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# Knowledge, Attitudes, and Experiences of Adolescents on Disaster Preparedness in an Area with a High Disaster Risk Index

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## Abstract

Studies evaluating teenage knowledge, attitudes, experiences, and readiness for disasters in high-risk areas are scarce, nevertheless. Determine the elements that influence teenage readiness for disasters in an area with a high disaster risk index. 170 high school students in their eleventh grade participated in an anonymous online survey as part of a cross-sectional study design. Purposive sampling was used to choose the respondents. Surabaya was chosen as the study site because it has a high disaster risk index. The partial impact of knowledge, attitudes, experience, and disaster preparedness was determined using the t-test, and the R-Square. It was found that attitudes and prior experience regarding disaster preparedness had a partial influence. The partial test between experience and disaster preparedness and the partial test between attitude and disaster preparedness showed that teenagers in an area with a high disaster risk index had different attitudes and experiences when it came to being prepared for disasters. According to the report, high schools and the government should encourage regular training so that teenagers can get positive attitudes and more experience with disaster preparedness

**Keywords:** knowledge; attitude; experience; disaster; teenager.

## Introduction

Disasters are characterized as a state of significant disruption to a community's or society's functioning at different scales, resulting from the interplay of a distress event with exposure, susceptibility, and unpreparedness conditions. Some people had psychological impact during disaster including adolescent such as anxiety, panic, fear, and stress (Tauba et al., 2020). Disaster occur everywhere, even in Indonesia.

Geographically, Indonesia is an archipelago nation situated at the meeting point of four tectonic plates: the Indian Ocean plate, the Pacific Ocean, the Indian Continent plate, and the Asian Continent plate (Asman\* et al., 2020). The islands of Sumatra, Java, Nusa Tenggara, and Sulawesi form a volcanic arc in the southern and eastern regions of Indonesia, with lowlands that are partially covered by marshes and old volcanic mountains forming its edges. Due to this circumstance, nearly all of Indonesia's areas are in danger from more than ten different types of natural disasters. According to the World Bank, Indonesia is ranked 12th out of 35 nations for having the highest risk of natural disasters (Winanto, 2021).

Disaster risk is understood as the result of a combination of factors: the intensity and occurrence rate of a hazard, the number of people and assets exposed to it, and their susceptibility to damage. Intensive risk refers to disaster risk linked to rare but high-impact events, while extensive risk is connected to frequent events with lower impacts. (Chen et al., 2021; Reduction, 2024). Another study states that lower disaster preparedness is associated with a 1.49 times higher risk of experiencing greater disaster impacts (Hargono et al., 2023). More than 45% of



Indonesia's more than 510 cities are in areas with a high catastrophe risk index, according to the country's disaster risk index for 2021 (Adi et al., 2022). A total of 1549 natural catastrophes, including hurricanes, floods, landslides, forest fires, waves, tides, droughts, earthquakes, and volcanic eruptions, were reported by the National Agency for Disaster Management in 2020 (UNDRR & ADPC, 2020). The average annual direct damage caused by calamities over the past 15 years was roughly 20 trillion IDR. The social impact of the disaster occurred as well, with the community in the disaster area losing their family, social environment, and property (Arcaya et al., 2020). This condition causes psychological issues for disaster victims and requires immediate attention. Not only that, in mental health issue, the most reported problems were persistent grief, a state of shock and fear, maladjustment and dysfunctionality. Several victims were diagnosed with mental disorders comprising of the symptoms such as avoiding a specific situation with a fear of being rejected or humiliated; a state of constant sadness and uncertainties; failing to understand the causes and reasons behind the grief; fear of socializing and persistently avoiding social situations (Makwana, 2019). Everyone must participate in disaster preparedness efforts to reduce the impact of disasters and save as many lives and livelihoods as possible in any disaster situation, allowing the affected population to return to normalcy as soon as possible.

