OPEN ACCESS
Jurnal Ilmiah Ilmu Terapan Universitas Jambi
Vol. 9 No. 3. September 2025, pp. 955-968 DOI. 10.22437/jiituj.v9i3.42581
Research Article

SCHOOL SAFETY STUDY: TALKING ABOUT DISASTER RISK REDUCTION KNOWLEDGE IN PUBLIC AND PRIVATE PRIMARY SCHOOLS, ARE THEY DIFFERENT?

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Article Info
Received: Apr 29, 2025
Revised: Jun 25, 2025
Accepted: Jul 02, 2025
OnlineVersion: Jul 04, 2025

Abstract
Indonesia is one of the countries prone to disasters. Children are one of the vulnerable groups to become victims when a disaster strikes. At the same time, not all public and private schools in Indonesia have good resilience in facing disasters, including not being able to provide adequate disaster education for students. This study aimed to determine whether there are differences in the implementation of disaster education between public and private primary schools and to find out whether there is a relationship between the availability of disaster information, ownership of procedures for evacuation, training, and disaster response simulations with the knowledge of disaster risk reduction (DRR) of school communities. This quantitative research used a cross-sectional study approach. The data analysis used the Mann-Whitney test for the difference test and the Spearman's rank correlation coefficient (CC) test for the relationship test. The results of the analysis show that there is a significant difference in disaster knowledge between public and private primary schools (Sig. .014). Availability of disaster information (CC .461) and emergency simulation (CC .321) are priority factors in increasing the DRR knowledge of school residents in both public and private primary schools. Based on these findings, it is necessary for both public and private schools to develop specific strategies to enhance their resilience to multiple disaster threats.

Keywords Disaster, Education, Private Primary Schools, Public Primary Schools

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INTRODUCTION

According to the law of the Republic of Indonesia number 24 of 2007 concerning disaster management, a disaster is an event or series of events that threatens and disrupts the life and livelihoods of the community, either caused by natural factors and/or non-natural factors as well as human factors resulting in human casualties, environmental damage, property loss, and psychological impact (Undang-Undang Republik Indonesia Nomor 24 Tahun 2007 Tentang Penanggulangan Bencana, 2007). Meanwhile, the definition of disaster according to UNISDR is a serious disruption to the functioning of

a community or society which involves a wide range of losses and impacts from human, material, economic or environmental, which exceed the ability of the affected community to cope with using its own resources (UNISDR, 2009). The meaning of the two definitions is almost the same, while the differences in the two definitions are in the broad impact aspects and the emphasis on disaster disruption that exceeds the ability of the affected community to cope by using their own resources.

Indonesia, as an archipelago, is in a geographic, geological, hydrological, and demographic position that is prone to disasters (Gugus Tugas Pengarusutamaan Pengurangan Risiko Bencana dalam Sistem Pendidikan Nasional, 2010). Data from the National Disaster Management Agency states that from January 1 to October 26, 2021, the total number of disasters in Indonesia reached 2,093, with a total of 575 deaths, and 1,382 schools were damaged (CNN Indonesia, 2021). Yogyakarta Province is one of the provinces in Indonesia that is prone to disasters. Types of natural disasters that occur in Indonesia, especially in Yogyakarta, include floods, tidal waves, abrasion/erosion, earthquakes, drought, volcanic eruptions, tornadoes, landslides, and tsunamis. In Indonesia, the earthquake and tsunami disasters were the types of disaster that have caused the most deaths, reaching 132,999 deaths, while in Yogyakarta, the earthquake was the type of disaster that has caused the most deaths, namely up to 4,929 followed by volcanic eruptions up to 4,249 deaths (Badan Nasional Penanggulangan Bencana, 2021).

Children are one of the vulnerable groups in the context of disasters (Jatmiko, 2012). One of the reasons for this is the lack of knowledge of children concerning disasters because the current provision of disaster education is still inadequate, especially for children in primary school. The content of safety education in subjects that exist in primary school education from grade 1 to grade 6 has not been presented and explored optimally by teachers, especially in subjects that urgently need safety education prerequisites, such as science, mathematics, and social skills lessons. Meanwhile, the content in teaching materials, teachers' competence, and school facilities play an important role in supporting the safety aspects of children, especially at school (Widowati, Hendriyani, et al., 2018; Widowati, Koesyanto, et al., 2018).

