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Implementing the disaster education program at an elementary school in the devastating tsunami affected area: A case study in Aceh, Indonesia

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Abstract

The earthquake and tsunami that struck the Indonesian province of Aceh at the end of December 2004 killed over 170,000 people, including those from the community where this research was conducted, the village of Deah Glumpang, Meuraxa sub–district, Banda Aceh. Nearly 95 percent of the houses and buildings were wiped out by the tsunami and more than 80 percent of the people living in this area were killed. One of the reasons why such a heartbreaking tragedy occurred was that people including students had never known or been taught about disaster mitigation. Learning from this condition, SDN 48, a state primary school located in the area, has offered a disaster education program to the students. The program has been going for more than two years and is feasible to study to see its impact on students. For this purpose, the researchers conducted interviews with the teachers including the school principal and students. It was found that the program has benefited both teachers and students in the knowledge of disaster mitigation. Nevertheless, their literacy on this issue is deemed still low. Therefore, the teacher respondents suggested improvements in the program that include continuous training for the teachers, better and upgraded facilities, and having parents be included in the program's activities. The discussion reflects that incorporating the disaster education program into the curriculum could sustain its position as an important subject to be taught to students in schools located in disaster–prone areas.

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Introduction

Natural disasters often unpredictably occur in a community, which results in people's losses of properties and lives. On December 26, 2004, an earthquake measuring 9.0 on the Richter scale struck off the western coast of North Sumatra, causing massive waves to wreak havoc across the Indian Ocean rim. Aceh Province in Indonesia suffered the most casualties, with widespread destruction extending along more than 1,000 kilometers of coastline. It was reported that more than 270,000 people were killed or missing in 14 countries. From this number in Aceh Province alone, it was reported that more than 170,000 people died or went missing (Euronews, 2014).

Among the victims of the tragedy in Aceh province, it was estimated that as many as 33,000 children died or lost one or both parents. Besides the loss of life, the tsunami displaced more than half a million people and destroyed homes, roads, businesses, schools, health facilities, places of work, and many others. The evidence of the enormity of the catastrophe is still clearly visible to date in Aceh, such as mass graves, ships above the roofs of houses, and a 2,600–ton electricity vessel, once in the sea, flung three kilometers inland. Various documents were printed and online media talked about the disaster. Besides this disaster, the unforgettable experiences of the victims of the earthquake and tsunami are still well recalled in the minds of many Acehnese people, especially those who survived the disaster and suffered traumas for a long period. The witnesses who are still alive often tell how the sea rolled over them, destroyed their homes, and separated them from their loved ones.

Humans must make efforts to anticipate or at least reduce the risk of such disasters. These efforts can be in the form of stories passed down from generation to generation related to disasters, or in the form of documents kept in a safe place, such as a library for everyone to study. It can also be applied in the field of education to teach children what to do if a similar disaster occurs.

During the earthquake and tsunami recovery period, many teachers and students in Aceh, or around the disaster area, were trained by various international institutions related to disaster risks, but over time the community's readiness to deal with disasters began to decline and be forgotten. Realizing this, the city of Banda Aceh initiated schools near the coastal areas to be assigned as disaster response schools. From 2009 to 2015, Aceh had 76 school–based disaster preparedness programs developed with the help of the government, non–governmental organizations, and universities (Rusydy et al., 2015). As follow–ups to the programs, various studies have been done to report the results. Adiyoso and Kanegae (2012) investigated the impact of various disaster education programs on the knowledge, risk perception, awareness, and preparedness behavior of 169 elementary school children. According to the findings, there was a significant difference in knowledge, risk perception, individual preparedness, and school preparedness among school children, but not in critical awareness.

Furthermore, Oktari et al. (2015) assessed school preparedness ten years after the tsunami in 19 Banda Aceh public junior high schools by administering questionnaires to 372 students and 243 teachers. They discovered that teachers in school–based disaster preparedness programs had a lower percentage of knowledge and information obtained from outside sources (i.e., socialization, seminars, meetings, friends, relatives, and government staff) compared to non–school-based disaster preparedness programs because they believed that what they had gained from the programs was enough. This is concerning because it may lead to a loss of motivation for continuing education on this subject. Meanwhile, students in these programs had a higher percentage of knowledge than students who were not enrolled in the programs.

