# DISASTER RISK PERCEPTION AND PREPAREDNESS: A CROSS-SECTIONAL STUDY OF SENIOR HIGH SCHOOL STUDENT

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## ABSTRACT

Earthquakes are unpredictable, making disaster preparedness essential. Risk perception is key, but its relationship with preparedness remains inconsistent. To analyze the relationship between risk perception and disaster preparedness. A cross-sectional study with 73 high school students selected via accidental sampling from a population of 1,509. Risk perception was measured using PRISM (S-CVI/ave = 0.9; reliability r = 0.95, p < 0.001), and preparedness using LIPI/UNESCO-ISDR (validity 0.566–0.895; reliability 0.969). Data were analyzed using descriptive statistics and Pearson correlation. Most students had low-risk perceptions (50.7%) but were categorized as prepared (64.4%). No significant correlation was found (p = 0.1, r = -0.19). Disaster knowledge significantly influenced preparedness (p < 0.05). Disaster knowledge affects preparedness more than risk perception. Schools should integrate disaster education into curricula, collaborate with BPBD, and empower extracurricular programs like PMR and Scouts.

**Keywords**: Earthquake, Preparedness, Risk Perception, Students

## INTRODUCTION

Indonesia is an archipelagic country with a very high risk of natural disasters. In 2023, Indonesia ranked second out of 189 countries with the highest natural disaster risk in the world (Frege et al., 2023). Over the past 10 years, disaster events in Indonesia have consistently increased annually (BPBD, 2024; Rosyida et al., 2024). In 2023, 5,400 disasters occurred, most of which happened I West Java. Compared to other regions, West Java experienced the highest number of earthquakes (BPBD, 2024; Rosyida et al., 2024).

The impact of earthquake disasters can affect anyone, including students at schools. Schools are vital structures where many individuals gather, especially during learning hours (Syarif & Mastura, 2015). One of the regions with a high risk of disaster impact is Bandung Regency. This area has the highest number of students in West Java (Kemendikbudristek, 2024). Additionally, Bandung Regency is located in the southern Bandung basin, which is tectonically influenced by active faults, such as the Cileunyi-Tanjungsari Fault and the Cicalengka Fault (Setianegara et al., 2023). These active faults are still shifting, posing a risk of earthquakes (Adi, 2024; Rasmid, 2014; Subagio, 2018).

To reduce the risks caused by earthquakes, all students need to adapt to the disaster risks in their area by improving their disaster preparedness. Every student has to understand and take responsibility for disaster preparedness (Sasmito & Ns, 2023; Susanti et al., 2014). One of the keys to surviving an earthquake and minimizing injuries is through planning, preparation, and drills for earthquake disasters (CDC, 2024). Therefore, disaster preparedness plays a critical role in reducing the impact of earthquakes.

Preparedness is influenced by several factors, one of which is risk perception. Risk perception is characterized as a psychophysical assessment of something felt based on experience and an object, event, or situation, which then leads to actions taken by the individual perceiving the object (Anuar et al., 2020; Soemanagara, 2006).

Given the high risk of disaster impact on students in Bandung Regency, it is important to research the relationship between risk perception and disaster preparedness among high school students. This study is crucial as it is expected to provide a deeper understanding of how risk perception can contribute to preparedness.

## LITERATURE REVIEW

According to the psychometric theory proposed by (Slovic et al., 1986), risk perception refers to how individuals assess hazards or risks they face, often differing from scientific or objective evaluations. This is because risk perception is influenced more by fear, uncertainty, and views on the seriousness of the risk, and the extent to which individuals feel they can control it (Slovic et al., 1986).

Risk perception arises when individuals feel a potential threat to their safety or well-being, such as the danger posed by disasters (Lynch et al., 2024). For example, risk perception before Hurricane Sandy influenced trust in authorities and exacerbated post-disaster recovery challenges (Lynch et al., 2024). Moreover, risk perception plays a crucial role in disaster management, as it is linked to disaster mitigation behaviors both before and during an event (Cai et al., 2023).

