

Strategies to Increase Knowledge of Disaster Preparedness Among Children: A *Literature Review*

Putri Karisa¹, Ristina Mirwanti², Farah Nibras¹, Syahida Ayu¹, Anastasia Yovita¹
Muhamad Gustaf Al Fajar¹

¹*Nursing Student, Faculty of Nursing, Universitas Padjadjaran, Indonesia*

²*Department of Emergency and Critical Nursing, Universitas Padjadjaran, Indonesia*

Corresponding author: putri19006@mail.unpad.ac.id

ABSTRACT

Background: Children are a vulnerable group when experiencing a disaster. This vulnerability occurs because children's knowledge about disasters is very minimal, making children feel unprepared for disasters. The physical, psychological and social impacts caused by disasters are very dangerous for children's future development.

Purpose: This study aims to determine interventions that can be done to improve children's knowledge related to disaster preparedness.

Methods: The literature search used PubMed, Google Scholar, Science Direct, and EBSCOHOST Journal databases. Articles were analyzed based on the criteria of publication year 2017-2022, English and Indonesian language, randomized controlled trial and quasi experimental research designs and research results according to the topic

Results: Six articles were obtained that discussed interventions to improve children's knowledge about disaster preparedness. There are several ways found in these articles, including disaster simulations with picture books, educational games, pop-up fairy tales, and animated videos, disaster awareness videos, and smartphone-based counseling.

Conclusion: Education related to disaster preparedness for children can be obtained through various media, such as picture books, educational games, pop-up fairy tales, and animated videos, disaster awareness videos, and smartphone-based counseling. This knowledge can make children more prepared in the face of disasters.

Keywords: Children; Disaster Preparedness; Intervention; Knowledge.

BACKGROUND

Indonesia as a country that is prone to natural disasters both caused by geological and meteorological factors and the shape of the territory consisting of most of the ocean makes Indonesia vulnerable to natural disasters such as tsunamis, earthquakes, and volcanic eruptions (Mujiburrahman et al., 2020). Natural disasters that occur can threaten anyone, including the safety and future development of children (Mooney et al., 2017). The increased risk of disasters further increases children's risk of direct and indirect harm (Norris et al., 2002). Thus, risk reduction, emergency preparedness, response and community recovery activities can be a solution to prevent disaster threats (WHO, 2019).

Children are the most vulnerable group during a disaster. This is because the level of psychological and behavioral development, physical size, and level of dependence on adults make it difficult for children to deal with disasters (Zahran et al., 2008). Disasters can damage children's physical and mental health (Subedi et al., 2019). It also harms children indirectly which can have a long-term impact on children (Berlemann et al., 2016; Seddighi et al., 2020). In addition, disasters will also destroy children's educational infrastructure, play environment, and disrupt learning in children (Nguyen & Minh, 2018). Not to mention cases of child trafficking due to the loss of parents, caregivers, and families children often have to work after disasters (Jones, 2018). In response, improving children's disaster preparedness is one of the main solutions to reduce post-disaster losses (Daoud et al., 2016; Midtbust et al., 2018).

Children play an important role in disasters, how they can try to protect themselves by playing a role in communicating risks, taking action and participating in decision-making to prevent disasters for their families and neighborhoods (Tanner, 2010). The greater the number of children who know about disaster preparation, the greater the opportunity for children to share information with their families and neighborhoods about disaster hazards (Shaw et al., 2004).

Children's limited knowledge about disaster knowledge is the cause of disaster vulnerability in children because they are not prepared to face disasters. When a disaster occurs, children are in a position when they are playing or studying at school, making children limited in making disaster preparations. Raising children's awareness about disaster risk and disaster preparedness as early as possible is the hope that children can know what to do when a disaster occurs (Indriasari, 2018). Integrating disaster preparedness material in schools is one of the efforts that can be made. However, disaster preparedness knowledge is not currently included in the education curriculum in Indonesia. However, several community organizations have actively provided disaster preparedness education to children, especially school-age children. However, the challenge that arises is that the educational methods provided tend to bore children. So that in addition to conventional education, various other methods have been developed such as using simulations, games, videos and picture books but there is still little evidence about this. Therefore, we intend to conduct a literature review to identify a variety of interventions to improve children's knowledge about disaster preparedness so that it can be a recommendation in providing education with diverse and fun methods.

