

Factors Related to Intentions Among Community Health Cadres to Participate in Flood Disaster Risk Reduction in Semarang, Indonesia

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ABSTRACT : Background: Health cadres hold enormous potential for flood disaster risk reduction (DRR) such as in reducing public health risks and building community resilience. However, they must risk their own lives to save others in disaster situations. Involving them, focusing on primary health care in the context of flood DRR, should be considered in this scheme.

Aim: This research aims to explore the factors related to intentions among health cadres to participate in flood DRR in Semarang, Indonesia.

Methods: A qualitative study was conducted from February to May 2019 in Semarang. Focus group interviews were conducted with 22 participants (health cadres, supervisors of health cadres, the head of Puskesmas, and municipal health officers). Content analysis was used to analyze qualitative data.

Results: Four themes of factors related to intentions among health cadres to participate in flood DRR emerged from the interview data, namely: tugas (a set of expectations to be carried out from encumbering the position of health cadres), existing supports, perceived insufficiency of supports, and existing obstacles. It was revealed that their intentions to participate in flood DRR was related to tugas, existing support, and perceived insufficiency of support.

Conclusions: Tugas, existing support, and perceived insufficiency of support are factors related to intentions among health cadres to participate in flood DRR in Semarang. The

findings of this study may contribute as a strategy for the governments and stakeholders to optimize sustainable community healthcare for flood DRR performed by health cadres in Indonesia.

Keywords: *intentions; community; health cadres; flood disaster; Indonesia*

1. INTRODUCTION

Many Asian countries have been experiencing floods as the most frequent environmental hazard, including Indonesia. Indonesia is placed third in the list of most vulnerable countries to flood hazard in Asia, after China and India [1]. Coastal flooding is one of the frequent natural hazards in Indonesia that occurs when the sea level rises to a critical height above the coastal lands due to tidal sea and sea surges [2, 3]. The coastal line is a strategic area for various activities such as port facilities, recreation, fisheries, agriculture, industries, settlements, etc. Despite these advantages, coastal areas are vulnerable to changes caused by coastal activities. Residents living in coastal areas are also vulnerable because they rely on the natural resources of these coastal areas. Global sea level is expected to rise from at least 20-100 cm within the current century [4]. Changes in sea level will adversely affect coastal communities by increasing the flood risk and/or coastal and cliff erosion, and that will also have ecological and economic impacts on valuable marine ecosystems (such as productive estuaries, coastal wetlands, and coral reefs). One of the cities located in a coastal area is Semarang.

On the other hand, the government states that efforts to reduce disaster risk have increasingly concentrated on Community-based Disaster Risk Management (CBDRM) [5]. Moreover, health cadres are directly connected with community members and they may establish trusting relationships [6]. The importance of local communities participating in DRR that they know their area and local situation best, and no outsider can understand the local opportunities and constraints as they do. Health cadres may play an important role in flood DRR because of their potential effectiveness in reducing public health risks, increasing disaster preparedness, and building trusting relationships among all stakeholders.

However, there are concerns about health cadres' intentions to participate in flood DRR. Health cadres may also become disaster survivors alongside caring for their families in disasters. Disaster volunteering is a choice one makes while sacrificing something else. Volunteers risk their own lives to save others but expect little in return [7]. Volunteers make it possible for humanitarian aid to access the vulnerable people [5]. Health cadres have the right to choose whether to participate in flood DRR, thus, we cannot force them.

Previous studies [8-13] found that there was more focus on capacity building to enhance the knowledge, attitude, and skills of health volunteers in emergencies and disasters. There is a limited body of literature that focuses on the intrinsic factors at the individual level and the extrinsic factors at the community and institutional level that influence health cadres to participate in DRR. Understanding the factors associated with intentions to participate in DRR would allow more effective planning for a disaster situation. Thus, research is necessary to delineate influencing factors for the participation of health cadres in flood DRR to optimize sustainable community healthcare during flooding in Indonesia.

