IMPLEMENTATION OF A LARVAL AND PUPAL SOURCE REDUCTION PROGRAM (LSRP) FOR SUSTAINABILITY IN PREVENTION AND CONTROL OF DENGUE HAEMORRHAGIC FEVER (DHF) IN COMMUNITY OF KRABI PROVINCE, THAILAND

Mr.Rewat Rugkua

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Public Health
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โปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่

นายเรวัต รักเกื้อ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรดุษฎีบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
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Thesis Title	IMPLEMENTATION OF A LARVAL AND PUPAL SOURCE REDUCTION PROGRAM (LSRP) FOR SUSTAINABILITY IN PREVENTION AND CONTROL OF DENGUE HAEMORRHAGIC FEVER (DHF) IN COMMUNITY OF KRABI PROVINCE, THAILAND
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Accepted by the College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Doctoral Degree

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เรวัต รักเกื้อ : โปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่ (Implementation of a Larval and Pupal Source Reduction Program (LSRP) for sustainability in prevention and control of Dengue Haemorrhagic Fever (DHF) in community of Krabi Province, Thailand) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : อ.ดร.กาญจนา รังษีหิรัญรัตน์; 184 หน้า

วัตถุประสงค์: 1) เพื่อศึกษาการเปลี่ยนแปลงด้านความรู้ การรับรู้ การประเมินถึงศักยภาพของตนเองและพฤติกรรมในการควบคุมและป้องกันโรคไข้เลือดออก 2) เพื่อศึกษาการเปลี่ยนแปลงของดัชนีชี้วัดความชุกลูกน้ำยุงลาย 4 ชนิด ได้แก่ ร้อยละของบ้านที่พบลูกน้ำ (HI) ร้อยละของภาชนะที่พบลูกน้ำ (CI) จำนวนภาชนะที่สำรวจพบลูกน้ำต่อบ้าน 100 หลังคาเรือน (BI) และ จำนวนภาชนะที่สำรวจพบตัวโม่งต่อบ้าน 100 หลังคาเรือน (PI) ภายหลังการได้รับโปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย (LSRP)

รูปแบบและวิธีการศึกษา: เป็นการวิจัยแบบกึ่งทดลอง ศึกษาวิจัยในจังหวัดกระบี่ระหว่างเดือนมีนาคม ถึงเดือนพฤศจิกายน 2555 โดยศึกษาในกลุ่มนักเรียนและกลุ่มแม่บ้าน คัดเลือกกลุ่มตัวอย่างเข้าสู่การศึกษาด้วยการสุ่มอย่างง่าย โดยในแต่ละกลุ่มจะถูกแบ่งออกเป็น 2 รุ่นเท่า ๆ กัน โดยรุ่นที่ 1 ได้รับการอบรมตามโปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย (LSRP) เป็นเวลา 3 วัน ในรุ่นที่ 2 ได้รับการถ่ายทอดความรู้ต่าง ๆ จากรุ่นที่ 1 ด้วยวิธีเพื่อนสอนเพื่อน (Buddy method) ในแต่ละรุ่นทำการวัดผลการทดลองจำนวน 5 ครั้ง วิเคราะห์ข้อมูลเพื่อหาประสิทธิผลอันเกิดจากอิทธิพลของโปรแกรมด้วยวิธี การวิเคราะห์ตัวแบบเชิงเส้นผสม (Linear mixed model analysis)

ผลการศึกษา : ผลการศึกษาพบว่าโปรแกรม LSRP ได้พัฒนาด้านความรู้ การรับรู้ การประเมินศักยภาพของตนเองและการปฏิบัติด้านการป้องกันและควบคุมไข้เลือดออกทั้งในกลุ่มนักเรียนและกลุ่มแม่บ้าน ซึ่งมีความแตกต่างระหว่างกลุ่มทดลองและกลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ ($P < .05$) วิธีการถ่ายทอดความรู้ด้วยวิธีเพื่อนสอนเพื่อน พบว่าได้พัฒนาความรู้และการรับรู้ในกลุ่มนักเรียน ในขณะที่วิธีการเพื่อนสอนเพื่อนได้พัฒนาการประเมินศักยภาพของตนเองและการปฏิบัติในกลุ่มแม่บ้านซึ่งมีความแตกต่างระหว่างกลุ่มทดลองและกลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ ($P < .05$) ส่วนผลการทดลองในโปรแกรมทั้ง 2 อย่าง ทั้งในกลุ่มนักเรียนและแม่บ้าน พบว่า ความรู้ การรับรู้และการประเมินศักยภาพของตนเองในระหว่างรุ่นนั้นไม่มีความแตกต่างกัน ($P > .05$) และในกลุ่มแม่บ้านยังพบว่าการปฏิบัติด้านการป้องกันและควบคุมโรคระหว่างรุ่นนั้นยังไม่มีความแตกต่างกันอีกด้วย ($P > .05$)

สรุปและอภิปรายผล: ในกลุ่มนักเรียน โปรแกรม LSRP มีผลต่อความรู้ การรับรู้ การประเมินศักยภาพของตนเองและการปฏิบัติในระยะเวลา 3 เดือนแรกได้ดีกว่าในระยะเวลา 9 เดือนหลังได้รับโปรแกรม ในขณะที่ โปรแกรม LSRP ไม่มีผลต่อ HI CI BI และ PI ส่วนวิธีการเพื่อนสอนเพื่อน ในกลุ่มนักเรียนสามารถใช้ได้ดีในการถ่ายทอดความรู้ การรับรู้และการประเมินศักยภาพของตนเองระหว่างรุ่น สำหรับในกลุ่มแม่บ้านพบว่า โปรแกรม LSRP มีผลต่อ ความรู้ การรับรู้ การประเมินศักยภาพของตนเองและการปฏิบัติ เฉพาะใน 3 เดือนแรก และพบว่าวิธีการเพื่อนสอนเพื่อน ใช้ได้ดีในการถ่ายทอดความรู้ การรับรู้ การประเมินศักยภาพของตนเองและการปฏิบัติระหว่างรุ่น ส่วนวิธีการเพื่อนสอนเพื่อน ทั้งในกลุ่มนักเรียนและกลุ่มแม่บ้านไม่สามารถใช้ได้กับค่าดัชนีชี้วัดความชุกลูกน้ำยุงลาย HI CI BI และ PI

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต.....

ปีการศึกษา 2555 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

##PH 5279212453 : MAJOR PUBLIC HEALTH
KEYWORDS : DHF / LARVAL AND PUPAL SOURCE REDUCTION PROGRAM / HOUSEWIFE / STUDENT / SUSTAINABILITY

REWAT RUGKUA: IMPLEMENTATION OF A LARVAL AND PUPAL SOURCE REDUCTION PROGRAM (LSRP) FOR SUSTAINABILITY IN PREVENTION AND CONTROL OF DENGUE HAEMORRHAGIC FEVER (DHF) IN COMMUNITY OF KRABI PROVINCE, THAILAND. ADVISOR: KANCHANA RUNGSIHIRUNRAT, Ph.D. 184 pp.

Objectives 1) to study the change in knowledge, perceived susceptibility, self-efficacy and practices regarding the prevention and control of DHF 2) to assess the House Index (HI), Breteau Index (BI), Container Index (CI) and Pupae Index (PI) between the experimental and control groups after the LSRP implementation.

Methods: A quasi-experimental study was conducted from March to November 2012 in Krabi Province. The participants were students and housewives were selected by simple random sampling. They were equally divided into two generations, the first generation who received 3-day newly LSRP. The second generation who received the DHF knowledge transfer from the first generation via buddy method. The intervention effects were assessed five times after intervention in each generation. The Linear Mixed model analysis was used to evaluate the mean score differences between groups of each follow-up time.

Results: The LSRP improved the knowledge, perceived susceptibility, self-efficacy, and practices regarding DHF prevention and control of both student and housewife, they were significant difference between experimental and control groups of $p < .05$, the buddy method has improved the knowledge and perceived susceptibility in the student group, while, it has improved the self-efficacy and practices regarding DHF prevention and control in the housewife group after intervention for three months, they were significant difference between experimental and control groups of $p < .05$. For both interventions, the result found that, the knowledge, perceived susceptibility and self-efficacy between generations of both student and housewife were similar of $p > .05$, in addition, in the housewife group the practice between generations were similar of $p > .05$.

Conclusion and Discussion: For student group, LSRP has affected to the knowledge, perception, self-efficacy and practice for three months after intervention better than nine months after intervention. While, the LSRP was not affect to the HI, CI, BI and PI. In addition the buddy method could be used to transfer the knowledge, perceived susceptibility and self-efficacy between generations. For housewife group, the LSRP has affected to the Knowledge, perceived susceptibility, self-efficacy, practices regarding DHF prevention and control and BI only for three months after intervention, in addition, the buddy method could be used to transfer the knowledge, perceived susceptibility, self-efficacy and practice regarding DHF prevention and control between generations for nine months after intervention. While, the buddy method were not affect to the HI, CI, BI and PI in both student and housewife groups.

Field of Study : Public Health Student's Signature .....

Academic Year : 2012 Advisor's Signature .....

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LIST OF ABBREVIATIONS

DHF	=	Dengue Haemorrhagic Fever
LSRP	=	Larval and Pupal Source Reduction Program
LMM	=	Linear Mixed Model analysis
K	=	Knowledge
PS	=	Perceived Susceptibility
SE	=	Self-Efficacy
P	=	Practice
HI	=	House Index
CI	=	Container Index
BI	=	Breteau Index
PI	=	Pupae Index
VHV	=	Village Health Volunteer
PHO	=	Public Health Officer
CCM	=	Community Committee Member
HCM	=	Health Club Member
PCU	=	Primary Care Unit
Q & A	=	Question and Answer

CHAPTER I
INTRODUCTION

1.1 Background and Rationale

Over half of the world's population resides in areas potentially at risk for dengue transmission, making dengue one of the most important human viral diseases in terms of morbidity and mortality. The incidence of dengue has grown dramatically around the world in recent decades. Some 2.5 billion people – two fifths of the world's population – are now at risk from dengue. WHO currently estimates there may be 50 million dengue infections world-wide every year. As per estimates, over 50 million infections with about 400,000 cases of DHF are reported annually which is a leading cause of childhood mortality in several Asian countries. Estimated 50 million dengue infections occur every year, including 500.000 cases of DHF that require hospitalization – equivalent to approximately one DHF cases in every minutes. At least 21,000 deaths from DHF occur every year, mostly among children-equivalent to one young life lost to DHF almost every 20 minutes.

The rise in dengue incidence has been marked by an expanding geographical distribution of the virus and the mosquito vector *Aedes aegypti,* which is found worldwide between latitudes 35° N and 35° S. Dengue viruses, the causative agent of Dengue Fever (DF) and Dengue Haemorrhagic Fever (DHF), are comprised of four distinct serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) (Gubler, 1998) and are members of the family *Flaviviridae*, genus *Flaviviridae*. Recovery from infection by one provides lifelong immunity against that serotype but confers only partial and transient protection against subsequent infection by the other three. There is good evidence that sequential infection increase the risk of more serious disease resulting in DHF.

1.1.1 A Global and the South-East Asia Public Health Problem

There has been a dramatic resurgence/emergence of infectious diseases in the past 15 years (National Centers for Infectious Diseases, 1994). This is especially true of dengue haemorrhagic fever, which has emerged as a major global public health problem in tropical areas of the world (Gubler and Clark, 1995). The global prevalence of DHF has grown dramatically in recent decades. The disease is now

endemic in more than 100 countries in Africa, the Americas, and the Eastern Mediterranean, South-east Asia and the Western Pacific (www.wonder.ced.gov; www.who.int/tdr/).

The global population at risk is estimated to range from 2.5 to 3 billion individuals living mainly in urban areas in tropical and subtropical regions (Prasittisuk & Kumar, 1998). It is estimated that there are at least of 500,000 cases of DHF annually which require hospitalization. Ninety percent of cases are children under the age of 15 years. DHF mortality rates average 5 percent, with approximately 25,000 deaths each year

In 1998, many countries in the South-east Asia and Western Pacific regions experienced epidemics of DHF, including India, Indonesia, Myanmar, Thailand, Malaysia, Vietnam, Laos, Cambodia and Singapore (Gubler, 1998). The disease continues to show increased incidence and geographical spread with more frequent outbreaks throughout the regions (www.w3.whosea.org/denguethailand/). In 2000, dengue viruses and *Ae. aegypti* mosquitoes had a worldwide distribution in the tropics (WHO, 2002). All tropical regions of the world have become hyper-endemic, with all four virus serotypes circulating simultaneously especially in the Americas, Asia, the Pacific and Africa (WHO, 1999; Prasittisuk, Andjaparidze, & Kumar, 1998).

In 2003, only 8 countries in South East Asia Region reported dengue cases. Bhutan reported the first dengue outbreak in 2004. An outbreak with a high case fatality rate (3.5%) was first reported in Timor-Leste in 2005. As of 2006, ten out of the eleven countries in the region (Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste) reported dengue cases. Nepal reported dengue cases for the first time in November 2006. The democratic Peoples' Republic of Korea is the only country in this region of WHO that has no report of indigenous transmission of DF/DHF.

In 2007, there were more than 890,000 reported cases of dengue in the Americas, of which 26,000 cases were DHF. The disease is now endemic in more than 100 countries in Africa, the Americas, the Eastern Mediterranean, South-east Asia and the Western Pacific.

There is no real ‘safe’ season although there seems to be a cyclical pattern and a rise in infections during rainy seasons. Rising rainfall in some regions has contributed to an extension of the season in recent years. The maximum transmission starts in July – September each year. But a study from 1995 – 2002 in Thailand 60% of cases were occurred in the dry season (December – June)

DHF has become a leading cause of hospitalization and death among children in several countries. Evaluation researchers have noted that, despite growing levels of knowledge and awareness about dengue and mosquitoes, many people are still not taking action. In some countries people know the dengue is caused by mosquitoes and that mosquitoes can breed in water containers, yet they still fail to do what is the best for them and containers are left unprotected. Therefore, WHO facilitated strengthening epidemiological surveillance; accelerated training and the adoption of WHO standard clinical management guidelines for DHF; promoting behavioral change at individual, household and community levels to improve prevention and control; and accelerating research on vaccine development, host-pathogen interactions and development of tools/ interventions. Therefore, people need to change their behavior to overcome the problem of DHF and not only knowledge and on raising awareness but also behavior change actually needed in future.

1.1.2 Burden of Dengue in Thailand

In Thailand, DHF has occurred for more than 40 years. The first large outbreak of the disease occurred in 1958 (Bureau of Epidemiology, 2006). Since then, the reported numbers of cases have been gradually increasing. During the first few outbreaks, the disease was mainly found in Bangkok and its surrounding areas, and then the disease spread to all regions of the country (Daengharn, Wangrungsarb, & Prasittisuk, 1996).

In 1987, a major epidemic occurred with the largest incidence of 174,285 cases and 1,241 deaths (Rojanapithayakorn, 2004; Bureau of Epidemiology, 2006). From 1990 to 1996, the number of DF/DHF cases reported had been declining every year, approximately 40,000–60,000 cases a year (Rojanapithayakorn, 2004). In 2003-2004, the numbers increased with 242 cases and 438 deaths. For the year 2005-2006 the numbers of cases sharply declined due to the implementation of the national DHF project for the celebration to mark the King’s birthday. But since then, the trend of

DF/DHF cases has increased and has become a serious public health problem in Thailand (Bureau of Epidemiology, 2008).

In the past five years, DHF mainly affected the younger age-group of less than 15 years old, with the highest percentage of cases occurring in the 5-9 year age-group, followed by the 10-14 years age-group (Rojanapithayakorn, 2004). It has also been noticed that the proportion of cases in the age-group of fifteen and over has been slightly increasing from 20% to 30% during this same time period. The disease now needs to be observed and explored since the alteration in the concept of seasonal variations in that the DHF outbreaks in 1997/1998 not only occurred in the rainy season but throughout the year; and there seemed to have been a shift in the age-groups affected from younger people to older people (Wangrungsarb, 2003; Rojanapithayakorn, 2004).

1.1.3 Prevention and Control Measures

Prevention and control measures of DHF in Thailand during the first period of the DHF epidemics (1958 - 1967), the primary control interventions were health education and vector control conducted as a “vertical” program by medical and health personals (Rojanapithayakorn, 2004). The main focus of the vector control activities in the first two periods were chemical spraying to kill the mosquito in areas where DHF cases were reported. In the last two period (1968 – 1977 and 1978 - 1987), the control program was integrated into local health services at the provincial level and health authorities at the central level provided the logistics. In the last period (1988 - 1997), more attention has been given to school settings as the potential risk areas for children who stayed at school during day-time and were therefore more likely to be bitten by Aedes mosquito there (Rojanapithayakorn, 2004). Cooperation between the Ministry of Public Health and the Ministry of Education has been very successful in mobilizing children to take part in vector control activities in schools (Wangroongsarb, 2003). At the same time, patients with DHF are effectively treated which has resulted in a low case fatality rate (Bureau of Epidemiology, 2008).