According to Law No. 24 of 2007, preparedness is a series of activities to anticipate disasters through proper and effective organization and measures. Preparedness also enables individuals or communities to respond effectively and recover more quickly when disasters occur while ensuring that the resources needed for response are readily available and effective (Sutton & Tierney, 2006). Preparedness is a continuous process regularly evaluated based on environmental changes, staff turnover, and new information and technologies (ICN, 2009).

Previous studies have shown that risk perception relates to disaster preparedness (Domingues et al., 2021; Leung, 2022). However, not all studies indicate a relationship between risk perception and preparedness (Tang & Feng, 2018). Some research shows that risk perception is not a primary predictor and is unrelated to preparedness. Therefore, this study analyzes the relationship between risk perception and disaster preparedness. This study analyzes the relationship by considering other factors, such as the characteristics of the population studied. Specifically, this study seeks to answer the following research questions: (1) How does the risk perception of senior high school

students relate to their disaster preparedness? (2) Are there any significant differences in disaster preparedness among students based on their risk perception?

## RESEARCH METHODS

This research design is a non-experimental quantitative analytical study using a cross-sectional approach. The independent variable is disaster risk perception, and preparedness is the dependent variable.

This study's population consists of 1,509 students. The sampling technique used is accidental sampling. This technique was chosen because an extraordinary event occurred during the data collection at the School, causing some challenges in the data collection process. As a result, 78 students participated in the study.

The instrument used in this study is the PRISM (The Pictorial Representation of Illness and Self-Measure) to measure risk perception. The PRISM instrument is a simple visual measurement tool developed by Tom Sensky and Stefan Buchi to assess patients' health perception and coping capacity (Büchi et al., 1998, 2002). According to Sensky and Buchi, the PRISM technique allows respondents to describe themselves more broadly (Sensky & Büchi, 2016).

The instrument was then adapted by (Parham et al., 2015) to assess multi-hazard risk perception relative to changes in geography education, and the PRISM tool was found to be easily understood. The instructions for the instrument were originally in English and later translated by the language center. This tool was used because it provides a simple visual representation to measure the perceived impact of hazards on respondents' current lives, and evaluate the importance of preparedness by asking respondents to place a cross (X) on the PRISM paper.

In this study, the paper-and-pencil version of PRISM was used. Respondents were asked to imagine an A4-sized paper representing their current life, with a circle in the lower-right corner representing "themselves." They were then asked where to place the earthquake hazard in their life on the PRISM paper.The distance between the center of the "self" circle and the cross indicates the perceived earthquake threat by the respondent, with a range of 0 to 26 cm. This distance was analyzed statistically, with a higher distance indicating a lesser perceived threat to the respondent's life.

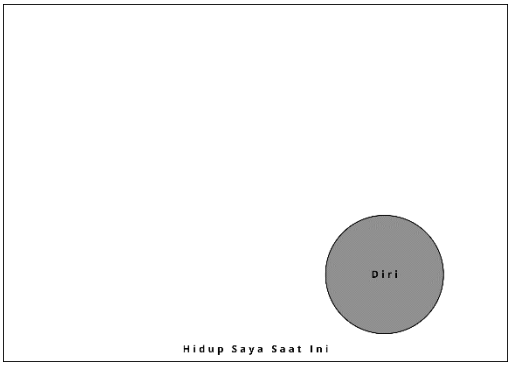


Figure 1. PRISM Visual Representation Sheet

Several instructions in Indonesian are given to the respondents before they fill out the PRISM sheet, which are as follows:

a. Saya ingin memahami lebih baik mengenai bagaimana bahaya alam gempa bumi di daerah Anda memengaruhi kehidupan Anda saat ini.
b. Saya ingin Anda melihat bahwa template putih di bawah ini mewakili kehidupan Anda saat ini.
c. Lingkaran di pojok kanan bawah melambangkan 'diri Anda'
d. Tanda silang (X) melambangkan bahaya gempa bumi.
e. Di mana Anda akan menempatkan bahaya gempa bumi untuk mencerminkan ancaman terhadap kehidupan Anda saat ini? Tuliskan bahaya tersebut dengan tanda silang (X) pada lembar kertas dan tidak melewati garis.

