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DETERMINANTS OF DISASTER PREPAREDNESS BEHAVIOR: A PSYCHO-PUBLIC HEALTH STUDY

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ABSTRACT

Background: The frequency of disasters, both man-made and natural, is increasing, exposing more people to public health disaster-related risks. Currently, the concept of disaster preparedness for resilience refers to the Disaster Risk Reduction (DRR) approach. However, the effectiveness of this concept is still questioned due to the complexity of other determinants related to disaster preparedness (e.g., risk assessment, self-efficacy).
Aim: The aim of this study was to investigate other possible determinants of disaster preparedness behavior instead of DRR.
Methods: The cross-sectional study enrolled 65 Public Health Students of Tadulako University, Indonesia using random sampling method. Data collection using questionnaires to identify psycho-public health variables: risk assessment, self-efficacy, religious beliefs and social cohesion. Spearman's test and Confirmatory Factor Analysis were used to analyze the data.
Results: Principal component analysis showed that risk assessment (factor=0.876), self-efficacy (0.765), religious beliefs (0.813), and social cohesion (0.837) were integrated as factors representing the construct of disaster preparedness. The correlation coefficient value for risk assessment (r=0.936, p=0.001), self-efficacy (r=0.713; p=0.001), religious beliefs (r=0.617, p=0.001), social cohesion (r=0.684; p=0.001) showed significant strong correlation on disaster preparedness.
Conclusion: The integration of risk assessment, self-efficacy, religious beliefs, and social cohesion were determinants of disaster preparedness behavior. The study about psyho-public health is important to investigate the public health related behavior on disaster preparedness.
Key words: Disaster preparedness, risk appraisal, self-efficacy, religious beliefs, social cohesion, Indonesia

INTRODUCTION

Recently, the frequency of natural and man-made disasters has increased. For example, the city of Palu is still recovering from the effects of the September 2018 disaster (i.e., earthquake, tsunami, and liquefaction). Then, not much later, the Covid-19 pandemic disaster hit the community. As a result, the situation worsened. This disaster had a costly impact public health in terms of deaths, physical injuries, psychological damage, and damage to facilities and infrastructure. Moreover, the impact can be felt deeply by the university students, much more for their academic continuation. Talking about disaster preparedness, currently the concept of disaster preparedness refers to disaster risk reduction (DRR) approach. In many literatures, it is explained that this approach is based on knowledge and experience in assessing disaster risk, therefore, individuals or communities are prepared to face disasters [1-3].
According to Davies, this approach emphasizes the knowledge and capabilities of the personal physical preparedness (risk assesments) of individuals and communities or people who experience disasters. In addition, he explains that relying solely on experience and knowledge of disasters to assess disaster risk is not enough to predict disaster preparedness [4]. The success of disaster preparedness is measured by the smaller the impact and the more resilient the community. However, the DRR approach has not yet effectively reduced the impact or consequences of the disaster. Why has this happened? According to experts, there are other factors, such as self-efficacy, religious beliefs, and

social cohesion, which also contribute to disaster preparedness. These factors are assumed as supporting factors to DRR that emphasize psychological preparedness and resilience to disaster risk after having knowledge or experience on that disaster.

Previous studies have found that positive self-efficacy influences disaster preparedness. Individuals with positive attitudes are more prepared for disasters [5-6]. Other research has reported that people's intentions to engage in disaster preparedness activities increase when they are supported by positive religious beliefs [7-9]. Social cohesion is believed to be individual participation at the social level, which refers to the extent to which individuals belong to society and should help each other and work together to achieve preparedness. The stronger the individual social cohesion, the more preparedness will be achieved [10-16].

The above mentioned suggest that these factors may contribute to disaster preparedness behavior in context of psycho-public health phenomena. Therefore, the aim of this research is to analyze the integration of risk assessment, self-efficacy, religious beliefs, and social cohesion that contribute as determinants of disaster preparedness behavior.

METHODS

Research design

The type of research used is a cross-sectional study that included independent variables: risk assessment, self-efficacy, religious belief, and social cohesion to be examined as possible determinants for the dependent variable: disaster preparedness behavior. The study was conducted in Tadulako University, Palu City, Indonesia.

Subjects

The population of the current study were students of the Faculty of Public Health, Tadulako University, Palu City, Indonesia. The reason for choosing this population is that students are one of the most affected by the effects of the disaster in the context of their academic continuation. Meanwhile, this population has been exposed to DRR strategy so that more effective to examine other alternative factors. The students are also more prepared for their psychological examination after facing the disaster. The inclusion criteria: a) active registered students; b) experienced the disaster happened in Palu; c) aged 19-22 years; and d) willing to be a respondent. The student who did not meet these inclusion criteria will not be allowed to participate. The total sample that met the criteria was 65 students. The sampling method is simple random sampling.

