



**A Survey of Knowledge and Perceived Skills Regarding Health Related Floods
Management Among Village Health Volunteers
in Southern Thailand**

Siriporn Runtiammak

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of
Master of Nursing Science (International Program)**

Prince of Songkha University

2015



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ABSTRACT

The natural disaster incidence has been increasing worldwide especially in regards to floods in southern Thailand. The adverse effects of the floods destroy both property and human life. The early evacuation of victims from a natural disaster scene could save people's lives. The competencies of village health volunteers (VHVs) play a critical infrastructural role in the emergency phase of a disaster in saving victims' lives before professional health teams or external organizations arrive to help. The purpose of this study was to explore the knowledge and perceived skills of Thai VHVs regarding health related flood management. The study identified the level of knowledge and perceived skills regarding health related flood management among 380 VHVs living in flood affected areas in southern Thailand through the means of self-report questionnaires. The knowledge and perceived skills regarding health related flood management questionnaires were analyzed by scale content validity index (SCVI) by three experts. The SCVI of those two questionnaires were found to be 1.0 for both questionnaires. The KR-20 coefficient of the Village Health Volunteer's Knowledge

Questionnaire was calculated, yielded value of .70. The Cronbach alpha coefficient of the Village Health Volunteer's Perceived Skills Questionnaire was found to be .96.

The study results showed that the VHVs had a high level of knowledge regarding health related flood management ($M = 80.7$, $SD = 8.7$). The VHVs had perceived skills regarding health related flood management at a moderate level ($Mdn = 77.5$, $IQR = 17.5$). Moreover, the area in which the VHVs had the highest level of knowledge was related to knowledge to administer first aid for Athlete's foot care ($M = 98.0$, $SD = 13.5$). The area that the VHVs had the least knowledge was related to knowledge to assess dwellers' perception of disaster preparedness ($M = 24.0$, $SD = 42.6$). The area that the VHVs had the highest perceived skills was related to skill to administer first aid for Athlete's foot care ($Mdn = 100$, $IQR = 20.0$). The VHVs were least perceived skills to administering first aid for close bone fracture care ($Mdn = 60.0$, $IQR = 20.0$).

The findings of this study will be used as basic information for conducting appropriate disaster management programs to promote VHVs' knowledge and enhance skills in flood management especially health risk management and the training of a disaster management plan.

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Chapter 1

Introduction

Background and Significance of the Problem

In the last decade, incidences of disasters in the world have increased in both frequency and severity (Sornsrivichai et al., 2012). A disaster is an emergent and unfortunate event that disrupts the functioning of society or a community, and causes human, material, economic, or environment damages (International Federation of Red Cross and Red Crescent Societies [IFRC], 2013). Disasters can be natural or man-made. Examples of natural disasters include floods, droughts, earthquakes, and wildfires. Political assembly, war, and terrorism are some examples of man-made disasters. The severity of disasters can result in tremendous adverse effects. They can cause loss or damage of property, physical disability, psychological problems, social and economic disruption, and environment destruction (The United Nations International Strategy for Disaster Reduction [UNISDR], 2009). The worst effect of a disaster is the loss of life of people living in the affected areas. In Asia, a report showed that approximately 77% of people have been killed in disaster events, which was the highest percentage for all recorded disasters that have occurred globally (IFRC, 2013).

In Thailand, the most devastating natural disaster was the tsunami of 2004 of which 5,401 people were killed; 11,775 were injured; and 2,921 disappeared (Department of Disaster Prevention and Mitigation [DDPM], Ministry of Interior, Thailand, 2013). The 2004 tsunami also caused economic damages. There was 14,491

million Baht lost in the Tsunami event, and tourist industries lost more than 30,000 million Baht (DDPM, Ministry of Interior, Thailand, 2013). Floods as a result are reported as the highest incidence of natural disasters in Thailand (DDPM, Ministry of Interior, Thailand, 2014). It was reported that during flood events from 2010 to 2011, 86 people were killed and 1,214,521 families from 47 provinces were affected by these events (DDPM, Ministry of Interior, Thailand, 2014). In addition, 4,095,725 people have been affected by floods which accounted for 35% of all Thailand's population (DDPM, Ministry of Interior, Thailand, 2014). Moreover, floods greatly impact on individuals' health and healthcare management (Sornsrivichai et al., 2012).

Health impacts caused by floods include drowning, acute trauma, rodent-borne diseases, physical injuries, vector-borne diseases, water-borne diseases, toxicity exposure, communicable diseases, malnutrition, and psychosocial problems (Ahern et al., 2005; Du et al., 2010; Sornsrivichai et al., 2012). In the immediate period of floods, drowning is the highest cause of mortality (Sornsrivichai et al., 2012). According to the report from The Bureau of Epidemiology Department of Disease Control, Ministry of Public Health, the mortality rate due to drowning was 61% in the flood event that occurred in the center part of Thailand, November, 2011 (Sornsrivichai et al., 2012). The intermediate health problems during floods are mostly caused by vector-borne diseases, water-borne diseases, and communicable diseases. Leptospirosis is one of rodent-borne diseases, which is an endemic disease that has been shown to increase the risk of infection in South-East Asia during floods (Alderman et al., 2012). Diarrhea outbreaks are also a common health problem found during flooding (Ahern et al., 2005). A survey of households affected by the tropical storm "Alison" showed that

diarrhea was significantly associated with floods (odds ratio = 6.2, 95 % CI: 1.4, 28.0) (Ahern et al., 2005). Moreover, floods impacted not only on physical health, but also on psychosocial health. One study found that flood exposure was associated with significantly increased depression ($p < .005$) and anxiety ($p < .0008$) episodes (Ahern et al., 2005). In addition, floods impact on healthcare management (Sornsrivichai et al., 2012).

Flooding has a direct effect on healthcare management. For example, the floods in Songkhla province, Thailand in 2010, destroyed public utilities and medical materials. Not only at the regional hospital in Hat-Yai city, but also several primary hospitals in the surrounding communities (Sornsrivichai et al., 2012). Those hospitals were, therefore, unable to provide healthcare services to the flood victims. Inadequate services during flood events could increase the level of both disability and loss of lives of flood victims. Since flood events regularly occur in the southern part of Thailand, effective flood disaster management is essential. This is especially for village health volunteers (VHVs) in order to reduce the severity and frequency of adverse effects. For this to occur, VHVs need to have knowledge and skills in preparation for flood disasters because in the initial few days of a flood disaster, it is difficult for external helpers to evacuate or help the victims in the flood affected areas as the disaster may destroy roads, bridges, ports and airports. Flood events can also disrupt communication facilities (World Health Organization [WHO] and United Nations Economic Commission for Europe [UNECE], 2010). As a result, external aid workers cannot gain access to the scene of the disaster (Kamal, 2012). Particularly VHV, who was human living in these flood areas are the first line persons who help each other.

The better the knowledge and skills of the VHVs, the lower the adverse effects of flood disasters.

According to the literature review, a disaster management framework is divided into three key phases; pre-disaster, disaster, and post-disaster phases (International Council of Nurses [ICN] & WHO, 2009; Jennings-Sanders, 2003; McLaughlin, 2011). The literature describes the “pre-disaster phase” as the disaster preparedness phase. The pre-disaster phase is related to: 1) risk, hazards, vulnerability and capacity assessment; 2) disaster management planning as the defining role and activities of helpers; and cooperation with external helpers; and 3) disaster management education for communities, and practicing the disaster management plan (ICN & WHO, 2009; Jennings-Sanders, 2003; McLaughlin, 2011). The second phase is the disaster phase that is focused on emergency management following the disaster plan in the pre-disaster phase. The third phase is the post-disaster phase. This phase primarily involves recovering the community (ICN & WHO, 2009; Jennings-Sanders, 2003). Of all three phases, the pre-disaster phase is the most important phase because this phase involves the people living in the community including the VHVs (Kamal, 2012). The Community-based Disaster Risk Management (CBDRM) framework focuses on the disaster preparedness phase, and is specifically endorsed for the community including the VHVs (McLaughlin, 2011).

Village Health Volunteers (VHVs) live in the communities, and their position is endorsed by the government. The VHVs’ job involves promoting better health for people living in their community. They act as non-healthcare providers who communicate between the people in the community and formal healthcare providers in

the primary care unit (PCU). They also are change-agents in regards to surveillance and protection for public health problems that may arise during a disaster or unexpected event (Training and Development of Public Health, North-Eastern Thailand, 2010). Their job description includes healthcare prevention, first aid, providing caring procedures and giving medications which are covered under the law of a VHV, referring patients to hospital, rehabilitation, and consumer protection (Sangsurin et al., 2012). Also, the VHVs play a critical role in a crisis or an emergency phase of a disaster in saving the lives of citizens before external teams arrive to give aid (Kamal, 2012). VHVs have superior background knowledge and skills regarding healthcare management computed to the generic population as they are required to attend a training program before receiving their qualifications. The contents of these programs though are not specifically designed for VHVs in terms of knowledge and skills regarding health related floods management (Training and Development of Public Health, North-Eastern Thailand, 2010). The training program is mostly related to general emergency management, and the knowledge and skills are inadequate for developing the VHVs' knowledge and skills in health related floods management (Training and Development of Public Health, North-Eastern Thailand, 2010). VHVs should be trained with sufficient knowledge and skills so that they may perform their job most effectively.

Although floods affect the lives of individuals and communities, well prepared and well-organized roles and/or competencies of the VHVs would prevent or at least reduce adverse effects of a flood disaster. Because they are the first responders to prepare and aid the community in these events. According to Kamal's study (2012), it was shown that the VHVs in Indonesia had a low level of knowledge in the areas

related to team organization, disaster triage, and early warnings. In terms of skills, they also had low levels of skills in areas of cardiopulmonary resuscitation and identifying the victims' health problems in the disaster scene. Therefore, surveying the VHVs' knowledge and skills regarding health related flood management in other countries is still needed.

According to the literature reviews, the factors that directly influence the VHV's knowledge and skills regarding health related flood management include training experience, working experience, and good support and/or good management of healthcare services (Buanjaroen, 2013; Kamal, Songwathana, & Sae-Sia, 2012). Most importantly, no previously published study was examined Thai VHVs' knowledge and perceived skills regarding health related to floods management. Although Kamal's study showed that some areas of VHV's knowledge and skills regarding emergency care during a tsunami event in Indonesia were at a low level, Thai VHV's backgrounds and contexts might be different from those of VHVs in Indonesia. The different training backgrounds, different knowledge and skills background, or different types or sizes of communities. Therefore, it is important to explore the knowledge and perceived skills of Thai VHVs regarding health related flood management. The findings of this study could be potentially helpful in the future for developing programs to promote VHVs' knowledge and skills regarding health related flood management. Therefore, the purpose of this study is to explore the level of knowledge and perceived skills of VHVs regarding health related flood management, especially those who are living in the flood affected areas. The knowledge and perceived skills cover the pre-disaster, disaster, and post-disaster phases.

Objectives

The objectives of this study are as follows:

1. To identify the level of knowledge regarding health related flood management among VHVs in southern Thailand.
2. To identify the level of perceived skills regarding health related flood management among VHVs in southern Thailand.

Research Questions

The research questions are as follows:

1. What is the level of knowledge regarding health related flood management among VHVs in southern Thailand?
2. What is the level of perceived skills regarding health related flood management among VHVs in southern Thailand?

Conceptual Framework

The conceptual framework of this study was constructed based on the disaster risk reduction planning process of the Community-based Disaster Risk Management (CBDRM) framework (McLaughlin, 2011) and literature reviews about health related flood management (Training and development of public health, North-Eastern Thailand, 2010; Sangsurin et al., 2012).

The CBDRM is a process in which at-risk communities are actively engaged in identification, analysis, treatment, monitoring, and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities (McLaughlin, 2011). The aim of CBDRM is to enhance the capacities of individuals within communities to determine their ability to assess the situation, identify risk reduction measures, and implement strategies to reduce the risks. The CBDRM framework has four processes including community identification, disaster risk reduction planning, implementation, and monitoring and evaluation (McLaughlin, 2011). The first process is community identification. It is used to identify the community's risks and hazards during disasters. The second process is disaster risk reduction planning. This process is aimed to develop a disaster risk reduction plan through a participatory process with the targeted community proposed in the first process. The third process is the implementation of disaster risk reduction activities as planned in the second phase. This implementation process focuses on implementing and monitoring activities with effective support and some assistance from the government and outside stakeholders. The last process is the monitoring and evaluation of the disaster risk reduction plan. The strategies used to monitor the disaster risk reduction plan includes practicing the plan by the means of role-play, as well as discussions with stakeholders. After that, the team analyzes whether or not the plan is appropriate for the particular community. If not, the team discusses strategies of how to improve the plan so it is more appropriate for the community.

In this study, the disaster risk reduction planning process was used to guide content of the knowledge and perceived skills of the VHVs in which this process

covered disaster risk reduction measures before, during and after a disaster in the community risk identification areas, the areas where floods occurred repeatedly. Although several components are listed in the list of disaster risk reducing measures as mentioned, the health related flood management before, during, and after a disaster were focused components in this study due to the fact that the role of VHVs are related to promoting health and preventing health problems of community dwellers. Therefore, the management of health before, during, and after flood disasters is a crucial role of the VHVs.

The knowledge and skills needed for health related flood management in the pre-disaster phase included the activities of 1) assessment: an assessment of the capacity of community dwellers in relation to health problems, health risk assessment, and coordination with healthcare providers, 2) management of health problems related to a flood disaster, and 3) disaster training and awareness raising.

The knowledge and skills in the disaster phase included 1) early warning, 2) first aid, 3) team organization, 4) search and rescue, and 5) logistics and communication, which are essential (Flint & Brennan, 2006). In post-disaster, the knowledge and skills that are related to disease prevention and provide health related flood services during flooding events are included (McLaughlin, 2011). Based on the literature reviewed (Training and development of public health, North-Eastern Thailand, 2010; Sangsurin et al., 2012), triage capability of VHVs during the disaster phase was added because it is important when saving people's lives and or preventing severe injuries. Therefore, the disaster triage knowledge and skills were incorporated

into the disaster phase of this study framework in order to cover all VHV's competencies. The framework of this study was depicted in Figure 1.

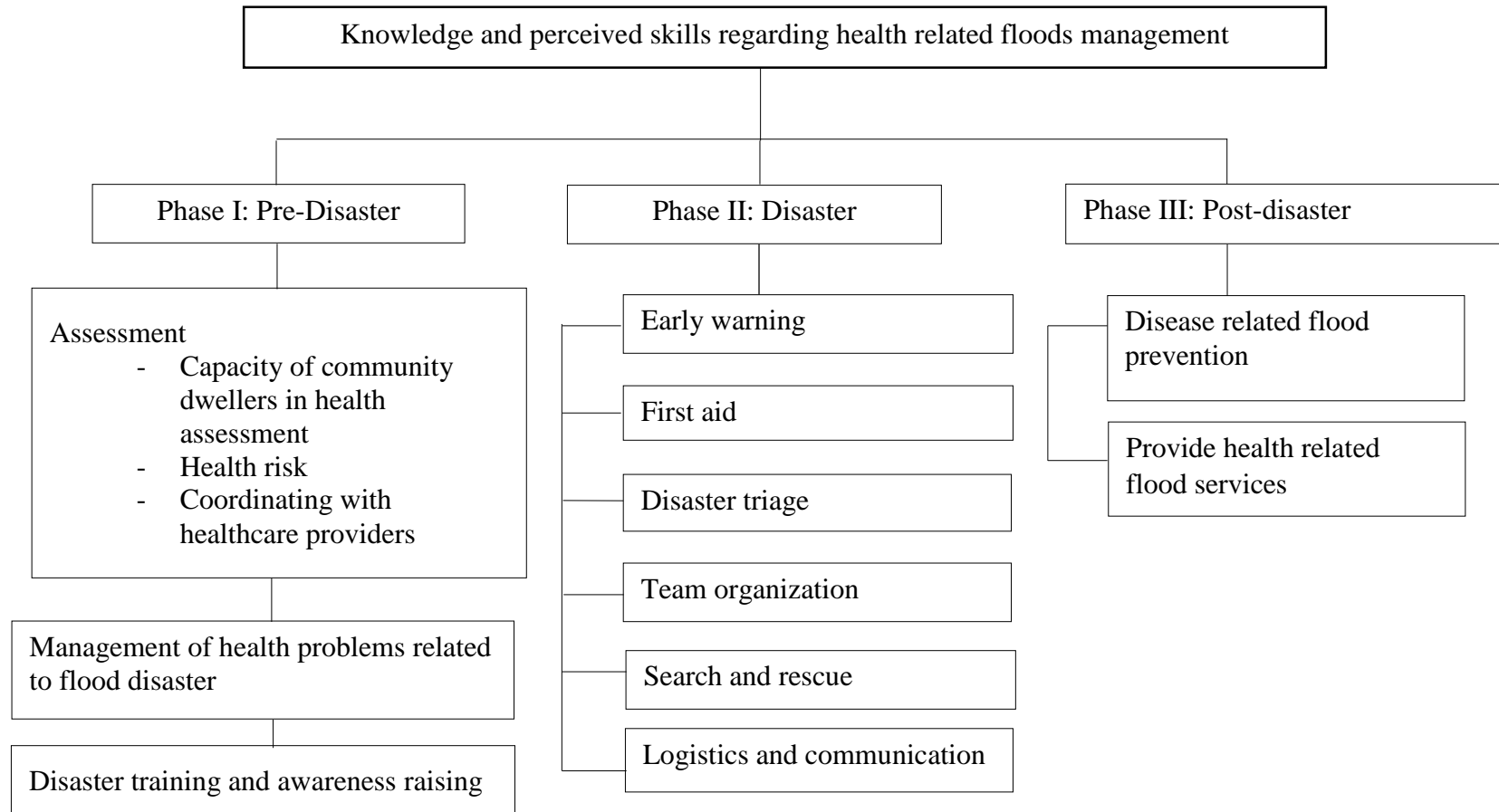


Figure 1. Conceptual framework of knowledge and perceived skills regarding health related flood management

Definition of Terms

VHVs' knowledge of health related flood management. It is defined as the VHVs' ability to remember, understand, and analyze their responsibilities in health related flood management in the pre-disaster, disaster, and post-disaster phase. Knowledge in the pre-disaster phase includes assessment (capacity of community dwellers in health assessment, health risk assessment and coordinating with healthcare providers), the management of health problems related to flood disaster, and disaster training and awareness raising. In the disaster phase, knowledge includes early warning, first aid, disaster triage, team organization, search and rescue, and logistics and communication. In the post-disaster phase, the knowledge aspect comprises of the prevention of flood related diseases, and providing health related flood services. The knowledge related floods management of VHVs was examined by questionnaires developed by the researcher that were based on the disaster risk reduction planning of the CBDRM's framework (McLaughlin, 2011) and literature reviews about health related flood management (Training and development of public health, North-Eastern Thailand, 2010; Sangsurin et al., 2012).