The description of safety education given to public primary school children shows that only 60% of the subjects in grade 1 contain safety education content in their teaching materials. Meanwhile, from grade 2 to grade 6, subjects that have safety education content were 14.3%, 90%, 100%, 87.5% and 50% respectively, although not all chapters have safety education content that is presented explicitly (Widowati, Koesyanto, et al., 2018). In comparison, grade school textbooks in Iran cover topics related to natural disasters, including various topics from disaster risk management, such as aspects of mitigation, preparedness, emergency response, and prevention and spread of infectious diseases, for readiness to face pandemics such as COVID-19 (Seddighi et al., 2021).

The way to increase knowledge of disasters in children is not only through providing teaching materials at school, but also through various content contained in game media. One intervention providing the game product "Snakes and Ladders safety education" at the previous research stage showed that there was an increase in knowledge of 72.8% through the results of the pre- and post-test scores in the intervention group (Widowati, Hendriyani, et al., 2018). In addition to the game of snakes and ladders, the traditional game *'Gobak Sodor'* which is widely recognized by the public in Indonesia is also proven to be able to shape children's social skills such as cooperation, responsibility and a sense of caring, which are some of the important values in disaster education. Games in children's development can play a role in forming social skills, in which the formation process cannot be done instantly because it requires time and a continuous learning process (Irmansyah et al., 2020). Besides games, cultural interventions are also very important in building societal resilience (Hirsu et al., 2020).

Disaster education has begun to be given to children in Indonesia. While many approaches still have a risk reduction paradigm, they mainly focus on what to do when a disaster strikes. The success of safety education is determined by the teaching content and the condition of adequate school infrastructure; in fact, 30% of schools throughout Indonesia are in poor condition or damaged (Jatmiko, 2012). The director of community empowerment at the national disaster management agency, Lilik Kurniawan, also stated that schools are one of the seven targets of facilities that must receive special attention in preventing the large number of victims and damage caused by natural disasters. This priority focus is because schools are central to community activities, where teachers, staff, and children spend approximately 6 hours daily at school (Ristianto, 2019). However, currently, the conditions of schools in Indonesia are not completely safe or child-friendly (Anisah, 2018).

The number of deaths due to disasters in Indonesia in the last 3 years, from 2017 to 2019, respectively, was 361, 5,500, and 517, while in Yogyakarta, they were 15, 4, and 6. Concerning the

schools affected by disasters in Indonesia in the last 3 years from 2017 to 2019, they were 1,326, 2,984, and 1,124, respectively, while in Yogyakarta, they were 3, 19, and 15 (Badan Nasional Penanggulangan Bencana, 2021). It can be said that in the last three years, many communities in Indonesia and Yogyakarta have been affected by natural disasters every school year.

Schools are responsible for ensuring students are safe during and after an emergency. Most schools in New Zealand have carried out various activities for emergency preparedness, such as preparing emergency plans and conducting exercises to provide hazard education to students. Previous emergency experience will increase preparedness. However, a survey of 355 schools in New Zealand explored emergency preparedness efforts, such as developing a plan, simulating emergency response, and educating students about hazards. The results show differences between existing schools in developing their emergency preparedness efforts. There are still many schools that may be less prepared to respond to future emergencies. This is especially true if that response requires reunification with the victims' families. A standard operating procedure (SOP) is still needed for emergency preparedness activities to ensure school consistency (Tipler et al., 2017). There are differences between schools in carrying out disaster preparedness and in providing disaster education to students. The resources owned by each school are not the same as those of public and private schools. The allocation of these resources is greatly influenced by the knowledge and awareness of school residents in fostering a safety culture to build a resilient school system against multi-hazard threats. Therefore, this study seeks to answer whether there is a difference in disaster risk reduction knowledge between public and private schools, as this is crucial for formulating intervention strategies in the next stage.

