The Impact of Disaster Awareness towards Household Disaster Preparedness among Families on the Coast of Banten, Sumur District, Indonesia

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Abstract. Located in the Ring of Fire, Indonesia has become a country with tectonic and volcanic activity with considerable intensity. One of the impacts of these activities is in the form of a tsunami. In December 2018, a tsunami occurred in Pandeglang, Ujung Kulon, Banten Province with the most victims being in the Sumur District. This research was conducted to determine the level of community awareness and household disaster preparedness in facing disasters. This research is a quantitative study using questionnaires containing statement items to be filled out by respondents. Disaster Preparedness scale form LIPI-UNESCO/ISDR which consists of five aspects and Disaster Awareness scale from Bhat which consists of three aspects were used in this research. There were 166 participants involved in this study. The study suggests that disaster awareness contribute to household disaster preparedness significantly. Meaning that families with high level disaster awareness are more prepared in response to disaster.

1. Introduction

Natural disasters often occur in Indonesia because its surrounded by the Ring of Fire or commonly referred to as the largest Pacific Ring of Fire in the world. Indonesia has 129 active volcanoes that cause the risk of geological disasters such as earthquakes, tsunamis, volcanic eruptions, and landslides. Based on BNPB's Indonesian Disaster Information Data (DIBI), between 2005-2015, Indonesia experienced more than 15,400 incidents, which are the 78% of disasters such as floods, extreme waves, land and forest fires, drought, extreme weather and around 22% of disasters such as earthquakes earth, landslides, tsunamis, and volcanic eruptions [1].
Disasters such as earthquakes, tsunamis, volcanic eruptions have the potential to cause large numbers of victims. BNPB summarizes the area, number of people, and environment exposed to the threat of disasters in Indonesia, can be seen in table 1.

| Disaster   | Environment exposed (ha) | Number of people exposed |
|------------|--------------------------|--------------------------|
| Earthquakes | 52,374,614               | 86,247,258               |
| Tsunami    | 961,133                  | 3,702,702                |
| Volcano    | 1,162,220                | 2,695,427                |

The high potential of the number of lives exposed to the threat of disaster, shows that the community, especially families need to increase understanding of disaster risk, so that people have awareness and preparedness in the face of disasters. This is marked by the earthquake in Lebak, Banten 6.1 SR (2018), which caused panic in the community which became a warning that community preparedness needs to be improved continuously [1].

When the Meteorology and Geophysics Agency provided information on the status of Mount Anak Krakatau, the Pandeglang community did not evacuate, but remained in the area and continued to carry out activities as usual. This matter indicates that the Pandeglang community still lacks preparedness in facing disasters. Household preparedness in facing disasters makes the community have the knowledge to act when facing disasters that are happening, or disasters that will occur.

To become a community that has disaster preparedness, there needs to be an awareness of the community. By having disaster awareness by the community, it is expected that the community will be able to know what disasters will occur around them, whether the disaster has a serious impact or not, whether the disaster is classified as a hazard or not for themselves, their families, their environment and the people around them.

The eruption of Mount Krakatau on December 22, 2018 caused 431 lives, 7,200 people were injured, 15 people were missing and 46,646 were displaced. The highest number of fatalities due to the disaster was in Pandeglang. Disaster preparedness is a series of activities carried out to anticipate disasters through organizing as well as through appropriate and efficient steps. The knowledge of this disaster preparedness is a major factor and is the key to preparedness [2]. Furthermore, families play an important role in primary health care. The family is also considered a living organism with a concrete or symbolic structure. As a social system, the family seeks to maintain the stability and
integrity of family members, when natural disasters occur, this will affect the family's internal and external systems [3].

Febriana (2009, cited in Lenawida, 2011) [3] suggests that disaster preparedness in families are actions that can be taken in the household to prepare themselves and families for disasters before disasters occur. The importance of disaster preparedness in the family is when a disaster occurs, the family will face a great impact of the disaster. The impact of disasters often separates family members, the effects of disability, death, mental stress, reduced ability to overcome problems, and family conflicts.

LIPI-UNESCO/ISDR [4] shows that there are five aspects that become parameters of disaster preparedness for families, namely: 1) knowledge about natural disasters; 2) family policies for household preparedness in the face of disasters; 3) household preparedness plan; 4) disaster warning; 5) mobilization of household resources.

Soekanto (2007, cited in Kurniasari, 2016) [5] proposed that one’s awareness is the ability to think, desire and feel. With this ability people gain knowledge and by their will, people direct their behaviors, and with their feelings people can achieve pleasure. Moreover, Soekanto (1982) also suggest that the indicators of awareness are consist of three aspects: 1) knowledge, 2) attitudes and 3) behavior patterns. This research therefore, defined disaster awareness the aspects of knowledge, attitudes and behaviors towards household preparedness in dealing with disasters among families in Banten coast, specifically in Sumur District.

