WEB-SAINSTREN (Science and Digital Disaster Literacy Website) to improving Knowledge and Disaster Preparedness of Islamic Boarding School Students

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ARTICLE INFORMATION	ABSTRACT
	Introduction: *Islamic boarding schools as educational institutions still rarely carry out educational activities on disaster mitigation. The lack of knowledge about disasters among students makes the risk of fatalities due to disasters high.* ***Objectives:*** *to analyze the influence of WEB-SAINSTREN on the level of knowledge and disaster preparedness of students at Islamic boarding schools.* ***Methods:*** *Pre-Experimental with pre-posttest design approach. The population in this study were students of PP Al Muhibbin (male and female), PP Al Ma'arij (male and female) and PP Al Madienah (female). Using purposive sampling, the sample that met the inclusion and exclusion criteria was (n = 171). The research instrument consisted of four parts: Website, demographic sheet, disaster knowledge questionnaire and disaster preparedness questionnaire. Univariate analysis was conducted by calculating the mean, median, mode and creating a frequency distribution based on the category of each variable. Bivariate analysis used the Wilcoxon sign rank test.* ***Results:*** *That disaster education through website using WEB-SAINTREN is effective in increasing the knowledge of students.* ***Conclusions:*** *There is a significant influence of providing disaster education through websainstren on increasing knowledge and disaster preparedness of Islamic boarding school students. In the long term, it will reduce the number of victims and losses steadily when an unpredictable natural disaster occurs.*

Introduction

Islamic Boarding School students are a vulnerable group and are still minimally educated regarding disasters, the website is one method in disaster education for Islamic boarding school students because it is considered more efficient and flexible in learning. WEB-SAINTREN is here to meet the needs of students regarding disaster education to improve knowledge and disaster preparedness.

Disasters result in loss of life, environmental damage, property loss, and psychological impacts (Dyah et al., 2022). The 2021 Global Natural Disaster Assessment Report states that 367 natural disasters occurred worldwide in 2021. Floods are the first natural disaster with 56.13% of the total disasters (Prajayanti & Susilowati, 2023). The National Disaster Management Agency (BNPB) reported that 4,940 natural disasters occurred in Indonesia in 2023 (Purniawan, 2017). Floods occurred in 1,170 cases and earthquakes occurred in 31 cases. In 2023, the number of disasters in East Java was 47.9% or 117 cases (Qodriyatun, 2020). At the end of December 2023, 31 districts/cities declared a state of emergency. The Jombang Regency Regional Disaster Management Agency (BPBD) stated that 34 villages from 8 sub-districts were prone to flooding. In 2022, the Jombang Regency BPBD recorded more than 150 disasters in various regions in Jombang Regency, with the highest disasters being floods, fires and tornadoes. Children are the group most at risk of being affected by disasters. There are 66 million children affected by disasters every year (Mudavanhu et al., 2015). It is estimated that more than 100 million children are exposed to disasters every year (Siregar & Wibowo, 2019). The average age of children who