VHVs' perceived skills of health related flood management. It is defined as the VHVs' perception of their ability to act on health related flood management in the pre-disaster, disaster, and post-disaster phase. The pre-disaster phase includes assessment (capacity of community dwellers in health assessment, health risk assessment and coordinating with healthcare providers), the management of

health problems related to a flood disaster, and disaster training and awareness. The disaster phase includes early warning, first aid, disaster triage, team organization, search and rescue, and logistics and communication. Post-disaster phase includes flood related disease prevention and providing health related flood services. The perceived skills related floods management of VHVs were examined by questionnaires conducted by the researcher that were based on the disaster risk reduction planning process of the CBDRM's framework (McLaughlin, 2011) and literature reviews (Training and development of public health, North-Eastern Thailand, 2010; Sangsurin et al., 2012).

Scope of the Study

This descriptive study was conducted among VHVs in Southern Thailand, to examine knowledge and perceived skills in relation to health related flood management. The VHVs were selected from 6 provinces out of the 14 provinces in southern Thailand where floods frequently occur. The study was conducted between November 2013 and March 2014.

Significance of the Study

The findings of this study can be used as foundation information for conducting appropriate disaster management programs for VHVs to improve their knowledge and skills in disaster management, especially health related flood

management. In addition, the findings could encourage VHVs to be more aware of their VHV role in disaster management.

Chapter 2

Literature Review

The aim of this study was to describe the knowledge and perceived skills regarding health related floods management among village health volunteers (VHVs) in southern Thailand. This covers the following topics:

1. Overview of disasters
 - 1.1. Definition of disasters
 - 1.2. Types of disasters
 - 1.3. Adverse effects of disasters
2. Overview of floods
 - 2.1. Definition of floods
 - 2.2. Adverse effects of floods
3. Disaster management frameworks
 - 3.1. Jennings Disaster Nursing Management Model
 - 3.2. ICN Framework of Disaster Nursing Competencies
 - 3.3. Community-based Disaster Risk Management (CBDRM)

Framework

4. Village health volunteers
 - 4.1. The criteria to be selected as village health volunteers
 - 4.2. Job description of village health volunteer

4.3. Village health volunteer's law regarding healthcare services

4.4. Village health volunteers' competencies regarding health related floods management

5. Facilitating factors related to VHV's knowledge and skills

Overview of Disasters

Disasters are caused by either nature or man-made. In the last 10 years, the adverse effects of natural disasters have included damages to health, economics, societies, and the environment (Sornsrivichai et al., 2012). Moreover, in the last 5 years man-made disasters have increased worldwide, including in Thailand. There are several types of disasters that have occurred in Thailand. Those are floods, landslides, Tsunami, and terrorisms. Disasters cause loss or damage of property, physical disability, psychological problems, social and economic disruption, environment destruction, and loss of lives (The United Nations International Strategy for Disaster Reduction (UNISDR), 2009). The following sections were discussed the definitions, types, and adverse effects of disasters focusing particularly on floods disaster.

Definition of disasters. There are several definitions of disasters that are outlined below. The International Council of Nurses (ICN) and the World Health Organization (WHO) (2009) define disasters as the destruction of the environment, the economic, social and healthcare infrastructure. The worst outcome of disasters is loss of lives (ICN & WHO, 2009). Adelman and Legg (2009) defined a disaster as any event that leads to requiring a response beyond which the affected community can deal with

locally. Another definition defines a disaster as a serious disruption of a community or society causing widespread human, material, economic or environmental losses, which exceeds the ability of the affected community or society to cope with using its own resources (International Strategy for Disaster Reduction [ISDR], 2009). In addition, a disaster occurs when a hazard impacts on a community that exceeds the capacity of the community to deal with disaster management. A disaster can be represented by the following mathematic formula (McLaughlin, 2011; Sornsrivichai et al., 2012):

$$\text{Disaster} = \frac{\text{Hazard impacts}}{\text{Community capacity}}$$

Types of disasters. According to the International Council of Nurses and World Health Organization (2009), disasters are classified as either “natural” or “technological”. However, most papers classified disasters as either natural or man-made (Adelmen & Legg, 2009; Kamal, 2012; McLaughlin, 2011 Sornsrivichai et al., 2012). There are key differences between these two types of disasters. Natural disasters include storms such as hurricanes and cyclone, floods, earthquakes, extreme temperatures, tsunamis, volcanic eruptions, and fires (Adelmen & Legg, 2009). Natural disasters are brought about by changes in natural phenomena (IFRC, 2013). The severity of the adverse effect of natural disasters is depended on the vulnerability of the population (IFRC, 2013). Man-made disasters are classified as anthropogenic disasters, and they occur as a result of human intent, error, or as a result of a failed systems (International Federation of Red Cross and Red Crescent Societies [IFRC], 2013). Man-made disasters include chemical transportation, biological, and radiological accidents

as well as acts of terrorism (ICN & WHO, 2009). In this study, the reviews were focused only on flood disasters.

Adverse effects of disasters. According to the literature reviews, both natural and man-made disasters can disrupt a community's infrastructure including its water, transportation, communication, electricity, and public health services (Sornsrivichai et al., 2012). In addition, healthcare cost can also increase directly and indirectly (ICN & WHO, 2009). In this study, the review was focused only on the natural disasters' adverse effects, those are regrading health related floods management.

Overview of Floods

Floods disasters are the most common natural disaster that occurs in both developed and developing countries (Ahern, Kovates, Few, & Matthies, 2005; IFRC, 2013). The large flood that occurred in Thailand from July 2012 to March 2013 impacted 65 provinces of Thailand. Also in Thailand, it has been found that flood events have increased in both frequency and severity (Department of Disaster Prevention and Mitigation [DDPM], Ministry of Interior, Thailand, 2014). In these events, a large number of people are affected by the flooding. For example, in 2009 a total of 8,881,758 people were affected by floods event, and in 2010 there were 13,485,963 people affected. In an event that occurred in 2011, 16,224,302 people were affected (DDPM, Ministry of Interior, Thailand, 2014). These disasters also damaged the country's economic structure. For example, 5,252 million Bath were lost in the flood events of 2009, a loss of 16,338 million Bath was recorded in a 2010 event, and in 2011 there

was total loss of 23,839 million Bath (DDPM, Ministry of Interior, Thailand, 2014). The definition of floods and adverse effects regarding flood disaster will be explained in the next sections.

Definition of floods. A flood is a natural disaster that causes damages to both people's properties and lives. It also results in damages to the environment in the community. A flood is an overflow of an expanse of water that submerges land. Flood situations are variable, and can occur as a result of spring snowmelt, severe thunderstorms, prolonged rains, inadequate drainage or failure of levees and dams (Sornsrivichai et al., 2012). The main cause of flooding in Thailand is heavy rainfall, which was the cause of the severe flooding of 2011 (Thai Meteorological Department, 2014).

Adverse effects of floods. Flood disasters damage and devastate homes and farms, displace families as well as pets and livestock, damage crops, and disrupt agriculture processing and business. Flood disasters impact not only on health of the people living in the community, but also on the healthcare services and management of the regional and/or primary care hospitals (Du et al., 2010). The following section illustrated the adverse effects of floods focused on health impacts. The health impacts caused by flood were classified according to onset time and type of health problems.

Based on the onset time of health problems occurred during floods, health impacts caused by floods were divided as immediate-term, medium-term, and long-term health impacts (Du et al., 2010).

Immediate-term health impacts. The following health problems can occur within the first few hours of the emergency phase of a flood. The health problems include drowning, acute trauma, rodent-borne diseases, injuries, and inadequate supplied medications and/or treatment, such as no shelters and inadequate health-care providers during floods events to care for chronically ill individuals (Ahern et al., 2005; Du et al., 2010; Sornsrivichai et al., 2012).

Medium-term health impacts. The health problems described below mostly occur during the recovering phase. The health problems include vector-borne diseases, water-borne diseases, toxicity exposure, communicable diseases, malnutrition, and psychosocial problems (Ahern et al., 2005; Du et al., 2010; Sornsrivichai et al., 2012).

Long-term health impacts. This type of health problems occur in the reconstruction or recovery phase, which can be from a few months up to several years after the flood disasters have taken place. The health problems found in this phase include non-communicable diseases, disability, psychosocial problems, malnutrition, and poor economic status (Ahern et al., 2005; Du et al., 2010; Sornsrivichai et al., 2012).

According to types of health during floods, there were nine types as drowning and acute trauma, injuries, toxic exposure, communicable diseases, rodent-bone diseases, vector-borne diseases, water-borne diseases and fetal oral diseases, respiratory and skin infections, and psychosocial problems. The details of each type of health problems were explored in the following sections.

Drowning and acute trauma. The majority of immediate fatalities occurred in flash and coastal floods due to drowning and acute trauma (Alderman,

Turner, & Tong, 2012). According to the Bureau of Epidemiology, Department of Disease Control, and Ministry of Thai Public Health report (2011), the mortality rate due to drowning was 61% during the central Thailand flood in November, 2011, which was the highest cause of death (Sornsrivichai et al., 2012).

Injuries. Injuries could be occurred before, during and after a flood disaster, though the majority of injuries occur during the process of cleaning up (Ahern et al., 2005; Alderman et al., 2012). The common causes of nonfatal injuries during flood disasters include cuts, falls, being struck by falling debris, or objects moving quickly in flood water (Ahern et al., 2005; Alderman et al., 2012). For example, in a community survey of the 1988 floods in Nimes, France, 6% of surveyed households reported mild injuries related to the flooding (Ahern et al., 2005).

Toxic exposure. Floods can act as a trigger, releasing chemicals that are already stored in the environment (Alderman et al., 2012). According to a review of longitudinal data on a flood-related chemical contamination incidence in the United Kingdom, it was revealed that the relationship between chemical contamination incidences during floods, and population morbidity and mortality remained inconclusive (Euripidou and Murray, 2004 as cited in Alderman et al., 2012). In post-flood events, land has been contaminated by carbon monoxide, pesticides, agricultural chemicals, dioxin and a number of heavy metals. Moreover, Exposure to such contaminants was known to be associated with cancer as well as cardiovascular, gastrointestinal, kidney, liver, and neurological diseases (Euripidou and Murray, 2004; Fox et al., 2009 as cited in Alderman et al., 2012).

Communicable diseases. According to the World Health Organization (2011), an increased risk of communicable diseases, endemic diseases and epidemic

diseases occurred immediately of floods. The most common diseases resulting from water contamination include cholera, diarrheal disease, hepatitis A and E, leptospirosis, parasitic diseases, rotavirus, shigellosis, and typhoid fever (Alderman et al., 2012). Specific water-borne diseases related to floods include wound infections, dermatitis, conjunctivitis, and ear, nose and throat infections (Ahern et al., 2005; Alderman et al., 2012). Also, flooding disasters are associated with an increased risk of water-borne and vector-borne diseases (Ahern et al., 2005; Alderman et al., 2012).

Rodent-borne disease. Diseases transmitted via rodents may also increase during heavy rainfall and flooding because of altered patterns of contact. High incidences of Hantavirus pulmonary syndrome and leptospirosis have been reported during flood events. There have also been reports of flood associated outbreaks of leptospirosis in a large number of countries including Argentina, Brazil, Cuba, India, Korea, Mexico, Nicaragua, Portugal, and Puerto Rico (Ahern et al., 2005). Leptospirosis is an endemic disease mostly found in South-East Asia. Leptospirosis has been found to increase the risk of infection during floods (Alderman et al., 2012).

Vector-borne disease. Floods and vector-borne diseases are closely related to one another. Vector-borne diseases are transmitted to humans through the bites of mosquitoes carrying the virus, and onset of the diseases in humans usually occurs several weeks following the floods (Alderman et al., 2012). Mosquitoes can transmit diseases such as malaria, dengue and dengue hemorrhagic fever (Alderman et al., 2012). For example, the number of malaria cases increased in Mozambique when a flood occurred in the year 2000 (Ahern et al., 2005).

Water-borne and fetal oral disease. According to literature reviews, there was potential for increased fecal and oral transmission of diseases. For example,

the result from a survey based study reported that cholera, cryptosporidiosis, nonspecific diarrhea, poliomyelitis, rotavirus, typhoid, and paratyphoid increased following floods (Ahern et al., 2005). The risk of contracting a gastrointestinal disease following flooding is higher in environments with poor hygiene and inadequate provisions of clean drinking water (Alderman et al., 2012). In Indonesia, it was found that paratyphoid fever increased following floods with an odds ratio of 4.52 (95 % CI: 1.90, 10.73) (Ahern et al., 2004). Another review found that the risk of cryptosporidiosis increased during flood events, with an odds ratio of 3.08 (95 % CI: 1.9, 4.9) (Ahern et al., 2005). A survey of households affected by tropical storm Alison found that diarrhea was significantly associated with residing in a flooded home with an odds ratio was 6.2, (95 % CI: 1.4, 28.0) (Ahern et al., 2005). Also, it was found that an increased risk of developing gastrointestinal diseases is associated with coming into contact with water during flooding in Germany (2002) (Alderman et al., 2012).

Respiratory and skin infections. Reports from the United States and South Asia revealed that upper respiratory infections were the most common types of infectious diseases occurring after floods (Alderman et al., 2012). For example, during flooding in Thailand (2005), a total of 102 patients complained of skin problems. Out of these individuals, 59 people (58%) were diagnosed with inflammatory dermatoses, and 40 of them (39%) were diagnosed with an infectious skin conditions (Alderman et al., 2012).

Psychosocial problems. Psychosocial problems as a result of longer-term losses and stress are also caused by flood events (Alderman et al., 2012). One study found that flood exposure was associated with a significant increase in depression ($p < .005$) and anxiety ($p < .0008$), especially in individuals with higher levels of pre-

flood depressive symptoms and those from lower socioeconomic groups (Ahern et al., 2005). In a longitudinal study conducted by Ginexi et al. (2000) (as cited in Ahern et al., 2005), it was found that respondents with a pre-flood depression diagnosis were 8.6 times more likely to be diagnosed with post-flood depression compared to those without a pre-flood depression (Ahern et al., 2005). In addition, flood disasters also impacted on the mental health of children. The behavior of bedwetting among children aged 2-9 years old increased from 16.8 % before flooding, to 40.4 % following the flooding. In addition, 16 children out of 162 children were found to be very aggressive post-flood (Ahern et al., 2005). A paper from China reported that suicide rates in the Yangtza Basin, an area affected by periodic floods, were 40 % higher than that in the rest of the country (Ahern et al., 2005).

