

## Age and Attitude are Dominant Factors Related to Health Workers' Preparedness in Dealing with Flood Disasters

Novi Dwi Astuti, Yuli Admasari\*, Sarliana

Poltekkes Kemenkes Palu, Palu, Central Sulawesi, Indonesia

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### CORRESPONDING AUTHOR

Yuli Admasari

BTN Nusantara II Blok B-7, Mamboro, Palu,  
Sulawesi Tengah, Indonesia

[admasariyuli@gmail.com](mailto:admasariyuli@gmail.com)

+62878-2048-1712

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### A B S T R A C T

Indonesia has a relatively high threat of disasters, including floods that result in human casualties, environmental damage, property losses, and psychological impacts. Prevention efforts need to be carried out, namely mitigation and preparedness. Central Sulawesi Province is the 9th out of 10 provinces in Indonesia that are often affected by disasters. Sigi Regency is a flood-prone area. In 2021, there have been eight floods in Rogo and Wisolo villages. Health workers are important and technical implementers before, during, and after disasters. The purpose of this study is to look at the factors that affect the preparedness of health workers in dealing with flood disasters at the Baluase Health Center. Analytical survey research with a cross-sectional approach. The sample is all health workers at the Baluase Health Center, totaling 44 people. The independent variables are age, gender, length of work, level of education, knowledge, and attitude. In contrast, the dependent variable is the preparedness of health workers in dealing with flood disaster situations. Questionnaires are used in primary data collection. The multivariate analysis of logistic regression variables in step 5 found a relationship between age ( $p=0.028$ ), attitude ( $p=0.052$ ), and preparedness of health workers in dealing with flood disasters. It is hoped that the increase in preparedness for health workers will continue to be improved to reduce the post-disaster impact.

## Introduction

Indonesia faces a relatively high threat of disasters, including earthquakes, tsunamis, floods, landslides, fires, and others (Anggun et al., 2020). Disasters are a series of events that threaten and disrupt people's lives and livelihoods, caused by natural and/or non-natural factors and human factors. They result in human casualties, environmental damage, property losses, and psychological impacts (Fitriadi et al., 2017; Wiarto, 2017).

Flood disaster is one of the hydrometric disasters that often occur, can occur every rainy season, and losses due to floods can be in the form of damage to residential buildings, loss of valuables at the bottom of the water current, to other losses (Cahyono et al., 2022). Based on the risk and impact study of disasters in Indonesia in 2010-2020, floods are the most high-risk disasters, with a value of 15.4, followed by landslides at a risk of 12 and then tornadoes with a risk value of 11.2 (Azizah et al., 2022). The impact of disasters on health is diverse, including infectious diseases, nutritional inequality, physical injuries and fatalities, poor sanitation, trauma, and psychological stress (Christian et al., 2023; Damayanti, 2024; Tumenggung, 2017).

Data from the Indonesian Disaster Data and Information Management Database (DIBI) for the years 2010–2020 showed that there were 24,969 occurrences nationwide between 2010 and 2020, totaling 5,060,778 fatalities, 4,400,809 homes, and 19,169 damaged public buildings (BNPB, 2020). Central Sulawesi Province is the 9th out of 10 provinces in Indonesia that are often affected by disasters. The total death toll due to disasters in the last 10 years in Central Sulawesi has reached 4,3040 people, including 2,657 people who have not been identified. Sigi Regency is one of the areas most at risk of flooding. In Rogo and Wisolo Villages, eight floods were the working area of the Baluase Health Center. The flood resulted in 94 families being affected and one person injured, 34 houses damaged, 39 houses and one prayer room submerged in water, and two bridges covered with tree trunks so that they could not be passed (BNPB Sulawesi Tengah, 2021; BPBD Kabupaten Sigi, 2021).

Disaster management in this country is still far from expected because many disaster events throughout Indonesia result in casualties and property damage. Although Indonesia is classified as a disaster-prone region, disaster management is not currently considered a priority (Direja & Wulan, 2018). Crisis management and other health problems should focus more on efforts before disasters occur, namely prevention, mitigation, and preparedness efforts (Kemenkes RI, 2019). The intended preparedness is the preparedness of resources before facing health problems that arise from disasters, including floods. Therefore, health workers are important technical implementers or implementers of operational activities before a disaster occurs, during, or after a disaster (Bakri et al., 2020).

The Baluase Health Center is one of the health centers that must be prepared in terms of health workers and equipment when a flood disaster comes. Based on the initial survey, the work area of the Puskesmas consists of 12 villages with a total of 44 health workers consisting of 3 doctors, 17 midwives, 10 nurses, four nutritionists, four sanitation, five public health, and one pharmacist. Based on information from the head of the Baluase Health Center, not all health workers at the health center have received disaster emergency response training, but when a disaster comes, all are committed to immediately taking a role in the affected area (Puskesmas Baluase, 2023).