2. METHODS

2.1. Study Design, Participants, and Sampling Techniques

A descriptive qualitative study with content analysis [14] was conducted to explore the factors related to intentions among health cadres to participate in flood DRR in Semarang, Indonesia. Focus group interviews were conducted with 22 participants (health cadres, supervisors of health cadres, the head of Puskesmas, and municipal health officers) (Table 2). Purposive sampling was used to recruit participants who met the following criteria: a) were either male or female; b) had a good understanding about the public health care system policy and practice, the current problems of health promotion, and community empowerment programs in Semarang; and c) were knowledgeable about the customs and habits of local people. Meanwhile, the participants who refused to give informed consent, got sick at the time of data collection, and discontinued participation were excluded from the study. Each interview lasted about 45–60 minutes.

2.2. Data Collection and Analysis

Data were collected through focus group interviews from February to May 2019 in Semarang, Indonesia. Semarang City is one of the severely affected areas by flood. The flood was not only bringing injuries and deaths but also reduces access to basic healthcare. Since most of the inhabitants live in densely populated cities near the coast, the consequences become worse if flooding often occurs in such areas without any strategies to reduce health risks.

The community leaders from disaster site helped the first author to identify potential participants based on inclusion criteria. The first author then contacted potential participants to explain the study. Participants were given a minimum of 48 hours to decide whether to join this study or to decline. This study used focus groups as the main data collection strategy. However, the study also employed face-to-face in-depth interviews to allow participants who wished to be included in this study but were unable to attend the focus groups because of conflicting schedules and to assure their confidentiality and comfort while no one else was present. Informed consent was obtained before conducting either a focus group or interview.

The focus group interviews were conducted by the first author in the Indonesian national language and organized in the meeting space in the Puskesmas or home to assure their confidentiality and comfort while no one else was present. Sometimes it was difficult for participants to express their ideas or opinions through the Indonesian language. To solve this, the first author allowed them to answer questions through the Javanese language. The first author used memo writing and field notes for recording their insights to facilitate data analysis. A guideline for the focus group interviews (Table 1) was employed. The guideline was developed from the literature review and expert consultation.

All recorded data and detailed notes were transcribed and analyzed via content analysis. Units of analysis were extracted from the focus group interviews then condensed into one text typed in the NVivo 10 software. Important sentences, keywords, or phrases underlying factors of the health cadres' participation in flood DRR were highlighted. Common ideas in the text were sorted and coded based on their differences and similarities to develop themes of factors. After several modifications, the definitive themes finally emerged.

All authors participated in this process and discussed the development of the themes and

categories. The sampling continued until data saturation was accomplished or until no new analytical information was derived in the 22 participants by using an individual response approach for generating themes and categories [15].

2.3.Trustworthiness

This study followed the four criteria proposed by Graneheim and Lundman to ensure the trustworthiness of qualitative content analysis research [16]. Research field triangulation and member checking were applied for achieving *credibility* and *dependency* criteria. *Credibility* was ensured through peer debriefing, including discussion and sharing the data with co-researchers. *Dependency* was maintained through documentation of the analytical processes of the study to allow auditability. Furthermore, *confirmability* and *transferability* of data were provided by a detailed description of the process of the study. *Confirmability* was gained by presenting the participants' quotations. The coding process, labeling and interpretations were confirmed by each participant and three qualitative research experts. Moreover, three senior disaster researchers from Japan reviewed and agreed with the analysis process and results. Lastly, *transferability* was ensured by presenting the description of the participants in this study.

Table 1. Guideline for focus group interviews

Participants	Questions
Supervisors of health cadres, head of Puskesmas, and municipal health officers	“What is your roles and functions in the DRR efforts in your area?” ; “Do you involve health cadres in the emergency situations/DRR efforts?” ; “How did you involve health cadres in the emergency situations/DRR efforts?” ; “How did you select, supervise, empower, and retain the health cadres for the emergency situations/flood DRR?” ; “What are the necessary supports to involve health cadres actively for the emergency situations/flood DRR?” ; “What challenges you faced when your community areas affected by flooding?”
Health cadres	“What is your roles and functions in the DRR efforts in your area?”; “How did the Puskesmas or health office involve you in the emergency situations/DRR efforts?” ; “How did you decide to participate in emergency situations/flood DRR with Puskesmas or health office?” ; “What are the necessary supports to involve you actively for the emergency situations/flood DRR?” ; “What challenges you faced for your participation in the emergency situations/flood DRR?”