Disaster Management Frameworks

Disaster management frameworks are used as guidelines for disaster management plans. The results from literature reviewed was that there were many disaster frameworks that can be referred to. Based on the literature, there are three disaster frameworks that have been proposed for village health volunteers. The first one is Jennings' disaster nursing management model (Jennings-sander, 2003). It is a framework that presents an overview of the concept of disaster management specific for healthcare professionals in the community. The second framework is the ICN Framework of Disaster Nursing Competencies (ICN & WHO, 2009). It describes the nurse's competencies regarding disaster management. The last framework is the community-based disaster risk management (CBDRM) framework (McLaughlin,

2011). This framework is appropriate for the village health volunteers (Kamal, 2012). The details of each framework are explained in the following section.

The Jennings Disaster Nursing Management Model. The Jennings Disaster Nursing Management Model was developed to introduce disaster nursing content to teach nursing students in a community health course (Jennings-Sanders, 2003). Jennings-Sander applied this model with nursing students. An explanation of the model was given to nursing students via lecture and case study. The result showed that this model was useful and could be applied to nurses to manage disaster events (Jennings-Sanders, 2003).

According to Jennings disaster nursing management model, disaster management has four phases including pre-disaster phase, disaster phase, post-disaster phase, and client or population outcome phase. Nowadays, the pre-disaster phase and disaster phase are essentially phases for everyone to be involved in because effective preparedness in pre-disaster phase and effective emergency management in disaster phase can reduce adverse effect of disasters.

Pre-disaster phase. There are three sub-steps within this phase. These steps are: assessment, education, and planning.

Assessment. This step involves the assessment of the work place in terms of resources and risks. The identification of resources includes adequate funds, established shelters, and cooperative agreements with other community agencies, prior training related to disaster education for employees, an existing disaster management plan, and existing disaster assessment tools (Jennings-Sanders, 2003).

Education. Nurses incorporate primary preventative interventions in this phase, including educating the people of the town to take measures such as having useful emergency phone numbers easily available, having a few sandbags or floorboards prepared to block doorways, owning a flood kit, establishing a disaster plan with loved ones, being aware of how to turn off the electricity and gas, storing valuables, having extra medications on hand, and contacting the insurance company to ensure adequate flood coverage (Jennings-Sanders, 2003).

Planning. The planning step involves: defining the role of all people, developing cooperative agreements with community agencies, developing or activating disaster assessment tools, developing disaster plans, seeking volunteers, and primary preventative intervention. This planning step would provide information to the community on how individuals can prepare themselves for a disaster. Seeking volunteers would encourage the people in the area to be involved with the community's preparations for a possible disaster. Allocating resources is highly important as well as providing primary shelter and medical facility in safe locations. In addition, if shelter is difficult to procure, selecting a church or school as an alternate shelter site is a good backup plan (Jennings-Sanders, 2003).

Disaster phase. In the disaster phase, nurses take on many roles such as caregiver, educator, and case manager (Jennings-Sanders, 2003).

Caregiver. As a caregiver, nurses have to triage clients, and refer victims to hospital, church, or school. Nurses focus on all aspects of care, including physical, emotional, psychosocial, and cultural.

Educator. Nurses may briefly educate patients regarding secondary prevention, such as early diagnosis, and promote treatment of health problems.

Case management. The nurses may volunteer to help victims. A nurse could make referrals to emergency room and clinics, and it is essential for the nurse to keep record of details such as why, where, and when victims were referred.

Post disaster phase. According to Jennings-Sanders (2003), nurses can re-assess their community's disaster plan. Nurses analyze the strengths and weaknesses of the plan's assessment, education, and planning steps. After that, re-planning and practicing the plan would be ideal in order to be well prepared for next disaster. In addition, nurses will also review case management records of individuals and follow up with those patients.

Client/population outcomes. This last phase is the implementation phase, which looks into the goals of the disaster management plan implication including decreased mortality rates, decreased healthcare costs, decreased disaster related costs, improved health status, increased disaster nursing knowledge, increased effectiveness of the disaster nursing plan, and increased collaborative relationships between nurses and other community agencies (Jennings-Sanders, 2003).

The Jennings Disaster Nursing Management Model is useful for community nurses in disaster management. Even though the Jennings disaster management model is useful for nurses who have better background knowledge and perceived skills than VHV, it also cannot be applied to VHV because this model focuses on nursing knowledge and skills of disaster management.

The ICN Framework of Disaster Nursing Competencies. Disaster occurrence has been found to be increasing worldwide. Disaster events can impact the public health in terms of deaths, injuries, infrastructure and facility damage and

destruction, suffering, and loss of livelihoods (ICN & WHO, 2009). Developing nations, and lower resourced countries and communities are particularly vulnerable to the impacts of disasters on health systems, healthcare, and overall social and economic functioning (Dorsey, 2014).

Nurses as the largest group of professional healthcare providers when faced with a disaster situation play a vital role. They serve as the first responders, triage officers and care providers, coordinators of care and services, providers of information or education, and as counsellors (ICN & WHO, 2009). However, health systems and healthcare delivery in disaster situations are only successful when nurses have the fundamental disaster competencies or abilities to rapidly and effectively respond (Dorsey, 2014).

The International Council of Nurses and the World Health Organization have both expressed concern for the acceleration of efforts to improve the capacities of nurses at all levels to safeguard populations, limit injuries and deaths, and maintain a functioning health system, and community well-being in disaster scenarios (Dorsey, 2014). In response to this issue, the International Council of Nurses and the World Health Organization designed the ICN Framework of Disaster Nursing Competencies. This framework focuses on the ICN Framework of competencies for generalist nurses, though does not address the additional competencies required for advanced practice nurses (ICN & WHO, 2009).

The ICN Framework of Disaster Nursing Competencies defines a nurse's competencies to organize under four areas as: mitigation/prevention, preparedness, response, and recovery/rehabilitation competencies (ICN & WHO, 2009). Within these four areas, 10 domains were identified: 1) risk reduction, disease

prevention and health promotion, 2) policy development and planning, 3) ethical practice, legal practice and accountability, 4) communication and information sharing, 5) education and preparedness, 6) care of the community, 7) care of individuals and families, 8) psychological care, 9) care of vulnerable populations, and 10) long-term recovery of individuals, families and communities.

The ICN Framework of Disaster Nursing Competencies was created in order to explain disaster management. Regardless, this framework is fit for general nurses or professional healthcare providers. In addition, it is complicated to apply in community due to the competencies being based on the nurse's knowledge and skills. Therefore, this framework would not be appropriate for applying to the VHV's.

The Community-Based Disaster Risk Management (CBDRM) Framework. The Community-Based Disaster Risk Management (CBDRM) is employed to improve people's capacity for coping with disaster risks and reduce their vulnerability thereby developing safer and more resilient communities. These approaches have been recognized and widely practiced by various community groups, national and international organization, and government departments for over two decades in South East Asian countries (McLaughlin, 2011). The CBDRM framework was built by the World Conference on Disaster Reduction in 2005 in Kobe, Japan. (Flint & Brennan, 2006). This framework was developed from the Hyogo Framework for Action (HFA) by the Member States of the United Nations. The CBDRM framework has been applied in 168 countries worldwide including Thailand.

According to the Department of Disaster Prevention and Mitigation, Ministry of Interior, Thailand, disaster preparedness is the best way to prevent and to

decrease adverse effects of disasters. Therefore, disaster preparedness is important for all people living in communities- especially those living in affected areas (Sonprasert et al., 2012). The key concept of disaster preparedness is the conceptual change from “disaster occurs due to fate” to “disaster preparedness can prevent disaster adverse effect” (Sonprasert et al., 2012). The Thai DDPM, has applied the CBDRM framework to conduct a disaster plan in 2004 (Sonprasert et al., 2012).

The CBDRM framework focuses on disaster risk reduction planning (DRR) (Sonprasert et al., 2012). The CBDRM has four processes including community identification and disaster risk assessment, disaster risk reduction planning, implementation, and monitoring and evaluation (McLaughlin, 2011). The details of each process is illustrated in the following section.

Community identification and disaster risk assessment. This first process is to identify the community’s capacity, disaster risk, and vulnerable groups such as, woman, children, elder and disability person (McLaughlin, 2011). Hazard assessment involves assessing the incidence and frequency of disaster followed by an analysis of the risk factors and root causes of problems that arise. In addition, analysis of the community resources- such as human, materials, equipment and organizations- are also necessary (McLaughlin, 2011). Moreover, promoting the community to better understand the risk factors and root causes is important. Employing these strategies can improve more people’s perception of risks (McLaughlin, 2011).

Disaster risk reduction planning. Disaster risk reduction planning is the next process that is built on community risk assessment analysis (McLaughlin, 2011). The first step in this process is setting a vision and objective for disaster planning. The goal of disaster management ideally should come from discussions between community

member and stakeholders (McLaughlin, 2011). The second step is to change climate mitigation measures. It is more clear to community members when the activities in each phase that occur before, during, and after disaster are identified (McLaughlin, 2011). The contents of disaster plans need to be completely followed using disaster risk reduction measures. Disaster risk reduction planning is divided into three phases of a disaster as pre-disaster, disaster, and post-disaster phase. The risk reduction plan of each phase of disasters is explained below.

Disaster risk reduction plans in the pre-disaster phase involves having a policy and strategy regarding disaster management, risk assessment systems, communication systems as early warning systems, coordination systems, disaster planning, and disaster training and awareness programs.

Disaster risk reduction plans during disaster phase are used to inform community members of knowledge and skills regarding emergency responders covered the roles of as coordinators, early warning activities evacuators, administrators of first aid, team organization, search and rescue, logistics and public kitchen mobilization, security and information management (Flint & Brennan, 2006; McLaughlin,2011).

Disaster risk reduction plans after the disaster phase focus on the recovery and support of water and foods, transportation, hygiene care, disease prevention, providing healthcare services, and the improvement of infrastructure (McLaughlin,2011). After developing the disaster plan, the committee implements this plan within the next step.

Implementation of disaster risk reduction activities. According to the disaster risk reduction plan in the previous step, human, financial, and technical resources are allocated and organized to ensure effective and timely implementation. It

is also to ensure good coordination between people of the community, government and stakeholders (McLaughlin, 2011). In addition, this phase will focus on the implementation of knowledge and skills of disaster management to the people living in the community and stakeholders (McLaughlin, 2011).

Monitoring and evaluation. The last process of the CBDRM framework is monitoring and evaluation. This process is to review the progress, and to support the decision-making and management system (McLaughlin, 2011).

The CBDRM framework is specific for people in communities as this framework was developed for preparing communities to manage disasters. The people's competencies in disaster management were described in the contents of the second process of disaster reduction planning.

In summary, most disaster management frameworks propose three phases including pre-disaster phase, disaster phase, and post-disaster phase. The Jennings Disaster Nursing Management Model also added a positive client/population outcomes phase (Jennings-sander, 2003). In this study, the contents of knowledge and perceived skills were constructed based on three phases of disaster management.

Therefore, the researcher developed this study framework based on the CBDRM framework. The framework of this study focused only on disaster risk reduction planning process because this process was to describe the activities that were covered in the three phases of disaster management: pre-disaster, disaster, and post-disaster phase. Those knowledge and skills focused only on activities that were related to health related floods management in each disaster phase. Knowledge and skills in pre-disaster phase included 1) assessment as capacity in health assessment, health risk assessment, and coordination with healthcare providers, 2) management of health

problems related to flood disaster, and 3) disaster training and awareness raising. In the disaster phase, knowledge and skills of 1) early warning, 2) first aid, 3) team organization, 4) search and rescue, and 5) logistics and communication are needed (Buajaroen, 2012; Kamal, 2012; Kamal, Songwathana & Sae-Sia, 2012; Williams, Nocera, & Casteel, 2008). In post-disaster, knowledge and skills that were related to flood related disease prevention and providing healthcare services were included (McLaughlin, 2011). Based on the literature reviews (Training and development of public health, North-Eastern Thailand, 2010; Sangsurin et al., 2012), triage knowledge and skills of VHVs during disaster phase also was important to save people's lives and prevent serious injuries. Therefore, disaster triage knowledge and skills were also added into the disaster phase of this study framework in order to cover all VHVs' competencies.

Village Health Volunteer

The Village Health Volunteers (VHVs) are people living within the community. The VHVs are first chosen by members of the community, before their position is endorsed by the government (Sangsurin, Chatchawanyungkun, Pramonjareonkit, & Sreesong, 2012). The follow section will review VHVs roles and what their job entails.

The criteria to select village health volunteers. Firstly, the village committee is set-up. Then, each VHV is selected by 10 to 15 of the households from the village. The Ministry of Public Health assigns one VHV to be responsible for these

10-15 households (Training and Development of Public Health, North-Eastern Thailand, 2010; Sangsurin et al., 2012). After being selected as the VHVs, they attend the VHV training course. This course is provided by the Ministry of Public Health. The contents of the training course is followed by the competencies of VHV endorsed by the Ministry of Public Health based on the Refresher Training Curriculum for Village Health Volunteers 2010 (Primary Healthcare Division, 2010). The contents of VHV training course is as follows:

1. The concepts and ideal characteristics of VHVs including skills of the public health, VHV's competencies, and roles of VHVs
2. The public health communication
3. The public health management
4. Primary care procedures and public health problems management

The primary care procedures includes disaster management. Disaster management described the basic knowledge of a disaster, a VHV's responsibility during disaster event, and basic cardiopulmonary resuscitation (CPR). To be more specific, disaster management contents are focused on the disaster phase (emergency phase), which includes the assessment of disaster situations, assessment of a victims condition, triage, and CPR performing.

Job description of village health volunteers. The roles of VHVs are to promote better health of people living in the community, and to communicate between people in the community and formal healthcare providers in the primary care unit (PCU). Their role is also to change agents in surveillance and protection of the public health problems including disasters or unexpected events (Training and Development

of Public Health, North-Eastern Thailand, 2010; Sangsurin et al., 2012). Moreover, they organize the activities to promote the equality of public health. They act as educators regarding health prevention, though are considered as non-professional healthcare providers. Their job description includes healthcare prevention, first aid, providing caring procedures and giving medications that is covered under the law of a VHV, referring patients to hospital, rehabilitation, and consumer protection (Sangsurin et al., 2012).

According to Refresher Training Curriculum for Village Health Volunteers (2010), the VHV's responsibilities are as follows:

1. Promote healthy behavior, and to be change agent by use their behaviors as a good model. They are responsible for promoting, controlling and prevention of health problems. They act as leaders of the activities, which improves the quality of life for people in the community.

2. Provide a quality environment, prevent global warming, and preventing communicable diseases. VHVs demonstrate leadership for supervising health promotion and monitoring health problems within communities, such as malnutrition, mother and child issues, pregnancy care, vaccination, and prevention of communicable disease.

3. Develop a proposal for solving healthcare problems, based on the assessed information. Then following this, requesting support in terms of finance from the Sub-District Administrative Organization (SAO) or another resource.

4. Inform professional healthcare providers to people in the community of healthcare information.

5. Coordinate between people in the community and professional healthcare providers, companies, and healthcare organization. Also they act as a coordinator to build a rapport of teamwork. Moreover, VHVs act as an organization academic committee where they can search and learn new knowledge.

6. Advocate for the Universal Coverage (UC) rights. They act as both coordinators to communicators with heads of the community, and SAO for setting the policies to provide sufficient UC. Moreover, these policies ideally should be based on sufficient economy philosophies.

7. Manage community health problems as non-professional healthcare providers, such as primary care and first aid providers. They also promote individuals to use condom by distributing free condoms to people. VHVs can measure blood pressure and blood sugar levels, and referral patients to hospitals.

8. Work in primary healthcare. The primary healthcare center is where the VHV's office is situated a place where healthcare services are provided. Services include dressing wounds, providing certain medicines such as paracetamol, mixture stomachic, or oral rehydration salts (ORS). Moreover, they give health education for community members, and meetings at primary healthcare center.

Low of village health volunteer regarding healthcare services.

According to the VHV's roles, they act as non-professional healthcare providers. Their performances in healthcare procedures should follow the Ministry of Public Health regulation from 1996 (based on section 5 and section 26 (4) of medical profession act of legislation, 1982). This was promulgated by the Ministry of Public Health (Chatchawan-Yangkun, Pawangkarat, Prakairungthong, & Natikhun, 2011).

The VHVs who can provide healthcare procedures need to attend a VHV training program, and are then certified by the Ministry of Public Health. Lawful healthcare procedures for VHVs are as follows.

1. Provide first aid care, such as managing fever, fever with rashes, fever with chills, coughs, headache, low back pain, stomachache, constipation, diarrhea, parasitic infestation, abscess, skin rash, toothache, gingivitis, pain at eyes or ears, beriberi, and anemia.

2. Provide emergency first aid care, such as wound care, stability of bone fracture, joint dislocation, managing burn wounds, fainting, convulsions, drowning, snake bites, animal bites and chemical contact.

