Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The Role of Knowledge and Attitude in Improving Disaster Preparedness Among Health Workers: a Study in Donggala Regency

A. Ferina Herbourina Bonita[1], Ummu Khaerat Rahmawan[2], Roswati[3], Yusniar Anggraeny[4], A. Suci Setiani Annisa[5], Rifdah Wardani[6]

[1]Department of Occupational Safety and Health, Faculty of Public Health, Tadulako University, [2]Department of Occupational Health and Safety,Faculty of Public Health, Cendrawasih University, [3]Department of Epidemiology, Faculty of Public Health, Cendrawasih University, [4,5]Department of Occupational Health and Safety, Faculty of Health Sciences, Sulawesi Barat University, [6]Department of Occupational Health and Safety, Faculty of Public Health, Mulawarman University

Article Info

Keywords:
Preparedness,
Earthquakes,
and Health Workers.

ABSTRACT

Natural disasters such as the earthquake in Central Sulawesi, particularly in Donggala Regency, have a significant impact on public health, making the preparedness of healthcare workers crucial. This study combines the results of three studies conducted at Punggava Tompe, Kanamaseha Batusuya, and Kami Seivi Lembasada Community Health Centers to identify factors associated with disaster preparedness among healthcare workers. All three studies used a quantitative design with a cross-sectional approach and involved total sampling, with 72, 57, and 70 respondents, respectively. Data analysis was performed using univariate and bivariate methods using the Chi-square test. The synthesis results showed differences in findings across locations. Two studies (Tompe and Batusuya) indicated that knowledge was not significantly related to preparedness ($p>0.05$), while attitude was significantly related ($p<0.05$). In contrast, the study in Lembasada found that both knowledge ($p=0.004$) and attitude ($p=0.000$) were significantly related to preparedness. Overall, a consistent attitude plays a crucial role in improving disaster preparedness, while knowledge yields varying results depending on the context and conditions of the community health center. It is recommended that community health centers strengthen training, outreach, and disaster simulation programs, as well as increase the knowledge and positive attitudes of health workers to address disaster threats in earthquake-prone areas.

Corresponding Author:
A. Ferina Herbourina Bonita
Department of Occupational Safety and Health, Faculty of Public Health, Tadulako University
andibonita@untad.ac.id

INTRODUCTION

Indonesia is one of the countries with a high level of vulnerability to natural disasters, especially earthquakes, due to its position at the meeting point of three major tectonic plates in the world: the Eurasian, Indo-Australian, and Pacific. World Disaster Report data recorded more than 3,700 disasters between 2008 and 2018, including earthquakes, tsunamis,

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

floods, landslides, and volcanic eruptions. The National Disaster Management Agency (BNPB) reported that there were 11,920 earthquakes in 2018 and 11,515 earthquakes in 2019. One of the largest disasters occurred in Central Sulawesi on September 28, 2018, when a 7.4 magnitude earthquake struck the Palu, Sigi, and Donggala regions, followed by a tsunami and liquefaction. This event resulted in more than 2,000 deaths, tens of thousands of injuries, hundreds of thousands of refugees, and enormous material losses.

Donggala Regency was one of the areas most affected by the disaster. Several community health centers (Punggava Tompe, Kanamaseha Batusuya, and Kami Seivi Lembasada) in the region suffered physical damage and operational disruptions. Yet, community health centers play a vital role as first-level healthcare facilities, serving at the forefront of medical emergency response, mitigation, and post-disaster recovery. In the context of disaster management, the preparedness of healthcare workers is key to minimizing mortality, disability, and other health risks.

Preparedness itself is defined in Law Number 24 of 2007 as a series of activities undertaken to anticipate disasters through effective organization, planning, and concrete steps. Factors influencing health worker preparedness can include knowledge, attitudes, and experience. Several previous studies have shown conflicting results: some found that knowledge was not significantly related to preparedness, while attitudes tended to play a significant role. On the other hand, other studies have shown that both knowledge and attitudes influence preparedness.