are vulnerable to disasters is 4,746,438 babies aged 0 years, 19,101,845 toddlers aged 1-4 years, 9,647,997 preschoolers aged 5-6 years, 27,843,336 children aged 13-18 years (Niman & Sari, 2021). Low knowledge and understanding of disaster risks result in a lack of preparedness in dealing with disasters. Jombang Regency is famous for its slogan of the city of santri. There are many Islamic education schools (Islamic boarding schools). Among the hundreds of Islamic boarding schools, there are thousands of students, the majority of whom are children. The number of Islamic boarding schools in Jombang ranks 17th in Indonesia with 155 Islamic boarding schools. Based on data from the Jombang Ministry of Religion, small Islamic boarding schools have fewer than 500 students, while large groups have more than 9,000 students. Disaster mitigation and training efforts for the community have been carried out, but these efforts are still not optimal in increasing preparedness, especially in schools. Islamic boarding schools as educational institutions still rarely carry out educational activities on disaster mitigation(Murtaqib & Widayati, 2017). The lack of knowledge about disasters among students makes the risk of loss of life due to disasters high. The impacts of disasters on students include physical injuries to fatalities, health problems, disruption of the teaching and learning process and loss of materials, in addition, disasters also cause dirty environmental sanitation which triggers disease and the proliferation of bacteria or pests that will reduce the health of students. Disaster education is needed to increase the knowledge and preparedness of students who will be provisions when facing disasters that occur (Finali et al., 2020). Natural disaster risk reduction must be carried out properly so as not to have a negative effect on society and the environment (Wicaksono & Pangestuti, n.d.). WEB-SAINSTREN is packaged in an e-learning method through a website that is easily accessible by students online. The effectiveness of online media as a means of health education is significant in increasing respondents' knowledge (Aba et al., 2020). The contents of WEB-SAINSTREN are: 1) education about disaster preparedness (floods, fires and earthquakes) in the form of scientific literacy (scientific references, pictures and disaster models) and digital education (disaster psychoeducation videos, disaster simulation video games with VR); 2) mitigation or risk management of disaster recognition in the Islamic boarding school environment and 3) explanation of flood, fire and earthquake disaster simulations.

Providing education about disaster preparedness increases a person's knowledge and experience so that when facing a possible disaster, they have a perception of the actions that must be taken (Kartika & Faradisa, 2022), so that they can anticipate and minimize the impact of the disaster optimally. The formulation of the problem in this study is how WEB-SAINSTREN influences the knowledge and disaster preparedness of Islamic boarding school students. The objectives of this study are: 1) to prove the influence of WEB-SAINSTREN on the level of disaster knowledge in Islamic boarding school students; 2) to prove the influence of WEB-SAINSTREN on disaster preparedness in Islamic boarding school students. The urgency of this study is that Islamic boarding schools do not yet have optimal access to knowledge about disasters. This is a threat of serious impacts if a disaster occurs because Islamic boarding schools are places of residence and daily activities for students who are mostly children and are a group vulnerable to disasters.

Methods

The research design used Pre-Experimental with a pre-post-test design approach. The population in this study were students of the Al Muhibbin Islamic Boarding School (Male and Female), Al Ma'arij Islamic Boarding School (Male and Female) and Al Madienah Islamic Boarding School (Female). Using purposive sampling, the sample that met the inclusion and exclusion criteria was (n = 171). The inclusion criteria in this study were: 1) students who have and can operate smartphones, 2) have the opportunity to use cellphones/laptops in the Islamic boarding school area. The research instrument consisted of four parts: website, demographic sheet,

disaster knowledge questionnaire and disaster preparedness questionnaire that had been tested for validity and reliability.

The independent variable is WEB-SAINSTREN (Website for Science Literacy and Digital Disaster of Islamic Boarding School Students). The dependent variable is Knowledge and disaster preparedness of Islamic boarding school students). Students carry out e-learning using the website. Students access the website by registering an account, after students have an account, students do a pre-test on the website. The pre-test was only conducted once before the pre-test menu disappeared from the website display. Students can access the website by logging in and taking attendance everytime they visit the website, and learning. In addition to learning interventions through WEB-SAINSTREN, it is provided together with disaster exercises and simulations for four weeks and at the end an assessment is carried out in the post-test. The post-test has been opened since the 3rd week of website learning. The results of the pre-test and post-test summarized on the website were analyzed univariately by calculating the mean, median, mode and creating a frequency distribution based on the category of each variable. Bivariate analysis used the Wilcoxon sign rank test because the data was not normally distributed. The study was conducted at the Al Muhibbin Islamic Boarding School (Male and Female student), Al Ma'arij Islamic Boarding School (Male and Female student) and Al Madienah Islamic Boarding School (Female student) Jombang Islamic Boarding School. The research was conducted from May to December 2024.