Then, Rusydy et al. (2015) described the development of Aceh's school–based disaster preparedness programs in general, from its commencement in 2009 to its implementation, evaluation, and scaling up. They observed that the programs had been auspiciously conducted in most schools, hence they suggested that the local government had to generate local regulation to ensure local public schools follow the regulations. Sakurai et al. (2018) provided an update on this issue, revealing that 56 percent of public elementary schools in Banda Aceh City are at high risk of tsunami, and due to a lack of ownership, institutional arrangements, and funding, most externally driven school disaster preparedness activities have been discontinued by schools.

Following the trailing problems of the school–based disaster preparedness programs in Aceh, Indonesia, in which there is lessening knowledge of school children on disaster risks, this study intended to further explore the activities that are still conducted by schools today. The researchers of this study selected SDN 48 (*Sekolah Dasar*

Nomor 48, translated as Elementary School Number 48) in Banda Aceh to conduct this present study. This is because based on a preliminary study on the disaster response schools in Banda Aceh, this school is found to have ongoing programs in preparing or training children and teachers to be responsive to disasters for the past two years. Besides, the school also has support from the TDMRC (Tsunami and Disaster Mitigation Research Centre) of Universitas Syiah Kuala in establishing mitigation programs. Similar to what has been done in Japan (Pongponrat, 2021), the students at Universitas Syiah Kuala have also been involved in the disaster preparedness programs designed in the school. The research essentially investigated how the disaster preparedness programs were practiced in SDN 48, and explored its impact on the children and teachers. It specifically aims to:

1. Find out the level of understanding of students at the elementary school regarding earthquake and tsunami disaster.
2. Obtain information as well as observe how disaster education is implemented in this school.
3. Evaluate whether disaster education programs and activities in this elementary school are suitable as a model for other elementary schools in the city of Banda Aceh specifically, and elementary schools near the coasts in Aceh Province in general.

By exploring the implementation of the programs in this school and its impact on teachers and students, it is expected that the results of this research can be beneficial to other schools that do not have these programs, have stopped carrying out these programs, or are still struggling to implement these programs in their schools, especially in the coastal areas and schools in areas with a high risk of disasters.

Literature Review

The Impact of Disasters on Children

According to research on disasters and children, there are three distinct effects on children: (1) physical health, (2) mental health, and (3) educational attainment (Kousky, 2016). Physical health deals with the situation where the children themselves are the victims (i.e., injured or killed during the disasters) and are malnourished after the event without having foods or catching diarrheal disease due to contaminated water, and difficulty to access medical care. Disasters can further lead to mental health problems such as stress, fear, and sadness because of the loss of beloved ones, such as parents, siblings, and other family members and friends. Then, there is educational attainment where disasters can disrupt their education because their educational facilities have been destroyed, or families have moved to new places due to the loss of their properties in the affected areas.

By understanding the impacts caused by natural disasters in various forms on children, it is essential for educational institutions, such as schools, to prepare children, especially in areas that are prone to natural disasters, to deal with disasters or to reduce the impact because children are usually the most susceptible to the disasters (Kousky, 2016) because they have different forms of physical, social, mental and emotional needs and support compared to adults (Peek, 2008). Schools need to provide and prepare various programs and activities designed to be socialized and practiced by children. Merchant (2015) observes that by teaching children how to prepare for and respond to disasters, they become more involved in the process, have greater control over the outcome of their situation, and thus are less vulnerable both during and after a disaster. Furthermore, it is expected that by preparing children mentally and physically for a disaster, families, and communities will be able to alleviate some of the concerns they have in the aftermath of a disaster.

The impact of catastrophes on both children and adult needs to be resolved regardless of the time needed to do so. Issues regarding disasters are to be handled in groups to achieve effective and more positive results. This is as stated by Math et al. (2008) that only a small percentage of those who survived disasters required intensive and individual psychiatric interventions, while the vast majority required community–based group interventions such as therapy, informal education, group discussions, art (painting/drawing), drama, storytelling, games, and sports.