Efforts to control this mosquito vector in Thailand, as in most dengue endemic countries of South-east Asia, have not been effective (Rojanapithayakorn, 2004). From the initial control program in the 1960s to the present, primary emphasis has been placed on chemical sprays to control the adult stage of mosquitoes. Since

the 1980s, official policy has been redirected to community–based control using village public health volunteers (www.w3.whosea.org/denguethailand/). However, most efforts and financial resources are still directed at the chemical control of *Ae. aegypti*. Unfortunately, none of the adult mosquito control methods used has had an impact on disease transmission (Rojanapithayakorn, 2004). This makes the disease more serious and it is still a major problem in all areas of the country.

Started from 1978, the Ministry of Public Health established the dengue prevention and control program, carried out nationwide by integrating the control program into the Primary health care system. In 1999, the king project for dengue prevention and control program was introduced in Thailand. The program aims to increase knowledge of DHF disease and prevention as well as encouraging people to carry out the larvae control in household.

1.1.4 DHF Problem in Krabi Province

Krabi Province was rank 10^{th} of DHF incidence rate and continued for 10 years with higher incidence rate of DHF than standard value of Ministry of Public Health of at least 5 years. (2004 – 2009: 66.70, 173.47, 65.93, 158.68, 225.03 per 100,000 populations respectively). In 2010, the incidence rate of DHF was 174.87 per 100,000 populations (Krabi Provincial Public Health Office, 2010). This rate was higher than the national target of less than 50 per 100,000 populations (Bureau of Epidemiology, 2008).

According to the health statistic report of Krabi Provincial Health Office the total number of DHF reported cases during 2006-2009 indicated that the distribution of DHF cases occurred throughout the year. However, the majority of cases were reported during the rainy season with its peak during July-August. In addition, the incidence of DHF cases by age group during 1998-2008 in Krabi was shown that the worst affected age groups are 5-9 years, followed by 10-14 and 0-4 years. The least affected age group is over 15 years old. Beginning in 2007 the trend of DHF cases had been increasing in older children and adults (age over 15 years) (Krabi Provincial Public Health Office, 2009).

DHF has become endemic throughout the Krabi province. In 2010, among the districts of Krabi, Plaipraya district had the high incidence of DHF. In the last three years, the morbidity rate of DHF in Plaipraya district was 281.45, 215.64 and 229.99

per 100,000 populations (Krabi Provincial Public Health Office, 2010). To solve the problem, Krabi Provincial Public Health Office set DHF policy and programs for each district. The main purpose of the DHF program was to control *Aedes* mosquito breeding places through the student and the housewife in the community. Although the DHF programs have been implemented in all districts of the province for many years, the DHF incidence has not been decreasing. DHF is thus an important public health problem in Krabi and there is an urgent need to find a better approach to prevent and control of DHF, e.g., an approach based on a source reduction and environmental management.

1.1.5 Summary

NO Dengue vaccine is available yet for the prevention of dengue infection and there are no specific drugs for its treatment. Hence DF/DHF control is primarily dependent on the control of *Aedes aegypti*. Dengue control programs in the region have in general not been very successful, primarily because they have relied almost exclusively on space spraying of insecticides for adult mosquito control. However, space spraying requires specific operations which were often not adhered to, and most countries found it cost prohibitive. In order to achieve sustainability of a successful DF/DHF vector control program, it is essential to focus on larval source reduction and to have complete cooperation with non-health sectors, such as nongovernmental organizations, civic organizations and community groups, to ensure community understanding and involvement in implementation.

To prevent and control DHF should be emphasis on community participation. Since this is viewed as the only approach, and it is cost-effective and would provide effective disease control over the long run (Gubler & Clark, 1994; WHO, 2002). The rationale is that by involving the persons who are responsible for creating or tolerating *Aedes aegypti* larval habitats in the local community environment can bring its habitats to be eliminated. They should learn in their best interest and participate with other members of their community and create community ownership of their program (Gubler & Gary, 1996).

In this case, community members are encouraged to undertake source reduction measures such as emptying of water containers, removal of solid waste material including used tyres and their proper disposal, preventing breeding in man-

made breeding sites, etc. These activities are not only require community participation, but also be continuously active by linking with social, culture and lifestyle of the community (WHO, 1999). Thus community is the focal point in developing, implementing, and evaluating a community-based DHF control program. It should also be a center for continuing learning experiences for their community members.

Besides the knowledge about DHF, it is essential for the community members to perform DHF prevention and control behaviors, was core contents of the study program, self-efficacy and outcome expectation as suggested by Social Cognitive Learning Theory (Bandura, 2005). From the literature reviewed, perception, self-efficacy and behavior changes and outcomes are highly correlated. Self-efficacy is an excellent predictor of behavior. Furthermore, self-efficacy has proven to be a more consistent predictor of behavioral outcomes than other potential predictors. Thus, this research focused on improving knowledge, perception about DHF, self-efficacy and behavioral practices in prevention and control of DHF among the study participants.

1.2. Research Questions

The research questions were:

1.2.1 Was there any different on effectiveness of Larval & Pupal Source Reduction Program (LSRP) between experimental and control groups?

1.2.2 What were the levels of knowledge, perception and self-efficacy regarding DHF between the experimental and the comparison groups?

1.2.3 What were the behavioral practices to prevent DHF between the experimental and comparison groups?

1.2.4 Did the Larval & Pupal Source Reduction Program (LSRP) improve the experimental group’s knowledge, perception, self-efficacy, and behavioral practices in relation to prevention and control of dengue hemorrhagic fever (DHF)?

1.2.5 Did the Larval & Pupal Source Reduction Program (LSRP) reduce House index (HI), Breteau index (BI), Container index (CI) and Pupae Index (PI) in communities?

1.3. Research Objectives

This research aimed to study the change of knowledge, perception, self-efficacy and practice in relation to DHF prevention and control also HI, BI, CI and PI at the start and the end all through the first, second and the third study period by using the knowledge transfer method of participants of their community this was one type of sustainable method, for the researcher or the public health workers as a facilitator that provides the knowledge at the first period, so the DHF sustainability measurement cannot be measured at a short time since there are so many factors that effected to DHF, but this research would find the trend of DHF prevention and control for the best way of DHF prevention and control of Krabi province.

1.3.1 General Objective

To study the effectiveness of the Larval & Pupal Source Reduction Program (LSRP) in relation to prevention and control of Dengue Hemorrhagic Fever (DHF) via knowledge transfer method among the student and housewife group in selected communities of Plaipraya district, Krabi province.

1.3.2 Specific Objectives

1.3.2.1 To study the change in knowledge, perception, and self-efficacy regarding the DHF prevention and control among the students and housewives after the LSRP implementation.

1.3.2.2 To study the change in practices in the prevention and control of DHF among the students and housewives after the LSRP implementation.

1.3.2.3 To assess the House Index (HI), Breteau Index (BI), Container Index (CI) and Pupae Index (PI) between the experimental and comparison groups after the LSRP implementation.

1.4. Significance of the Study

A Larval & Pupal Source Reduction Program (LSRP) in relation to prevention and control of Dengue Hemorrhagic Fever (DHF) would be used as a demonstration model for knowledge transfer in communicable disease as the public health problem and to assess the participation and involvement of the community stakeholders. Results of this study can be applied to the other communities with a high incidence rate of DHF and also be applied to another public health problem.

Knowledge, perception, self-efficacy including learning experiences would be gaining from the study.

Results of this study also could help the health worker to be awareness on the importance of socio-cultural factors in developing a health program at the community level.

1.5. Study Variables

1.5.1 Independent variable is a Larval & Pupal Source Reduction Program (LSRP) for enhancing the knowledge, perception and self-efficacy of the students and the housewives on DHF prevention and control, socio-economic information and behavior practice. The LSRP was a continuing educational process trained the participants through active participation in prevention and control of DHF.

1.5.2 Dependent variables were:

1.5.2.1 Changing in knowledge about DHF

1.5.2.2 Changing in perception about DHF

1.5.2.3 Changing in self-efficacy in the prevention and control of DHF.

1.5.2.4 Changing in behavioral practices in the prevention and control of DHF.

1.5.2.5 House Index (HI), Breteau Index (BI), Container Index (CI) and Pupae Index PI).

1.5.2.6 DHF incidence rate

1.6. Operational Definitions

1.6.1 A Larval & Pupal Source Reduction Program (LSRP),which was initiated in this study by researcher in order to control and prevention of DHF, is a continuing educational process to empowered the housewives and the student through active participation. Development of an LSRP curriculum been used as baseline data and information to evaluate of the program implementation. The LSRP main strategy is “continuing training activities” through active participation among the participants. The LSRP methods were comprised of participatory learning, group discussion, brainstorming, and continuous dialogue.

The LSRP had been classified into 3 study periods: 1) first study period: the first generation were trained by researcher for 3 days and they been implement in their villages for 3 months: 2) second study period: the first generation trained the second generation by themselves via buddy method in the first day of fourth month then the second generation been implement in their habitat and surrounding for 3 months and 3) the third study period the first and the second generation had been freed from measurement for 3 months and had been measured at the ninth month of study.

1.6.2 The Effectiveness of a Larval & Pupal Source Reduction Program (LSRP) to prevention and control of DHF refer to the changing of knowledge, perception, self-efficacy and behavioral practices in the prevention and control of DHF including the reduction of larvae indices (HI, CI, BI and PI) after the LSRP implementation.

1.6.3 Community stakeholders refer to the key representatives of people that lived in the community for at least six months. There were two groups:

1.6.3.1 Housewives were comprises of the wife of household headman representative in each family who lived in the target village as the experimental and comparison groups.

1.6.3.2 Students were comprises of the students who studying in the secondary school level 2 and 3 were the representatives of each village and lived in the target village as the experimental and comparison groups.

1.6.4 Knowledge about DHF was the ability of students and housewives to remember and recall facts or information regarding DHF.

1.6.5 Perception about DHF: refers to a person's belief and awareness of the DHF problem. They also believed that they and their family members are susceptible to DHF infection.

1.6.6 Self-efficacy in the prevention and control of DHF: refers to a person' s belief that they could be successful in controlling and destroying the *Aedes* breeding sites and that it can prevent mosquito bites.

1.6.7 Behavioral practices in the DHF prevention and control refer to activities of the participants to undertake source reduction measures according to the standard measurements such as: surveying mosquito larvae, destroying mosquito

breeding sites, removal of solid waste material including used tyres and their proper disposal, preventing breeding in man-made breeding sites e.g. wells, jars, etc. In addition, it refers to their actions to undertake personal protection methods such as the used of mosquito nets, coils, etc. to prevent mosquito bites.

1.7. Conceptual Framework of the research

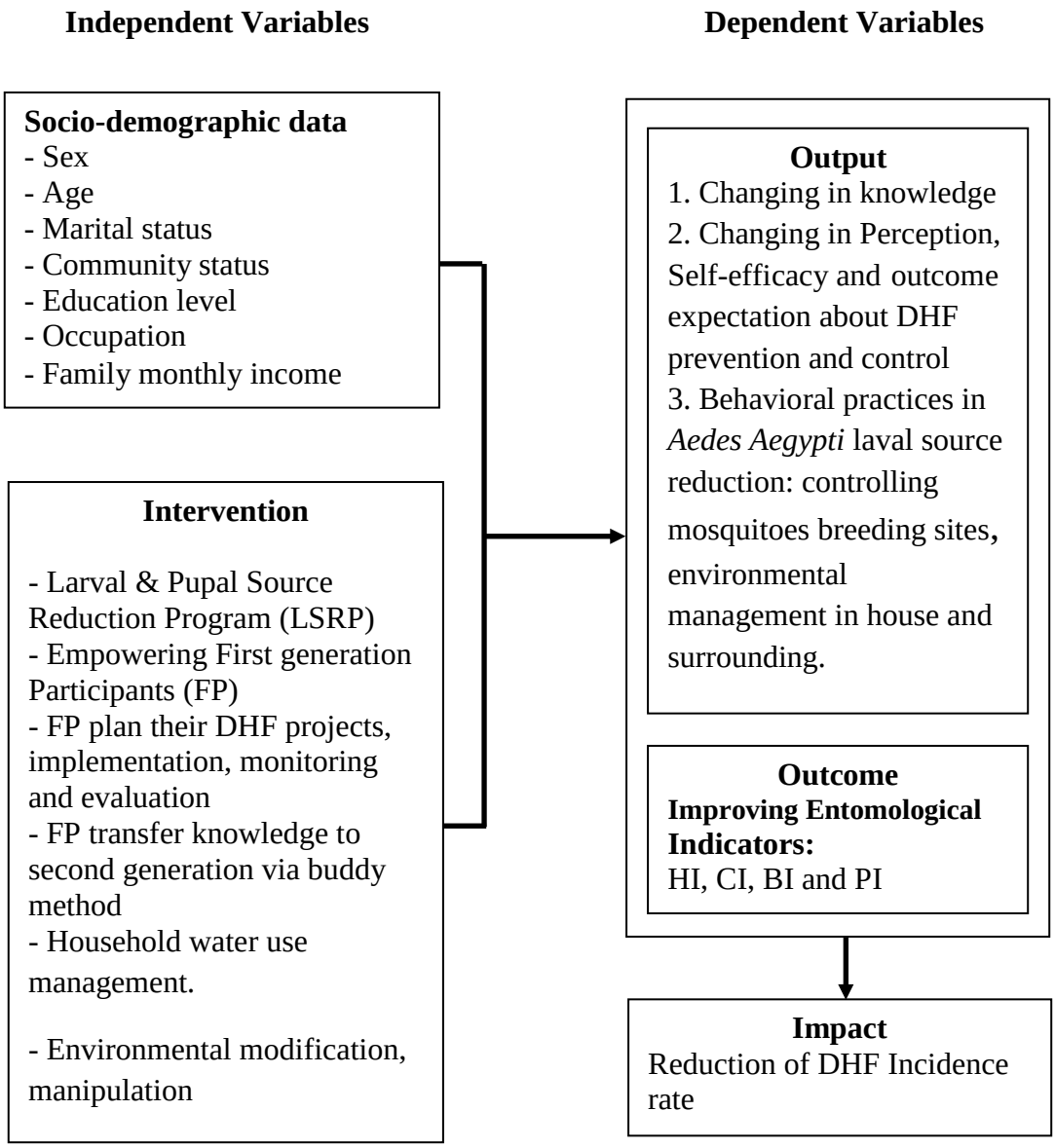


Figure 1.1 *Conceptual Framework of the study*

CHAPTER II
LITERATURE REVIEW

This chapter presents an integrative review of the theoretical and empirical literature describing the concepts in the study model and the interrelationships among them. Reviews of related literatures are as following.

1. Dengue Haemorrhagic Fever (DHF)
2. Community participation and development
3. Empowerment Education Technique
4. Social Cognitive Theory
5. Peer Education
6. Seasons in Southern of Thailand
7. Relevant Researches

2.1. Dengue Haemorrhagic Fever (DHF)

2.1.1 Epidemiology of Dengue Haemorrhagic: Fever In order to understand dengue haemorrhagic fever, it is important to recognize its fundamental epidemiological aspects. These aspects usually involve the dengue virus, the vector, the host and the transmission of dengue virus to humans.

2.1.1.1 Dengue Virus: The dengue viruses are members of the genus Flavivirus and family flaviviridae. The dengue viruses have four serotypes, which are designated as DEN-1, DEN-2, DEN-3 and DEN-4 (WHO, 1997). They can be distinguished by serological methods (WHO, 1999). Infection in humans by one serotype produces life-long immunity against re-infection by the same serotype, but only temporary and partial protection against the other serotypes. Although all four serotypes are antigenically similar, they are different enough to elicit cross-protection for only a few months after infection by any one of them (Gubler, 1998).

2.1.1.2 The Vector: *Aedes aegypti* is the main vector of DHF that transmits the dengue virus from person to person. The spread of dengue throughout the world can be directly attributed to the proliferation and adaptation of this mosquito (www.biohaven.com). When a female *Aedes aegypti* feeds on a dengue virus infected person; the viruses multiply in the insect body and remain there for the whole life

span of the mosquito, approximately 1-2 months (WHO, 1999). The dengue virus does not affect the mosquito in anyway, but an "incubation" period of 8 to 11 days is required before the mosquito is deemed infective (Knudsen, 1996).