OBJECTIVE

This study aims to identify a range of interventions to improve children's knowledge of disaster preparedness.

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METHODS

The method used in this literature review is a scoping review with the aim of finding interventions that can increase children's knowledge about disaster preparedness from various articles. The databases used for searching articles are Pubmed, ScienceDirect, Google Scholar, and Ebsco. The article search used English keywords, namely "Children" OR "Child" AND "Intervention" OR "technique" AND "knowledge level" AND "disaster preparedness" and Indonesian keywords, namely "children" AND "intervention" AND "knowledge" AND "disaster preparedness". The searched articles are presented in the results table. The inclusion criteria in the study, namely full text articles in English and Indonesian, the range of publication years 2017-2022, experimental research designs namely RCT, Quasi experimental, and pre-experimental and articles that review interventions that can increase knowledge in children about disaster preparedness. The exclusion criteria in the study were review articles, thesis manuscripts, and books.

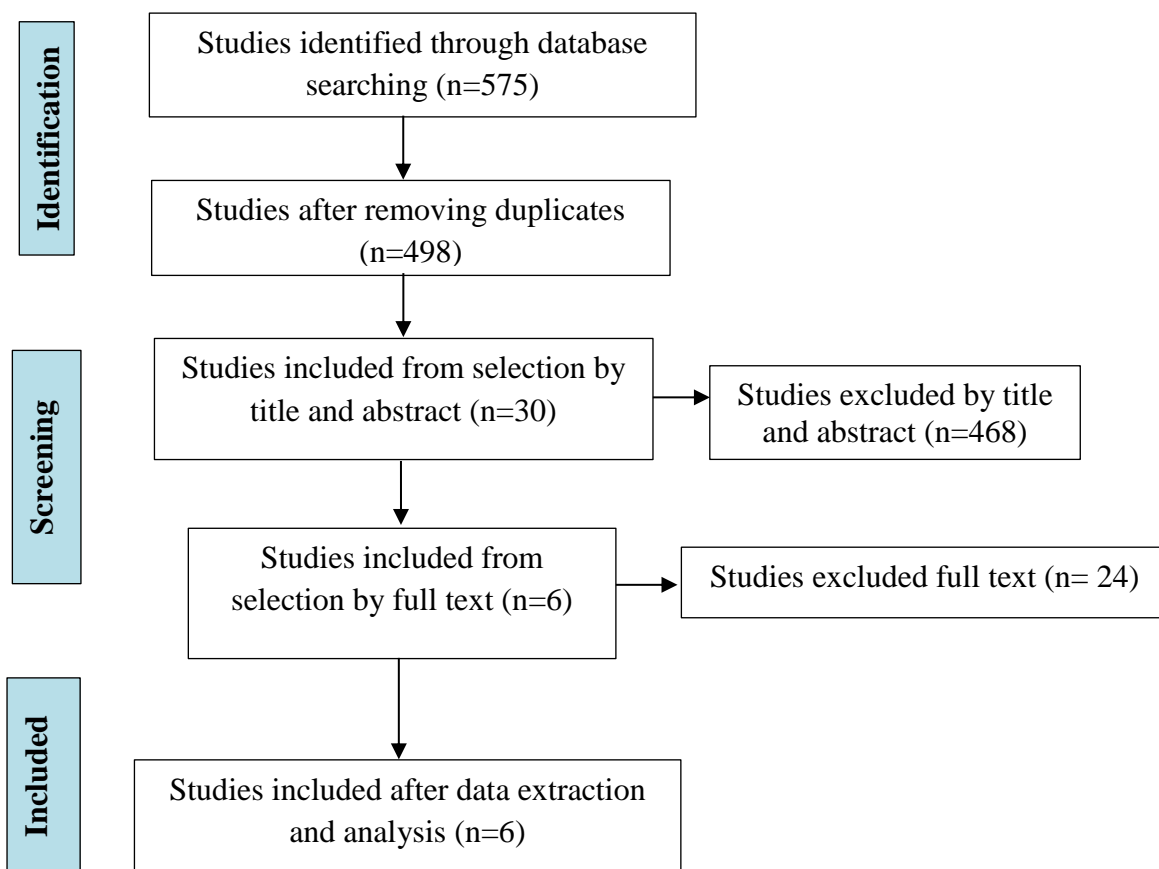


Figure 1. Prism Flow Chart

RESULTS

In detail, the research that describes interventions to improve children's knowledge about disaster preparedness can be seen in table 1, a literature review table with research articles collected all in English and Indonesian, has a Quasi Experimental design with pretest and posttest design, and the research was conducted in three countries namely Indonesia, Malaysia and Korea.

