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Review Article

The Effect of Disaster Education of Increasing Earthquake Disaster Preparedness : A Narrative Review

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Abstract

Aims: Earthquake is a disaster that causes a lot of losses both physically, mentally and the highest cause of death compared to other disasters. This is because public knowledge about management and preparedness in dealing with disasters is lacking, so socialization related to education regarding disaster management due to earthquakes is crucial to be given to the community to minimize losses caused. So there is a need for a literature review related to the implementation of education in disaster management.

Purpose: Conducted a narrative review to determine the effect of disaster education on increasing earthquake preparedness.

Methods: The article search strategy used three databases (Google Scholar, EBSCO, Garuda) which were searched from 2014-2021 in the form of research reports and reviews that discussed the effect of disaster education on increasing earthquake preparedness. with the keywords Education, Earthquake Disaster, Preparedness, Education, Earthquake Disaster, Preparedness in a database search. Then the critical appraisal tools from JBI were carried out. There were six articles that met the inclusion and exclusion criteria set.

Results: Shows that the provision of earthquake disaster preparedness education can be carried out by various methods, including the introduction of school-based disaster risk, with lectures, questions and answers, simulations, demonstrations, and audiovisual techniques. The several journals above, it shows a significant difference in the form of an increase in results before being given the intervention and after being given the intervention.

Conclusion: Based on the results of the literature review is that there is the effect of disaster preparedness training earthquake with methods of educational disaster on community preparedness. And this educational method can be applied to the community to increase preparedness for earthquake disasters.

Keywords:

Earthquake Disaster, Education, Preparedness

INTRODUCTION

Indonesia is an archipelago that is very prone to disasters. This is the responsibility and obligation of the government in anticipating disasters either before or after

a disaster occurs. One of the disasters that often occurs in Indonesia is an earthquake.

Earthquake is a disaster that causes the highest number of injuries and deaths compared to other disasters (1). In addition,

earthquakes can cause economic losses, physical damage to the environment, and psychological disturbances for disaster victims. The threat of an earthquake is sudden and predictable so it gets widespread attention, but it is difficult to determine when it will occur (2).

The West Sumatra earthquake (September 30, 2009) is an illustration of how big the losses caused by disasters in Indonesia are. As many as 1,195 people died and 249,833 housing units were damaged (114,797 heavily damaged), 2,512 educational facilities (9,051 local), health facilities, 1,010 government facilities, 2,104 worship facilities, 177 km roads, 4,980 m bridges, 25 hotels, irrigation facilities, markets, power outages, telecommunications networks, clean water networks, and other infrastructure facilities. Not to mention the impact of other losses, namely on the psychological side of the community and other aspects of life, such as education, economy and social (3).

The main factor that causes many deaths due to earthquakes is the lack of public understanding about disasters and the lack of community preparation for disasters (4). The impact and losses caused by the earthquake are due to the lack of preparation of the surrounding community to face the disaster (5). The impact of this disaster left many people with pain and hardship. Therefore, there is a need for community preparedness in dealing with disasters, both psychological preparation and daily activities carried out by adults both inside and outside the home.

Disaster preparedness is an action taken in the pre-disaster period (before the disaster occurs). The purpose of disaster preparedness is to reduce the risk (impact) caused by a disaster. (6) explains that disaster preparedness is an action that allows governments, organizations, communities and individuals to be able to respond to a disaster quickly and effectively to a disaster situation. Disaster preparedness measures also include

disaster management, disaster management arrangements, resource maintenance and personnel training (7).

One of the ways in which this preparedness can be improved is by providing education to the public regarding the response that must be taken in the event of an earthquake and how to handle it. One of them is preparing an emergency response plan so the community can know what actions to take in the event of a disaster. From this background explanation, the author will analyze the effect of disaster education on increasing earthquake preparedness.

METHODS

The method used is a systematic review. And using the PICO (Population) approach, Intervention (disaster education), comparison (-), outcome (Improved earthquake preparedness).

Search articles using PRISMA charts through electronic databases, namely Google Scholar, Garuda, Sciencedirect, PubMed, DOAJ and Ebscohost.

The key words used "*Education, Earthquake Disaster, Preparedness*". Findings from various sources were limited by inclusion and exclusion criteria.