The PRISM instrument was validated by four disaster nursing experts, yielding an S-CVI/ave of 0.97 and an S-CVI/UA of 0.83, indicating good content validity (Shi et al., 2012). It also showed high reliability, with test-retest reliability of $r = 0.95$, $p < 0.001$, and interrater reliability of $r = 0.79$, $p < 0.001$ (Büchi et al., 2002; Büchi & Sensky, 1999).

Preparedness was measured using the LIPI/UNESCO-ISDR (2006) instrument, which assesses school earthquake and tsunami preparedness across four parameters: disaster knowledge and attitudes, emergency plans, warning systems, and resource mobilization. The instrument demonstrated strong validity (item validity: 0.566–0.895, r-table = 0.361) and high reliability (Cronbach's Alpha = 0.969) (Wihayati, 2018). The Universitas Padjadjaran Research Ethics Committee approved the study with ethical approval number 636/UN6.KEP/EC/2024.

Univariate analysis used descriptive statistics and frequency distribution. Numerical data, such as risk perception and disaster preparedness, were analyzed for mean, minimum, maximum, and standard deviation. Risk perception and preparedness levels were analyzed using frequency distribution and percentages. Demographic data, such as gender, were also analyzed with frequency distribution and percentages.

## RESEARCH RESULT

Therespondent characteristics were described using frequency and percentage distributions. The study involved 73 students, mostly female (56.2%, 41 students; Table 1).

**Table 1. Student Characteristic (n=73)**

| Characteristic | Frequency (n) | Percentage (%) |
|---|---|---|
| Gender | | |
| Male | 32 | 43,8 |
| Female | 41 | 56,2 |

Risk perception data (Table 2) showed an average perceived hazard distance of 17.3 ± 4.23 cm, indicating a relatively low-risk perception with minimal data variability. The smallest perception distance was 7.3 cm, and the largest was 24.9 cm.

**Table 2. Overview of Risk Perception and Disaster Preparedness (n=73)**

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Risk perception | 17,3 | 4,23 | 7,3 | 24,9 |
| Preparedness | 65,8 | 7,9 | 41 | 84 |

Based on the analysis of students' risk perception levels (Table 4), the majority (50.7%, 37 students) had low-risk perception, with 11% (8 students) having very low perception. This indicates that most students perceive the risk of earthquakes at their school as minimal. Only 4.1% (3 students) perceived the risk as high, and none perceived it as very high. Meanwhile, 34.2% (25 students) perceived the risk as moderate, reflecting some awareness of earthquake risks, albeit not strongly.

Regarding preparedness levels (Table 4), most students (64.4%, 47 students) were in the "ready" category, indicating they were prepared to face earthquakes. However, 35.6% (26 students) fell into the "less ready" and "almost ready" categories, highlighting the need for improvement in disaster preparedness.

**Table 3. Combined Preparedness Index Value Of All Student**

| Preparedness Index | Nilai |
|---|---|
| Preparedness | 66,5 |
| Knowledge and attitude | 71 |
| Emergency planning | 70,9 |
| Disaster warning | 58,2 |
| Resource mobilization | 49 |

Based on the combined preparedness assessment of all students (Table 3), the overall preparedness score is 66.5, indicating that students are generally in the "ready" category. For the knowledge and attitude parameter, students scored 71, placing them in the "ready" category. This suggests they have a basic understanding and a positive attitude toward disaster preparedness. The emergency planning parameter scored 70.9, also categorized as "ready," indicating that students generally have an emergency plan.

Students scored (58,2) for the disaster warning system parameter, placing them in the "almost ready" category. This suggests gaps in recognizing and responding to disaster warnings effectively. Meanwhile, students scored (49), for the resource mobilization parameter, falling into the "not ready" category, indicating a lack of preparedness in managing resources for emergencies.

