

Disaster Mitigation Preparedness: Cases of Persons with Vision Disabilities in Indonesia

Mohammad Efendi¹, Anik Nur Handayani², Rizqi Fajar Pradipta³, Rizky Amalia Rosyidi⁴, Mohammad Arief Nazaruddin⁵, Syar Meeze Rashid⁶

Abstract

It is empirically identified that persons with disabilities in several natural disasters evacuate themselves because they have not been optimally involved in disaster preparedness programs. The purpose of this study is to describe the preparedness of persons with visual disabilities in several provinces in Indonesia to face natural disasters, especially earthquakes which can occur at any time in their neighborhood. To achieve this goal, the research design in this study is an ex post facto descriptive study involving 62 respondents who have visual impairment taken randomly from several provinces in Indonesia. The conclusion shows that the initial knowledge of persons with visual disabilities regarding natural disasters can be categorized as enough. Likewise, their understanding of natural disaster early warning and emergency rescue when natural disasters occur can be categorized as enough. The results of these studies need further correction.

Keywords: *Disaster mitigation, visual disability.*

1. Introduction

The frequency of natural disasters that have occurred in Indonesia in the last 10 years has been quite high in intensity. Several types of natural disasters that often occur in Indonesia include earthquakes, tsunamis, volcanic eruptions, landslides, floods, tornadoes, and others. In the list of the world's volcano population, about 13% are in the Indonesian archipelago and have the potential to cause natural disasters with a magnitude of difference. According to Indonesian Disaster Data (DIBI/Data Bencana Indonesia) and reports National Disaster Management Agency (BNPB/ Badan Nasional Penanggulangan Bencana), during 2022 it will happen 28 earthquakes, 1 volcanic eruption, 1530 floods, 1067 extreme weather, 634 landslides, 252 land forest fires, 26 tidal waves and abrasion, and 4 droughts. Whereas in 2020, there were 593 floods, 798 landslides, 489 tornadoes, and 176 forest fires (Aditya & Rastika, 2023). The earthquake and flood disaster is one of the most frequent disasters during the last 10 years.

Natural disasters are disasters caused by a series of events in the universe (Etkin, 2015). Natural disasters in any format, it is certain that these events will become a serious disturbance to the functioning of a society, causing widespread harm to human life as well as in material, economic or environmental terms (Tang & Wen, 2009). The earthquake

¹ Universitas Negeri Malang; ⁴ Universitas Brawijaya Malang

² Universitas Negeri Malang; ⁴ Universitas Brawijaya Malang

³ Universitas Negeri Malang; ⁴ Universitas Brawijaya Malang

⁴ Universitas Negeri Malang; ⁴ Universitas Brawijaya Malang

⁵ Universitas Negeri Malang; ⁴ Universitas Brawijaya Malang

⁶ Universiti Kebangsaan Malaysia

and tsunami natural disasters in Aceh are one of the most devastating natural disasters in the world for the past 40 years. According to the UN report, 229826 victims were missing and 186983 others died in the earthquake and tsunami. The 9.3 magnitude earthquake (according to the Pacific Tsunami Warning Center) has devastated the northern part of Aceh, North Sumatra, the West Coast of Peninsular Malaysia, Thailand, the East Coast of India, Sri Lanka, and even the East Coast of Africa. This natural disaster caused the biggest death in the history of earthquakes. Nearly 50% of the buildings in the area were destroyed by the earthquake which was followed by a tsunami wave reaching 9 meters in height (Hendrawan et al., 2010). In the event of the next natural disaster, in 2010 the eruption of Mount Merapi occurred which caused more than 350 people to die, and agricultural land and residents' houses were destroyed. The total number of victims who died was 355 people. The results of the identification show that the number of vulnerable population groups exposed to high-risk volcanic hazards is as many as 56 thousand people or 0.13% of the total exposed population. Among the victims of the disaster are many persons with disabilities (State Ministry for National Development Planning, 2012). It is difficult for persons with disabilities to evacuate themselves and their families lack knowledge in evacuating persons with disabilities when a disaster occurs.

