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RESEARCH ARTICLE

INTEGRATION OF KNOWLEDGE, ATTITUDE, AND PREPAREDNESS OF HEALTH WORKERS IN FACING FLOOD DISASTER

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ABSTRACT

The quality of health services in flood disaster conditions still needs to get better attention because health workers carry out actions in this condition that are not yet effective. It was closely related to the quality of preparedness of these health workers. It can reflect whether there was an integration of health workers' knowledge, attitude, and preparedness in dealing with flood disasters.

The study used a mixed method consisting of a quantitative design with a correlation test and a qualitative design with interviews. The quantitative design study involved a total population of 22 health workers, and the qualitative design involved 8 participants who are representatives of each profession. Analysis used univariate analysis and bivariate analysis with Fisher's exact test.

Knowledge and preparedness of health workers to face flood disasters were still not good and not ready when compared to attitudes. Knowledge relates to preparing the health workers to face flood disasters with p 0.009, and a study with a qualitative design using eight participants who are representatives of each profession. Health workers dealing with flood disasters have not fully integrated knowledge, attitudes, and preparedness. We need to improve aspects of behavior that are still not optimal.

KEYWORDS

integration, knowledge, attitude, preparedness, flood disaster

INTRODUCTION

In all parts of the world, disasters tend to occur with a significant increase, including in Indonesia which has the potential to experience the potential for flood disaster. The various kinds of natural formations in Indonesian such as lowlands, basins, and some ocean situations have caused floods. Global climate change creates uncertainty over seasons, land cover, and use [1], the declining condition of a watershed accompanied by an increase in the density of the surrounding population [2] is another cause of flood disasters.

North Sumatra Province is a province that has had the highest percentage of disaster events when compared to other areas. This province has two areas most prone to meteorological disasters- Medan City and Deli Serdang Regency. Data on flood events in the North Sumatra Province usually show a strong relationship between the pattern of the number of flood events and the design of variations in the amount of excess rainfall. The Medan and Deli Serdang areas are sites on the east coast of Sumatra and experience vulnerability to regional climate disturbances from the waters of the Malacca Strait and the South China Sea [3].

Floods can have an impact on society due to unfavorable conditions. Therefore, it is necessary to predict these impacts through preparedness efforts. Preparedness can reduce the effects of additional hazards through potent prevention efforts by ensuring efficient and appropriate management, timing, and response to help [4].

A Public Health Center is needed as the front line in reducing these risks. Its role includes first aid for victims, preparing the community for the prevention of emergency cases, and providing skills in performing first aid according to their abilities [5].

The quality of disaster preparedness will synergize with the quality of service when a disaster occurs. This means that during the preparedness before a disaster occurs, tools and efforts need to prepare so that when a disaster occurs, it can ensure that effort can use with the tools prepared [6]. If users receive services on time as expected, it will have a major affect the quality of health services [7].

The first parameter that becomes an important point for preparedness for natural disasters that will occur are knowledge and attitude. Knowledge is the principal and primary factor that is important for preparedness action. Existing knowledge can usually lead to the behavior attitude of being prepared to anticipate disasters [8].

A preliminary survey in Unit Disaster Management in the Health Sector of the Health Office of North Sumatra Province found that the highest disaster incidence in the city of Medan was in the Medan Maimun sub-district at a frequency of 2-3 times a year. This survey was based on the Kampung Baru Health Center, a Health Center located in the working area of Medan Maimun District, using only outpatient services and served cases due to the flood disaster. Interviews in the preliminary study with 30 residents of Medan Maimun District regarding the health services received during the 2011 flood disasters, set out that some of the health services available (as a result of the disaster) were lacking, especially regarding the treatment and management of risk factors that could arise after the disaster.

From this background, we can conclude that a problem is how to describe the integration between knowledge, attitudes, and behavior in the preparedness of health center health workers in dealing with flood disasters. The study aimed to describe the integration of knowledge, attitudes, and preparation of health workers at the public health centre level in dealing with flood disasters.

METHODS

DESIGN

The study used a mixed method design, a quantitative approach with a correlation description, and a qualitative approach.

PARTICIPANTS SAMPLE

The population were all health workers who worked at the Kampung Baru Public Health Center, Medan Maimun District. For a quantitative design, the entire center population became study informants involving 22 health workers.

As for the qualitative method, informants are representatives of each health profession, totaling eight people.