**Table 4. Level Of Risk Perception And Disaster Preparedness**

| Variable | Frequency (N) | Percentage (%) |
|---|---|---|
| Risk Perception | | |
| Very low | 8 | 11 |
| Low | 37 | 50,7 |

| | | |
|---|---|---|
| Moderate | 25 | 34,2 |
| High | 3 | 4,1 |
| Very high | 0 | 0 |
| Disaster Preparedness | | |
| Not ready | 0 | 0 |
| Not ready enough | 9 | 12,3 |
| Almost ready | 17 | 23,3 |
| Ready | 47 | 64,4 |
| So ready | 0 | 0 |

The Pearson correlation analysis (Table 5) revealed a significance value of 0.10 ($p > 0.05$), indicating no statistically significant relationship between risk perception and disaster preparedness. The correlation coefficient was -0.19, showing a very weak negative relationship. This suggests that as students' risk perception slightly increases, their disaster preparedness decreases slightly, and vice versa. However, due to the lack of statistical significance, these findings cannot be generalized to the population or considered meaningful. Therefore, it can be concluded that there is no significant relationship between risk perception and disaster preparedness among students.

**Table 5. Relationship Between Risk Perception And Disaster Preparedness**

| Variable | Mean | Standard Deviation | *p* | r |
|---|---|---|---|---|
| Risk perception | 17,3 | 4,23 | 0.1 | -0.19 |
| Preparedness | 65,8 | 7,9 | | |

## DISCUSSION

### Disaster Risk Perception

This study found that students have a low-risk perception. The results showed that the average risk perception distance among students was 17.3 ± 4.23 cm (Table 2), with most students having a low level of risk perception (Table 4). This indicates that students perceive their school as not risky and feel safe from earthquake hazards. The low-risk perception among students is likely influenced by a large psychological distance, which affects how students think about disaster risks. This cognitive process can be explained by Construal Level Theory (CLT), which posits that an individual's perception of an object is influenced by their psychological distance (Trope et al., 2007). There are four types of psychological distances: social, spatial, temporal, and hypothetical. Among these, students were found to have a relatively distant hypothetical distance, while their social, spatial, and temporal distances were relatively close.

First, regarding social distance, students demonstrated high behavior in sharing disaster knowledge with their peers (65.8%) (**Error! Reference source not found.**). This social proximity indicates a sense of similarity among students and others, which can influence their perceptions and actions (Trope et al., 2007). This suggests that the students' social distance is close, where their similarities with peers encourage interaction and mutual influence in sharing disaster knowledge. Second,

concerning spatial distance (where the event occurs), the School is geographically located near earthquake sources, including the Lembang Fault, the Cileunyi-Tanjungsari Fault, and the Cicalengka Fault (Pratama, 2021; Setianegara et al., 2023). This close location indicates that the school is objectively situated in an area with significant earthquake hazard potential.

Third, regarding temporal distance (when the event occurs), 63% of students understand that earthquakes are unpredictable events, indicating a close temporal distance. This proximity in temporal distance necessitates constant preparedness, which is reflected in their attitudes, as 93.2% of students consider self-rescue drills important to prepare for earthquake disasters (**Error! Reference source not found.**).

The three distances proximity is sufficient to increase students' risk perception regarding disasters. Looking at the fourth psychological distance, namely hypothetical distance (the likelihood of occurrence), students have not experienced its direct impact on their school environment. However, the School is located in an earthquake-prone area. The PRISM distance, which reflects the perception of earthquake threats, also tends to be low, indicating that students' hypothetical distance is far. This can lead students to perceive that earthquakes at school are unlikely to impact them. The low hypothetical distance contributes to students' low-risk perception, as all four psychological distances are interconnected and play a role in various aspects of life, including evaluating a potential hazard (Wang et al., 2021). In CLT, this far psychological distance leads students to think abstractly. An object interpreted abstractly tends to be seen as something distant and is evaluated by focusing only on the bigger picture (Wang et al., 2021).

