THE RELATIONSHIP BETWEEN SELF EFFICACY AND EARTHQUAKE AND TSUNAMI DISASTER PREPAREDNESS AMONG STUDENTS OF SMAN 13 BANDA ACEH

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Abstract

Disaster is often perceived as uncontrollable things. Self-efficacy has been identified in having significant influence toward behavior in facing uncontrollable problems. School is one of the areas that have a higher risk of casualties during earthquake and tsunami because it is a gathering place of students, teachers, and other academic members especially on school hours; Therefore, they need the preparedness to face the disaster. The purpose of this research is to understand the correlation between self-efficacy and disaster preparedness of earthquake and tsunami on students at State Senior High School 13 of Banda Aceh. The type of the research is descriptive-correlative method with a cross-sectional study design. The sampling technique used is total sampling. The instrument used is a questionnaire which is self-efficacy questionnaire and preparedness questionnaire that develop by LIPI-UNESCO/ISDR. The data analysis used in this research was Spearman's Correlation. This research shows that there is a significant correlation between self-efficacy and disaster preparedness on students at State Senior High School 13 of Banda Aceh. The data analysis shows that p-value of self-efficacy (0.001) including dimension of level (0.007), dimension of strength (0.002), dimension of generalization (0.001). Schools are recommended to improve students' self-efficacy with disaster preparedness simulation training of earthquake and tsunami.

Keywords: Disaster Preparedness of Earthquake and Tsunami, Self-Efficacy, Students

1. INTRODUCTION

Disaster is an event or a series of events that result in casualties, property damage, environmental destruction, and the loss of life. One of the natural disaster factors that frequently occurs in Indonesia is earthquakes, as Indonesia is the convergence point of three active tectonic plates: the Indo-Australian plate, the Eurasian plate, and the Pacific plate. Given this situation, Indonesia faces various disaster threats that can occur at any time (Hermon, 2021).

According to data from the National Disaster Management Agency (2018), Indonesia experienced 143 earthquake events and 5 tsunami events in the last ten years. In Aceh alone, there were 21 earthquake events and 2 tsunami events during the same period. Banda Aceh is located in a disaster-prone area for earthquakes due to its proximity to the Indonesian Ocean, where the Eurasian and Australian plates meet. Besides undersea earthquakes, Banda Aceh is also vulnerable to on-land earthquakes due to the nearby Sumatra fault line. The 2004 tsunami in Aceh resulted in extensive damage to infrastructure, property, and loss of life. According to data from the Provincial Disaster Management Agency of Banda Aceh, the 2004 earthquake and tsunami disaster claimed the lives of 165,708 people, with 37,063 reported missing and approximately 100,000 people suffering injuries, both severe and minor.

One of the most perilous places during earthquakes and tsunamis is educational facilities, as they are vital structures with many individuals, especially during school hours. School buildings are vulnerable to various hazards. In 2018 alone, the National Disaster Management Agency reported that 77 educational facilities were damaged in Indonesia. This data illustrates the significant impact of school damage, especially classrooms, which disrupts the normal teaching and learning process. Therefore, both teachers and students need to be prepared to prevent casualties when facing earthquake and tsunami disasters.

Self-efficacy plays a crucial role in various aspects, especially in disaster management, where individuals must believe in their abilities to confront and overcome challenges. Self-efficacy refers to an individual's belief in coordinating skills and abilities to achieve positive outcomes when facing and addressing various issues. Self-confidence also affects an individual's stress levels and experiences of anxiety in different situations.

Disaster preparedness is defined as actions taken to enhance personal safety during disasters (Rinaldi, 2009). It also includes actions designed to protect property from damage and chaos resulting from disasters, as well as the ability to engage in restoration and early recovery activities after a disaster. Several factors contribute to the high number of casualties in earthquakes, including the lack of public knowledge about disasters and the inadequate preparedness of communities in anticipating these events. For earthquakes, many victims perish due to being trapped in rubble from collapsed buildings.

Research conducted by Spittal et al. (2005, as cited in Rinaldi, 2009) on optimistic bias in earthquake preparedness indicates that an optimistic attitude among the public can provide confidence in facing future disasters. This aligns with Bandura's concept of self-efficacy, as Major (1999, as cited in Rinaldi, 2009) states that individuals have the belief and ability to act or control situations during disasters. Self-efficacy possessed by an individual can be assessed based on three dimensions. Firstly, the level dimension refers to the extent to which someone believes in the efforts or actions they can undertake. Secondly, the strength dimension pertains to the self-confidence that exists within an individual. Thirdly, the generality dimension is defined as the versatility of the self-efficacy a person possesses, allowing them to apply it in different situations (Al, 2009).

