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A Review of Health Workers' Preparedness in Flood Disaster Management at Rantau Selamat Public Health Center, East Aceh Regency

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Abstract. *Health personnel play a crucial role in delivering health services, including disaster management. In Indonesia, floods are the most frequent type of disaster, with East Aceh District experiencing recurring floods that resulted in four fatalities between 2019 and 2022. Rantau Selamat Subdistrict is particularly vulnerable, making it essential for the local health center to function effectively as a frontline facility during flood events. This study aims to describe the preparedness of health workers in flood disaster management at the Rantau Selamat Health Center, East Aceh District. A descriptive research design with a cross-sectional approach was employed. Total sampling was used, involving 96 health workers. Data were collected through questionnaires. The results indicated that 95.8% of respondents had good knowledge and attitudes toward flood preparedness. However, disaster emergency response capacity was low among 62.5% of respondents, and 81.3% showed limited access to or awareness of an effective early warning system. In contrast, all respondents (100%) reported good readiness in terms of resource mobilization. In conclusion, most health workers demonstrated good knowledge, attitudes, and readiness in terms of resource and medication availability. However, weaknesses were identified in the emergency response plan and early warning system, indicating the need for strategic improvements to enhance overall preparedness for flood disaster management at the Rantau Selamat Health Center.*

Keywords: *Health workers; Flood; Preparedness; Disaster; Phc*

1. INTRODUCTION

Disasters can be either natural or man-made and pose threats to the safety of human lives and livelihoods. Natural disasters tend to have a broader impact than man-made ones. This is regulated in Law Number 24 of 2007, which states that disasters have the potential to cause loss of life, environmental damage, material losses, and psychological impacts (Kementrian RI 2007).

The global average number of deaths from disasters is approximately 28,730 people per year. Earthquakes and storms are the leading causes of death from natural disasters in the Asia-Pacific region, followed by floods. Indonesia is considered a disaster-prone country due to its position on the equator and at the convergence of three major tectonic plates (Husein and Onasis 2017; Nasional 2019).

Flooding is one of the most frequently occurring natural disasters, especially during the rainy season. It occurs when water volume exceeds the capacity of drainage channels such as rivers, or when the flow is obstructed, causing overflow into surrounding areas (Suripin 2003).

Aceh Province is one of the regions in Indonesia often affected by natural disasters. The Aceh Disaster Management Agency (BPBA) recorded 465 disaster events from January to

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August 2021. These disasters resulted in 3 deaths, 1 missing person, 5 injuries, and impacted 29,643 families or 100,868 individuals. Most of these events were dominated by floods (Aceh 2021; Rismawati, Sukarno, and Binilang 2016).

East Aceh Regency is one of the areas frequently affected by floods, with a total of four deaths recorded during the period 2019–2022. In early 2022, in Rantau Selamat District, several villages were affected by flooding, including: Bayeun Village (at risk: 336 households or 1,065 individuals), Alue Seuleumak Village (29 households or 105 individuals), Sarah Kayee Village (32 households or 117 individuals), Alue Kaol Village (82 households or 202 individuals), Alue Punti Village (76 households or 320 individuals), and Simpang Peut Village (1 household or 4 individuals) (Aceh 2022).

Given the impact and frequency of floods, further preventive efforts are necessary. Preventive measures may include drainage improvement, vegetation protection, dam construction, and increased community participation supported by the preparedness of health workers at Community Health Centers (Puskesmas). Health workers are expected to be optimally prepared to manage flood disaster response (Angrelia et al. 2020).

Puskesmas serve as the frontline in the primary healthcare system, providing comprehensive and integrated services for individuals and communities. As institutions focusing on promotive and preventive approaches within their service areas, Puskesmas carry a vital responsibility to maintain and improve public health. In times of crisis, such as natural disasters, they are expected to continue functioning, particularly in the emergency response phase. This includes saving lives and preventing further casualties. During disasters, Puskesmas are capable of operating essential medical services, including 24-hour emergency care, setting up mobile health posts with standby medical personnel, providing nutrition services, maternal and child health services, monitoring environmental conditions such as sanitation in refugee camps, and detecting and intervening early in mental health issues. Moreover, they play an important role in ensuring rapid and appropriate medical referrals to higher-level healthcare facilities for disaster victims requiring further care (Indonesia 2014; Susilawati, Hadisuyatmana, and Efendi 2019).