Disaster preparedness, particularly in areas with a high disaster risk index such as Indonesia, is a critical component of disaster management. The lack of synergy, especially in the disaster preparedness and efforts to increase mitigation is a crucial evaluation finding in Indonesia (Ayuningtyas et al., 2021). Activities in disaster preparedness include: awareness of hazards; oversight, leadership, and coordination of emergency operations; established formal and informal response agreements; securing resources to ensure effective execution of emergency tasks; safeguarding human lives; protecting property; managing emergencies and restoring essential functions; and initiating recovery efforts (Sutton & Tierney, 2006). Having a disaster anticipation plan for families and carefully practicing the plan, reducing the impact of hazards through mitigation exercises, and engaging in efforts must be carried out with the participation of many members of society. These include understanding the surrounding environment that has a potential hazard, understanding the early warning system, knowing evacuation routes, having the skills to evaluate situations quickly, and acting initiatives to protect themselves.

In studies on adolescents' knowledge, attitudes, and experiences related to disaster preparedness, key findings show that while many adolescents have a moderate understanding of disaster risks, their preparedness levels are often not sufficient. Educational interventions in schools have been shown to improve their knowledge and readiness. For example, research in disaster-prone areas suggests that regular exposure to disaster education significantly increases students' confidence in responding to emergencies. However, gaps still exist in translating this knowledge into effective preparedness actions (Seddighi et al., 2020). Numerous studies have identified adolescents as citizens aged 12 to 25 who frequently suffer severe consequences when a disaster occurs and struggle to find solutions for unforeseen events such as when a disaster situation arises in their lives, but who also have the potential to reduce disaster risks and impacts (Bessaha et al., 2021; Self-Brown, 2017). The number of adolescents in Indonesia reaches more than 27% of the Indonesian population (more than 75 million people). Adolescents have great potential, particularly in terms of rapid development of thinking skills and transitions to new roles in society. Furthermore, the adolescent age group has a high rate of post-disaster resilience. Involving youth with all their potential in disaster preparedness activities is another option. To complete this, youth must be equipped with good disaster preparedness knowledge, attitudes, and experiences.

About half of the participants (50%) had a good understanding of disaster preparedness. The most common source of their information was social media (78.8%). Despite the participants had a good understanding of disaster preparedness. The most common source of their information was social media (78.8%) (Alkalash et al., 2023). Several previous studies have found that knowledge, attitudes, and experience can all have an impact on disaster preparedness (N. Ahayalimudin et al., 2012; N. A. Ahayalimudin & Osman, 2016; Ao et al., 2020;

Arsenijević et al., 2017; Kamal et al., 2012). However, there have been few studies on assessing adolescent knowledge, attitudes, experiences, and disaster preparedness in a high disaster risk area. This research presents something new, as previous studies have focused on the general community, while in-depth studies specifically related to the knowledge, attitudes, and experiences of adolescents living in areas with a high disaster risk index are still very limited. On the other hand, this research will also contribute to the development of a more specific disaster preparedness model for adolescents, which can later be used in a disaster preparedness curriculum in schools that is more contextual and relevant to the needs of adolescents in vulnerable areas. As a result, the purpose of this study was to identify the factors influencing disaster preparedness among adolescents in an area with a high disaster risk index. The findings of this study may assist the government, particularly the National Agency for Disaster Management, in developing specific programs for adolescents, such as educational training, to improve adolescent knowledge, attitudes, and experiences regarding disaster preparedness in areas with a high disaster risk index. Others research also states that the university curriculum impacts the disaster awareness of students while the establishment of university emergency procedures impacts the disaster preparedness of students (Patel et al., 2023).

## Methods

The aim of this study was to identify factors affecting disaster preparedness among adolescent in an Area with a High Disaster Risk Index. This study was undertaken at public and private high schools in Surabaya and surroundings in 2020. One of the Indonesian regions with a high risk of disaster is Surabaya. The city is susceptible to several dangers, like as earthquakes, tsunami risk, and coastal floods. Based on current studies, Surabaya is at a moderate risk of coastal flooding, which can cause damage to infrastructure and disturb the lives of those living along the coast. Because the city is close to active fault lines, which increases the possibility of damage in its heavily populated metropolitan areas, there is also a substantial earthquake threat. The health research ethics committee at STIKES Katolik St.Vincentius a Paulo Surabaya gave its approval to the study's protocol. All responders provided their informed consent. One hundred and seventy high school students at eleventh grade were selected for this study using purposive sampling. The dependent variable in this study is disaster preparedness, while the independent factors are attitude, knowledge, and experiences. The research instrument used in this study was a knowledge questionnaire with a Reliability value of: 0.966 and Validity: 0.640 – 0.830, an Attitude questionnaire with a Reliability value of: 0.914 and Validity: 0.682 – 0.950, an Experience questionnaire with Reliability: 0.699 and Validity: 0.751 – 0.896 and the Preparedness questionnaire has a value of Reliability: 0.916 and Validity: 0.571 – 0.809. Data were analysed using multiple regression analysis with the help of SPSS.