3. Give certain medications, which are enacted in the VHVs hand book.

Village health volunteers' competencies regarding health related floods management. Based on the reviewed literature, the components of a non-professional community health worker's competencies including VHVs in disaster management during floods is composed of (1) early warning, (2) first aid, (3) disaster triage, (4) logistic and communication, (5) knowledge and skill of search and rescue, (6) team organization, and (7) home visits (Buajaroen, 2012; Kamal, 2012; Kamal, Songwathana & Sae-Sia,2012; Williams, Nocera, & Casteel,2008). The crucial components recommended for disaster management are team organization, logistics and communication. In addition, first aid and disaster triage are next in necessary competencies for community nurses and community workers. Moreover, community nurses and community workers including VHVs need knowledge and skills of early warning signs of disasters, and for the search and rescue of victims. (Buajaroen, 2012;

Kamal, 2012; Kamal, Songwathana & Sae-Sia, 2012). The VHV's competencies in floods disaster management are explained in the following section.

Early warning. According to Kamal, Songwathana, and Sae-Sia (2012), VHVs must be prepared to notice the warning signs of a disaster, and- when they identify a sign of approaching disaster they should notify and inform the people in the community. Also, VHVs monitor the warning signs of disasters and communicate with the Sub-District Administrative Organization (SAO), as to where the disaster center is located (Sukkumneard et al., 2012).

First aid. Basic first-aid techniques, such as clearing an airway, performing mouth-to-mouth resuscitation, carrying out CPR, treating shock, controlling bleeding, and applying a splint, are needed for the VHVs' to perform their role effectively (Kamal et al., 2012). Based on Sukkumneard et al. (2012)'s study, VHVs also need to have knowledge and skills of moving or transferring victims from disaster areas.

Disaster triage. VHVs needed to have knowledge of triage classification, namely Simple Triage and Rapid Treatment (START), by using a color coding system (Kamal et al., 2012). According to the Refresher Training Curriculum for VHVs in 2010 (Thai Primary Healthcare Division, 2010), Thailand VHVs' were recommended to be able to classify or triage the victims into three categories: emergency, urgent, and non-urgent. Emergency victims are people who need immediate treatment and transport as soon as possible. For example, these victims may experience airway obstruction, shock or sever bleeding. Urgent patients are patients who need constant observation and rapid treatment, such as for a drug over dose, multiple major fractures, or burns. Non-urgent victims are people who need treatment

that can be delayed. For example, minor fracture with no bleeding, and psychiatric diseases (Primary Healthcare Division, 2010).

Logistics and communication. In a crisis situation, healthcare providers should be able to provide information related to the disaster situation, and communicate with government leaders and collaborate with related partners, such as with hospitals, police and fire departments. The VHV should also provide shelters and temporary camps for families in the community (Kamal et al., 2012).

Knowledge and skills of search and rescue. According to Kamal et al. (2012), after triage and relocating the victims from the impact zone, VHVs should be able to re-triage and provide ambulance areas. they also should be able to perform the care necessary to save victims lives and prevent major injury that is within their abilities and also given the limited resources they have available in treatment stations. The next action is preparing transportation for the victims to a health center, or hospital, by contacting an ambulance or at least providing a stretcher for the injured persons.

Team organization. In disaster situation, the VHVs need to communicate with the local government, local population, community leader, and health professionals in disaster areas effectively, and also collaborate with other organizers (Kamal et al., 2012). According to the cross-sectional descriptive study, which aimed to study factors relating the role performance of VHVs in Sisaket province, it was found that team organization positively correlated to the performance of the VHVs ($r = .55, p < .01$) (Thammakong, Shuaytong, & Kajornchaikul, 2012). Therefore, team organization is suggested to promote VHV's competency for disaster management (Thammakong, et al., 2012).

Home visit. Before flood disasters occur, VHVs visit people in the community to assess how many vulnerable people are living in the community. Health information, such as signs and symptoms, basic health information, and healthcare needs, are also required to be collected. This information helps the VHVs to create a disaster preparedness plan that would be implemented during the disaster phase (Bunjaroen, 2012; Sukkumnead et al., 2012). During the disaster phase, VHVs are recommended to visit the victims or vulnerable people at their homes (Sukkumnead et al., 2012).

According to literature reviews, most of previous published studies were focused on determination and improvement of knowledge and skills regarding health related floods management among healthcare providers (Harman & Pinto, 2007; Hammad, Arbon, Gebbie, & Hutton, 2012; Sato, Atogami, Nakamura, Kusaka, & Yoshizawa, 2014). Although, some studies were focused on community volunteers or lay persons, flood management explored in these groups of participants were related to skills of evacuation of flood victims, or skills of distribution of food, water, and shelter for the victims (Jha, & Jha, 2011; Tariq, & Giesen, 2012; Somrotrat, 2014;). However, no previous published study focused on health management of the flood victims except one recent study in Indonesia (Kamal et al., 2012). The result from Kamal's study (2012) showed that the VHVs in Indonesia had lower levels of knowledge in the areas related to team organization, disaster triage, and early warning. In terms of skills, they had lower levels in areas of CPR and triage to identify the victims at the disaster. However, no previously published study examined Thai VHVs' knowledge and perceived skills regarding health related to floods management

Facilitating Factors Related to Knowledge and Perceived Skills

The result from the literature showed that factors that promote the VHVs' competencies regarding health related floods management included training experience, work experience, and good support and management. It was found that training experience was the highest recommendation to promote competencies of disaster management of the VHVs (Buanjaroen, 2013; Kamal, 2012; Kamal, et al., 2012). In addition, work experience was the secondary recommendation. Good support and good management of healthcare services was the last recommended factor to promote competencies of the VHVs in disaster management (Buanjaroen, 2013).

Training experience. According to Kamal et al. (2012), training and education are an essential part of preparedness skills for VHVs when responding to a disaster. The systemic review showed that training interventions increased disaster-related knowledge (Williams, Nocera, & Casteel, 2008). In addition, education and training can improve knowledge regarding health related floods management for nursing students (Buanjaroen, 2013). According to literature reviewed, training interventions for healthcare providers in disaster preparedness improved knowledge and skills in disaster response. (Williams, Nocera, & Casteel, 2008). Also, based on Bloom's taxonomy (1956) (as cited in Center for Excellence in Learning and Teaching (CELT), 2011), knowledge could be enhanced by providing information via cognitive remembering, analyzing, and synthesizing. The learning process can occur while the VHVs attended training courses. Therefore it is hypothesized that training intervention would increase the knowledge and skills of VHVs.

Working experience. Direct experience on disaster events would help the VHVs to gain insights and acquire new views on disaster management. Moreover, VHVs who have more experience in emergency care during a disaster could play a critical role in disaster response. They are often the first people to arrive at the scene and are typically trusted by the victims (Kamal et al., 2012). It was revealed that having experience during flood events could result in more knowledge and skills regarding health related flood management in nursing students (Beunjaroen, 2013). It was shown that VHVs who worked for a longer time in the role of a VHV gained more experience and mastery on knowledge and skill related to emergency care during disasters. In addition, VHVs who had more work experience were more adept than those who had less experience (Kamal et al., 2012). Although direct experience with exposure to disaster events could increase VHVs' competencies, this notion was still inconclusive. For example, Kamal's study showed that VHVs working in the non-Tsunami affected areas had significantly higher mean rank of overall knowledge compared to those working in the Tsunami-affected areas. However, no significant difference existed in terms of perceived skills of disaster management between the two groups (Kamal, 2012). Therefore, future studies are needed.

Work experience was not only related to direct exposure to disaster events, but also to indirect exposure to disaster events. The indirect experience could also increase knowledge and perceived skills of VHVs. According to Kamal et al. (2012), disaster simulation or drills can be used to increase knowledge and skills to be able to act efficiently in real life situation. Disaster simulations or drills have been widely used throughout the world, and were considered as a fundamental tool for the

evaluation and improvement of the disaster response capacity for healthcare providers (Kamal et al., 2012).

Management of healthcare system. Good support and good management of healthcare services were another facilitating factor that promotes VHV's competencies of disaster management. A study of lessons learned from the severe floods of central Thailand in 2010 stated that volunteers being well prepared in providing healthcare services for flood victims is important. Moreover, good planning and good a good supply of medical equipment could facilitate sufficient healthcare services (Buanjaroen, 2013). However, the volunteers in Buanjaroen's study were nursing students in which the background of knowledge and skills are different from that of VHVs. Therefore, the factor of good support and good management to promote VHVs' knowledge and skills in disaster management requires further investigation.

Summary of Literature Review

Flooding is a common natural disaster that frequently occurs in Asia, such as Southern Thailand. Health impacts caused by floods include drowning, acute trauma, rodent-borne diseases, injuries, vector borne diseases, water-borne diseases, toxicity exposure, communicable diseases, malnutrition, and psychosocial problems. Although floods can have serious health impacts, individuals in the community who are well prepared in performing self-care and helping others could save lives during such times. Moreover, effective flood preparedness regarding health related flood management is essential, especially for VHVs. VHVs are considered non-professional

health providers who are the first people to respond in a disaster events. They help victims before external helpers arrive on the scene to evacuate the victims during floods as they also live in the community.

According to literature reviews, disaster management framework is divided into three phases: pre-disaster, disaster, and post-disaster phase. The VHVs play critical role in helping the victims before, during, and after flood disasters especially to manage health problems of the community dwellers.

Of all these three phases, the management of pre-disaster phase was the most important phase because this phase involves the people living in the community including the VHVs to help the victims. The VHVs are expected to possess knowledge and skills regarding health related flood management. Most published studies explored health related flood management in professional healthcare providers, such as nurses. Although some studies explored the management of community volunteers, most of the published studies were examined the managements of evacuation of victims, or distribution of foods, clothes, or shelters. However, no known previous study examined the health related flood management in community dwellers or lay persons including community volunteers, except one current study that was examined the knowledge and skills of community volunteers affected and non-affected by Tsunami in Indonesia. Due to the fact that no published study have examined the knowledge and skills of Thai village health volunteers in terms of health related flood management; therefore, this study examined the levels of knowledge and perceived skills of Thai VHVs regarding health related flood management.

Chapter 3

Research Methodology

This descriptive study was aimed at identifying the level of knowledge and perceived skills regarding health related flood management during floods among village health volunteers (VHVs) in southern Thailand. The research methods employed are outlined in the following sessions.

Population and Setting

The sample of this study was VHVs living in communities in southern Thailand. There are six provinces of southern Thailand where floods commonly occur. These are Nakhon Si Thammarat, Surat Tani, Phattalung, Satun Songkhla, and Narathiwat provinces (Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior, Thailand, 2012). A total of 75,689 VHVs have been registered in the Primary Health Care Division. (Primary Health Care Division, 2014). The six selected districts, where floods commonly occur, are shown in Appendix A.

Inclusion criteria of the participants were as follows:

1. Work experience in VHV position of more than 6 months
2. Working as a VHV in flood affected areas
3. Aged between 18 to 60 years old
4. Able to communicate in Thai language

Sample size calculation

The sample size calculation was calculated based on the Taro Yamane formula (Polit & Beck, 2012) as shown in the following equation:

$$n = N / (1 + Ne^2)$$

n = sample

N = population

e = error

$$n = N / (1 + Ne^2)$$

In this study, defined estimated error = ± 5

$$n = 75,689 / (1 + (75,689 \times 0.05^2))$$

The total participants in this study = 398 VHVs

Although the minimum participant requirement was 398 participants, the 380 (80.9%) questionnaires were returned. The 8 participants quitted during data collection due to flood occurred in Narathiwat and Songkhla and 10 participants had emergent duty to manage epidemic disease.

Sampling Technique. The samples were recruited using multi-stage random sampling technique in the following proportions:

1. Sampling districts from each province using the ratio 1:4
2. Sampling sub-districts from each district using ratio 1:2
3. Sampling VHVs from each sub-district using ratio 1:200

The proposed proportion using lottery simple random technique was set to meet the required numbers of the participants and to ensure that the participants were the representatives of the sub-districts, districts, and provinces of the flood areas. The

sampling technique is displayed in Figure 2. The number of participants selected from each of those six provinces is shown in the Table 1.

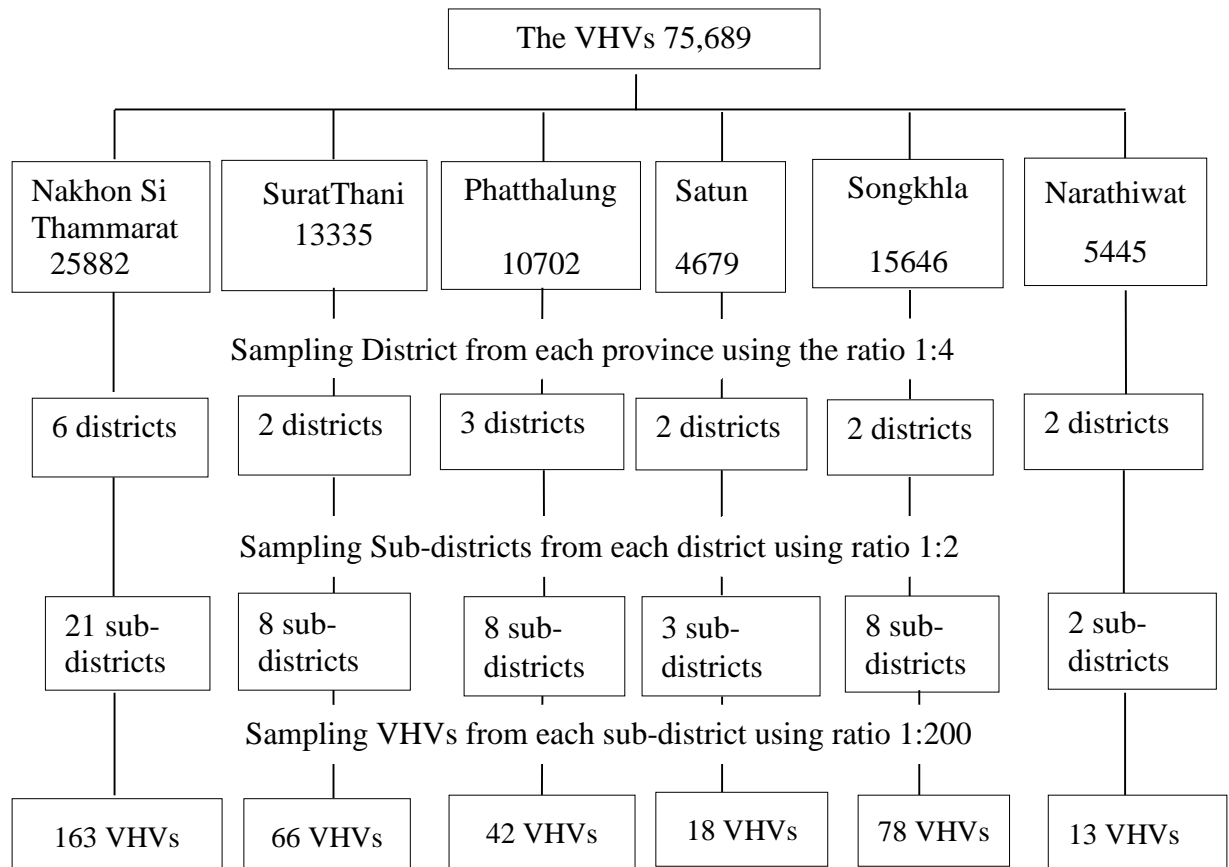


Figure 2. Participant Sampling Diagram

Table 1

The Number of Participants from Each Province

No	Province	N	n
1	Nakhon Si Thammarat	25,882	163
2	Surathanee	13,335	66
3	Phattalung	10,702	42
4	Satun	4,679	18
5	Songkhla	15,646	78
6	Narathiwat	5,445	13
Total		75,689	380

Note. The total number of village health volunteers has been registered in the Primary Health Care Division, Thailand devised by providence and assessed by the Primary Health Care Division. (2014). *Name address and family member of village health volunteer in each Ampher and Tombol report*. Retrieved from <http://www.thaiphc.net/phc/phcadmin/Administrator/Report/OSMRP00002.php>

Instrumentation

The self-report questionnaires were composed of three parts. These were 1) Demographic Data Questionnaire, 2) Village Health Volunteer's Knowledge Questionnaire, and 3) Village Health Volunteer's Perceived Skills.

The Demographic Data Questionnaire. The Demographic Data Questionnaire consisted of the following 10 items; age, gender, marital status, religion, level of education, occupation, work experience in VHV position, previous experience of flood disasters, previous experience regarding health related flood management, and

the number of times having attended any training program/course regarding health related flood management (Appendix D).