A previous study by Iga Berliana (2019), titled *"Health Workers' Preparedness in Facing Flood Disasters in the Work Area of Curahnongko and Cakru Health Centers, Jember Regency,"* found that health workers in Puskesmas faced challenges in disaster preparedness due to limited infrastructure and facilities (Berliana 2019).

Given the essential role of Puskesmas in disaster emergency response especially in frequent flood-prone areas in Indonesia such as East Aceh the preparedness of health workers

becomes a crucial aspect to ensure effective service delivery. This preparedness includes the ability for early detection, contingency planning, cross-sector coordination, and sustainable healthcare delivery amid limited conditions. Based on this background, the researcher is interested in exploring and describing the current state of such preparedness through a study titled: **"An Overview of Health Workers' Preparedness in Flood Disaster Management at Rantau Selamat Health Center, East Aceh Regency."**

2. LITERATURE REVIEW

Disaster Preparedness is a series of activities carried out before a disaster occurs to ensure that all involved sectors can respond quickly, appropriately, and effectively. According to the WHO, preparedness in the health sector includes strengthening the healthcare system, training healthcare personnel, and providing emergency facilities and infrastructure to reduce disaster risks and impacts (Haksama, Rahmawati, and Prayoga 2024).

Health workers play a strategic role in every phase of disaster management, particularly during the emergency response and recovery phases. In the context of flood disasters, healthcare readiness involves knowledge of victim management, intersectoral coordination skills, access to early warning systems, and the mobilization of logistics and resources. As the primary healthcare facility, Puskesmas (Community Health Centers) are crucial in providing basic medical services, public education, and crisis management during disasters. Therefore, health workers' preparedness at Puskesmas encompasses knowledge, attitudes, emergency response planning, involvement in early warning systems, and logistical readiness (Nengrum 2020).

Previous studies have shown that health workers' readiness for disasters is often hindered by a lack of training, limited resources, and poor access to early warning information. Therefore, evaluating their preparedness is essential to enhance disaster response capacity, especially for floods, which frequently occur in regions like East Aceh.

3. METHOD

This study employed a descriptive approach with a cross-sectional design, in which all variables were measured simultaneously at a single point in time. The research was conducted at Rantau Selamat Community Health Center (Puskesmas), East Aceh Regency, during the period of January to February 2023. A total of 101 participants were selected based on predefined inclusion and exclusion criteria. The sampling technique was purposive, involving the deliberate selection of respondents according to the study's objectives.

Data were collected using a questionnaire designed to gather information on respondents' characteristics and their level of preparedness for flood disasters. The questionnaire covered various aspects including knowledge and attitudes towards disasters, emergency response planning, early warning systems, and the ability to mobilize available resources within the health center. All data were analyzed using univariate analysis to describe the frequency distribution and proportions of each observed variable.

4. RESULT AND DISCUSSION

Respondent Characteristics

Table 1. Description of Health Workers' Characteristics at Rantau Selamat Public Health Center, East Aceh Regency.

Characteristic	Frequency (n=96)	Percentage (%)
Age		
Late Adolescence (17–25 years)	10	10.4%
Early Adulthood (26–35 years)	18	18.8%
Late Adulthood (36–45 years)	37	38.5%
Early Elderly (46–55 years)	26	27.1%
Late Elderly (56–65 years)	5	5.2%
Senior (>65 years)	0	0.0%
Gender		
Male	15	15.6%
Female	81	84.4%
Occupation		
Medical Staff	5	5.2%
Nursing Staff	29	30.2%
Midwifery Staff	42	43.8%
Pharmacy Staff	2	2.1%
Public Health Staff	14	14.6%
Nutrition Staff	3	3.1%

Disaster Preparedness Based on Knowledge and Attitude

Table 2. Description of Preparedness Based on Knowledge and Attitude.