These findings support a study by (Mohammad, 2019) on high school students in Savar City, Bangladesh. The study found that 83.4% of students felt their homes were at high risk of earthquakes, but only 49.2% considered the Savar City area to be at risk of earthquakes. This shows that risks closer to home tend to be perceived as more real and specific, while risks in broader areas feel more abstract and lower in perception. The findings of this study are also consistent with research conducted by (Domingues et al., 2021), which found low disaster risk perception among 131 residents of Portugal and (Domingues et al., 2021) found that this low-risk perception was influenced by risk perception normalization, a condition where individuals accept the existing disaster risks as part of their living environment.

Therefore, it is essential to improve students' disaster risk perception. Enhancing this perception can begin by reducing students' psychological distance, particularly the hypothetical distance, by making students realize that earthquakes will inevitably occur, even though they cannot be predicted. Therefore, a feasible program is a field-based education to increase risk perception, making it more concrete and tangible. Field-based education activities involve observing disaster risk locations firsthand. This type of field-based learning has been proven to increase students' disaster risk awareness (Parham et al., 2021). The activities aim to expose students directly and tangibly to local disaster risks while encouraging experiential learning

through observation and expert interaction (Parham et al., 2021).

The activities are conducted by having students identify and map safe zones in their local area before visiting disaster-prone sites. Additionally, students observe evidence of past disasters, such as damage to buildings caused by disasters, and then discuss potential risks. After returning from the field, students are asked to reassess the safe zones they evaluated earlier and update their assessments based on their new knowledge. The findings demonstrate a significant difference ($p < 0.05$) in students' perceptions of disaster risks after participating in field-based learning activities (Parham et al., 2021). These activities connect theoretical knowledge with concrete real-world examples, enabling students to see risks more clearly and understand them more easily. Furthermore, students can improve their understanding and be encouraged to take proactive safety measures when facing earthquake disasters.

This approach is important because limited knowledge and information about risks often lead individuals to rely on intuition or emotional experiences to assess risks (Andrei, 2019). Moreover, understanding disaster risks more concretely can enhance students' awareness that earthquakes will inevitably occur. According to Kolb's Experiential Learning Theory, experience is crucial in learning, as it helps students retain knowledge through interaction and experience with their environment (Kolb, 2014; Parham et al., 2021). Meanwhile, Bandura's Social Cognitive Theory and Vygotsky's Social Learning Theory emphasize that optimal learning occurs through continuous observation and social interaction, suggesting that understanding does not necessarily happen in a single training session (Aubrey & Riley, 2018). Therefore, concepts and skills must be reinforced through repetition, hands-on actions, and discussions with experts or facilitators (Aubrey & Riley, 2018).

**Disaster Preparedness**

Based on the research findings, overall, students are categorized as prepared overall. This indicates that students possess sufficient basic knowledge and skills to face earthquake disasters. However, none of the students have reached the "very prepared" category, meaning no students have achieved optimal preparedness for an earthquake disaster. Good knowledge and attitudes readiness for earthquake disaster preparedness. As many as 68.5% of students have a level of knowledge categorized as prepared (Table 3). The majority of students understand the definition of disasters, types, causes, signs, and specific knowledge, such as first aid (91.8%), rescue and evacuation (90.4%), and disaster warnings (84.9%) (**Error! Reference source not found.**). This indicates that students understand earthquake disaster well and the necessary steps to take when facing them.

This knowledge about disasters is acquired through various sources, such as radio and TV media (95.9%) and schools (91.8%), which provide disaster-related materials in the form of books (74%), posters, leaflets, comics, and newspaper clippings (86.3%), VCDs and tapes (53.4%), and earthquake lessons in school (94.5%) (**Error! Reference source not found.**). This highlights schools important roleplay in increasing students' disaster knowledge through various resources. This knowledge not only strengthens students' understanding but also shapes positive attitudes

toward preparedness. As many as 97.3% of students realize the importance of gaining knowledge about earthquakes to reduce disaster risks (**Error! Reference source not found.**), and 39.7% of students are categorized as prepared in planning for earthquakes, including knowing the necessary steps to take and utilizing supporting facilities at school. This indicates that students understand that being prepared for an earthquake can reduce risks.