Aedes albopictus or the "Tiger Mosquito" is now a secondary vector of dengue haemorrhagic fever. It operates as a rural vector of the disease and may occur in urban areas especially if *Ae. Aegypti* is absent (www.biohaven.com/dengue.htm). Its breeding habits are similar to *Ae. aegypti*, but it appears to exhibit a much broader ecological range. It is strongly attracted to discarded automobile tires (Knudsen, 1996).

Aedes mosquitoes are closely associated with human habitation. The mosquitoes can be found both inside and outside houses. Larvae and pupa are mostly found in artificial containers that may hold clear water, such as jars, vases, flowerpots, cans, and discarded tyres (Knudsen, 1996). Moreover, they can also be found in natural sites such as tree-holes, and discarded coconut shells. The adult mosquito usually rests in dark indoor places such as closets and under beds (WHO, 1995).

2.1.1.3 The Host: Dengue viruses infect humans and several species of lower primates. Humans are the main reservoir of the viruses. Dengue virus strains grow well in insect tissue cultures and on mammalian cell cultures after adaptation (WHO, 1999).

2.1.1.4 Transmission: All four dengue viruses are transmitted to humans via the bite of infective female Aedes mosquitoes. It is active only during the day, and it is highly domesticated, living in urban areas (Knudsen, 1996; WHO, 1999). An infected mosquito will infect a human; during the latter's infective period, it may be bitten by a non-infected mosquito, and becomes infective. If female mosquitoes infected, they may transmit the virus to the next generation (WHO, 1999).

The species is day-active, with most biting activity occurring in the early morning or late afternoon. The mosquito becomes infected by a blood meal from a viraemic person and becomes infective after an obligatory extrinsic incubation period of 10-12 days. After the mosquito becomes infective, it may transmit dengue by taking a blood meal, or by simply probing the skin of a susceptible person (Sheppard et al., 1996; Reiter et al., 1995).

2.1.2 Pathogenesis and Pathophysiology

The pathogenesis of DHF/DSS is still controversial, but two main pathophysiologic changes occur as following (Gubler, 1998):

1.) Increased vascular permeability resulting in plasma leakage, hypovolaemia and shock. DHF appears unique in that there is selective leakage of plasma into the pleural and peritoneal cavities and the period of leakage is short (24-48 hours).

2.) Abnormal haemostasis due to vasculopathy, thrombocytopenia and coagulopathy, leading to various haemorrhagic manifestations.

Activation of the complement system is a constant finding in patients with DHF. Levels of C3 and C5 are depressed, and C3a and C5a are elevated. The mechanisms of complement activation are not known. The presence of immune complexes has been reported in DHF cases, however, the contribution of antigen-antibody complexes to complement activation in patients with DHF has not been demonstrated (Gubler, 1998).

According to Gubler (1998) in dengue and dengue hemorrhagic fever reviews, it has been hypothesized that the severity of DHF compared with DF is explained by the enhancement of virus multiplication in macrophages by heterotypic antibodies resulting from a previous dengue infection. There is evidence, however, that viral factors and a cell-mediated immune response are also involved in the pathogenesis of DHF.

2.1.3 Diagnosis of Dengue haemorrhagic fever

2.1.3.1 Clinical Diagnosis: Dengue virus infections may be asymptomatic or may lead to undifferentiated fever, dengue fever (DF) or dengue haemorrhagic fever (DHF) with plasma leakage that may lead to hypovolaemic shock (dengue shock syndrome, DSS)

1.) Undifferentiated fever: Infants, children and some adults who have been infected with dengue virus for the first time (i.e. primary dengue infection) will develop a simple fever indistinguishable from other viral infections. Maculopapular rashes may accompany the fever or may appear during defervescence (Nimmanitya, 1987).

2.) Dengue Fever (DF): Dengue fever is an acute febrile illness characterized by frontal headache, retroocular pain, muscle and joint pain, nausea, vomiting, and rash. The febrile, painful period of DF lasts 5-7 days, and may leave the patient feeling tired for several more days. A biphasic or "saddle-back" fever curve is not the norm (Gubler, 1998). The majority of infections, especially in children under age 15 years, are asymptomatic or minimally symptomatic. Infants and young children may have an undifferentiated febrile disease with a maculopapular rash. Older children and adults may have either a mild febrile syndrome or the classical and even incapacitating disease. There may be a flushing of the face, neck, and chest initially in the febrile period; or a centrifugal maculopapular rash arising on the third or fourth day; or a later confluent petechiae rash with round pale areas of normal skin; or a combination of these manifestations (WHO, 1997).

3.) Dengue Haemorrhagic Fever (DHF): DHF is the most common in children less than 15 years of age, but it also occurs in adults. DHF is characterized by four major clinical manifestations: high fever, haemorrhagic phenomena, and often, hepatomegaly and circulatory failure (WHO, 1999). Moderate to marked thrombocytopenia with concurrent haemoconcentration is a distinctive clinical laboratory finding of DHF. The major pathophysiological change that determines the severity of disease in DHF-and differentiates it from DF- is the leakage of plasma, as manifested by an elevated haematocrit (i.e. haemoconcentration), a serous effusion or hypoproteinaemia (WHO, 1999). The most common haemorrhagic phenomenon is a positive tourniquet test, easy bruising and bleeding at venepuncture sites. Present in most cases are discrete fine petechiae scattered on the extremities, axillae, face and soft palate, which are usually seen during the early febrile phase. Epitasis and gingival bleeding occur infrequently; mild gastrointestinal haemorrhagic may be observed during the febrile period (WHO, 1999).

4.) Dengue shock syndrome (DSS): DSS is defined as DHF with signs of circulatory failure, including narrow pulse pressure (<=20 mm Hg), hypotension or frank shock. The liver may be palpable and tender; and liver enzymes are usually mildly abnormal but jaundice is rare (Thongcharoen, Wasi, & Puthavathana, 1993). The four warning signs for impending shock are intense, sustained abdominal pain; persistent vomiting; restlessness or lethargy; and a sudden change from fever to

hypothermia with sweating and prostration (Nimmanitya, 1987).

2.1.3.2 Criteria for Clinical Diagnosis of DHF/DSS (WHO, 1999)

Fever: acute onset, high and continuous, lasting 2 to 7 days. Any of the following haemorrhagic manifestations (including at least a positive tourniquet test): petechiae, purpura, ecchymosis, epistaxis, gum bleeding, and haematemesis and/or melena.

Enlargement of the liver (hepatomegaly) is observed at some stage of the illness in 90-98% of Thai children, but its frequency may be variable in other countries.

Shock, manifested by rapid and weak pulse with narrowing of the pulse pressure (20mm Hg or less), or hypotension, with the presence of cold, clammy skin and restlessness.

2.1.3.3 Grading the Severity of DHF

The severity of DHF is classified into four grades. The presence of thrombocytopenia with concurrent hemo-concentration differentiates Grade I and Grade II DHF from dengue fever. Grading the severity of the disease has been found clinically and epidemiologically useful in DHF epidemics in children in the South-East Asia, Western Pacific, and American Regions of WHO. Experiences in Cuba, Puerto Rico and Venezuela suggest that this classification is also useful for adults (WHO, 1999).

2.1.3.4 Laboratory Diagnosis

A definitive diagnosis of dengue infection can be made only in the laboratory and depends on isolating the virus, detecting viral antigen or RNA in serum or tissues, or detecting specific antibodies in the patient's serum. However, the laboratory findings in DHF are as follows (Gubler, 1998):

- The WBC may be normal, but leucopenia is common initially, with neutrophils predominating. Towards the end of the febrile phase there is a drop in the total number of white cells as well as in the number of polymorphonuclear cells. A relative lymphocytosis with more than 15% atypical lymphocytes is commonly observed towards the end of the febrile phase (critical stage) and at the early stage of shock.

- Thrombocytopenia and hemo-concentration are constant findings in DHF. A drop in platelet count to below 100,000/mm3 is usually found between the third and eighth days of illness. A rise in haematocrit occurs in all DHF cases, particularly in shock cases. Hemo-concentration with haematocrit increased by 20% or more is considered objective evidence of increased vascular permeability and leakage of plasma. It should be noted that the level of haematocrit may be affected by early volume replacement and by bleeding.

- A transient mild albuminuria is sometimes observed.

- Occult blood is often found in the stool.

- In most cases, assays of coagulation and fibrinolytic factors show reductions in fibrinogen, prothrombin, factor VIII, factor XII, and antithrombin III. A reduction in antiplasmin (plasmin inhibitor) has been noted in some cases. In severe cases with marked liver dysfunction, reduction is observed in the vitamin K- dependent prothrombin family, such as factors V, VII, IX and X.

- Partial thromboplastin time and prothrombin time are prolonged in about one-half and one-third of DHF cases respectively. Thrombin time is also prolonged in severe cases.

- Serum complement levels are reduced.

- Other common findings are hypoproteinemia, hyponatremia, and mildly elevated serum aspartate aminotransferase levels. Metabolic acidosis is frequently found in cases with prolonged shock. Blood urea nitrogen is elevated in the terminal stage of cases with prolonged shock.

2.1.4 Prevention and Control Measures

Prevention and control of DHF has become more urgent with the expanding geographic distribution and increased disease incidence in the past 20 years. Unfortunately, tools available to prevent dengue infection are very limited. There is no vaccine currently available, and options for mosquito control are limited. Clearly, the emphasis must be on disease prevention if the trend of emergent disease is to be reversed (Gubler, 1998). However, prevention and control of DHF should focus on several integrated components; environmental management, personal protection, biological control, and chemical control.

2.1.4.1 Environmental management involves any change that prevents or minimizes vector breeding and hence reduces human-vector contact. Environmental methods to control Ae. aegypti and Ae. albopictus and to reduce man-vector contact are source reduction, solid waste management, modification of man-made breeding sites, and improved house design (WHO, 1999). For example, the major sources of Ae. aegypti breeding in most urban areas and some rural areas in Thailand are containers storing water for household use including clay, ceramic and cement water jars, metal drums, and smaller containers storing clear water or rain water. Water storage containers should be covered with tight-fitting lids or screens, care being taken to replace them after water is used (WHO, 1999). Furthermore using automobile tires are another major importance as breeding sites for urban Ae. agypti. Discarded tires should always be kept under cover to prevent the collection of rainwater (Reiter et al, 1995).

2.1.4.2 Personal Protection means protecting the risk of mosquito biting of people. People who are at risk should wear protective clothing, long sleeves and trousers with stockings. It may help to protect the arms and legs from mosquito bites (WHO, 1999). Household insecticide products, namely mosquito coils, pyrethrum space spray and aerosols have been used extensively for personal protection against mosquitoes. Repellents are a common means of personal protection against mosquitoes and other biting insects. Essential oils from plant extracts are the main natural repellent ingredients, i.e. citronella oil, lemongrass oil and neem oil (WHO, 1999).

2.1.4.3 Biological control of DHF is usually used larvivorus fish (Gambusia affinis and Poecilia reticulata) have been extensively used for the control of An. stephensi and/or Ae. aegypti in large water bodies or large water containers in many countries in South-East Asia. The applicability and efficiency of this control measure depend on the type of containers (WHO, 1999).

2.1.4.4 Chemical Control: Chemical Larviciding or "focal" control of Ae. aegypti is usually limited to domestic-use containers that cannot be destroyed, eliminated, or otherwise managed. It is difficult and expensive to apply chemical larvicides on a long-term basis. Therefore chemical larvicides are best used in situations where the disease and vector surveillance indicate the existence of certain

periods of high risk and in localities where outbreaks might occur (WHO, 1997).

2.1.5 Vector Surveillance especially *Ae. aegypti* surveillance is important in determining the distribution, population density, major larval habitats, spatial and temporal risk factors related to dengue transmission, and levels of insecticide susceptibility or resistance, in order to prioritize areas and seasons for vector control. These data will enable the selection and use of the most appropriate vector control tools. The selection of appropriate sampling methods depends on surveillance objectives, levels of infestation, and availability of resources (Gubler, 1998).

2.1.5.1 Larval Surveys: For practical reasons, the most common survey methodologies employ larval sampling procedures rather than egg or adult collections. The basic sampling unit is the house or premise, which is systematically searched for water-holding containers. Containers are examined for the presence of mosquito larvae and pupae. Depending on the objectives of the survey, the search may be terminated as soon as Aedes larvae are found, or it may be continued until all containers have been examined. Three indices are commonly used to monitor *Ae. aegypti* infestation levels are presented in Figure 3 (WHO, 1999).

The house index has been most widely used for monitoring infestation levels, but it does not take into account the number of positive containers nor the productivity of those containers. Similarly, the container index only provides information on the proportion of water-holding containers that are positive. The Breteau index establishes a relationship between positive containers and houses, and is considered to be the most informative, but again there is no indication of container productivity. Nevertheless, in the course of gathering basic information for calculating the Breteau index, it is possible and desirable to obtain a profile of the larval habitat characteristics by simultaneously recording the relative abundance of the various container types, either as potential or actual sites of mosquito production (e.g. number of positive jars per 100 houses, number of positive tyres per 100 houses, etc.). These data are particularly relevant for focusing control efforts on the management or elimination of the most common habitats and for the orientation of educational messages for community-based initiatives (WHO, 1997).

House index (HI): The percentage of houses infested with larvae and/or pupae.

$$\text{HI} = \frac{Number\ of\ houses\ infested}{\text{Number of houses inspected}} \times 100$$

Container Index (CI): The percentage of water-holding containers infested with larvae.

$$\text{CI} = \frac{Number\ of\ positive\ containers}{\text{Number of containers inspected}} \times 100$$

Breteau Index (BI): The percentage of water-holding containers infested with larvae.

$$\text{BI} = \frac{Number\ of\ containers\ infested}{\text{Number of houses surveyed}} \times 100$$

Pupae Index (PI): The percentage of water-holding containers infested with pupae.

$$\text{PI} = \frac{Number\ of\ containers\ infested}{\text{Number of houses surveyed}} \times 100$$

2.2. Community Participation and Development

2.2.1 The concept of community participation or people's participation in development has come to have a major influence upon development thinking and practice. To understand community participation, it is useful to look at the two words separately (Kahssay & RerOakley, 1999; WHO, 2002).

The term "community" is commonly used to refer to people grouped on the basis of geography, common interest, identity or interaction. It can thus be defined as:

"a group of people who share an interest, a neighborhood, or a common set of circumstances. They may or may not acknowledge membership of a particular community".

Community is a multidimensional concept involving a complexity of horizontal and vertical relationships between people and organizations. Use of the term is inevitably problematic, as discussed by Boutilier et al. (1998). DeLeeuw (1999) expands on this to argue that communities are characterized by

communication arrangements, highlighting the impact of change in technology in the late 20th century in challenging conventional understandings of community and opening up new of connectedness.

The term "participate" clearly implies several different things. Drawing on key literature the following working definition will be used:

"a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change" (Smithies & Adams, 1990).

Community participation is often used interchangeably with or alongside a number of other terms, however it defies any single attempt at definition or interpretation; in many ways participation has become and umbrella term for a new and more people-centered approach to intervention. Although there is no clear consensus on the distinction between these terms and without going into detail, it is useful to clarify the meanings of these (Kahssay & RerOakley, 1999).

2.2.2 The importance of community participation

Community participation is important for many different reasons and offers many different benefits for individuals, communities, organizations and society as a whole (Smithies & Webster, 1998). These benefits relate to both the process and the effects and outcomes of participation –participation as an end in itself and participation as a means to achieve other goals (Kahssay & RerOakley, 1999).

Community participation can make an important contribution to achieving a number of objectives, as detailed below (WHO, 2002; Abbott, 1996).

Increasing democracy: Community participation in decision-making, planning and action is a human right. An increasing number of citizens are disillusioned with government and want to see more participatory approaches to democracy. It is increasingly being argued that new styles and structures of governance are needed that transcend people being viewed as passive recipients of services provided by agencies and decided by elected representatives and enable genuine participation, empowerment and citizenship.

Combating exclusion: Community development and community organizing often work with specific groups of the population especially, those that are marginalized and disadvantaged. According to WHO (2002), the changing contexts within and between European countries (such as the increase in asylum seekers) can pose special cultural and political challenges and require that workers be equipped with relevant skills, knowledge and attitudes. By giving these communities a voice, community participation can play an important role in combating social exclusion within society.

Empowering people: Community participation can be both an outcome of empowerment and an effective empowerment strategy. The actual process of participation can inherently empower individuals and communities to understand their own situations and to gain increased control over the factors affecting their lives. This can, in turn, enhance people's sense of well being and quality of life, as highlighted in health21 (WHO, 2002).