Accordingly, the researchers aimed to know whether schools in Indonesia, especially in Yogyakarta Province, also have differences in implementing disaster education, particularly in public and private primary schools, because ideally both schools should have relatively the same preparedness in realizing school resilience from the threat of disasters because they are both at the same locus, namely in disaster-prone provinces. In addition, the researchers also aimed to know whether there is a relationship between the availability of disaster information, the ownership of SOP for evacuation, disaster training, and emergency simulations, and knowledge of disasters in the school community, especially in primary schools.

RESEARCH METHOD

This quantitative research used a cross-sectional study approach. This research protocol was approved by the Health Research Ethics Committee at Universitas Negeri Semarang. The sample in this study was 230 elementary schools in Yogyakarta Province, 115 of which were public primary schools and 115 private primary schools. The sampling technique used a simple random sampling technique; the sample was taken randomly using a computer-generated random number for the public and private primary school groups. Respondents in this study were school principals or other personnel appointed by the school based on their special competence in the disaster mitigation aspects in schools (school emergency coordinator).

The independent variables in this study are the availability of disaster information, ownership of SOP for evacuation, disaster training, and emergency simulations. In contrast, the dependent variable is the school community's knowledge of disaster risk reduction (DRR). The hypothesis of this study consists of two hypotheses, namely the comparative hypothesis and the association hypothesis. Hypothesis 1: comparative hypothesis, with Ha: there is a difference in knowledge of DRR between public and private primary schools. Hypothesis 2: The association hypothesis with Ha is a relationship between the availability of disaster information, ownership of SOP for evacuation, disaster training, emergency simulations, and knowledge of DRR of the school community.

The operational definitions are presented in Table 1, where the measurement reference uses the Disaster Preparedness and Safety School (SSSB) measurement tool (Widowati et al., 2020; Widowati, Istiono, & Husodo, 2021).

Table 1. Operational definition of research variables

Variable	The operational definition	Measuring tool/ measurement method	Category	Data scale
Availability of disaster information	The availability of disaster-related information in schools, both internal and external, with the target of information being school community (school management, teachers, staff, students and school committees).	SSSB (Disaster Preparedness and Safety School) measurement tool	1 = If there is no disaster information available at school. 2 = If the school has disaster information, but it is not disseminated to the school community. 3 = If disaster information is available in schools, but it is only disseminated to some school communities. 4 = If disaster information is available at school and it has been disseminated to all school communities.	Ordinal
Ownership of SOP for evacuation	School evacuation procedures in case of disaster.	SSSB (Disaster Preparedness and Safety School) measurement tool	1 = If school does not have an evacuation procedure when a disaster occurs at school. 2 = If school has an evacuation procedure but it has never been simulated. 3 = If school has an evacuation procedure, but the implementation is inconsistent (in simulations or during real conditions). 4 = If school has an evacuation procedure and its implementation is consistent (in simulation or during real conditions).	Ordinal
Disaster training	Disaster-related training conducted in schools, whether the organizers come from internal or external to the school, with the target of training being school communities (school management, teachers, staff, students and committees).	SSSB (Disaster Preparedness and Safety School) measurement tool	1 = If there is no training at school. 2 = If school has a training plan document, but it has never been simulated. 3 = If there is training, however, the implementation does not involve all components of the school community. 4 = If there is training and it involves all components of the school community.	Ordinal
Emergency simulations	Emergency response especially disaster response simulation activities carried out at school and followed by school community. (school management,	SSSB (Disaster Preparedness and Safety School) measurement tool.	1 = If no simulation has been done in the last 5 years at school. 2 = If school has a simulation plan document, but it has never been simulated. 3 = If there is a simulation,	Ordinal

Variable	The operational definition	Measuring tool/ measurement method	Category	Data scale
	teachers, staff, students and committees).		the implementation does not involve all components of the school community. 4 = If there is a simulation and it involves all components of the school community.	
Knowledge of disaster risk reduction (DRR) in the school community	Average knowledge related to disaster risk reduction (DRR) generally possessed by school principals, teachers, students, staff and school committees.	SSSB (Disaster Preparedness and Safety School) measurement tool. The score is obtained based on the respondents' answers (consensus/ school representatives) to the SSSB questionnaire.	1 = If the average school community member does not have adequate knowledge regarding DRR. 2 = If the average school community member has sufficient knowledge regarding DRR. 3 = If the average school community member has good/adequate knowledge regarding DRR. 4 = If the average school community member has very good knowledge regarding DRR.	Ordinal

SSSB: Disaster Preparedness and Safety School.