Students' knowledge and attitudes are important in facing earthquakes. Attitudes toward earthquake disasters can determine an individual's behavior, enabling them to face such situations without anxiety or panic (Alkalash et al., 2023; Lisnasari, 2018). Students' knowledge and attitudes are reflected in their disaster preparedness plans, which are categorized as prepared with an index score of 70.9 (Table 3). The majority of students (39.7%) fall into the prepared category, knowing what needs to be prepared before an earthquake occurs, understanding priorities during an earthquake, and accessing supporting materials and facilities at school.

However, despite students having good knowledge and attitudes toward disaster preparedness, their practical skills are still lacking, especially in the parameter of resource mobilization. This parameter reflects students' participation in practice-based activities that can support their disaster preparedness, such as joining the junior medical team, the Youth Red Cross (PMR), and Scouts, participating in training and evacuation simulations, as well as disaster-related activities.

The findings show that the resource mobilization parameter for students is categorized as not ready, with an index score of 48 (Table 3), and the majority of students are categorized as less prepared (28.8%) (Table 4). Although students' participation in disseminating disaster information is relatively high, their involvement in school-based practice activities such as junior medical teams, PMR, Scouts, and evacuation training and simulations shows limited participation (**Error! Reference source not found.**). The low participation of students in practice-based activities is suspected to be due to school policies requiring students to choose only one extracurricular activity, with membership limits for each activity. As a result, many students opt for other extracurriculars, preventing practice-based plans from being optimally implemented.

The importance of practical activities is supported by research (Andespa & Fauzi, 2021), which found low disaster preparedness among 154 students. (Andespa & Fauzi, 2021) stated that the low preparedness of students for earthquake disasters is due to schools not facilitating training or socialization on the necessary steps to take during an earthquake, and schools not integrating earthquake disaster preparedness materials into classroom lessons.

This finding is also supported by research (Nurkholifah & Sumunar, 2021), which showed that high resource mobilization among students is achieved through high participation in extracurricular activities such as Scouts and the Youth Red Cross (PMR). This is attributed to school policies requiring students to participate in Scouts. This study aligns with the findings of (Khotimah et al., 2019), which showed that students' preparedness levels fell into the "very prepared" category. This high

level of preparedness was achieved through school collaborations with the local Disaster Management Agency (BPBD) to conduct annual consultations and disaster simulations.

The lack of practical activities calls for schools to make efforts to enhance students' resource mobilization. The importance of practical disaster education is underscored by the fact that 84.9% of students feel the need for self-rescue training before an earthquake occurs (**Error! Reference source not found.**). However, this sentiment has yet to materialize, as evidenced by 90.4% of students never receiving rescue and evacuation knowledge and 68.5% never participating in disaster warning drills or simulations (**Error! Reference source not found.**). To maximize students' preparedness, one approach that can be implemented in schools is the disaster risk reduction (DRR) model developed by UNESCO. This model encompasses five dimensions of disaster education, one of which is safety drills and procedures (Selby et al., 2022). This dimension can be implemented through disaster simulation and evacuation drills in schools, which can be carried out in collaboration with local BPBD agencies.

However, DRR implementation is often developed and delivered by disaster agencies or non-governmental organizations that tend to neglect local contexts and involve communities only minimally (Johnson et al., 2014). As a result, such programs often face low acceptance and lack sustainability after the activities are completed (Johnson et al., 2014). Preparedness, on the other hand, is a process that must be carried out continuously and periodically evaluated (ICN, 2009). Thus, integrating DRR into the school curriculum becomes a strategic step. By incorporating the DRR model into the curriculum, schools can teach students about various hazards and preparedness strategies that are relevant to the local school context (Shah et al., 2024). Schools can also include local disaster-related content in their lessons to ensure program sustainability.