Disaster preparedness is defined as actions aimed at enhancing personal safety during disasters, such as protective actions during earthquakes and hazardous material spills. The Indonesian Institute of Sciences (LIPI) conducted research in three areas: Aceh Besar Regency, Bengkulu City, and Padang City. The study aimed to assess disaster preparedness levels (knowledge of disaster risks, emergency response plans, early warning systems, and resource mobilization). The findings showed that school disaster preparedness levels were lower than those of the general public and authorities. From these findings, it can be concluded that schools are vulnerable public spaces. Schools play a crucial role in early disaster prevention and mitigation. Teachers have significant responsibilities in educating, assisting, and guiding students. One aspect of a teacher's responsibility is supporting students in developing psychological responses, including disaster risk. Therefore, schools significantly influence students' knowledge of disaster preparedness through the support provided, such as school attitudes and actions, school policies, preparedness planning, and resource mobilization.

Based on preliminary research conducted on December 19, 2018, where interviews were conducted with five students within the school environment, it was found that in the

event of an earthquake, even a small one, students still panic, become confused, and afraid. Two of them did not even know the correct self-rescue actions during a disaster. The factors causing students to panic, become confused, and afraid include the school's proximity to the coastline. Moreover, Aceh has experienced numerous earthquakes, especially given its history of the 2004 earthquake and tsunami disaster. SMA Negeri 13 Banda Aceh is a school at high risk of earthquakes and tsunamis compared to other high schools in Banda Aceh, mainly due to its location close to the coastline. Therefore, this research aims to determine the relationship between self-efficacy and earthquake and tsunami disaster preparedness among students of SMA Negeri 13 Banda Aceh.

2. LITERATURE REVIEW
2.1. Disaster Concept

A disaster is an unforeseen situation that results in damage, loss of human lives, destruction of property, houses, belongings, and potentially affects animals and plants. Natural disasters are events caused by natural occurrences. Disasters can happen gradually over time or suddenly, without warning signs. Disasters often cause panic among the population and lead to prolonged suffering and sadness, including injuries, deaths, economic pressures due to loss of businesses or jobs, wealth, family members, as well as infrastructure and environmental damage (Jokowinarno, 2011).

2.2. Preparedness Concept

Preparedness consists of a series of activities aimed at anticipating disasters through proper and effective organization and measures (Paramesti, 2011). Preparedness involves actions taken to anticipate a disaster to ensure that actions can be carried out correctly and effectively during and after a disaster. According to the disaster preparedness framework developed by LIPI-UNESCO, preparedness is categorized into four parameters: 1) Knowledge and attitudes towards disaster risks, 2) Emergency response plans, 3) Disaster warning systems, and 4) Resource mobilization.

2.3. Self-Efficacy Concept

Self-efficacy is one's ability to self-regulate. The concept of self-efficacy was first proposed by Bandura, who defined it as an individual's belief in their ability to control their functioning and events in their environment. Self-efficacy has three dimensions:

a. Level Dimension: This dimension pertains to the individual's belief in their ability to undertake specific actions or tasks. It is related to the level of difficulty faced by an individual when dealing with a particular problem. If individuals are presented with tasks of varying difficulty levels, their self-efficacy may be limited to tasks they find easy, moderate, or even those considered most challenging, depending on their perceived ability to meet the behavioral demands required at each level.

b. Strength Dimension: The strength dimension relates to an individual's confidence in their ability to achieve specific performances. It concerns the level of strength or weakness in an individual's belief or expectations about their abilities. Low confidence in one's abilities makes them vulnerable to discouragement when faced with unsupportive experiences, whereas high confidence encourages individuals to persist in their efforts, even in the face of less supportive experiences. This

dimension is closely associated with the level dimension, as the higher the task's difficulty level, the weaker the perceived belief in completing it (Nur, 2016).

c. Generality Dimension: Generality refers to the adaptability of an individual's self-efficacy beliefs for use in different situations. It concerns the breadth of an individual's behavioral belief in their ability to achieve success. Individuals may either have confidence limited to specific activities and situations or extend their confidence to a range of varied activities and situations.

These dimensions collectively contribute to an individual's overall self-efficacy, influencing their behavior and responses in various situations and challenges.

3. RESEARCH METHODS

This study employs a descriptive correlational research method with a cross-sectional study design approach. The descriptive method is used to provide a clear overview of the relationship between the variables under investigation. The correlational method is utilized to identify the relationship or correlation between two or more variables. The cross-sectional study design approach collects data at a single point in time, aiming to evaluate the relationship between self-efficacy and earthquake and tsunami disaster preparedness among students of SMAN 13 Banda Aceh.