Mobilizing resources and energy: Communities have a wealth of untapped resources and energy that can be harnessed and mobilized through community participation, using a range of practical techniques that can engage people and, where appropriate, train and employ them in community development work. There is a clear tension here between mobilizing resources in a way that empowers communities and mobilizing to reduce the cost of providing services.

Achieving better decisions and more effective services: Involving people in identifying needs, planning and taking action can result in better and more creative decisions being taken and more responsive and appropriate services being provided.

2.2.3 Levels of community participation

Community participation has different degrees or levels of participation. The challenge for many people working in local authorities, health authorities and other agencies is to move up the ladder, finding new tools and techniques that promote active and genuine involvement, citizenship and empowerment rather than settling for the more passive processes of providing information and consultation. Clearly, this style of participation can only flourish in societies with a political culture that encourages it and, as highlighted above, a number of commentators have for new systems of governance that support this approach (WHO, 2002).

If community participation is to be sustainable and effective, it must be developed and practiced in a coherent, coordinated and strategic way. The notion of sustainable infrastructures, which in this form is new to the 1990s, has reinforced the need to see work around community involvement in health as an ongoing, continuous and strategic activity rather than as a series of ad hoc or "pilot" projects which remain outside the mainstream of an organization' s endeavors. This means that action to enable community participation must take place in a number of ways at a number of different levels. It should include support for grassroots community level capacity building and development, the establishment and strengthening of networks and infrastructures for communities and professionals and a commitment to meaningful organizational development (Smithies & Webster, 1998).

Grassroots work and local action with both geographical communities and communities of interest is usually the starting-point in enabling community participation. This process is long term, involving the establishment of trust and mutual respect between communities (especially those often excluded) and professionals, investment in capacity building and a concern to work with communities to address their priorities (Tsouros, 1990).

Developing community participation and increasing its influence requires facilitating the development of community and professional infrastructure. This can enable communities, development workers and professionals within organizations to network–sharing common experiences, learning from each another, strengthening competencies and building alliances (Tsouros, 1990).

2.2.4 Community Stakeholders

Community participation can contribute greatly to the effectiveness and efficiency of a program; the crucial factor in its success is the attitude of agency staff in the field. If the staff does not treat people with respect or are seem to favor particular individuals or groups within a community, this can have a highly destructive effect on participation (Fietbergen & Narayan, 1998). For this reason it is important to identify key representatives and groups within the affected population early.

"Community Stakeholders" are people, groups, or institutions, which are likely to be affected by a proposed intervention, or those which can affect the

outcome of the intervention

2.2.4.1 Stakeholder Analysis

It may not be possible for each and every member of the affected population to contribute to a program equally but attempts can be made to identify key groups and individuals that can be actively involved.

"Stakeholder Analysis" is a vital tool for understanding the social and institutional context of a project or policy. Its findings can provide early and essential information about who will be affected by the project (positively or negatively); who could influence the project (again, positively or negatively); which individuals, groups, or agencies need to be involved in the project, and how; and whose capacity needs to be built to enable them to participate. Therefore, the main proposes of "Stakeholder Analysis" are (Fietbergen & Narayan, 1998):

To identify stakeholders, interests in, importance to, and influence over operation;

To identify local institutions and processes upon which to build; and to provide a foundation and strategy for participation.

Stakeholder Analysis therefore, provides a foundation and structure for the participatory planning, implementation, and monitoring that follows.

Stakeholder Analysis is essentially a four-step process (Fietbergen & Narayan, 1998). This page and those that follow describe each step in the analysis, indicate who should be involved in the work, and then a series of matrices that can help to guide the process are provided.

The first step of a stakeholder analysis is to identify the key stakeholders – whose participation will be sought– from the large array of institutions and individuals that could potentially affect or be affected by the proposed intervention.

The second step is to assess stakeholder interests and the potential impact of the project on these interests.

The third step is to assess stakeholder influence and importance. Influence refers to the power that stakeholders have over a project. It can be exercised by controlling the decision-making process directly and by facilitating or hindering the project implementation. This control may come from a stakeholder's status or power, or from informal connections with leaders.

The last step is to outline a stakeholder participation strategy.

2.2.4.2 Selecting the Key Stakeholders (Fietbergen & Narayan, 1998).

The focus of the stakeholder is the local community, but other types of stakeholder also need to be involved if the external input to decision-making is not to be dominated by one perspective or set of interests. Stakeholders are much less likely to respond constructively in future if they feel unfairly excluded.

Internal or external stakeholders that have a reasonable degree of commonality of interest with the organization in question are the most obvious category of stakeholder, and are sometimes referred to as ‘true stakeholders’. There is however other classes of stakeholder that are affected by the decisions an organization takes or have a strong view on its conduct, even if their interests are very different.

Organizations require a 'license to operate' from a wider range of stakeholders. This is obvious in the case of regulators such as the Health & Safety Executive, where authority has been delegated by society. The right of shareholders to regulate the direction of a business is also readily appreciated. In practice however, organizations find that their ‘license to operate’ can also be compromised or even withdrawn because they have lost the consent of the local community in which they operate, or they have lost the confidence of politicians and financiers. Campaign groups often see themselves as having a “license to operate”, but they are also often significant as opinion formers able to influence other stakeholders. The media are sometimes considered to be stakeholders, but are more often considered separately with other opinion formers, on the basis that there is usually no strong commonality of interest. They may have considerable influence on other stakeholders and may also be seen in turn as an indicator of a broader, unobserved, public mood.

2.3. Empowerment Education Technique

2.3.1 Concept of Empowerment

Empowerment is one type of educational models that emphasizes active learning by using dialogue to exchange knowledge and opinions among learners, have learners identify their own problems, analyze the causes and backgrounds of the problems through critical thinking and developing “visions” of the future society.,

Then a strategic plan is developed to solve the problems in accordance with the goals set. This type of educational strategy not only helps learners enhance their self-esteem, and increase their self-efficacy but it also enables them to practice more accurate health behaviors, both individually and collectively (Wallerstein & Bernstein, 1988).

2.3.2 The Significance of Empowerment

Empowerment is a social process that promotes individual, organizational and community self-control, and the ability to make decisions and determine the individual's, organization's and community's future. Empowerment is a process that individuals work together in the society with the aim to make change in the desired direction but it is not the power to force or oppress others (Wallerstein & Bernstein, 1994). This internal power is the thing that individuals/groups must develop by themselves. It is believed that situations in which an individual is powerless will cause a lot of problems including health problems. Therefore empowerment means the opposite of powerless or depowering whereby the people who have been depowered will feel that they do not have any power (powerless), are not willing to control any situation, ignore or do not respond to any stimuli, and lack of motivation. (Empowerment Education Model) Regarding an individual not empowered him/herself may be caused by the individual's self-concept, by other people or by the system itself that tries to have power over that individual, or does not want to have some changes, or get the feeling toward other persons as disability, cannot be self-directed, must be of oppressed or led by others. Therefore, with this feeling, those people are not allowed to express their opinion, have not been motivated, or not even involved.

Empowerment is important in implementing the new concept of health promotion, whereby the World Health Organization has recommended strengthening the participation of individuals and community through getting more information, developing skills and self-esteem in order to be able to control or determine their own health (Tones, Tilford, & Robinson, 1990). Formally, when an empowerment concept has been applied in health education programs, individual empowerment was emphasized to enhance an individual ability to make decisions and have control over his or her personal life, but presently, the role of health education also emphasizes

community change; empowerment should be aimed at developing policy and changing environments that are conducive to community health (Tones, Tilford, & Robinson, 1990).

2.3.3 Principles of Empowerment

The principles of empowering individuals, groups and communities are as follows (Arnold, Barndt, & Bruk, 1983):

1.) To empower people by supporting the learner to realize relationships between themselves and the environment and promote perception of self-worth to change their own health, including the health of community and society.

2.) The starting point is forming a concrete experience with the learner. Then critically assessing the social role of their problems and develop action strategies to change their personal and social life.

3.) Involving a high level of participation in all step, starting from selecting interesting and significant issues to be learned, planning the activities, involving in dialogue and implementing of the activities, self-evaluation and program evaluation.

4.) Collective learning should be emphasized. It is assumed that everyone is learning together, everyone teaches, everyone learns. Teacher's role is changed to be a facilitator or coordinator instead of transmitter of knowledge. Through the group process whereby learners can exchange their knowledge, opinions, experiences, it is not only promoting individual learning but also develop a sense of being in a group that thinks and acts together which this powerful group learning can lead to solve problems or change something to meet the target goals.

5.) The aim should emphasize change of knowledge, attitudes, feeling, and skills. These changes may be immediate or take time to change after the individuals take actions.

6.) It is a continuous process that is not limited only in the classroom since learners can learn from concrete experience and from their own actions.

7.) It is a flexible educational process and fun by modifying content, methods and materials appropriately with needs of learners and the group. The learners do not feel that they are forced to study the non-related or non-significant issues or forced to do the things that they do not have ability to do.

8.) The learning of objectives must be clearly stated which helps to select

appropriate procedures, techniques, instruments and activities.

2.3.4 Process and Outcome of Empowerment Education

The dimensions of empowerment are varied; it can be a process and outcome for individual development. The process dimension means interaction among people in allocation of power or mobilizing mutual power, helping people improve their own potential and cooperate with other persons for improving society. For the outcome dimension, it means the effect of an empowerment training which consisted of ability, efficiency, strength in living his/her life or performing any activities in daily life (Wallerstein & Bernstein, 1988). Regarding the assessment is the measurement of self-esteem and self-efficacy. The second idea is the measurement of the outcome-related to the product from being involved in the group's activities by measuring social network, social support on individual's satisfaction of having interaction with other persons on getting together in the group. And the third idea is the measurement of the changes of the environment on health status (Tones, Tilford, & Robinson, 1990). For this project, the outcome of the empowerment program was measured based on the first idea whereby self-esteem and self-efficacy of health personnel were measured.

2.4. Social Cognitive Theory

Social cognitive theory is an updated version of social learning theory, both of which were developed by Albert Bandura (1986). Bandura advanced a view of human functioning that accords a central role to cognitive, vicarious, self-regulatory, and self-reflective processes in human adaptation and change. People are viewed as self-organizing, proactive, self-reflecting and self-regulating rather than as reactive organisms shaped and shepherded by environmental forces or driven by concealed inner impulses. From this theoretical perspective, human functioning is viewed as the product of a dynamic interplay of personal, behavioral, and environmental influences. For example, how people interpret the results of their own behavior informs and alters their environments and the personal factors they possess which, in turn, inform and alter subsequent behavior. This is the foundation of Bandura's conception of reciprocal determinism, the view that personal factors in the form of cognition, affect, and biological events, behavior, and environmental influences create interactions that

result in a triadic reciprocality. Bandura (2001) altered the label of his theory from social learning to social "cognitive" both to distance it from prevalent social learning theories of the day and to emphasize that cognition plays a critical role in people's capability to construct reality, self-regulate, encode information, and perform behaviors.

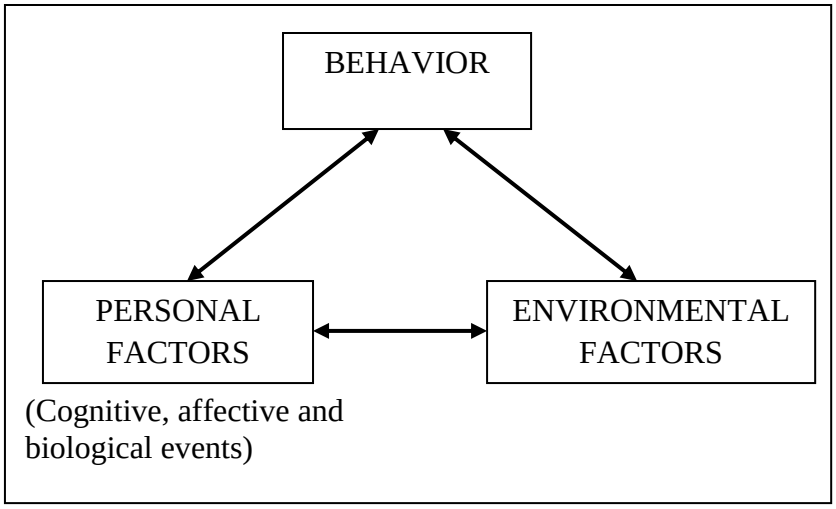


Figure 2.1. *Diagram of Social Cognitive Theory*

The reciprocal nature of the determinants of human functioning in social cognitive theory makes it possible for therapeutic and counseling efforts to be directed at personal, environmental, or behavioral factors. Strategies for increasing well-being can be aimed at improving emotional, cognitive, or motivational processes, increasing behavioral competencies, or altering the social conditions under which people live and work.

Social cognitive theory is rooted in a view of human agency in which individuals are agents proactively engaged in their own development and can make things happen by their actions. Key to this sense of agency is the fact that, among other personal factors, individuals possess self-beliefs that enable them to exercise a measure of control over their thoughts, feelings, and actions, that “what people think, believe, and feel affects how they behave”(Bandura, 1986). Bandura provided a view of human behavior in which the beliefs that people have about themselves are critical

elements in the exercise of control and personal agency. Thus, individuals are viewed both as products and as producers of their own environments and of their social systems. Because human lives are not lived in isolation, Bandura expanded the conception of human agency to include collective agency. People work together on shared beliefs about their capabilities and common aspirations to better their lives. This conceptual extension makes the theory applicable to human adaptation and change in collectively oriented societies as well as individualistically-oriented ones.

Environments and social systems influence human behavior through psychological mechanisms of self-system. Hence, social cognitive theory posits that factors such as economic conditions, socioeconomic status, and educational and familial structures do not affect human behavior directly. Instead, they affect it to the degree that they influence people's aspirations, self-efficacy beliefs, personal standards, emotional states, and other self-regulatory influences. In all, this social cognitive view of human and collective functioning, which marked a departure from the prevalent behaviorist and learning theories of the day, was to have a profound influence on psychological thinking and theorizing during the last two decades of the twentieth century and into the new millennium.

Self-efficacy Beliefs

Of all the thoughts that affect human functioning, and standing at the very core of social cognitive theory, are self-efficacy beliefs, "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances". Self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment. This is because unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties. Much empirical evidence now supports Bandura’s (2001) contention that self-efficacy beliefs touch virtually every aspect of people's lives—whether they think productively, self-debilitating, pessimistically or optimistically; how well they motivate themselves and persevere in the face of adversities; their vulnerability to stress and depression, and the life choices they make. Self-efficacy is also a critical determinant of self-regulation. Of course, human functioning is influenced by many factors. The success or failure that people experience as they engage the myriad tasks that comprise their life naturally

influence the many decisions they must make. Also, the knowledge and skills they possess will certainly play critical roles in what they choose to do and not do. Individuals interpret the results of their attainments, however, just as they make judgments about the quality of the knowledge and skills they posses.

Bandura's (2001) key contentions as regards the role of self-efficacy beliefs in human functioning is that "people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true". For this reason, how people behave can often be better predicted by the beliefs they hold about their capabilities than by what they are actually capable of accomplishing, for these self-efficacy perceptions help determine what individuals do with the knowledge and skills they have. This helps explain why people's behaviors are sometimes disjoined from their actual capabilities and why their behavior may differ widely even when they have similar knowledge and skills. For example, many talented people suffer frequent (and sometimes debilitating) bouts of self-doubt about capabilities they clearly possess, just as many individuals are confident about what they can accomplish despite possessing a modest repertoire of skills. Belief and reality are seldom perfectly matched, and individuals are typically guided by their beliefs when they engage the world. As a consequence, people's accomplishments are generally better predicted by their self-efficacy beliefs than by their previous attainments, knowledge, or skills. Of course, no amount of confidence or self-appreciation can produce success when requisite skills and knowledge are absent.

People's self-efficacy beliefs should not be confused with their judgments of the consequences that their behavior will produce. Typically, of course, self- efficacy beliefs help determine the outcomes one expects. Confident individuals anticipate successful outcomes. For example, students confident in their social skills anticipate successful social encounters. Those confident in their academic skills expect high marks on exams and expect the quality of their work to reap personal and professional benefits. The opposite is true of those who lack confidence. Students who doubt their social skills often envision rejection or ridicule even before they establish social contact. Those who lack confidence in their academic skills envision a low grade before they begin an examination or enroll in a course. The expected results of these imagined performances would be differently envisioned: social

success or greater career options for the former, social isolation or curtailed academic possibilities for the latter. Because individuals operate collectively as well as individually, self-efficacy is both a personal and a social construct. Collective systems develop a sense of collective efficacy—a group's shared belief in its capability to attain goals and accomplish desired tasks.