3. RESULTS

3.1. Demographic Characteristics of the Participants

Focus group interviews were conducted with 22 participants including health cadres (n=8), supervisors of the health cadres (n=6), the head of Puskesmas, and municipal health officers as managers of health cadres program (n=8). Participants were mostly university graduates aged between 33 and 46 years (Table 2).

Table 2. Demographic characteristics of participants (n=22)

Participant Code	Gender	Age	Occupation	Education Level
Health Cadres (n=8)				
C-1	Female	45	Housewife	Senior High School
C-2	Female	45	Housewife	Senior High School
C-3	Female	35	Entrepreneur	Vocational/Training School
C-4	Female	38	Housewife	Junior High School
C-5	Female	34	Housewife	Senior High School
C-6	Female	43	Entrepreneur	Vocational/Training School
C-7	Female	44	Labor	Senior High School
C-8	Female	39	Housewife	Vocational/Training School
Supervisors of Health Cadres (n=6)				
S-1	Male	35	Nurse	Vocational/Training School
S-2	Female	42	Midwife	University
S-3	Male	39	Sanitarian	Vocational/Training School
S-4	Male	44	Sanitarian	Vocational/Training School
S-5	Male	37	Dietitians	University
S-6	Male	42	Nurse	University
Managers of Health Cadres Program (n=8)				
M-1	Male	42	Head of <i>Puskesmas</i>	University
M-2	Male	33	Municipal health officer	University

M-3	Male	46	Municipal health officer	Vocational/Training School
M-4	Male	40	Municipal health officer	Vocational/Training School
M-5	Male	40	Municipal health officer	University
M-6	Female	46	Municipal health officer	University
M-7	Male	40	Municipal health officer	University
M-8	Male	41	Municipal health officer	University

3.2. Themes of Factors Related to Intentions Among Health Cadres to Participate in Flood DRR

Four themes of factors related to intentions among health cadres to participate in flood DRR emerged from the interview data, namely: *tugas* (a set of expectations to be carried out from encumbering the position of health cadres), existing supports, perceived insufficiency of supports, and existing obstacles (Table 3).

Table 3. Factors related to intentions among health cadres to participate in flood DRR

Themes	Categories
3.2.1. <i>Tugas</i>	a) home visits
	b) meetings with Puskesmas and health offices
	c) clean and healthy living community behavior (PHBS) programs
	d) transporting residents and mobilization
	e) basic first aid for emergencies
	f) provision of food nutrition
	g) eradication of mosquito
3.2.2. Existing support	a) perceived support from family, relatives, and friends
	b) perceived support from the community
	c) perceived support from Puskesmas
	d) perceived support from the health office
3.2.3. Perceived insufficiency of support	a) directions and supervision
	b) insurance coverage
	c) insufficient stipend
	d) lack of logistic support and basic supplies in emergencies
	e) inadequate vehicle
3.2.4. Existing obstacles	a) damaged roads
	b) ineffective coordination and dispatching mechanism
	c) family responsibilities
	d) unreachable distance, and takes cost and time

Source: Primary data (2017)

3.2.1. *Tugas*

Tugas in the Indonesian language comes with multiple meanings that are role, function, task, and duty, which cannot be expressed in a single English term. *Tugas* of health cadres is expected by Puskesmas and health office.

According to the context of interview data and the phenomenon in the field, health cadres belong to Puskesmas and health offices who have incumbency, task, roles, and functions at the community level but voluntarily implement primary health care activities ordered by Puskesmas and health offices, namely: a) home visits, b) meetings with Puskesmas and health offices, c) clean and healthy living community behavior (PHBS) programs, d) transporting residents and mobilization, e) basic first aid for emergencies, f) provision of food nutrition, and g) eradication of mosquito.

a) Home visits

The core of health cadres' routine work consists of visits to the households assigned to them. Supervisors of health cadres and health cadres reported that they visited each household together (interview, C-6).