The population for this research comprises all students from grades X, XI, and XII at SMAN 13 Banda Aceh, with a total population of 44 students. The selection of the entire population as the research sample is done using the total sampling method to ensure that all population members become research subjects. This allows the study to provide more representative results concerning self-efficacy and earthquake and tsunami disaster preparedness among SMAN 13 Banda Aceh students. This research was conducted at SMAN 13 Banda Aceh on March 11, 2019. The choice of timing and location is in line with the research objectives and enables the collection of relevant data pertaining to the students' conditions at that time.

4. RESULTS AND DISCUSSION
4.1. Characteristics of Respondents

The identity of the respondents can be seen from table 1 below:

Table 1. Frequency Distribution
Based on Demographic Data of Students (N=44)

Categories	(n)	(%)
Age		
15 years old	2	4.5
16 years old	13	29.5
17 years old	19	43.2
18 years old	7	15.9
19 years old	3	6,8
Total	**44**	**100**
Gender		
Boy	32	72.7

Girl	12	27.3
Total	**44**	**100**
Class		31.8
X	14	38,6
XI	17	29,5
XII	13	
Total	**44**	**100**

Based on table 1 above, it can be seen that the age of the respondents of the 44 respondents who were mostly 17 years old, namely 19 students with (43.2%), seen from the gender of the 44 respondents who were mostly male, namely 32 students with (72.7%), and seen from the class of 44 respondents who were mostly in class XI, namely 17 respondents with (38.6%).

Table 2. Relationship Between Self-Efficacy
and Earthquake & Tsunami Disaster Preparedness (N=44)

| Self Efficacy | Kesiapsiagaan | | | | | | | | | | Jumlah | | P-Value | α |
| | Sangat Siap | | Siap | | Hampir Siap | | Kurang Siap | | Belum | | | | | |
	f	%	f	%	f	%	f	%	f	%	f	%		
Tinggi	10	83,3	2	16,7	0	0	0	0	0	0	12	100		
Sedang	1	5.6	6	33,3	6	33,3	3	16,7	2	11,1	18	100	0,001	0,05
Rendah	5	35,7	3	21,4	1	3,1	1	7,1	4	28,6	14	100		
Jumlah	16	36,4	11	25,0	7	15,9	4	9,1	6	13,6	44	100		

Table 2 above shows 18 respondents with moderate self-efficacy, 6 respondents (33.3) whose preparedness is between ready and almost ready. 6 respondents (33.3) whose preparedness was between ready and almost ready, while there were 14 respondents with low self-efficacy, whose preparedness was less ready. 1 respondent (7.1). This shows that student preparedness is more dominant.

Table 3. Relationship Between the Magnitude Level Dimension
and Earthquake & Tsunami Disaster Preparedness (n=44)

| Self Efficacy | Kesiapsiagaan | | | | | | | | | | Jumlah | | P-Value | α |
| | Sangat Siap | | Siap | | Hampir Siap | | Kurang Siap | | Belum | | | | | |
	f	%	f	%	f	%	f	%	f	%	f	%		
Tinggi	10	76,9	3	23,1	0	0	0	0	0	0	13	100		
Sedang	1	5,3	5	26,3	6	31,6	3	15,8	4	21,1	19	100	0,007	0,05
Rendah	5	41,7	3	25,0	1	8,3	1	8,3	2	16,7	12	100		
Jumlah	16	36,4	11	25,0	7	15.9	4	9,1	6	13,6	44	100		

Table 3 above shows that there are 19 respondents whose level dimension (magnitude level) is moderate, there are 6 respondents (33.3) whose preparedness is almost ready, while the low-level dimension (magnitude level) is 12 respondents, whose preparedness is less ready 1 respondent (8.3%). This shows that student preparedness is more dominant.

**Table 4. Relationship between Strength Dimension
and Earthquake & Tsunami Disaster Preparedness (n=44)**

Self Efficacy	Kesiapsiagaan													Jumlah		P-Value	α
	Sangat Siap		Siap		Hampir Siap		Kurang Siap		Belum								
	f	%	f	%	f	%	f	%	f	%	f	%						
Tinggi	7	100	0	0	0	0	0	0	0	0	7	100					0,002	0,05
Sedang	4	18,2	8	36,4	3	13,6	3	13,6	1	4,5	22	100						
Rendah	5	33,3	3	20,0	1	6,7	1	6,7	5	33,3	15	100						
Jumlah	16	36,4	11	25,9	4	9,1	4	9,1	6	13,6	44	100						

Table 4 above shows 2 respondents whose strength dimension is moderate, there are 8 respondents (36.4) whose preparedness is between ready, while those with a low strength dimension are 15 respondents, whose preparedness is almost ready and less ready 1 respondent (7.1). This shows that student preparedness is more dominant.