The Village Health Volunteer's Knowledge Questionnaire. The Village Health Volunteer's Knowledge Questionnaire was developed by the researcher based on the conceptual framework of this study. The items covered the three phases of disaster management; pre-disaster, disaster, and post disaster. The blueprint of developing the questionnaires is shown in Appendix E. The questionnaires involved true/false type questions. The total items of this questionnaire were 49, which was divided into pre-disaster phase (12 items), disaster phase (32 items) and post-disaster (5 items). Moreover, each disaster phase composed of the following components. In the pre-disaster phase, there were 3 components as 1) assessment (7 items), 2) management of health problems related to floods disaster (2 items), and 3) disaster training and awareness raising (3 items). Disaster phase composed of 6 components as 1) early warning (8 items), 2) first aid (13 items), 3) disaster triage (2 items), 4) team organization (3 items), 5) search and rescue (3 items), and 6) logistic and communication (3 items). Also, in the post-disaster phase, there were 2 components as 1) disaster related floods prevention (1 item), and 2) providing health related flood services (4 items). One point was given for each correct answer and zero points for each incorrect answer. The possible scores ranged from 0 to 49. For the standardization of knowledge scores, these scores could be compared with the results of other studies. Therefore, the total scores of knowledge were converted into a percentage. Levels of knowledge were categorized into four levels (McDonald, 2002) as follows:

Levels of knowledge	Score (%)
Very low	< 60.00
Low	60.00 - 69.99
Moderate	70.00 - 79.99
High	> 80

The Village Health Volunteer's Perceived Skills Questionnaire.

The Village Health Volunteer's Perceived Skill Questionnaire was developed by the researcher based on the conceptual framework of this study. The blueprint of conducting each item of this questionnaire is shown in Appendix E. There were total 32 items, which composed of the pre-disaster phase (8 items), disaster phase (18 items), and post-disaster phase (6 items). Moreover, each disaster phase composed of the following components. In the pre-disaster phase, there were 3 components as 1) assessment (6 items), 2) management of health problems related to floods disaster (1 item), and 3) disaster training and awareness raising (1 item). Disaster phase composed of 6 components as 1) early warning (2 items), 2) first aid (9 items), 3) disaster triage (1 item), 4) team organization (2 items), 5) search and rescue (2 items), and 6) logistic and communication (3 items). Also, in the post-disaster phase, there were 2 components as 1) disaster related floods prevention (3 items), and 2) providing health related flood services (3 items). Each item was rated by using a 5-point Likert scale with 1 = unable to practice the statement at all, 2 = considered hardly able to practice this statement, 3 = uncertain, 4 = able to practice the statement followed by given instruction, and 5 = able to practice the statement automatically. The possible scores ranged from 32 to 160. For the standardization of perceived skills scores, these scores can be compared with

the results of another study. So, the total scores of perceived skills were converted into a percentage. For interpretation, the levels of perceived skills were categorized into four levels (McDonald, 2002) as follows:

Level perceived skill	Score (%)
Very low	< 60.00
Low	60.00 - 69.99
Moderate	70.00 - 79.99
High	> 80

Testing Validity of Instruments. The Village Health Volunteer's Knowledge and Perceived Skills Questionnaires were tested for content validity. These questionnaires were examined by three experts: 1) one lecturer, an expert in disaster management from the Faculty of Nursing, Prince of Songkla University, 2) provincial health care leader who worked with VHVs in south of Thailand, and 3) a VHV who had experience in disaster management. According the experts' recommendations, 42 items out of 91 items of first draft of Knowledge Questionnaire were revised, deleted or modified into other items. Finally, 49 items of the Knowledge Questionnaire were approved by the experts. Similarly, 13 items out of 45 items of Perceived Skill Questionnaire were revised, deleted or modified into other items. Finally, 32 items of this questionnaire were approved by the experts.

The content validity was analyzed by the content validity index (CVI). The item content validity index (ICVI) and scale content validity index (SCVI) of those two questionnaires were found to be 1.0 and 1.0, respectively, which were deemed acceptable values.

Testing Reliability of Instruments. The internal consistency reliability was used to determine the reliability of the Village Health Volunteer's Knowledge and Perceived Skills Questionnaires. These two questionnaires were tested in 20 VHVs, who had similar characteristics to the study participants. The Kuder-Richardson formula 20 (KR-20) was employed to test the internal consistency reliability of the Village Health Volunteer's Knowledge. The KR-20 coefficient of reliability of the Village Health Volunteer's Knowledge Questionnaire was calculated yielded the value of .70. The Cronbach alpha coefficient was examined the Village Health Volunteer's Perceived Skills Questionnaire was found to be .96.

Ethical Consideration

Data was collected after the approval of the Ethics Committee from the Faculty of Nursing, Prince of Songkla University, Thailand. In addition, permission was obtained from the Head of the Social Department of each sub-district, where the participants were recruited by the researcher or research assistants, then the approached participants who met the inclusion criteria by the invitation of the administrator of Primary Care Unit (PCU). The researcher or research assistants explained the purposes of the study and the expectations for the agreement to participate in this study. After they agreed to participate in the study, written or oral informed consent was obtained from the VHVs (Appendix B). The participants also were informed about the right to withdraw from the study at any time and for any reason. Information of the participants was maintained and kept confidential by using a code. The questionnaires were destroyed after the completion of the study.

Data Collection

The data collection methods were divided into two phases: preparation phase and implementation phase.

Preparation phase

1. The researcher selected 30 research assistants. They were composed of 8 heads of PCU and 22 nurses who were the supervisors of the VHVs.

2. The research assistants were trained by the researcher. The contents of the training included research objectives, sample inclusion criteria, study protocol, and data collection procedure.

3. The researcher or research assistants met the head of the VHVs and explained the data collection method. The head of VHVs was asked to invite participants to participate in this study.

Implementation phase

1. After the invitation by the head of VHVs, the researcher or research assistant explained the study to the participants, and asked them to self-report the Village Health Volunteer's Knowledge and Perceived Skills Questionnaires.

2. The participants took approximately 60 to 90 minutes to fill in both questionnaires; then they returned the questionnaires to the researcher or research assistants.

3. The researcher or research assistants checked the completion of the questionnaires.

Data Analysis

In this study, the data was analyzed by the following statistics:

1. Demographic data was analyzed by descriptive statistics:

frequencies, percentage, means, and standard deviation.

2. Both the levels of the VHVs' knowledge and perceived skills regarding health related flood management during floods were analyzed by descriptive statistics. The normality of the VHV's Knowledge scores and perceived skills scores were examined (Appendix. F). The VHVs' knowledge score was a normal distribution; therefore, frequency, percentage, mean, and standard deviation were used for analyzing the knowledge variable. However, the perceived skills variable showed a skewed distribution. Therefore, the median and interquartile range were used.

Chapter 4

Results and Discussions

Results

The aim of this chapter was to report 1) the demographic data of the VHV participants, 2) the level of knowledge regarding health related flood management among the VHVs in southern Thailand, and 3) the level of perceived skills regarding health related flood management among the VHVs in southern Thailand. The total number of participants was 380 VHVs. In addition, the findings are also discussed and presented as followed by each objective.

Demographic Data

The participants were 380 VHVs included in this study. The majority of the VHVs were female (n = 388, 88.9%) with a mean age of 44.49 years old (SD = 7.82). Most of the participants were married (n = 322, 84.7%). Majority of them were Buddhists (n = 345, 90.8%), and nearly half of the participants (n = 186, 49.0%) had an education background at high school level. Nearly sixty percent of them were farmers (n = 237, 57.1%). The average work experience in a VHV position for these participants was 9.92 years (SD = 6.61), with 62.4% (n = 237) of them having experience in the VHV position ranging between 1 to 10 years. Of those VHVs, 62.1% (n = 236) of them had been affected by floods and 248 participants (65.3%) had experience in attending disaster training courses. However, only 46.8% of VHVs (n = 178) had attended courses

on health related flood management. The demographic characteristics of the VHV's are shown in Table 2.

Table 2

Demographic Characteristics of Village Health Volunteers (N = 380)

Demographic Characteristics	n	(%)
<i>Age group (years) (M = 44.49, SD = 7.82, Min = 19, Max = 60)</i>		
19-30	17	(4.5)
31-40	104	(27.4)
41-50	171	(45.0)
51-60	88	(23.1)
<i>Gender</i>		
Female	338	(88.9)
Male	42	(11.1)
<i>Marital status</i>		
Single	26	(6.8)
Married	322	(84.7)
Divorced	32	(8.5)
<i>Religion</i>		
Buddhist	345	(90.8)
Muslim	33	(8.7)
Christian	2	(0.5)

Table 2

Demographic Characteristics of Village Health Volunteers (continued)

Demographic Characteristics	n	(%)
Education level		
No education	3	(0.8)
Primary school	114	(30.0)
High school	186	(49.0)
Vocational certificate	40	(10.5)
Bachelor degree	37	(9.7)
Occupation		
Farmer	217	(57.1)
Employee	62	(16.3)
Business	41	(10.8)
Housewife	10	(2.6)
Retired	50	(13.2)
Work experience in VHV position (years)		
(M = 9.92, SD = 6.61, Min = 1, Max = 35)		
< 10	237	(62.4)
≥ 10	143	(37.6)
Direct experience in flood affected areas		
Yes	236	(62.1)
No	144	(37.9)

Table 2

Demographic Characteristics of Village Health Volunteers (continued)

Demographic Characteristics	n	(%)
Having attended disaster training courses		
No	132	(34.7)
Yes	248	(65.3)
Having experience in flood management		
No	202	(53.2)
Yes	178	(46.8)
Unspecified areas	145	(81.5)
First aid	8	(4.5)
Evacuation	12	(6.7)
Assistance in distributing necessary items	12	(6.7)
Psychosocial support	1	(0.6)

As shown in Table 3, based on in-class only training method, the top five topics that most VHVs were trained were: disaster early warning related health problems (n = 176, 46.3%), first aid (n = 163, 42.9%), disaster early warning signs related to emergency care (n = 162, 42.6%), assessment of community vulnerability and community capacity (n = 161, 42.4%), and disaster plan especially healthcare management (n = 159, 41.8%). (Appendix G).

Table 3

The Top Five Disaster Management Training Topics That Most VHV's Were Trained Categorized by Training Topics and Training Methods (In-class only, Practice only, and both In-class and Practice) (n = 248)

Training Topics	Training Methods					
	In-class		Practice		Both In-class	
	Only		only		and Practice	
	n	(%)	n	(%)	n	(%)
1. Disaster early warning signs related to health problems	176	(46.3)	29	(7.6)	9	(2.4)
2. First aid	163	(42.9)	47	(12.4)	23	(6.1)
3. Disaster early warning signs related to emergency care	162	(42.6)	31	(8.2)	7	(1.8)
4. Assessment of community vulnerability and community capacity	161	(42.4)	25	(6.6)	10	(2.6)
5. Disaster plan, especially healthcare management	159	(41.8)	44	(11.6)	9	(2.4)

Note: The order of top five topics was based only on the in-class training method

Level of knowledge regarding health related flood management

Overall, the VHVs had a high level of knowledge ($M = 80.7$, $SD = 8.7$) in regards to health related flood management. When considering the disaster phases, the results showed that VHVs had a moderate level of knowledge in the pre-disaster phase ($M = 78.2$, $SD = 13.3$); however, they had knowledge both in the disaster ($M = 82.3$, $SD = 9.85$) and post-disaster phases ($M = 93.8$, $SD = 19.5$), at a high level (Table 4).

Table 4

Mean, Standard Deviation, and Level of Knowledge Categorized by Overall Scores and Each Disaster Phase (N = 380)

Knowledge	M (SD)	Level
Total scores	80.7 (8.7)	High
Pre-disaster phase	78.2 (13.3)	Moderate
Disaster phase	82.3 (9.85)	High
Post-disaster phase	93.8 (19.5)	High

Note: M = Mean percentage, SD = Standard deviation

For all 49 items of knowledge regarding health related floods management (Appendix. E), the top three topics that the majority of VHVs had the highest knowledge scores were 1) knowledge to administer first aid for Athlete's foot care ($M = 98.0$, $SD = 13.5$), 2) knowledge to administer first aid for fever ($M = 98.0$, $SD = 14.4$), and 3) knowledge for administering first aid for close bone fracture care

(M = 97.0, SD = 18.2). However, the top three areas in which the VHVs had the lowest knowledge scores were 1) knowledge to assess dwellers' perception of disaster preparedness (M = 24.0, SD = 42.6), 2) knowledge to administer first aid for fever (M = 52.0, SD = 50.0), and 3) knowledge in frequency for practicing the health related floods management plan (M = 56.0, SD = 49.8) (Table 5).

Table 5

Mean, Standard Deviation (SD), and Level of the Top Three Highest and Top Three Lowest Knowledge Scores Categorized by Items of Health Related Flood Management (N = 380)

Items of Knowledge	M (SD)	Level	Disaster Phase
The top three highest scores			
1. Knowledge to administer first aid for Athlete's foot care.	98.0 (13.5)	High	Disaster
2. Knowledge to administer first aid for fever.	98.0 (14.4)	High	Disaster
3. Knowledge for administering first aid for close bone fracture care.	97.0 (18.2)	High	Disaster
The top three lowest scores			
1. Knowledge to assess dwellers' perception of disaster preparedness.	24.0 (42.6)	Very low	Pre-disaster
2. Knowledge to administer first aid for fever.	52.0 (50.0)	Low	Disaster
3. Knowledge in frequency for practicing the health related floods management plan.	56.0 (49.8)	Low	Pre-disaster

Note: M = Mean percentage, SD = Standard deviation

When considering the disaster phases, for all 49 items of knowledge regarding health related flood management, the top two items that the majority of VHV's had the highest knowledge scores categorized by each phase were: In pre-disaster phase the top two highest knowledge scores were 1) knowledge to assess community dwellers' ability in performing self-care and assisting vulnerable people in community (M = 95.0, SD = 21.3) and 2) knowledge to assess dwellers' perception of the severity effects of floods (M = 95.0, SD = 22.4). In the disaster phase, the top two highest knowledge scores were 1) knowledge to administer first aid for Athlete's foot care (M = 98.0, SD = 13.5) and 2) knowledge to administer first aid for fever (M = 98.0, SD = 14.4). In the post-disaster phase, the top two highest knowledge scores were composed of 1) knowledge and skill to provide wound care service during post-flooding (M = 93.0, SD = 25.7) and 2) knowledge to observe and prevent post-traumatic stress disorder (PTSD) (M = 87.0, SD = 33.3) (Table 6).

Moreover, the top two items that the majority of VHV's had the lowest knowledge scores categorized by each phase were: In the pre-disaster phase, the top two lowest scores were 1) knowledge to assess dwellers' perception of disaster preparedness (M = 24.0, SD = 42.6) and 2) knowledge in frequency for practicing the health related floods management plan (M = 56.0, SD = 49.8). In the disaster phase, the top two items that VHV's had the lowest scores of knowledge were 1) knowledge to administer first aid for food poisoning (M = 52.0, SD = 50.0) and 2) knowledge to administer first aid for food poisoning (M = 62.0, SD = 48.5). And in the post-disaster phase, the top two lowest knowledge scores were 1) knowledge in hyperventilation management (M = 73.0, SD = 44.2) and 2) knowledge hypoglycemia management (M = 83.0, SD = 37.0). (Table 7).

Table 6

Mean, Standard Deviation (SD), and Levels of the Top Two Highest Knowledge Scores of Each Phase Categorized by Items of Health Related to Floods Management (N =380)

Knowledge in Each Phase	M (SD)	Level
Pre-disaster phase		
1. Knowledge to assess community dwellers' ability in performing self-care and assisting vulnerable people in community.	95.0 (21.3)	High
2. Knowledge to assess dwellers' perception of the severity effects of floods.	95.0 (22.4)	High
Disaster phase		
1. Knowledge to administer first aid for Athlete's foot care.	98.0 (13.5)	High
2. Knowledge to administer first aid for fever.	98.0 (14.4)	High
Post-disaster phase		
1. Knowledge and skill to provide wound care service during post-flooding.	93.0 (25.7)	High
2. Knowledge to observe and prevent post-traumatic stress disorder (PTSD).	87.0 (33.3)	High

Note: M = Mean percentage, SD = Standard deviation

Table 7

Mean, Standard Deviation (SD), and Level of the Top Two Lowest Knowledge Scores of Each Phase Categorized by Items of Health Related Floods Management (N =380)

Items of Knowledge	M (SD)	Level
Pre-disaster phase		
1. Knowledge to assess dwellers' perception of disaster preparedness.	24.0 (42.6)	Very low
2. Knowledge in frequency for practicing the health related floods management plan.	56.0 (49.8)	Very low
Disaster phase		
1. Knowledge to administer first aid for food poisoning.	52.0 (50.0)	Very low
2. Knowledge to administer first aid for food poisoning.	62.0 (48.5)	Low
Post-disaster phase		
1. Knowledge in hyperventilation management.	73.0 (44.2)	Moderate
2. Knowledge hypoglycemia management.	83.0 (37.0)	High

Note: M = Mean percentage, SD = Standard deviation

Level of perceived skills regarding health related floods management

As shown in Table 8, the overall perceived skills of participants regarding health related flood management was at a moderate level (Mdn = 77.5, IQR = 17.5). When considering each phase of disaster, the pre-disaster phase (Mdn = 77.5, IQR = 17.5) and disaster phase (Mdn = 76.0, IQR = 20.0) were at moderate levels, respectively. However, VHVs had a high level of perceived skills in post-disaster (Mdn = 80.0, IQR = 20.0).