2. Literature Review

Natural disasters in Indonesia over the past 10 years have made local governments aware of the importance of disaster mitigation in anticipation of similar events. Disaster Mitigation is a series of efforts to reduce disaster risk both through physical development and awareness and capacity building in dealing with disaster threats (Yousuf et al., 2020). Efforts to identify risks, awareness of disaster risks, and planning for countermeasures need to start from prevention before a disaster occurs to handling after a disaster occurs (Rachmah et al., 2022;Carter, 2008). It is very essential to know more about mitigation, the importance of mitigation, steps, and examples of mitigating natural disasters or other disasters for those who live in disaster-prone areas including persons with visual disabilities. So, disaster mitigation is an effort that aims to reduce the risks and impacts of disasters, both natural disasters and disaster not-natural and social disasters (Caraka et al., 2021). Persons with visual disabilities are a subsystem of society inclusively, so that, their existence in normal society must be able to adapt quickly when an adverse event occurs in their environment (Lusli, 2009).

Many behavioral theories have been developed with psychology as a strategic basis for promoting the application of disaster preparedness measures. The health belief model, the extended parallel process model, the theory of planned behavior (TPB) (Ajzen, 1991), and social cognitive theory are the most commonly used behavioral theories, applicable to disaster research on epidemic diseases, floods, and earthquakes (Rincon et al., 2001). TPB can be directly used to evaluate disaster preparedness by looking at beliefs and attitudes toward acceptable and unacceptable behavior (Bradley, 2010). The growing need for people to be able to respond in a timely and effective manner to the challenges posed by natural disaster events has highlighted the need for them to prepare in ways that reduce their risks and enhance their capacities for resilient and adaptive response and recovery when disasters strike (Paton, 2020).

To minimize risks or losses, they need knowledge, understanding, and skills to prevent, detect and anticipate earlier about various kinds of disasters (Tang & Wen, 2009). The necessary disaster mitigation includes protective activities that can be started from preparation before the disaster takes place, assessing the disaster hazard, and disaster management, in the form of rescue, rehabilitation, and relocation (Yousuf et al., 2020). All of these are done to prevent other unfavorable impacts of the emergence of communicable diseases due to disasters, especially additional economic losses for the recovery process (Mavrouli et al., 2023).

In an emergency, losing the ability to see (low vision and blindness) is a big loss. Because visual events about natural disasters in the vicinity cannot be accessed properly. They appear a priori, have difficulty with social communication, appear skeptical, indifferent, uncommunicative, and have difficulty adapting to their environment (Atowa et al., 2019) as well as hesitation in taking action and drawing conclusions. Information relating to the preparedness of persons with disabilities in the impact that they cannot fully act quickly in saving themselves in the event of a disaster (Raja & Narasimhan, 2013). Facing various kinds of natural disasters is important to explore because it is possible individually that they have different potentials and capabilities (Efendi et al., 2022).

Disaster preparedness is a series of preparatory and adjustment actions to ensure that the resources needed for an effective response are available before a disaster occurs, or the necessary resources can be obtained quickly when needed (Madanian et al., 2018). The purpose of this research is very important to analyze the understanding and readiness of persons with visual disabilities and to be used as a basis for improving the quality of steps related to prevention, mitigation, preparedness, early warning, emergency response, post-disaster rehabilitation, and reconstruction in Indonesia.

3. Method.

This study aims to describe the preparedness of persons with visual disabilities in several provinces in Indonesia to face natural disasters, which can occur at any time in their neighborhood. Preparedness is manifested in a series of activities carried out to anticipate disasters through appropriate and useful organization and steps (Gundran et al., 2023).

To achieve this goal, the research design used in this research is a quantitative descriptive study. Quantitative descriptive research is a method that aims to create an objective picture or description of a situation using numbers, starting from data collection, interpretation of the data as well as the appearance and results (Creswell & Hirose, 2019). This research is suitable for seeing an overview of phenomena, descriptions of activities are carried out systematically and emphasize factual data rather than conclusions. The data collection method is after the fact. Ex post facto study or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher.

