DISASTER MITIGATION LITERACY PROFILE OF HIGH SCHOOL STUDENTS IN PONTIANAK

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ABSTRACT

Understanding disaster mitigation is needed to reduce risk and respond more effectively to disasters. This study aimed to analyze the disaster mitigation literacy profile of high school students in Pontianak. This research used a quantitative descriptive method. The research subjects involved grade XI high school students in Pontianak, with as many as 331 respondents. The instrument in this study used a questionnaire containing a list of statements arranged according to a Likert scale. The results indicated that the disaster mitigation literacy of high school students in Pontianak included the criteria of "tough" in all components and indicators showed by the average percentage score of the knowledge component is 75.55%, the attitude component is 77.47%, and the skills component is 74.36%. The results of disaster mitigation literacy of high school students in Pontianak based on gender and disaster experience are also included in the "tough " criteria. Therefore, the study results show that the disaster mitigation literacy of high school students in Pontianak is in the "tough" criteria.

INTRODUCTION

Disaster is an events that may happen at any time, regardless of age and gender. According to Wulansari et al. (2017) and Parulian et al. (2019), disaster is a phenomenon or series of events that can cause significant human losses regarding property, environment, infrastructure, and even the order of human emotional and psychological life.

Coppola (2015) opined that disasters can hit any country with varying economic status, but developing countries experience the worst impacts. One of these developing countries is Indonesia, which still has limitations in dealing with disasters compared to developed countries. This limitation is caused by how most people view disasters, which tend to surrender and accept fate, thus affecting the level of alertness to potential disasters (Prihatin, 2018; Crosweller & Tschakert, 2021; Damayani et al., 2022).

Indonesia is located between 4 tectonic plates, including the Pacific, Philippine Sea, Indo-Australian, and Eurasian (Hutchings & Mooney, 2021; Prasetio et al., 2023; Mardiani et al., 2024). This geography is quite risky for disasters, although secure areas such as the island of Borneo exist. However, Kalimantan remains vulnerable to natural disasters including flooding, forest and land fires, extreme drought, and coastal abrasion (Badan Pengembangan Infrastruktur Wilayah, 2017).

West Kalimantan Province, especially the capital city of Pontianak, is often the target of various disasters such as floods, extreme weather, forest and land fires, and drought (Badan Nasional Penanggulangan Bencana, 2021). The potential risk of disasters affecting all communities emphasizes the importance of disaster education, so improving disaster mitigation literacy is critical to taking appropriate action to reduce impacts and improve response strategies when disasters occur (Cabello et al., 2021; Fazeli et al., 2024).

Disaster mitigation literacy represents the awareness, knowledge, and techniques that enable individuals to interpret, comprehend, and apply information for informed decision-making and guidance in disaster mitigation, preparation, response, and recovery. It involves the development of knowledge, attitudes, and skills pertinent to disaster mitigation (Kanbara et al.,

2016; Logayah et al., 2022). It involves increasing knowledge, assessing needs, planning, developing approaches, content, and tools, and engaging organizations to improve disaster preparedness and mitigation dedication across many societal tiers (Aghaei et al., 2018; Katayama et al., 2021; Kawasaki et al., 2023).

Measuring the level of disaster mitigation literacy needs to help identify students' ability for disaster preparedness, a disaster-aware generation, and their initial steps in dealing with disaster risks (Teo et al., 2018; Suharini et al., 2019).

Based on Al-Maraghi et al. (2017) at SMA IT Riyadlussholihin shows that the ability of students' volcano disaster mitigation literacy is at an average of 25% on a scale of 0%-100%, which is included in the low category, so it requires education in schools that aims to strengthen students' literacy, especially disaster mitigation literacy regarding volcanoes. Similar to Meliana et al. (2020) at SMA Negeri 10 Semarang, which indicated that students in schools prone to tidal flooding were at level 1 of the six existing levels or classified as low with a percentage is 33.3% at disaster mitigation literacy skills. This result is due to the lack of learning resources that require improvement through scientific assessment, relevant teaching materials, and related learning.

From the above studies, it is clear how vital disaster mitigation literacy is. This is aligned with Chaudhary & Piracha (2021) and Logayah et al. (2022), who state that students need disaster mitigation literacy to decrease the effects of present and forthcoming disasters caused by natural and artificial disasters. Considering their current vulnerability to disasters, it is essential that they possess sufficient knowledge and capacity (Thorup-Binger & Charania, 2019; Juhadi et al., 2021; Spencer & Thompson, 2024).

According to the description above, this research intends to analyze disaster mitigation literacy profile of high school students in Pontianak based on components, indicators, gender, and students' experience in dealing with disasters. This research can contribute to disaster mitigation literacy and become a reference for designing targeted education programs and policies to increase awareness and preparedness for disaster risks.

METHOD

This research applies a quantitative descriptive method to analyze the disaster mitigation literacy profile of high school students in Pontianak. The population research was class XI high school students in Pontianak, which consisted of 12 public high schools. The selection of class XI was based on the consideration that students at this level have studied environmental change material in class X, so they have a better understanding of environmental issues, including disasters.

Sample selection using *a cluster sampling* technique. The *cluster sampling* technique is a technique in which the entire population is divided into clusters or groups, followed by random sampling of the clusters, all used as the final sample (Wilson, 2014). The clusters in this study were sub-districts in Pontianak. The study sample consisted of 331 students decided based on Yamane's formula. The cluster sampling technique selected 6 out of 12 public senior high schools based on the proportion of schools in each cluster, as presented in Table 1.

Table 1. Sample Distribution Based on Clusters

Cluster	School	Sample of Each Cluster
Pontianak Kota	SMA 4	71
Pontianak Barat	SMA 11	46
Pontianak Timur	SMA 6	42
Pontianak Selatan	SMA 1, SMA 10	122
Pontianak Utara	SMA 5	50
Total		**331**

This study used the High School Disaster Mitigation Literacy Inventory instrument as a questionnaire prepared on a Likert scale and distributed using Google Forms to grade XI students in each school. The questionnaire consisted of 43 statement items based on 8 indicators of the 3 components of disaster mitigation literacy, namely knowledge, attitudes, and skills, according to Chung & Yen (2016). Examples of questionnaire statements representing each indicator in each component, as presented in Table 2.

Table 2. Sample Questionnaire Statements Representing Each Indicator in Each Disaster Mitigation Literacy Component

Component	Indicator	Statement	Item Number
Knowledge	Disaster Knowledge	I understand the different types of disasters that can occur in my area.	4
	Preparedness Knowledge	I know information about evacuation routes and safety assembly points in my neighborhood.	8
	Response Knowledge	I can take the initiative in responsive actions to disasters and the severity of disasters.	9
Attitude	Prevention Awareness	I realized that implementing disaster mitigation measures must become part of society's habit.	17
	Prevention Values	I fully support government actions that inform disaster-prone areas.	21
	Prevention Sense of Responsibility	I understand disaster prevention and implementation plans in both my neighborhood and school.	25
Skills	Preparedness Action	I check and replace emergency medicine supplies regularly.	35
	Response Behaviors	I am ready to help and take action according to the protocols learned during the simulation to protect myself and my friends.	40

The questionnaire instrument used has been tested for feasibility through validity and reliability tests. Content validity and item validity are used for the validity test. In content validity, the questionnaire was validated by 6 validators, and the results were measured using Aiken's V formula, so the average V result was 0.985, with a valid description because of V≥0,78. During the validity of the items, 100 students validated the questionnaire, and the results were calculated using Rasch modeling so that out of 50 statements, only 43 were accepted. In contrast, the other 7 statement items were rejected because they needed to fulfill the MNSQ outfit, ZTSD outfit, and point measure correlation criteria. Then, the reliability test also used Rasch modeling so that the results obtained person reliability is 0.90, which is classified as "good", item reliability is 0.96, which is classified as "special", and Cronbach alpha is 0.93, which is classified as "very good".

Analysis of research data was conducted by first counting the percentage of indicators based on the questionnaire answer scores and then calculating the percentage of components based on the average percentage score of the indicators.

Indicator percentages are calculated using the formula:

$$indicator\ score\ percentage = \frac{total\ score\ obtained}{total\ maximum\ score} \times 100\%$$

The percentage of components was calculated using the formula:

$$component\ score\ percentage = \frac{\sum \text{indicator percentage result}}{total\ indicators}$$

Then the results that have been obtained are used to determine the criteria, as presented in Table 3.

Table 3. Disaster Mitigation Literacy Score Criteria

Percentage Scale (%)	Criteria
81 < score ≤ 100	Very Tough
61 < score ≤ 80	Tough
41 < score ≤ 60	Moderately Tough
21 < score ≤ 40	Not Tough
0 < score ≤ 20	Very Not Tough

(Juhadi et al., 2021 with modifications)

RESULT AND DISCUSSION

The instrument in this study used a questionnaire based on 8 indicators from 3 components of disaster mitigation literacy, including knowledge, attitudes, and skills referring to Chung & Yen (2016). The results of the disaster mitigation literacy were interpreted through a bar chart in Figure 1.
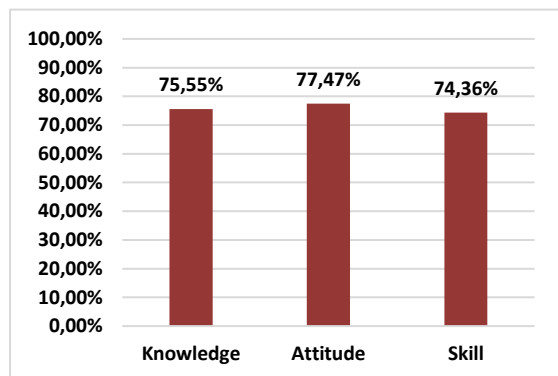

Figure 1. Bar Chart of Disaster Mitigation Literacy Results of High School Students in Pontianak

As shown in the bar chart in Figure 1, it is known that the disaster mitigation literacy of high school students in Pontianak is relatively good, characterized by the three components of disaster mitigation literacy that have "though" criteria.

The results of this study revealed that the average percentage score of the knowledge component of high school students in Pontianak was 75.55% with the criteria is "tough". In this context, the "tough" criteria are interpreted as students having shown good understanding and awareness of identifying potential disaster hazards, causes of disasters, and possible consequences, especially in the Pontianak area.

According to Albris et al. (2020) and Saputra & Ahyuni (2024), knowledge about disaster mitigation is basic knowledge that makes students understand and realize they need to be more alert in dealing with emergencies so that they can save themselves and others.

Furthermore, the attitude component in this study relates to the psychological and emotional dispositions necessary for disaster prevention and preparation. The results of this study identified that the average percentage score of the attitude component of high school students in Pontianak was 77.47% with the criteria of "tough". In addition, the attitude component has the highest percentage among other components. In this context, the "tough" criteria are interpreted by students showing a positive attitude seen from the willingness of students to cooperate by following instructions given by the authorities when a disaster occurs, actively participating in disaster simulations, and supporting mitigation efforts carried out by the government, school, and community. The attitude is the actualization of knowledge and perceptions of potential disasters, resulting in adaptation strategies, which are adjustments made in response to environmental threats (Prihatin, 2018; Jiang et al., 2019).

Then, the skills component of this study refers to the practical abilities needed to apply knowledge and attitudes in real situations. The results of this study found that the average percentage score of the skills component of high school students in Pontianak was 74.36% with the criteria of "though". These results indicate that high school students in Pontianak already have good basic skills in dealing with disasters. Skills make disaster preparedness something that students must teach and own and can be used in everyday life, even emergencies (Taklal et al., 2023; Rahmatul & Haji, 2024).

Description of Disaster Mitigation Literacy Based on Knowledge Component

In this study, disaster mitigation literacy consists of 3 components with 8 indicators. In the knowledge component, there are 3 indicators, which include disaster knowledge, preparedness knowledge, and response knowledge. These

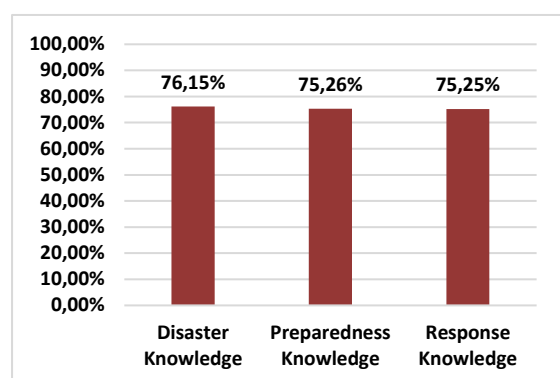results are interpreted through the bar chart in Figure 2.

Figure 2. Bar Chart of Disaster Mitigation Literacy Results Based on Knowledge Component

Knowledge is one of the components of disaster mitigation literacy. Knowledge is the initial introduction to understanding disasters and prevention in the local environment (Maryani, 2016; Al Thobaity et al., 2017).

The study results found that the highest average indicator score was found in the disaster knowledge indicator is 76.15% with the criteria of "tough". These results indicate that high school students in Pontianak already have good disaster knowledge, including the significance of students focusing on the evolution of disasters happening in different regions globally, understanding the concept of disaster mitigation, knowing the kinds of disasters that can happen, the causes of disasters, and can identify patterns or seasons of disaster occurrence in their area, especially in Pontianak. Khoirunisa (2016) and Pfefferbaum et al. (2018) stated understanding disaster knowledge is crucial for preparing individuals, and it should be imparted as early as possible, as a person's level of knowledge can significantly influence their preparedness in dealing with disasters.

In the indicator of preparedness knowledge, the average score was 75.26% with the criteria of "though". It indicates that high school students in Pontianak already have good preparedness knowledge, including considering education and information on disaster mitigation should be an integral part of the school curriculum, knowing information on evacuation routes and safety gathering points in their neighborhood,

understanding emergency evacuation procedures in schools, homes, and offices, believing early warning systems can reduce disaster risks, and consider it essential to have knowledge of First Aid Kit and disaster resilient equipment. The importance of preparedness knowledge is keeping with the meaning of preparedness knowledge as an effort to efficiently respond to disasters to minimize disaster risks such as loss of life and property (Oktari et al., 2020; Sejati & Prajayanti, 2024).

Last, the response knowledge indicator from the research results obtained an average score is 75.25% with the criteria of "though". These results indicate that high school students in Pontianak already have good response knowledge, including being able to take initiative in responsive actions to disasters and the severity of disasters, understanding the importance of turning off energy sources at home during a disaster to avoid additional incidents, understanding how to access emergency information and resources from local authorities during or after a disaster, being prepared to engage in disaster management efforts and recognizing the significance of collaborating with authorities during a disaster. According to Li et al. (2013) and Xu et al. (2015), response knowledge becomes the basic knowledge of the community in responding to disasters and reducing the negative impact of disasters with the most effective strategies so that people can increase their capacity for self-rescue and mutual assistance early on.

Description of Disaster Mitigation Literacy Based on Attitude Component

Based on Onuma et al. (2017) and Istiqomah & Prajayanti (2023), attitude is defined as a form of individual response to a phenomenon, in other words, an individual may only understand disaster mitigation efforts if they have experience with disasters. The attitude component has 3 indicators, including prevention awareness, prevention values, and prevention sense of responsibility. These results are interpreted through the bar chart in Figure 3.
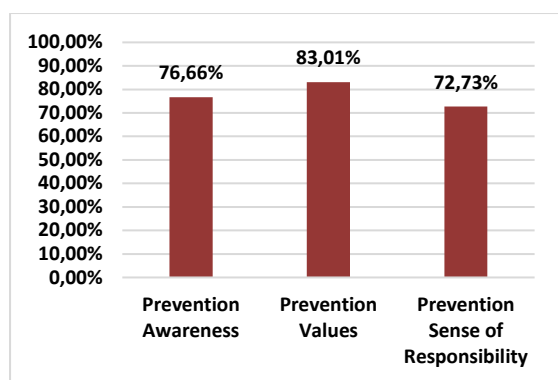
Figure 3. Bar Chart of Disaster Mitigation Literacy Results Based on Attitude Component

From the study results, the prevention awareness indicator received an average score is 76.66% with the criteria is " tough." These results indicate that high school students in Pontianak already have good prevention awareness, including awareness that the implementation of disaster mitigation actions must be a habitual part of the community, awareness that disaster mitigation actions can help reduce losses due to disasters, can explain to peers or communities to be more aware of the importance of reducing disaster risk, and proactively informing peers or communities of environmental changes so that they can be prepared when a disaster warning is issued. It is aligned with the concept of prevention awareness refers to the extent to which everyday individuals comprehend the significance of information, resources, and social readiness in relation to disasters (Ozeki et al., 2017; Tada et al., 2022).

Furthermore, the prevention values indicator received the highest average indicator score among the other indicators of the attitude component, which was 83.01% with the criteria is "tough". It indicates that high school students in Pontianak already have good prevention values, including supporting the government to prioritize disaster mitigation efforts in development and regional planning, believing the government should spend funds on programs or activities aimed at reducing disaster risk, fully supporting government actions that inform disaster-prone areas, supporting the establishment of buildings with strong and safe foundations and relocation of disaster-prone buildings, supporting afforestation actions with woody plants with taproot systems

and considering it essential to build joint discussions related to disaster prevention and preparedness. Through applying the prevention values, a culture of disaster resilience will be formed so that disaster response will be more effective and increase trust between the community, the community, and the government, particularly in planning and reaction strategies when disaster arises (Ma & Christensen, 2018; Bonfanti et al., 2024).

Last, the prevention sense of responsibility indicator received an average score is 72.73% with the criteria is "tough". These results indicate that high school students in Pontianak already have good preventive responsibilities, including being aware of disaster posts to accommodate people affected by disasters in the neighborhood and school, understanding prevention plans and implementation both in the neighborhood and school, actively participating in disaster mitigation programs to protect themselves and others and having made emergency plans to deal with disasters with family. Responsibility is understood as an individual's awareness of intentional and unintentional positive attitudes (Anafiah & Rezkita, 2020). When people feel responsible for their safety and the safety of others, they are more likely to engage in proactive measures, such as participating in preparedness training and following safety protocols during emergencies (Monteil et al., 2024; Bonfanti et al., 2024).

Description of Disaster Mitigation Literacy Based on Skill Component

According to Justine (2016), skill is defined as an individual's ability or proficiency in implementing knowledge into actions that require synchronization of muscle movements (Suparmanto et al., 2024). The skills component has 2 indicators, which include preparedness

action and response behaviors. These results are interpreted through the bar chart in Figure 4.
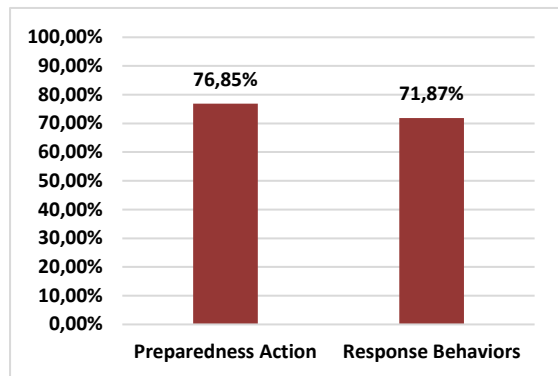

Figure 4. Bar Chart of Disaster Mitigation Literacy Results Based on Skill Component

Based on the study results, the preparedness action indicator received the highest average score is 76.85% with the criteria is "tough". These results indicate that high school students in Pontianak already have good preparedness actions, including collecting emergency contact information such as telephone numbers for the police, fire department, and hospital, being accustomed to having enough food and water reserves to deal with emergencies such as disasters, keeping essential documents in a safe place in anticipation of a disaster, checking and replacing emergency medicine supplies regularly, actively participating in disaster simulations to improve preparedness in the face of disasters, and being enthusiastic and severe when there are disaster simulations because they can help respond more effectively in natural disaster situations. Preparedness is seen as an action in the pre-disaster period that aims to minimize disaster risk so that governments, organizations, society, communities, and individuals can respond to disasters effectively and deftly (Carter, 2008; Lukman & Muhammad, 2023).

Meanwhile, the response behaviors indicator gets an average score is 71.87% with the criteria "tough". It indicates that high school students in Pontianak already have good response behaviors, including having mitigation, planning, response, and recovery skills as a form of disaster handling steps, being able to distinguish and recognize various types of disaster warnings through disaster signs, cooperating in disaster drills or simulations at school or outside school, being ready to help

and take action according to the protocols learned during simulations to protect themselves and friends, being willing to assist in rescue actions when disasters and post-disasters occur, being able to provide first aid to disaster victims, and being able to prepare emergency bags containing essential needs during an evacuation. Habituation to disaster response behaviors not only makes individuals understand the potential of disasters but also increases their sensitivity to these threats so that the worst risks can be minimized through appropriate mitigation measures (Cui et al., 2021; Evie & Hasni, 2022).

Description of Disaster Mitigation Literacy Based on Gender

The disaster mitigation literacy of high school students in Pontianak was also examined based on gender to determine the differences in perspectives between male and female students regarding the level of disaster mitigation literacy. The results of the disaster mitigation literacy are interpreted through a bar chart in Figure 5.
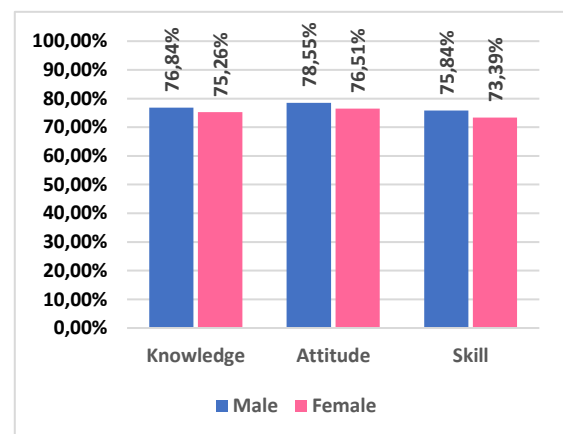

Figure 5. Bar Chart of Disaster Mitigation Literacy Results Based on Gender

Based on the results of the study, the results of the knowledge component from the total average of combining 3 indicators of knowledge components in male students, include disaster knowledge is 76.56%, preparedness knowledge is 76.98%, and response knowledge is 76.98%. Meanwhile, in female students, the disaster knowledge is 75.88%, the preparedness knowledge is 74.13%, and the response knowledge is 75.78%. Overall, the average results of the knowledge component of male students get higher results, which is 76.84%. In contrast, female

students are 75.26% of the total, both included in the "tough" criteria, with a difference in the average knowledge component of 1.58%.

Furthermore, the results of this attitude component are obtained from the total average of combining 3 indicators of the attitude component in male students for the prevention awareness indicator is 77.39%, the prevention value indicator is 83.78%, and the prevention sense of responsibility indicator is 74.48%. Meanwhile, for female students, the prevention awareness indicator is 76.19%, the prevention values indicator is 82.50%, and the prevention sense of responsibility indicator is 70.84%. Calculating the average of all attitude components, male students achieved higher results than female students, with the average component of male students at 78.55%. In contrast, the average component of female students was 76.51%, with a difference is 2.04%.

Lastly, the results of the skills component are obtained by combining two indicators, in male students for indicators of preparedness actions is 77.39% and response behaviors is 74.48%. Meanwhile, for female students, the indicator of preparedness action is 76.19%, and the indicator of response behaviors is 70.84%. The results of this combination are calculated on the overall average to get the results of male students who also get higher results, which is 75.84%. In comparison, female students are 73.39%, both of which are included in the "tough" criteria, with a difference of 2.45%.

Based on the average component and indicator, male students are ahead of female students even though the difference is insignificant. This difference indicates a difference in perspective between male and female students. It is aligned with Cutter et al. (1992) and Nastiti et al. (2021) that both males and females see the world from different perspectives due to cultural and social differences.

Description of Disaster Mitigation Literacy Based on Disaster Experience

Disaster mitigation literacy of high school students in Pontianak is also examined based on disaster experience. The results of the disaster mitigation literacy are interpreted through a bar chart in Figure 6.
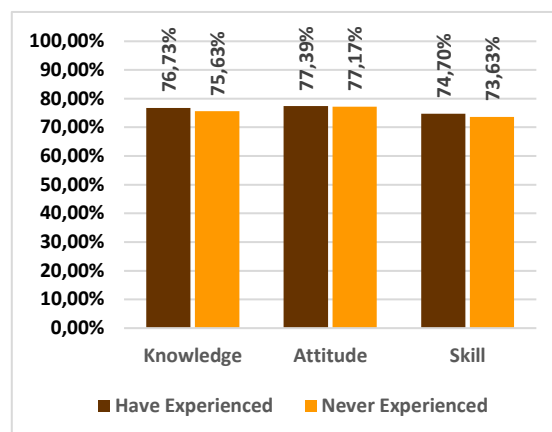

Figure 6. Bar Chart of Disaster Mitigation Literacy Results Based on Disaster Experience

Based on the study's results, this knowledge component is obtained from the total average of combining 3 indicators of knowledge components in students who have experienced disasters for disaster knowledge indicators is 76.42%, preparedness knowledge indicators is 75.43%, and response knowledge indicators is 78.34%. Meanwhile, for students who have never experienced a disaster, the disaster knowledge indicator is 75.58%, the preparedness knowledge indicator is 74.91%, and the response knowledge indicator is 76.39%. Overall, the average results of the knowledge component are that students who have experienced a disaster get a higher average component is 76.73%. In comparison, students who have never experienced a disaster are, 75.63%, both of which are included in the "tough" criteria, with a difference in the average knowledge component is 1.10%.

Furthermore, the results of this attitude component are obtained from the total average of combining 3 indicators of the attitude component. In students who have experienced disasters, the prevention awareness indicator is 77.19%, the prevention value indicator is 82.72%, and the prevention sense of responsibility indicator is 72.25%. Whereas for students who have never experienced a disaster, the prevention awareness indicator gets a result is 75.58%, the prevention value indicator is 83.60%, and the prevention sense of responsibility indicator is 72.34%. Calculating the average attitude component,

students who have experienced a disaster achieve higher results than students who have never experienced a disaster, which is the average component of students who have experienced a disaster is 77.39%. In comparison, the average component of students who have never experienced a disaster is 77.17%, both of which are classified as "tough" with a difference in the average component is 0.22%.

Last, the results of the skills component are obtained by combining two indicators; in students who have experienced disasters, the preparedness actions is 77.20%, and the response behaviors is 72.20%. Meanwhile, for students who have never experienced a disaster, the preparedness action is 76.12% and the response behaviors is 71.13%. The results of this combination are calculated on the overall average to get the results of students who have experienced disasters also get the average results of higher components, which is 74.70%. In comparison, students who have never experienced a disaster are 73.63%, both of which are included in the "tough" criteria, with a difference in the average component is 1.07%.

Based on the average component and the average indicator, students who have experienced a disaster are ahead of students who have never experienced a disaster. However, the difference is not significant. Through disaster experience, a person's tendency towards disaster preparedness will increase and can encourage appropriate and efficient disaster response attitudes (Havwina et al., 2016; Becker et al., 2017).

CONCLUSION

Based on the research results, disaster mitigation literacy of high school students in Pontianak has a toughness in all components and indicators. The knowledge component has an average score percentage is 75.55%, including disaster knowledge indicators (76.15%), preparedness knowledge (75.26%), and response knowledge (75.25%). Furthermore, the attitude component has an average score percentage is 77.47%, including prevention value indicators (83.01%), prevention awareness (76.66%), and prevention sense of responsibility (72.73%). The skills component has an average score percentage is 74.36%, including preparedness action

indicators (76.85%) and response behavior (71.87%). In addition, the results of disaster mitigation literacy of high school students in Pontianak based on gender and disaster experience are included in the "tough" criteria.