Previous research from Paramesti [6] shows the low of community preparedness of people in Pelabuhan Ratu area in facing the danger of earthquake and tsunami. Some of the main factors causing the emergence of many victims due to the tsunami disaster are due to lack of public knowledge about the disaster and lack of community preparedness in anticipating the disaster.

A study carried out by LIPI-UNESCO/ISDR [4] showed that the level of community preparedness varied between poorly prepared in Aceh Besar District and Bengkulu, and almost ready in Padang. Preparedness is an important point in increasing disaster preparedness. So that preparedness can play a role in finalizing the impact of disasters and reducing both physical and psychological losses, it is important to focus disaster preparedness within the scope of the family. Individuals and households are the main stakeholders that are very important in community preparedness, and are the spearhead, subject and object of preparedness, which directly influences disaster risk [4].

Research by Djafri and Nofrianti [7] shows that there is a significant relationship between the level of awareness and household preparedness in facing earthquake and tsunami. The level of preparedness varied based on the level of awareness and will likely last in a long time.

This research was conducted to determine the level of disaster awareness in the community in Sumur District which located in disaster prone areas, as well as to determine the level household preparedness in facing disasters. This study also aims to investigate the impact of disaster awareness towards household disaster preparedness among families in Sumur District, Banten. The results gained from this research hopefully may give useful information to minimize losses due to the disaster.

2. Method
This research used a quantitative approach. The research was conducted on July 9 – 13, 2019 among families in Sumur District. There were 166 participants from Sumur District joined the study. Purposive sampling technique were used to collect the participants of this study. The sample criteria for the research to be carried out are as follows: 1) living in the coastal area of the Sumur District, Banten City; 2) father or mother stated in Kartu Keluarga (family card); and 3) have experience of tsunami disasters in the Banten coast.

The research instrument for the household disaster preparedness was adapted and modified from LIPI [4] and from Bhat, et al [8] for the disaster awareness scale. Household disaster preparedness scale measures five aspects which are:1) knowledge and attitudes towards disaster risk, 2) family policies or guidelines for preparedness, 3) emergency response plans, 4) disaster warning systems, and 4) resource mobilization. The Cronbach’s alpha for the reliability of the scale is 0.930. Whereas, the
awareness scale from Bath consists of three aspects: knowledge, attitudes, and behavior towards disaster with the Cronbach’s alpha for the reliability of the scale is 0.899. Data analysis using SPSS version 22.

3. Results and Discussion

3.1 Demographic data of the respondents

This section analyses the various demographic characteristics of the respondents. Supporting tables and figures are provided.

Gender composition

The gender composition of the respondents was 2% male (n = 3) and 98% female (n = 163). The majority of the respondents were female, because most of the man were working during the data collection processed (see figure 2).

![Figure 2. Gender composition of the respondents](image)

Age distribution

The age distribution of the respondents who participated in the study is provided in figure 3.

![Figure 3. Age distribution of the respondents](image)

Educational background of respondents

Regarding the educational background of the respondents, Figure 4 indicates that 68 participants (41%) had primary school completed, 31 participants (18.7%) and 59 participants (35.5%) had some form of secondary schooling. Only very low percentages of the respondents had diplomas (1.8%) and bachelor’s degree (3%).
Job/employment status of respondents
Considering the job/employment status of the respondents, table 2 shows that 79.5% are housewife, follow by farmer (8.4%) and fisherman (4.8%). Only 1.8% are working as entrepreneur in private sector and 3% are self-employed.

Table 2. Job/employment status of respondents

| Employment      | Frequency | Percentage |
|-----------------|-----------|------------|
| Teacher         | 3         | 1.8        |
| Housewife       | 132       | 79.5       |
| Fisherman       | 8         | 4.8        |
| Farmer          | 14        | 8.4        |
| Entrepreneur    | 3         | 1.8        |
| Self-employed   | 5         | 3          |

3.2 Findings
Statistical descriptive of household disaster preparedness variable
Descriptive analysis from the household disaster preparedness variable were shown in table 3 whereas Table 4 shows the categorization of the household disaster preparedness variable in this study.

Table 3. Statistical descriptive of household disaster preparedness

|          |          |            |
|----------|----------|------------|
| Mean     | 168.7    |            |
| Median   | 173      |            |
| Standard Deviation | 28,736 | |
| Variance | 825,778 | |
| Range    | 133      |            |
| Maximum score | 237   | |
| Minimum score | 104   | |

Based on the table 4, there were 33 respondents have low score of (19.9%) on household disaster preparedness, while 133 respondents (80.1%) have high level of household disaster preparedness. It can be concluded in this study that almost all respondents had a high level of household disaster preparedness.

Table 4. Level of household disaster preparedness

| Level   | Score  | Frequency | Percentage |
|---------|--------|-----------|------------|
| Low     | X < 140| 33        | 19.9%      |
| High    | X ≥ 140| 133       | 80.1%      |
| Total   |        | 166       | 100%       |

Statistical descriptive of disaster awareness
Descriptive analysis from the disaster awareness variable were shown in table 5 whereas table 6 shows the categorization of the disaster awareness variable in this study.