Enhancing students' preparedness through practice-based activities aligns with the Sendai Framework for Disaster Risk Reduction 2015-2030, which emphasizes strengthening individual and community capacities through four priority actions (UNDRR, 2015). One of these priority actions is to enhance disaster preparedness for effective responses (UNDRR, 2015). This can be achieved by promoting daily disaster preparedness, response and recovery drills, training, and the development of regionally-based support systems (UNDRR, 2015).

These efforts have been proven effective in increasing student preparedness. Studies by (Kamil et al., 2020), (Anggraeni, 2019), and (Putro & Alviawati, 2021), which integrated the DRR model into school curricula, showed effective results in reducing disaster risks. Therefore, the implementation of DRR is not only relevant for improving student preparedness but also contributes directly to disaster risk reduction. Moreover, the high rate of students sharing disaster knowledge and skills with others (**Error! Reference source not found.**) demonstrates the significant potential to empower students as agents of change in schools. To capitalize on this potential, schools can empower and facilitate extracurricular activities such as the Youth Red Cross (PMR) and Scouts as platforms to disseminate disaster knowledge and skills to other

students who are not part of these extracurricular activities. This approach can not only enhance preparedness but also improve students' risk perception. Intensified media dissemination can amplify public risk perception (Andrei, 2019).

Good theoretical knowledge must be complemented by practice to enable students to respond to disasters effectively. This practice-based approach not only supports individual student readiness but also trains them to share disaster-related knowledge and skills with the surrounding community.

**Relationship Between Risk Perception And Disaster Preparedness**

The results indicate no significant relationship between risk perception and student preparedness (Table 5). This suggests that risk perception does not have a strong or consistent influence on student preparedness. These findings are intriguing because, despite students having low risk perception, their preparedness falls under the "ready" category. This indicates that student preparedness is not influenced by risk perception but by other factors. To identify these influencing factors, the researchers conducted further analysis using regression analysis to determine the factors contributing to student preparedness.

Based on the results (**Error! Reference source not found.**), the knowledge parameter has a significant impact on student preparedness ($p < 0.01$), with every 1-point increase in students' knowledge score leading to a 0.54-point increase in preparedness. In contrast, other preparedness parameters and students' risk perception do not significantly affect preparedness. This indicates that students' preparedness is more influenced by their understanding of earthquakes, mitigation actions, and steps to take during an earthquake rather than their perception of earthquake risks.

The lack of a relationship between risk perception and preparedness is influenced by the school's role in enhancing students' disaster knowledge. This knowledge equips students to be more prepared for earthquakes. Schools play a key role in high preparedness levels, aligning with (Sari et al., 2019), which found a significant link between earthquake knowledge and student preparedness. Effective disaster education, including awareness programs and curriculum integration (Asiah et al., 2023; Marlyono & Triyanto, 2023), strengthens this preparedness. Conversely, (Andespa & Fauzi, 2021) found that low preparedness among Indonesian high school students resulted from a lack of disaster training and curriculum integration.

The researchers interpret risk perception from the perspective of the Construal Level Theory (CLT). Students' risk perception is influenced by a hypothetical psychological distance, making them feel that the perceived risk is irrelevant or too abstract to anticipate concretely. This disconnect may explain why risk perception does not correlate with preparedness. In contrast, disaster-related knowledge, which is more concrete, directly supports preparedness as it relates to actionable steps students can take during an earthquake.

This study contrasts with (Domingues et al., 2021), which found a relationship between risk perception and preparedness. (Domingues et al., 2021) and (Mañez et al., 2013) discovered that strong emotional attachment to one's place

of residence can moderate risk perception through a normalization mechanism. Additionally, direct disaster experiences tend to increase risk perception, though not always accompanied by adequate preparedness. (Andrei, 2019) and (Domingues et al., 2021) highlight that the relationship between risk perception and preparedness is contextual, influenced by factors such as local characteristics, emotional attachment, and individual disaster experiences.