Given the high disaster risk in Central Sulawesi and the discrepancies in previous research findings, further research is essential to understand the factors associated with the preparedness of health workers in community health centers. This information is expected to inform the development of training programs, outreach programs, and disaster mitigation policies in primary healthcare facilities, particularly in disaster-prone areas. disasters such as Donggala Regency.

RESEARCH METHODS

This study used a quantitative approach with a cross-sectional study design to analyze factors related to disaster preparedness among health workers in community health centers. The study was conducted in three different locations in Donggala Regency, namely Punggava Tompe Community Health Center, Kanamaseha Batusuya Community Health Center, and Kami Seivi Lembasada Community Health Center. The study population was all health workers working in the three community health centers. The sampling technique used total sampling, so that all health workers who met the inclusion criteria were included as respondents. The total sample size was 72 people at Punggava Tompe Community Health Center, 57 people at Kanamaseha Batusuya Community Health Center, and 70 people at Kami Seivi Lembasada Community Health Center. Thus, the total number of respondents in this study was 199 health workers. The research instrument was a structured questionnaire consisting of several sections, namely Data on respondent characteristics (age, gender, education). The independent variables were Knowledge about disaster preparedness and Attitude towards disaster preparedness. The dependent variable

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

was the level of disaster preparedness among health workers. The questionnaire was administered directly to respondents with the assistance of the researcher to ensure understanding.

Data collection was conducted by distributing questionnaires to all respondents at each community health center. Prior to completion, respondents were given an explanation of the research objectives and asked to complete an informed consent form. The collected data were analyzed using univariate analysis to describe the frequency distribution of each variable, and bivariate analysis to test the relationship between the independent variables (knowledge and attitude) and the dependent variable (preparedness). The statistical test used was Chi-Square with a significance level of p = 0.05. The results of the analysis are presented in the form of distribution tables and cross-tabulations accompanied by p-values to determine the significance of the relationship.

RESULTS

Respondent Characteristics

This study involved 199 healthcare workers spread across three community health centers in Donggala Regency: Punggava Tompe Community Health Center (72 respondents), Kanamaseha Batusuya Community Health Center (57 respondents), and Kami Seivi Lembasada Community Health Center (70 respondents). The majority of respondents were in the productive age group (29–36 years), with women dominating over 65% at each location. The educational level of most respondents was a Diploma III in Health, with fewer medical personnel holding bachelor's degrees or medical professions.

Distribution of Knowledge, Attitude and Preparedness

Based on data obtained from the data collection and processing carried out, the results obtained are as follows

Table 1. Distribution of Knowledge, Attitude and Preparedness

Variables	Tompe	Batusuya	Lembasada	Total
Good Knowledge	41 (56.9%)	48 (84.2%)	20 (28.6%)	109 (54.8%)
Lack of Knowledge	31 (43.1%)	9 (15.8%)	50 (71.4%)	90 (45.2%)
Good Attitude	66 (91.7%)	45 (78.9%)	22 (31.4%)	133 (66.8%)
Poor Attitude	6 (8.3%)	12 (21.1%)	48 (68.6%)	66 (33.2%)
Readiness Ready	43 (59.7%)	39 (68.4%)	17 (24.3%)	99 (49.7%)
Unpreparedness	29 (40.3%)	18 (31.6%)	53 (75.7%)	100 (50.3%)

Source: Primary data (2025).

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Table 1 In general, the level of respondents' knowledge regarding disaster preparedness varies. At the Tompe Community Health Center, more than half of the respondents had good knowledge (56.9%), in Batusuya the percentage was higher (84.2%), while in Lembasada the majority of respondents had poor knowledge (71.4%). Meanwhile, respondents' attitudes towards disaster preparedness were dominated by the good category in Tompe (91.7%) and Batusuya (78.9%), but in Lembasada the majority of respondents had poor attitudes (68.6%). For the preparedness variable, at the Tompe Community Health Center 59.7% of respondents stated they were ready, in Batusuya 68.4% stated they were ready, while in Lembasada only 24.3% were ready, indicating a gap in preparedness between locations.

