Mobilization of Resources in Times of Disaster

In table VI, it can be explained that most of the respondents have a good category for the parameter of resource mobilization during a disaster.

Discussion

On the parameters of knowledge and attitudes of respondents to disasters, most of them are in a good category. This is possible because, since the tsunami disaster in December 2018, many components of the community and government have provided information related to the disaster. In addition to direct information in the form of counseling, in the villages of Kunjir and Way Muli, there are many information boards or pamphlets about the earthquake and tsunami disaster, including its preparedness.

Someone's knowledge is a major factor and is the key to preparedness. The knowledge possessed can influence the attitude and concern of the community to be ready and alert in anticipating disasters, especially for those who live in coastal areas that are vulnerable to natural disasters (9). The recent tsunami disaster is still looming over the community so that currently the community's preparedness is still quite good.

Understanding of the causes of earthquake disasters, most respondents agree that earthquakes are caused by friction of plates beneath the earth's surface. While the most answer choices for the cause of the tsunami disaster were earthquakes that occurred under the sea. On the item of earthquake-resistant buildings, most of the respondents answered buildings that have strong foundations and are deeply embedded. Meanwhile, for buildings that are more resistant to tsunamis, the most chosen answers are buildings with strong structures. However, many also think that there is no building that is resistant to the tsunami because it is certain that the building will be damaged if it is hit by a tsunami.

In the second parameter, which is about family preparedness plans from disasters, it was found that most of the respondents were in the sufficient category in preparing all needs in the event of a disaster. This is possible because most of the respondents still live in semi-residential (Huntara) so that currently respondents still feel safe so they have not really planned what to do if there is a tsunami disaster in the future. Preparedness planning, such as the division of tasks in the family when a disaster occurs, no family has done it yet. In the preparedness plan for evacuation sites, almost all respondents know the evacuation places and evacuation routes, but respondents still do not know what items should be brought for evacuation. Included here is the preparation of alternative communication tools such as radio communication tools such as handy talkie (HT). No community has yet prepared and there are no groups that form communication communities using amateur radio.

At this point of preparedness planning, the government needs to contribute more, because it is related to the cost of purchasing communication tools or training in the form of handling accidents in disasters.

In the disaster warning preparedness parameter, it was found that most of them already understood the early warning signs of a tsunami with a percentage of 93% in the good category. This parameter is the same as the knowledge and attitude parameter. The community has received a lot of information about the early warning system for natural disasters, both traditional and digital. A good level of public understanding is not matched by facilities for tsunami early detection tools. Currently, people only rely on information from loudspeakers from mosques or shouts from people.

In the resource mobilization parameter, most of the respondents have a good category for mobilizing resources during a disaster. This good level of understanding has not been followed by concrete steps such as preparing a bag that can contain important files or other preparations. This

is possible due to family limitations in preparing the equipment. Most of the respondents are fishermen, but currently, many of their boats have been damaged or washed away by the currents, so they cannot go back to sea.

Conclusion

The level of community preparedness from the aspect of community knowledge and attitudes about disasters, mostly in the good category, in the aspect of planning in dealing with disasters in the sufficient category, aspects of the early warning system against tsunami disasters mostly in the good category, aspects of resource mobilization in dealing with the tsunami disaster, mostly in the good category.

The preparedness of the community in dealing with disasters based on information and knowledge is quite good, but in practice, there are many things that should have been prepared, but in fact, there is no preparation or readiness to face disasters. This is because of the community's economic limitations. Most of the people make a living as fishermen, but currently, fishermen do not have boats, because their boats were lost or damaged by the tsunami. The role of the government is very much needed to empower the community in preparedness in dealing with the tsunami disaster.

REFERENCES

1. BBC News Indonesia. Tsunami Selat Sunda: 430 orang tewas, Krakatau waspada, hujan abu di beberapa tempat. [Internet]. Jakarta: BBC Newa Indonesia;2018. Available form: https://www.bbc.com/indonesia/live/indonesia-46663949/page/3
2. BNPB. Indeks risiko bencana indonesia (IRBI) Tahun 2013. Jakarta: Direktorat Pengurangan Risiko Bencana Deputi Bidang Pencegahan dan Kesiapsiagaan; 2014

3. BNPB. Menuju Indonesia tangguh menghadapi tsunami. Jakarta: Badan Nasional Penanggulangan Bencana; 2019

5. BPPD. Laporan korban Tsunami Selat Sunda di Lampung Selatan. Bandar Lampung: Badan Nasional Penanggulangan Bencana, 2018