MEASUREMENT

This study used a quantitative data instrument that has validity and reliability tests, consisting of knowledge, attitudes, and flood preparedness. Preparedness for flood disasters is all actions and activities of health workers, driven by appropriate and effective efforts in anticipating health problems that will arise due to flooding in the future, consisting of 14 questions. Knowledge about flood disaster preparedness was how health workers at the Public Health Center understand everything about flood disaster preparedness at the Public Health Service level, consisting of 16 questions. The attitude of preparing for floods was how health workers at the Public Health Center tend to respond in carrying out flood preparedness actions, consisting of 16 questions. In addition, there was a checklist instrument for health supplies in disaster management. This study also used qualitative data consisting of 8 questions which developed into sub questions.

DATA COLLECTION

Collecting data on knowledge, attitudes, and preparedness for floods used guided interviews, and data on health supplies in disaster management used observation. While qualitative data used in depth interviews

RESEARCH PERMIT

This research has received permission from the Medan City Health Office with the number 440/150.37/V/2012 and the Kampung Baru Health Center, Medan Maimun District with the number 100/38/PKB/VI/2012.

DATA ANALYSIS

Data were analyzed using IBM SPSS stats 11 software, including univariate analysis and bivariate analysis with Fisher's Exact and multivariate analysis using Multiple Logistic Regression Test at 95% confidence level (a = 0.05) with Backward LR method.

RESULTS

PARTICIPANT CHARACTERISTICS

The 22 participants who participated in this study consisted of 3 general practitioners; 1 dentist; 8 nurses; 1 dental nurse; 4 midwives; 1 nutritionist; 2 health analysts; 1 pharmacist assistant; and 1 pharmacist.

Characteristics of participants including age, gender, length of work, education and training can be seen in Table 1.

TABLE 1. CHARACTERISTICS OF PARTICIPANTS

Characteristics	Amount (n)	Percentage (%)
Age (years)		
18 – 34	7	31.8
35 – 60	15	68.2
Amount	22	100.0
Gender		
Men	1	4.5
Women	21	95.5
Amount	22	100.0
Length of work (years)		
< 10	8	36.4
≥ 10	14	63.6
Amount	22	100.0
Education		
< Bachelor	14	63.6
≥ Bachelor	8	36.4
Amount	22	100.0
Training		
Ever	5	22.7
Never	17	77.3
Amount	22	100.0

From Table 1, it can seen that the majority of participants were aged 35-60 years {68.2%}; the majority were women participants {95.5%}; length of work experience was greater than 10 years for 14 participants {63.6%}; education levels for those with less than a bachelor's degree were recorded by 14 participants {63.6%}. The majority of those interviewed (17 participants)had never attended training regarding disasters or emergencies {77.3%}.

Preparedness Behavior in Facing Flood Disaster

The health worker knowledge questionnaire about preparedness for flood disasters consists of 16 questions with a 'good' category with correct answers equal to or more than eight questions. The attitude questionnaire consists of 16 questions with five answer choices from strongly disagree with a value of 1 to strongly agree with a value of 5, with a maximum score of 80. The positive attitude category if the score was equal to or more than 40. The preparedness questionnaire consisted of 14 questions with the ready category if the participant answered readiness in preparedness was the same to or more than seven items. Preparedness behavior in respect to those interviewed who were facing flood disasters can be seen in Table 2.

TABLE 2. DISTRIBUTION OF KNOWLEDGE, ATTITUDES AND PREPAREDNESS CATEGORIES FOR FLOOD DISASTERS

No	Knowledge	Frequency (n)	Proportion (%)
1.	Good	6	27.3
2.	Bad	16	72.7
	Amount	**22**	**100.0**
No	Attitude	Frequency(n)	Proportion (%)
1	Positive	21	95.5
2.	Negative	1	4.5
	Amount	**22**	**100.0**
No	Preparedness	Frequency (n)	Proportion (%)
1	Not Ready	17	77.3
2.	Ready	5	22.7
	Amount	**22**	**100.0**

From Table 2, it can see that the majority of participants had poor knowledge regarding preparedness for flood disasters with 16 participants having bad experiences (72.7%), 21 participants (95.5%) having a positive attitude, and 17 participants not being prepared (77.3%).