Table 1. Respondents' Educational Qualifications

No.	Qualification	Frequency (%)
1.	Elementary school	14.30
2.	First Middle School	3.60
3.	Senior High School	25.00
4.	College	35.70
5.	Others (homeschooling, non-formal)	21.40
		100.00

N=62

The determination of research subjects was taken randomly from various regions in Indonesia, without taking into account the proportion of region origin. The assumption is that all members of the population have the same characteristics and criteria that have been determined. In this case, persons with visual disabilities do not have other psychological and physiological barriers (double handicapped).

Table 2. Respondents' Disability Phase

No.	Qualification	Frequency (%)
1.	From birth	55.3
2.	Children's age	11.9
3.	Elementary school age	15.1
4.	Teenagers/Adults	17.7
		100.00

N=62

Respondents were given a list of questions that had to be filled in according to the conditions felt or experienced so far. Distribution of subjects in Table 2, the proportion of visual abnormalities acquired from birth. Visual disabilities acquired from birth have limited experience so understanding the environment relies more on the mental map (Efendi, 2018).

To analyze research data that has been collected and classified according to type (Miles and Huberman, 1994). For interpretation, some of the qualitative data provided by the respondents were transformed into a scale, then analyzed using the help of the formula:

percentage = real score / ideal score x 100%.

Table 3. Interpretation Scale of Measurement Percentage

Range	Description
0% - 20 %	Very weak
21% - 40%	Weak Enough
41% - 60%	
61% - 80%	Strong
81% - 100%	Very strong

4. Results

A description of research data on the preparedness of persons with visual disabilities in dealing with natural disasters can be seen in the following section.

Table 4. Respondents' Knowledge of Natural Disasters

No	Rated aspect	Agree	Disagree
		(%)	(%)
1.	Understanding of natural disaster events	65	35
2.	Understanding of the characteristics and types of natural disasters that often occur in Indonesia	86.3	13.7
3.	Understanding the factors that cause natural disasters	71.58	28.42
4.	Understanding of the accompanying impact of natural disasters after the earthquake	66.22	33.78
5.	Understanding the intensity of natural disasters	39.6	60.4

6.	Understanding the characteristics of high-intensity Earthquakes	63.3	36.7
7.	Understanding the relationship between earthquake events and Tsunamis	56.65	43.35
8.	Understanding of tsunami qualifications in Aceh	69.1	30.9
9.	The positive and negative impacts of various volcanic eruptions	60.3	39.7
	Mean	64.23	35.77

N=62

Table 4. Shows that the knowledge of persons with visual disabilities about

natural disasters includes: 65% of respondents can categorize natural events in the category of natural disasters and not natural disasters, 72.7 respondents understand natural disasters occur not because of human intervention. Furthermore, 86.3% of respondents understand the classification of natural disasters based on their own experience and information from their surroundings such as tsunamis, earthquakes, volcanic eruptions, flash floods, cyclones, landslides, and fires. Related to earthquake natural disasters, 71.58% of respondents understand that the cause of earthquakes is due to shifts in the earth's crust. As a result of the frequent occurrence of earthquakes in Indonesia, 66.22% of respondents assume that earthquakes are always associated with tsunamis. According to the perception of 63.3% of respondents, the big and small categorization of earthquake natural disasters was identified by the presence of aftershocks and the number of buildings that collapsed.

Learning from the case of the natural tsunami disaster in Aceh, every underwater earthquake has the potential to trigger a tsunami so 69.1% of respondents believe the tsunami in Aceh is the biggest tsunami that has ever happened in Southeast Asia. The effects of these disasters indirectly become good learning material, because 39.6% of respondents believe that earthquakes in Indonesia can occur based on certain time cycles. On this basis, when a similar event occurred, around 60.2% of respondents said they had an understanding of the dangers posed by the tsunami. For that, they will stay away from coastal areas and try not to panic.