“We together with the personnel of Puskesmas Karangdoro visit home to assess a mother's pregnancy condition and perform monitoring on inspecting mosquito larva in the bathroom at each household.” (focus group interviews, C-6).

These visits may be conducted for referrals, data collection, health promotion and education, and so on. The visits also covered actionable recommendations to improve the household members' knowledge and behavior related to maternal and child health. The messages also included information on the prevention of dengue fever and diarrhea, more specifically, that proper handwashing and improved sanitation and hygiene can prevent diarrhea and draining the water tank every two weeks can reduce dengue fever cases.

b) Meetings with Puskesmas and health office

The supervisors of health cadres reported that nurses and midwives from Puskesmas conduct monthly meetings with health cadres that are held in each village.

“We conduct meetings with health cadres once a month at our hall.” (focus group interviews, S-1).

This is intended to enable the health cadres to maintain their knowledge and skills to mobilize and empower households and community members for health action. During the monthly meetings, the Puskesmas' community health nurses and midwives discuss thematic areas with the health cadres based on their areas of need as a way of promoting continuous community development activities program.

“We share the importance of information from the health office and about PHBS,

nutrition, etc. We have meetings every month to evaluate the activities of previous months and plan activities of the current month." (focus group interviews, M-5).

c) Clean and healthy living community behavior (PHBS) programs

The municipal health officers reported that health cadres are assigned to behave and promote the Clean and Healthy Living Behavior (PHBS) program for reducing the incident rates of dengue fever in the community.

"We hope health cadres could routinely conduct Posyandu together with Clean and Healthy Living Community Behavior (PHBS) in villages."(focus group interviews, M-3).

In addition, health cadres reported that they are expected to be able to deliver health education about PHBS programs and perform a simulation of washing hands using soap to the community.

"We (health cadres) try to conduct PHBS once a month but the problem, in some areas we only are able to conduct it once every 2 months because the area is hard to reach."(focus group interviews, C-2).

d) Transporting residents and mobilization

The supervisors of health cadres reported that when the referral Puskesmas were unable to treat a case, health cadres authorized by such Puskesmas will refer the patient to a hospital.

"They (health cadres) rely on a motorbike, taxi motor, or motor becak in their community to transport patients to the nearest 24 hours Puskesmas even they carry patients during rainy days and floods."(focus group interviews, S-2).

e) Basic first aid for emergencies

The supervisors of health cadres reported that health cadres have been engaged in emergency response training in providing basic first aid and distributing hygiene kits.

"We are also trained by PMI and/or NGOs to respond safely, responsibly, and effectively to emergency situations for our communities such as diarrhea, fever or injured."(focus group interviews, C-1).

With the first aid training, health cadres have also learned about the ways to treat minor injuries. However, there were cases where the health cadres felt able to provide some first aid (in relation to minor burns, wounds, and diarrhea), but for the most part, health cadres reported that this was not part of their role.

"Health cadres will assess the situation, if they are still able to take care of the patient then they will treat the patient there. If they could not treat it, then they have to send the patient to the nearest 24 hours Puskesmas or hospital."(focus group

interviews, S-6).

f) Food nutrition

The municipal health officers reported that health cadres are working together in coordination with the nurses and midwives from Puskesmas.

"Health cadres also distribute Vitamin A and deworming at Posyandu because many children get suffering diarrhea and dehydration at the village."(focus group interviews, M-6).

g) Eradication of mosquitos

Supervisors of health cadres and health officers mentioned that Kemijen urban village is a flood-prone area as well as a Dengue Hemorrhagic Fever (DHF) endemic area. Further, health cadre empowerment in dengue vector control is an attempt to encourage the community to participate in the prevention and control of DHF by monitoring and inspecting mosquito larva in the bathroom and water tank at each household.

"Kemijen includes Dengue Hemorrhagic Fever (DHF) endemic because this area is a flood-prone area and is an area often affected by high tides. Health cadres' empowerment in dengue vector control is an attempt to encourage the community to participate in the prevention and control of dengue."(focus group interviews, M-8).