The Relationship Between Knowledge and Health Worker Preparedness

Based on data obtained from the data collection and processing carried out, the results obtained are as follows

Table 2. The Relationship Between Knowledge and Health Worker Preparedness

Community Health Center	Knowledge	NoReady	Ready	Total	*p-value*
Tompe	Not good	15 (48.8%)	16 (51.6%)	31 (100%)	0.328
	Good	14 (34.1%)	27 (65.9%)	41 (100%)	
Batusuya	Not good	4 (44.4%)	5 (55.6%)	9 (100%)	0.442
	Good	14 (29.2%)	34 (70.8%)	48 (100%)	
Lembasada	Not good	43 (61.4%)	7 (10.0%)	50 (100%)	0.004
	Good	10 (14.3%)	10 (14.3%)	20 (100%)	

Source: Primary data (2025).

Table 2 Chi-square test results showed that knowledge was not significantly associated with preparedness at the Tompe Community Health Center (p=0.328) and Batusuya Community Health Center (p=0.442). Conversely, a significant relationship was found at the Lembasada Community Health Center (p=0.004). This indicates that the influence of knowledge on preparedness varies depending on the context of each community health center.

The Relationship Between Attitude and Health Worker Preparedness

Based on data obtained from the data collection and processing carried out, the results obtained are as follows

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Table 3. The Relationship Between Attitude and Health Worker Preparedness

Community Health Center	Attitude	Not Ready n (%)	Ready n (%)	Total n (%)	*p-value*
Tompe	Not good	5 (83.3%)	1 (16.7%)	6 (100%)	
	Good	24 (36.4%)	42 (63.6%)	66 (100%)	0.036
Batusuya	Not good	7 (58.3%)	5 (41.7%)	12 (100%)	
	Good	11 (24.4%)	34 (75.6%)	45 (100%)	0.037
Lembasada	Not good	53 (75.7%)	0 (0.0%)	53 (100%)	
	Good	0 (0.0%)	17 (24.3%)	17 (100%)	0,000

Source: Primary data (2025).

Table 3 Test results at all three locations consistently showed a significant correlation between attitude and preparedness. In Tompe, the p-value was 0.036, in Batusuya, p-value was 0.037, and in Lembasada, p-value was 0.000. This indicates that positive attitudes among health workers were the most consistent factor influencing disaster preparedness across all community health centers.

Discussion

This study aims to analyze factors related to disaster preparedness among health workers in three community health centers in Donggala Regency, namely Punggava Tompe, Kanamaseha Batusuya, and Kami Seivi Lembasada Community Health Centers. The results of the analysis showed differences in findings between locations, especially in the knowledge variable, while the attitude variable showed consistent results.

The Relationship between Knowledge and Preparedness

The results of the study showed that knowledge was not significantly related to preparedness at the Tompe Community Health Center (p=0.328) and Kanamaseha Batusuya (p=0.442). This finding aligns with Salmawati's (2022) study, which showed no significant relationship between knowledge and disaster preparedness at the Palu City Community Health Center. A similar study was conducted by Sukardi et al. (2022) at the Singkohor Community Health Center, Aceh Singkil, which found no significant relationship between knowledge and health worker preparedness. However, a different result was shown by a study at the Kami Seivi Community Health Center in Lembasada, which found a significant relationship between knowledge and preparedness (p=0.004).

This is in line with research by Hesti et al. (2019) in Padang City, which reported a relationship between knowledge and midwives' preparedness for earthquakes and tsunamis, and research by Listiana et al. (2021) in Bengkulu, which found that the higher the level of knowledge, the better the preparedness of health workers for earthquakes. These differences in results may be due to variations in conditions at each community health

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

center, including direct experience with disasters, the availability of training or simulations, and differences in the characteristics of health workers. For example, at the Lembasada Community Health Center, most respondents had direct experience with facility damage caused by the 2018 earthquake, which may raise awareness of the importance of knowledge in preparedness.