The Role of Educational Institutions on Disaster Education

Disaster education aims to change students' knowledge, attitudes, and skills about disaster (Joshi et al., 2019; Zhu & Zhang, 2017). This change includes those who previously did not know, to understand that their area of residence is a disaster-prone area, those who did not care about efforts to prevent the number of casualties, those who were previously untrained to become trained in saving and rescue efforts in the event

of a disaster. Therefore, disaster education that is taught to students needs to cover three aspects, namely: knowledge, attitudes, and skills (Zhu & Zhang, 2017). The application of disaster education in early childhood educational institutions or elementary schools is an effort to provide knowledge and understanding from an early age so that students are prepared for disasters (Zhu & Zhang, 2017). Through this education, students are expected to be able to think, act quickly and accurately in dealing with disasters.

Communities throughout the world believe that children are the hope for the future, and it is believed that schools have a direct impact on children. Instilling cultural values, various knowledge and skill, and including disaster preparedness programs should also be a part of the educational institution's responsibilities to inform their students. Implementing disaster risk and preparedness education into school curricula is critical (Astuti & Sudaryono, 2010; da Silva & Helnywati, 2021) because it can help build disaster awareness and knowledge on how to handle disasters (Muzani et al., 2020), and is critical in saving lives and protecting community members, particularly those who live in disaster–prone areas (Fatanti et al., 2019).

Honesti and Djali (2012) further mention that for disaster preparedness programs in schools, several teaching materials are required, such as: (1) providing knowledge to school residents about natural disasters (i.e., tsunamis and earthquakes); (2) clarifying human behavior that damages the ecosystems; (3) showing events that can disrupt natural livelihoods; (4) needing to have simulation on resource mobilizations in disaster preparedness; (5) more understanding of disasters due to social, cultural and political crises; (6) promoting the role of institutions and abilities of the school community; (7) integrating Disaster Risk Reduction (or *Pengurangan Risiko Bencana*, abbreviated as PRB in Indonesian) into the unit of formal curriculum or extra–curricular; and (8) building partnerships and networks between parties to support PRB implementation in schools.

Russell (2016), for example, provided security checks related to earthquakes that can be carried out by the schools: (1) consider the school buildings' resistance to earthquakes, whereby the scale can be evaluated by architects; (2) secure furniture; infrastructure used in walls or elsewhere is safe; (3) create a cache of emergency supplies, such as food for an emergency; (4) make students familiar with safety procedures; (5) hold earthquake drills; (6) practice evacuation plans; and (7) prepare for search and rescue; here, students are informed on the danger that they may face and how to reduce it.

Ohnishi and Mitsuhashi (2013) explain that disaster prevention is included in the national curriculum standard in Japan under the Social Studies and Geography subject, beginning in the third grade and continuing through to twelfth grade. Disaster education lessons are taught through a variety of sources and activities, such as learning disaster through map reading (i.e., reading the history of land use, studying hazard maps and DIG (Disaster Imagination Game), and having a combination of lectures and fieldwork. The Philippines and the United States (in Oregon and Texas states) also incorporate UNICEF and UNESCO's DRR (Disaster Risk Reduction) Curriculum into their Kindergarten to Grade 12 programs or have adopted it into their Next Generation Science Standards (NGSS) curriculum in Oregon and Texas Essential Knowledge and Skills (TEKS) curriculum in Texas (Merchant, 2015). Each curriculum guide covered disaster risk reduction education topics such as multiple hazards, climate change, causes and effects, and the option to emphasize local and community disaster risks.

According to Amri (2017), 75 percent of schools in Indonesia are located in disaster–prone areas. Nevertheless, the learning process on disaster preparedness and mitigation in the Indonesian schools has not yet met the standards since there are no fixed syllabus or curriculum (Nurhayati & Muhajir, 2019). Rather, most educational institutions teach disaster preparedness and mitigation based on materials provided in textbooks without proper practical activities that follow. Despite research demonstrating that basic disaster preparedness training in the community is effective, students are rarely trained to act in the form of drills or simulations in the face of disasters (Juanita et al., 2018). As a result, while students have a basic understanding of how to survive disasters, their literacy in disaster mitigation remains low (da Silva & Helnywati, 2021). Meanwhile, numerous studies have concluded that with proper planning and preparation, the number of people affected by disasters can be reduced in the future (Merchant, 2015).