Relationship Between Characteristics, Knowledge, Attitude for Flood Disasters

The relationship between characteristic, knowledge, attitude and preparedness for flood disaster can be seen in Table 3

TABLE 3. RELATIONSHIP BETWEEN CHARACTERISTICS, KNOWLEDGE, ATTITUDE FOR FLOOD DISASTERS

No	Respondent Characteristics	Knowledge				Total		Sig.
		Good		Bad				
		n	%	n	%	n	%	
	Age (years)							
1	18 – 34	1	14.3	6	85.7	7	100	0.349
2	35 – 60	5	33.3	10	66.7	15	100	
	Length of work (years)							
1	< 10	1	12.5	7	87.5	8	100	0.255
2	≥ 10	5	35.7	9	64.3	14	100	
	Education							
1	< Bachelor	3	21.4	11	78.6	14	100	0.369
2	≥ Bachelor	3	37.5	5	62.5	8	100	
	Training							
1	Ever	4	80.0	1	20.0	5	100	0.009
2	Never	2	11.8	15	88.2	17	100	

No	Respondent Characteristics	Attitude				Total		Sig.
		Positive		Negative				
		n	%	n	%	n	%	
	Age (years)							
1	18 – 34	7	100.0	0	0.0	7	100	0.682
2	35 – 60	14	99.3	1	6.7	15	100	
	Length of work (years)							
1	< 10	8	100.0	0	0.0	8	100	0.636
2	≥ 10	13	92.9	1	7.1	14	100	
	Education							
1	< Bachelor	13	92.9	1	7.1	14	100	0.636
2	≥ Bachelor	8	100.0	0	0.0	8	100	
	Training							
1	Ever	5	100.0	0	0.0	5	100	0.773
2	Never	16	94.1	1	5.9	17	100	

No	Respondent Characteristics	Preparedness				Total		Sig.
		Ready		Not Ready				
		n	%	n	%	n	%	
	Age (years)							
1	18 – 34	1	14.3	6	85.7	7	100	0.477
2	35 – 60	4	26.7	11	73.3	15	100	
	Length of work (years)							
1	< 10	2	25.0	6	75.0	8	100	0.620
2	≥ 10	3	21.4	11	78.6	14	100	
	Education							

1	< Bachelor	2	14.3	12	85.7	14	100	0.233
2	≥ Bachelor	3	37.5	5	62.5	8	100	
	Training							
1	Ever	3	60.0	2	40.0	5	100	0.055
2	Never	2	11.8	15	88.2	17	100	

From table 3, it can see that only the training characteristics related to knowledge about flood preparedness with p 0.009.

Relationship Between Knowledge, Attitude and Preparedness for Flood Disasters

The relationship between knowledge, attitude and preparedness to face flood disasters can be seen in Table 4.

TABLE 4. RELATIONSHIP BETWEEN KNOWLEDGE, ATTITUDE AND PREPAREDNESS FOR FLOOD DISASTERS

No	Knowledge	Attitude				Total		Sig.
		Negative		Positive				
		n	%	n	%	n	%	
1.	Good	1	6.3	15	93.7	16	100	1.000
2.	Bad	0	0.0	6	100.0	6	100	

No	Knowledge	Preparedness				Total		Sig.
		Ready		Not Ready				
		n	%	n	%	n	%	
1.	Good	1	6.3	15	93.7	16	100	
2.	Bad	4	66.7	2	33.3	6	100	0.009

No	Attitude	Preparedness				Total		Sig.
		Ready		Not Ready				
		n	%	n	%	n	%	
1.	Negative	0	0.0	1	100.0	1	100	1.000
2.	Positive	5	23.8	16	76.2	21	100	

It can see from table 3 that worse knowledge was still not aligned with the majority positive attitude, and there was no relationship, bad knowledge was in line with not being ready, and there was a relationship. While a positive attitude tends to be unprepared, and there was no relationship between the two variables with Fisher's exact test.

Regression Analysis of Variables Related to Health Workers' Preparedness in Facing Disasters

Regression analysis of variables related to the preparedness of health workers for flood disasters can be seen in Table 5.

TABLE 5. REGRESSION ANALYSIS

Step		B	S.E.	Wald	df	Sig.	Exp (B)
Step 1(a)	Knowledge	3.332	1.350	6.096	1	0.014	28.000
	Attitude	185.64	40192.970	.000	1	1.000	115391061.737
	Constant	-.693	.866	.641	1	.423	.500
Step 2(a)	Knowledge	3.401	1.348	6.368	1	.012	30.000
	Constant	-.693	.866	.641	1	.423	.500

Regression analysis showed that there was one most related variable, namely knowledge. The equation model obtained P=1/(1+e ^(-y)), with y = -0.693 + 3.401(Knowledge), then the probability of a health worker was being prepared to face a flood disaster with good knowledge is 0.666 or 66.6%.