Table 5. Readiness of Respondents in Facing Natural Disasters

No	Assessment Aspects	Priority (%)	Optional (%)
1	Be prepared for an earthquake & tsunami	43.6	56.4
2	Anticipate in the event of an earthquake/tsunami	66	34
3	Priority for rescue during an earthquake or tsunami	60.4	39.6
4	Know the signs of a tsunami	51.9	49.1
5	This is important when a natural disaster occurs	40	60
6	It's important to stay at home when a natural disaster occurs	48.1	51.9
	Mean	51.67	48.33

Table 5. Shows that the readiness of persons with visual disabilities to anticipate the occurrence of natural disasters or tsunamis that may occur at any time, the right way as practiced by 43.6% of respondents need to take part in self-rescue training from earthquakes and tsunamis, thereby increasing related knowledge, securing belongings to a safe place, listening to information from radio and TV is optional. As for self-rescue

training as a precautionary measure before a natural disaster occurs, as was done by 66% of respondents, this is the right step, so knowing important places such as hospitals and places of refuge is optional. Efforts made by 60.4% of respondents by choosing the top priority for self-rescue in the event of an earthquake and tsunami were the right steps, helping their families and saving valuable documents or other optional items.

Recognizing warning sounds through sirens, bells, trumpets, drums, or other sounds, as perceived by 51.9% of respondents, is the most appropriate way to find out signs of a natural disaster occurring in the vicinity. Notifications from people around, TV/radio announcements, or waiting for the results of local officials' meetings, regarding this matter can hamper rescue efforts.

When a disaster occurs, 40% of respondents understand the importance of maps and evacuation routes for rescue, the rest are more concerned with evacuation equipment, identifying health posts, and the importance of first aid kits. Likewise, when an earthquake occurs while they are at home, around 48.1% of respondents think that what needs to be done is to take cover under a sturdy table while holding on to the table leg is the right step, so run to an open place, away from windows and bookshelves is an optional step.

The implication of the understanding of respondents who are identified as persons with visual disabilities and the urgency of a natural disaster mitigation guidebook for them is highly expected. The results of this survey show that information about natural disasters understood by 54.8% of respondents was obtained via the internet or social media, the rest via radio/TV broadcasts 23.8%, 16.7% from other people, and 4.7% from books.

5. Discussion

The aspects discussed in this section refer to the following indicators: knowledge and understanding of warnings about natural disasters, and preparedness to deal with natural disasters. Empirically, respondents' knowledge of natural disaster mitigation can be categorized as enough. They know information about natural disasters through audio or hearing senses, listening to radio information, or word of mouth from people around them both from fellow blind people and other people. They understand enough about warning of natural disasters that have been known before, especially earthquakes, tsunami hazards, early warning of tsunami hazards, and other natural disasters. The results of this exploratory research are not significantly different from previous research on preparedness for the blind in Banda Aceh after the tsunami disaster is in the category of preparedness 51% (Madanian et al., 2018). Less than the maximum achievement, due to: 1) The disaster preparation program is not maximized, 2) Disabled participation is minimal in disaster risk reduction education, 3) Disability accessibility to disaster risk reduction materials, 4) Persons with disabilities cannot act quickly in rescue (Hendrawan et al., 2010). Even though the essence of having competence is related to disaster for persons with visual disabilities so that they can deal with a serious disturbance of an event that can cause widespread harm to human life, materially, the economy, and the environment (Tang & Wen, 2009).

As long as people with visual disabilities are unable to make full use of their sense of sight, they will experience problems in social adjustment in their environment. Moreover, if they have not been well educated, they often show delays in mastering some abstract concepts and their social-emotional abilities (Kirk et al., 2009). Mental stimulation and encouragement from the surrounding environment can provide opportunities for people with visual disabilities to develop their intelligence. Limited ability in mobility causes smooth social interaction with the surrounding environment to become a difficulty in itself. Departing from these conditions, in general, the problems that appear in persons with visual disabilities including references to familiarizing the

environment are more verbalistic in nature, it is difficult to make associations with events that cannot be reached by both hands and a lack of mastery of the rhythms and styles of social communication in society.