The data collection technique in this study used a questionnaire with the standard SSSB instrument (Widowati et al., 2020) completed by the selected respondents. Collecting data on respondents began with an explanation of the objectives and scope of the research through an informed consent form, then continued with filling out the informed consent form. The questionnaire was completed by the respondent filling in the data directly, individually, or collectively. The reliability test of the SSSB instrument on all item sets conducted produced an alpha coefficient figure of 0.976 (an alpha coefficient of 0.90 means it has very good reliability).

The data collected from filling out the questionnaire were checked for completeness and then analyzed quantitatively through SPSS 20.00 version for Windows (IBM Corp., Chicago). The quantitative analysis for the difference test was done through the Mann-Whitney test, while the relationship test used the Spearman rank correlation coefficient (CC) test. Data on the level of knowledge for public and private primary schools were analyzed descriptively and quantitatively using percentages and means.

RESULTS AND DISCUSSION

Results of the normality test

In a sample of more than 50, the normality test results are known through the Sig. in Kolmogorov-Smirnov which is .000 < .05 for all variables in this study, so it can be said that all variables, either independent variables (availability of disaster information, ownership of SOP for evacuation, disaster training and emergency simulations) or tied (knowledge of disaster risk reduction (DRR) school community) were not normally distributed. Because the data were not normally distributed, the Mann-Whitney test was used to determine whether there was a difference in knowledge between the public and private primary schools. The detailed normality test results are presented in Table 2.

Table 2. Tests of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Availability of disaster information	.236	230	.000	.872	230	.000
Ownership of SOP for evacuation	.369	230	.000	.697	230	.000
Disaster training	.237	230	.000	.831	230	.000
Emergency simulation	.216	230	.000	.839	230	.000
Knowledge of DRR	.273	230	.000	.856	230	.000

a. *Lilliefors significance correction.*

Results of the association test and comparison

The results of data analysis on the difference test through the Mann-Whitney test show a significant difference in disaster knowledge between the public and private primary schools, with the Sig. (2-tailed) .014 < .05. The total score of disaster knowledge for public primary schools was 320, with an average of 3 points, which means that the average school community in public primary schools already has "good/adequate" knowledge regarding DRR. Meanwhile, the total score for private primary schools was 286, with an average of 2 points, which means that school residents in private primary schools only had "sufficient" knowledge regarding DRR. This average result shows that the average DRR knowledge for public primary schools was higher than the average knowledge in private primary schools. According to a cross-sectional descriptive study conducted in 100 randomly selected public and non-public elementary schools in Mashhad, Iran, in 2017, there was no statistically significant difference between public and non-public schools in terms of environmental health status and safety (p> 0.05) (Noghani et al., 2019). Another study in Shiraz City, Iran, indicated that in terms of security and safety, there was no significant difference between public and private schools because 71% of public schools and 73% of private schools have decent conditions (Hoseini & Azhdarpoor, 2016). Some of these studies stated that there may be no significant difference in security and safety conditions between public and private schools. Still, this study in Indonesia found a significant difference in DRR knowledge between public and private schools.

