CHAPTER I

INTRODUCTION

BACKGROUND AND RATIONALE

Dengue hemorrhagic fever (DHF), caused by dengue virus, has become a major problem in Thailand and nearby countries. It has been a problem for medical and public health services for more than 4 decades (Veravit Boonyapisit, 1988) and has become endemic in Thailand (Ongard Charoensuk, 1995), where patients are infected by the virus every year but lack correct diagnosis and proper treatment, sometimes resulting in dengue shock syndrome and death. The government spends large sums of money on treating these patients every year (Vimolman Ponglitsakda, 1985). Dengue hemorrhagic fever emerged about 45 years ago, in 1949. It first spread in the Philippines, in 1954 (Srivika Sangtharathip, 2002). Currently, dengue hemorrhagic fever is an insoluble problem in Southeast Asia with increasing numbers of infected people every 3-5 year period, though mortality rates have dropped from 5 to 2%. Among the 10 countries in the Southeast Asia region, Thailand, Indonesia and Myanmar were in the top range for dengue hemorrhagic fever epidemics. The dengue hemorrhagic fever situation in India and Sri Lanka was at a medium level. In 1996, 8,866 patients and 378 deaths were found in Delhi, which accounted for 4.3% of the mortality rate, whereas, in Bangladesh, widespread dengue hemorrhagic fever was found in 1964. Therefore, most people had improved their antibody levels to dengue virus. This figure showed frequent widespread DHF in this area, with a similar

situation in the Maldives (Srivika Sangtharathip, 2002). In Thailand, the first appearance of widespread DHF was noted in 1958 in Bangkok, with 2,000 infections and 300 deaths (Ousa Tisayakorn, 1999). Five years later, it was reported that, or people infected with DHF every year, most were from Bangkok and Thonburi areas, where the spread increased over one year and dropped the following year. Later on, it had spread to other major provinces, particularly those with large populations and convenient access. DHF spread further into every area of Thailand within a short time. The spread of DHF can be divided into 4 stages, with each stage taking about 10 years: the 1st stage (1958-1967) had low numbers of sick people, with 3,114 patients per year, equivalent to an average infection rate of 10.77/100,000 patients. In 1965, a maximum numbers of 7,663 patients was reported, or an average infection rate of 25.06/100,000 people. Most patients lived in the major provinces, which were likely to be easily accessed, and where an epidemic had taken place every other year (Sujittara Nimmannit, 1993). In the 2nd stage (1968-1977), higher numbers of infections were reported, with averages of 13,313 patients per year, and an average infection rate of 33.45/100,000 population. During the 2nd stage, in 1977, the maximum number was 38,768 patients, or an average infection rate of 89.24/100,000 population. Most patients were found in the major provinces, where there were large populations, or in urban areas, while the epidemic took place for two years and disappeared every one or two years. The 3rd stage (1978-1987), was reported at an early stage, with similar numbers of patients to the 2nd stage. However, in year 1987, it had become the largest epidemic of DHF in Thailand, with 174,285 patients and an average infection rate of 325.13/100,000 population, whereas, the whole of this stage had shown 49,655 patients per year, while the average infection rate was 97.39/100,000 population. Moreover, it

spread to every area of the country, from urban to rural areas and it happened every two or three years. The 4th stage (1988-1997) saw a drop in patient numbers from the outset due to a fuller state of alertness. Nevertheless, there was a high number of patients, > 35,000 almost every year, and huge numbers during 2 epidemics in this stage: in 1990, there were 92,005 patients with an average infection rate of 163.43/100,000 population, and in 1997 there were 101,689 patients with an average infection rate of 167.21/100,000 population. During the whole stage, there was an average of 59,661 patients per year, and an average infection rate of 103.10/100,000 population. In addition, the DHF situation during 1998-2002 saw 2 large epidemics, in 1998 and 2001; in 1998, there were 129,494 patients, and an average infection rate of 211.42/100,000 population, with 424 fatalities, while in 2001, there were 139,732 patients, with an average infection rate of 225.82/100,000 population, with 244 fatalities (Srivika Sangtharathip, 2002). At the beginning of 2002, 100,361 patients were reported, with an average infection rate of 161.07/100,000 population, and 159 fatalities, a mortality rate of 0.26/100,000 population. As for differences by geographic region, the Northeastern region had the highest infection rate of 31,557 patients, with an average infection rate of 146.82/100,000 population and 50 fatalities, i.e. a mortality rate of 0.23/100,000 population. Secondly, in the Southern region, there were 29,494 patients, with an average infection rate of 354.85/100,000 population and 61 fatalities, i.e. a mortality rate of 0.73/100,000 population. In the Central region, there were 26,193 patients, with an average infection rate of 128.53/100,000 population and 26 fatalities, i.e. a mortality rate of 0.13/100,000 population. In the Northern region, there were 3,117 patients, with an average infection rate of 108.19/100,000 population, and 22 fatalities, i.e. a mortality rate of 0.18/100,000 population