As the case in Aceh, Indonesia, Oktari and Kumala (2020) rang up the fact that many schools in Aceh, Indonesia, did not continue their disaster preparedness activities which were initiated by the local government and non–governmental organizations in 2009 even though teachers of the schools understood and are capable of carrying them out. This is because they

deemed that conducting those activities would require a large amount of money (costly). There was also a sense of dependence on the assistance of other parties. As a result, their study emphasized the value of collaboration in developing more creative and innovative disaster risk and preparedness education learning packages that meet the needs and characteristics of students at a lower cost, such as posters, poems, short stories, videos, and dances (Oktari & Kumala, 2020).

Methodology

This research is qualitative in nature by interviewing the school principal, teachers, and students in Grades 5 and 6 to obtain information on the mitigation programs implemented at the schools thus far, and the impact on students and the community around this school. Besides interviews, direct observations of the disaster education learning process at this elementary school were also observed. FGD (Focus Group Discussion) was conducted with teachers and school principals on the research findings to ensure the data obtained are accurate and reliable. The research procedure is further explained in the next sub-sections.

Participants

This qualitative study aimed at exploring the mitigation programs that are still carried out at a state primary school in Banda Aceh, Indonesia, namely, SDN 48 (Elementary School Number 48) located in a devastated tsunami–affected area, Deah Glumpang village. The data were obtained by interviewing 16 random students from Grades 5 (8 students) and 6 (8 students), ages 11–13 years old, four teachers who taught Grades 5 and 6, and the program (one of these teachers was the coordinator of the program), and the school principal. Studying documents such as student's works, and observing the media used and disaster laboratory were also part of data collection.

Data Collection

The questions asked during the interview with the school principal included: (1) background of disaster education taught at this school; (2) who supports this program; (3) parental support; (4) support from the local government (education authority); and (5) efforts and suggestions to strengthen this program. Meanwhile, questions asked during the interview with four teachers included: (1) the forms of teacher's support for the disaster education program; (2) the number of teachers trained in disaster education and what were they trained for; (3) efforts undertaken in the future to strengthen this program. Lastly, the questions for the students included: (1) what they have learned in the program; (2) their knowledge and understanding on disaster; (3) skills they gained from the program; and (4) if they enjoyed the program.

Each interview with the respondents lasted for 15 to 25 minutes and was recorded with a tape recorder. To validate the data and information from the interviews, the researchers further held a Focus Group Discussion (FGD) by involving only the teachers (including the coordinator in charge of the mitigation program) and school principal. The FGD lasted for one hour and was also recorded.

Data Analysis

The results of the interview were recorded and transcribed. Based on the transcriptions, data analysis was done by thematic analysis (Braun & Clarke, 2006) and following the steps as proposed by Maguire and Delahunt (2017), which are to become acquainted with the data, generate preliminary codes, search for themes, review themes, define themes, and final write–up. The teachers and the school principal are coded as T1 to T4 in this article, meanwhile, the students are coded as S1 to S16, in which students from the 5th grade are S1–S8, and students from the 6th grade are S9–S16.

Results and Discussion

The analysis of data from the interviews and FGD resulted in five themes. They are the state of the school under study, assistance and training, students' knowledge on disaster risks and preparedness, learning activities on disaster risks and preparedness, and suggestions for improvement. Each of these findings is explained and discussed below.

The State of the School under Study

Proximity to the sea

SDN 48 at Ulee Lheu is only 300 m from the sea. During the tsunami which hit Aceh in 2004, the sea water moved 4 to 5 kilometers inland on average, straight into the center of Banda Aceh city. Many schools in Aceh,

especially in the western part of the province, were destroyed by the tsunami. The principal of SDN 48 stated that the school was chosen as one of the disaster response schools in Banda Aceh due to its proximity to the sea. Consequently, it is logical that this school was used as an object of research because it was completely destroyed by the 2004 Aceh earthquake and tsunami.