Instruments and Procedure

The instrument used questionnaires consisting of disaster preparedness behavior, risk assessment, self-efficacy, religious belief and social cohesion questions with good reliability test results (α>0.80). Disaster preparedness is an assessment and interpretation of disaster hazards through a set of knowledge and skills about disasters, positive attitudes and beliefs that increase awareness of disaster preparedness. Risk assessment is knowledge in the form of the ability to combine a person's perceived likelihood as a threat (person's vulnerability to disaster risk), perceived severity (the severity of the consequences of the risk), and in the form of rewards (perceived benefits) from efforts to reduce risk. Self-efficacy is the belief that a person is capable of taking protective actions to protect themselves from the consequences of hazards, and the belief that they have the personal resources (time, skills, physical resources, and social networks) necessary to take protective or mitigating actions. Religious belief provides risk awareness that helps to carry out disaster mitigation and avoids religious belief that fosters fatalistic attitudes that can hinder mitigation. Social cohesion is community participation in terms of feelings of attachment to people and places that influence decision adaptation, where people with strong feelings about people and places help to change intentions or can turn them into actual or actual preparedness by taking mitigation actions.

Participants took face-to-face interview by the researchers with estimated 20 minutes. All procedures were performed after explanation of research objectives and written informed consent signed by the participants. Participation was voluntary and no compensation was given to the subject.

Analysis Data

The reliability of the questionnaire was measured using Cronbach alpha test. Confirmatory factor analysis and Spearman rho' correlation tests were applied to examine factor loading and correlation between independent variables and dependent variables. Factor criteria analysis to test the feasibility of component analysis using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) criteria should be greater than 0.50. Statistical analysis was performed using IBM SPSS for Windows, version 25.0 (IBM Corp., Armonk, NY, USA) with confidence interval (CI) 95% or alpha (α) 0.05.

RESULTS

Table 1. Confirmatory factor analysis

Variables	Communalities		Loading Factor Component
	Initial	Extraction	1
Risk assesment	1.000	0.768	0.876
Self-efficacy	1.000	0.585	0.765
Religious beliefs	1.000	0.660	0.813
Social cohesion	1.000	0.701	0.837

All variables met the KMO-MSA criteria

Table 1 shows that the confirmatory factor analysis of four variables related to disaster preparedness behavior. The extraction of four variables met the community requirement value because the score was above the 0.50. Therefore, the four variables were related to each other. In addition, grouping or forming a factor produces a loading factor value for risk assessment (0.876), self-efficacy (0.765), religious beliefs (0.813), and social cohesion (0.837), indicating the consistency of them in a group with score above 0.70. This means that risk assessment, self-efficacy, religious beliefs, and social cohesion form a factor or construct of disaster preparedness.

Table 2. Correlation between determinants and disaster preparedness behavior

	Disaster Preparedness Behavior	Interpretation
	r	
Risk assesment	0.936**	strong
Self-efficacy	0.713**	strong
Religious beliefs	0.684**	strong
Social cohesion	0.617**	strong

**p-value<0.001. r>0.500 indicates as strong correlation

There was significant and strong correlation between risk assessment (r=0.936, p<0.001), self-efficacy (r=0.713, p<0.001), religious belief (r=0.684, p<0.001), and social cohesion (r=0.617, p<0.001) and disaster preparedness behavior (Table 2).

DISCUSSION

The aim of this study was to investigate other possible determinants of disaster preparedness behavior using psycho-public health study. This approach implies the potential links between psychosocial behaviors and health at the population level to promote better public health. The result showed that four possible determinants form as a group factor related to disaster preparedness behavior. Meanwhile, the correlation of the four also strong to the dependent variable. Therefore, risk assessment, self-efficacy, religious beliefs, and social cohesion are the determinants of disaster preparedness behavior. The findings from this study have been confirmed by previous studies from other countries that risk assessment [1-3], self-efficacy [5-6], religious beliefs [7-9], and social cohesion [10-16] can influence the disaster preparedness.

Disaster preparedness behavior is an assessment and interpretation of disaster risks through a set of disaster knowledge and skills, positive attitudes and beliefs that increase awareness of disaster preparedness, as well as individual participation in interacting with communities related to disaster preparedness, which lead to actions or behaviors in disaster preparedness [1, 18-21]. Therefore, this behavior could be reinforced by individuals having positive risk appraisal and self-efficacy [1,5]. In addition, positive religious beliefs could also strengthen the formation of intentions to carry out preparedness efforts [7,8]. Having a strong cohesion with the environment will also lead individuals to better cope with disasters [10,12].

The strength of this finding compared to previous research is the comprehensive view of four variables related to disaster preparedness behavior. Instead, the common application of preparedness such as disaster risk reduction, integrating these variables in the application can more strengthen disaster preparedness behavior in the community. However, this research also has limitations. the current design cannot explain the causal effect between four variables to disaster preparedness behavior. How they form a formation to influence and strengthen the dependent variable, the current also failed to give better explanation about this. In addition, this study may also be about the subject (i.e., university students), which need caution to generalize to the general population as well as the small sample size. Therefore, further research needs to focus on how the harmonization of four variables that are found as a one-loading factor that contribute to disaster preparedness behavior. The other limitation, the current study does not statistically examine the DRR effect. The researchers only assume the other determinants because there is ineffectiveness of DRR without highlighting this in the investigation. Therefore, this factor also needs to be assessed further in relation with other potential determinants. The public health implication of this study is the potential of applying psycho-public health strategies to disaster preparedness behavior that emphasize the comprehensive ways integrated with the common strategies such DRR that strengthen the mitigation of any potential disaster.

CONCLUSION

Risk assessment, self-efficacy, religious beliefs, and social cohesion are determinants of disaster preparedness behavior. The four variables form a loading factor that constructs integration in the implementation of disaster preparedness behavior and are also strongly correlated.

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