Sources of Self-Efficacy Beliefs Development

According to Bandura (2001) individuals form their self-efficacy beliefs by interpreting information primarily from four sources. The most influential source is the interpreted result of one's previous performance, or mastery experience. Individuals engage in tasks and activities, interpret the results of their actions, use the interpretations to develop beliefs about their capability to engage in subsequent tasks or activities, and act in concert with the beliefs created. Typically, outcomes interpreted as successful raise self-efficacy; those interpreted as failures lower it. Of course, people who possess a low sense of efficacy often discount their successes rather than change their self-belief. Even after individuals achieve success through dogged effort, some continue to doubt their efficacy to mount a similar effort. Consequently, mastery experiences are only raw data, and many factors influence how such information is cognitively processed and affects an individual's self-appraisal.

In addition to interpreting the results of their actions, people form their self-efficacy beliefs through the vicarious experience of observing others perform tasks. This source of information is weaker than mastery experience in helping create self-efficacy beliefs, but when people are uncertain about their own abilities or when they have limited prior experience, they become more sensitive to it. The effects of modeling are particularly relevant in this context especially when the individual has little prior experience with the task. Even experienced and self-efficacious individuals, however, will raise their perceived self-efficacy even higher if models teach them better ways of doing things. Vicarious experience is particularly powerful when observers see similarities in some attribute and then assume that the model's performance is diagnostic of their own capability. For example, a girl will raise her perceived physical efficacy on seeing a woman model exhibit physical strength but not after seeing a male model do so. In this case, gender is the attribute for assumed

similarity. Observing the successes of such models contributes to the observers' beliefs about their own capabilities ("If they can do it, so can I!"). Conversely, watching models with perceived similar attributes fail can undermine the observers' beliefs about their own capability to succeed. When people perceive the model's attributes as highly divergent from their own, the influence of vicarious experience is greatly minimized. It bears noting that people seek out models that possess qualities they admire and capabilities to which they aspire. A significant model in one's life can help instill self-beliefs that will influence the course and direction that life will take.

Individuals also create and develop self-efficacy beliefs as a result of the social persuasions they receive from others. These persuasions can involve exposure to the verbal judgments that others provide. Persuaders play an important part in the development of an individual's self-beliefs. But social persuasions should not be confused with knee-jerk praise or empty inspirational homilies. Effective persuaders must cultivate people's beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable. And, just as positive persuasions may work to encourage and empower, negative persuasions can work to defeat and weaken self-efficacy beliefs. In fact, it is usually easier to weaken self-efficacy beliefs through negative appraisals than to strengthen such beliefs through positive encouragement.

2.5 Peer Education

Definition of Peer Education

Peer education is a popular concept that implies an approach, a communication channel, a methodology, a philosophy, and a strategy. In the olden days of kings and queens (in England), peers were nobleman, aristocrats, lords, titled men and patricians. The English term “peer” refers to "one that is of equal standing with another; one belonging to the same societal group especially based on age, grade or status". In modern times, the term has come to mean fellow, equal, like, co-equal or match according to the dictionary of synonyms (Oxford Thesaurus). Recently the term is used in reference to education and training. Peer education is now viewed as an effective behavioural change strategy, and it draws on several well-known

behavioural theories – Social Learning Theory, Theory of Reasoned Action and Diffusion of Innovation Theory.

Theories of Peer Education in Brief

Social Learning Theory asserts that people serve as models of human behaviour, and some people (significant others) are capable of eliciting behavioural change in certain individuals, based on the individual's value and interpretation system (Bandura, 1986).

Theory of Reasoned Action states that one of the influential elements for behavioural change is an individual's perception of social norms or beliefs about what people, who are important to the individual, do or think about a particular behavior (Fishbein and Ajzen, 1975).

Diffusion of Innovation Theory posits that certain individuals (opinion leaders) from a given population act as agents of behavioural change by disseminating information and influencing group norms in their community (Rogers, 1983).

The Theory of Participatory Education has also been important in the development of peer education (Freire, 1970). Participatory, or empowerment, models of education posit that powerlessness at the community or group level, and the economic and social conditions inherent to the lack of power are major risk factors for poor health (Amaro, 1995). Empowerment, in the Freirian sense, results through the full participation of the people affected by a given problem or health condition. Through such dialogue the affected community collectively plans and implements a response to the problem or health condition in question. Many advocates of peer education claim that this horizontal process of peers (equals) talking among themselves and determining a course of action is key to the impact of peer education on behavioural change.

Application of Peer Education

Peer education has been used in many areas of public health, including nutrition education, family planning, substance use and violence prevention. Use of peer education in the realm of HIV/AIDS stands out because of the number of examples of its use in the recent international public health literature. Because of this popularity, global efforts to further understand and improve the process and impact of

peer education in the area of HIV/AIDS prevention, care and support have also increased. Questions concerning the nature of a peer and what constitutes education have a range of answers. Peer education typically involves using the members of a given group to effect change among other members of the same group. Peer education is often used to effect change at the individual level by attempting to modify a person's knowledge, attitudes, beliefs, or behaviours. However, peer education may also effect change at the group or societal level, by modifying norms and stimulating collective action that leads to changes in programmes and policies.

Peer Education and Youth

In most societies, young people often find it difficult to obtain clear and correct information on issues that concern them such as sex, sexuality, substance use, reproductive health, HIV/AIDS and STIs. This happens for many reasons: sociocultural norms and taboos, economic deprivation or lack of access to information. Many times, information is available but it may be given in a manner that is authoritarian, judgmental, or non-adapted to the young people's values, viewpoints and lifestyle. One effective way of dealing with these issues is peer education, because it is a dialogue between equals. It involves members of a particular group educating others of the same group. For example, young people share information with each other, some acting as facilitators of discussions. It usually takes the form of an informal gathering of people who, with the help of the peer educator, (someone of a similar age or social group), discuss and learn about a particular topic together. Peer education works well because it is participatory and involves the young people in discussion and activities. People learn more by doing than just getting information. Peer education is, therefore, a very appropriate way to communicate in the context of HIV / AIDS. It empowers young people to take action. Examples of participatory activities used in peer education are games, art competitions and role-plays. All of these can help people to see things from a new perspective without “being told” what to think or do.

Role of the Peer Educator

The main role of the peer educator is to help the group members define their concerns and seek solutions through the mutual sharing of information and experiences. S/he is the best person to disseminate new information and knowledge

to the group members and can become a role model to others by "practicing what s/he preaches". Since s/he is from the same group, s/he can empathize and understand the emotions, thoughts, feelings, language of the participants, and, therefore, relate better. A peer educator not only tells the peers about a desired risk reduction practice but also models it. S/he demonstrates behaviour that can influence the community norms in order to promote HIV/AIDS risk reduction within their networks. They are better able to inspire and encourage their peers to adopt health-seeking behaviours because they are able to share common weaknesses, strengths and experiences.

Knowledge and Skills Needed to be A Peer Educator

The basic requisite for becoming a peer educator is to be a ***peer***. For example, a sex worker peer educator will be more comfortable working with sex workers, a migrant worker peer educator will be more at ease with migrants and so on. If you are a peer, you speak the same language and are familiar with the cultural norms and values of the group/community. It is important for them to have had some training in group facilitation or peer education. In order to answer questions clearly and correctly, the peer educator also needs to have an overall knowledge of the subject. It is not necessary to be an expert. It is generally better to refer people to organizations or leaflets where more information can be found. A peer educator should be aware of where more information and support can be accessed. As a person grows into the role of a peer educator, one should increase one's knowledge of the subject and include related subjects, such as reproductive health care and support for people living with HIV/AIDS. Updating knowledge and skills in group facilitation continuously, increase a peer educator's value for the group. A peer educator should be sensitive, open minded, a good listener and a good communicator. S/he should be acceptable to the community and be trust worthy. In brief, s/he should possess good interpersonal skills. A peer educator should also develop leadership and motivation skills. People often tend to judge others. Peer educators need to be non-judgmental and open minded. Being non-judgmental means not making judgement statements out loud or in one's mind

Developing a Peer Educator

The development of a peer educator involves the application of various methods such as counseling, training, personal orientation, exposure visits, improving social contacts, participatory planning and assessment.

Probation: It is advisable to have the peer educators work on probation for 2-3 months on a project or programme so that they can receive training in the basic skills required for their work.

Counseling: Continuous sessions of counseling will help to improve communication patterns, family and interpersonal relations, self-confidence and self-respect.

Training: Is very effective for skill development and education. It increases motivation and self-respect.

One-to-one Education: Personal and individual education are of prime importance in equipping the peer educators with information on sexual health and related matters.

Exposure visits: These are highly useful for refreshing and developing relationships, motivation, cohesion, "we feelings" and pride in one's work.

Social Contacts: Peer educators make many social contacts when they are involved in the advocacy process. This increases their motivation and commitment.

Participation: Participation in the planning and evaluation of their work leads to better understanding and improves skills for implementation.

2.6. Seasons in Southern of Thailand

Weather Variations for Regions of Southern Thailand

South - The climate of Southern Thailand is influenced by the Southwest monsoon and Northwest monsoon winds and sea breezes, as well as depression storms. The Phuket and Nakhorn Sri Thammarat mountain ranges block the Southwest monsoon winds and thus the South and West of the region are the rainiest parts of Thailand. The *South* has 2 seasons, the *Rainy Season*, from May to December, and the *Dry Season*, from January to April.

Andaman Sea - The area around Phuket has a Tropical Monsoon Climate. It is warm year round with *two hot seasons, April-May and September-October.* The

September-October Hot Season is also the Wettest. November till March is the *Mild Season and is* influenced by the *Northeast Monsoon***.**

The southern region of Thailand really has only two seasons - the wet and the dry. These seasons do not run at the same time on both the east and west side of the peninsular. On the west coast the southwest monsoon brings rain and often heavy storms from April through to October, whilst on the east coast the most rain falls between September and December.

2.7. Relevant Researches

2.7.1 Research Conducted in Thailand

Lausy P, et al. (1998) studied dengue control in Songkla Province, The study was carried out in a high-risk area of Songkla. The study group was made up of 180 mothers randomly chosen from six villages and the preselected heads of departments connected with the dengue control program. Their results of the administration data analysis indicated that heads had good knowledge of Dengue Haemorrhagic Fever (DHF) but that the intersectoral interaction was not as clear cut as necessary for efficient action. The links between departments for the supply of chemicals appeared too weak and may benefit from being strengthened. Local funding appeared also to be insufficient but accurate assessments were not available to them. Most mothers (169 respondents) had good knowledge about DHF with 64% recognizing classical dengue and 95% recognizing the symptoms of DHF. Ninety-five percent knew it was caused by the *Ae. aegypti* mosquito and that it is a day biter. One of the results indicated that 30% of the children bring home correct DHF information from school, whereas 70% bring home wrong or inappropriate information. The results also showed good health education coverage but poor community organization. In addition the results also indicated that face to face education is the method most reported in the rural areas as the source of DHF knowledge whereas in the urban areas the media appears more influential, and mothers with a previous family exposure of DHF were much more aware of other DHF cases in the village.

Therawiwat M, (2002) studied a Community-based approach for the prevention and control of Dengue Haemorrgagic Fever in Kanchanaburi province, Thailand. This study was conducted in two villages of Mueang District,

Kanchanaburi Province, to assess the effectiveness of a community-based-approach program. Knowledge, perceived susceptibility, self-efficacy, and regular larval survey practices were measured. Container Index (CI), House Index (HI), and Breteau Index (BI) were used to confirm program outcomes. Key community stakeholders in the experimental village were identified and empowered through active learning in the village. Monthly meetings with the key stakeholders were used to share experiences, to reflect on the program outputs and outcomes and to plan for the next cycle of program activities. The program was quite successful. Knowledge, perception, self-efficacy, and larval survey practice scores in the experimental community were significantly higher than before the experiment, and higher than the comparison community. CI, HI, and BI had decreased sharply to better than the national target. Community status of community leader was the best predictor for larval survey behavior at the first survey. Participating in the study program activities was the best predictor at the end of the program. The results of this study suggest that dengue haemorrhagic fever (DHF) prevention and control programs at the sub-district health level should be more proactive and emphasized at the village level. Disease control program outputs and outcomes should be monitored regularly during monthly meetings. Finally, local health officers need to be empowered in this context.

Swaddiwudhipong W, et al. (1998) studied the effect of health education on community participation in control of dengue hemorrhagic fever in an urban area of Mae Sot District, Tak Province, Thailand. This study was conducted in 3 years (1988-1990). In 1988, the research provided public health education program about DHF control through mass media, lectures and discussions. After the program, the Aedes Breteau index reduced from 241 in March to 126 in June 1988. In 1989 and 1990, twice a year house-to-house visits by trained health workers were added to the health education campaigns. Ae. agypti larval indices were decreased far more in the epidemic year of 1990 than in 1989. During this 3-year period, water-storage containers for drinking, washing, bathing and ant-traps were the primary sources of larval habitats, accounting for about 90% of the total breeding sites. Reduction of *Ae. agypti* larvae in these sources was due to various larval control measures. By August 1990 water containers for non-drinking purposes were the remaining important breeding sites. The introduction of larvivorous fish may be an effective method of

larval control for these containers. Most houses were supplied by public piped water system; however, a shortage of piped water for a period of time resulted in a significant increase in the number of water containers. An adequate water supply to the community should be provided continuously to prevent creation of new breeding sites. Modifying behavioral practices to reduce domestic man-made water containers should be encouraged.

Jittasirinuvatra P, et al. (2003) conducted a participatory action research on community participation approach to DHF prevention in Lamae district, Chumporn province. This study was conducted during January 2001- March 2002 with the concerted efforts of health authorities, public organizations, local government, private sector and local people. It was designed to quantify the Breteau Index (BI) and assessed the relative effectiveness of the control of *Ae. aegypti* larvae by health volunteers and community leaders. Also their knowledge, attitude and practice were assessed before and after the community participation program. The results showed that the Breteau Index was significantly reduced ($p<0.01$) after the interventions. The knowledge and behavior of the health volunteers and the community leaders were also improved significantly ($p<0.01$) yet their attitude was found to be unaffected by the program ($p<0.05$).

Siriprasert R. (2004) studied a community-based DHF Preventive Model in Prachin Buri Province in 1999. To determine the impact of the program, the Aedes larval indices were assessed in about 40% of the total villages (communities) in the province first in May and then in November 2002. In addition to the provincial program, community participation in the vector control program through village public health volunteers was intensively active in 32 villages. To evaluate this program, the researcher compared the results of the larval index survey between these 32 study and 45 control villages before and after the program. The results showed that the Breteau Index (BI) of the province was 293.0 in May compared to 199.0 in November 2002. Aedes larval indices were decreased far more in the 32 study villages than in the 45 control villages. The study indicated that community participation the DHF control program was essential. Health personnel should encourage and endorse community participation as a mean to sustain a long-term community-based vector control.

Meesuk N. (2004) conducted community participation in the control of *Ae. Aegypti* Larvae in Muang district, Chonburi province. In her study, the samples (202 family health leaders) were divided into experimental and control groups. Only the experimental group was trained by a researcher's team. The results of this study revealed that after the experiment, the experimental group had gained significantly more knowledge about DHF. They also had a better perception of susceptibility to and severity of DHF and a better appreciation of the cost-benefits in controlling the *Ae. Aegypti* larvae than the comparison group. It was also found that the House Index, Container Index and Bretea u Index of the experimental group were significantly lower than those of the comparison group. The results of the experiment suggest that this health education program with community participation concepts could be successfully applied to other similar communities.

Butraporn P, et al. (2002) conducted the control of dengue haemorrhagic fever by Local Wisdom in Chaiyapum province, Thailand. Their procedures were to identify the official channels for approaching the Provincial Health Officers who could establish linkages with all levels schools, village leaders, women's groups and the President of the Sub-district Administrative Organization (SAO). They selected a group of people by villagers themselves to formed an environmental master team (30 members) and trained them. An environmental master team implemented the control of DHF. The results showed that, the house index, the container index and the breteau index all showed a reduction. But the mosquito landing rates remained unchanged and sometimes showed fluctuations. Interestingly, the experimental village has shown no evidence of DHF cases since the implementation of the project.

Lailang V, et al. (2001) conducted an Aedes aegypti control Models via community participation in Yasothorn Province, Thailand. There were six villages in Yasothorn province were randomly selected and were divided into three areas (A, B, C). In area A, students in primary school grade 4-6 were assigned to control *Ae. aegypti*. In areas B, the Committee of the Primary Health Care Centre did the control with emphasis on destroying physical breeding place of *Ae. aegypti* and putting abate sand in the breeding sites. Area C was a control area with regular control programme performed by local health officers. The programme was supported with equipment and evaluated by the Office of Communicable Disease Control Region 7,

Ubolratchatani Province. The results revealed that area B showed the best result when compared with the other areas. The control measures of this area had significantly decreased the number of houses or utensils with *Ae. aegypti* larvae. Thus, community cooperation was found to be an important factor in controlling dengue heamorrhagic fever. If responsible health officers were able to encourage and support the community to continue their participation regularly in controlling breeding sites of *Ae. aegypti*, the control of DHF would have been highly effective.