## Results

The variables in this study were knowledge, experience, attitude, and disaster preparedness. Table 1 displays a description of respondents' knowledge responses. A total of 13 statements were obtained, and most respondents' responses were correct, with an average variable of 0.80. This demonstrates that the respondent correctly answered the knowledge test.

**Table 1.** Description of Respondent Knowledge about Disaster Preparedness.

| No | True |      | False |     | Mean |
|----|------|------|-------|-----|------|
|    | F    | %    | F     | %   |      |
| 1  | 119  | 70%  | 51    | 30% | 0.70 |
| 2  | 170  | 100% | 0     | 0%  | 1.00 |
| 3  | 170  | 100% | 0     | 0%  | 1.00 |
| 4  | 95   | 56%  | 75    | 44% | 0.56 |

| No            | True |      | False |     | Mean |
|---------------|------|------|-------|-----|------|
|               | F    | %    | F     | %   |      |
| 5             | 105  | 62%  | 65    | 38% | 0.62 |
| 6             | 112  | 66%  | 57    | 34% | 0.66 |
| 7             | 67   | 39%  | 103   | 61% | 0.39 |
| 8             | 142  | 84%  | 28    | 16% | 0.84 |
| 9             | 131  | 77%  | 38    | 22% | 0.78 |
| 10            | 167  | 98%  | 3     | 2%  | 0.98 |
| 11            | 168  | 99%  | 2     | 1%  | 0.99 |
| 12            | 161  | 95%  | 9     | 5%  | 0.95 |
| 13            | 170  | 100% | 0     | 0%  | 1.00 |
| Mean Variable |      |      |       |     | 0.80 |

Table 2 depicts the description of responses to experience, with a total of 15 statements obtained and the majority of "never" with an average variable of 1.35. This demonstrates that many respondents have no experience with disaster preparedness.

**Table 2.** Description of Respondent Experience about Disaster Preparedness.

| No            | Never |     | Sometimes |     | Often |     | Mean |
|---------------|-------|-----|-----------|-----|-------|-----|------|
|               | F     | %   | F         | %   | F     | %   |      |
| 1             | 148   | 87% | 20        | 12% | 2     | 1%  | 1.14 |
| 2             | 160   | 94% | 7         | 4%  | 3     | 2%  | 1.08 |
| 3             | 150   | 88% | 17        | 10% | 3     | 2%  | 1.14 |
| 4             | 99    | 58% | 65        | 38% | 6     | 4%  | 1.45 |
| 5             | 122   | 72% | 42        | 25% | 6     | 4%  | 1.32 |
| 6             | 119   | 70% | 42        | 25% | 9     | 5%  | 1.35 |
| 7             | 140   | 82% | 28        | 16% | 2     | 1%  | 1.19 |
| 8             | 136   | 80% | 33        | 19% | 1     | 1%  | 1.21 |
| 9             | 141   | 83% | 26        | 15% | 3     | 2%  | 1.19 |
| 10            | 148   | 87% | 20        | 12% | 2     | 1%  | 1.14 |
| 11            | 99    | 58% | 67        | 39% | 4     | 2%  | 1.44 |
| 12            | 92    | 54% | 64        | 38% | 14    | 8%  | 1.54 |
| 13            | 140   | 82% | 29        | 17% | 1     | 1%  | 1.18 |
| 14            | 147   | 86% | 20        | 12% | 3     | 2%  | 1.15 |
| 15            | 19    | 11% | 51        | 30% | 51    | 30% | 2.76 |
| Mean Variable |       |     |           |     |       |     | 1.35 |

Table 3 describes the attitudes expressed by respondents. Four statements were obtained, and most respondents responded agree or strongly agree, with an average variable of 3.49. This indicates that respondents responded positively to the attitude variable.