Table 8

Median, Interquartile Range, and Level of Perceived Skills Categorized by Overall Scores and Each Disaster Phase (N = 380)

Perceived Skills	Mdn (IQR)	Level
Total scores	77.5 (17.5)	Moderate
Pre-disaster phase	77.5 (17.5)	Moderate
Disaster phase	76.0 (20.0)	Moderate
Post-disaster phase	80.0 (20.0)	High

Note: Mdn = Median, IQR = Interquartile range

As shown in Table 9, the top three items out of the 32 items (Appendix F), show that the majority of VHVs had the highest level of perceived skills in 1) skill to administer first aid for Athlete's foot care (Mdn = 100.0, IQR = 20.0) and 2) skill to home visit people during post-flooding (Mdn = 100.0, IQR = 20.0), and 3) skill to administer first aid for fever (Mdn = 100.0, IQR = 40.0). The three areas in which VHVs

demonstrated the lowest level of perceived skills were 1) skill for administering first aid for close bone fracture care (Mdn = 60.0, IQR = 20.0) 2) skill to transfer patients who have spinal injuries (Mdn = 60.0, IQR = 20.0), and 3) skill to perform basic CPR correctly and effectively (Mdn = 60, IQR = 35.0)

Table 9

Median, Interquartile Range (IQR) and Level of the Three Highest and Three Lowest Items of Perceived Skills Scores Categorized by Items of Health Related Floods Management (N = 380)

Areas of Perceived Skills	Mdn (IQR)	Level	Disaster Phase
The three highest scores			
1. Skill to administer first aid for Athlete's foot care.	100.0 (20.0)	High	Disaster
2. Skill to home visit people during post-flooding.	100.0 (20.0)	High	Post-disaster
3. Skill to administer first aid for fever.	100.0 (40.0)	High	Disaster
The three lowest scores			
1. Skill for administering first aid for close bone fracture care.	60.0 (20.0)	Moderate	Disaster
2. Skill to transfer patients who have spinal injuries.	60.0 (20.0)	Moderate	Disaster
3. Skill to perform basic CPR correctly and effectively.	60.0 (35.0)	Moderate	Disaster

Note: Mdn = Median, IQR = Interquartile range

For all 32 items of perceived skills regarding health related floods management, in consideration of the disaster phases, the top two highest perceived skills scores in those are three disaster phases. The pre-disaster phase were 1) skill to analyze community's demographic data and synthesize it into a health related flood management plan (Mdn = 80.0, IQR = .0) and 2) skill to practice the health related flood management plan (Mdn = 80.0, IQR = .0). Also, the top two items that were at the highest perceived skills scores in the disaster phase were 1) skill to administer first aid for Athlete's foot care (Mdn = 100.0, IQR = 20.0) and 2) skill to administer first aid for fever (Mdn = 100.0, IQR = 40.0). Furthermore, in the post-disaster phase, the top two highest scores of perceived skills were 1) skill to home visit people during post-flooding (Mdn = 100.0, IQR = 20.0) and 2) skill to observe and prevent post-traumatic stress disorder (PTSD) (Mdn = 80.0 IQR = 20.0). (Table 10). In addition, the top two lowest scores of those perceived skills are presented in the following section.

The top two lowest scores of the perceived skills regarding health related flood management in the pre-disaster phase were 1) skill to assess community's ability in health related floods management preparedness (Mdn = 80.0, IQR = 20.0) and 2) skill to assess community dwellers' ability in performing self-care and assisting vulnerable people in the community (Mdn = 80.0, IQR = 40.0). Moreover, in the disaster phase, the top two items with the lowest perceived skills scores were 1) skill for administering first aid for close bone fracture care (Mdn = 60.0, IQR = 20.0) and 2) skill to perform basic CPR correctly and effectively (Mdn = 60.0, IQR = 40.0). In the post-disaster phase, the top two items with the lowest perceived skills scores were 1) skill to observe and prevent health problems in post-flood phase (Mdn = 80.0, IQR =

40.0) and 2) skill to teach the dwellers to prevent the accident after flooding event (Mdn = 80.0, IQR = 40.0) (Table 11).

Table 10

Median, Interquartile Range (IQR), and Level of the Top Two Highest Items of Perceived Skills of Each Phase Categorized by Items of Health Related Floods Management (N =380)

Items of Perceived Skills	Mdn (IQR)	Level
Pre-disaster phase		
1. Skill to analyze community's demographic data and synthesize it into a health related flood management plan.	80.0 (.0)	High
2. Skill to practice the health related flood management plan.	80.0 (.0)	High
Disaster phase		
1. Skill to administer first aid for Athlete's foot care.	100.0 (20.0)	High
2. Skill to administer first aid for fever.	100.0 (40.0)	High
Post-disaster phase		
1. Skill to visit people during post-flooding.	100.0 (20.0)	High
2. Skill to observe and prevent post-traumatic stress disorder (PTSD).	80.0 (20.0)	High

Note: Mdn = Median, IQR = Interquartile range

Table 11

Median, Interquartile Range (IQR), and Level of the top Two Lowest Items of Perceived Skills of Each Phase Categorized by Items of Health Related Floods Management (N =380)

Items of Perceived Skills	Mdn (IQR)	Level
Pre-disaster phase		
1. Skill to assess community's ability in health related floods management preparedness.	80.0 (20.0)	High
2. Skill to assess community dwellers' ability in performing self-care and assisting vulnerable people in the community.	80.0 (40.0)	High
Disaster phase		
1. Skill for administering first aid for close bone fracture care.	60.0 (20.0)	Moderate
2. Skill to perform basic CPR correctly and effectively.	60.0 (40.0)	Moderate
Post-disaster phase		
1. Skill to observe and prevent health problems in post-flood phase.	80.0 (40.0)	High
2. Skill to teach the dwellers to prevent the accident after flooding event.	80.0 (40.0)	High

Note: Mdn = Median, IQR = Interquartile range

Discussion

The findings of this study showed that VHVs had a high level of knowledge regarding health related flood management. However, the perceived skills regarding health related flood management was at a moderate level. The explanations are discussed in the following sessions.

Knowledge regarding health related flood management

Overall, the results of the study showed that the VHVs had knowledge regarding health related flood management at a high level. The high level of knowledge regarding health related flood management of the VHV participants would be due to three reasons. These reasons were previous training experience, being victims in flood affected areas, and having previous experience in helping victims in flood disasters.

Firstly, previous training experience is one factor that may increase the level of knowledge. According to the previous studies, it was indicated that having training experience could increase disaster related knowledge (Beunjaroen, 2013; Kamal, Songwathana, & Sae Sia, 2012; Kano, Siegel & Bourgue, 2005). As seen in the demographic data, 65.3% of the VHVs had experiences in attending disaster management training. According to Bloom's taxonomy (1956) (as cited in Center for Excellence in Learning and Teaching (CELT), 2011), knowledge could be enhanced by providing information via cognitive remembering, analyzing, and synthesizing. As mentioned, nearly two third of the VHVs had attended disaster training courses, which were mostly related to the first aid, disaster early warning signs of health problems,

signs of emergency care, and assessment of health problems of flood victims. This information is endorsed by the Ministry of Public Health. Indeed, VHVs are required to attend general training courses focusing on health management of community dwellers before they are certified in a VHV position. This training course is a compulsory course. Therefore, the training knowledge could enhance cognitive memory leading to increased knowledge scores regarding health related floods management. Although the contents of the training course does not mainly focus on flood management, the health management during flooding especially the knowledge to administer first aid, the assessment of community dweller's ability in performing self-care and assisting vulnerable people in the community, early warning signs of healthcare problems during flooding does not differ from other health problems found in the community. Therefore, the VHVs could apply the knowledge they had gained during their compulsory training course as VHVs to flood disaster health related floods management in this current study. This is similar to the previous study in which it was shown that a lay person who attended a first aid training course had a level of first aid knowledge higher than those who had not attended a training course (Kano, Siegel, & Bourgue, 2005). Therefore, knowledge can be enhanced by dialectic learning.

Secondly, being victims of a flood event is another explanation of the increased level of knowledge of the VHVs. It is not only through the training experience that knowledge may be gained, but VHVs may also learn through observing healthcare providers while they help the flood victims. For example, the VHVs as the flood victims could observe healthcare providers performing wound care or evacuating the victims. The results of most previous studies also support that having direct experience in disaster events would help the VHVs to gain knowledge regarding disaster management

(Kamal et al., 2012). Similarly, the previous study found that direct experience in a disaster event could increase VHVs' knowledge regarding health related floods management. VHVs can gain insights, acquire new learning experiences from observing formal healthcare providers (Maulidar, 2010 as cited in Kamal et al., 2012)

Thirdly, having experience in flood management is also a factor to increase the VHVs' knowledge. Nearly half of the VHVs in this study had flood management experience. Their jobs in flood management included distributing food, water, and clothes etc. In addition, in the emergency situation, they had the role to evacuate the victims from the danger flood areas to the safe areas. They also worked as an assistant to the healthcare providers in performing first aid, such as wound dressings, transferring victims or fever care. Although they worked as an assistant to the healthcare provider, they also gained knowledge of disaster healthcare management by learning from those healthcare providers. This is similar to Chan's study (2009), (as cited in Kamal, 2012), in which the results showed that the VHVs who achieved the experience in helping victims during a disaster event, gained more mastery in knowledge and skills related to emergency care. Therefore, direct observation and working as an assistant to the healthcare providers would help the VHVs gain more knowledge related to health related floods management.

However, there had some areas that the VHVs had knowledge of health related floods management at the low and very low level. The lowest score is related to the assessment the knowledge to areas dweller's perception of disaster preparedness. The explanation of this lowest score is that most of VHVs concern in their role is as a helper during the flood disaster and they work mostly under the command or supervision of the capacity building healthcare providers, so that they are not aware of

the role of being an instructor to teach the community dwellers to assess the dweller's perception. Also, the Thai VHV's job description identifies the VHVs' role in general, but does not clarify the role of the VHVs in assessment the dweller's perception. Therefore, this role may not be a priority job for the VHVs.

Perceived skills regarding health related flood management

The results showed that VHVs had perceived skills regarding health related flood management at a moderate level. There are four factors that might influence the perceived skills of VHVs. These are training experience, direct experience in disaster events, experience in disaster management, and having a high level of knowledge of disaster management.

The first factor is having training experience especially practice training experience. According to the demographic data, it was shown that first aid was the top highest topics that VHVs had attended in practice training. These two areas of training experiences are also the top highest areas that VHVs perceived high scores of skills. These two areas were providing healthcare services during the floods and post-flood phase. In the post-flood phase, first aid is a healthcare service that VHVs commonly perform for the community dwellers. Practice training may have improved VHVs' practice skills because during practice training class/program they had a chance to drill the scenario or/and case study. Therefore, VHVs had perception of high skills in these two areas. It was shown that the learning method of role-play or a given scenario can improve the skills and students' behavior (Lepi, 2012).

Second, having direct experience of a disaster event and having experience in disaster management are factors that might increase the VHV's perceived skills regarding health related floods management. Although most of the VHVs had minor roles in health related floods management, they learnt from observing the healthcare providers. Indeed, they are the main persons who are the assistants of the healthcare providers. Therefore, they have learned some procedures through hands on experience of being an assistant. Furthermore, during floods, the major role of the VHVs in the emergency phase usually focuses on the distribution of food, water, and shelter for the victims. Most flood victims with minor injuries can care for themselves. However, after the floods, healthcare providers always assign VHVs to give continuing care as home visits, checking blood pressure and blood sugar levels. So, the VHVs are confident to provide healthcare services during the post-flood phase. These explanations are the rationale for identifying the perceived skills of the VHVs at a moderate level.

Finally, the knowledge of disaster management is an important factor related to the perceived skills of disaster management. According to Star's study (2013), knowledge leads to the correct and confident way to act. It is proposed that the higher knowledge leads to higher perceived skills of doing action. According to the findings of this current study, it was shown that the top two areas of knowledge regarding health related floods management were also in accordance to the top two areas with the highest scores of perceived skills and also vice versa for the lowest scores of knowledge and perceived skills. For example, most VHVs had the highest score in the area of first aid and they also had the highest score of perceived skills in the same area.

Although the VHVs had perceived skills regarding health related flood management at a moderate level, there had some areas that the VHVs had perceived skills of health related floods management at the lower and very low levels. The lowest score was related to performing cardiac pulmonary resuscitation (CPR). This finding was similar to that found in Indonesian VHVs (Kamal, 2012). In Kamal's study (2012), both VHVs working in tsunami-affected and non-affected areas had the lowest skill in performing basic CPR. Although the VHVs in Thailand are required to re-practice the CPR procedure every year, performing CPR is not a daily basic procedure as other procedures, such as wound dressing or bandaging. Therefore, they are not confident to perform CPR. Informal communication between the researcher and some VHVs showed that most VHVs had a fear and lack of confidence in performing CPR.

It has been proposed that higher knowledge levels also lead to higher skill levels of performing some actions. However, this propos is not the case in this current study. According to the results of this study, it has been shown that overall knowledge regarding health related flood management of the VHVs was at the high level, but the VHV's perceived skills regarding health related flood management was at a moderate level. Therefore, it would be other factors, not only knowledge, which may influence the level of perceived skills of the VHVs. Those factors may be practice training experience. It was found that less than 15% of the VHVs had experience in performing CPR training or 65.3% of the VHVs had experience in disaster training management. In addition, most of them had training experience once a year, so that lack of periodical practice training could relate to a lack of confidence to perform a specific task, such as CPR, or disaster triage. These factors might lead to the moderate level of perceived skills of the VHVs.

According to the above discussion, municipality or related administrators are recommended to provide strategies to enhance the VHV's knowledge and perceived skills of health related floods management. In addition, the strategies are suggested to be endorsed in the fiscal year plan and also need to be monitored for the efficacy of those implemented strategies. The first priority to promote VHV's knowledge is related to increasing the ability of community dwellers to assess and perceive the level of health risks during floods, disaster planning, disaster training and awareness, and cardiac pulmonary resuscitation (CPR) which showed the low scores of knowledge and perceived skills.

Chapter 5

Conclusion and Recommendations

This study identified the level of knowledge and perceived skills regarding health related flood management among 380 VHVs living in flood affected areas in southern Thailand.

Summary of the Study Findings

The results showed that the VHVs had a high level of knowledge regarding health related flood management. They had perceived skills regarding health related flood management at a moderate level. Moreover, the VHVs had the highest corrected score of knowledge in relation to assessing community dwellers' abilities in performing self-care and assisting the vulnerable community members, and the lowest corrected score of knowledge was related to the assessment of community dwellers' perception of health risks. In addition, the highest corrected score of perceived skills was related to the capability of VHVs to provide healthcare services during the post-floods phase. The lowest corrected score of perceived skills was related to the capability of VHVs to perform cardiac pulmonary resuscitation (CPR).

Strengths of the Study

This study is the first study that explores knowledge and perceived skills regarding health related flood management among village health volunteers in southern Thailand. The questionnaires are first developed specifically to explore VHVs' knowledge and the perceived skills of the VHVs working in the flood areas in southern Thailand. The findings of the study would be useful for the Ministry of Public Health to use as foundation information to conduct training courses for VHVs who reside in flood affected areas in southern Thailand.

Limitation of the Study

The length of the items of the knowledge and perceived skills regarding health related flood management questionnaires can reduce the attention of the VHVs to respond by completion in the questionnaires which may preclude the true answer of knowledge and perceived skills. The self-report questionnaires of perceived skills might not represent the true capacities of VHVs related to health related flood management.

Recommendations

The findings of study are useful for public health officers, nursing practice, and future studies.

The public health officers

The findings of this study will be used as foundation information for conducting appropriate disaster management programs to promote VHV's knowledge related to increasing the ability of community dwellers to assess the community dwellers' perception of health risks during floods, team organization, disaster training and awareness, cardiac pulmonary resuscitation (CPR), and logistics and communication which showed the lower scores of knowledge and perceived skills.

Nursing practice

The results of this study will be foundation information for nurses to conduct the training programs that are appropriate and specific for the VHV's. Besides, the questionnaires of this study can be applied to explore the level of VHV knowledge and perceived skills regarding health related conditions in floods in other areas of repeated flood events. However, the items of those questionnaires are recommended to be revised to be shortened and to be specific to the health management of floods.

Future study

For future study, it is recommended that the data regarding perceived skills be collected by direct observation or by the vignette data collection technique. Furthermore, it is suggested that the questionnaires are to be revised to be more appropriate to the VHVs. Then, a repeated study is suggested for VHVs who work in other regions where floods often occur.