3.2.2. Existing Support

Existing support refers to perceived support from: a) family, relatives, and friends, b) community, c) Puskesmas, and d) health offices, that help health cadres work well.

a) Perceived support from family, relatives, and friends

Health cadres perceived little support from their family, relatives, and friends because of the burden of duty which requires them to work in times of flooding.

"We perceived little support from my husband because of the workloads of health cadres tasks in the time of flooding."(focus group interviews, C-5).

b) Perceived support from the community

Some health cadres perceived little support from all of the community members due to health cadres not being adequately trained to handle some primary healthcare services.

"Some of us perceived not much support from community members due to mistrust. Perhaps they do not trust us because we (health cadres) are not adequately trained persons to handle some primary healthcare services."(focus group interviews, C-4).

c) Perceived support from Puskesmas

Health cadres received support from Puskesmas' nurses and midwives such as counseling and health examinations while health cadres organize Posyandu at the village.

“Puskesmas personnel provide counseling or examination while we (health cadres) carry out registration, weighing and other measurements during Posyandu.”(focus group interviews, C-2).

d) Perceived support from the health office

Health cadres reported good support from Puskesmas supervisory, but only occasional support from health officials.

“We sometimes sent complaints to the health office about our obstacles we faced in the village. But they just gave some warning to the staff. Yeah, that is all. It often occurs.”(focus group interviews, C-6).

3.2.3. Perceived Insufficiency of Support

Perceived insufficiency of support refers to the kinds of support that health cadres wish to have to better perform their work in flood DRR, namely: a) directions and supervision, b) insurance coverage, c) insufficient stipend, d) lack of logistic support and basic supplies in emergencies, and e) inadequate vehicle.

a) Directions and supervision

The head of Puskesmas and the supervisors of health cadres mentioned that they are often overwhelmed by their own duties at Puskesmas.

“We felt that Puskesmas personnel were often overwhelmed by the task and suggested the community leader be included to support in some areas.”(focus group interviews, M-1).

Health cadres mentioned that they want to have adequate directions and supervision for their performances.

“We need to receive some directions and supervision for our works from Puskesmas.”(focus group interviews, C-7).

b) Insurance coverage

Health cadres and their supervisors mentioned that health cadres do not have adequate insurance for their performance.

“Emergency rescue is risky, and health cadres don’t have any injury insurance coverage.”(focus group interviews, S-4).

Health cadres may put themselves at risk of injury and even death in trying to rescue others in disaster sites.

“If I participate in flood DRR, I’m not sure if there is an agency that would provide me with life protection. We need to have it for our works.”(focus group interviews,

C-6).

c) Insufficient stipend

In reality, most health cadres are in poor economic situations and require income. Health cadres mentioned that they perceived insufficiency of stipends for their performance in the community.

“Health cadres generally are given a few remunerations.”(focus group interviews, S-6).

“There is a lack of incentives for health cadres activities in routine days, even during floods.”(focus group interviews, C-8).

d) Lack of logistic support and basic supplies in emergencies

Health cadres reported a lack of proper logistical support and basic supplies in emergencies to undertake their work.

“We have some of the health equipment here, but all is now expired, or some are missing.”(focus group interviews, C-3).

e) Inadequate vehicle

Health cadres reported that lack of means transport prevented them from obtaining needed supplies.

“I don’t have an adequate vehicle to a camp medical supplies place.”(focus group interviews, C-2).

3.2.4. Existing Obstacles

Existing obstacles refer to the limitation of health cadres’ ability to do their work at community, namely: a) damaged roads, b) ineffective coordination and dispatching mechanism, c) family responsibilities, and d) unreachable distance, and takes cost and time.

a) Damaged roads

Health cadres and their supervisors reported that floods have damaged roads, and access to food and healthcare has been hampered.

“There were times that it was flooding, and it was at night and we were not able to reach the given place since damaged roads and we do not have adequate vehicles. It was hard.”(focus group interviews, C-5).

b) Ineffective coordination and dispatching mechanism

Health officers reported that health cadres do not know exactly what their job description is, what they are allowed to do, and what they are not allowed to do in terms of healthcare services, especially at times of floods.