Mastery of knowledge about disaster mitigation information systems for people with visual disabilities, of course, must be based on the characteristics of students with all their limitations. The urgency is that the perception and understanding of the information learned can be internalized properly so that if at any time there is a disaster event around them, they can manage themselves to quickly get out of a critical situation. Therefore, the development of an information system on disaster mitigation for persons with visual disabilities should ideally be transmitted through appropriate strategies and media. The impact will encourage the excitement of learning and internalize the material in the behavior of everyday life (Momay & Tukang, 2023). In addition, the use of discussion, simulation, and demonstration methods, as well as assisted by film media, pictures, and maps is indeed quite effective. Another consideration that is very important for these students, they may survive and/or complete the degree program if they have support in college, especially universally available support (Newman et al., 2018).

To strengthen the learning experience about disaster mitigation in schools, it is necessary to simulate evacuation practices in stages, starting with saving oneself and taking shelter in the nearest objects in the classroom, directing students out of the classroom, and gathering students in a safe assembly point (Afrian et al., 2020). Informal disaster mitigation topics can be transformed through community outreach activities, professional groups, government/private agencies, as well as citizen forums, community organizations, and other social institutions (Arai et al., 2023).

Steps related to disaster analysis, mitigation, preparedness, early warning, emergency management, rehabilitation, and post-disaster reconstruction which need to be transmitted to persons with disabilities include some phases such as mitigation, preparedness, response, and recovery. The mitigation phase is efforts to minimize the negative impacts of disasters (eg. zoning and building codes, vulnerability analysis, and public learning). The preparedness phase is planning how to respond to a disaster (eg. planning preparedness, emergency drills, and warning systems). The response phase is an effort to minimize the damage caused by the disaster (eg search and rescue; emergency measures). The recovery phase is returning the community to normal conditions (e.g. temporary housing, financial assistance, health care). The response phase is efforts to minimize the damage caused by the disaster (eg. temporary housing, financial aid, and health care) (Mavrouli et al., 2023).

The implication is that every person with disabilities needs to have knowledge, understanding, and behavioral skills in preventing, detecting, and anticipating disasters effectively so that they can participate actively in society. Armed with disaster mitigation preparedness skills, they can carry out independent, fast, precise, and targeted evacuations based on work steps in carrying out self-rescue from disasters. Good disaster preparedness is an important link in disaster risk management and an effective means of reducing disaster losses (Zhuang et al., 2021). The urgency is when an earthquake or other natural disaster recurs, one will understand what actions must be taken. Because other natural disasters cannot be avoided, they can be circumvented. Therefore, disaster education needs to be implemented from an early age to raise awareness of the importance of disaster preparedness, especially for vulnerable groups of people, including persons with visual disabilities.

The results of the analysis of entry behavior regarding disaster mitigation from several currently detected respondents can be used as capital to increase the intensity of integrated learning by utilizing a more varied learning media such as using applicable books, relevant information technology, and assistive technology. The assumption is that

through the use of appropriate variations of learning facilities, students will not feel bored with the material being explained. Learning facilities for disaster mitigation purposes are learning media that can function as a tool to transform the substance of the message. The important role of the media in learning interactions can stimulate the thoughts, feelings, and willingness of learning citizens so that they can encourage the learning process to occur in themselves and increase the motivation of learning residents (Vu et al., 2021). The effectiveness of learning interventions can be monitored through the activities of learning residents in responding to learning materials and feedback responses to the material being taught by understanding the deep dangers of this disaster issue and being able to explore the roles of various parties in disaster mitigation and preparedness. Awareness that facing risks and insecurities is a central part of developing strategies that position disaster mitigation and preparedness on many agendas, including poverty alleviation as a result of natural disasters (Christopher et al., 2001). Disaster preparedness is an important link in disaster risk management and an effective tool for reducing disaster losses (Wu et al., 2022).