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Tabel 1. Summary of findings

Author, Year	Study Design	Sample	Intervention	Instrument	Result
Sari et al (2019)	Quasi Experiment with one group pretest-posttest design	70 Elementary School Students	Education through socialization and picture books accompanied by simulations for 60 minutes	Disaster preparedness questionnaire created by the National Disaster Management Agency.	The results showed that there was an increase in students' knowledge of earthquake preparedness.
Winarni (2018)	Quasi Experiment with one group pretest-posttest design	58 Elementary School Students	Earthquake educational game app for 15 minutes	Disaster preparedness questionnaire	There was a significant increase in students' knowledge about earthquakes
Shin- Jeong Kim & Cho (2017)	Quasi Experiment with pretest-posttest design	86 Elementary School Students	Preparedness Education Based on Smartphone	Disaster preparedness questionnaire	Disaster preparedness education through smartphones showed higher knowledge improvement scores in the intervention group than the control group.
Benardi (2018)	Quasi Experiment	224 Preschool Students	Disaster education through fairy tale method based on pop up media for 1 month	Disaster preparedness questionnaire	Landslide disaster education intervention through fairy tale method based on pop up media can improve knowledge outcomes and learning motivation
Saparwati et al., (2020)	Quasi Experiment with pretest-posttest design	68 Elementary School Students	Animated video on disaster preparedness	Disaster preparedness questionnaire from LIPI	Knowledge after watching animated videos in the good category 54.4%
Indriasari et al., (2018)	Quasi Experiment with pretest-posttest design	23 students with special needs "autism"	The 20-minute disaster awareness video is divided into five scenes about right and wrong actions and wrong actions that must be done during an earthquake disaster	Disaster preparedness questionnaire	The increase in preparedness of autistic children before and after being given a simulation was 87% after 5 simulations through video viewing.

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DISCUSSION

Various interventions have been found to improve children's disaster preparedness. Education to improve disaster preparedness is a promising solution to improve children's knowledge and skills towards disaster preparedness. High knowledge will affect a person's behavior when saving themselves during a disaster so that they can know exactly what actions to take (Terpresta., 2011). Equipping children's knowledge and skills about disaster is very important to do because so far the focus of education has not been provided to children so that children have very little disaster experience and children's imagination about disasters is also limited (Kim and Lee, 2020). Interventions that can be carried out are disaster preparedness education using picture book and simulation methods, educational game applications, disaster education applications, animated videos, and storytelling with pop-up book media.

Disaster education interventions with picture book and simulation methods have a positive influence on children's knowledge of disaster preparedness. Sari et al (2019) conducted an earthquake disaster preparedness education intervention for 70 elementary school students using the picture book method, and simulation resulted in an increase in pretest scores or before intervention (10.31) and post test or after intervention (13.86). Supported by research by Lindel at al (2015) and Oral et al (2015) which states that children involved in disaster simulations have a higher understanding of disasters compared to children who do not participate in simulations.

Learning strategies through simulation provide opportunities for children to explore and increase their knowledge about disaster (Syuaib., 2014). Disaster simulation can assess the extent to which a person's level of preparedness in facing natural disasters. The simulation approach is used in children because this activity is fun so that the message to be conveyed is much easier to absorb and children tend to be excited in following the practice directly (Putra., 2014). Research conducted by Katada et al (2016) showed that disaster simulation exercises carried out repeatedly when no disaster occurred managed to save 3,000 school children who survived the big earthquake and Tsunami that attacked Kamaishi City Even out of nearly 1,000 victims only 5 school-age children died.