**Table 5. Relationship between Generalization Dimension
and Earthquake & Tsunami Disaster Preparedness (n=44)**

Self Efficacy	Kesiapsiagaan													Jumlah		P-Value	α
	Sangat Siap		Siap		Hampir Siap		Kurang Siap		Belum								
	f	%	f	%	f	%	f	%	f	%	f	%						
Tinggi	10	100	0	0	0	0	0	0	0	0	10	100					0,001	0,05
Sedang	2	8,3	8	33,3	6	25,0	3	12,5	5	20,0	24	100						
Rendah	4	40,0	3	30,0	1	10,0	1	10,0	1	10,0	10	100						
Jumlah	16	36,4	11	25,0	7	15,9	4	9,1	6	13,6	44	100						

In Table 5 above, it was found that there were 24 respondents with a moderate level of generalization, among whom 8 respondents (33.3%) were categorized as well-prepared. On the other hand, among those with a low level of generalization, there were 10 respondents, and only 1 respondent (7.1%) was categorized as less prepared. This indicates that students' preparedness is more dominant.

5. CONCLUSION

This research sheds light on the significant correlation between self-confidence and students' preparedness for earthquake and tsunami disasters in SMAN 13 Banda Aceh. It underscores the pivotal role that self-confidence plays in influencing students' readiness and proactive behavior in disaster situations. These findings underscore the importance of integrating self-confidence enhancement programs into the school curriculum and disaster preparedness initiatives. Moreover, educational institutions should consider engaging teachers in fostering self-confidence among students and inculcating disaster awareness, as teachers can serve as vital facilitators in promoting self-efficacy and preparedness among the student population. Future research in this domain should delve deeper into assessing the effectiveness of targeted interventions aimed at building self-

confidence and disaster preparedness while exploring the nuances of the teacher-student dynamics that contribute to improved disaster resilience in disaster-prone areas.

Furthermore, it is recommended that schools and educational authorities devise comprehensive disaster preparedness programs that encompass not only theoretical knowledge but also practical training exercises, drills, and simulations to bolster students' confidence and competence in dealing with real disaster scenarios. Additionally, collaboration with local disaster management agencies and community involvement can further enhance students' readiness, creating a network of support that extends beyond the school premises. In this context, ongoing research should focus on refining these educational strategies and evaluating their long-term impact on students' ability to respond effectively to earthquake and tsunami disasters. Ultimately, such initiatives can contribute significantly to building resilient communities and reducing the vulnerability of individuals, especially in disaster-prone regions like Banda Aceh.

REFERENCES

Al, W. (2009). *Psikologi kepribadian*. Malang: UMM Press.

Hermon, D. (2021). *Geografi Bencana Alam-Rajawali Pers*. PT. RajaGrafindo Persada.

Jokowinarno, D. (2011). Mitigasi bencana tsunami di wilayah pesisir lampung. *Jurnal Rekayasa*, *15*(1), 13–20.

Nur, M. (2016). *Teori-teori Psikologi*.

Paramesti, C. A. (2011). Kesiapsiagaan masyarakat kawasan Teluk Pelabuhan Ratu terhadap bencana gempa bumi dan tsunami. *Jurnal Perencanaan Wilayah Dan Kota*, *22*(2), 113–128.

Rinaldi, R. (2009). Readiness in Facing Disasters on Indonesian People. *Jurnal Psikologi*, *16*(1).

Badan Nasional Penanggulangan Bencana 2018. Availble from : http://dibi.bnpb.go.id/dibi/. [diakses 10 november 2018]

https://id.wikipedia.org/wiki/Daftar_gempa_bumi_di_Indonesia [diakses 17 november 2018]

https://bpba.acehprov.go.id/ [diakses 10 November 2018]. LIPI-UNESCO/ISDR. 2006. Kajian Kesiapsiagaan masyarakat dalam Mengantisipasi bencana Gempa Bumi dan Tsunami. Meliputi ilmu Pengetahuan Kebumian Lembaga Ilmu pengetahuan indonesia

Pusat Krisis Fakultas Psikologi Universitas Indonesia. 2012. The 4th Learning From Japan Symposium. [diakses 10 november 2018]

Feist, J., dan Feist, G.J. 2010. Teori kpribadian, Jakarta : Salemba Humanika

Jeanne E,Ormrod,. 2008. Psikologi Pendidikan. Jakarta : Erlangga

Bandura (dalam Shohifatul,2012;27) Izzah, Shohifatul Izzah.2012.Perbedaan Tingkat Self Efficacy Antara Mahasiswa Fakultas Psikologi Dan Sains Dan Teknologi Universitas Islam Negeri Uin Malik Ibrahim

Bandura, A. 1997. Self Efficacy The exercices of control. New York: W.H Freeman and company