Empirically when a disaster occurs, in certain communities some are quick to respond and some are slow to save themselves. Residents who do not have adequate disaster knowledge are more likely to stop doing something and stay instead of immediately evacuating their homes. Instead, residents who have an adequate understanding of the disaster immediately evacuated. After a disaster occurs, residents who are less aware of the disaster are more likely to remain silent and wait for the latest information and confirmation that their families are safe compared to those who flee again to a safer place (Wu et al., 2022). The results of an empirical study using a binary logit model to verify the peer effects of professionals on the general public indicate that there are significant differences between the general public and professionals in emergency supplies preparedness and knowledge training preparedness. The general public will imitate disaster preparedness professionals to achieve disaster preparedness convergence (Zhuang et al., 2021).

Indonesia is one of the countries most vulnerable to climate change due to its geographical, physical, and socio-economic conditions (Djalante & Thomalla, 2012). In anticipation of future large-scale disaster events, there is an urgent need to set up a highly collaborative framework based on all available resources. These resources can be mobilized to help each other and save disaster management systems between regions and countries based on international humanitarian assistance (Norio et al., 2011). Strategic and preventive planning for disaster mitigation in conjunction with regional development planning for physical, social, and economic planning will greatly help to reduce the impact of future disasters, including among others building safety audits in terms of resilience to future hazards and critical infrastructure strengthening requirements (Yousuf et al., 2020). An intelligent simulation system for earthquake disaster assessment Computers & Geosciences, which serves as an intelligent seismic hazard assessment, for evaluating damage and losses due to earthquakes, optimizing emergency response, and post-earthquake recovery plans (Tang & Wen, 2009).

6. Conclusion

Information relating to the preparedness of persons with visual disabilities in dealing with natural disasters in Indonesia shows a fairly good level. Knowledge of persons with visual disabilities regarding natural disasters includes: categories of natural disasters, classification of disasters, causes of natural disasters, effects of natural disasters, frequency of occurrence of disasters, as well as the positive and negative impacts of natural disasters that often occur in Indonesia can be categorized as quite good. Likewise, their understanding of preparedness anticipation in case of natural disasters, rescue priorities, important signs when natural disasters occur, as well as emergency rescue

when natural disasters (earthquakes) which often occur in Indonesia can be categorized as quite good, although some among them there needs to be further correction so that people with visual disabilities in Indonesia gain a very good understanding of disaster mitigation programs.

7. Acknowledgement

The research team would like to thank LP2M State University of Malang for providing moral and financial support for the implementation of research activities and partner institutions in Jakarta, Banjarmasin (South Borneo), Semarang (Central Java), Surabaya, Malang (East Java). Denpasar (Bali), Bandung (West Java), and Padang (Padang).

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

- Aditya, N. R., & Rastika, I. (2023). BNPB: Terjadi 3.542 Bencana Selama 2022. Kompas.Com. <https://nasional.kompas.com/read/2023/01/18/14322181/bnpb-terjadi-3542-bencana-selama-2022>
- Afriani, R., Hariadi, J., Akob, B., & Islami, Z. R. (2020). Local Culture Inventory for Disaster Mitigation Learning. IOP Conf. Series: Earth and Environmental Science, 1–6. <https://doi.org/10.1088/1755-1315/412/1/012017>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Arai, K., Nakaoka, Y., Fukuda, O., Yamaguchi, N., Yeoh, W. L., & Okumura, H. (2023). Method for Frequent High Resolution of Optical Sensor Image Acquisition using Satellite-Based SAR Image for Disaster Mitigation. *International Journal of Advanced Computer Science and Applications*, 14(3), 385–392. <https://doi.org/10.14569/IJACSA.2023.0140343>
- Atowa, U. C., Hansraj, R., & Wajuihian, S. O. (2019). Visual problems: a review of prevalence studies on visual impairment in school-age children. *International Journal of Ophthalmology*, 12(6), 1037–1043. <https://doi.org/10.18240/IJO.2019.06.25>
- Bradley, A. T. (2010). Handbook to practical disaster preparedness for the family. 528. https://books.google.com/books/about/Handbook_to_Practical_Disaster_Preparedn.html?hl=id&id=eXdCK7QghcgC
- Caraka, R. E., Lee, Y., Chen, R. C., Toharudin, T., Gio, P. U., Kurniawan, R., & Pardamean, B. (2021). Cluster around Latent Variable for Vulnerability towards Natural Hazards, Non-Natural Hazards, Social Hazards in West Papua. *IEEE Access*, 9, 1972–1986. <https://doi.org/10.1109/ACCESS.2020.3038883>
- Carter, N. W. (2008). Disaster Management: A Disaster Manager's Handbook. In Asian Development Bank. <https://doi.org/10.1109/oceans.1977.1154316>
- Christopher, I., Liljelund, A., & Mitchell, J. (2001). Re-framing risk: The changing context of disaster mitigation and preparedness. *Disasters*, 25(3), 185–198. <https://doi.org/10.1111/1467-7717.00171>
- Creswell, J. W., & Hirose, M. (2019). Mixed methods and survey research in family medicine and community health. *Family Medicine and Community Health*, 7(2). <https://doi.org/10.1136/FMCH-2018-000086>
- Djalante, R., & Thomalla, F. (2012). Disaster risk reduction and climate change adaptation in Indonesia: Institutional challenges and opportunities for integration. *International Journal of Disaster Resilience in the Built Environment*, 3(2), 166–180. <https://doi.org/10.1108/17595901211245260>