"Because of a lack of effective coordination, health cadres often fail to play their role in emergency rescue efforts."(focus group interviews, M-5).

c) Family responsibilities

Health cadres reported that they face time constraints of household chores and get disapproval from husbands for health cadres' activities.

"I am a widow and have children. So, when I am called for action day, I don't have time due to my busy work. I have to sell fish and assist my husband's work to get family income because that is what I use to feed the family and pay rent rather than going to a job without payment."(focus group interviews, C-7).

d) Unreachable distance, and takes cost and time

Health cadres reported that long distances and geographic conditions prevented them from reaching Puskesmas as the field coordination unit center.

"When flood occurred, we could not come because of long distances and unreachable access to the field coordination unit center."(focus group interviews, C-6).

4. DISCUSSION

Figure 1 shows the factors related to intentions among health cadres to participate in flood DRR. Disaster arises as a result of the hazard and the vulnerability of actors facing potential risks. Efforts to reduce disaster risk have increasingly concentrated on community-based actions focusing on reducing vulnerability and increasing resilience to disasters. The importance of communities to participate in DRR is that local communities know their own village and local situation best and that no outsider can understand the local opportunities and constraints as they do.

In Indonesia, health cadres are directly connecting with community members and establishing trusting relationships. Health cadres also serve as a liaison between community members and health care providers. Health cadres may play an important role in flood DRR because of their potential effectiveness in reducing public health risks, increasing disaster preparedness, and building trusting relationships among all stakeholders. However, there are concerns about their intentions to participate in flood DRR. Most health cadres are female, non-health professionals, the first responders at the community who may also become disaster survivors alongside caring for their families in disasters. Disaster volunteering is a choice one makes in the sacrifice of doing something else. Volunteers risk their own lives to save others but expect little in return [7]. Volunteers make it possible for humanitarian aid to access the vulnerable people [5]. If health cadres are working for humanity, the authorities should protect them socially and economically. Health cadres have the right to participate or not participate in flood DRR, thus, we cannot force them.

In addition, health cadres are usually outside the formal health system, although they may receive support from it to discharge their functions. Their backgrounds are diverse.

Some have formal education, while others are housewives, laborers, entrepreneurs, community leaders, and members of civil society organizations. Then, health cadres could be defined as lay-persons of varied backgrounds, coming from, or based in the communities they serve, who have received brief training on a health problem they have volunteered to engage with. It is important to develop trust and harmony between the government, local community, and the health cadres, especially in relation to improving health cadres' intention in flood DRR program.

Health cadres, whose duties encompass a wide range of service delivery tasks, tend to have the heaviest workload in terms of the number of tasks they are asked to perform. The core of health cadres' routine work consists of visits to the households that have been assigned to them monthly. These visits may involve referrals, data collection, health promotion and education, and so on. The visits also covered actionable recommendations to improve the household members' knowledge and behavior related to maternal and child health. CHWs can "perform better with clearly defined roles and a limited series of specific tasks than if they are expected to undertake broader tasks or have an ill-defined role" [17]. Programs must carefully assess and monitor the workload of health cadres and the effect on health cadres' motivation. Enough organizational support and appropriate relations with an organization could motivate health cadres to fulfill their *tugas* for primary healthcare within the context of DRR. We should reduce barriers to motivation by designing effective health cadres' job descriptions, and we should create systems that allow health cadres to meet their own needs.

Some health cadres faced challenges in the field. They perceived little support from their family, relatives, and friends because of the burden of duty which requires them to work in times of flooding. Moreover, some health cadres perceived little support from all the community members due to health cadres not being adequately trained to handle some primary healthcare services. Training and education are perhaps the most used strategy for improving knowledge and awareness. Moreover, coordination from related stakeholders is required to support the health cadres' intention to participate in the flood DRR program. The main stakeholders are the Puskesmas and local governments. There is a need to encourage health cadres to perform effectively and sustainably. Health cadres, as one of the main executors of the primary healthcare program at the community level, need the Puskesmas to work accordingly. To achieve sustainability, some components need to be considered such as information, operational support, and policy support from the local governments. The support is expected to improve the health cadres' capacity to resolve health-related problems in the surrounding society within the DRR context.