(http/www.cdcnet.moph.go.th/dhfweb/week46/index1.html). A review of the above situation indicates that the DHF infection rate appears at risk of increasing further, without strict prevention controls and ongoing planning.

DHF can infect anyone of any age or gender; 70-75% of patients were between 5-14 years old, which was about 3-4 times higher than other ages (The Epidemic Department, 1997). However, infection has been reported in the newborn, aged 6 days; the physician believed that the newborn had been infected by transfer from his mother, who had been infected with DHF two days prior to delivery (Ousa Tisyakorn, 1999). Epidemics of DHF may be caused by *Aedes* mosquitoes, which attack people in the daytime, because most infected people habitually stayed on their beds during the day without a mosquito net. DHF infection can occur in any season of the year, but it has mostly been found in the rainy season, because there are plenty of water-filled containers that become good breeding places. Moreover, children prefer to stay at home more than in the other seasons, and this led to the rapid spread of epidemics (Supat Sujarit, 1991). Therefore, the effects and complications of disease caused severe symptoms that developed into serious illness and death for many children each year. Furthermore, the suffering caused by the sickness might affect the physical and mental development of those sick children. In addition, it would cause their families to become anxious and inevitably spend a lot of time and money on their treatment, particularly when it ended in death. Furthermore, it would be an invaluable loss to the country because children are valuable resources for developing the country in the future. (Yongyut Wangrungruang, 1995). Currently, a dengue vaccine is not available, so that the best way to prevent and control the disease is to eliminate places mosquitoes

use for breeding, which also directly concerns the practices and behaviors of people in families and the community (Supat Sujarit, 1991), because improper behaviors might lead to health problems at both individual and family levels, and may extend to become health problems at community and national levels (Somsong Rakpao, 1997). The prevention and control of DHF by the Ministry of Public Health, which responded directly to taking control with some strategies and support for DHF prevention and control in the past, may not have achieved a satisfactory level because of some troubles and unsolved problems, which may be summarized as follows: the strategies of current disease control, such as controlling the numbers of carriers and elimination of breeding areas, did not seem to be effective for the whole year, and required a lot of participation for success (Yawwalak Anurak, 1997). Also, many people paid less attention because they perceived that it was not their business to get involved with protection activities, so they left them to the public health officers (Yongyut Wangrungruang, 1995). So, it was most important to motivate and persuade people to participate in those activities.

The Ministry of Public Health had foreseen the importance of public participation and had led public health training activities for all family members, such as prevention and control of disease, and also encouraged them in collaborative efforts with public health units. The Public Health Development Plan (Edition 8), in 1997-2001, realized the importance of human development, since it was concerned with the healthy behaviors individuals, families and whole communities. The program promoted self-initiated improvement of healthy conditions and the prevention of disease and introduced selecting family members to become family health leaders, to take responsibility for supporting family members to be healthy, and also for arranging

health for everyone in the family to have healthy minds and healthy bodies (Pensri Pleankom, 1999). Those family health leaders should have good behavior, be non-alcoholics, non-smokers, and their families should be able to provide leadership as good examples of health self-care. The main roles of the family health leaders concerned taking care of their family members' health conditions, being good health examples for family members, and becoming cooperators for participatory problem solving and improving public health activities for their families and their community. According to the policy, training for those family health leaders in Phatthalung Province took place in every district, aiming to introduce knowledge and select family health leaders who would take part fully in their area for 5 years, starting in 1997. In Tamode District, they had foreseen the importance of the prevention and control of DHF for effectiveness and continuity, and they had also maintained participation among many organizations, such as public health volunteer groups, community leaders and local schools to keep close communication current about DHF, by providing a one-day seminar that involved the general background of DHF to prevent disease, elimination of breeding areas of *Aedes* mosquitoes, and observing the symptoms of disease before going to see a doctor. They also provided knowledge about DHF to the family health leaders, to take part in appropriate behaviors and encourage other family members to maintain healthy conditions; then they could build community networks to control DHF as a whole. After the seminar, there were also some assessments, which found that they were at a satisfactory level. However, some problems and troubles were encountered in the prevention of DHF due to discontinuity or little participation, which may have been caused by low motivation or little support. Moreover, the practical cases had been inadequate to prevent egg-laying by mosquitoes.