People displacement and evacuation

In the 2004 earthquake and tsunami that hit Aceh, it was estimated more than 80 percent of the total number of students (230) were killed in the disaster. The principal added that SDN 48 was previously SDN 91, but one year after the 2004 disaster, it was rebuilt by the NGO "Education International (EI)" and renamed. At the time, there were not many people living around the school, and the number of students ranged from only 7 to 15 per class. Deah Glumpang village lost many inhabitants, and over time, people from outside of the area continued to arrive and live in this village. Therefore, the number of students has continued to grow. The newcomers are from different parts of Aceh (i.e., Pidie Jaya, Sigli, etc.) due to displacements (i.e., displaced survivors) after the disaster, and new marriages (Panjwani, 2013). In 2019 about 160–180 students were studying in this school with nine teachers.

School Model for disaster education

After the earthquake and tsunami, this school was used as a model for disaster education to be implemented at the elementary level. Besides being designated as one of the disaster response schools in Banda Aceh, SDN 48 is also not far from the four–stories Escape Building built by a foreign donor. The escape building is for the people around this area to go to if a similar disaster, such as a tsunami, occurs. Satria (2018) also documents the infrastructures that are typically found around nine disaster response schools in Aceh, including SDN 48, namely: to have an emergency/rescue ladder, to have a gathering place during a disaster (i.e., open field), and to have an evacuation/shelter closest to the school (i.e., Escape Building).

The learning process and the obstacles encountered can be used as input for other schools that will carry out the same program. The principal and teachers affirmed that the disaster risks and preparedness program is thus far good at this school, and it has had a positive impact on both students and teachers. Students, for example, are seen to no longer litter, and the school looks clean, nice, and healthy.

Assistance and Training

As one of the disaster response schools in Banda Aceh, SDN 48 received technical assistance and training from the Tsunami and Disaster Mitigation Research Center (TDMRC) of Universitas Syiah Kuala, Banda Aceh, including the model of mitigation programs, and arranging one class to be a disaster laboratory where children learn and practice. The program includes:

1. Understanding various natural disasters and human–caused disasters and why they happen.
2. Practicing by writing what students think of the consequences of disasters to them, friends, and family.
3. Discussion to find steps that need to be taken when and after a disaster occurs.

Essentially, disaster education at SDN 48 and several other schools in the city of Banda Aceh was initially facilitated or assisted by Universitas Syiah Kuala through the Tsunami and Disaster Mitigation Research Center (TDMRC) Program in the form of providing media and training teachers who teach for these programs. However today, the respondents commented that the local government's support for this program has decreased, with fewer trainings and facilities.

According to Rahiem et al. (2018), children are usually the most affected when a disaster occurs due to their physical weakness and psychological and social inability, experiencing long–suffering after the disaster has passed. Children from poor families suffer even more from disasters like a tsunami, where they have to live in temporary shelters while their parents are unemployed. Consequently, at the end of the interview, the principal said (E refers to the interview excerpts presented consecutively in this article, the code of the respondent is presented at the end of the excerpt):

E1: "Children need to be prepared and accustomed from the beginning in the face of disasters and need to build awareness to help fellow humans anywhere else if there is a disaster". (T4)

Teachers are trained through workshops by preparing them to be ready to support this program. Unfortunately, the disaster training that the teachers received was not sustainable so their competence in mitigations could not be shared with other schools in Banda Aceh. The principal also admitted that his school's mitigation program is still ineffective and needs to be strengthened. Adequate school facilities and infrastructure are critical in disaster preparedness (Satria, 2018). Disaster preparedness schools should be accompanied by facilities and infrastructure. However, the principal believed that the

existing programs are far better than in other schools around Banda Aceh, that are also designated as disaster response schools. He intends to develop better disaster preparedness programs and to share success with other schools. The respondents genuinely hope that the local government/authorities and TDMRC do not only maintain existing programs/activities but design even better ones in the future.

Students' Knowledge on Disaster Preparedness and Mitigation

Confidence to deal with the disaster

The students interviewed ranged in age from 11 to 13 years old and had not been born at the time of Aceh's 2004 earthquake and tsunami. Most of their parents were also not from this village; they came and settled in this location two or three years after the tragedy. Thus, when they were asked about the tsunami, they could tell very little. Two students in the fifth grade, for example, could not explain much about the tsunami, and this could be because their parents rarely talked about it. Their knowledge is limited to what the teachers at school have explained. This is the case with S6 from 5th grade who commented that she did not understand much about the tsunami, but was frightened when she was told about the tragedy and watched it on videos. Another student, S8, who was also from the 5th grade, knew more about what happened to the village where he now lives since his parents were from the village, survived the disaster, and have shared many stories of the tragedy.