Patitat N, et al. (2001) studied the effectiveness of controlling dengue haemorrhagic fever in villages with and without chemical control by community involvement in Khon Kaen Province. Community stakeholders, the village leaders, housewives, teachers, and students, in study village were motivated and trained by lecture and group discussion about methods of DHF control before implementing the intervention program. The data collected were knowledge, perception and practice by personal interview, the Breteau Index; Biting Rate and Landing Rate were also measured. The results showed that the mean score of knowledge, perception and practice in each village significantly improved ($p<0.01$). And the mean score of knowledge, perception and practice between the two villages was not significantly different.

Manu Taluengpet (2000) studied the effect of protection motivation theory and social support as applied to a health education program on Dengue Haemorrhagic Fever prevention among grade 5 students in Nakhonsrithammarat province. This study was quasi-experimental research focused on the effectiveness of health education program on Dengue Haemorrhagic Fever prevention among primary school students by applying Protection Motivation Theory and Social Support. The samples were 91 grade 5 students which were divided into the experimental group of 43 students and comparison group of 48 students. The experimental group participated in a health education program for 8 weeks. Data were collected through questionnaires and survey forms both before and after the experiment. Statistical methods included percentage, arithmetic mean, standard deviation, independent t-test and pared t-test. The results found that in experimental group in after implementation had higher perceived severity, perceived vulnerability, self-efficacy, response efficacy for Dengue Haemorrhagic Fever than before and also higher than

comparison group. This group also exhibited better prevention behavior at home and school. These differences were statistically significant at p-value < 0.05. Also, the Breteau Index, Container Index at home and school and House Index of Aedes aegypti larvae decreased after the experiment. The results showed that health education program by applying Protection Motivation Theory and Social Support improved preventive behavior for Dengue Haemorrhagic Fever in the experimental group. Thus this program should be applied to students in other primary schools.

Phanthumachinda B, et al. (2000) conducted community participation in *Aedes aegypti* control at Phanus Nikhom district, Chonburi Province, Thailand. The initial workshop conducted for 97 community leaders from the three study areas (village chiefs, village scouts, health communicators, school teachers, students, etc) created a foundation for the three mass larval control campaigns. The training program consisted of group education and vector campaign for source reduction. The results showed that about 80% of the total premises were surveyed but the family could not achieve complete coverage mostly due to low acceptance of larvicide in water jars. Although the prevalence of larval breeding was reduced by 60-80 %, the Breteau Index remained higher than 100 throughout the year. Furthermore, school children were found to be more productive than village volunteers especially in urban communities.

Roongtiwa Sudsiri (2001) studied the health promoting school development for Dengue Haemorrhagic Fever prevention and control among primary school students in Nakornnayok province. The main objective of this study was to assess the effectiveness of the Health Promoting School Model Development for Dengue Haemorrhagic Fever prevention and control among primary school students. The model was comprised of five components of the Health Promoting School Program, namely school policy, school administration, school community involvement, school environment support and school health instruction. The sample included 53 guardians and 66 students attending the fourth grade to the sixth grade of Wangplsjeed primary school, in Prommanee district. Program implementation and data collection were conducted for 3 months. Program evaluation was performed twice, before and after program implementation, in both groups by using self-administered questionnaires, in-depth interviews, observation and a larval indices survey. The data were

qualitatively and quantitatively analyzed by using percentage distribution, arithmetic mean, standard deviation and paired sample t-test. Data for larval indices were analyzed by using percentage. The result found that after completion of the program the new school health program activities had been launched resulting in significant changes in the students and their guardian's knowledge, attitudes and practices regarding Dengue Haemorrhagic Fever. The larval indices showed lower scores than before program implementation.

Nutavadee Woranetesudatip (2003) studied the effectiveness of a health education program on dengue haemorrhagic fever prevention behavior among grade 6 students Thunyaburi district in Pathumthani province. The study was quasi-experimental research aimed to study the effectiveness of a health education program by applying the concepts of Health Belief Model and social support from teachers and guardians in changing haemorrhagic fever prevention behavior of grade 6 students in Thunyaburi district, Pathumtani province. The sample consisted of 90 students from 2 primary schools which were divided into two groups. Forty-five students were assigned to the experimental group while the rest were assigned to the comparison group. The experimental group participated in a health education program for 12 weeks. Data were collected through questionnaires and survey form both before and after the experiment. Statistical methods included percentage, arithmetic mean, standard deviation, paired t-test, independent t-test and Z-test. The finding found that after the program, the experimental group had higher perceived susceptibility, perceived severity, perceived benefits, perceived barriers for Dengue Haemorrhagic Fever than before experimentation and they also higher than those of the comparison group. This group also exhibited better prevention behavior at school and at home. These differences were statistically significant at $p < 0.001$. Also, the House Index and Container Index of *Aedes aegypti* larvae at school and at home decreased after the experiment. The results of this study showed that the health education program applying the Health Belief Model and social support could improve prevention behavior for DHF among grade 6 students.

Mie Mie Han (2009) studied a dengue preventive behavior among secondary school students in Bangkok. A cross-sectional studied aimed to explore preventive behavior on Dengue Haemorrhagic Fever (DHF) and its related factors among

secondary school students in Nong-Kheam district, Bangkok, Thailand during January and February, 2009 by using self-administered questionnaires. Data were subsequently analyzed descriptive and analytic statistic by Chi-square test. The sample was comprised of 300 students between the ages of 12 to 16 years old who were attending secondary school under Bangkok Metropolis. The results revealed that 4.7% of students had good level of preventive behavior and 75.7% had need improvement of prevention behavior. There were significant associations between knowledge on dengue infection with preventive behavior on DHF among students. It was recommended that health education program should be continued and intensified with emphasis on improve the knowledge of the students on prevention and control practice.

2.7.2 Research Conducted in Other Countries

Kroeger et al. (2002) conducted a community-based dengue control program. The study was undertaken in a poor urban area in Cucuta, Columbia. The first bjective was to describe people, s knowledge, attitudes and practices regarding dengue fever, the transmission of the disease and possible preventive measures. The second objective was to analyze the infestation of the community with *Ae. Aegypti* larvae, and the third objective to test the efficacy of Bti (Bacillus thuringiensis israelensis) with respect to the level and duration of reduction of *Ae. aegypti* in water tanks. The result found that people had a very fragmentary knowledge about dengue and about the necessary protective measures which did not lead them to any action. The infestation of water containers, particularly the larger tanks, was very high (HI=61; BI=96). The application of Bti in water tanks led to satisfactory results: For one month and longer, the water tanks created with Bti were free of mosquito larvae. The effect was reduced by a lower dose, washing the tanks and a less potent formulation. People, s acceptance of Bti was higher than that of temephos.Nam VS, et al. (2002) studied the eradication of Aedes aegypti from a village in northern Vietnam by using copepods (Mesocyclops) and community participation. The used of Mesocyclops was complemented by community participation with respect to recycling to eliminate unused and discarded containers that collected rainwater and provided *Ae. aegypti* breeding sites that could not be treated effectively with Mesocyclops. After experiment *Ae. aegypti* disappeared from 400 houses of the

treated village in August 1999 and has not reappeared, a result of particular significance, because there are virtually no other recorded instances of eradicating this mosquito anywhere in the world during the past 25 years, and certainly not with community-based approaches. When used in combination with community recycling, Mesocyclops is an easy and inexpensive method of *Ae. Aegypti* control that should be effective for many communities in Vietnam and elsewhere.

Lloyd et al. (2002) studied the design of a community-based Health education intervention for the control of Ae. aegypti in Meridia, Yucatan, Mexico. The process of this research was broken into five stages: formative research, developing recommendations for behavior change, development of educational messages, development and production of education materials, and distribution of the materials. Appropriate terminology and taxonomies for dengue were obtained from open in-depth interviews: baseline data from a knowledge, beliefs, and practices questionnaire served to confirm this information. A larval survey of house lots was carried out to identify the *Ae. aegypti* larval production sites found on individual house lots. This enabled the program to target the most important larval habitats. Community groups were organized to work on the development of messages and production of the educational materials to be used. The results showed that, the education intervention was successful in stimulating changes in both knowledge and behavior, which were measured in the evaluations of the intervention. The mean number of container positive for *Ae. aegypti* larvae per house lot significantly decreased in the intervention group (from 1.5 to 1.2 by paired t-test $p<0.05$) while it increased significantly in the comparison group (from 1.2 to 1.6 by paired t-test $p<0.05$). The difference between the two groups was nearly significant (1.2 versus 1.6 by t-test $p<0.06$). The researchers concluded that a community education program might be insufficient to support behavior change unless it is supported by measures such as refuse collection and the need to design appropriate covers for water containers and establish biological control measures.

Nam VS, et al. (2003) conducted Dengue vector control in Viet Nam by using mesocyclops through community participation (Thuongtin district, Hatay province) since August 2001. In this study two training courses were held for project field staff of DF/DHF vector control measures using mesocyclops, community participation and

field organizing skills. Community participation in eliminating discarded water containers and releasing Mesocyclops in other breeding sites was mobilized through monthly activities of local communication network (videos, loudspeakers, posters, affiches), home visits by health volunteers, school children and by the leadership of the local authority and health staff. The results showed that after using Mesocyclops to control *Ae. aegypti* mosquito via community participation *Ae. aegypti* disappeared from the experimental village and *Ae. aegypti* has not reappeared in water containers and other breeding sites so far.

Yatim F. (2003) studied DHF control by source reduction through a school health program and village DHF working groups in Indonesia. DHF working groups were comprised of health officer, village leader, village cadre, and village's key person. The working group was assigned to arrange source reduction activities through all communities. The activities included source detection and its elimination by emptying and refilling of water containers, covering of water jars, removal of discarded materials, tins, bottles, tyres, etc. The plan of action permitted divided responsibilities. Families were advised to carry out these activities under the supervision of health cadres. Ten houses were supposed to be monitored by each cadre. Health centers undertook evaluation of *Ae. aegypti* survey once/twice a year. The results showed that there was a definite decrease in the number of cases reported and in case fatality rates. Source reduction methods, if sustained on a continuous basis, will ultimately bring significant reduction in the breeding index and will help reduce the transmission potential through successive years, till it does not remain a public health problem.

Fernandez et al. (2003) studied a community-based intervention to decrease infestation of Aedes mosquitoes in cement washbasins in El Progreso, Honduras. Washbasins and metal drums are important sources of *Ae. Aegypti* mosquitoes in much of Latin America. When manual cleaning was found to be ineffective in eliminating mosquito larvae in a community-based control programme in El Progreso, Honduras, it was decided to develop and evaluate an improved method of removing mosquito eggs based on commonly-available materials. The method, named La Untadita, consists of five steps: mixing chlorine bleach and detergent to make a paste, applying the mixture to the walls of the container, waiting 10 min,

scrubbing with a brush, and finally rinsing with water. A field trial of the Untadita was conducted in 13 peri-urban neighborhoods. At the first post-intervention survey, in spite of high levels of exposure to the community-based intervention, high levels of knowledge regarding the Untadita and high levels of its reported use, little or no impact was discernable on mosquito larvae and pupae. Then, the method was modified by increasing the recommended quantities of bleach and detergent and simplifying the instructions. In the second post-intervention survey, knowledge of the steps and their order increased further; the intervention neighborhoods had significantly fewer algae on washbasin walls, an indicator of more effective cleaning; and numbers of pupae and 3rd and 4th instars larvae were significantly lower than in untreated neighborhoods. Effective promotion of the Untadita should be able to control mosquito infestation in many washbasins, especially those in frequent use, thus reducing the need for chemical and biological larvicides that may be either more costly or less acceptable to householders.

Khamphou Philasouk (2009) studied about Dengue fever preventive behavior of housewife in urban Lungprabang, Lao P.D.R. the result showed that the majority of household representative were female (93.7%) who were household head with a mean age of 38 years. Educationally 47% and 40.0% attained primary and secondary school respectively. Regarding occupation, only 14.3% was farmers. However, 63.0% engaged and earned at least 1,000,000 kips a month. Knowledge on dengue prevention was rather good as compared to knowledge on mosquito that can cause the disease, 84.2% and 3.8% were at good level respectively. Concerning perception, 17.4% and 88.3% perceived that dengue was easily susceptible and rather serve. However, 84.5% and 80% perceived at good level on benefit and less barrier on the dengue prevention. Regarding dengue prevention, 19.2% was at good level of household prevention, but only 1.5 was at good level of informing neighbors on the prevention. Factors significantly associated to the disease prevention were educational attainment of the representative, knowledge perceived on severity of dengue benefit and barrier of prevention.

CHAPTER III
METHODOLOGY

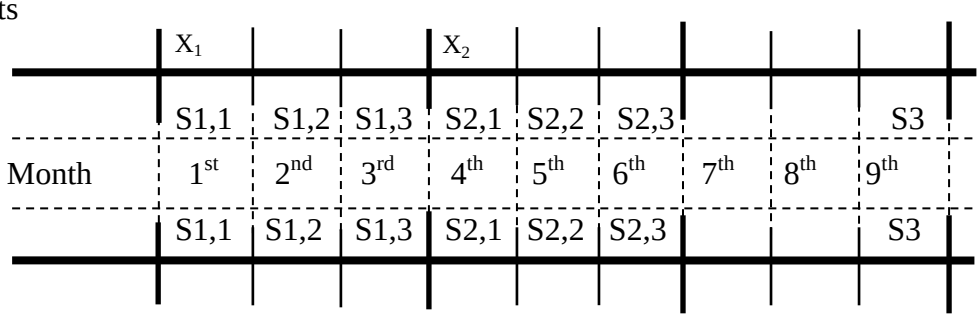
This chapter presents a description of the research methodology that which had been used in this study, including research design, study site, population and sample, research intervention, research instruments, data collection and data analysis.

3.1. Research Design

The research design was a Quasi-experimental study with 2 experimental and 2 comparison groups of housewife and student. Quantitative data had been collected before and after as well as during the experiment.

<u>Experimental Group</u>

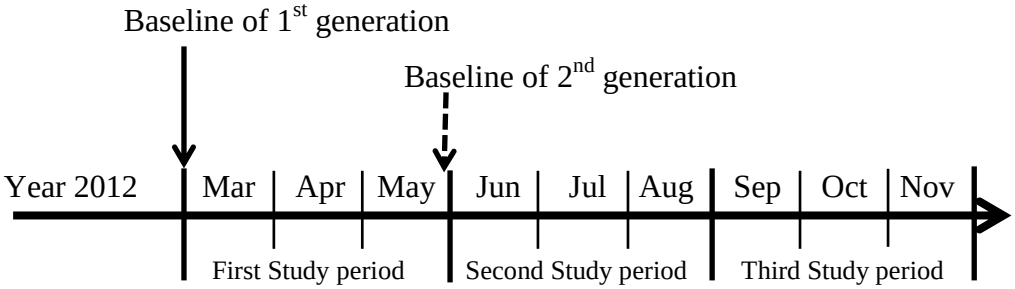
- Housewives OE1,1 OE1,2 OE1,3 OE2,1 OE2,2 OE2,3 OE3
- Students



<u>Control group</u>

- Housewives OC1,1 OC1,2 OC1,3 OC2,1 OC2,2 OC2,3 OC3
- Students

Experimental group



Experimental group

OE1,1 refers to the identifying the housewives and students to be the first generation participants,

OE1,2 refers to re-gathering the data by using questionnaire in relation to DHF prevention and control, analyze and summarize project activity assessment in the first study period, discussion and also continuous training program of the first generation to the second generation participants in each group.

OE2,1 refers to identifying the second generation of housewife and students to be the subjects to gathering their baseline data after they were trained for 3 days and ongoing sharing experience from first generation group through the second period of study for 3 months.

OE2,2 refers to re-gathering the data by using questionnaire in relation to DHF prevention and control, analyze, discussion and summarize project activity assessment as the endpoint of the second study period.

OE3 refer to gathering the data by using questionnaire in relation to DHF prevention and control and also surveying the HI, CI, BI and PI, analyze and summarize project activity assessment of the end of the research.

S1,1 , S1,2 , S1,3 refers to surveying HI, CI, BI and PI in every last Friday of month, monthly meeting discussion and re-planning their activities of first generation participants.

S2,1 , S2,2 , S2,3 refers to surveying HI, CI, BI and PI in every last Friday of month, monthly meeting discussion and re-planning their activities of second generation participants.

S3 refer to surveying HI, CI, BI and PI as the end of the research.