The Relationship Between Attitude and Preparedness

The results showed that attitudes were consistently significantly related to preparedness across all locations (Tompe p=0.036; Batusuya p=0.037; Lembasada p=0.000). This confirms that positive attitudes of health workers are a crucial factor in disaster preparedness. This finding supports the research of Kardi et al. (2022) who found a significant relationship between attitudes and preparedness of health workers at the Singkohor Community Health Center, Aceh Singkil. Similar results were also found by Harefa et al. (2021) in North Nias Regency, who reported that the behavior and attitudes of health workers significantly influenced disaster preparedness. Adem's (2018) research in Turkey also showed a positive relationship between attitudes towards earthquakes and officer preparedness.

In contrast, several other studies have shown conflicting results. Rika (2021) found that attitudes were not related to preparedness among healthcare workers in hospitals, and Marzaleh et al.'s (2019) study of dentists in Nigeria also showed that attitudes were not significantly related to preparedness. These differences may be due to the different types of healthcare facilities (health centers vs. hospitals) and country contexts, which influence preparedness cultures.

Research Implications

Overall, the results of this study confirm that the attitudes of health workers are a key factor in disaster preparedness at the community health center level. Meanwhile, knowledge has a variable influence, seemingly influenced by local context and direct experience with disasters. Therefore, interventions focused on strengthening positive attitudes through outreach, training, and disaster simulations should be prioritized. Furthermore, improving knowledge remains crucial to support preparedness, particularly in areas with low levels of knowledge. which is still low, such as Lembasada. Training based on real-world experiences and lessons learned from previous disasters can be an effective strategy for improving both the knowledge and attitudes of health workers.

CONCLUSION

Knowledge and attitude play different roles in influencing disaster preparedness among healthcare workers. The results showed that knowledge was not significantly related to preparedness in Tompe and Batusuya, but was significantly related in Lembasada. Conversely, attitude was consistently significantly related to preparedness across all three study sites. These findings confirm that a positive attitude among healthcare workers is a key factor in improving disaster preparedness, while knowledge plays a different role depending on the context, direct experience with disasters, and the institutional conditions of the community health center (Puskesmas). Therefore, preparedness improvement

programs need to focus on fostering responsive attitudes through routine training, disaster simulations, and ongoing outreach. Furthermore, efforts to improve knowledge remain crucial, especially in areas with low levels of understanding. The synergy between strengthening attitudes and improving knowledge is expected to optimize the preparedness of healthcare workers and ensure the readiness of community health centers as the frontline of healthcare services in disaster-prone areas such as Donggala Regency.

REFERENCES

Artini, B., Mahayaty, L., Prasetyo, W., & Yunaike, F. (2022). Hubungan Tingkat Pengetahuan Kesiapsiagaan Bencana pada Tenaga Kesehatan dengan Sikap Kesiapsiagaan Bencana. *Jurnal Keperawatan, 11*(2), 1–8.

CRED. (2023). *2022 Disaster in Numbers*. Retrieved from https://cred.be/sites/default/files/2022_EMDAT_report.pdf

Dwiyanti, I., Palupi, R., Giamboro, H., Handini, et al. (2020). Analisis Hubungan Magnitudo Gempa Bumi terhadap Hasil Frekuensi Dominan pada Rangkaian Gempa Aceh 2004. *Jurnal Meteorologi Klimatologi dan Geofisika, 7*(3), 44.

Fery, & Raheni. (2020). Menggerakan Perekonomian Melalui Pemulihan Usaha Skala Mikro Pascabencana Gempa Bumi dan Tsunami di Kecamatan Sirenja Kabupaten Donggala Sulawesi Tengah. *Jurnal Sinar Manajemen, 7*(2), 72–75.

Hadi, H., Agustina, S., & Subhani, A. (2019). Penguatan Kesiapsiagaan Stakeholder dalam Pengurangan Risiko Bencana Alam Gempabumi. *Geodika: Jurnal Kajian Ilmu dan Pendidikan Geografi, 3*(1), 30.