**Table 5. Statistical descriptive of disaster awareness**

|                      |            |
|----------------------|------------|
| Mean                 | 133.48     |
| Median               | 140        |
| Standard Deviation   | 20.459     |
| Variance             | 418.566    |
| Range                | 96         |
| Maximum score        | 179        |
| Minimum score        | 83         |

Table 6 shows that there were 13.9% of the respondents have low level of disaster awareness and most of the respondents (86.1%) have high level of disaster awareness.

**Table 6. Level of disaster awareness**

| Level  | Score | Frequency | Percentage |
|--------|-------|-----------|------------|
| Low    | X < 105 | 23         | 13.9%      |
| High   | X ≥ 105 | 143        | 86.1%      |
|        | Total  | 166        | 100%       |

**Hypothesis testing**

From Table 7, it can be seen that the constant value of the household disaster preparedness variable in the family is 35,607 while the regression coefficient of the disaster awareness variable is 0.998.

**Table 7. Regression analysis**

| Model                   | Unstandardized Coefficients | Standardized Coefficients |
|-------------------------|-----------------------------|---------------------------|
|                         | B                           | Std. Error                | Beta | t    | Sig.  |
| 1 (Constant)            | 35,607                      | 10,425                    | 3,416 | 0,000 |
| disaster awareness      | 0.998                       | 0,077                     | 0,710 | 12,922 | 0,000 |

a. Dependent variable: household disaster preparedness

The results of this research showed that the hypothesis proposed in this study was accepted, that there was a positive and significant influence from disaster awareness towards household disaster preparedness among families in the Banten coast of Sumur District with the p value is 0.000. (see table 8).

**Table 8. ANOVA**

| Model                   | Sum of squares | dF  | Mean Square | F    | Sig  |
|-------------------------|----------------|-----|-------------|------|------|
| 1 Regression            | 68741,142      | 1   | 68741,142   | 166,985 | 0.000 |
| Residual                | 67512,159      | 164 | 411,660     |      |      |
| Total                   | 136253,301     | 165 |             |      |      |

a. Dependent Variable: household disaster preparedness
b. Predictors: (Constant), disaster awareness

R square value of 0.505 indicates that the contribution of the influence of disaster awareness towards household disaster preparedness among families of Sumur District by 50.5% (see table 9).
It means that the influence between awareness of household preparedness in the face of disasters is positive. This shows that the higher the disaster awareness, the higher the disaster preparedness shown by the community. Vice versa, if the disaster awareness is low, then disaster preparedness will be low, this can be known through the linearity between the two variables.

This finding was in line with the results of Djafri and Nofrianti’s study. The correlation between awareness and disaster preparedness has previously been investigated by Djafri and Nofrianti. In their research, it was found that the value of $p < \alpha (0.05)$, this shows that there is a significant relationship between the level of disaster awareness and household disaster preparedness in facing the earthquake and tsunami in Padang.

The influence of disaster awareness towards household disaster preparedness by 50.5%, provides an information that if the community in Sumur District already has a high awareness, then the community in Sumur District will more prepare in facing disasters. The study also shows that the level of disaster awareness that 86.1% of people in Sumur District have high awareness about disasters, and the 80.1% of them were also in the high level of household disaster preparedness. In this case, there are still some people who have awareness and disaster preparedness in the low category, this may occur because the community has not received training or seminars on disaster mitigation. This can also occur because the community already feels safe, but they do not know what needs and items they should carry when evacuating.

In this study there were 11 respondents who were outliers, 9 out of 11 of them participated in filling out the questionnaire dominated by the same number and it can be said that the 11 respondents had non-varied answers, so it could be said to be outliers and data to 11 people It cannot be used in this study, so the data used in this study uses the results of 166 other respondents.

This study has several limitations encountered during the study. On the way to the research location, it takes quite a long time, because access to the location is still limited due to damaged roads, and the location is quite far from the city of Banten, so the implementation of data retrieval is too late. Many residents have less qualified educational background, so researchers must take a personal approach (read out statements and help fill out questionnaires) and took longer time to for one questionnaire lasting approximately 30 minutes to be completed.

4. Conclusion
To conclude, there is a positive and significant impact of disaster awareness towards household disaster preparedness among families on Sumur District. The results show that 50.5% of the household disaster preparedness was determined by disaster awareness. It means that the higher the awareness, the higher the preparedness of households in dealing with disasters in families of Sumur District. Based on this research, there are still respondents who have low scores on disaster preparedness, this is because there is no training or seminar on disaster mitigation equally, there are only a few respondents who have attended training or seminars. Lack of training or seminars on disaster mitigation can also make the preparedness of several families in the Sumur District lower.

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