- Efendi, M. (2018). The Implementation of Inclusive Education in Indonesia for Children with Special Needs: Expectation and Reality. *Journal of ICSAR*, 2(2), 142–147. <https://doi.org/10.17977/UM005V2I22018P142>
- Efendi, M., Pradipta, R. F., Dewantoro, D. A., Ummah, U. S., Ediyanto, E., & Yasin, M. H. M. (2022). Inclusive Education for Student with Special Needs at Indonesian Public Schools. *International Journal of Instruction*, 15(2), 967–980. <https://doi.org/10.29333/iji.2022.15253a>
- Etkin, D. (2015). *Disaster theory : an interdisciplinary approach to concepts and causes*.
- Gundran, C. P. D., Lam, H. Y., Tuazon, A. C. A., Cleofas, J. V., Garcia, F. B., & Puli, T. E. M. (2023). Simulation Training Needs Assessment for Disaster Preparedness and Disaster Response among selected agencies in National Capital Region, Philippines. *International Journal of Disaster Risk Reduction*, 94, 103824. <https://doi.org/10.1016/J.IJDRR.2023.103824>
- Hendrawan, I. G., Sukresno, B., & Sugimori, Y. (2010). PRESENT UNDERSTANDING OF ACEH TSUNAMI (APPLICATIONS OF DATA FROM FIELD TO SATELLITE OBSERVATIONS). *International Journal of Remote Sensing and Earth Sciences (IJReSES)*, 4(1). <https://doi.org/10.30536/J.IJRESES.2007.V4.A1222>
- Kirk, S., Gallagher, J. J., Coleman, M. R., & Anastasiow, N. (2009). *Educating Exceptional Children* (12th ed.) (12th ed.). Houghton Miffl in Harcourt. <https://fpg.unc.edu/publications/educating-exceptional-children-14th-ed>
- Lusli, V. L. M. M. (2009). Helping children with sight loss: membantu anak dengan kehilangan penglihatan: cara jitu memenuhi kebutuhan belajar mereka / V.L. Mimi Mariani Lusli.
- Madanian, S., Airehrour, D., Kumar, N., & Cherrington, M. (2018). Smart Cap for Visually Impaired in Disaster Situations Work in Progress Research Paper-Human centred design for collaborative systems supporting 4Rs (Reduction, Readiness, Response and Recovery) Proceedings of ISCRAM Asia Pacific. 2018.
- Mardiana, & Hartati, E. (2020). User Satisfaction Level on Implementation of SISKEUDES Application. *Journal of Physics: Conference Series*, 1500(1). <https://doi.org/10.1088/1742-6596/1500/1/012102>
- Mavrouli, M., Mavroulis, S., Lekkas, E., & Tsakris, A. (2023). The Impact of Earthquakes on Public Health: A Narrative Review of Infectious Diseases in the Post-Disaster Period Aiming to Disaster Risk Reduction. *Microorganisms* 2023, Vol. 11, Page 419, 11(2), 419. <https://doi.org/10.3390/MICROORGANISMS11020419>
- Miles and Huberman. (1994). *Qualitative Data Analysis. A Methods Sourcebook*. 1994, 28(4), 485–487.
- Momay, I. S. I., & Tukang, B. (2023). THE TEACHER’S ROLE IN INTERNALIZING LOCAL WISDOM VALUES AT SMA PGRI KUPANG. *SocioEdu: Sociological Education*, 4(1), 21–26. <https://doi.org/10.59098/SOCIOEDU.V4I1.872>
- Newman, L. A., Madaus, J. W., Lalor, A. R., & Javitz, H. S. (2018). Support Receipt: Effect on Postsecondary Success of Students With Learning Disabilities. <https://doi.org/10.1177/2165143418811288>, 42(1), 6–16.
- Norio, O., Ye, T., Kajitani, Y., Shi, P., & Tatano, H. (2011). The 2011 eastern Japan great earthquake disaster: Overview and comments. *International Journal of Disaster Risk Science*, 2(1), 34–42. <https://doi.org/10.1007/S13753-011-0004-9>
- Paton, D. (2020). Social–Psychological Perspectives on Preparedness Theory and Practice: Facilitating Resilience. 139–167. https://doi.org/10.1007/978-981-15-4320-3_8
- Rachmah, D. N., Zwagery, R. F., Azharah, B., & Azzahra, F. (2022). Psikoedukasi mengenai stunting pada anak dan peran pengasuhan orangtua untuk meningkatkan pengetahuan mengenai stunting. *Altruis: Journal of Community Services*, 3(1), 8–13. <https://doi.org/10.22219/altruis.v3i1.18390>
- Raja, D. S., & Narasimhan, N. (2013). *INCLUSIVE DISASTER AND EMERGENCY MANAGEMENT FOR PERSONS WITH DISABILITIES*.