Harefa, E. K., Ginting, D., Sitorus, M. E. J., & Nababan, D. (2021). Pengaruh Perilaku Tenaga Kesehatan terhadap Kesiapsiagaan Bencana di Kabupaten Nias Utara Tahun 2021. *Jurnal Kesehatan Masyarakat, 5*(2), 1152–1158.

Hesti, G., Ginting, S., Sitorus, M. E. J., & Nababan, D. (2019). Faktor-faktor yang Berhubungan dengan Kesiapsiagaan Bidan dalam Menghadapi Bencana Gempa dan Tsunami di Puskesmas Kota Padang. *Jurnal Kesehatan Andalas, 8*(2), 338– 345.

Indonesia. (2007). *Undang-Undang No. 24 Tahun 2007 tentang Penanggulangan Bencana*. Lembaran Negara RI Tahun 2007 No. 66.

Kardi, O., Kataren, R., Rohanna, T., Dakhi, F., & Tarigan, F. L. (2022). Faktor-faktor yang Berhubungan dengan Kesiapsiagaan Petugas Kesehatan Menghadapi Bencana Alam di Wilayah Kerja Puskesmas Singkohor Aceh Singkil. *PREPOTIF: Jurnal Kesehatan Masyarakat, 6*(3), 2229–2242.

Listiana, D., Fatima, N. S., & Sasmita, A. S. (2021). Relationship of Knowledge and Attitude with Health Center Officers' Preparedness in Facing Earthquake Disasters. *Jurnal Vokasi Keperawatan, 4*(2), 369–383.

Marzaleh, A., Khaledi, M., Saadatmand, H., & Khaledi, F. (2019). Investigating the Effect of Perceived Social Support on the Preparedness of Health Workers in Disaster Situations. *Prehospital and Disaster Medicine, 34*(2), 132–136.

Rika, N. (2021). Pengetahuan, Sikap, dan Perilaku Kesiapsiagaan Pegawai Rumah Sakit dalam Menghadapi Bencana di RSU P. *Jurnal Kesehatan Masyarakat*.

Rusrendra, W. (2022). Klasterisasi Dampak Bencana Gempa Bumi Menggunakan Algoritma K-Means di Pulau Jawa. *Jurnal Edukasi dan Penelitian Informatika, 8*(1), 175–179.

Salmawati, L. (2022). The Influence of Knowledge, Attitude, and Action on Fire Disaster Preparedness in Palu City Health Center. *Journal of Health and Nutrition Research, 1*(3), 161–165.

Setiawati, I., Utami, G. T., & Sabrian, F. (2020). Gambaran Pengetahuan dan Sikap Perawat tentang Kesiapsiagaan Pelayanan Kesehatan dalam Menghadapi Bencana Banjir. *Jurnal Ners Indonesia, 10*(2), 158.

Simanjuntak, M., & Asnawati. (2021). Kesiapsiagaan Rumah Sakit dalam Penanggulangan Bencana (Studi Kasus di RSU Elpi Al Aziz Rantauprapat). *Jurnal Kesehatan Masyarakat, 5*(2).

Sulistiawan, J., Syahtaria, I., Siantur, D., Prakoso, L., Saragih, H. J. R., & Bagun, E. (2022). Sinergitas TNI dan BNPB dalam Penanggulangan Bencana Gempa Bumi dan Tsunami di Palu Guna Meningkatkan Pertahanan Nirmiliter dalam Rangka Memperkuat Pertahanan Negara. *Jurnal Inovasi Penelitian, 28*, 2841–2848.

Wahyu, A., & Rushendra. (2022). Klasterisasi Dampak Bencana Gempa Bumi Menggunakan Algoritma K-Means di Pulau Jawa. *Jurnal Edukasi dan Penelitian Informatika, 8*(1), 175–179.

Wartatmo, H., Donna, B., Danu, S. S., Sutono, Ariani, M., & Pangaribuan. (2020). Modul Rencana Penanggulangan Bencana dan Krisis Kesehatan di Dinas Kesehatan. *Pusat Kebijakan Manajemen Kesehatan, Fakultas Kedokteran UGM*.