INTERVIEW RESULTS

The results of interviews regarding the knowledge of informants from various professions, 85.7%, stated that they played a role in flood disaster management in the emergency response and recovery stages by serving as health workers in places established in each village. 75% said they did not understand the meaning of flood preparedness and more often stated that preparedness is the duty of the emergency unit and health workers in general during the emergency response stage.62.5% of the

informants did not fully understand the function of the public health center as a development center with a health perspective that supports flood disaster preparedness, and 25% of informants knew the function of the public health center as a community empowerment center that supports flood disaster preparedness. 37.5% of informants knew correctly the function of the public health centre as a first level health service center that supports flood disaster preparedness.

The majority (87.5%) of informants knew correctly about the knowledge of medicines and supplies needed for emergency treatment and referrals. 50% of informants did not know in detail the availability of standard operating procedures for emergency handling.

87.5% of informants understood that preparedness was a common task for health workers during the emergency response stage and required effort to improve. One of the informants conveyed it as follows.

"... *Regarding preparedness at the Public Health Center, there was a program called emergency which was a flood or fire accident, and the officer prepared to go directly to the field*".

Interviews regarding the attitude of the informants concluded that most of them needed to carry out health surveillance, but some stated that it was the duty of the surveillance officer, and there were some participated in carrying out the activity. Most of the study informants were necessary to carry out health education to the community so that they were ready to face floods, but some did not tend to do this. Most stated that it was necessary to cooperate with parties outside the Puskesmas (community health center) in preparing for flood disasters because preparedness could not be carried out only by Puskesmas health workers and could not work independently.

Some informants stated that it was necessary to train the community to become trained cadres ready to deal with flood disasters, and some tended not to do that. A small number stated that they did not need to be involved in family empowerment for flood disaster preparedness because the family had been trained and was not part of the work of the health worker concerned. Some informants stated that they did not need to carry out standard operating procedures for handling emergencies and referrals because the duties of the Emergency Unit were handled directly and not by health workers. Several informants stated that they did not need to be involved in planning the provision of medicines and supplies or health facilities and infrastructure to deal with flood disasters because the Head of the Public Health Center had already arranged for the staff to be on duty.

All informants stated that it was necessary to hold competency improvement training in flood emergency management because knowledge was increased and refreshed, there was new information, and health workers at the Public Health Center who were prone to flooding would know more about this handling.

The frequency of training stated by informants varied from 1 to 3 months, 1 to 2 years or up to 5 years.

All study informants need to provide services to the community to improve public health so that the community can deal with floods and their impacts in the future.

One part of flood disaster preparedness attitude needs to be improved because some informants did not need to carry out standard operating procedures for handling emergencies and referrals. Some of the informants' statements are listed here:

Emergency department only … No need, we will only deal with it, we should, but there was nothing … I did not think so, there was not my job.

The results of interviews regarding the preparedness of informants to face flood disasters include some who have not taken action in assessing conditions in the work area of the public health center at risk or not at risk of flooding. All informants did not map flood-prone regions in the working area of the public health center. All informants did not know the signs of a flood disaster, and some could not interpret the mark of a disaster.

Several informants conducted health education to the community regarding flood preparedness. Some informants worked with village or sub district officials and partnered with community organizations or non governmental organizations in flood disaster preparedness efforts. Almost all of the informants coached cadres in implementing community based health efforts, and a small number empowered families as health development partners to experience disaster preparedness.

Almost all of them did not carry out standard operating procedures for handling emergency services and their referrals.

Several informants provided services to the community to improve public health so that the community experienced the ability to deal with floods and their impacts.

Several informants stated that they carried out health education to the community regarding flood preparedness efforts and that health workers needed to improve this intervention. Several informants stated this as stated here:

"...*At least explain about environmental cleanliness ... yes, dispose of trash in its place, and did not live in low areas ... where water flows ...*"

OBSERVATION RESULTS

Observations based on the checklist sheet for the equipment officer who also serves as a health worker in the medicine division showed that antibiotics, analgesics, skin medicines, eye medicines, oral rehydration solutions (ORS), and cough medicines fulfilled the supply. Meanwhile, antipyretic drugs, antacids, anti-allergy, anti-inflammatory, and psycho pharmaceuticals only fulfilled part of their supply.