According to a previous study reviewed by Artini et al. (2022) on "The relationship between the level of knowledge of disaster preparedness in health workers and attitudes towards disaster preparedness" shows that out of a total of 19 respondents, 41.3% of them have a good level of education and a positive attitude. Meanwhile, only one respondent, or around 2.2%, is intelligent in his knowledge, but his attitude is negative (Artini et al., 2022). According to a study conducted by (Habte, 2018), 64.8% of health practitioners have good knowledge and attitudes regarding disaster preparedness. The next is having a low level of knowledge and attitude.

This study aims to determine the relationship between each factor and health worker preparedness and analyze the most dominant variable factors related to health worker preparedness for flood disasters.

## Method

This study uses a cross-sectional design and quantitative research methodology. A questionnaire given to respondents directly was used to determine the variables pertaining to health personnel's readiness to handle flood disasters. The study was conducted in April and May 2024 at the Baluase Health Center in Sigi Regency, and it was approved ethically by the Health Polytechnic of the Ministry of Health Palu's ethics committee (number 000235/KEPK POLTEKKES KEMENKES PALU/2024).

This study's sample consists of 44 health workers at the Baluase Health Center. The data were collected using a questionnaire comprising 15 knowledge questions, 10 attitude statements, and 15 questions about health workers' readiness for handling flood disasters. The questionnaire has a reliability test result of 0.68 and a validity test score of 0.76. The respondents' scores range from 0 to 75; the higher their score, the better their knowledge, readiness, and attitude.

This study uses univariate analysis to describe the characteristics of the respondents. Furthermore, a bivariate test of research data was carried out using the chi-square and multivariate tests using logistic regression.

## Results

**Table 1** Univariate Analysis

Characteristic	Frequency (n)	Percentage (%)
<b>Age of Respondents</b>		
≤ 35 years	18	40,9
> 35 years	26	59,1
<b>Gender</b>		
Woman	39	88,6
Man	5	11,4
<b>Length of Work</b>		
≤5 years	21	47,7
>5 years	23	52,3
<b>Education</b>		
Diploma	34	77,3
Bachelor	10	22,7
<b>Knowledge</b>		
Poor	17	38,6
Good	27	61,4
<b>Attitude</b>		
Negative	13	29,5
Positive	31	70,5
<b>Preparedness</b>		
Not ready	21	47,7
Ready	23	52,3

Based on Table 1, it can be seen that in terms of age, most of the respondents, namely 26 respondents (59.1%), are in the age category over 35 years old. In contrast, respondents based on gender found that most respondents, namely 39 respondents (88.6%), are female. In addition, the results were obtained that most of the respondents, namely 23 respondents (52.3%), were included in the category of working for more than 5 years and based on education, the results were obtained that most of the respondents, namely 34 respondents (77.3%), were included in the category of diploma education. The characteristics of the respondents based on knowledge were obtained that most of the respondents, namely 27 respondents (61.4%), were in the category of good knowledge and based on attitudes, the

results were obtained that most of the respondents, namely 31 respondents (70.5%), were in the category of positive attitudes. The last information obtained was that most respondents had good preparedness, namely 23 respondents (52.3%).

**Table 2** Bivariate analysis

Group Variable	Preparedness		OR	95%CI	p
	Not ready (%)	Ready (%)			
<b>Age</b>					
≤ 35 years	13 (29,5%)	5 (11,4%)	5,85	1,55-22,02	0,007
> 35 years	8 (18,2%)	18 (40,9%)			
<b>Gender</b>					
Woman	19 (43,2%)	20 (45,5%)	1,42	0,21-9,49	0,713
Man	2 (4,5%)	3 (6,8%)			
<b>Length of Work</b>					
≤5 years	14 (31,8%)	7 (15,9%)	4,57	1,28-16,27	0,016
>5 years	7 (15,9%)	16 (36,4%)			
<b>Education</b>					
Diploma	16 (36,4%)	18 (40,9%)	0,88	0,21-3,64	0,870
Bachelor	5 (11,4%)	5 (11,4%)			
<b>Knowledge</b>					
Poor	12 (27,3%)	5 (11,4%)	4,80	1,28-17,87	0,016
Good	9 (20,5%)	18 (40,9%)			
<b>Attitude</b>					
Negative	10 (22,7%)	3 (6,8%)	6,06	1,37-26,76	0,012
Positive	11 (25,0%)	20 (45,5%)			

The calculation using the chi-square test showed that age (p-value=0.007), length of work (p-value=0.016), knowledge (p-value=0.016), and attitude (p-value=0.012) were related to the preparedness of health workers in dealing with flood disasters at the Baluase Health Center, Sigi Regency.

**Table 3.** Logistic Regression Results (step 5)

Variable	p-value	OR	95%CI
Age	0,028	4,74	1,18-19,20
Attitude	0,052	0,14	0,98-22,89

Nilai Nagelkerke R Square : 0,310

Based on Table 3, it is known that there is a relationship between age and preparedness of health workers in dealing with flood disasters (p=0.028). The attitude variable is close to significant, namely the p-value of 0.052. The results of Nagelkerke R Square showed a value of 0.310, which shows that the variables in this study show that age and attitude are related to the preparedness of health workers in dealing with flood disasters by 31.0%. In comparison, other variables outside the study influence the remaining 69.0%.