The correlation test revealed a significant relationship between DRR knowledge and the availability of disaster information, with Sig. .000 and the CC value of .461 mean a relatively strong relationship exists between disaster information availability and DRR knowledge among the school community. There is a significant relationship between DRR knowledge and SOP ownership for evacuation with Sig. .001 and CC .217, which means that the relationship between ownership of SOP for evacuation and knowledge of DRR of the school community is very weak. There is a significant relationship between DRR knowledge and disaster training with Sig. .000 and CC .236, which means that the relationship between disaster training and knowledge of DRR among the school community is very weak. There is a significant relationship between DRR knowledge and the emergency simulation with Sig. .000 and CC .321, which means a strong relationship exists between emergency simulations and knowledge of DRR among the school community. The correlation test results show that the disaster information factor and the emergency simulation factor are priority factors in increasing disaster knowledge of the school community compared to the other two factors. The results of data analysis for the difference test and relationship test are presented in detail in Table 3.

Table 3. Recapitulation of data analysis results

Factors related to knowledge of DRR	Significance (2-tailed)	Interpretation of significance	Correlation coefficient	Interpretation of relationships	Direction of relationship
Availability of disaster information	.000	There is a significant relationship.	.461	Fairly strong (.26 - .50)	Positive/ unidirectional
Ownership of SOP for evacuation	.001	There is a significant relationship.	.217	Very weak (.00 – .25)	Positive/ unidirectional
Disaster training	.000	There is a significant relationship.	.236	Very weak (.00 – .25)	Positive/ unidirectional
Emergency simulation	.000	There is a significant relationship.	.321	Fairly strong (.26 – .50)	Positive/ unidirectional

The urgency of disaster education in children

Disasters impact individuals, families, and communities' physical, psychological, social, and economic aspects. The effect of a disaster on children is far greater than that on adults. Preparedness for psychosocial disasters, through teachers, is one of the best ways to prepare children for the psychosocial consequences of disasters (Elangovan & Kasi, 2015). The age of children is considered very appropriate to be given disaster education because at this age, a person can learn more easily and absorb information given to them (Jatmiko, 2012). Providing safety education to primary school-age children will be an important foundation for developing thinking skills, which will influence the formation of a safety culture in their future lives (Widowati, Hendriyani, et al., 2018). Therefore, primary school children need to gain knowledge and understanding of all potential hazards that can threaten their safety including the possibility of disasters occurring both at school and in their neighborhood, because providing safety education as early as possible can contribute to preventing injuries, both with minor impacts until the occurrence of disability and death. This issue of safety preparedness needs greater attention because a disaster can have a severe effect, especially if it affects children physically and psychologically. After all, children are the future generation of the nation who must be optimally protected (Widowati, Koesyanto, et al., 2018).

This urgent disaster education needs to be given to children in Indonesia. Regarding the practice of teaching disaster prevention that currently exists, the condition is deemed ineffective in several schools on the island of Java in Indonesia because many depend on textbooks and pictures as teaching media, so there is still confusion among students regarding disasters and their mitigation (Tuswadi & Hayashi, 2014). In addition, the number of Disaster Preparedness Schools (SSB) in Indonesia is minimal. The number of SSBs at the primary school level in Yogyakarta in 2018 was only 39 primary schools, or 2.1% of the total primary schools in this province (BPBD, 2018).

School-based DRR programs are also needed in Indonesia and all countries. Accordingly, the world's nations have widely agreed upon the importance of school-based DRR since implementing the Hyogo Framework for Action (HFA) 2005-2015 and the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030. UNISDR and UNESCO stated that DRR efforts start in schools. This initiative aligns with priority 3 of the Hyogo Framework for Action 2005-2015: "knowledge, innovation and education to build a culture of safety and resilience at all levels." In many countries, DRR is part of a community where safety is important in preparedness and post-disaster (UNISDR, 2007). In addition, schools are the best places to forge these values, so they are very suitable for building a safety culture and disaster resilience. The concept of school resilience is interpreted broadly, namely being resistant to multiple hazards, both ecological, psychological, sociological, and public health awareness of the danger of accidents that may occur in schools (Shiwaku et al., 2016; Widowati, Istiono, & Sutomo, 2021).