Category	Knowledge (n=96)	Percentage (%)	Attitude (n=96)	Percentage (%)
Poor	0	0%	0	0%
Fair	4	4.2%	4	4.2%
Good	92	95.8%	92	95.8%
Total	**96**	**100%**	**96**	**100%**

Disaster Preparedness Based on Emergency Response Plan

Table 3. Description of Preparedness Based on Emergency Response Plan.

Category	Frequency (n=96)	Percentage (%)
Poor	60	62.5%
Fair	13	13.5%
Good	23	24.0%
Total	**96**	**100%**

Disaster Preparedness Based on Early Warning System

Table 4. Description of Preparedness Based on Early Warning System.

Category	Frequency (n=96)	Percentage (%)
Poor	78	81.3%
Fair	15	15.6%
Good	3	3.1%
Total	**96**	**100%**

Disaster Preparedness Based on Resource Mobilization

Table 5. Description of Preparedness Based on Resource Mobilization.

Category	Type of Supplies	Type of Medicines
Poor	0 (0%)	0 (0%)
Fair	4 (4.2%)	4 (4.2%)
Good	92 (95.8%)	92 (95.8%)
Total	**96 (100%)**	**96 (100%)**

Description of Respondent Characteristics

The majority of respondents in this study were in the 36–45 year age group, totaling 37 individuals. Age is considered a factor that influences physical performance and skills, and it may also affect behavior, as it reflects a person's level of organ and mental maturity (Nurayatiya, Sunarti, and RY 2022).

Most of the respondents were female, amounting to 81 individuals. However, according to the study by Bai MKS et al. (2021), gender is not the only factor influencing disaster preparedness for flood events. Both males and females play their respective roles in enhancing flood disaster preparedness (Bai et al. 2021). In this study, the highest number of health workers were midwives, totaling 42 individuals. According to Kurniyanti M (2012), health workers are a crucial component in the success of disaster response, as the absence or inadequacy of health personnel can result in harm and losses during a disaster (Kurniyanti 2012).

Description of Health Worker Preparedness Based on Knowledge and Attitude

Health worker preparedness in dealing with flood disasters is essential, especially in flood-prone areas. As one of the health service institutions located in a disaster-prone area, the Rantau Selamat Community Health Center plays a strategic role in providing healthcare services during flood events (Widayatun and Fatoni 2013). The study results indicate that the majority of respondents had good knowledge and attitudes related to flood disaster management. This reflects that health workers at Rantau Selamat Health Center have gained adequate information and understanding regarding flood disaster management. They understand the importance of preparation and prompt response in emergency situations caused by floods.

These findings are in line with research by A. Susilawati et al. (2019) on the preparedness of health workers in health centers located in disaster-prone areas, where most health workers already had good knowledge of disaster response (Susilawati et al. 2019).

Description of Preparedness Based on Emergency Response Plan

The study found that most respondents lacked adequate emergency response plans. Based on the researcher's observations, this low level of preparedness was due to a lack of training on the procedures to be followed in flood emergency response planning. This includes mapping flood-prone areas, which should be known by all health workers, as well as a lack of collaboration with relevant institutions at the sub-district and district levels in preparedness efforts.

These findings are consistent with research by Agustina Boru Gultom (2012) at the Kampung Baru Health Center, Medan Maimun District. In her study, she recommended that health workers learn how to create disaster-prone maps and train community health volunteers (kaders) to always be ready to respond to floods (Gultom 2012).

Description of Preparedness Based on Early Warning Systems

Disaster early warning systems play a crucial role in minimizing health risks for communities affected by flooding. Health workers at Puskesmas must be capable of monitoring and predicting potential floods and their impacts, as well as delivering timely alerts and rapid response actions when disasters occur. Sources of warning may come from the community or local crisis officers, as well as from Pusdalops PB as the operational unit of BPBD. Information can be conveyed through various means such as verbal communication, telephone, radio, or hazard markers (sirens/gongs) (Yassir Arafat 2007).