RATIONALE

Phatthalung Province was an area with epidemics of DHF every year. According to reports (Public Health Department, Phatthalung Province, 2002), there were 4 epidemics of DHF in the previous 14 years (1988-2001), in which epidemics occurred about every 4 years, with outbreaks about every 2 years. The first epidemic was in 1990, with a total of 3,552 patients, and an average infection rate of 774.31/1000 population. The second epidemic was in 1995, with a total of 1,379 patients, and an average infection rate of 284.80/100,000 population. The third epidemic was in 1998, with a total of 1,987 patients, and an average infection rate of 402.10/100,000 population. The fourth epidemic was in 2001, with total of 1,832 patients, and an average infection rate of 398.45/100,000 population (Public Health Department, Phatthalung Province, 2002). The DHF situation in Phatthalung Province, in 2002, was reported as 2,463 infections from 1st January to 31 December 2002, with an average infection rate of 489.02/100,000 population, and no report of fatality. Most reports were made by local hospitals that counted (55.62%), followed by general hospitals (43.27%) and provincial hospitals (1.11%), in which inpatients and outpatients were 89.04 and 10.96%, respectively. In the Phatthalung area, patients aged 10-14 years were found to be the highest in number, with an average infection rate of 507.40/100,000 population; second were patients aged 5-9 years, with an average infection rate of 451.65/100,000 population; third were patients aged 0-4 years, with an average infection rate of 296.61/100,000 population; and fourth, patients aged 15-24 years, with an average infection rate of 117.76/100,000 population. Moreover, most patients (75.17%) were < 15 years old (Public Health Department, Phatthalung Province, 2002).Regarding the DHF situation in Tamode District, 343 patients were

infected with DHF, with an average infection rate of 1,242.79/100,000 population. In comparison with the others, Tamode District had the highest DHF infection rate, followed by Khao-Chaison District, and Srinakarin Sub-district, respectively. The disease was found in 31 villages located in rural areas, in which the disease had already taken place for 2 of 4 weeks, whereas the spread of disease in each Tambon showed a maximum infection rate in Sub-District-Maekaree, of 547.12/100,000 population, followed by Sub-District-Tamode, and Sub-District-Klongyai, with average infection rates of 409.43 and 286.24/100,000 population, respectively (Health Office, Tamode District, 2002). It is known that the large numbers of larvae and dengue virus in the mosquitoes caused the disease, so that, if the population of *Aedes* mosquitoes is kept low, DHF infections are rare or non-existent, such as in Singapore (Medical Entomology Department, 1990). The monthly survey since January demonstrated the prevalence of mosquito larvae in Tamode District, and every village in Tamode District had a larval index value above the limit of not more than 10/100 house surveys. Surveys have shown that greater numbers of mosquito larvae might increase the risk of developing more adult *Aedes* mosquitoes, which carry the disease. The geography, weather conditions and geographical environments of Tamode District made it a good place to contribute to the spread of DHF, because most areas had been low-lying land and hillsides that usually had high water levels in the rainy season. The rainy season in the South lasts almost 8 months, during which it might produce an abundance of filled water containers, with consequent negative results. If containers with water for use were improperly covered, or other containers of wastewater were not eliminated, they became good places for laying mosquito eggs. Also, each house had its own open water reserve for use in summer, which might also cause the spread of DHF. The

study by Suporn Chunhawuttiyanon focused on people's behaviors leading to breeding areas for *Aedes* mosquitoes in Buriram Province, and showed that water-container usage behaviors were related to the breeding areas of *Aedes* mosquitoes with significance, at P value = 0.05. This study showed that most people had behaviors that contributed to the risk of creating breeding areas for mosquitoes. In Tamode District, most people worked in agriculture as rubber farmers, orchardmen, etc., whereas most people spent their nighttimes working and slept during the daytime; for example, rubber farmers seemed to be easily infected with the disease, while the *Aedes* mosquitoes sought food in the daytime, between 09.00-11.00 hr and 14.00-17.00 hr, when they might also harm children who slept in the daytime (Yongyut Wangrungthap, 1995). If people spent their daytimes sleeping without a mosquito net, their behavior might increase the risk of infection with the disease. So, if the right protection and effective control of mosquito breeding areas were not provided, the numbers of mosquito larvae might rise dramatically, resulting in increased numbers of people infected with DHF. Whenever the *Aedes* mosquitoes attacked an infected person, and then attacked another, it might lead to the spread of disease in the community very quickly.