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APPENDICES

Appendix A
The Setting of Data Collection

Setting of data collection			
Province	District	Sub-district	VHVs
Nakhon Si Thammarat	Tha Sala	Thai buri	7
		Tha Khuen	10
		Sa Kaeo	6
		Don tako	5
	Phra Phrom	Na Phru	8
		Thai Samphao	11
	Nopphitam	Karo	8
	Hua Sai	Ko Phet	5
		Bang Nop	3
		Sai Khao	4
		Hua Sai	7
		Na Saton	5
	Thong Song	Thi Wang	13
		Namtok	4
		Na Luang Sen	4
Na Mai Phai		8	
Khao Ro		9	
Na Pho		5	
Ron Phibun	Khuan Phang	11	
	Sao Thong	11	
	Ron Phibun	19	
Surat Thani	Kanchanadit	Phaiwat	8
		Khlong Sa	10
		Thong Kong	7
		Thong Rang	8
		Takhian Thong	6
	Phanom	Phanom	9
		Khlong Cha-un	10
		Khlong Sok	8

The Setting of Data Collection (continued)

Setting of data collection				
Province	District	Sub-district	VHVs	
Phattalung	Mueang	Tha Khae	6	
		Phattalung	Chai Buri	5
	Tha Miram		5	
	Prang Mu		4	
	Khok Cha-ngai		4	
	Bang Keao		Knok Sak	6
		Tha Maduea	5	
	Pak Phayun	Falami	6	
		Satun	La-ngu	Num Phut
	Kamphaeng			4
Khuan Kalong	Khuan Kalong		9	
Songkhla	Ranot	Khlong Daen	9	
		Ban Mai	8	
		Bo Tru	9	
		Ban Khao	8	
		Phang Yang	6	
		Rawa	11	
	Khuan Niang	Huai Luek	7	
		Rattaphum	20	
Narathiwat	Mueang	Lum Phu	8	
	Narathiwat	Su-ngai Padi	Riko	5
Total			380	

Appendix B
Informed Consent Form

Study title: A Survey of Knowledge and Perceived Skills Regarding Health Related Floods Management among Village Health Volunteers in Southern Thailand

My name is Siriporn Runtiammak, and I am a Master's Nursing Student of the Faculty of Nursing, Prince of Songkha University, Songkhla, Thailand. I am conducting a thesis study to identify the level of knowledge and perceived skills in terms of health related floods management among VHVs in southern Thailand.

The study and its procedures have been approved by the Ethic Committee, Faculty of Nursing of Prince of Songkha University, Thailand, and Ethic Committee, Department of Health Service Support, Southern Thailand to ensure that the results of the study is beneficial to given communities. I personally invite you to participate in this research by filling in the questionnaire and returning it to me upon its completion. The completed response from you will provide important data for the study. This is a self-reported questionnaire, of which you are required to read every question and fill in by yourself. Please do not ask other individuals, use books, or other resources when answering questions. You should not feel concerned if your answers are incorrect as it has no consequences to your career. A code number is issued for each participant so that their identity remains anonymous and their information is kept confidential. Neither your name nor any identification information will be used in the report of the study, and the questionnaires will be destroyed after the completion of the study.

Your participation in this study is voluntary. There is no discomfort, risk or negative consequence in participating or not participating in this study. You also can

withdraw from the research at any time if you prefer. Your written signature on this Form or oral agreement to fill the questionnaire indicate that you understand, and are willing to participate in this thesis study without pressure from any individual.

Date:.....

Date:.....

Participant

Researcher

()

()

Thank you for your participation. If you have any inquiries, please contact me or my advisor (Assist. prof. Dr. Wipa Sae-Sia)

Siriporn Rumtiammak, Faculty of Nursing, Prince of Songkha University. Cell phone: 0887901512, E-mail: siriporn.rumtiammak@gmail.com

Assist, prof. Dr. Wipa Sae-Sia, Faculty of Nursing, Prince of Songkha University. Cell phone: 086698584, E-mail: wipa.s@psu.ac.th

Appendix C

แบบสอบถาม ความรู้และทักษะการจัดการด้านสุขภาพผู้ประสบอุทกภัยของ อาสาสมัครสาธารณสุขชุมชน (อสม.)

รหัส:

วันที่:

คำอธิบาย: แบบสอบถามชุดนี้ มีวัตถุประสงค์เพื่อสำรวจความรู้และทักษะการจัดการด้านสุขภาพของ
ผู้ประสบอุทกภัยของอาสาสมัครสาธารณสุขชุมชน โดยแบบสอบถามประกอบด้วย 3 ส่วน กรุณา
อ่านข้อคำถามอย่างละเอียดและทำเครื่องหมาย (✓) หรือเติมข้อมูลในช่องว่างให้ตรงตามความเป็น
จริงของท่านมากที่สุด

ส่วนที่ 1 ข้อมูลทั่วไป

1. อายุ.....ปี
2. เพศ
() หญิง () ชาย
3. สถานะภาพ
() โสด () สมรส () หย่าร้าง () หม้าย
4. ศาสนา
() พุทธ () อิสลาม
() คริสต์ () อื่นๆ (ระบุ).....
5. ระดับการศึกษา
() ไม่ได้ศึกษา () ประถมศึกษา () มัธยมศึกษา
() ประกาศนียบัตรวิชาชีพ () ปริญญาตรี () ปริญญาโท/เอก
6. อาชีพ
() เกษตรกร () รับจ้าง () ธุรกิจส่วนตัว
() ข้าราชการ/รัฐวิสาหกิจ () แม่บ้าน () เกษียณ
() อื่นๆ (ระบุ).....
7. ระยะเวลาที่ทำหน้าที่เป็นอาสาสมัครสาธารณสุขชุมชน.....ปี
8. ประสบการณ์การได้รับประสบอุทกภัย
() ไม่เคย () เคย
9. ประสบการณ์การช่วยเหลือด้านสุขภาพผู้ประสบอุทกภัย
() ไม่เคย () เคย (ระบุ).....

10. การได้รับการอบรมความรู้และทักษะการช่วยเหลือด้านสุขภาพผู้ประสบภัย

() ไม่เคย () เคย

ถ้าเคยโปรดทำเครื่องหมาย (✓) ในช่องของเรื่องที่เคยอบรม (เลือกได้มากกว่า 1 ข้อ)

หัวข้อ	เคยอบรม ความรู้	เคยฝึก ปฏิบัติ
10.1. การประเมินชุมชนเพื่อใช้ในการวางแผนการจัดการปัญหาสุขภาพของผู้ประสบภัยพิบัติ		
10.2. การวางแผนการจัดการปัญหาสุขภาพของผู้ประสบภัยพิบัติ		
10.3. การฝึกซ้อมแผนการจัดการปัญหาสุขภาพของผู้ประสบภัยพิบัติ		
10.4. การเฝ้าระวังและป้องกันปัญหาสุขภาพของผู้ประสบภัยพิบัติ		
10.5. การเฝ้าระวังภาวะฉุกเฉินของปัญหาสุขภาพของผู้ประสบภัยพิบัติ		
10.6. การปฐมพยาบาลเบื้องต้น		
10.7. การช่วยฟื้นคืนชีพเบื้องต้น		
10.8. การคัดแยกผู้ประสบภัยพิบัติ		
10.9. การจัดการทีมและการทำงานเป็นทีม		
10.10. การค้นหาและกู้ภัย		
10.11. การเคลื่อนย้ายผู้ประสบภัยและการติดต่อสื่อสาร		
10.12. การจัดบริการสุขภาพแก่ผู้ประสบภัยหลังเกิดภัยพิบัติ		

ส่วนที่ 2 ความรู้การจัดการด้านสุขภาพผู้ประสบภัย

อ่านข้อความอย่างละเอียดและทำเครื่องหมาย (✓) ในช่องถูกหากข้อความนั้นถูก และใส่เครื่องหมาย (✓) ในช่องผิดหากข้อความนั้นผิด

คำถาม	ถูก	ผิด
1. อสม. จะต้องประเมินความรู้และความสามารถของชาวบ้านในการดูแลตนเอง และช่วยเหลือเด็ก หญิงตั้งครรภ์ ผู้พิการ คนชรา รวมทั้งผู้ป่วยเมื่อเกิดน้ำท่วม ในชุมชนได้		
2. อสม. ต้องประเมินจำนวนของสมาชิก อสม. ที่สามารถปฏิบัติงานได้จริงเมื่อเกิดน้ำท่วม		
3. อสม. จะต้องประเมินปัญหาที่ต้องขอความช่วยเหลือจากภายนอกเมื่อเกิดน้ำท่วมได้		
4. อสม. จะต้องสอบถามการรับรู้ของชาวบ้านเกี่ยวกับความรุนแรงของผลกระทบจากภาวะน้ำท่วมที่มีต่อตนเอง เด็ก หญิงตั้งครรภ์ ผู้พิการ คนชรา รวมทั้งผู้ป่วย เมื่อเกิดน้ำท่วมได้		
.....		
.....		
.....		
ขณะทำการค้นหา อสม. พบว่า บ้านบริเวณท้ายหมู่บ้านมีผู้ประสบภัย ประกอบด้วย ชายอายุ 70 ปี ไม่มีโรคประจำตัว สามารถช่วยเหลือตัวเองได้ และเด็กวัยรุ่นอายุ 25 ปี มีไข้สูงมาก เรือของอสม. มีที่ว่างเพียงพอที่เดียว ท่านจึงเลือกช่วยคนชราก่อนเพราะเป็นกลุ่มเปราะบาง		
47. การใช้วิทยุเครื่องแดงในการติดต่อสื่อสารภายในทีมเมื่อเกิดน้ำท่วมเป็นวิธีที่สะดวกที่สุด		
48. การเคลื่อนย้ายผู้ป่วยที่มีการบาดเจ็บกระดูกสันหลัง ต้องเคลื่อนย้ายในท่าท่อนซุง โดยผู้ที่ผ่านการฝึกการเคลื่อนย้ายผู้ป่วยแล้วเท่านั้น		
49. ห้าม หญิงตั้งครรภ์เดินลุยน้ำที่สูงกว่าระดับเอว เพราะอาจทำให้เกิดการติดเชื้อทางช่องคลอด		

ส่วนที่ 3 ทักษะการจัดการด้านสุขภาพผู้ประสบอุทกภัย

คำอธิบาย: โปรดอ่านข้อความต่อไปนี้และเติมเครื่องหมาย (✓) ลงในช่องว่าง เพียงคำตอบเดียวที่ตรงกับความเป็นจริงมากที่สุด จากข้อความที่บ่งชี้ความสามารถในการดูแลเมื่อเกิดอุทกภัยของท่าน มี 5 ระดับ คะแนน 1 –5 หมายถึง ดังนี้

- 1 คะแนน หมายถึง ท่านไม่สามารถทำได้เลย
- 2 คะแนน หมายถึง ยากที่ท่านจะทำได้
- 3 คะแนน หมายถึง ไม่แน่ใจว่าท่านทำได้
- 4 คะแนน หมายถึง ท่านสามารถทำได้ โดยต้องทำตามคำบอกหรือได้รับแนะนำขั้นตอน
- 5 คะแนน หมายถึง ท่านสามารถทำได้ด้วยตัวเอง

ทักษะ	1	2	3	4	5
1. สามารถประเมินความเสี่ยงของชุมชน ต่อการเกิดปัญหาด้านสุขภาพ เมื่อเกิดภาวะน้ำท่วม โดยเฉพาะกลุ่มเปราะบาง ได้ครอบคลุมทุกปัญหา					
2. สามารถประเมินความต้องการของกลุ่มเปราะบางในการดูแลตนเอง เช่น ยาที่ใช้ต่อเนื่อง สถานที่อพยพ เมื่อเกิดน้ำท่วม ได้ครบถ้วน					
3. สามารถประเมินความพร้อมของชาวบ้านในการดูแลตนเอง เมื่อเกิดน้ำท่วมได้ครบถ้วน					
.....					
.....					
.....					
29. สามารถให้การเยียวยาผู้ที่มีอาการซึมเศร้า หรือเครียด เพื่อป้องกันการเกิดภาวะซึมเศร้าหลังเกิดน้ำท่วมได้อย่างมีประสิทธิภาพ					
30. สามารถให้ความรู้ชาวบ้านในการป้องกันอุบัติเหตุที่จะเกิดขึ้นหลังน้ำท่วมได้อย่างมีประสิทธิภาพ					
31. สามารถจัดให้บริการทางด้านสุขภาพผู้ประสบภัย ในระยะหลังเกิดน้ำท่วมได้อย่างมีประสิทธิภาพ					
32. สามารถเยี่ยมบ้านผู้ประสบภัยพิบัติได้ทุกหลังคาเรือน					

Appendix D

‘The Village Health Volunteers (VHVs) Knowledge and Perceived Skills Regarding Health Related Floods Management’ Questionnaire

Code:

Date:

Instruction: This questionnaire is to examine the VHV’s knowledge and perceived skills regarding health related floods management. This questionnaire is divided into three parts. Please read each question carefully before filling in the blank, and marking (✓) inside the bracket of your selected answer where indicated.

Part 1. The Demographic Data Questionnaire

1. Age:.....years

2. Gender

() Female () Male

3. Marital status

() Married () Single () Divorced () Widowed

4. Religion

() Buddhist () Muslim

() Christian () Other religion.....

5. Level of education

() No education () Primary school () High school

() Vocational Certificate () Bachelor degree () Master degree

6. Occupation

() Farmer () Employer () Private business

() Government officer () Housewife () Retirement

() Other (please specify)

7. Time period of work experience as a village health volunteer.....years

8. Previous experience in floods disaster

Yes No

9. Previous aid experience regarding healthcare of flooding victims

No yes

10. Having seminar of any training skills regarding healthcare of flooding victims

No Yes

Please mark (✓) of the given topic items related to your past seminar attendance

(more topic items can be selected)

Training topics	Training methods	
	In-class only	Practice only
1. Assessment of community vulnerability and community capacity		
2. Disaster plan, especially healthcare management		
3. Disaster planning practices to implement the plan of healthcare management		
4. Disaster early warning related to health problems		
5. Disaster early warning signs related to emergency care		
6. First aid		
7. Cardiac pulmonary resuscitation (CPR)		
8. Disaster triage		
9. Team organization		
10. Disaster search and rescue		
11. Logistic and communication		
12. Providing Healthcare services after disaster phases		

Part 2: The VHV's Knowledge Regarding Health Related Floods Management

Questionnaire

Instruction: Please read each question carefully and mark (✓) if it's true or false.

Item	True	False
1. Village health volunteer should assess people's knowledge and skills related to self-care and vulnerable people such as children, women, pregnant women, disabled people, elderly, and patients.		
2. VHV must prepare the specific numbers of members of VHVs who will surely be available to volunteer during floods.		
3. VHVs should analyze problems to request for help from external helpers during the floods.		
4. VHV should ask information from people's perception on severity effects on individuals, children, pregnant women, disabled people, and patients during floods.		
5. VHV should ask people's perception about causes of health problems during floods such as electrical plug, house condition, and household item management.		
6. People in a community are prepared themselves by stocking high quantities of drugs and first aid equipment that show people's good perception for good disaster preparation.		
.....		
47. The best way to communicate within teamwork during floods is to use the CB radio.		
48. Transferring patients with spinal injuries needs to transport in a look-role posture by VHV who received transporting patient training.		
49. Pregnant women should avoid walking in water with higher waist deep because of infection risk.		

Part 3. The VHV’s Perceived Skills Regarding Health Related Floods

Management Questionnaire

Instructions: This questionnaire was developed to determine VHVs’ perceived skills regarding healthcare management during floods. Please read the following statements carefully and put a mark (✓) in the following columns that indicate your ability to perform the regular practices for each competency. Five possible options are available for each statement for you to indicate your ability level, including:

1 = Unable to practice the statement at all

2 = Consider hardly able to practice this statement

3 = Uncertain

4 = Able to practice the statement followed by given instruction

5 = Able to practice the statement automatically

Skill Items	1	2	3	4	5
1. Able to assess risk regarding health related floods management especially with vulnerable people.					
2. Able to assess vulnerable people' needs at home, medication and evacuation centers during floods, completely.					
.....					
31. Able to provide healthcare services during post-flood phase effectively.					
32. Able to visit victim homes during post-floods completely.					