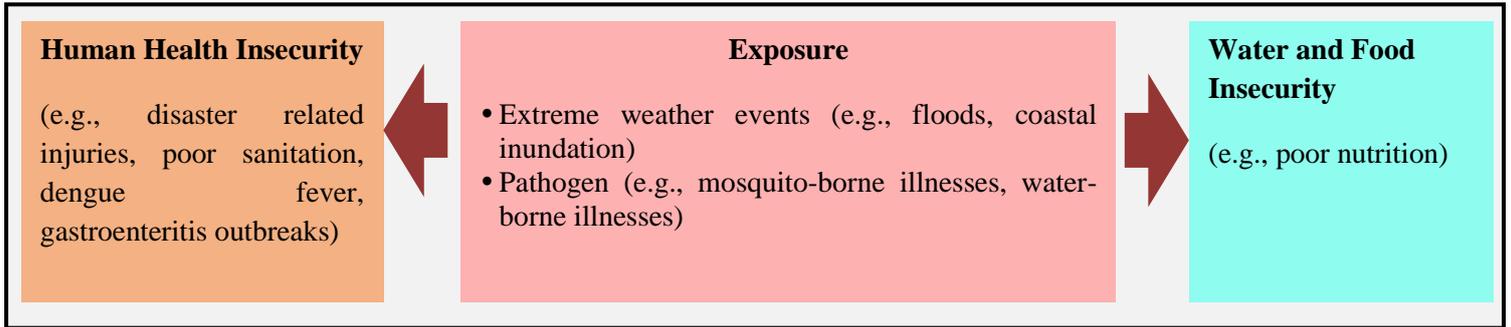
In addition, health cadres who do not have insurance can be a risk in flood DRR. Health cadres risk their own lives to save others but expect little in return. We must all work together to protect, promote, and recognize each and every one of health cadres. It suggests ensuring their safety as effective strategies to enhance their retention rate in the mission. Motivating the volunteers and retaining their dignity and ensuring their health and security should be included in health for DRR plan.

Lack of financial compensation for services rendered would lead to an inability of community volunteers to provide for their family and is particularly exacerbated in areas of pervasive poverty. The influence of incentive mechanisms on emergency volunteering and