To handle the DHF situation in Phatthalung Province and in Tamode District, it was followed by the Ministry of Public Health's policy and plan for the protective control of DHF. The plan was taken from the provincial level to the village level, in cooperation with other units and organizations in the community. Moreover, the public health office in Tamode District implemented protective control strategies for disease by using the family health leaders' group, who had been educated about public health services. In the past, public health volunteer groups took part in introducing knowledge

to protect people from DHF, but there were problems with improper balance and discontinuity (Public Health Office, Tamode District, 2002), so they revised the plan to enroll people into a cooperative network for protection against DHF.

The public health office in Tamode District had run a seminar for family health leaders, in which it aimed to provide knowledge about protective control of DHF, especially the elimination of mosquito larvae, mosquito larva surveys, watching for and observing the symptoms of infected people before going to see a doctor, and promoting networks for protective control of DHF. The seminar included assessment of the knowledge to the family health leaders prior to and after the seminar. The prior test comprised 30 questions (30 points), in which the lowest score was 14 points and the highest 21. The post-seminar test results showed that all of the family health leaders had improved their scores, with a minimum score of 15 points and a maximum of 25. The opinion survey responses of each trainee using the assessment form (18 choices) were separated into 3 levels (good, satisfactory, and poor) for time spent, communication methods, teaching tools, and seminar location. The responses were in the satisfactory level with percentage values of 71.42, 62.58, 54.28, 51.42, 60.00 and 62.85%, respectively. Understanding and knowledge about DHF were at a good level (62.50%), while protective control of disease and elimination of breeding areas were at satisfactory (30.10%) and poor levels (7.4%), respectively. After the seminar, the results for their protective control of dengue disease practices were followed up and assessed by the prevalence of mosquito larvae and the DHF infection rate in Tamode District. It was found that the larval index still remained higher than the standard (i.e., $< 10\%$ of the families surveyed) and the infection rate was $> 50/100{,}000$ population

(Public Health Office, Phatthalung Province, 2002). Initially, it was assumed that the failure of disease prevention in Tamode District may have resulted from mistakes in the process of disease control, or partly from improper practices or bad attitudes, lack of equipment to handle mosquito larvae, insufficient support and motivation, losing contact with the public health officer or volunteers to continue the program, and other factors that may have affected the people's practices.

As mentioned above, given such circumstances, the researcher was interested and needed to know the DHF prevention and control behaviors of the family health leaders, and the influencing factors that either encouraged or impeded those. So, in this research, the PRECEDE-PROCEED Model was used to analyze factors that particularly affected the support or obstruction of DHF prevention and control behaviors. Since this Model was well suited to analyzing behavior problems and it kept close to people's lives, it would be useful for making plans and establishing methods to support or change the causes of factors that successfully encouraged the dengue prevention and control program.

RESEARCH QUESTIONS

1. How did the family health leaders in Tamode District practice DHF prevention and control behaviors?

2. What are the predisposing, reinforcing and enabling factors related to the prevention and control behaviors of the family health leaders?

GENERAL OBJECTIVE

To study the dengue prevention and control behaviors of the family health leaders in Tamode District, Phatthalung Province.

SPECIFIC OBJECTIVES

1. To study the dengue prevention and control behaviors of the family health leaders.

2. To study knowledge about DHF and the prevention and control of disease, people's attitudes towards DHF, and the prevention and control of disease by family health leaders.

3. To study factors affecting the dengue prevention and control behaviors of family health leaders.

OPERATIONAL DEFINITIONS

1. DHF patients means persons diagnosed with the symptoms of DF, DHF and DSS, as defined by Dr. Yongyut Wangrungthap, having acute high fever and sustained high fever for 2-7 days, gastric bleeding, petechiae, and hepatomegaly.

2. Family health leader means the family members who take the main responsibility for arranging health support for each family member.

3. Knowledge about DHF refers to the knowledge gained by the family health leader through experiences about the cause, transmission, prevention and control of DHF.

4. Attitudes about dengue hemorrhagic fever refers to the feelings of the family health leader with regards to prevention and control behaviors against DHF.

5. Prevention and control behaviors of DHF means practices that try to reduce breeding places for mosquito larvae, such as having covers on the top of water containers, elimination of unused water containers, and biochemical treatment to eliminate mosquito larvae.