In addition, there are other learning media that are appropriate for use in children is education through picture books, because picture books can help develop children's emotions, fun and stimulate children's imagination (Nurgiyantoro., 2015). The storytelling method is also widely used as a medium for disaster education in children, one of which is with pop-up storybooks. Pramesti (2015) stated that making storybooks about landslide disaster preparedness in children must be conveyed as simply as possible. In addition, the book must consider three-dimensional elements and motion elements that increase children's interest and increase children's understanding. Judging from the results of Benardi's research (2018), the intervention can improve student learning outcomes seen based on pre-test and post-test scores with an increase in scores of 60%.

Advances in the development of science and technology have contributed to the development of applications as a means of increasing children's knowledge in disaster preparedness. Various applications are designed according to the characteristics of children, one of which is through educational game media. Game-based teaching can increase children's learning motivation, thus encouraging children to acquire knowledge and skills (Garris et al., 2002). Educational games are currently a trend in nursing education and can improve learning outcomes (Wingo et al., 2019). The results of Winarni's research (2018) stated that there were significant differences in pretest

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and post test scores when before and after participating in learning with the application. Even research by Solinska et al (2018) comparing the effects of educational games with learning through simulation methods resulted in better scores because in educational games students are given more autonomy so that students have the opportunity to handle various information simultaneously. Educational games can also develop students' characters to be able to respond to various difficulties and emotional role changes.

Smartphone-based preparedness education interventions are recognized as an effective alternative education method (DG kim & Kim, 2013). Smartphone-based education may be useful for children who are familiar with these devices (Bain, Jones, O'Brian, & Lipman, 2015), emergency preparedness education delivered through smartphones is also needed to develop children's coping knowledge. Shin Jeong Kim et al (2017) stated that there were 86 elementary school students who conducted a preparedness education intervention through smartphones. Before the intervention or pretest there was no significant difference between the two groups and after the intervention or posttest there was a significant difference as much as (50.0%) these results showed that the positive response from the children's evaluation of smartphone-based education increased. Furio, Seguit, and Vivo (2015) reported that smartphone-based education is more effective than traditional centered education. Likewise, emergency preparedness education delivered through smartphones on coping knowledge can be considered effective in actual emergency situations.

In addition, there are other learning media that are appropriate for use in children is education through animated videos of disaster preparedness. Saparwati et al (2020) stated that there were 68 students who participated in watching the animated video. Before being given information about disaster preparedness using animated videos, most children had a category of less (29.4%), then after giving information about disaster preparedness through animated videos, children's knowledge increased; better (54.4%). this proves that after giving information using animated videos about disaster management, there is an increase in knowledge of student preparedness in dealing with earthquake disasters. supported by KPBI (2011) one of the factors that influence student preparedness is the knowledge factor. In line with Supriyano's (2014) where good knowledge about preparedness will shape good behavior or attitudes regarding disaster preparedness.

Research conducted by Indriasari et al (2018) is to provide interventions to 23 children with special needs "autism" in the form of a disaster awareness simulation video where the video is 20 minutes long which is divided into five scenes showing the right and wrong actions that must be taken during an earthquake disaster. From what we know that children with special needs are the most vulnerable group in the event of a disaster. some of them have mobility barriers to get protection. In addition, there are also communication disorders that show interaction problems with people around them. children's involvement and ability to perform the simulation showed an increase of up to 87% after the simulation was carried out. This disaster awareness video is considered effective as a learning medium for autistic children, because it can trigger spontaneous verbal reactions. this study shows that by using the earthquake disaster awareness simulation method, the involvement of autistic children in the simulation is proven to increase. The simulation proved to be effective for autistic children compared to the interview and picture method. the material delivered by simulation makes it easier for children to accept and understand the lesson.

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CONCLUSION

There are several ways found interventions for increasing children's knowledge related disaster preparedness, including education with picture books, disaster simulations, educational games, education with pop-up storybooks, animated videos, simulation videos and smartphone-based counseling. Increasing children's knowledge related to disaster preparedness can be done with various methods as evidenced in several research articles. Hopefully, this literature review discussion can be used properly by children and parents if children need to be assisted in carrying out interventions that can increase disaster preparedness knowledge and many other studies will develop to help find more effective interventions. Further research in the form of systematic reviews is needed to determine the effects of further interventions and which interventions are most effective.

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