Based on field observations, the main factors contributing to the weak early warning system in the area include a lack of training and outreach, as well as insufficient infrastructure

and supporting equipment. These findings are consistent with the research by Agustina Boru Gultom (2012), who recommended that health workers develop the capacity to monitor early warning systems as part of disaster preparedness for floods (Gultom 2012).

Preparedness Description Based on Resource Mobilization

In terms of resource and medicine mobilization, the majority of respondents demonstrated good preparedness. This indicates that most health workers are ready and able to take the necessary actions during emergencies or crisis situations. Effective facility and logistics management is essential to ensure that resources are used appropriately in responding to flood disasters (Leeuw and Jonkman 2009).

However, these findings contradict those of Agustina Boru Gultom (2012) in her study at Puskesmas Kampung Baru, Medan Maimun District, which found that only certain types of logistics were available and that there was no emergency unit or triage system in the Puskesmas (Gultom 2012).

Deskripsi Kesiapsiagaan Berdasarkan Sistem Peringatan Dini

Sistem peringatan dini bencana berperan penting dalam meminimalkan risiko kesehatan bagi masyarakat terdampak banjir. Tenaga kesehatan di Puskesmas harus mampu memantau dan memprediksi potensi banjir serta dampaknya, sekaligus memberikan peringatan dan tindakan cepat bila bencana terjadi. Sumber peringatan dapat berasal dari masyarakat atau petugas krisis lokal, serta dari Pusdalops PB sebagai pelaksana BPBD. Informasi bisa disampaikan melalui berbagai cara seperti lisan, telepon, radio, atau penanda bahaya (sirene/kentongan) (Yassir Arafat 2007).

Berdasarkan observasi lapangan, kurangnya pelatihan dan sosialisasi, serta minimnya infrastruktur dan peralatan pendukung, menjadi faktor utama lemahnya sistem peringatan dini di wilayah ini.

Hal ini juga sesuai dengan penelitian Agustina Boru Gultom (2012) yang menyarankan agar tenaga kesehatan mengembangkan kemampuan dalam memantau sistem peringatan dini sebagai bentuk kesiapsiagaan terhadap bencana banjir (Gultom 2012).

Deskripsi Kesiapsiagaan Berdasarkan Mobilisasi Sumber Daya

Dalam aspek mobilisasi sumber daya dan obat-obatan, mayoritas responden menunjukkan kesiapsiagaan yang baik. Hal ini menunjukkan bahwa sebagian besar tenaga kesehatan siap dan mampu mengambil tindakan yang diperlukan dalam situasi darurat atau krisis. Pengelolaan fasilitas dan logistik yang baik sangat penting untuk menjamin penggunaan sumber daya secara tepat saat menghadapi bencana banjir (Leeuw and Jonkman 2009).

Namun, temuan ini bertentangan dengan hasil penelitian Agustina Boru Gultom (2012) di Puskesmas Kampung Baru, Kecamatan Medan Maimun, yang menemukan bahwa hanya jenis-jenis logistik tertentu yang tersedia, serta tidak terdapat unit gawat darurat atau sistem triase di Puskesmas tersebut (Gultom 2012).

5. CONCLUSION

Based on the research findings, it can be concluded that the majority of respondents in this study were female, aged between 36–45 years (late adulthood), and most of them were midwifery personnel. Most respondents demonstrated good knowledge and attitudes regarding flood disaster management. However, the majority showed inadequate preparedness in terms of emergency response planning and early warning systems. On the other hand, most respondents exhibited good capabilities in mobilizing resources to respond to flood disasters.

The researcher recommends that relevant health institutions enhance the development of flood early warning systems, strengthen cross-sectoral collaboration, and formulate comprehensive emergency response plans that include mapping of flood-prone areas. Furthermore, training related to flood disaster management and improved coordination with other relevant agencies should be conducted. For future researchers, it is suggested to explore additional variables that may influence the level of preparedness for flood disasters, in order to improve the accuracy of findings and provide a solid foundation for further studies, particularly concerning the preparedness of health workers in facing flood emergencies.

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