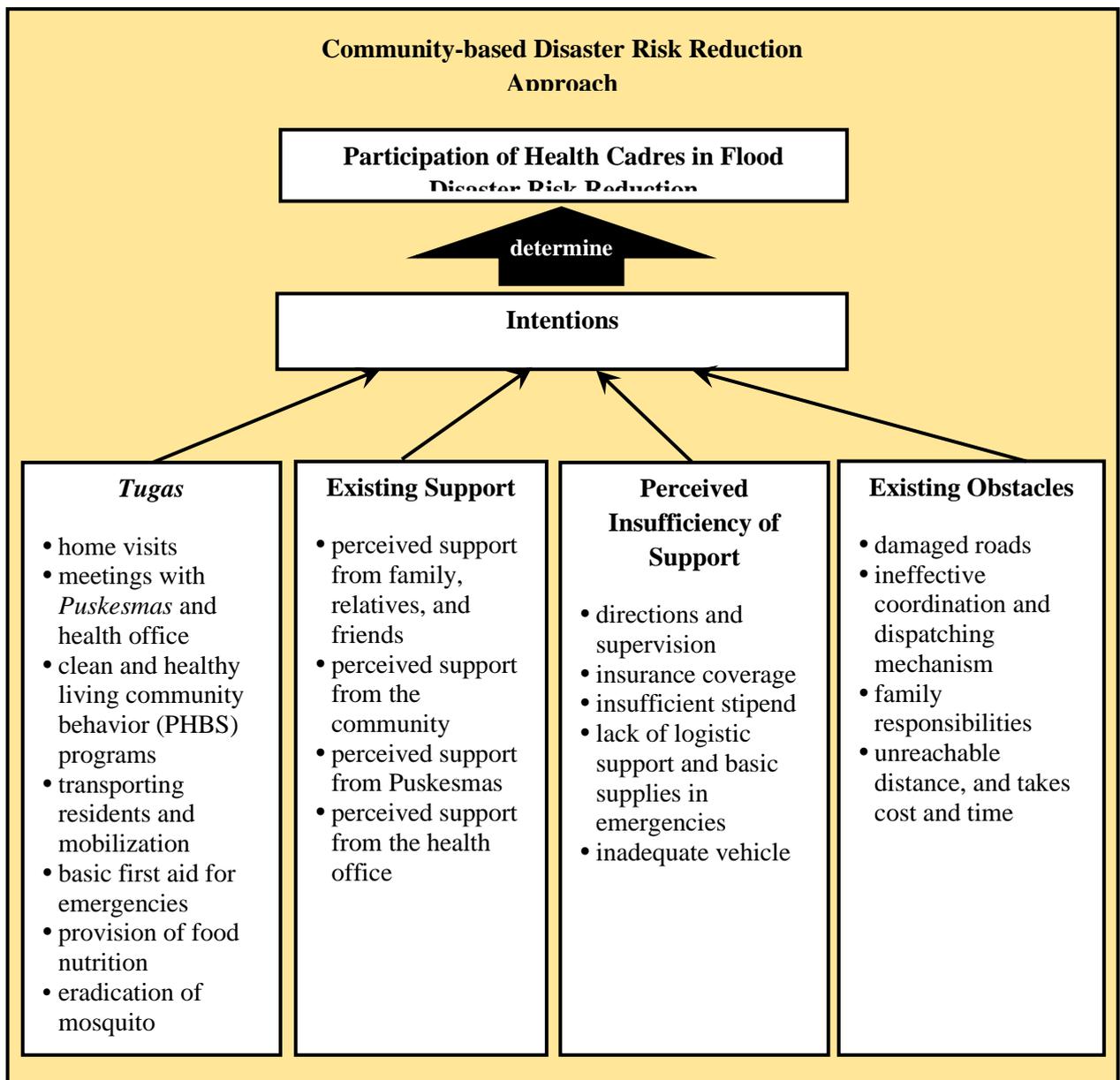
found that the desire for advancement opportunities and better pay is a strong reason for providing emergency volunteer services [18]. The willingness to become a volunteer could be influenced by the wish to earn an income or the hope of being compensated eventually, especially in situations where there is high unemployment or fewer job opportunities [19-21].

Environmental context such as long travel distances and geographic conditions prevented health cadres from obtaining drugs and other needed supplies from Puskesmas as the coordination unit center. Occasionally they are forced to use their own money to hire a motor “*becak*” or taxi motor services. The cost of travel and replenishment of the supplies, material, and equipment are important determinants of their performance that should be taken into consideration. It also becomes a dire situation when health cadres with low monthly incomes are challenged with availability and high cost of transport when implementing their *tugas*.

The main limitations of the present study are the study was a cross-sectional study that did not allow causal conclusions to be drawn. We started with a cross-sectional study to first establish whether there were associations among current variables. For this purpose, a longitudinal study design needs to be employed by future studies to determine cause and effect in the study area over time. Moreover, the qualitative study did not allow the measurement of the examined problems. Participants were aware of the background of the researcher as a male nurse, and this may have influenced their responses.



**risk
reduction**



5. CONCLUSION

Tugas, existing support, and perceived insufficiency of support are factors related to intentions among health cadres to participate in flood DRR in Semarang. The findings of this study may contribute as a strategy for the governments and stakeholders to optimize sustainable community healthcare for flood DRR performed by health cadres in Indonesia. This study also presents a conceptual framework on community health cadres' intentions to participate in flood DRR for nursing academia and researchers to develop further DRR programs in building community resilience.

Ethical Approval and Consent to Participate

The study was carried out with approval from the Institutional Review Board/Ethics Committee both at the University of Kochi in Japan (Reg No.: 18-60/Jan/22/2019) and the local governments in Semarang, Indonesia (Ref No.: 070/9309/04.5/2019). They were made aware of ethical, secrecy (anonymity in publishing) and voluntary participation principles (the right to withdraw from the study even after the interview), and the process of voice recording the interviews

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Conflict of Interest

The authors have no conflict of interest to declare.

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