## **Discussion**

The study's results found that age, length of work, knowledge, and attitude are related to the preparedness of health workers in dealing with flood disasters ( $p$ -value  $< 0,05$ ). If these variables are discussed more deeply, they will show a correlation that supports each other. If a person is of a mature age, it can be known that they will also have more working hours than a young age. This is also correlated with knowledge formation; the more mature a person is, the more information is obtained so that knowledge is better. The provision of mature age, more working hours, and better knowledge will also positively correlate with a person's attitude in responding to a problem, one of which is the preparedness of health workers in dealing with flood disasters. These results align with the research conducted by Fatih (2019) that the older the health worker, the more ready he will be. Other research suggests that older healthcare workers fear less and are more willing to work during disasters. This is due to their increased experience and confidence in handling emergencies (Lin et al., 2023; Sultan et al., 2020).

The interplay between age, length of service, knowledge, and attitude significantly affects the preparedness of health workers. Older and more experienced healthcare workers tend to possess better knowledge and display more positive attitudes toward emergency preparedness, ultimately enhancing their readiness to respond effectively to crises. Continuous education and supportive training environments are essential for fostering these attributes among all health workers, regardless of age or experience level (Laily et al., 2024; Odiase et al., 2024; Ughasoro et al., 2019; Zarei et al., 2024).

In addition to age, the length of work is also related to the preparedness of health workers in dealing with flood disasters. This is related to increased practical experience, skill development, in-depth understanding of procedures and protocols, increased confidence in decision-making, and a wider professional network (Xue et al., 2020). More extended experience helps health workers be more prepared, effective, and efficient in responding to disaster situations to provide better services and improve the safety and welfare of patients and the community (Rizki et al., 2021).

Another factor related to health workers' preparedness for flood disasters is knowledge. Knowledge is significantly related to preparedness for disasters. Research consistently shows that healthcare workers with good knowledge of disaster preparedness are better prepared for disasters. This is because knowledge provides a foundation for understanding the types of disasters, their causes, and management strategies, which are essential for effective disaster response (Budiana et al., 2021; Darmayanti et al., 2018; Laily et al., 2024).

Comprehensive training (disaster training participation and knowledge of disaster protocols), skill development (infection control practices and emergency management operation), psychological readiness (resilience training and understanding roles), and ongoing education (ongoing education and feedback mechanisms) are critical components of disaster preparedness for health workers. These elements collectively enhance their ability to respond effectively during crises, ultimately improving community resilience (Balut et al., 2022; Mohtady Ali et al., 2022; Susila et al., 2019).

The next factor related to the preparedness of health workers is attitude. This is because it affects his willingness to participate in disaster management and his response in times of emergency. Research shows that healthcare workers with a positive attitude toward disaster management are better prepared and respond effectively. This is because a positive attitude can increase confidence, motivation, and willingness to take a role in the event of a disaster, which is essential for effective disaster preparedness and response (Boru Gultom, 2023a; Laily et al., 2024; Patel et al., 2022). Health workers should embody proactive engagement, teamwork, resilience, empathy, and a strong focus on preparedness when facing flood disasters. These positive attitudes not only enhance their effectiveness but also contribute significantly to the overall resilience of the healthcare system during emergencies (Laily et al., 2024; Shanableh et al., 2023).

Of the four factors related to the preparedness of health workers, based on the results of multivariate tests, it was found that age and attitude were the most dominant factors affecting preparedness. The age and attitude of health workers are the most dominant factors related to the preparedness of health workers in dealing with floods because they significantly affect their willingness to participate in disaster management and their response to emergencies. Research has consistently shown that healthcare workers with a positive attitude toward disaster management are better prepared and effective in responding. At the same time, age can also play a role in their preparedness, and older healthcare workers generally have more experience and confidence in handling emergencies (Boru Gultom, 2023b; Laily et al., 2024; Sanjaya Putra et al., 2020).

Age affects physical strength, mental resilience, practical experience, and adaptability, all of which are important and needed in disaster situations (Xue et al., 2020). Meanwhile, attitudes affect motivation, mental and emotional readiness, and the ability to work in teams and leadership, which is crucial for quick and effective responses in dealing with disasters (Arafat et al., 2023). With a combination of age and positive attitudes, healthcare workers can provide a more responsive, effective, and holistic response in disaster management, ensuring the safety and well-being of patients and society.

## Conclusions

There is a relationship between age, length of work, knowledge, and attitude and the preparedness of health workers to deal with flood disasters at the Baluase Health Center, Sigi Regency, Central Sulawesi. The most dominant factors related to the preparedness of health workers in dealing with flood disasters are attitude and age.

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