When asked what they would do if an earthquake or tsunami occurred in their village, many of the respondents provided confident answers; this reflected that the mitigation programs taught at the school are compelling. Their answers were:

E2: "I would run to the Escape Building nearby as told by my teachers" (S1–3rd grade).

E3: "I would find a safe place such as a table" (S5–4th grade).

From the extracts in E2 and E3, the students understood that the function of the Escape Building is their destination if a tsunami occurs, and the function of a table is a secure place to be under if an earthquake happens.

E4: "According to our teachers, jumping could break our legs, hands or could hurt our body, and we should walk down the stairs" (S11–5th grade).

The extract in E4 is the answer provided by a fifth–grader when the researcher asked, "Why not jump from the second floor to save yourself if an earthquake happens?" His answer reflected his knowledge on how to escape a disaster by paying attention to his safety during the flight.

When the students were interviewed and asked about their impression of the disaster preparedness program at their school, most of them said they enjoyed the activities and found them useful.

E7: "I feel that it is very useful, especially if I face a real disaster one day" (S13–6th grade).

According to the students, the activities are presented in a fun way, such as watching videos and having discussions afterward. When asked if they had ever entered the Tsunami Museum located at the center of Banda Aceh, six out of 16 students said that they had been there with their parents, while the others had never been inside the museum.

E8: "I hope one day the teacher can take me there" (S3–3rd grade).

The Tsunami Museum is a good place to visit as media of learning about disasters because it keeps various documents, such as pictures, photos, home materials, and videos, as evidence of the devastating earthquake and tsunami that struck Aceh, particularly Banda Aceh, in 2004.

Limited knowledge

Based on the interviews with students, it can be concluded that not all of them know what they should and should not do if an earthquake or tsunami occur again. Independent and confident students (60%) easily said they would follow the instructions given in their disaster risks and preparedness lessons, another 25 percent said they would wait for the teachers' instruction, and the rest, 15 percent, gave no answers. From the answers, it could be said that the principal's opinion was equitable, that the students need to be taught and trained in the mitigation programs continuously to better deal with natural disasters that could occur at any time.

Since this is a qualitative study, based on our observations, it can be said that the level of students' understanding of preparedness in dealing with disasters such as earthquakes and tsunamis increases on an average level with the existence of a disaster education program at this school. Nevertheless, most of the student respondents are still unfamiliar with understanding signs related to disasters, except a few that are available around them. Similarly, da Silva and Helnywati (2021), discovered that while Indonesian students have basic knowledge about

how to survive disasters, their literacy in disaster mitigation is still low. As a result, students must also be able to read, comprehend, and apply information to make informed decisions and follow instructions in the context of disaster mitigation, preparation, response, and recovery. Natural disaster literacy should be included in the curriculum and implemented consistently (Adiyoso & Kanegae, 2013; da Silva & Helnywati, 2021; Desfandi, 2014; Öztekin et al., 2014).

Learning Activities on Disaster Preparedness and Mitigation

Group discussion

The learning process about risk disasters was usually carried out on every first Saturday of the month in the school hall other than those given in class. When the students were asked what they had learned, S2 from the 5th grade said that she learned about disasters through group discussions by writing her opinion about a disaster on paper. When asked about the things they wrote on paper, the following comments were their answers:

E5: "It was about a disaster that killed a lot of people, including students from this primary school" (S2 – 5th grade).

E6: "I will inform my friends to run to the Escape Building and stay there until the tide recedes."

The excerpts in E5 and E6 show that the students knew what should be done if a tsunami hit their region again.

Drill practice

Three students were also informed of the "drill" practice, where students act as if they are facing natural disasters and have to evacuate to the escape building, which is located approximately 300 m from the school. Usually, this drill is carried out every December 26, and sometimes on the same date but in different months. On every December 26, an alarm on the coast is sounded by officers, and the public is informed that it is a drill to avoid panic. The community around the beach, especially students, are asked to participate in this drill. Some students still feel frightened by the yearly drill, but others do not because they are used to the drill from school practice during the mitigation program. This drill is conducted as a learning experience from the past, when many people did not believe that the sea could inundate the land and kill many people.