Appendix E

The Village Health Volunteer's Knowledge and Perceived Skills Regarding Health Related Floods Management

Questionnaire Blueprint

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
Pre-disaster phase	1. Assessment	- Knowledge and skill to assess community dwellers' ability in performing self-care and assisting vulnerable people in the community.	1	3
		- Skill to assess community's ability in health related floods management preparedness.	-	4
		- Knowledge to assess the number of members of VHV's who will be available to volunteer during floods.	2	-

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
		- Knowledge and skill to assess the vulnerable people's needs during flooding event.	3	2
		- Skill to assess the community's vulnerability.	-	1
		- Knowledge to assess dwellers' perception of the severity effects of flooding.	4	-
		- Knowledge and skill to assess dwellers' perception of the direct and indirect cause of health problems during floods.	5	5
		- Knowledge to assess dwellers' perception of disaster preparedness.	6	-
		- Knowledge and skill to assess VHVs' ability to coordinate with healthcare providers for referring patients in emergency events.	7	6

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
	2. Management of health problem related to floods disaster	- Knowledge and skill to analyse community's demographic data and synthesize it into a health related flood management plan.	8	7
		- Knowledge to develop vision and goals of health related flood management plan.	9	-
	3. Disaster training and awareness raising	- Knowledge to teach the health related flood management planning to people in the community for effective practice.	10	-
		- Knowledge and skill to practice the health related flood management plan.	11	8
		- Knowledge in frequency for practicing the health related floods management plan.	12	-

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
Disaster phase	1. Early warning	- Knowledge in common health problems that occur during floods.	13	-
		- Knowledge in health problems related to floods prevention.	14	-
		- Skill to detect the health problems during flooding event.	-	9
		- Skill to detect signs of emergency health problems.	-	10
		- Knowledge in leptospirosis detection.	15	-
		- Knowledge in dengue hemorrhagic fever detection.	16	-
		- Knowledge in malaria fever detection.	17	-
		- Knowledge in conjunctivitis detection.	18	-
		- Knowledge in hyperglycemia detection.	21	-
		- Knowledge in hypertension detection.	22	-

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
	2. First aid	- Knowledge and skill to perform basic CPR correctly and effectively.	24	11
		- Knowledge of CPR to administration.	25	-
		- Knowledge in right position to perform CPR.	26	-
		- Knowledge for administering first aid for animal bites.	27	-
		- Knowledge and skill for administering first aid for wound care.	28	14
		- Knowledge and skill for administering first aid for close bone fracture care	30	15
		- Knowledge for administering first aid for open bone fracture care	31	-
		- Knowledge in first aid for sprains and dislocation care.	32	-

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
		- Knowledge and skill to administer first aid for conjunctivitis care.	35	17
		- Knowledge and skill to administer first aid for Athlete's foot care.	36	16
		- Knowledge and skill to administer first aid for food poisoning.	37	18
		- Knowledge and skill to administer first aid for fever.	38	19
		- Skill to administer first aid for hypertensive syndrome.	-	13
		- Knowledge and skill in psychotic problem management.	23	20
	3. Disaster triage	- Knowledge in classifying the victims, based on disaster triage.	39	-

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
		- Knowledge and skill to analyse the disaster triage to classify the victim in a flooding event.	40	21
	4. Team organization	- Knowledge and skill to assign the right person to work in the right position during floods.	41	22
		- Knowledge in team preparedness before going out to work.	42	-
		- Knowledge and skill to communicate with other organizations.	43	23
	5. Search and rescue	- Knowledge to evaluate the area that the VHV will be going to join in the evacuation.	44	-
		- Knowledge and skill to prepare themselves before going to join the evacuation.	45	24

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
		- Knowledge and skill to search and rescue victims effectively.	46	25
	6. Logistic and communication	- Knowledge and skill to communicate with external organizations effectively.	47	26
		- Knowledge and skill to transfer patients who have spinal injuries.	48	27
		- Knowledge to transfer patents who are pregnant.	49	-
Post-disaster phase	1. Disaster related flood prevention	- Knowledge and skill to observe and prevent health problems in post-flood phase.	34	28
		- Knowledge and skill to observe and prevent post-traumatic stress disorder (PTSD).	19	29

Phases of disaster	Components	Item developed questionnaire	Knowledge items	Perceived skills items
		- Skill to teach the dwellers to prevent the accident after flooding event.	-	30
	2. Provide health related flood services	- Knowledge and skill to provide wound care service during post-flooding.	29	31
		- Knowledge in hypotension care.	33	-
		- Knowledge in hyperventilation management.	34	-
		- Knowledge and skill in hypoglycemia management.	20	12
		- Skill to home visit people during post-flooding.	-	32

Appendix F

The Results of VHV's Knowledge and Perceived Skills Regarding Health

Related Floods Management Scores Normal Distribution Test

The normal distribution test was used to test assumptions of parametric statistics. This was done by using a 'skewness' value; above and below ± 2 indicates a severe skewness (Munro, 2001, p. 42-32). The formula:

$$\text{Skewness} = (\text{mean} - \text{median}) / \text{SD}$$

The knowledge reading health related floods management score

$$\text{Mean} = 39.55$$

$$\text{Median} = 40$$

$$\text{SD} = 4.28$$

$$\text{Skewness} = (\text{mean} - \text{median}) / \text{SD} = 39.55 - 40 / 4.28 = -.11$$

The skewness value of the knowledge reading health related floods management score = -.11

The perceived skills reading health related floods management score

$$\text{Mean} = 119.19$$

$$\text{Median} = 124$$

$$\text{SD} = 21.83$$

$$\text{Skewness} = (\text{mean} - \text{median}) / \text{SD} = 119.19 - 124 / 21.83 = -.22$$

The skewness value of the knowledge reading health related floods management score was calculated to be -.22

Appendix G

Experience of Disaster Training Among VHV's Being Trained Categorized by Training Topics and Training Methods (In-class only, Practice only, and Both in-class and Practice (N = 380))

Training topics	Training methods			
	Never trained	In-class only	Practice only	Both in- class and practice
	n (%)	n (%)	n (%)	n (%)
1. Assessment of community vulnerability and community capacity	184 (84.4%)	161 (42.4%)	25 (6.6%)	10 (2.6%)
2. Disaster plan, especially healthcare management	168 (44.2%)	159 (41.8%)	44 (11.6%)	9 (2.4%)
3. Disaster planning practices to implement the plan of healthcare management	181 (47.6%)	145 (38.2%)	44 (11.6%)	10 (2.6%)
4. Disaster early warning related to health problems	166 (43.7%)	176 (46.3%)	29 (7.6%)	9 (2.4%)
5. Disaster early warning related to emergency care	180 (47.4%)	162 (42.6%)	31 (8.2%)	7 (1.8%)
6. First aid	147 (38.7%)	163 (42.9%)	47 (12.4%)	23 (6.1%)
7. Cardiac pulmonary resuscitation (CPR)	176 (6.3%)	154 (44.5%)	32 (8.4%)	18 (4.7%)
8. Disaster triage	202 (53.2%)	136 (35.8%)	33 (8.7%)	9 (2.4%)
9. Team organization	176 (45.8%)	140 (36.8%)	46 (12.1%)	20 (5.3%)
10. Disaster search and rescue	206 (54.2%)	125 (32.9%)	44 (11.6%)	5 (1.3%)
11. Logistic and communication	197 (51.8%)	140 (36.8%)	37 (9.7%)	6 (1.6%)
12. Providing Healthcare services after disaster phases	184 (48.4%)	152 (40.0%)	35 (9.2%)	9 (2.4%)

Appendix H

Mean, Standard Deviation, Median, and Interquartile Range (IQR) of the Corrected Score of Knowledge Categorized by Disaster Phases, and Items of Health Related Floods Management

Phases of disaster	Item of knowledge	Mean (SD)	Median (IQR)
Pre-disaster phase		78.7 (8.7)	83.3 (25.0)
	1. Knowledge to assess community dwellers' ability in performing self-care and assisting vulnerable people in the community.	95.0 (21.3)	100.0 (.0)
	2. Knowledge to assess the number of members of VHV's who will be available to volunteer during floods.	92.0 (26.0)	100.0 (.0)
	3. Knowledge to assess the vulnerable people's needs during flooding event.	84.2 (36.5)	100.0 (.0)
	4. Knowledge to assess dwellers' perception of the severity effects of floods.	95.0 (22.4)	100.0 (.0)
	5. Knowledge to assess dwellers' perception of the direct and indirect cause of health problems during floods.	89.0 (30.7)	100.0 (.0)
	6. Knowledge to assess dwellers' perception of disaster preparedness.	24.0 (42.6)	.0 (.0)

Phases of disaster	Item of knowledge	Mean (SD)	Median (IQR)
	7. Knowledge to assess VHVs' ability to coordinate with healthcare providers for referring patients in emergency events.	81.0 (39.2)	100.0 (.0)
	8. Knowledge to analyse community's demographic data and synthesize it into a health related flood management plan.	84.0 (36.8)	100.0 (.0)
	9. Knowledge to develop vision and goals of health related flood management plan.	78.0 (41.7)	100.0 (.0)
	10. Knowledge to teach the health related floods management planning to people in the community for effective practice.	87.0 (33.8)	100.0 (.0)
	11. Knowledge to practice the health related flood management plan.	74.0 (44.0)	100.0 (100.0)
	12. Knowledge in frequency for practicing the health related floods management plan.	56.0 (49.8)	100.0 (100.0)
Disaster phase		82.3 (9.85)	84.4 (12.5)
	13. Knowledge in common health problems that occur during floods.	76.0 (42.6)	100.0 (.0)
	14. Knowledge in health problems related to floods prevention.	94.0 (22.9)	100.0 (.0)
	15. Knowledge in leptospirosis detection.	88.0 (32.7)	100.0 (.0)
	16. Knowledge in dengue hemorrhagic fever detection.	92.0 (27.4)	100.0 (.0)
	17. Knowledge in malaria fever detection.	88.0 (32.0)	100.0 (.0)

Phases of disaster	Item of knowledge	Mean (SD)	Median (IQR)
	18. Knowledge in conjunctivitis detection.	90.0 (30.4)	100.0 (.0)
	21. Knowledge in hyperglycemia detection.	92.0 (27.4)	100.0 (.0)
	22. Knowledge in hypertension detection.	76.0 (42.9)	100.0 (.0)
	24. Knowledge in step to perform basic CPR correctly and effectively.	72.0 (45.2)	100.0 (.0)
	25. Knowledge of CPR administration.	77.0 (42.4)	100.0 (.0)
	26. Knowledge in right position to perform CPR.	86.0 (35.0)	100.0 (.0)
	27. Knowledge for administering first aid for animal bites.	76.0 (43.0)	100.0 (.0)
	28. Knowledge for administering first aid for wound care.	74.0 (43.7)	100.0 (100.0)
	30. Knowledge for administering first aid for close bone fracture care.	97.0 (18.2)	100.0 (.0)
	31. Knowledge for administering first aid for open bone fracture care.	81.0 (39.7)	100.0 (.0)
	32. Knowledge in first aid for sprains and dislocation care.	71.0 (45.3)	100.0 (100.0)
	35. Knowledge to administer first aid for conjunctivitis care.	64.0 (48.0)	100.0 (100.0)
	36. Knowledge to administer first aid for Athlete's foot care.	98.0 (13.5)	100.0 (.0)
	37. Knowledge to administer first aid for food poisoning.	62.0 (48.5)	100.0 (100.0)

Phases of disaster	Item of knowledge	Mean (SD)	Median (IQR)
	38. Knowledge to administer first aid for fever.	98.0 (14.4)	100.0 (.0)
	23. Knowledge in psychotic problem management.	70.0 (45.8)	100.0 (.0)
	39. Knowledge in classifying the victims, based on disaster triage.	79.0 (41.0)	100.0 (.0)
	40. Knowledge to analyse the disaster triage to classify the victim in a flooding event.	86.0 (35.0)	100.0 (.0)
	41. Knowledge to assign the right person to work in the right position during floods.	52.0 (50.0)	100.0 (100.0)
	42. Knowledge in team preparedness before going out to work.	89.0 (31.4)	100.0 (.0)
	43. Knowledge to communicate with other organizations.	89.0 (31.4)	100.0 (.0)
	44. Knowledge to evaluate the area that the VHV will be going to join in the evacuation.	93.0 (24.8)	100.0 (.0)
	45. Knowledge to prepare themselves before going to join the evacuation.	94.0 (24.4)	100.0 (.0)
	46. Knowledge to search and rescue victims effectively.	73.0 (44.2)	100.0 (100.0)
	47. Knowledge to communicate with external organizations effectively.	81.0 (39.0)	100.0 (.0)
	48. Knowledge to transfer patients who have spinal injuries.	89.0 (31.1)	100.0 (.0)
	49. Knowledge to transfer patents who are pregnant.	73.0 (44.2)	100.0 (100.0)

Phases of disaster	Item of knowledge	Mean (SD)	Median (IQR)
Post-disaster phase		80.1 (13.4)	77.8 (22.2)
	19. Knowledge to observe and prevent post-traumatic stress disorder (PTSD).	87.0 (33.3)	100.0 (.0)
	29. Knowledge to provide wound care service during post-flooding.	93.0 (25.7)	100.0 (.0)
	33. Knowledge in hypotension care.	84.0 (37.0)	100.0 (.0)
	34. Knowledge in hyperventilation management.	73.0 (44.2)	100.0 (.0)
	20. Knowledge in hypoglycemia management.	83.0 (37.2)	100.0 (.0)

Appendix I

Mean, Standard Deviation, Median, and Interquartile Range (IQR) of the Score of Perceived Skills Categorized by Disaster Phases, and Items of Health Related Floods Management

Phases of disaster	Item of perceived skill	Mean (SD)	Median (IQR)
Pre-disaster phase		74.1 (14.5)	77.5 (17.5)
	3. Skill to assess community dwellers' ability in performing self-care and assisting vulnerable people in the community.	77.1 (21.0)	80.0 (40.0)
	4. Skill to assess community's ability in health related floods management preparedness.	73.1 (19.9)	80.0 (20.0)
	2. Skill to assess the vulnerable people's needs during flooding event.	72.2 (19.5)	80.0 (20.0)
	1. Skill to assess the community's vulnerability.	69.5 (18.6)	80.0 (20.0)
	5. Skill to assess dwellers' perception of the direct and indirect cause of health problems during floods.	71.1 (18.5)	80.0 (20.0)
	6. Skill to assess VHV's ability to coordinate with healthcare providers for referring patients in emergency events.	78.9 (18.3)	80.0 (20.0)
	7. Skill to analyse community's demographic data and synthesize it into a health related flood management plan.	74.4 (18.3)	80.0 (.0)
	8. Skill to practice the health related flood management plan.	76.4 (18.2)	80.0 (.0)
Disaster phase		74.0 (14.5)	76.9 (20.0)
	9. Skill to detect the health problems during flooding event.	76.4 (19.2)	80.0 (20.0)
	10. Skill to detect signs of emergency health problems.	75.0 (19.3)	80.0 (20.0)
	11. Skill to perform basic CPR correctly and effectively.	63.2 (23.4)	60.0 (35.0)
	14. Skill for administering first aid for wound care.	74.1 (20.0)	80.0 (20.0)

Phases of disaster	Item of perceived skill	Mean (SD)	Median (IQR)
	15. Skill for administering first aid for close bone fracture care	64.0 (21.6)	60.0 (20.0)
	17. Skill to administer first aid for conjunctivitis care.	78.4 (20.1)	80.0 (40.0)
	16. Skill to administer first aid for Athlete's foot care.	84.7 (19.4)	100.0 (20.0)
	19. Skill to administer first aid for fever.	80.5 (19.6)	100.0 (40.0)
	13. Skill to administer first aid for hypertensive syndrome.	74.1 (19.6)	80.0 (20.0)
	20. Skill in psychotic problem management.	70.7 (20.5)	80.0 (20.0)
	21. Skill to analyse the disaster triage to classify the victim in a flooding event.	73.8 (19.8)	80.0 (20.0)
	22. Skill to assign the right person to work in the right position during floods.	78.3 (19.7)	80.0 (20.0)
	23. Skill to communicate with other organizations.	75.9 (20.6)	80.0 (40.0)
	24. Skill to prepare themselves before going to join the evacuation.	77.4 (20.6)	80.0 (40.0)
	25. Skill to search and rescue victims effectively.	69.0 (19.8)	80.0 (20.0)
	26. Skill to communicate with external organizations effectively.	73.6 (20.4)	80.0 (20.0)
	27. Skill to transfer patients who have spinal injuries.	63.6 (21.0)	60.0 (20.0)
Post-disaster phase		77.2 (17.0)	80.0 (20.0)
	28. Skill to observe and prevent health problems in post-flood phase.	77.2 (20.5)	80.0 (40.0)
	29. Skill to observe and prevent post-traumatic stress disorder (PTSD).	70.0 (21.4)	80.0 (20.0)
	30. Skill to teach the dwellers to prevent the accident after flooding event.	78.2 (19.3)	80.0 (40.0)
	12. Skill in hypoglycemia management.	74.5 (19.6)	80.0 (20.0)
	32. Skill to home visit people during post-flooding.	83.6 (21.3)	100.0 (20.0)

Appendix J

List of Experts

The questionnaires of this study were validated by three experts

1. Luppana Kitrungrrote, RN., PhD. Assistant. Professor, Faculty of Nursing, Prince of Songkla University, Thailand
2. Chotika Phuchaisiri, RN., Director of Pore-Prom Primary Care Unite, Hatyai, Songkla, Thailand
3. Malinee Gada, VHV of Pore-Prom Primary Care Unite, Hatyai, Songkla, Thailand