X_1 refer to the researcher put a Larval & Pupal Source Reduction Program (LSRP) to both experimental groups.

X_2 refer to the first generation transferred the knowledge and shared their experience about Larval & Pupal Source Reduction Program (LSRP) to the second generation in each group via buddy method.

Comparison group

OC1,1 refers to the gathering of the baseline data by using questionnaire in relation to DHF prevention and control including survey of HI, CI, BI and PI.

OC1,2 refers to re-gathering of the data by using questionnaire in relation to DHF prevention and control, analyze and summarize the data as the first study period.

OC2,1 refers to identifying the second generation of housewife and students to be the participants to gathering their baseline data without training and sharing experience from the first generation group in relation to DHF prevention and control by using questionnaire in relation to DHF prevention and control and also surveying the HI, CI, BI and PI as the second study period.

OC2,2 refers to re-gathering the data by using questionnaire in relation to DHF prevention and control, analyze and summarize data as the endpoint of the second study period.

OC3 refer to final-gathering the data by using questionnaire in relation to DHF prevention and control, analyze and summarize data of the end of the research.

S1,1 , S1,2 , S1,3 refers to surveying HI, CI, BI and PI in every last Friday of month.

S2,1 , S2,2 , S2,3 refers to surveying HI, CI, BI and PI in every last Friday of month.

S3 refer to surveying HI, CI, BI and PI at the last time of the study.

Both housewife and student groups were provided research intervention, namely a Larval & Pupal Source Reduction Program (LSRP) which had been carried out and continued monitoring from researcher for 9 months in the last 6 months the researcher was just the facilitator. A continuing meeting for the study participants had been conducted in every month in order to re-plan their activities. Nevertheless in 4 areas had been received a routine DHF control program from local sub-district healthcare center and researcher is the facilitator in all through study period after finished the empowering of the first generation study participants as shown in Figure 3.1.

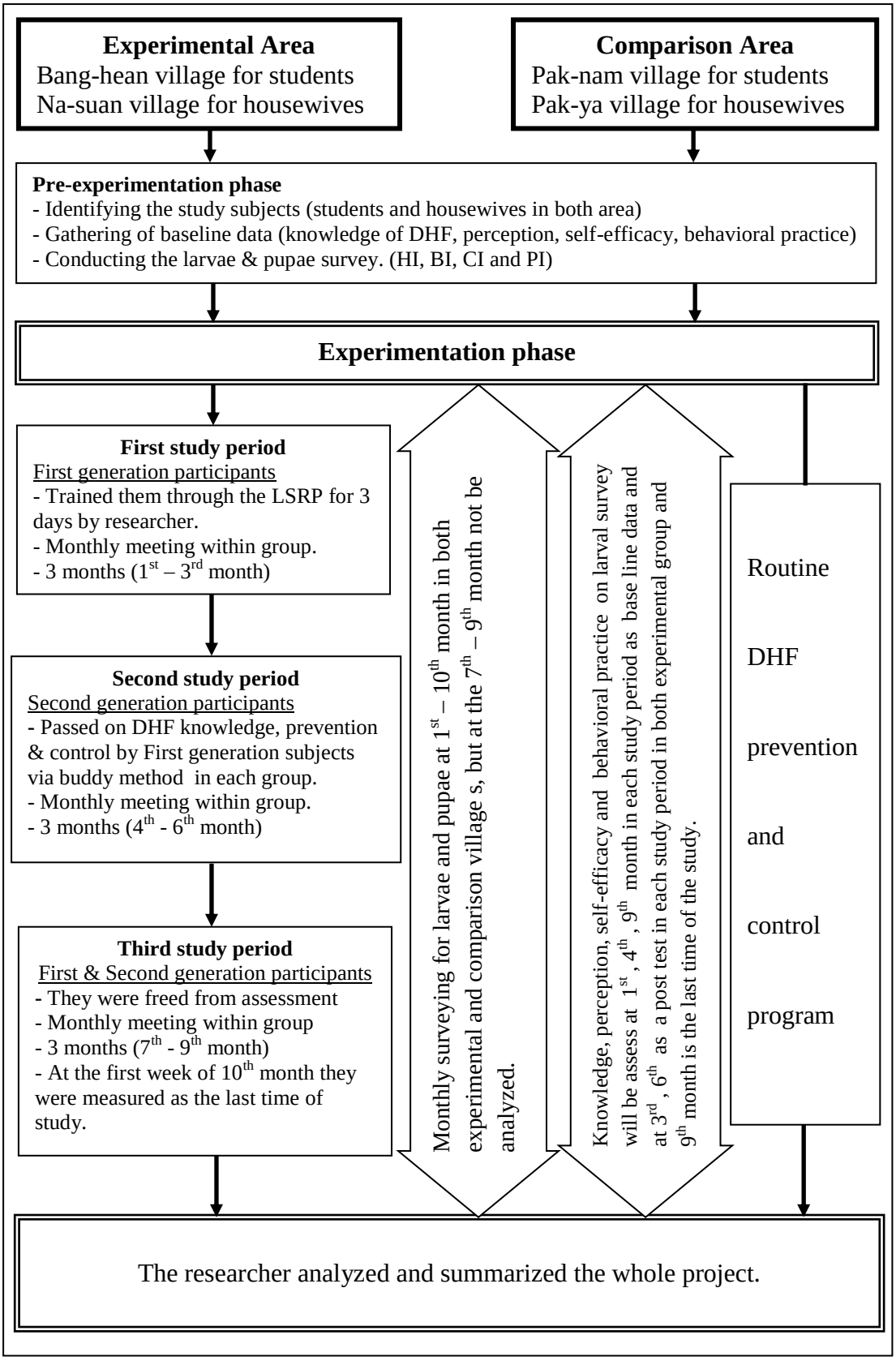


Figure 3.1 *Study Procedure*

3.2. Study Site

The study was carried out in Krabi province. Since this was a quasi-experimental research, the researcher provided a Larval & Pupal Source Reduction Program (LSRP) to the housewives and students who lived in the village as 2 experimental areas. Thus, the study site was purposively selected according to the following steps.

1.) One district of Krabi province that has the high incidence of DHF during 2008 – 2010 had been selected.

2.) Since the study could not put in the whole district, therefore 2 villages in sub-district that had the highest DHF incidence rate was the experimental area and the second of DHF incidence rate in 2010 was the comparison area.

The health statistics record of Krabi Provincial Health Office in 2010 showed that Plaipraya district had the high incidence rate of DHF (88.86 per 100,000 persons). Among the sub-districts of Plaipraya, Plaipraya sub-district had the highest incidence rate of DHF. Therefore Plaipraya sub-district was selected as the experimental area.

Plaipraya sub-district was about 6 kilometers distance from Plaipraya District Public Health Office. Plaipraya sub-district was comprised of 14 villages, among the 14 villages, Moo 6 Banghean village was purposively selected as the experimental area since it had the highest incidence of DHF in 2010, thus 90 students in the village was included in this study as the participants. From such procedure and the same criteria, Moo 9 Na-suan village of Plaipraya sub-district was purposively select as the housewife experiment area. The 90 housewives of Na-suan village were chosen to be the participants.

3.3. Population and Sample

3.3.1 Population: This research took place in both study areas of Plaipraya sub-district, Banghean and Na-suan villages were the experiment areas, all people in the both village that were susceptible to DHF had been included in the study population villages were the experiment areas, thus all people in the village that were susceptible to DHF were included in the study population.

3.3.2 Sample: the step of sample selection was purposively selected by

researcher based on the statistics record of DHF in the past 3 years of Krabi province. The district with the high incidence rate of DHF was selected. Plaipraya district was the target area to implement the program of the study. Been purposively selected the sub-district with the high incidence rate of DHF in 2010 as follow

Sub-district	DHF Incidence rate /100,000 pop.
Plaipraya	265.90
Khaokane	195.01
Khao-tor	208.08
Keereewong	165.17

Health Center	Plaipraya sub-district / Year 2010					
	Village	population	Households	HI	CI	DHF inc. Rate
Plaipraya hospital	1. Pak-nam	976	234	65.00	16.25	409.84
	2. Khaokane-nai	668	151	46.67	11.67	149.70
	3. Pak-ya	963	206	66.67	18.75	415.37
	4. Klongpraya	843	190	44.44	12.12	0.00
	5. Wang-ja	1722	437	43.48	11.11	174.22
	8. Koke-jeak	940	237	40.00	10.91	212.77
	12. Sripraya	772	172	45.45	14.29	259.07
Banghean PCU	6. Bang-hean	2574	543	63.33	16.52	505.05
	7. Hadtua	2123	482	44.00	12.22	235.52
	9. Na-suan	2368	596	60.71	15.45	464.53
	11. Namsum	870	184	33.33	8.62	0.00
Ta-lehoy PCU	10. Ta-lehoy	1829	318	52.94	14.75	218.70
	13. Kuankiew	1188	320	26.67	7.02	0.00
	14. Rimsuan	592	127	15.00	8.57	0.00

Plaipraya sub-district was the target area, there are 14 villages, such procedure and the same criteria were used to select the target villages. The first being experimental area is Moo 6 Banghean village and Moo 9 Na-suan village were purposively selected since they had the high DHF incidence rate in 2010.

The sample group of this studied were categorized into two groups in both experimental areas. 1) First and second generation housewives in the housewife group 2) First and second generation students in the student group were recruited for experimental participants.

The sample Size for a hypothesis test of the different mean of experimental design in case $\sigma_1^2 \neq \sigma_2^2$ or Heteroscedastic Variance, to estimate sample size *n* was calculated as:

$$n = \frac{\left(Z_{\frac{\alpha}{2}} + Z_{\beta}\right)^2 \times (\sigma_1^2 + \frac{\sigma_2^2}{c})}{(\mu_1 - \mu_2)^2}$$

Where

$n = n_1$ and $n_2 = c\,n$ when $c = \frac{n2}{n1}$

n = sample size of each group when $n_1 = n_2 = n$

μ_1 , μ_2 = mean of each group (Therawiwat, 2002)

σ_1^2 , σ_2^2 = variance of each group (Therawiwat, 2002)

Given, 5% significant level

(1- α) = 95%, α = 0.05, $Z_{\frac{\alpha}{2}}$ = 1.96

(1- β) = 95%, Z_β = 1.645

σ_1 = 2.21, σ_2 = 4.31

μ_1 - μ_2 = 2.78

c = 1

So

$$n = \frac{(1.96 + 1.645)^2 \times (2.21^2 + \frac{4.31^2}{1})}{2.78^2}$$

n = 39.45 + 10%; n = 45

The sample size of this research for each group was at least 45 participants.

3.3.2.1 First and second generation students

The total number 90 students were included by inclusion criterions in this study been the student experimental participants. Thus, 45 students used a simple random sampling method been the first generation participants and the last 45 students were the second generation participants.

3.3.2.2 First and second generation housewives

The total number 90 housewives of Na-suan village were chosen by systematic random sampling method from the population after included by inclusion criterions, 45 housewives were the first generation of experimental group by using simple random sampling method and the last 45 housewives were the second generation participants.

In summary, the total sample size was 360 subjects were identified into the study: 90 students were the experimental participants in the student group, 45 students were the first generation participants and 45 students were the second generation participants and 90 students were a comparison group, 90 housewives were the experimental participants in the housewife group, 45 housewives were the first generation participants and 45 housewives were the second generation participant and 90 housewives were a comparison group.

3.4. Research Process and Intervention

In both experimental groups

The research intervention activities of this study were classified into two major phases consists of pre-experimentation and experimentation phase.

3.4.1 Pre-experimentation Phase

This phase was comprised of three basic activities; gathering baseline data about the study villages, identifying the researcher assistants of 5 village health volunteers per area to monitored and taken care the participants, in which one researcher assistant responsible 9 participants of each generation. In addition, to identifying the participants in both areas and conducting a village survey regarding DHF. While, the experimentation phase emphasized empowering the participants to carried out the DHF prevention and control activities.

1) Identifying the participants

The students and the housewife participants were identified as mentioned above. However, the students and the housewife participants of each study village were emphasized of the DHF prevention and control activities about planning, implementing, monitoring, and evaluating the project. For the student participants was focus on the secondary school level 2, 3 Since the students in the study village had some basic knowledge about DHF, they were important because they could convince their parents and other family members to control and prevent DHF. If they gotten more skill of preventive behavior, they would relay this information on their parents and also when they become adults they would take care of their children from dengue by doing preventive activities on DHF. They were included into the study by inclusion criteria were **1)** they were secondary school students level 2 or 3 **2)** either male or female **3)** be able to read and write **4)** lived in target village at least 6 months **5)** have no any plan to move out from the village during the study period and **6)** willingness to participated in the study. For the housewife group they usually are concerned about the safety of their family members, especially their children, since the latter are in the leading risk group for DHF. Due to the nature of the duties of housewives, they usually have enough free time to take care of their local village environment which was beneficial because it reduces the risk of DHF infection. They were included into the study by inclusion criteria were **1)** they were the wife of household headman **2)** the range of age between 20-50 years old **3)** be able to read and write **4)** living in target village at least 6 months **5)** had no any plan to move out from the village during the study period and **6)** willingness to participate in the study.

2) Gathering of baseline data about the study village.

Baseline data about the study village structure as well as information in relation to DHF prevention and control were gathered prior to identifying of the village health volunteers as the researcher assistant to give researcher some basic information of the study village. During the village visit, time would be structured so that a variety of methods would be employed in gathering information and to crosscheck what would have been discovered. As information had been collected it was used to modify the process. Thus, it was important for the study team to build in time at the end of each day to meet with each other, to discuss what the team would

have learn, and then design activities to gain additional information and/or check on an idea that had come up during the day.

The information was gathered, those were knowledge regarding DHF, perceived susceptibility, self-efficacy in controlling of DHF, and behavioral practices regarding the prevention and control of DHF as well as larva survey for HI, CI, BI and PI. The community activities about the *Aedes* larval control were also assessed. Such information and data above were gathered from 90 identified as first generation participants. These data were used as baseline data for the following steps and for the pretest data as well.

3.4.2 Experimentation Phase: Action Process

3.4.2.1. First study period

Training the first generation study participants in both experimental groups for 3 days of the curriculum with the whole content of "How to prevent and control the DHF via Larval & Pupal Source Reduction Program (LSRP)". For the housewives group were empowered at the Na-suan village hall, for the students group were done at the Bang-hean village hall and the interviewing of both groups were occurred at the individual house.

Larval & Pupal Source Reduction Program (LSRP) was the curriculum consists of:

Environmental methods to control *Ades aegypti* and to reduce man-vector contact were 1) source reduction, 2) solid waste management, 3) modification of manmade breeding sites.

Environmental modification

It is essential that potable water supplies be delivered in sufficient quantity, quality and consistency to reduce the necessity and use of water storage containers that serve as the most productive larval habitats.

Environmental manipulation

Domestic storage

The major sources of *Aedes aegypti* breeding in most habitats were containers storing water for household use including clay, ceramic and cement water jars of 200 litres size, 210 liters (50 gallon) metal drums, and smaller containers

storing fresh water or rain water. Water storage containers should be covered with tight-fitting lids or screens, care being taken to replace them after water is used.

Flower pots/vases and ant traps

Flower pots, flower vases and ant traps were common sources of *Aedes aegypti* breeding. They should be punctured to produce a drain hole. Alternatively, live flowers could be placed in a mixture of temephos or abate sand and water. Flowers should be removed and discarded weekly and vases scrubbed and cleaned before reuse. Brass flower pots, which make poor larval habitats, can be used in cemeteries in place of traditional glass containers. Ant traps to protect food storage cabinets can be treated with common salt or oil.

Aedes breeding in incidental water collections

Desert (evaporation) water coolers, condensation collection pans under refrigerators, and air conditioners should be regularly inspected, drained and cleaned.

Solid waste disposal

Solid wastes, namely tins, bottles, buckets or any other waste material scattered around houses, should be removed and buried in landfills. Scrap material in factories and warehouses should be stored appropriately until disposal. Household and garden utensils (buckets, bowls and watering devices) should be turned upside down to prevent the accumulation of rain water. Similarly, canoes and small boats should be emptied of water and turned upside down when not in use. Plant waste (coconut shells, cocoa husks) should be disposed of properly and without delay.

Tyre management

Used automobile tyres are of major importance as breeding sites for urban Aedes, and are therefore a significant public health problem. Tyre depots should always be kept under cover to prevent the collection of rain water.

Filling of cavities of fences

Fences and fence posts made from hollow trees such as bamboo should be cut down to the node, and concrete blocks should be filled with packed sand, crushed glass, or concrete to eliminate potential Aedes larval habitats.

Glass bottles and cans

Glass bottles, cans and other small containers should be buried in landfills or crushed and recycled for industrial use.