Safe schools are considered local bases for community-based disaster management (Amini Hosseini & Izadkhah, 2020). Mainstreaming DRR programs for schools in Indonesia is implemented through three main strategies, namely empowering the institutional role and capacity of the school

community, integrating DRR into the formal education unit curriculum, and building partnerships and networks between various parties to support the implementation of DRR in schools (Gugus Tugas Pengarusutamaan Pengurangan Risiko Bencana dalam Sistem Pendidikan Nasional, 2010). In comparison, the South American and Caribbean countries have three pillars of comprehensive school safety: (1) safe learning facilities, (2) school disaster management, and (3) risk reduction and resilience education (Muñoz et al., 2020). Whereas, the Australian IDNDR coordinating committee, since 2000, has developed a strategy to support schools to build a culture of disaster prevention in schools and to increase the level of public awareness, among other ways, by facilitating the existing partnerships between emergency management and the school education community (Ozmen, 2006). From this comparison, it is clear that the success of implementing DRR in schools in various countries cannot be separated from the important function of the availability of knowledge possessed by school residents regarding DRR itself, whether given through the educational curriculum, the availability of information through various media in schools, training program, procedures to the availability of facilities in schools. However, in its implementation, it is still adjusted to local values and conditions in each country.

The research in Botswana which was conducted using a mixed-methods design, where data were collected using a questionnaire given to 30 teachers, document review, and in-depth interviews with the Curriculum Development Unit and the National Disaster Management Agency stated that the one way to create an understanding of risk is to integrate DRR into the primary school curriculum, such as safety concepts integrated into existing subjects (Mutasa & Coetzee, 2019). Meanwhile, several studies assessed the differences between public and private elementary schools. One study conducted in Districts 1 and 2 of Sari in Iran used descriptive research in 100 elementary schools (both public and non-profit), the data collection used questionnaires with direct interviews, and the data were analyzed using independent numerical T2 testing through Excel and SPSS software. They found that private or nongovernmental schools had relatively better Health and Safety Executive (HSE) ratings than general schools. This finding could be due to the awareness of managers and the application of good HSE standards in schools. However, the study only assessed the HSE aspects between general schools and private schools and did not specifically measure knowledge related to DRR as is done in this present article (Behzadkolaee et al., 2015).

Training vs. disaster response simulation

Natural disasters have devastating impacts globally; one of the impacts of a disaster is the emergence of mental health and psychosocial disorders, whereas currently, disaster management has shown a shift toward DRR programs (Gray et al., 2021). One of the efforts to reduce disaster risk includes conducting intensive training and disaster response simulations to build community resilience. The resilience of the disaster-prone community is always important to measure and improve because the strength of this community can change due to disasters that often come suddenly and regularly with time (Copeland et al., 2020).

In schools, disaster response simulations conducted for teachers and students are effective for DRR and increased preparedness for school communities. Meanwhile, the availability of information sources is very important to increase DRR knowledge as well as promote preparedness for disasters that may occur in the future (Muñoz et al., 2020). Disaster preparedness simulations are also implemented in schools in Iran annually to increase students' preparedness against potential earthquakes. These are called "Earthquake and Safety" training programs. This activity begins with educating students on safety, self-protection, and evacuation measures, followed by an annual exercise. The simulation can also be expanded to involve the community living around the school to achieve "Safe Schools - Resilient Communities". This can simultaneously be used to promote public participation in disaster management at the local level to increase resilience, develop local capacity for emergency response, and adapt to conditions after a disaster (Amini Hosseini & Izadkhah, 2020).

Lack of awareness of the resources available and the need for teacher training are the most significant barriers to optimal use of existing resources. Therefore, the increased use of resources includes the use of web-based technology for teacher training, integration of disaster preparedness messages into children's programs, including disaster education content as one of the prerequisites in the curriculum, a sustainable evaluation system and increasing teaching that involves volunteering as one of the national strategies for integrating disaster education curricula are essentially important (Johnson et al., 2014). In the era of the COVID-19 pandemic, disaster materials can also be provided

online. Still, it is necessary to anticipate the obstacles associated with providing material online, including network problems, connectivity, security, and feedback (Diningrat et al., 2020). In addition, challenges for teachers, especially in rural areas, include parental involvement, work environment, teacher salaries, and the need for personal development (Ling et al., 2020).