SCOPE OF STUDY

This research focuses on family health leaders who attended a seminar provided by the public health staff in Tamode District, Phatthalung Province.

EXPECTED OUTCOMES

1. To study the DHF prevention and control behaviors of family health leaders.

2. To study the knowledge of people and their attitudes about the prevention and control of dengue disease among family health leaders.

3. To study the factors relevant to the dengue prevention and control behaviors among family health leaders.

CONCEPTURAL FRAMEWORK

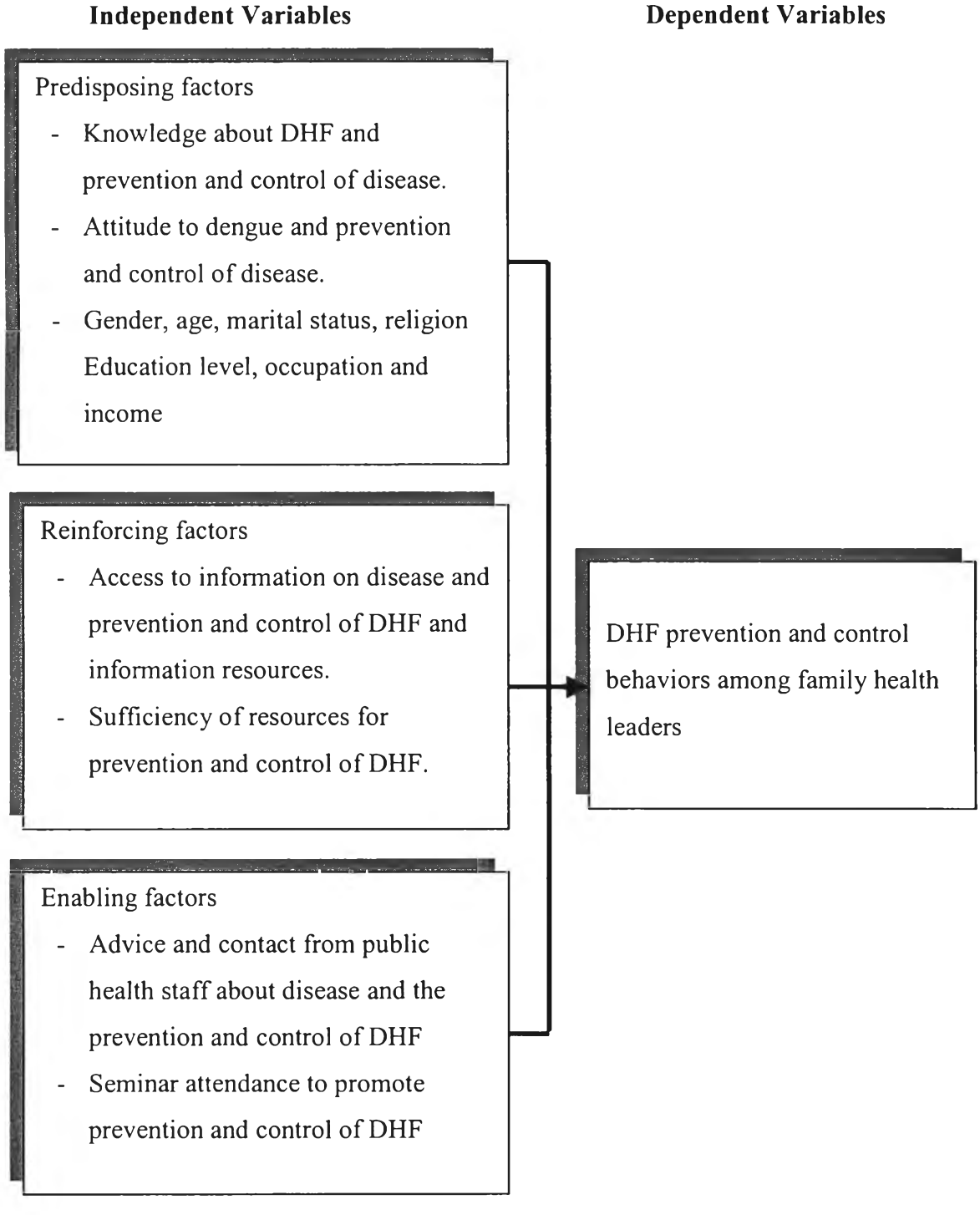

Figure 1. Conceptual framework for the DHF prevention and control behavior of family health leaders in Tamode District, Phatthalung Province