The inclusion criteria of this study are the year 2014-2021, while the respondents are the general public, full text, English and Indonesian articles, Education, quasi-experimental and Pre-experimental designs, Earthquake Disasters, Preparedness. While the exclusion criteria are comparisons or combinations with other interventions, duplication, and focus on outcomes not only related to increased preparedness for earthquake disasters.

Based on a systematic article search process, 56,295 articles were found from the databases of Google Scholar, Sciencedirect, Ebscohost, and searches through other sources. Furthermore, 50,531 articles were issued with a publication year before 2014 so that 17,606 articles remained. Of the 17,000 articles there are

1,014 duplicate articles, and the topic is not in accordance with the research objectives.

There are 1000 full text articles that match the desired title. Of the 105 full text articles, a re-examination was carried out based on the inclusion criteria that had been set and 99 articles were issued that did not meet the inclusion criteria, so that there were 6

articles that would be reviewed by the authors which would be explained into a scientific paper on the Effect of Disaster Education on Improvement of Earthquake Disaster Preparedness, so that it can be used as a recommendation for interventions that can be applied by health workers in increasing preparedness for earthquake disasters.

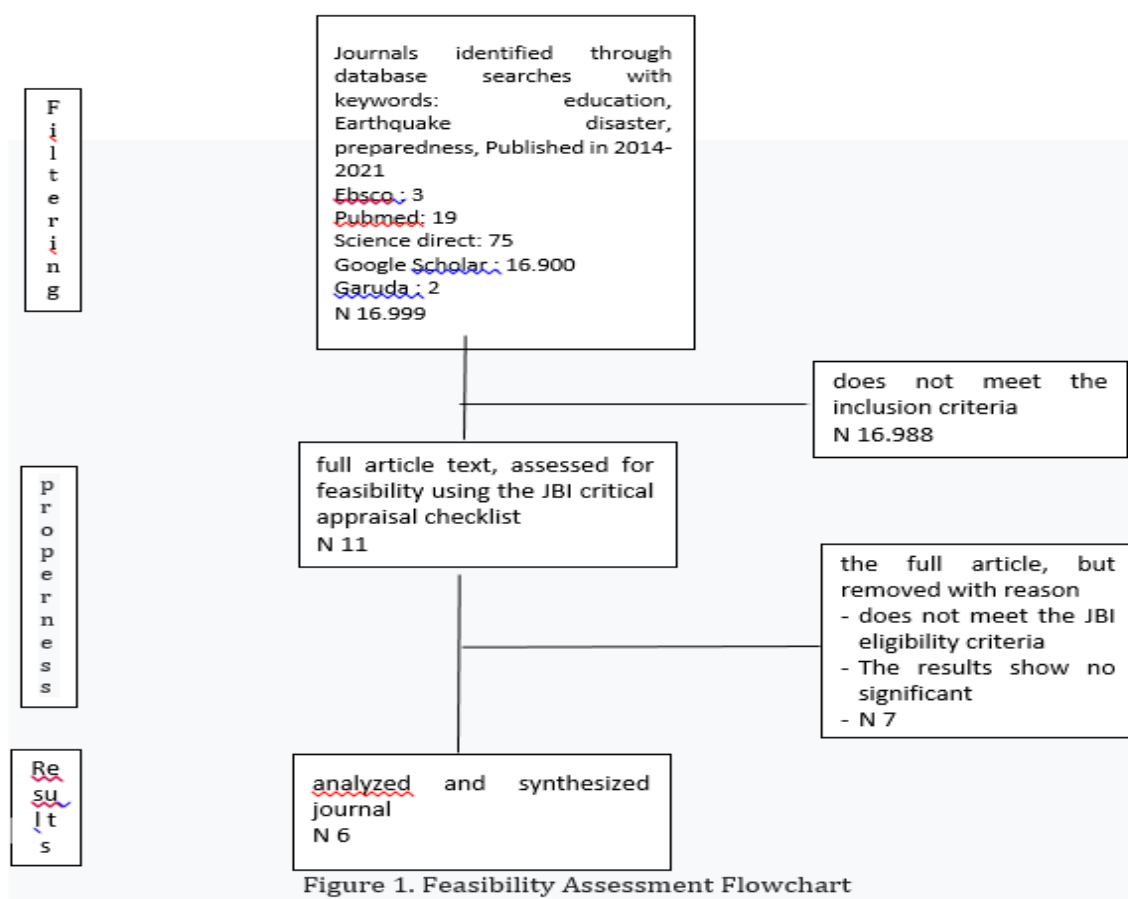


Figure 1. Feasibility Assessment Flowchart



RESULTS

In the table below, 6 articles that meet the eligibility criteria are included in this systematic review. The study was conducted in Indonesia (n=4), Japan (n=1), and India (n=1).