Independent training for teachers is one of the strategies for improving teacher professionalism (Ling et al., 2020), but on the other hand, teacher training is still minimal; this results in teachers having less knowledge and skills related to disaster prevention teaching (Tuswadi & Hayashi, 2014). At the same time, teaching is a way to communicate between teachers and students, including in the context of disaster mitigation. These communication-related factors are important because they affect people's capacity to prepare for and respond to a disaster (Hansson et al., 2020). Accidents and disasters have the potential to affect most elementary school students. The government, especially the Education Office and the National and Regional Disaster Management Agency, the Fire Department, the police and referral hospitals, as well as the Indonesian Red Cross, Child Protection Services, NGOs and social workers need to develop partnership networks with schools to improve school capabilities and competencies in mitigating multi-hazard risks to improve school resilience (Widowati et al., 2023).

Traditionally, disaster management information systems have been designed to facilitate communication and coordination in a hierarchical manner, where actors' roles serve as a key element in designing a disaster management information system (Nespeca et al., 2020). The role of these actors must receive serious attention, because individual failures can trigger the collapse of a system. The failures of these individuals can potentially result in a systemic risk (Hochrainer-Stigler et al., 2020).

School preparedness in facing disasters

In Indonesia, many schools are located in disaster-prone zones. For example, 56% of public elementary schools in Banda Aceh City have a high risk of a tsunami, even though not all of these schools have implemented the Disaster Preparedness School (SSB) program (Sakurai et al., 2018). A school safety survey conducted in two Midwestern states showed that only 56.3% of students answered strongly agree/agree that their school is safe (Skiba et al., 2006).

In implementing education and disaster mitigation, personal student resilience is needed to build school resilience. Strategies to increase student resilience include building resilient schools and having resilient teachers (Dwiningrum et al., 2020). Teachers must participate in creating a culture of safety in schools. Teacher participation can influence, contribute to, and significantly impact school performance (Rosita et al., 2025). More broadly, schools should be resilient to disasters and resistant to multi-hazard threats, including safety hazards and violence against children. The main indicators for realizing multi-hazard resilience in schools are commitment, provision of information exposure, adequacy in the formal education curriculum, school infrastructure and facilities, empowerment of the institutional role and ability of the school community, availability of adequate supervision systems and school preparedness (Widowati, Istiono, & Husodo, 2021). In a study in Lebanon conducted prospectively by apprentice school nurses in 11 private schools for the 2018-2019 school year, the data were analyzed descriptively and inferentially. Results showed that compliance with playground safety standards, injury prevention strategies, and active school supervision can reduce child injuries and ensure a safe and injury-free school environment (Al-Hajj et al., 2020).

Based on the results, it is clear that schools should be able to provide information exposure to all school members both to school management, foundations, students, staff, teachers (Mutasa & Coetzee, 2019), security, school guards and parents (school committees) regarding disaster education to increase knowledge of school residents to increase the resilience of schools to face disasters. The information exposure aspect consists of the availability of information on DRR and knowledge of DRR in the school community. Disaster key message information must be available in the school area. Providing disaster education for children through various information exposures must consider the emotional and psychological aspects of children, for example, by using a variety of approaches, including both narrative or creative conversations, designing and making art works, using technology for film making, presenting documentary films so that it makes it easier for children to absorb information either individually or collaboratively (Mutch, 2013; Suharwoto, Nurwin, TD, Supatma, Dirhamsyah, et al., 2015). In addition, it should be complemented with providing informative books and educational games that can be used while the children are waiting for their parents (O'Connor, 2013).

Preparedness aspects, especially related to contingency plans, DRR implementation guidelines, SOP for evacuation, or SOP for response, must be written, unanimously agreed upon, implemented by

all school components, and updated regularly. In addition, regular simulations, monitoring, and the availability of an early warning system understood by all school components are also very important aspects of preparedness in the successful implementation of DRR. All elements of this preparedness must be structured by considering local accuracy and contextuality (Anak, 2015; Centers for Disease Control and Prevention, 2017; International Federation of Red Cross and Red Crescent Societies and UNDP, 2015; Konsorsium Pendidikan Bencana Indonesia, 2011; Suharwoto, Nurwin, TD, Supatma, Bank, et al., 2015; Suharwoto, Nurwin, TD, Supatma, Rudianto, et al., 2015).