Results

The appearance of the Websainstren website which was accessed via both PC and respondent's mobile phone.
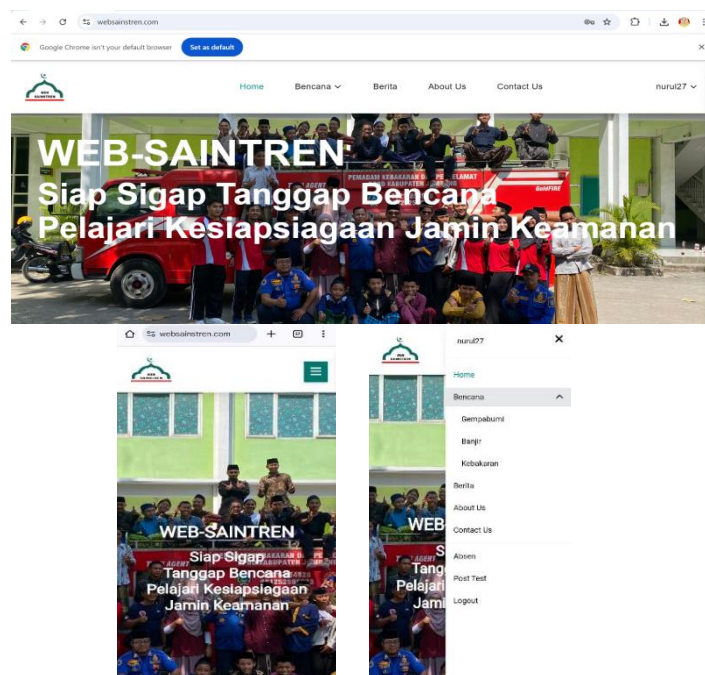

Figure 1 Home view of websainstren

The following will present general data on respondents including age, gender, level of education and participation in disaster-related education or training.

Table 1 Respondent demographic data

Age	n=171	(n)%
13 - 15 year	64	37,4
16 -18 year	70	40,9
19 -22 year	37	21,6
Total	15	100
Gender	n=171	(n)%
Male	94	55
Female	77	45
Total	15	100
Education	n=171	(n)%
Basic (SD-SMP)	64	37,4
Midle (SMA)	70	40,9
High (D3-Bachelor)	37	21,6
Total	15	100
Disaster Edu	n=171	(n)%
ever	74	43,3
never	97	56,7
Total	171	100

The results of the first table show a comparison of preparedness before and after disaster training and simulation. There are 13 people with preparedness results after simulation training lower than before simulation training, 59 people remain the same, and 99 people have better preparedness than before training and simulation.

The next results show a comparison of knowledge before and after disaster training and simulation. There are 9 people with knowledge results after simulation training lower than before simulation training, 131 people remain the same, and 31 people have better knowledge than before training and simulation.

Test Statistics[a]		
	KesiapsiagaanPOST - KesiapsiagaanPRE	PengetahuanPOST - PengetahuanPRE
Z	-7.620b	-3.571b
Asymp. Sig. (2-tailed)	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The test statistics section shows the results of the Wilcoxon test, obtaining a significance value of 0.000 ($p < 0.05$) thus it is concluded that "there is a significant difference in preparedness between before and after the disaster training and simulation. The test statistics section shows the results of the Wilcoxon test, obtaining a significance value of 0.000 ($p < 0.05$) thus it is concluded that "there is a significant difference in knowledge between before and after the disaster training and simulation.

Discussion

The mechanism of society in dealing with events (coping mechanism) is formed and born from experience, knowledge, understanding, and meaning of every event, phenomenon, hope and problem that occurs around them (Adi, 2022). This mechanism is passed on through the socialization process from generation to generation and its implementation depends on the level of quality of understanding and its implications in their lives. Disaster management is all efforts or activities carried out in the context of prevention, mitigation, preparedness, emergency response and recovery related to disasters carried out before, during and after a disaster (Widyaningrum et al., 2020). Disaster Management Activities are basically a series of activities before, during and after a disaster that are carried out to prevent, reduce, avoid and recover from the impact of disasters (Laveda et al., 2024). The government and local governments are responsible for implementing disaster management (Heryati, 2020). Because government responsibility is important in disaster management, and success depends on active community participation and coorperation between government and community.