A meta-analysis by (Valkengoed & Steg, 2019) further supports that factors such as self-efficacy, negative emotions, beliefs in effective outcomes, and social norms are primary predictors of preparedness behavior. In contrast, risk perception mainly influences the intention to adapt rather than directly driving preparedness. Moreover, (Li et al., 2019) found that disaster preparedness can also be influenced by education level, socioeconomic status, housing location, and geographical conditions. Previous study using the Theory of Planned Behavior (TPB), found a relationship ($p < 0.05$) between risk perception and preparedness (Leung, 2022). In this theory, risk perception influences disaster preparedness intention and behavior through two mechanisms: directly between risk perception, intention, and preparedness behavior, and indirectly through objective and subjective norms (Leung, 2022). However, the study also showed that risk perception alone is often insufficient to drive concrete actions without support from other factors.

In line with this study, (Tang & Feng, 2018), utilizing the Protection Motivation Theory (PMT) found no relationship between risk perception and preparedness. Risk perception could influence personal intentions regarding preparedness but is insufficient to drive concrete actions (Tang & Feng, 2018). They found that factors such as self-efficacy and behavioral intentions positively correlate with disaster preparedness behavior, while barriers such as lack of knowledge, skills, time, and financial resources negatively impact preparedness intentions and behavior. This suggests that while risk perception can shape intentions to take protective preparedness actions, actual actions can be hindered by various barriers.

This study reinforces that student preparedness is contextual. Preparedness is not solely influenced by risk perception but also by other factors such as knowledge, self-efficacy, and social norms. This aligns with the notion that preparedness is a multidimensional phenomenon influenced by social, cultural, and individual experiences. As an implication, interventions to improve student preparedness should focus on enhancing locally relevant knowledge, strengthening self-efficacy, and addressing practical barriers that may hinder preparedness efforts.

**Limitations**

This study has several limitations in its implementation. First, the small sample size was due to school policies that restricted the number of students allowed to participate in the study. Second, during the sampling process, an extraordinary event occurred, which resulted in only two classes being included. These limitations may affect the generalizability of the study's findings and provide opportunities for future research with larger and more representative samples. Third, this study did not consider risk perception based on the dimensions of psychological distance (temporal, spatial, social,

and hypothetical), which could influence how individuals understand and respond to risks. As a result, this study may not fully capture the diverse risk perceptions among participants.

## CONCLUSION

It can be concluded that the students have a low perception of earthquake disaster risk. This indicates that students do not perceive earthquake disasters as a significant threat to themselves. However, their low-risk perception does not result in low disaster preparedness. The majority of students have prepared a category when facing earthquake disasters. Students' disaster preparedness is not influenced by their risk perception. This is evidenced by the absence of a significant relationship between risk perception and earthquake disaster preparedness among students. This finding suggests that preparedness is influenced by other factors, particularly students' disaster knowledge. This knowledge is obtained through the school's role in providing disaster education.

To enhance students' risk perception and disaster preparedness, schools can implement the Disaster Risk Reduction (DRR) model developed by UNESCO and integrate it into the curriculum. Schools can introduce local content in the form of disaster education to ensure that efforts to improve risk perception and preparedness are sustained over time.

To increase risk perception, schools can organize field visits to earthquake-prone areas, such as the Lembang Fault. Before the visit, students should be tasked with identifying and mapping safe zones around the school. After returning, they can reassess these safe zones based on the new knowledge gained from the visit. This approach has been proven effective in enhancing students' risk perception. During these activities, schools can collaborate with the Regional Disaster Management Agency (BPBD) to provide students with the opportunity to discuss directly with experts during the visit. In addition to improving risk perception, this collaboration can also facilitate disaster simulations, particularly for training students in disaster preparedness.

Furthermore, to strengthen students' preparedness, schools can empower extracurricular activities such as the Red Cross Youth (PMR) and Scouts to disseminate disaster-related knowledge and skills to other students who are not involved in these activities. Future research is recommended to explore risk perception through the lens of psychological distance, including temporal, spatial, social, and hypothetical dimensions. This would provide a more comprehensive understanding of how individuals process risk perception in the context of earthquakes or other disasters.

## DAFTAR PUSTAKA

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