Conducting the Laval & Pupal Source Reduction Program (LSRP) for the first generation in both groups as :

Laval & Pupal Source Reduction Program (LSRP) curriculum

Purpose: To building the self-efficacy in controlling of DHF

First day

First Participation Learning Session: Dissemination of health knowledge about DHF

Session A: Getting to know the DHF

Learning objective	Learning content	Learning process/time	Learning material	Evaluation
To know about DHF	- cause of DHF - Epidemiology of DHF - sign & symptoms of DHF - prevention & control of DHF	- **Sharing experience:** Participants been paired and discuss about DHF - **Reflecting the concepts**: 5-6 small group members discussed on the points of DHF prevention & control and how to manage DHF cases - **Re-building the concepts**: 2-3 samples or paired samples have been randomly asked & discussed and shared with other group different opinions and suggestions. - **Summarized by researcher**	Multimedia, poster Multimedia, poster	Q & A Q & A Q & A

Laval & Pupal Source Reduction Program (LSRP) curriculum

Purpose: To building the self-efficacy in controlling of DHF

First day

First Participation Learning Session: Dissemination of health knowledge about DHF

Session B: The Great Danger of Dengue Haemorrhagic Fever (DHF)

Learning objective	Learning content	Learning process/time	Learning material	Evaluation
To know about how does DHF danger	- susceptibility, severity & impact of DHF to their family and community	- **Organization of the concepts:** small group discussion - **Concepts application**: small group discussion of 5-6 members will be set about "How to prevent undesired events that occurred in the case study" **- Summarized by researcher**	Multimedia of case study	Q & A Q & A

Laval & Pupal Source Reduction Program (LSRP) curriculum

Purpose: to building the self-efficacy in controlling of DHF

Second day

Second Participation Learning Session: This session involve to building perception on cost benefit in prevention and controlling or destroying *Aedes aegypti* mosquito breeding places

Session C: If there were no mosquito everyone will be safe

Learning objective	Learning content	Learning process/time	Learning material	Evaluation
- To know the benefit of without DHF in the community - building perception on the benefit in prevention *Aedes aegypti* Larvae and controlling or destroying *Aedes aegypti* mosquito breeding places - To make community slogan	- Environmental methods to control *Ades aegypti* and to reduce man-vector contact were 1) source reduction 2) solid waste management 3) modification of manmade breeding sites.	- **Sensational building**: Watching different environmental risk to DHF susceptibility - **Organization of the concepts**: small group discussion of 5-6 members considering the picture will be presented whether the conditions in the picture affect to *Aedes aegypti* larvae and the endemic of DHF. - **Concept application**: brainstorming by small group of 5-6 members to create slogan for *Aedes aegypti* lavae control in community. **- Concepts building**: representative of each small group will present slogans and will select the best one for their community. - **Summarized by researcher**	Multimedia, poster Multimedia, poster Poster	Q & A 3-4 group members have been randomly asked. Q & A Representative of each small group Having community slogan

Laval & Pupal Source Reduction Program (LSRP) curriculum

Purpose: to building the self-efficacy in controlling of DHF

Third day

Second Participation Learning Session: building perception on cost benefit in prevention and controlling or destroying *Aedes aegypti* mosquito breeding places (Cont.)

Session D: Danger that closes to you

Learning objective	Learning content	Learning process/time	Learning material	Evaluation
- To know the breeding places of *Aedes aegypti* mosquito.	- Environmental modification - Environmental manipulation	- **Exchanging experience:** sharing about life cycle of *Aedes aegypti* mosquito. - **Concepts building**: lecturer will give brief lecture - **Reflecting the concepts**: 5-6 small group members will discuss on the issue of mosquito breeding places. - **Concepts application**: small group of 5-6 members will do the *Aedes aegypti* breeding places from simulation exhibition to discuss how to prevent *Aedes aegypti* to laying eggs and how to control *Aedes aegypti* larvae. - **Concepts building:** discussion. - **Summarized by researcher**	Poster Multimedia, Poster Poster Poster	Q & A 3-4 group members have been randomly asked. Q & A Q & A Q & A

Laval & Pupal Source Reduction Program (LSRP) curriculum

Purpose: to building the self-efficacy in controlling of DHF

Third day

Third Participation Learning Session: This session involved the development skill to surveying *Aedes aegypti* larvae

Session E: Don't let the *Aedes aegypti* larvae alive

Learning objective	Learning content	Learning process/time	Learning material	Evaluation
- To practice surveying *Aedes aegypti* larvae. - To survey the *Aedes aegypti* larvae.	- Environmental modification - Environmental manipulation - Surveying *Aedes aegypti* larvae	- **Concepts building**: researcher lectured about how to survey *Aedes aegypti* larvae.	Poster	Q & A
		- **Sharing experience**: person having experience to *Aedes aegypti* larvae demonstrated about *Aedes aegypti* larvae surveying.	Poster, Survey *Aedes aegypti* larvae set	Q & A 3-4 group members will randomly asked.
		- **Concepts application**: small group of 8-10 members surveyed the *Aedes aegypti* larvae.	Surveyed *Aedes aegypti* larvae set	- Q & A - observing the skill of *Aedes aegypti* survey
		- **Re-building the concepts**: All group members surveyed the *Aedes aegypti* larvae in the community.	Surveyed *Aedes aegypti* larvae set	Q & A
		- **summarized all of learning experiences by researcher**		

Empowering the first generation participants were done before conducting the village survey. “Larval & Pupal Source Reduction Program” (LSRP) was a continuing educational program to empower the participants through active participation in the study of DHF prevention and control. The LSRP main strategy is an “continuing training activities” that were developed around the basic concepts of a problem solving process: - problem identification, clarification of the problem, identification of possible solutions, project development, project implementation, project evaluation, small group discussion, brainstorming, and continuous dialogue are educational methods that will be used in the LSRP. The project activities at the first generation participants were specific to each village context, specifically the mosquito breeding sites. Activities in relation to destroying or controlling of the breeding sites of mosquitoes in every Friday all through their study period for 3 months and at the first generation that is going to be initiated was also developed around the basic concepts of problem solving process.

At the last week of the third month they were tested all knowledge in relation to DHF prevention and control, those who obtain a score of 70% or more would have passed and would then been paired with someone from the second generation in order for them to passed on the knowledge that they have gained as regards DHF. and who got the points less than 70%, they were left out from the study.

3.4.2.2. Second study period

After 3 months of first generation finished they were next trained to the second generation in each group by themselves via **buddy method**, they were paired after the end of the first study period. The second generation participants were paired up based on either an existing personal relationship or by proximity from one another. The second generation would be known the similar to the first generation already known to destroyed or control the breeding sites of mosquitoes. The second generation study participants of the group developed the activities with the assistance of the first generation study participants of that group. So the project activities at the second generation level were specific to each village context, specifically the mosquito breeding sites. Activities in relation to destroying or controlling of the breeding sites of mosquitoes in every Friday all through their study period for 3 months and at the second level that is going to be initiated were also developed

around the basic concepts of problem solving process. In this case the activities was start from mapping of possible breeding sites of mosquitoes in and house surrounding, identification of the breeding sites, identification of possible solutions, implementation the selected solutions, monitoring and evaluation on the implementation outcome.

3.4.2.3. Third study period

After 3 months of second study period finished all of first and second generation were freed from measurement of researcher for 3 months but all activities in relation to destroying or controlling of the breeding sites of mosquitoes in every Friday, the project activities by them all through group process at monthly meeting were still going on.

Until the study period going to the end of ninth month of the third study period all of them were measured as a final, to analyzed and summarized data of the study period and at the endpoint of research by using questionnaire in relation to DHF prevention and control including all study subjects survey of HI, CI, BI and PI.

In summary the project planning and implementation were carried out on three levels. At the second generation study subjects, the project was implemented by themselves and they were monitored by the first generation study subjects. At the first generation study subjects level, motivational, support activities and monitored were done by the researcher. At the community level as a whole, the project activities were developed by all participants through group process at monthly meetings and the process were leaded and guided by the researcher.

As mentioned earlier, the LSRP was a continuous learning program; monthly meetings were scheduled for the participants in advance. However, few scheduled dates were adjusted depending on the participant's time available. Monthly meeting was quite important and crucial for the LSRP since the meetings given a chance for the participants to share their experiences from what they had been doing with their habitat in the past month. The problems or obstacles in implementing DHF prevention and control projects would also rise for discussion during the meeting. Brainstorming was used to seek alternative solutions and the next month activities would be planned. It turn out that brainstorming was an effective method of gleaning the study subject's perceptions and ideas and moving them out of conflict and toward

consensus. Besides sharing experiences and information, the study subjects will also have a good chance to get more information and skills about DHF from the researcher. Mainly the researcher team act as facilitators and sometimes as field guides as well.

Project implementation, monitoring, and evaluation by researcher

Each assigned to first generation participants were plan their project activities to solve the problem with their buddy within their area. Group representatives were present project progress. Each project were monitored and adjusted periodically. The assessment of the project outcomes were conducted and used for monitoring and adjustment of the project activities on a monthly basis.

The Dengue Haemorrhagic Fever (DHF) prevention and control program of local public health office were implemented as usual.

Conducting experimental data after the end of study period were about HI, CI, BI and PI, knowledge of DHF, Self-efficacy and outcome expectation about DHF prevention and control, Behavioral practices in controlling mosquitoes breeding sites, environmental management in house and surrounding, behavioral practices in larval source reduction.

In both comparison groups

As mentioned above Plaipraya sub-district was the target area, there were 14 villages, such procedure and the same criteria were used to select the target villages. The first comparison area was village 1 Pak-nam village were purposively selected been the student comparison group since it had the high incidence of DHF in 2010 and also village 3 Pak-ya village were purposively selected been the housewife comparison group. In both comparison areas had no intervention, they were implemented the Dengue Haemorrhagic Fever (DHF) prevention and control program from local public health office as usual.

3.5. Measuring of the program

The program effectiveness was assessed through the following indicators:

First, the program outcome that related to the reduction of HI, BI, CI and PI were used to assess the program effectiveness. Containers were examined for the presence of mosquito larvae and pupae. For this study the searching was not

terminated if *Aedes* larvae were found, it was continued until all containers had been examined.

The House Index (HI) was most widely used for monitoring infestation levels, but it did not take into account the number of positive containers or the productivity of those containers. Similarly, the Container Index (CI) only provides information on the proportion of water-holding containers that were positive. The Breteau Index (BI) establishes a relationship between positive containers and houses, and it was considered to be the most informative, but again there was no reflection of container productivity. Nevertheless, in the course of gathering basic information for calculating the Breteau Index, it was possible and desirable to obtain a profile of the larval habitat characteristics by simultaneously recording the relative abundance of the various container types, either as potential or actual sites of mosquito production (e.g. number of positive jars per 100 houses, number of positive tires per 100 houses, etc.). The Pupae Index (PI) was the index in order to compare the relative importance of larval habitats, the pupal index could be broken down to “useful”, “non-essential” and “natural” containers, or by specific habitat types, such as tyres, flower vases, drums, clay pots, etc. Given the practical difficulties and labour-intensive efforts entailed in obtaining pupal counts, especially from large containers, this method did not need to be used in every survey, but may be reserved for special studies or used once in each locality during the wet season and once during the dry season, to determine the most productive container types. The pupal index has been most frequently used for operational research purposes. These data were particularly relevant for focusing control efforts on the management or elimination of the most common habitats and for the orientation of educational messages for community-based initiatives.

According to WHO (1999) there was no specific indices for *Aedes* larval survey and evaluation at the present time thus guideline from yellow fever might be applied to evaluate the HI, BI and CI as follow:

House Index more than 10 %	=	high risk of transmission
House Index less than 1%	=	low risk of transmission
Breteau Index more than 50 %	=	high risk of transmission
Breteau Index less than 5 %	=	low risk of transmission

Container Index more than 10 % = high risk of transmission

Container Index less than 1 % = low risk of transmission

For House Index (HI) and Container Index (CI) between 1-10% and Breteau Index (HI) between 5-50% was an acceptable value or within a normal range.

(The Pupae Index has been most frequently used for operational research purposes, WHO did not mention)

Since the program emphasized on the behavioral changes at the household level, therefore CI, HI, BI and PI were mainly used.

Second, the program output namely regular behavioral practices in surveying mosquito larvae, destroying and controlling mosquito breeding sites were used to assess the main output of the program. While, the essential knowledge was gained, the change of perception on DHF, and the increasing of self- efficacy about DHF used to assess the program direct output.

Finally, since the program was finished after 9 months, the reduction of DHF incidence was used to assess the program impact.

The above data was used as the post-test data to compare with the pre-test data to determine the program intervention effectiveness.

Besides the assessment of the program products, the program process in relation to action process activities and program progress were assessed mainly through interviewing the study participants that were randomly selected.

3.6. Research Instruments

The research instruments were comprises of an interviewing questionnaire, a larvae record survey form.

3.6.1 Interview Questionnaire

The interviewing questionnaire consisted of 5 parts as follows:

Part 1 Socio-demographic information: This part contained 13 questions about age, marital status, education, history of sickness, occupation, housing environment etc.

Part 2 Knowledge regarding DHF: This part contained 15 knowledge items that were comprises of questions about disease transmission, significant symptoms, prevention, control, and treatment. Each item had one correct answer. Correct

response got one point and zero point for an incorrect answer. Therefore the possible range of knowledge score was 0 – 15.

Part 3 Perceived susceptibility to DHF: The fifteen perception Likert type items were constructs with three choices "Agree, Uncertain and Disagree". The following scoring system was applied. The possible range of perceived susceptibility score was 15 – 45.

Part 4 Self-efficacy in DHF: The question items in this part related to self-efficacy regarding prevention and control practices of DHF. The Likert type scale items were also used. There were 11 self-efficacies items with the possible range of self-efficacy score was 11 – 33.

Part 5 Behavioral practices in DHF prevention and control: This part comprised of 11 questions regarding the behavioral practices of the participants about DHF prevention and control, in this part the possible range of behavioral practices score was 11 – 33. The questions are about destroying and controlling mosquito breeding sites of the participants and concerned their behavioral practices in doing monthly regular larval survey.

3.6.2 Larval Record Survey Form

This larval record form was applied from the Department of Diseases Control, Ministry of Public Health. It was designed for the participants to record all data needed on 5 pages of paper. So it was quite easy to keep and to record. The participants were asked to record number of mosquitoes breeding sites they inspected by type and the number infested with larvae. The larval survey was done on the monthly basis and its result was used to motivate the study subjects to perform larval survey and control mosquitoes breeding sites regularly and continually. Only five larval surveys at before, first, second, third and the last month of the experiment that was done by themselves were presented in this study.

3.7. Validity and Reliability of the Questionnaire

After the first draft of data collection instruments was constructed, it was assessed by thesis advisors for content and construct validity. After the first draft of instruments were improved then only the interview questionnaire for all participants were tested for its reliability with 68 randomly selected household members from

Nam-sam village of Plaipraya sub-district. The Cronbach's alpha coefficient method (Rosenthal and Rosnow, 1991) was employed to assess reliability of the knowledge and perception, self-efficacy and behavioral practice parts. The Cronbach's alpha coefficient of the interview questionnaire was 0.747.

3.8. Developing the LSRP Curriculum

An *Ae.aegypti* Laval & Pupal Source Reduction curriculum was developed by the researcher. The objectives of the *Ae.aegypti* laval & pupal Source Reduction program were to enhance the participants to understand and respect one-self and others; to develop creativity and critical consciousness; to build team working, problem solving skills; and to set a plan for DHF prevention and control in their village.

3.9. Data Collection

As mentioned earlier a quantitative data was collected. It carried out five times per generations; baseline and one month after intervention, two months after intervention, three months after intervention and nine months after intervention by using the same interview questionnaire. Mosquito larval surveys form was conduct similar to interview questionnaire. These data was obtained by using larval survey form. Main methods of data collection were interview and survey.

3.10. Data Analysis

Quantitative data: It should be noted that in performing statistical analysis, 360 participants in both experimental and comparison groups were include in the analysis since they were required to perform DHF control and prevention activities in their habitat and surrounding. All of them were household members of the community sections. And the main purpose of this research was to assess the LSRP intervention effectiveness via knowledge transfer of participants; it did not attempt to test the significant different of the program outputs, outcomes and program impact of the whole population.

1.) Descriptive statistics contained frequency, mean ($\bar{x}$), standard deviation (S.D), and percentage (%) were performed to describe socio-demographic characteristics of the participants.

2.) Independent t-test was conducted to examine the difference of knowledge, perceived susceptibility, and self-efficacy and the behavioral practices in relation to prevention and control of DHF and also HI, CI, BI and PI between 2 study groups at the time of before and after intervention in each study period.

3.) