INTEREST: Jurnal Ilmu Kesehatan
Volume 15, Issue 2, November 2026
https://doi.org/10.37341/interest.v15i2.782

Original Research

Snakes and Ladders Education on Disaster Preparedness Knowledge Mount Merapi to Elementary School Students

Adhelia Cantika Tama[1*], Siwi Ikaristi Maria Theresia[2], Herlin Lidya[2]

[1] Undergraduate Nursing Study Program Student, Panti Rapih College of Nursing Yogyakarta, Indonesia 55223.
[2] Lecturer of Undergraduate Nursing Study Program, Panti Rapih College of Nursing, Yogyakarta, Indonesia 55223.

ABSTRACT

Background: *Indonesia is highly vulnerable to natural disasters due to its location along major tectonic plates and the Pacific Ring of Fire, with Mount Merapi posing significant risks to communities in Disaster-Prone Area (KRB) III. Elementary school students in this area are particularly vulnerable because they often lack adequate disaster preparedness knowledge, highlighting the urgent need for early and age-appropriate disaster education. This study aimed to examine the effect of snakes and ladders game-based education on improving disaster preparedness knowledge among elementary school students.*

Methods: *This study employed a quantitative pre-experimental design with a one-group pretest–posttest approach. A total of 85 fourth- and fifth-grade students were recruited using total sampling. Disaster preparedness knowledge was measured using a questionnaire, and data were analyzed using the Wilcoxon test*

Results: *An improvement in students' preparedness knowledge was observed after the intervention. The Wilcoxon test showed a p-value of 0.000 ($p < 0.05$), indicating a significant effect of the snakes and ladders educational game on students' disaster preparedness knowledge.*
(*$p<0.001$).*

Conclusion: *Health education using a snakes and ladders game is effective in improving disaster preparedness knowledge related to Mount Merapi eruptions among elementary school students. Health education using a snakes and ladders game is effective in improving disaster preparedness knowledge related to Mount Merapi eruptions among elementary school students. This finding implies that game-based learning can be integrated into school-based disaster education programs as an engaging and effective strategy to enhance early preparedness among children in high-risk areas.*

ARTICLE HISTORY
Received: March 25th, 2026
Accepted: August 3rd, 2026

KEYWORDS
eruption, preparedness, self-efficacy, students;

CONTACT
Adhelia Cantika Tama
adheliacantika99@gmail.com
Nursing Department, Panti Rapih Yogyakarta College of Nursing, Jl. Tantular 401 Pringwulung, Condong Catur, Depok, Sleman, Yogyakarta, Indonesia 55223.

Cite this as: Snakes and Ladders Education on Disaster Preparedness Knowledge Mount Merapi to Elementary School Students. (2026). *Interest: Jurnal Ilmu Kesehatan*, *15*(2). https://jurnalinterest.com/index.php/int/article/view/101-111

INTRODUCTION

Indonesia is a country with a high risk of natural disasters due to its location at the confluence of three major tectonic plates and along the Pacific Ring of Fire, which forms a series of volcanoes in Sumatra, Java, and Nusa Tenggara. Mount Merapi is one of the most active volcanoes in the world with a stratovolcano character and a height of approximately 2,968 meters above sea level. Administratively, Merapi is located in four districts: Sleman (DIY) and Magelang, Klaten, and Boyolali in Java Province (Kurniawan et al., 2021). The shape of the mountain is steep at the top and gentle at the bottom, influenced by lava with a high silica content that hardens quickly, so it is categorized as acid lava (Deffontaines & Violette, 2012).

Mount Merapi has a steep upper slope and relatively gentler lower slopes, which are shaped by high-silica magma that solidifies rapidly, classifying it as an andesitic to dacitic stratovolcano (Global Volcanism Program, 2023). The area around Mount Merapi is classified into Disaster-Prone Areas (KRB) based on the level of volcanic activity threat. KRB III is the riskiest zone, followed by KRB II and KRB I with decreasing levels of danger (Sari Monikha Meassa, 2017). The area surrounding Mount Merapi is classified into Disaster-Prone Areas (*Kawasan Rawan Bencana* / KRB) based on the level of volcanic hazard. KRB III represents the highest-risk zone with the greatest potential impact from eruptions, followed by KRB II and KRB I with progressively lower risk levels (BNPB, 2020).

The 2010 Merapi eruption was the largest disaster, with hundreds of fatalities and thousands of damaged homes (Sari Monikha Meassa, 2017). Major eruptions in 1872 and 2010 were recorded as having a VEI of 4, and more than 400,000 people were displaced by the 2010 eruption. This situation demonstrates the urgency of disaster mitigation education in vulnerable areas (Nakada et al., 2019). Major eruptions of Mount Merapi, including the 2010 VEI 4 event, resulted in more than 300,000 evacuations and nearly 400,000 internally displaced persons. In addition, ongoing eruptive activity up to 2024 continues to pose significant threats to surrounding communities, highlighting the urgent need for strengthened disaster mitigation education in high-risk areas (Global Volcanism Program, 2024).

Efforts to reduce casualties need to be carried out from an early age, indicating low mitigation knowledge among elementary school students (Khatimah et al., 2020). Early intervention is essential to reduce disaster-related casualties, as evidence indicates that elementary school students generally demonstrate insufficient knowledge and preparedness regarding disaster mitigation, emphasizing the importance of structured, developmentally appropriate educational strategies (Widowati et al., 2023), while Sapuntala et al., (2025) found that student preparedness around Merapi was at a high level even though the correlation with self-awareness was still low. This condition shows that high preparedness does not necessarily reflect optimal self-awareness of disaster risks. High preparedness scores can be influenced by external factors such as previous disaster experiences, routine simulation programs at school, or direction from teachers and parents, self-awareness.

However relates to an individual's internal awareness of risk, recognition of danger signs, and the ability to reflect on personal roles and responsibilities during a disaster. Low self-awareness can occur because students primarily receive instructional information without a deep reflective process. This suggests that disaster education should not only improve technical knowledge and skills but also foster self-awareness to make preparedness more meaningful and sustainable. Mutiarni et al., (2022) emphasize

the importance of a community-based approach and local participation in strengthening a sustainable preparedness system. Early education is a crucial strategy for building a culture of preparedness in eruption prone areas.

At elementary school age, children are at the concrete operational stage so they need visual, interactive, and real learning media (Indriyani et al., 2024). In addition to cognitive aspects, educational games also stimulate children's social and emotional development through collaboration and emotional management (Santrock Jhon W et al., 2021). Various educational media can be used, ranging from print, audiovisual, interactive digital, and educational games, with media selection must be appropriate for the child's age and learning context (Yudianto et al., 2023).

The Snakes and Ladders disaster game is an appropriate medium because it combines educational and entertainment elements. Board games have been shown to increase social interaction, empathy, and participant engagement (Jang & Tan, 2022), and are even effective in fostering disaster response intentions (Chew et al., 2023). Learning success is greatly influenced by the role of the facilitator as a guide and motivator. Game-based educational methods also enhance students' motivation, critical thinking, and social responsibility, especially when supported by a fun learning environment (Yuliani & Juhana, 2025).

Based on this, this study uses the snakes and ladders disaster media as an interactive educational tool to improve knowledge of Merapi eruption preparedness among elementary school students in the KRB III area. Therefore, researchers are interested in conducting a study entitled The Effect of Snakes and Ladders Education on Knowledge of Mount Merapi Disaster Preparedness among Elementary School Students in Pakem District as an effort to fill the research gap and strengthen disaster education from an early age.

This study utilizes a snakes and ladders disaster-based educational game as an interactive tool to improve elementary school students’ knowledge of Mount Merapi eruption preparedness in Disaster-Prone Area III. The novelty of this study lies in the use of a locally contextualized, game-based learning approach tailored to volcanic disaster risk for children. This study aims to examine the effect of the intervention on students’ preparedness knowledge. The findings are expected to contribute to the development of innovative, context-based disaster education strategies for elementary schools in high-risk areas.

MATERIALS AND METHODS

This study used a quantitative approach with a pre-experimental one group pretest–posttest design. This study used a quantitative approach with a pre-experimental one-group pretest–posttest design, which was chosen to evaluate changes in students’ disaster preparedness knowledge before and after the intervention within a real school setting. This design allows for direct measurement of the effect of the educational intervention when a control group is not feasible due to practical and ethical considerations, making it appropriate for a preliminary evaluation of intervention effectiveness), which aimed to assess the effect of disaster preparedness education using the snakes and ladders game on students' knowledge.

The study was conducted from September 2025 to January 2026 in three elementary schools in Pakem District, located in Disaster-Prone Area III. Prior to the study, researchers distributed informed consent forms to students for their parents/guardians. The forms outlined the purpose, benefits, procedures, and voluntary

participation rights of the study. Parents who consented signed the forms and returned them to their homeroom teachers, with assurances that the data would be kept confidential and for scientific purposes only.

The study population was all 83 fourth and fifth grade students, and a total sampling technique was used to sample the entire population. After the study was conducted, 83 respondents were analyzed because two students did not participate in the complete series of activities. Inclusion criteria included fourth and fifth grade students who were willing to participate in the study with parental consent, while exclusion criteria were students who were absent during the intervention process.

This study has obtained ethical approval from the ethics committee of Panti Rapih Hospital Yogyakarta (229/SKEPK-KKE/XII/2025) and official permission from the relevant educational institution. All respondents participated in the study voluntarily through informed parental consent, and data confidentiality was guaranteed throughout the study.

The independent variable in this study was the snakes and ladders game-based disaster education, while the dependent variable was students' disaster preparedness knowledge regarding Mount Merapi eruptions. The research instrument was a Mount Merapi eruption disaster preparedness knowledge questionnaire consisting of 20 multiple-choice questions covering the pre-disaster, disaster, and postdisaster stages. A score of 1 was given for correct answers and 0 for incorrect answers, with a maximum total score of 20. The instrument was declared valid and reliable based on previous tests, with a Cronbach's Alpha reliability value of 0.713.

Prior to the study, researchers distributed informed consent forms to students for their parents/guardians. The forms outlined the purpose, benefits, procedures, and voluntary participation rights of the study. Parents who consented signed the forms and returned them to their homeroom teachers, with assurances that the data would be kept confidential and for scientific purposes only.

Data collection was carried out in stages in each class according to the agreed schedule at Kaliurang 1 Elementary School, Kaliurang 2 Elementary School, and Banteng Elementary School in December 2025. The research began with a brief explanation and assistance during the questionnaire filling. Students are then divided into small groups of four people. use a counting method to be fair and objective, then play the snake game stairs according to instructions. After completion, the researcher checked the completeness of the answers and gave a simple reward in the form of a pencil case as a form of appreciation.

Data collection was carried out by administering a pretest, followed by education. Disaster preparation using the peer group method assisted by the snake game stairs, then ending with a posttest. Educational activities are carried out in groups with the assistance of researchers and research assistants, accompanied by reinforcement material if there are parts of the game that cannot be missed.

Univariate analysis was used to describe the characteristics of respondents and level of knowledge, while bivariate analysis was conducted to see the differences in knowledge scores before and after the intervention. Because the data is not evenly distributed normally, the Wilcoxon signed rank test was used.

RESULTS

Table 1. Characteristics of Respondents of Elementary School Students in Grades 4 and 5 in Pakem District (n = 83)

Respondent Characteristics	Frequency (n)	Percentage (%)
Gender		
Female	45	54.2
Male	38	45.8
Grade		
Grade 4	47	56.6
Grade 5	36	43.4
Age		
10 years	51	61.4
11 years old	32	38.6
12 years old	-	-
Disaster Experience		
Yes	64	77.1
No Yes	19	22.9
Types of Disasters That Yes Experienced		
No Yes	19	22.9
Volcanic Eruption	47	56.6
Flood	10	12.0
Landslide	7	8.4

Based on Table 1, the majority of respondents were female (54.2%), with a class composition dominated by fourth-grade students (56.6%). In terms of age, the majority were under 10 years old (61.4%), indicating that the study participants were predominantly in the early elementary school age group. Interestingly, more than three-quarters of respondents had experienced a disaster (77.1%), indicating high exposure to disaster risk in the study area. The most common type of disaster experienced was a volcanic eruption (56.6%), significantly higher than floods (12.0%) and landslides (8.4%). This finding confirms that the eruption of Mount Merapi is a primary disaster experience for students, thus providing a relevant context in developing their knowledge and preparedness.

Meanwhile, 22.9% of students had never experienced a disaster directly, indicating variations in individual experiences despite being located in a disaster-prone area. Most students had prior disaster experience (77.1%), mainly volcanic eruptions (56.6%), indicating high exposure to relevant disaster risks. However, this exposure does not necessarily reflect adequate preparedness knowledge, supporting the need for educational intervention.

The majority of students were in early elementary age (10 years: 61.4%) and grade 4 (56.6%), emphasizing the importance of using interactive and age-appropriate learning methods. The dominance of eruption experience compared to floods (12.0%) and landslides (8.4%) also confirms that the intervention content is contextually relevant, which may enhance its effectiveness in improving disaster preparedness knowledge.

Table 2. Overview of Children's Preparedness Knowledge Before and After Being Given Education Using the Snakes and Ladders Game

Knowledge	Mean	Median	Sdt.Deviation	Min-Max	95% CI
Before	10.02	10.00	± 3,339	3-19	9.30-10.75
After	11.71	11.00	± 3,441	5-18	10.96-12.46

Based on table 2, There was a clear increase in students' disaster preparedness knowledge after the intervention, as reflected by the higher mean score (from 10.02 to 11.71). This indicates that the snakes and ladders game-based education contributed to improving students' understanding. Although the score distribution remained relatively similar, the upward shift in both central tendency and confidence interval suggests a consistent improvement across participants. These findings support the study objective that interactive educational media can effectively enhance disaster preparedness knowledge among elementary school students.

Mean of children's preparedness knowledge before being given education using the snakes and ladders game was 10.02 with a median of 10.00 and a standard deviation of 3.339. The lowest score obtained by respondents was 3, while the highest score was 19. The results of the analysis show that with a 95% confidence level, the average of children's preparedness knowledge before being given education was in the range of 9.30 to 10.75. After being given education using the snakes and ladders game, the average of children's preparedness knowledge was 11.71 with a median of 11.00 and a standard deviation of 3.441. The lowest score after the intervention was 5, while the highest score was 18. Based on a 95% confidence interval, the average of children's preparedness knowledge after education was in the range of 10.96 to 12.46.

Table 3. The Effect of Education Using the Snakes and Ladders Game on the Preparedness Knowledge of Elementary School Children in Disaster-Prone Area III in the Pakem District

Group	n	Mean	Median (Min-Max)	Std. Deviation	P *Value*
Pretest	83	10.02	10.00 (3-19)	± 3,339	0.000
Posttest	83	11.71	11.00 (5-18)	± 3,441	<0.001

The Wilcoxon test was used because the data were not normally distributed. The analysis results in Table 3 show a significance value of 0.000 (<0.001) ($p < 0.05$), which indicates a significant difference between the pretest and posttest scores after providing education using the snakes and ladders game, so Ha is accepted and H0 is rejected. These findings prove that the snakes and ladders game media is effective in increasing students' knowledge of volcanic eruption disaster preparedness and has a positive impact on preparedness attitudes, where increased knowledge is followed by increased disaster risk reduction efforts.

DISCUSSION

Respondent characteristics indicate a predominance of female students and the majority are from grade 4, reflecting the actual population situation as the study used total sampling. This pattern aligns with the findings of (Nugroho et al.,2025), who also reported a higher number of female respondents than male respondents in a disaster preparedness study in the Merapi region. In terms of age, the majority of respondents

were 10 years old, followed by 11 years old, with no 12-year-old respondents, indicating that the participants were in the elementary school developmental phase. This is consistent with Nugroho's theory (2025), which explains that differences in the number of respondents between grades reflect the distribution of students in schools. At this age range, children are in the concrete operational stage, where logical thinking skills begin to develop but still require concrete, hands-on learning. Therefore, an educational game approach is relevant to support disaster understanding (Marinda, 2020).

Most respondents had experience with disasters, particularly volcanic eruptions, consistent with the geographical characteristics of the study area, which is located in a disaster-prone area of Mount Merapi. Other experiences, such as floods and landslides, were also present, to a lesser extent. This diversity of experiences indicates different risk exposures among students, which can influence their perceptions and preparedness for disasters. These direct and indirect experiences have the potential to shape initial awareness of disaster threats, but do not always translate into optimal preparedness. This is in line with (Nastiti et al.,2021), who stated that preparedness is not solely determined by disaster experience but is also influenced by factors such as age, education level, and gender. Therefore, structured educational interventions are needed to strengthen students' overall preparedness.

Initial conditions indicated that children's knowledge of disaster preparedness was still limited because most had never received structured and engaging disaster education. Their understanding generally stemmed from everyday experiences and indirect information from their surroundings, thus not yet forming a comprehensive picture of preparedness. Conventional, one-way learning methods also failed to accommodate the characteristics of elementary school-aged children who require a concrete and interactive approach. After being provided with education through the Snakes and Ladders game, understanding improved because this medium allowed children to learn through play, discussion, and repetition of information naturally. This approach increased children's attention, motivation to learn, and retention of preparedness material, resulting in more effective internalization of concepts.

These findings align with research by (Saparwati et al., (2020), which demonstrated that the use of engaging educational media can improve disaster preparedness knowledge in school-age children. This confirms that children have the capacity to effectively receive disaster information when delivered through methods appropriate to their developmental stage. However, during the study, variations in attention and concentration levels were still found among respondents, with some children easily distracted by their surroundings and peer interactions, resulting in suboptimal delivery of the material. Given the limited research on disaster preparedness education in volcanic areas for elementary school children, these results can serve as an initial reference in developing more adaptive and contextual learning methods for local disaster risks.

The test results showed a significant influence between preparedness before and after providing education using the snakes and ladders game, which confirms the effectiveness of this media in increasing knowledge and shaping students' preparedness attitudes towards the risk of volcanic eruptions. This increase in understanding has implications for improving students' attitudes in disaster risk reduction, where the better the knowledge possessed, the preparedness also tends to increase. This finding is in line with research Vina Dharma Yani et al., (2025) which proves that education through the

snakes and ladders game can improve disaster preparedness knowledge in elementary school students. Similar results are also supported by Maulina et al., (2025), who stated that game media is still relevant and effective for use in children's health education, despite the increasing development of electronic media.

The Snakes and Ladders game has advantages as a learning medium because it carries a game-based approach that increases active student engagement through a combination of images, text, and educational questions, thereby helping to repeat the material and strengthen memory. However, during the implementation of the study, variations in student concentration levels were still found due to environmental distractions and peer interactions, which affected the optimization of material delivery. Given that research on disaster preparedness in elementary school children in volcanic areas is still limited, these results can be an initial reference for developing more adaptive educational methods. In addition to the Snakes and Ladders game, other media such as educational booklets have also proven effective in increasing disaster understanding because they present material systematically with simple language and attractive illustrations, making them an alternative or complement in preparedness learning (Putro Pambayun et al., 2025).

The Snakes and Ladders game has advantages as a learning medium because it applies a game-based approach that increases active student engagement through a combination of images, text, and educational questions, thereby reinforcing learning and memory retention. This finding implies that interactive and game-based learning can be effectively integrated into school-based disaster education programs, particularly in high-risk areas, to improve students' preparedness knowledge from an early age.

A key strength of this study lies in the use of a context-specific and developmentally appropriate educational medium, as well as its implementation in a disaster-prone area, which enhances the relevance of the findings. However, this study also has limitations, including the absence of a control group, variations in students' concentration during the intervention, and the relatively short duration of the educational session, which may affect the generalizability of the results.

Therefore, future research is recommended to apply a more rigorous experimental design with a control group, extend the duration of intervention, and combine various educational media to improve effectiveness. In addition to the snakes and ladders game, other media such as educational booklets have also been shown to improve disaster understanding, as they present information systematically using simple language and engaging illustrations, making them a useful alternative or complementary learning tool.

CONCLUSION

This study shows that the majority of respondents were female, with the maximum age being 10 years, and most had disaster experience, which has the potential to shape students' initial preparedness. The results of the study showed an increase in preparedness knowledge after being given health education using the snakes and ladders game media, and the Wilcoxon test proved a significant difference between before and after the intervention, so that the media was considered effective in improving the preparedness of elementary school children in Disaster Prone Area III, Pakem District. Therefore, schools are advised to carry out education or training on Mount Merapi eruption preparedness regularly by utilizing the snakes and ladders game media, ideally using one facilitator for each small group for a more optimal learning process. For further research, it is recommended to use a control group, equalize the sedimentation

time, ensure the reading ability of respondents, and pay attention to factors of time, space, and number of facilitators to obtain more optimal results.

ACKNOWLEDGMENTS

The author would like to thank the school, all respondents, and all parties who have helped carry out this research, especially in the process of collecting data and implementing activities in the field.

REFERENCES

Chew, KS, Wong, SSL, Tarazi, IS binti, Koh, JW, Ridzuan, NA 'Ain bint, & Wan Allam, SAS bin. (2023). Tutorless board game as an alternative to tabletop exercise for disaster response training: perception of interaction engagement and behavioral intention. *BMC Medical Education*, *23* (1). https://doi.org/10.1186/s12909-023-04356-4

Deffontaines, B., & Violette, S. (2012). *Characterization of the volcano-sedimentary deposits of an active strato-volcano: the Merapi case example (Central Java, Indonesia)* . https://www.researchgate.net/publication/273058211

Global Volcanism Program. (2023). *Merapi (Indonesia)*. Smithsonian Institution. https://doi.org/10.5479/si.GVP.VOTW4-2013

Global Volcanism Program. (2023). *Report on Merapi (Indonesia)*. Smithsonian Institution. https://volcano.si.edu/volcano.cfm?vn=263250

Indriyani, R., Taswadi, & Sobandi, B. (2024). Analysis of Cognitive Development Theory by Jean Piaget on Color Games on Early Childhood Development. *EduLine: Journal of Education and Learning Innovation* , *4* (4), 504–511. https://doi.org/10.35877/454ri.eduline3068

Jang, L.-F., & Tan, W.G. (2022). Let's play board games together: How board games benefit child development and learning. *International Journal of Research Studies in Education* , *11* (5). https://doi.org/10.5861/ijrse.2022.135

Khatimah, H., Sari, A., & Dirhamsyah, M. (2015). The effect of implementing the school watching simulation method on students' preparedness attitudes in facing earthquake disasters. *Postgraduate Program of Syiah Kuala University* , *8* (1), 11–18.