Poster as preferred media

Nevertheless, besides the activities that have been done in this school through writing essays, stories, watching videos, and doing escape drills, research by Oktari and Kumala (2020) discovered that students in their research saw posters as their most preferred media in learning disaster risk and preparedness because posters combine letters, numbers, images, and colors which make them more attractive and are better understood as a medium for delivering information and knowledge. Other learning media that can be used are poetry, creative dance. According to Desfandi (2014), incorporating local wisdom into disaster risk and preparedness learning is effective, even better than receiving advice from the apparatus. Furthermore, according to Muzani et al. (2020), to provide an appropriate education for both encountering and dealing with disasters, a disaster curriculum should incorporate local wisdom. Community knowledge and disaster adaptation based on local knowledge can be considered ritual communication processes (Fatanti et al., 2019); ritual communication places a greater emphasis on efforts to foster community and preserve society's structure (Kadir et al., 2020). In disaster studies, ritual communication is distinguished by the use of symbolic language (typical) about the local community's previous experiences with the disaster itself (Fatanti et al., 2019). Respectively, dance, games, stories, and spoken language all use symbolic language (Hadi, 2016).

Curriculum and local wisdom

In the meantime, all of the teachers strongly support the disaster preparedness programs carried out in the school. They realize that everyone who lives in disaster–prone areas needs disaster knowledge. Some teachers explained the importance of this program in schools:

E9: "The program is not only beneficial to students but also to the people who live around the school" (T1).

E10: "It is almost certain that the people of Banda Aceh had never known about a tsunami, so when they heard that the sea flooded the land when the tsunami hit the coastal areas, they were still ignorant and even considered it nonsense" (T2).

E11: "In Sinabang, there were not many fatalities because the people there are familiar with Smong that is passed on from generation to generation" (T3).

E9 and E10 stated that disaster preparedness programs in schools, particularly those in disaster–prone areas, benefit not only the students but also the communities surrounding the school. Illiterate parents, for example, could learn from their children.

In E11, T3 explained that the people in Sinabang (the capital city of Simeulue Island, Aceh, which lies off the western coast of Sumatra in Indonesia) did not face many fatalities during the 2004 earthquake and tsunami. The number of victims on this island was very low because they knew about tsunami disaster (Wikantiyoso, 2010), called *Smong* in their language (i.e., Devayan), from the elders' stories which have been passed on from generation to generation (Fatanti et al., 2019). The elders claimed that about 100 years ago, a massive tsunami had also hit the island and the people have learned how to minimize the risks if they were to face another tsunami in the future.

Suggestions for Improvement

Parents' involvement

Despite the success of continuing the disaster preparedness program in the school, the teachers also wanted improvement in its implementation. Among the suggestions they put forward was by involving students' parents because during an earthquake or tsunami the children could be at home and their parents would decide what to do. There is a possibility that the parents would be influenced by their feelings, which are not based on the knowledge as taught to their children at school. Parents' involvement in this program may not be as frequent as the students' involvement because this program is part of the school's activities. However, the parents need to know what to do if there is an earthquake, tsunami, or other disasters that occur in their environment. The school committee, according to the teachers, could be an intermediary so that the program could be implemented for the parents as well.

Government support

The principal of the school and program coordinator said that it needed serious support from the government to increase the motivation of teachers and students to learn about natural disasters such as tsunami.

E12: "We need more continuous training for teachers on how to keep developing the activities so that the students are persistent in learning the disaster risk and preparedness. The government, both local and central, should always support programs such as this to schools located in disaster–prone areas, always updating activities and helping us with facilities."

From the suggestions provided by T3 in E12, it can be concluded that the improvements could be:

1. Training teachers regularly about disaster risk and preparedness.
2. Providing a variety of complete teaching aids, such as pictures and videos of disasters.
3. Providing books or other references in the library.
4. Getting continuous support from the government and universities
5. Facilitating teachers to conduct comparative studies in regions or countries, such as Japan, that are frequently affected by earthquakes and tsunamis.