Many researchers agree that modern schools should focus on safety and security. On the other hand, public primary schools tend to use more school security instruments than private primary schools (Mowen, 2015). There is a difference in knowledge between public and private schools related to school disaster preparedness so that in implementing the DRR program, the local context, conditions and capabilities of each school must be considered to improve the sustainable school preparedness system, which begins with a discussion process with the school community to develop related action plans on the logic and evidence of current DRR programs (Petal et al., 2020). The discussion process and the development of action plans should also involve children or students as part of the school community since this will develop children's attitudes to contribute to society in the long term (Sakurai et al., 2020).

Further researchers are expected to be able to measure school preparedness in facing disasters at various levels of education, namely at the primary, junior high, high school and college levels, both for public and private schools or universities, differentiated by research locus (province or country) and also the level of school income, namely low, medium to high income. So that it can be used as input in developing the right intervention strategy at the following implementation stage to increase school resilience to multiple disaster threats. The weakness in this study is that it does not differentiate schools based on locus, for example, which primary schools are located in cities, suburbs, or villages. The underlying consideration is that the research uses only one province as a locus. The conditions for each city and district are relatively the same, i.e., all are in disaster-prone areas. In addition, this research also does not differentiate schools based on their income levels for public or private primary schools, which may affect school readiness in dealing with disasters, from the available infrastructure to training or drilling that can be held by each school concerned with disaster mitigation. This is done because the sample selection technique uses simple random sampling so that all public and private primary schools have the same probability of being selected as samples. It is recommended that future research measure school readiness comprehensively—covering knowledge and all aspects of preparedness—by comparing public and private schools while considering each school's location and level of economic strength. This is important because every school’s condition requires tailored intervention strategies to build a safety culture, particularly in facing multi-hazard threats and disasters. Location is crucial, as community participation, traditional practices, reconciliation methods, and decision-making based on local wisdom can foster strong cultural mechanisms that significantly support social reconstruction (Muhamad et al., 2025).

CONCLUSION

While the education system in various countries is very diverse, as well as the DRR system, the type of school and resources available in schools, this research shows that these conditions significantly impact differences in DRR knowledge of school residents, especially between private and state primary schools. The results of this study indicate a significant difference in knowledge related to DRR between public and private primary schools, with a Sig. .014. The average DRR knowledge score in public primary schools is higher than in private ones. The mean of DRR knowledge in public primary schools was 3 points ("good/adequate" category) while in private primary schools it was 2 points ("sufficient" category). Meanwhile, from the results of the correlation test, there is a significant relationship between the availability of disaster information (correlation coefficient .461), ownership of procedure for evacuation (.217), disaster training (.236), and emergency simulation (.321) with knowledge of DRR of the school community. The factor of availability of disaster information (correlation coefficient .461) and the emergency simulation factor (correlation coefficient .321) are priority factors in increasing the DRR knowledge of school residents, both in public and private primary schools, compared to the two other factors, namely SOP ownership for disaster evacuation and training. Therefore, further research is needed to analyze how effective the school's safety procedures are and how capable it is in implementing its safety procedures. The allocation of these resources is greatly influenced by the knowledge and awareness of school residents in building a safety culture to strengthen school resilience

against multi-hazard threats. Therefore, identifying whether there is a difference in disaster risk reduction knowledge between public and private schools is crucial, as it informs the development of appropriate intervention strategies in the next implementation stage to enhance school resilience.

ACKNOWLEDGMENTS

I would like to thank the funding for this research; this research was partially funded by the competitive research of Universitas Negeri Semarang, Indonesia.

AUTHOR CONTRIBUTIONS

The authors' contributions are as follows: Author 1 developed the concept, instruments, and methodology. Author 2 is responsible for the data curation and data analysis process. Author 3 is responsible for the literature search, investigation, and discussion. While Author 4 is responsible for reviewing, editing, and translating.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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