Kurniawan, FA, Prasetya, JD, Maharani, YN, Pembangunan, U., Veteran, N. ", & Yogyakarta, ". (2021). KONSTELLASI: Convergence of Technology and Information Systems for School Preparedness in Facing the Merapi Volcanic Eruption Disaster Case Study at SMP Negeri 2 Cangkringan and SMP Sunan Kalijogo Cangkringan, Sleman Regency.

Marinda. (2020). Jean Piaget's Theory of Cognitive Development and Its Problems in Elementary School-Aged Children.

https://media.neliti.com/media/publications/340203-teori-perkembangan-kognitif-jean-piaget-00d2756c.pdf

Nakada, S., Maeno, F., Yoshimoto, M., Hokanishi, N., Shimano, T., Zaennudin, A., & Iguchi, M. (2019). Eruption scenarios of active volcanoes in Indonesia. *Journal of Disaster Research* , *14* (1), 40–50. https://doi.org/10.20965/JDR.2019.P0040

Nastiti, R., Pulungan, RM, & Iswanto, AH (2021). Factors Related to Community Preparedness in Facing Flood Disasters in Kebon Pala Village, East Jakarta. Poltekita: Journal of Health Sciences, 15(1), 48–56. https://doi.org/10.33860/jik.v15i1.219

Nugroho, A., Eka Rahmuniyati, M., Sahayati, S., & Denliana Polnesta Ita, M. (2025). The Impact of Playing a Snakes and Ladders Game about Mount Merapi Disaster Awareness on Students' Preparedness Knowledge at Kepuharjo Cangkringan Elementary School Article Info. *Journal of Health Education* , *10* (1). https://doi.org/10.15294/jhe

Putro Pambayun, Y., Karunia Estri, A., & Lidya, HPPY (2025). *Education using booklet media on disaster preparedness knowledge of mount merapi eruption among elementary school children in jogjakarta*.

Santrock John W, Deckard Kirby Deater, & Lansford Jennifer E. (2021). *Child Development* .(Santrock, J. W., Deater-Deckard, K., & Lansford, J. E. (2021). *Child development* (15th ed.). McGraw-Hill Education.)

Saparwati, M., Trimawati, & Wijayanti Fikri. (2020). Improving Disaster Preparedness Knowledge with Animated Videos in School-Age Children. In | Pro Health Scientific Journal of Health (Vol. 2, Number 1). http://jurnal.unw.ac.id/index.php/PJ/

Sari Monikha Meassa. (2017). Study of the Analysis of the Distribution of Fatalities Based on Age and Gender on the 2010 Merapi Volcanic Eruption KRB Map.

Vina Dharma Yani, M., Wayan Sukawana, I., Made Sukarja, I., Made Juniari, N., Made Wedri, N., Made Mertha, I., & Kemenkes Denpasar, P. (2025). Educational Media Snakes and Ladders Game Improves Elementary School Students' Knowledge in Facing Earthquake Disasters. In *Jurnal Gema Keperawatan* | (Vol. 18, Number 2). https://doi.org/10.33992/jgk.v18i2.4043

Widowati, E., Koesyanto, H., Istiono, W., & Sutomo, A. H. (2023). *Disaster Preparedness and Safety School as a Conceptual Framework of Comprehensive School Safety*. *December*, 1–11. https://doi.org/10.1177/21582440231211209

Yudianto, A., Pd, S., Pd, M., Lestari, D., Pd, SI, Nururi, I., Putri, SA, Sari, S., Hestiningtyas, R., Maulidia, LN, & Rabuandika, A. (2023). *Interdisciplinary Education in Indonesia: Perspective of PT. MIFANDI MANDIRI DIGITAL* .

Yuliani, A., & Juhana, A. (2025). Building a Dynamic Learning Environment in Elementary Schools Through Board Games: A Systematic Review. In *LENTERA: Educational Scientific Journal* (Vol. 18, Number 1). http://10.52217/lentera.v18i1.1579