The results of observations on the availability of medical supplies in disaster management at the public health center showed that medical service equipment met the availability. While the need for triage, airway resuscitation equipment, cardiac resuscitation equipment, wound care medical equipment, communication, and transportation facilities fulfilled some of the supplies. The evacuation tools and provision of additional food were not available. Table 6 describes the availability of health supplies for disaster management at the Public Health Center.

TABLE 6. AVAILABILITY OF HEALTH SUPPLIES

No	Supplies Type	Results
1.	Triage needs (identification, triage cards and labels, administrative equipment, stretchers, lighting equipment)	Partially available
2.	Airway resuscitation equipment (oxygen cylinders, intubation kits, tracheostomy kits, ambubags)	Partially available
3.	Cardiac resuscitation equipment (infusion sets, RL infusion fluids, NaCl, Dextrose, shock management drugs)	Partially available
4.	Medicines for wound care (cotton, elastic bandage, gloves, minor surgery set, antiseptic, splint/spalk, neck collar, blanket)	Partially available
5.	Evacuation equipment (lighting devices, stretchers)	Not available
6.	Treatment service equipment (sphygmomanometer, stethoscope, flashlight, minor surgery set)	Available
7.	Means of communication and transportation (radio, communication, ambulance), identity of officers	Partially available
8.	Provision of additional food (for pregnant women, mothers giving birth, infants and toddlers)	Not available

DISCUSSION

This study aimed at understanding how to integrate the preparedness behavior of public health workers in dealing with flood disasters. Behavioral motivation is important to achieve service quality and will lead to satisfaction [9].

Knowledge about flood disaster preparedness tended to show that it was still not at a satisfactory level based on these research results. The results of the cross table test between age, education, and training showed that training was closely related to the participants' knowledge.

The participants' knowledge tended to be poor, reinforced by the background characteristics of the participants who rarely attended disaster training.

The results of the in-depth interviews confirmed that the participants still lacked knowledge about flood disaster preparedness. On the other hand, attitudes tended to be positive because participants were more willing to intervene in dealing with floods. The results of the in-depth interviews confirmed that most of the participants showed a generally positive attitude toward flood disaster preparedness.

However, in association with the results of the cross table test between age, length of work, education, and training the tendency of the characteristic variables did not show a significant correlation with knowledge, attitudes, and flood preparedness efforts. Only the correlation between training and flood disaster preparedness knowledge showed significance.

The researcher concluded that attitude was not the result of expertise obtained through receiving information or training but rather the attitude that occurred in participants at the stage of having positive feelings about conditions or things that were happening or at the affective stage.

The results of the research showed that the tendency of health workers was not yet ready to face flood disasters. Statements from health workers through in-depth interviews strengthened these findings. They stated that they needed better efforts in preparing themselves for flood disasters.

Knowledge, attitudes, and practices are a combination of integrated variables. Good knowledge will lead to attitudes and actions that are in harmony with knowledge [10].

The results of this study showed that the integration between knowledge, attitudes and preparedness of health workers in dealing with flood disasters was still not optimal. This was evidenced only by knowledge related to flood disaster preparedness with p 0.009, while knowledge was not related to attitudes towards flood disasters, and also attitudes were not related to flood disaster preparedness. It was necessary to harmonize the knowledge and attitudes of health workers in dealing with flood disasters to achieve more effective preparedness.

The study showed that the majority of attitudes were positive, the majority of knowledge was still not at an optimal level, and there was a lack of preparedness for flood disasters. Therefore, it was the knowledge and preparedness of health workers that needs to be improved, with the intention of integrating the knowledge, attitudes, and preparedness of health workers to face flood disasters.

Various efforts to increase knowledge in working in flood disaster areas include reading materials and books about disaster management, searching and reading materials on disaster preparedness via the internet, and attending conferences and seminars related to disaster management [11]. Based on the results of this study's in-depth interviews, efforts to increase the preparedness of health workers for floods are to equip emergency service facilities, provide operational standards for emergency handling and referrals, and create support from policies and staff commitment.

CONCLUSIONS

Health workers already have the knowledge, attitudes, and preparedness for flood disasters, although the integration between these components did not complete. Therefore, it was necessary to improve aspects that are not yet optimal, including the knowledge and preparedness of health workers to face flood disasters. Efforts include increasing the capacity of health workers and support from various parties involved in the preparedness of health workers in dealing with flood disasters.

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