Disaster management aims to provide protection to the community from the threat of disaster, build public and private participation and partnerships and ensure the implementation of disaster management in a planned, integrated, coordinated and comprehensive manner (Sekartaji et al., 2022). Disaster management in situations where there is potential for disasters includes preparedness, early warning and disaster mitigation Mitigation is a series of efforts to reduce disaster risks, both through physical development and awareness and increased ability to face disaster threats (Widyaningrum et al., 2020). Mitigation activities are carried out including through the provision of education, counseling, and training both conventionally and modernly (Budiyono, 2021). With disaster mitigation we can reduce these risks, such as Flood Disaster Mitigation to reduce the risk of losses from flood disasters, prevention should be taken such as monitoring land use and planning locations to place vital facilities in safe areas, adapting building designs in flood areas by making house buildings flood resistant, starting from materials and a strong foundation to build watertight infrastructure. This will be very helpful in dealing with natural disasters that will occur by understanding disaster mitigation (Putri et al., 2022). Disaster preparedness, early warning, and mitigation are important interrelated aspects to reduce the impact of disasters. Mitigation, such as education and training, can increase community awareness and capacity. Disaster management should focus on preparation to protect communities from future threats. Education of the Islamic Boarding School students can increase awareness of disasters. Earthquake information systems and tsunami warnings are interconnected, allowing timely information dissemination for rapid decision making. Safety improvements can be made with with a reliable information system, reducing the risk of loss of life and and property.

The provision of education, counseling, and training both conventionally and modernly can be carried out through information systems in this case such as earthquake information systems and tsunami early warning systems. Earthquake information systems and tsunami early warning systems are components that are regularly interrelated to form a totality that includes observations of disaster symptoms, analysis of observation results, and dissemination of analysis results, in the form of tectonic and/or volcanic earthquake information originating from volcanoes in the sea and tsunami early warnings for decision making and action by the community (Paulina, 2024). Earthquake information systems and tsunami early warnings have a strategic and important role in anticipating and mitigating so that efforts are needed to strengthen and develop continuously to improve the safety of lives and property of the Indonesian people from earthquakes and tsunamis.

Information in Websainstren is creatively packaged to attract consumer attention, such as in the form of news articles, posters and videos. In Websainstren there is a communication

process that aims to persuade or lead people to take profitable actions and is a continued communication process that brings the audience to important information so that the message in it can be conveyed to the target group in this case public service advertisements whose content is about disaster mitigation.

Websainstren is a means of conveying information, inviting or educating the audience with the aim of social benefits such as increasing knowledge so that it has an impact on the emergence of awareness of attitudes and changes in behavior towards the advertised problem so that it becomes an advantage for oneself.

Conclusion

Websainstren plays a role in every stage of disaster management, starting from mitigation, response, and post-disaster recovery. In this context, Websainstren becomes a liaison between official institutions and the public and other stakeholders. Websainstren is considered optimal for implementing disaster education in the aspect of optimizing the socialization and counseling of natural disaster mitigation according to the mandate of laws and regulations. It is hoped that this optimization will increase education and understanding of information about natural disaster mitigation in the community, in this case, Islamic boarding school students, so that in the long term it will reduce the number of victims and losses stably if a natural disaster occurs that cannot be predicted when it will occur.

Ethics approval and consent to participate

This research was conducted by paying attention to the ethical principles of confidentiality, beneficence and has obtained informed consent from respondents and meets ethical eligibility with Number 0624070020/KEPK/STIKES-PEMKAB/JBG/VII/2024 at KEPK STIKES Pemkab Jombang.

Acknowledgments

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