**Table 3.** Description of Respondent attitudes about Disaster Preparedness.

| No            | Strongly Disagree |    | Disagree |    | Agree |     | Strongly agree |     | Mean |
|---------------|-------------------|----|----------|----|-------|-----|----------------|-----|------|
|               | F                 | %  | F        | %  | F     | %   | F              | %   |      |
| 1             | 0                 | 0% | 6        | 4% | 70    | 41% | 94             | 55% | 3.52 |
| 2             | 4                 | 2% | 4        | 2% | 49    | 29% | 113            | 66% | 3.59 |
| 3             | 1                 | 1% | 13       | 8% | 93    | 55% | 63             | 37% | 3.28 |
| 4             | 1                 | 1% | 1        | 1% | 67    | 39% | 101            | 59% | 3.58 |
| Mean Variable |                   |    |          |    |       |     |                |     | 3.49 |

Table 3 displays a description of the attitudes expressed by respondents. A total of four statements were obtained, and the majority of respondents responded agree or strongly agree, with an average variable of 3.49. This indicates that respondents had a positive attitude to disaster preparedness.

**Table 4.** Description of Respondent about Disaster Preparedness.

| No            | Strongly Disagree |     | Disagree |     | Agree |     | Strongly agree |     | Mean |
|---------------|-------------------|-----|----------|-----|-------|-----|----------------|-----|------|
|               | F                 | %   | F        | %   | F     | %   | F              | %   |      |
| 1             | 2                 | 1%  | 1        | 1%  | 68    | 40% | 99             | 58% | 3.55 |
| 2             | 0                 | 0%  | 1        | 1%  | 76    | 45% | 93             | 55% | 3.54 |
| 3             | 0                 | 0%  | 3        | 2%  | 112   | 66% | 55             | 32% | 3.31 |
| 4             | 0                 | 0%  | 2        | 1%  | 84    | 49% | 84             | 49% | 3.48 |
| 5             | 0                 | 0%  | 1        | 1%  | 46    | 27% | 123            | 72% | 3.72 |
| 6             | 31                | 18% | 49       | 29% | 37    | 22% | 53             | 31% | 2.66 |
| Mean Variable |                   |     |          |     |       |     |                |     | 3.38 |

Results reveals  $F$  value of 17.736 and a significance value of 0.000. In comparison, the  $F$  table value at degrees of freedom 3 and 166 with an alpha of 5% is 2.659. These findings indicate that the calculated  $F$  value is greater than the  $F$  table value ( $F$  value  $>$   $F$  table) and the significance value is less than 0.05 (sig 0.05), implying that there is a significant concurrent effect between knowledge, experience, and attitude toward disaster preparedness. The coefficient of determination or  $R$  Square was .243, indicating that the influence on the disaster preparedness variable that is explained by the variable's knowledge, experience, and attitude is 24.3 percent, while the rest is explained by factors other than knowledge, experience, and attitude.

The partial test between knowledge and disaster preparedness yielded a  $t$  value of 0.257 and a significance value of 0.797. In comparison, the  $t$ -table value at 166 degrees of freedom and the alpha at 5% are both 1.974. These findings showed that the  $t$  value was less than the  $t$  table value and the significance value was greater than .05 (sig  $>$ .05), implying that there was no significant relationship between knowledge and disaster preparedness.

The partial test between experience and disaster preparedness yielded a  $t$  value of 3.192 and a significance value of .002. In comparison, the  $t$ -table value at 166 degrees of freedom and the alpha at 5% are both 1.974. These results showed that the  $t$ -count value was greater than the  $t$ -table value and the significance value was less than .05 (sig .05), indicating that there was a significant influence of experiences on disaster preparedness.

The partial test between attitude and disaster preparedness yielded a  $t$  value of 6.584 with a significance value of .000. In comparison, the  $t$ -table value at 166 degrees of freedom and the alpha at 5% are both 1.974. These findings showed that the  $t$ -count value was greater than the  $t$ -table value and the significance value was less than .05 (sig .05), indicating that attitudes toward preparedness had a significant influence on disaster preparedness.

## Discussion

The author should discuss the results and interpretation of the problems stated in the introduction. The author may discuss their finding with previous studies, its implications and future research directions. The discussion could be very specific to the research findings and/or not limited to the broad context of the discipline.

The following text is an example of the citation style that is being used in IJDM.

In the text, each citation should be written (Tanesab, 2020). If the referred citation has more than one published source, it should be written (Mukherjee et al., 2020; Sari et al., 2020). If a citation is in the form of an in-line citation, as mentioned by Mawarni et al. (2020). The citation format used in the manuscript is APA style. This citation style is available through a selection of citation programs that are freely accessible.

## Conclusions

Knowledge is one of the predisposing factors that make it easy for someone to do something, or the trigger for individual, group, or community behaviour. Knowledge is one of the most important factors in the formation of individual behaviour, with knowledge-based behaviour typically remaining in a person longer than non-knowledge-based behaviour (Arsenijević et al., 2017; Weichselgartner & Pigeon, 2015). Because disasters can occur at any time, having an understanding of disaster emergency management has become a top responsibility (Husna et al., 2020). The findings of this study revealed that there was no significant effect on the knowledge and attitude of youth about disaster preparedness. According to Seyedin research (Seyedin et al., 2015), knowledge of disaster preparedness is still lacking. This is also consistent with the findings of Ghanbari (Ghanbari V et al., 2011), who discovered that the average level of disaster preparedness knowledge is lower. According to Melnikov, Itzhaki, and Kagan (Melnikov et al., 2014; Hermanus et al., 2022; Sitohang & Saragi, 2023), disaster preparedness knowledge and attitudes are influenced by several factors, including disaster-related knowledge, a realistic assessment attitude toward disasters, and the self-efficacy of nurses to carry out preparedness. According to Chen (Hui Chen, Shu. Chuan Chang & Li-Chin Chen, Chun-Lan Lee, and Fu-Chih Lai, 2017), preparedness will be good if knowledge and education related to preparedness are also in the good category, so that the knowledge factor is something that cannot be separated from preparedness. According to Park and Kim (Park & Kim, 2020), disaster management experience can have a significant influence, followed by disaster-related knowledge of 25.6%. The findings of this study differ from those of Ahayalimudin and Osman (N. A. Ahayalimudin & Osman, 2016), who claimed that 80% of respondents were knowledgeable about disasters and their management. Early warning, disaster triage, first aid, search and rescue, logistics and communication, and team structure are the six parts of disaster emergency management knowledge and skills (Kamal et al., 2012). According to Chen et al. (2017), one of the factors that can shape one's preparedness in dealing with disasters is knowledge. Good knowledge is required to form the proper mindset for disaster management, particularly preparedness. When a natural disaster strikes, it is hoped that they will be able to act in accordance with their role by assisting the community or other people, thereby avoiding the effects of disasters, such as the impact on physical and psychological health. Preparedness will be good if knowledge and education, as well as self-efficacy related to preparedness, are also high. Based on (Kinanthi et al., 2022) research's show that 62,8% of the preparedness behaviour variables could be explained by the experience, knowledge and self-efficacy variables. According to Ahayalimudin (N. Ahayalimudin et al., 2012), knowledge and practice adequacy can describe a positive attitude toward disaster response. According to the findings of this study, knowledge and attitudes have no relationship

with youth preparedness in dealing with disasters in Surabaya. The small number of respondents is also one of the study's limitations.

The findings of the description of responses to experience, with a total of 15 statements obtained from respondents' responses, never had an average variable of 1.35. This demonstrates that many respondents have never responded to the experience variable. The effect of experience on disaster preparedness is shown in Table 1 with a regression coefficient of 0.118, a statistical t-value of 3.192, and a significance value of .002. These findings indicate a significant positive effect, implying that more experience will lead to better disaster preparedness. The findings of this study are consistent with those of Emily's research (Chan et al., 2014). Study of Tkachuck, also stated that prior experience with natural and man-made disasters was positively correlated with disaster preparedness (Tkachuck et al., 2018). Another study stated that four core categories of experience were identified, including direct disaster experience, indirect disaster experience, vicarious experience, and life experience as a predictor of preparedness choices (Becker et al., 2017). The experience of a disaster event provides everyone with a perspective on a disaster, allowing them to learn how a disaster can occur and what to do before, during, and after a disaster, allowing them to determine the level of preparedness required to avoid the fatal impact of a disaster. Previous experience has a  $t = 3.192$  and a significance of 0.002, indicating that it has a significant influence on disaster preparedness in adolescents. Experience is anything that has previously been felt, experienced, or done. Life as a human is inextricably linked to experience. Experience becomes a lesson because it affects how people behave in the future. People who have had experience with disasters may be able to see the hazards that lurk in them and may be inspired to prepare for them. Individuals will either become better or worse at handling events in the future because of their own experience, so personal experience alone is insufficient. Every experience with a disaster offers the opportunity to be ready for hazards that could happen at any time. Direct personal experience might also affect readiness behaviour. Direct experience with previous disasters can increase the need to learn more about the occurrence (Hamutoglu et al., 2021; Kato, 2021). Based on the above description, the researcher hypothesizes that personal experiences with disasters, whether directly or indirectly, enable people to understand disaster causes, characteristics, and the proper actions to take before, during, and after a disaster, as well as shelter in the event of a disaster. People's personal disaster experiences tend to boost disaster preparedness because past experiences might motivate immediate, necessary activities to be performed in the event of a disaster. People with prior disaster experience will be better equipped when a crisis strikes. Because experiencing a tragedy can motivate one to be ready and vigilant, it can be claimed that disaster experience is one of the elements that influences readiness. This is corroborated by the findings of research done in China, in order to better understand flood preparedness intents and attitudes toward financial risk-taking generally, this study examined the effects of previous flood experiences, trust in public flood protection, and perceptions of flood risk on Chinese citizens. Residents of a flooded and non-flooded area were surveyed in Study 1 ( $n = 241$ ) and Study 2 ( $n = 1599$ ), respectively. Using structural equation modelling, the relationships between the variables were examined (SEM). Overall, the two studies indicated that citizens' flood experiences, faith in government protection, and assessment of flood danger not only predicted their readiness for floods but also their aversion to financial risk. In particular for those who have not yet experienced flooding, this study emphasizes the significance of people's trust in public flood protection for flood risk management and communication (Zhang et al., 2021). The experience of prior flood catastrophes, according to a study at 2020, is a factor that motivates individuals to be more disaster-prepared. The experience of death and damage to personal property as a result of a flood disaster has a strong positive impact on disaster preparedness behaviour ( $b = .855$ ,  $P = .012$ ). Someone will be motivated to act on disaster preparedness by the rising number of deaths from floods. The community will take proactive steps to prepare for disaster in their day-to-day lives after suffering a flood (Ao et al., 2020).

While the attitude component has a value of  $t = 6,584$  and a significance of ,000, it can be concluded that this aspect also significantly affects teenage disaster preparedness. According to the notion, attitude is a predisposition to engage in a particular conduct, suggesting that attitude is more of an individual conscious process than a purely internal psychological condition. The previous studies use a cross-sectional, analytical, observational methodology. One hundred residents from the Lambung village in Banda Aceh City served as the study's sample. A questionnaire that has been evaluated for validity and reliability was used to collect the data. The chi-square test was used for univariate and bivariate data analysis. The findings indicated that, on a scale of high to low, disaster preparedness knowledge was moderate (63.0%) and good (37.0%) among the residents of Lambung village. According to the community's attitude, the highest proportion in terms of disaster readiness was moderate (69.0%), and it was closely followed by third place (31.0%) (Suryadi et al., 2021). Other research also shows there is a positive relationship between the attitude of disaster preparedness and the behaviour of disaster preparedness. Correlation coefficient ( $r_{y2}$ ) = 0.421 and determination coefficient ( $r^2$ ) = 17.749% (Retnowati et al., 2020). As a result, attitude is more of an internal psychological condition of the individual than a purely psychological trait. Researchers believe that having a caring attitude fosters a spirit of self- and other preparation so that one is capable of performing self-rescue in the event of a tragedy. A person's attitude can influence their level of readiness; a positive attitude of alertness translates into better readiness. Because attitude is correlated with ideas about personality and motivation, it influences preparedness for earthquake disasters. Because attitude is a component of the crisis management process, it has an impact on preparedness as well.

According to the study's findings, 24.3% of disaster preparedness is influenced by adolescents' knowledge, experience, and attitudes, with the remaining portion being accounted for by other factors. According to this study, experience and attitude have the most effects on how prepared young people are for disasters.

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