The type of research from the six selected journals is quasi-experimental research.

Table 1. Key Findings from Research Articles

No	Title, Author and Year	Research purposes	Sample and Sampling Technique	Types of research	Interventions/Educational Methods	Result
1	<i>Effectiveness of Disaster - Based School Program on Students' Earthquake - Preparedness in Bantul, Yogyakarta</i> Adiyoso & Kanegae (2013)	Assess the effectiveness of disaster risk education on earthquake preparedness.	Sample: 239 student	Quasi eksperimen	Education: experience interview	Multivariate Analysis of Variation (MANOVA) revealed that there were significant differences in the variables studied among students. This study provides evidence that having schools adopt disaster risk reduction issues effectively increases knowledge, risk perception, awareness and critical attitude but is limited in preparedness behavior.



No	Title, Author and Year	Research purposes	Sample and Sampling Technique	Types of research	Interventions/Educational Methods	Result
2	Effect of Simulation Facing Earthquake Disaster on Preparedness of Students at SDN 86 Bengkulu City Yustisia., Aprilatutini, & utama (2019)	Knowing the effect of the disaster simulation method on the readiness of children.	Sample: 62 student Sampling technique: Total sampling	Quasi eksperimen	Education with children's simulation	The results of this study indicate that there is an effect on disaster preparedness with the simulation method of children with $p < 0.005$.
3	Pengaruh Edukasi Manajemen Bencana Gempa Bumi Terhadap Kesiapsiagaan Siswa Dalam Menghadapi Gempa Bumi di SMK Ma'arif 1 Piyungan Bantul Romdhonah., Sucipto., & Nekada (2019)	The Effect of Earthquake Disaster Management Education on Students' Preparedness in Facing Earthquakes at Ma'arif 1 Piyungan Vocational School, Bantul	Sample: 36 student Sampling technique: Stratified random sampling	Quasi eksperimen	Counseling: lecture	Based on results of the pre test and post test on intervention group that is $0.011 p < 0.05$ statistically there is an effect between pre test and post test in the intervention group. Based on results of the pre test and post test in the control group are $0.046 p < 0.05$ statistically there is an influence between pre test and post test in the control group.
4	The Effect of Health Counseling on Preparedness for Earthquake Disasters in Elementary School No. 7 Labuhan Haji Students, South Aceh Regency Simeulu dan Asmanidar (2020)	Knowing the effect of health education on improving preparedness for earthquake disasters.	Sampel: 30 student Sampling technique: purposive random sampling	Quasi eksperimen	Counseling: disaster preparedness simulation	The level of preparedness before and after being given counseling with the acquisition of $p < 0.000 (< 0.05)$ with t count 9.849 and t table 1.699.

No	Title, Author and Year	Research purposes	Sample and Sampling Technique	Types of research	Interventions/Educational Methods	Result
5	The Effect of Earthquake Disaster Education on Increasing Knowledge and Attitudes of Karya Bangsa Vocational High School Students in Tangerang City Achmad (2020)	Knowing the effect of earthquake disaster education on increasing knowledge and attitudes of SMK Karya Bangsa students in Tangerang City.	Sample: 50 student Sampling technique: Purposive sampling	Quasi eksperimen	Submission of material with audiovisual	There are differences in the knowledge and attitudes of respondents before and after being given earthquake education with $p = 0.000$.
6	<i>A Community-based Intervention Study to Assess the Effectiveness of Awareness Imparted on Earthquake Preparedness among the Residents of South Delhi, India</i> Agarwalla, R.; Pathak, R.; Siddiqui, A.; Panda, M.; Gupta, E.; Islam, F (2020)	To assess knowledge and preparedness about earthquakes among residents of South Delhi.	Sample: 300 orang Sampling technique: Purposive sampling	Quasi eksperimen	Demonstration by preparing disaster tools in each house	Based on the results, the mean pretest + SD was $5.45 + 1.19$, and the mean posttest + SD was $7.84 + 0.81$. The difference was found to be statistically significant $p < 0.0001$.