- Rincon, E., Linares, M. Y. R., & Greenberg, B. (2001). Effect of previous experience of a hurricane on preparedness for future hurricanes. *The American Journal of Emergency Medicine*, 19(4), 276–279. <https://doi.org/10.1053/AJEM.2001.22668>
- State Ministry for National Development Planning. (2012). National action plan for disaster risk reduction 2010 - 2012.
- Tang, A., & Wen, A. (2009). An intelligent simulation system for earthquake disaster assessment. *Computers & Geosciences*, 35(5), 871–879. <https://doi.org/10.1016/J.CAGEO.2008.03.003>
- Vu, T. Van, Magis-Weinberg, L., Jansen, B. R. J., van Atteveldt, N., Janssen, T. W. P., Lee, N. C., van der Maas, H. L. J., Raijmakers, M. E. J., Sachisthal, M. S. M., & Meeter, M. (2021). Motivation-Achievement Cycles in Learning: a Literature Review and Research Agenda. *Educational Psychology Review* 2021 34:1, 34(1), 39–71. <https://doi.org/10.1007/S10648-021-09616-7>
- Wu, J., Yang, X., Deng, X., & Xu, D. (2022). Does disaster knowledge affect residents' choice of disaster avoidance behavior in different time periods? Evidence from China's earthquake-hit areas. *International Journal of Disaster Risk Reduction*, 67, 102690. <https://doi.org/10.1016/J.IJDRR.2021.102690>
- Yousuf, M., Bukhari, S. K., Bhat, G. R., & Ali, A. (2020). Understanding and managing earthquake hazard visa viz disaster mitigation strategies in Kashmir valley, NW Himalaya. *Progress in Disaster Science*, 5, 100064. <https://doi.org/10.1016/J.PDISAS.2020.100064>
- Zhuang, L., He, J., Deng, X., & Xu, D. (2021). The influence of professionals on the general public in the choice of earthquake disaster preparedness: Based on the perspective of peer effects. *International Journal of Disaster Risk Reduction*, 66, 102593. <https://doi.org/10.1016/J.IJDRR.2021.102593>