In line with T3, Sakurai et al. (2018) strongly advocate for local government policy support to ensure city–wide, all–schools disaster preparedness program implementation. Local governments must be actively involved in disaster mitigation, especially when collaborating with disaster mitigation agencies, and nursing education institutions are required to create synergy and understanding in response to any emergency conditions that may arise (Juanita et al., 2018). Hence, students in disaster response schools can also be taught first aid by voluntarily students (Pongponrat, 2021) and nurses when facing injuries during a disaster. Furthermore, Nurhayati and Muhajir (2019) suggested that disaster materials be developed and integrated into religious education curricula. This is because a curriculum based on religious and local wisdom can help students better understand the relationship between humans, the natural environment, and the religious and cultural environments in which they live (Desfandi, 2014).

The findings of this study are expected to lead to changes in viewing disasters both in the school being studied, other schools in Aceh, and other schools situated near or in disaster areas around the world. The 2004 Aceh earthquake and tsunami disaster, which claimed many lives, was a bitter experience for the people of Aceh. This event becomes a point for leaning, improvement, and development in dealing with disasters by preparing students through disaster education. At the school level, school principals and teachers need to take the initiative so that disaster education has a place in the curriculum, or at least knowledge of disaster is included in relevant subjects.

Conclusion and Recommendation

Based on the findings of this study, it was discovered that the SDN 48 (or Sekolah Dasar Negeri Nomor 48, literally translated as Elementary School Number 48) in

Banda Aceh has continued to teach disaster education to students through the Disaster Education Program despite the fact that many schools today in the badly hit city during the 2004 earthquake and tsunami in Aceh, Indonesia, stopped the program due to a variety of reasons. The students are taught monthly through discussions and journal writing on disasters with two hours for each meeting. They are further drilled or do field exercise twice a year. It was found that the level of students' understanding of preparedness in dealing with disasters such as earthquakes and tsunamis increases on an average level with the existence of a disaster education program at this school. The Escape Building in the village area of Deah Glumpang, Meuraxa sub–district, Banda Aceh, is approximately 300 meters from the school. This eases their yearly practice for escape drills. They already know what to do if the seaside tsunami alarm sounds. Most of them also understand what actions they will take if an earthquake hits their area of residence.

However, the respondents (teachers and the principal) commented that the learning process of disaster education at this school was still not optimal because there were not enough media available to assist the teaching and learning process. The coordinator and teachers teaching this program also deemed that they had not received enough disaster training. They still found an imbalance between practice and theory. Accordingly, they strongly agreed that the school's ongoing disaster program needs improvement in terms of strengthening the teachers' training for this program. Students' literacy on disaster risk and preparedness should also be bolstered and enriched. Future activities in this program are foreseen to include parents. Parents, especially illiterate ones, should better understand this education than children because when a disaster occurs, it is likely that a child would follow the instructions or directions given by his or her parents even if it is erroneous. Aside from that, teaching media in the disaster laboratory must be added and improved by scientific and technological advancements. The discussion reflects that incorporating the disaster education program into the curriculum could sustain its position as an important subject to be taught to students in schools located in disaster–prone areas. Here, the local government is expected to play a part in continuously evaluating, assisting, funding, and providing support to response schools in Aceh.

Finally, the disaster education that has been carried out or taught in this school cannot be entirely used as an example for other schools because of setbacks such as lack of teacher training and facilities. Nevertheless, what has been programmed and implemented in this school deserves to be appreciated. Through the results of this research, it is hoped that there will be input for schools to prepare better disaster education programs in the future so that they become more suitable for dissemination to other schools in the city of Banda Aceh, and Aceh Province in general.

This study was conducted not without limitations. It currently covered the development of the pre–existing disaster education program from the government as one of the disaster response schools in Aceh through a qualitative approach of interviewing the teachers and students at the school. Therefore, future research could include more of these schools to obtain larger sets of data from more respondents using other instruments, such as surveys, tests, and observations. With larger data sets, it is possible to obtain results that are significant to complement the findings presented in this study.

Conflict of Interest

The authors declare that there is no conflict of interest.

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