6. Donahue, A. K., & Fitzpatrick, C. Household risk perception, preferences, and preparedness. University of Connecticut DIEM: A DHS Center of Excellence, UConn Department of Public Policy Disaster Risk Perception, Preferences, and Preparedness Project; 2010

7. Hartono B, dkk. Pedoman umum pengembangan desa dan kelurahan siaga aktif. Jakarta: Kementerian Kesehatan RI; 2010

8. Juniarti N., Zannettino L., Fuller J., Grant J. Desirable and Undesirable Outcomes of the Nursing Centre Model as a Collaborative Approach to Service Learning in Community Health in Indonesia. In: Hall T., Gray T., Downey G., Singh M. (eds) The Globalisation of Higher Education. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-74579-4_23; 2018

9. Juniarti, N., Fuller, J., Zannettino, L., & Grant, J. Conceptual framework of the nursing centre for the integration of community health nursing practice, education, and research. *Primary Health Care Research & Development, 20*, E99. doi:10.1017/S1463423619000331; 2019

10. Khoirunisa, Tingkat Pengetahuan Masyarakat Terhadap Bencana Gempa Bumi Dan Gunung Meletus Di Kecamatan Boyolali Kabupaten Boyolali, Proseding Seminar Nasional Kemandirian Daerah Dalam Mitigasi Bencana Menuju Pembangunan Berkelanjutan 19 September 2015 (pp.575–587) di Universitas Sebelas Maret, 2015

11. Latief Hamzah, dkk. Review masterplan pengurangan risiko bencana tsunami. Jakarta: Badan Nasional Penanggulangan Bencana; 2014

12. LIPI & UNESCO. Pengembangan framework untuk mengukur kesiapsiagaan masyarakat terhadap bencana alam. [Internet]. 2006, diakses [28 September 2011], dari http://Repository.upi.edu.com

13. Notoatmodjo, S., Pendidikan Dan Perilaku Kesehatan. Jakarta: Rineka Cipta: 2003

14. Notoatmodjo S. Ilmu Perilaku Kesehatan Jakarta: Rineka Cipta; 2014

15. Project. Local Government Official. Risk perception, preferences, and preparedness survey findings, West Hartford : University of Connecticut, Department of Public Policy

16. Purnama. Modul Manajemen Bencana, Bali: Fakultas Ilmu Kesehatan Masyarakat Universitas Udayana; 2017

17. Ramli, Koehatman. Pedoman Praktis Manajemen Bencana. Jakarta: Dian Rakyat, 2016

18 Rudi Hamarno, Modul bahan ajar cetak keperawatan, keperawatan Kegawatdaruratan dan Manajemen Bencana, Jakarta: Pusdiknakes Kemenkes R.I

19. Urata. Keperawatan bencana (Ed. 1). Banda Aceh: Forum Keperawatan Bencana

20. Susilaningsih, F. Sri; Kurniawan, Titis. Patients' attendants community empowerment as clean and healthy behaviors' volunteers in hospital setting. Uttar Pradesh: Indian Journal of Public Health Research & Development . Dec2019, Vol. 10 Issue 12, p1697-1702. 6p.

21. Tiurmaida Simandalahi, Ahsan, Ari Prasetyadjati, Pengetahuan tentang isu pengurangan risiko bencana berbasis komunitas kelompok siaga bencana di Kecamatan Padang Barat Kota Padang. Padang: Jurnal The Indonesian Journal Of Health Science, Vol. 6, No. 1, Desember 2015

22. Tuhusetya, S. Pendidikan kebencanaan dan kesigapan mengurangi resiko. Dikutip tanggal 15 September 2011, dari http://sawali.com: 2010

23. Yunus R, Nugroho PC, dkk. Indeks Risiko Bencana Indonesia. Jakarta; Direktorat Pengurangan Risiko Bencana Badan Nasional Penanggulangan Bencana; 2019

24. Wikipedia, 2018, Letusan Krakatau 1883, downloaded from https://id.wikipedia.org/wiki/Letusan_Krakatau_1883, on May 1, 2018

25. Wikipedia, 2018, Gempa bumi Liwa 1994, downloaded from https://id.wikipedia.org/wiki/Gempa_bumi_Liwa_1994 on May 1, 2018