REFERENCES

Aghaei, N., Seyedin, H., & Sanaeinasab, H. (2018). Strategies for disaster risk reduction education: A systematic review. Journal of Education and Health Promotion, 7(1), 1–8. https://doi.org/10.4103/jehp.jehp

Al Thobaity, A., Plummer, V., & Williams, B. (2017). What are the most common domains of the core competencies of disaster nursing? A scoping review. International Emergency Nursing, 31, 64–71. https://doi.org/10.1016/j.ienj.2016.10.003

Albris, K., Lauta, K. C., & Raju, E. (2020). Disaster Knowledge Gaps: Exploring the Interface Between Science and Policy for Disaster Risk Reduction in Europe. International Journal of Disaster Risk Science, 11(1), 1–12. https://doi.org/10.1007/s13753-020-00250-5

Al-Maraghi, F. A., Rochman, C., & Suhendi, H. Y. (2017). Profil Literasi Peserta Didik Terhadap Mitigasi Bencana Gunung Berapi di Daerah Sukaratu Tasikmalaya. Jurnal Wahana Pendidikan Fisika, 2(2), 32–35. https://doi.org/10.17509/wapfi.v2i2.8275

Anafiah, S., & Rezkita, S. (2020). Pendidikan karakter dalam komik Gigana (Digital Mitigasi Bencana) Gempa Bumi Karya Siti Anafiah dan Shanta Rezkita. Trihayu: Jurnal Pendidikan Ke-SD-An, 7(1), 1043–1049. https://doi.org/10.30738/trihayu.v7i1.8403

Badan Nasional Penanggulangan Bencana. (2021). Kajian risiko bencana nasional Provinsi Kalimantan Barat 2022 – 2026. Kedeputian Bidang Sistem dan Strategi, Direktorat Pemetaan dan Evaluasi Risiko Bencana.

Badan Pengembangan Infrastruktur Wilayah. (2017). Sinkronisasi program dan pembiayaan pembangunan jangka pendek 2018-2020 keterpaduan pengembangan kawasan dengan infrastruktur PUPR Pulau Kalimantan. Jakarta: Pusat Pemrograman dan Evaluasi Keterpaduan Infrastruktur PUPR, Badan

Pengembangan Infrastruktur Wilayah, Kementrian Pekerjaan Umum dan Perumahan Rakyat.

Becker, J. S., Paton, D., Johnston, D. M., Ronan, K. R., & McClure, J. (2017). The role of prior experience in informing and motivating earthquake preparedness. International Journal of Disaster Risk Reduction, 22(March), 179–193. https://doi.org/10.1016/j.ijdrr.2017.03.006

Bonfanti, R. C., Oberti, B., Ravazzoli, E., Rinaldi, A., Ruggieri, S., & Schimmenti, A. (2024). The Role of Trust in Disaster Risk Reduction: A Critical Review. International Journal of Environmental Research and Public Health, 21(1), 29. https://doi.org/10.3390/ijerph21010029

Cabello, V. M., Véliz, K. D., Moncada-Arce, A. M., García-Huidobro, M. I., & Juillerat, F. (2021). Disaster risk reduction education: Tensions and connections with sustainable development goals. Sustainability (Switzerland), 13(19), 1–18. https://doi.org/10.3390/su131910933

Carter, W. N. (2008). Disaster Management: A Disaster Manager's Handbook. Mandaluyong: Asian Development Bank.

Chaudhary, M. T., & Piracha, A. (2021). Natural Disasters — Origins , Impacts , Management. Encyclopedia, 1(4), 1101–1131. https://doi.org/10.3390/encyclopedia1040084

Chung, S., & Yen, C. (2016). Disaster Prevention Literacy Among School Administrators and Teachers: A Study on the Plan for Disaster Prevention and Campus Network Deployment and Experiment in Taiwan. Journal of Life Sciences, 10, 203–214. https://doi.org/10.17265/1934-7391/2016.04.006

Coppola, D. P. (2015). Introduction to International Disaster Management (3th ed.). Oxford: Butterworth-Heinemann.

Crosweller, M., & Tschakert, P. (2021). Disaster management and the need for a reinstated social contract of shared responsibility. International Journal of Disaster Risk Reduction, 63, 102440. https://doi.org/10.1016/j.ijdrr.2021.102440

Cui, P., Peng, J., Shi, P., Tang, H., Ouyang, C., Zou, Q., … Lei, Y. (2021). Scientific challenges of research on natural hazards and disaster risk. Geography and Sustainability, 2(3), 216–223. https://doi.org/10.1016/j.geosus.2021.09.001

Cutter, S. L., Tiefenbacher, J., & Solecki, W. D. (1992). En-gendered Fears: Femininity and Technological Risk Perception. Industrial Crisis Quarterly, 6(1), 5–22. https://doi.org/10.1177/108602669200600102

Damayani, N. A., Saepudin, E., Rusmana, A., Rizal, E., & McArthur, J. M. B. (2022). The local wisdom-based disaster mitigation literacy of the indigenous Pangandaran community. Jurnal Studi Komunikasi (Indonesian Journal of Communications Studies), 6(2), 424–439. https://doi.org/10.25139/jsk.v6i2.4862

Evie, S., & Hasni. (2022). Faktor-faktor yang Berhubungan dengan Kesiapsiagaan Keluarga dalam Tanggap Bencana Tsunami. Poltekita: Jurnal Ilmu Kesehatan, 15(4), 409–418. https://doi.org/10.33860/jik.v15i4.828

Fazeli, S., Haghani, M., Mojtahedi, M., & Rashidi, T. H. (2024). The role of individual preparedness and behavioural training in natural hazards: A scoping review. International Journal of Disaster Risk Reduction, 105(September 2023), 104379. https://doi.org/10.1016/j.ijdrr.2024.104379

Havwina, T., Maryani, E., & Nandi. (2016). Pengaruh Pengalaman Bencana Terhadap Ancaman Gempa Bumi dan Tsunami (Studi kasus pada SMA Negeri Siaga Bencana Kota Banda Aceh). Gea. Jurnal Pendidikan Geografi, 16(2), 124–131. https://doi.org/10.17509/gea.v16i2.4041

Hutchings, S. J., & Mooney, W. D. (2021). The Seismicity of Indonesia and Tectonic Implications. Geochemistry, Geophysics, Geosystems, 22(9), 1–42. https://doi.org/10.1029/2021GC009812

Istiqomah, Y., & Prajayanti, E. D. (2023). Gambaran Pengetahuan dan Sikap Masyarakat Tentang Mitigasi dan Kesiapsiagaan Bencana Banjir. Nursing News: Jurnal Ilmiah Keperawatan, 7(1), 11–21. https://doi.org/10.33366/nn.v7i1.2525

Jiang, Y., Ritchie, B. W., & Verreynne, M. L. (2019). Building tourism organizational resilience to crises and disasters: A dynamic capabilities view. International Journal of Tourism Research, 21(6), 882–900. https://doi.org/10.1002/jtr.2312

Juhadi, Hamid, N., Trihatmoko, E., Herlina, M., & Aroyandini, E. N. (2021). Developing a Model for Disaster Education to Improve Students' Disaster Mitigation Literacy. Journal of Disaster Research, 16(8), 1243–1256. https://doi.org/10.20965/jdr.2021.p1243

Kanbara, S., Ozawa, W., Ishimine, Y., Ngatu, N. R., Nakayama, Y., & Nojima, S. (2016). Operational definition of disaster risk-reduction literacy. Health Emergency and Disaster Nursing, 3(1), 1–8. https://doi.org/10.24298/hedn.2014-0016

Katayama, A., Hase, A., & Miyatake, N. (2021). Disaster prevention education along with weekly exercise improves self-efficacy in community-dwelling japanese people—a randomized control trial. Medicina (Lithuania), 57(3), 1–9. https://doi.org/10.3390/medicina57030231

Kawasaki, H., Cui, Z., Kurokawa, M., & Sonai, K. (2023). Current Situation of Disaster Preparedness for Effective Response in Japanese Special Needs Schools. Disaster Medicine and Public Health Preparedness, 17(2). https://doi.org/10.1017/dmp.2023.98

Khoirunisa, N. (2016). Disaster Knowledge of Student For Disaster Preparedness. The First International Conference on Child - Friendly Education, 219–222. Retrieved from https://www.researchgate.net/publication/326082914_DISASTER_KNOWLEDGE_OF_STUDENT_FOR_DISASTER_PREPAREDNESS

Li, L. I., Yu-bo, L. I., Yan, N., Yan, C., Jun, T. Da, & Jun-feng, H. (2013). Intervention Effects of Knowledge and Skills of the Public to Respond to Public Health Emergencies in Sichuan Province , China. Evaluation Review, 37(2), 140–157. https://doi.org/10.1177/0193841X14523619

Logayah, D. S., Maryani, E., Ruhimat, M., & Wiyanarti, E. (2022). The importance of disaster mitigation literacy in social studies learning. IOP Conference Series: Earth and Environmental Science, 986(1), 1–7. https://doi.org/10.1088/1755-1315/986/1/012015

Lukman, S., & Muhammad, H. H. (2023). Penerapan Model Pembelajaran Simulasi untuk Meningkatkan Pengetahuan Kesiapsiagaan Siswa dalam Menghadapi

Bencana. Jurnal Georafflesia: Artikel Ilmiah Pendidikan Geografi, 8(2), 122–128. Retrieved from https://journals.unihaz.ac.id/index.php/georafflesia/article/view/4285

Ma, L., & Christensen, T. (2018). Government Trust, Social Trust, and Citizens' Risk Concerns: Evidence from Crisis Management in China. Public Performance and Management Review, 42(2), 383–404. https://doi.org/10.1080/15309576.2018.1464478

Mardiani, E., Rahmansyah, N., Ningsih, S., Lantana, D. A., Wulandana, N. P., Lombu, A. A., & Budyarti, S. (2024). Classification of potential tsunami disaster due to earthquakes in Indonesia based on machine learning. International Journal Software Engineering and Computer Science (IJSECS), 4(1), 13–23. https://doi.org/10.35870/ijsecs.v4i1.2084

Maryani, E. (2016). Model Pembelajaran Mitigasi Bencana dalam Ilmu Pengetahuan Sosial di Sekolah Menengah Pertama. Jurnal Geografi Gea, 10(1), 42–58. https://doi.org/10.17509/gea.v10i1.1664

Meliana, D., Suharini, E., & Sanjoto, T. (2020). The Profile Of Disaster Mitigation Literacy Ability By Students In The School Prone To Tidal Floods. Proceedings of the 5th International Conference on Science, Education and Technology (ISET), 1–8. https://doi.org/10.4108/eai.29-6-2019.2290314

Monteil, C., Foulquier, P., Defossez, S., Vinet, F., & Péroche, M. (2022). Rethinking the share of responsibilities in disaster preparedness to encourage individual preparedness for flash floods in urban areas. International Journal of Disaster Risk Reduction, 67, 102663. https://doi.org/10.1016/j.ijdrr.2021.102663

Nastiti, R. P., Pulungan, R. M., & Iswanto, A. H. (2021). Faktor-Faktor yang Berhubungan dengan Kesiapsiagaan Masyarakat dalam Menghadapi Bencana Banjir Di Kelurahan Kebon Pala Jakarta Timur. Poltekita: Jurnal Ilmu Kesehatan, 15(1), 48–56. https://doi.org/10.33860/jik.v15i1.219

Oktari, R. S., Munadi, K., Idroes, R., & Sofyan, H. (2020). Knowledge management practices in disaster management: Systematic review. International Journal of Disaster Risk Reduction, 51, 101881.

https://doi.org/10.1016/j.ijdrr.2020.1018 81

Onuma, H., Shin, K. J., & Managi, S. (2017). Household preparedness for natural disasters: Impact of disaster experience and implications for future disaster risks in Japan. International Journal of Disaster Risk Reduction, 21, 148–158. https://doi.org/10.1016/j.ijdrr.2016.11.0 04

Ozeki, M., Shimazaki, K., & Yi, T. (2017). Exploring Elements of Disaster Prevention Consciousness: Based on Interviews with Anti-disaster Professionals. Journal of Disaster Research, 12(3), 631–638. https://doi.org/10.20965/jdr.2017.p0631

Parulian, P., Tinambunan, M. H., Ginting, S., Khalil Gibran, M., Wanto, A., Muharram, L. O., … Bhawika, G. W. (2019). Analysis of Sequential Order Incremental Methods in Predicting the Number of Victims Affected by Disasters. Journal of Physics: Conference Series, 1255(1). https://doi.org/10.1088/1742-6596/1255/1/012033

Pfefferbaum, B., Pfefferbaum, R. L., & Van Horn, R. L. (2018). Involving children in disaster risk reduction: the importance of participation. European Journal of Psychotraumatology, 9, 1425577. https://doi.org/10.1080/20008198.2018.1425577

Prasetio, A., Effendi, M. M., & Dwi, M. M. N. (2023). Analisis Gempa Bumi Di Indonesia Dengan Metode Clustering. Bulletin of Information Technology (BIT), 4(2), 338–343. https://doi.org/10.47065/bit.v4i3.820

Prihatin, R. B. (2018). Masyarakat Sadar Bencana: Pembelajaran dari Karo, Banjarnegara, dan Jepang. Aspirasi: Jurnal Masalah-Masalah Sosial, 9(2), 221–239. https://doi.org/10.22212/aspirasi.v7i1.10 84

Rahmatul, A., & Haji, I. P. (2024). Pendidikan Mitigasi Bencana Pada SD Islam Al Amanah Cileunyi. Jurnal Al-Hikam, 5(1), 1–8. Retrieved from https://journal.stitmhpali.ac.id/index.ph p/ah/article/view/51

Saputra, N., & Ahyuni. (2024). Peningkatan Literasi Bencana Melalui Gerakan Literasi Sekolah Pada Siswa SMA Negeri 1 Sungai Tarab Kabupaten Tanah Datar. Jurnal Pendidikan Tambusai, 8(1), 6263–6272. https://doi.org/10.31004/jptam.v8i1.133 66

Sejati, W., & Prajayanti, E. D. (2024). Gambaran Tingkat Pengetahuan dan Sikap Kesiapsiagaan Masyarakat di Daerah Kekeringan Desa Jemowo Kabupaten Boyolali. An-Najat, 2(4), 94–101. https://doi.org/10.59841/an-najat.v2i4.1726

Spencer, G., & Thompson, J. (2024). Children and young people's perspectives on disasters – Mental health, agency and vulnerability: A scoping review. International Journal of Disaster Risk Reduction, 108, 104495. https://doi.org/10.1016/j.ijdrr.2024.1044 95

Suharini, E., Meliana, D., Sanjoto, T. B., & Kurniawan, E. (2019). The Strategy of Disaster Mitigation Literacy through Problem-Based Learning (PBL) in the School Prone to Tidal Floods. Proceedings of the 1st International Conference on Environment and Sustainability Issues (ICESI). https://doi.org/10.4108/eai.18-7-2019.2290156

Suparmanto, G., Saputro, S. D., Kurniawan, S. T., Syukur, B. A., & Dewanto, D. (2024). Analisis Faktor Keterampilan Triage Bencana pada Anggota Basarnas Surakarta. Jurnal Kesehatan Kusuma Husada, 15(2), 101–109. https://doi.org/10.34035/jk.v15i2.1453

Tada, M., Iwamoto, S., Kubo, H., & Senou, A. (2022). Relationship between disaster prevention awareness and preparedness among residents living in mountainous areas of Japan. Health Emergency and Disaster Nursing, 9, 95–102. https://doi.org/10.24298/hedn.2020-0010

Taklal, S. A., Ikka, E. G., Ajeng, J., & Deliviana, E. (2023). Pendidikan kebencanaan bagi siswa berkebutuhan khusus. Orien: Cakrawala Ilmiah Mahasiswa, 3(1), 1–6. https://doi.org/10.30998/ocim.v3i1.8980

Teo, M., Goonetilleke, A., Ahankoob, A., Deilami, K., & Lawie, M. (2018). Disaster awareness and information seeking behaviour among residents from low socio-economic backgrounds. International Journal of Disaster Risk Reduction, 31, 1121–1131. https://doi.org/10.1016/j.ijdrr.2018.09.0 08

Thorup-Binger, C., & Charania, N. A. (2019). Vulnerability and capacities of international students in the face of disasters in Auckland, New Zealand: A qualitative descriptive study.

International Journal of Disaster Risk Reduction, 39(September 2018), 101136. https://doi.org/10.1016/j.ijdrr.2019.101136

Wilson, J. (2014). Essentials of business research: A guide to doing your research project. London: SAGE.

Wulansari, D., Darumurti, A., & Eldo, D. H. A. P. (2017). Pengembangan Sumber Daya Manusia Dalam Manajemen Bencana. Journal of Governance and Public Policy, 4(3), 407–421. https://doi.org/10.18196/jgpp.4383

Xu, W., Hao, Y., Wu, Q., Ning, N., You, J., Liu, C., … Lu, J. (2015). Community preparedness for emergency: A cross-sectional survey of residents in Heilongjiang of China. BMJ Open, 5(11), 1–8. https://doi.org/10.1136/bmjopen-2015-008479