DISCUSSION

Based on the 6 articles that have been reviewed, the researcher will explain the results of the intervention, duration, and effective education methods to increase community preparedness for earthquakes.

In the research of (8), it was stated that disaster education was carried out by the researcher using the interview method about the experience of the earthquake disaster. This study also states that disaster education on increasing perceptions is important because it can affect disaster preparedness. In line with this, this study provides evidence that having schools adopt disaster risk reduction issues effectively increases knowledge, risk perception, awareness and critical attitude but is limited in preparedness behavior.

In (9), it was stated that disaster education with disaster management simulations (roleplay and mock situations) conducted by researchers was carried out with a duration of 120 minutes. The study also stated that there was a simulation carried out that affected the knowledge of students' actions towards disaster management with $p_v = 0.005$. The effect of the simulation is also said to greatly affect the self-confidence of nursing student (10), and this will be their provision in the future when they work, either in hospital or community settings. The results of research conducted by (11) also mentioned that nurses in charge of disaster programs in public health services in West Java are mostly nurses. With the competencies possessed by nurse obtained during education, it is expected to increase the preparedness of nurses as health workers.

In (12), it was stated that earthquake disaster education with the extension method had an influence on the level of preparedness of respondents. The counseling given by the lecture method had a significant effect on both groups (control group and intervention group) with $p_v < 0.005$. This is also in line with (13)

which states that good knowledge about preparedness will form good behavior or attitudes regarding preparedness. This research is in line with other research, where disaster preparedness is strongly influenced by the level of education, disaster and emergency training that is followed, work experience and has been a disaster volunteer (14).

In the research of (15) it was stated that disaster education carried out by researchers using counseling methods and disaster preparedness simulations had an effect on increasing respondents' preparedness with $p_v = 0.000 (< 0.05)$. (16) also stated that earthquake disaster education with the audiovisual method of delivering material had an effect on increasing preparedness with $p_v = 0.000$. One of the efforts to minimize the impact of disasters is to increase public awareness of disasters, one of which is by providing training with the question and answer lecture method and simulation of handling disaster victims and the average knowledge score increases from 77.07 before the training to 89.57 after the training, accompanied by an increase in attitude, positive and enthusiastic participants in participating in the simulation of disaster victim handling (17)

In the research of Agarwalla, Pathak, Siddiqui, Panda, Gupta, & Islam (2020) it was stated that disaster education with the demonstration method and the preparation of disaster tools in every house, had a significant effect on respondents' preparedness, with $p_v = 0.0001$.

Of the six reviewed journals, in line with the theory put forward by (6) explaining that disaster preparedness is an action that allows governments, organizations, communities and individuals to be able to respond to a disaster quickly and effectively to a disaster situation (19). Disaster preparedness measures also include disaster management, disaster management arrangements, resource maintenance, and personnel training, and are in line with the

theory put forward by (20) where good knowledge about preparedness will form good behavior or attitudes about preparedness.

The results of the intervention from all of these articles showed that education with various methods (counseling with lectures, simulations, roleplays, demonstrations, audiovisuals, and preparing disaster tools in every house) was effective in increasing community preparedness with an average of $p=0.001$ (<0.005).

The facts above show that there is agreement with the theory which states that disaster education can increase community preparedness for earthquakes.

CONCLUSION

Disaster education can be used as an effort to reduce losses due to disasters because it can help improve community preparedness for disasters, especially earthquakes. In addition, disaster education is also considered effective, safe, and easy to do. This is supported by the 6 articles that have been reviewed above and in the article it is stated that disaster education delivered by various methods (counseling with lectures, simulations, roleplays, demonstrations, audiovisuals, and preparing disaster tools in every house) has a significant influence.

The effective duration for conducting education cannot be determined because of the six selected journals there is only one journal that clearly states the duration of education. Although there is only one article that clearly states the duration of education, all the studies discussed show a significant effect on expected preparedness.

The role of nurses in the disaster cycle can start from the preparedness phase and throughout the disaster cycle. One of them is by educating the public on how to respond and respond appropriately during a disaster.

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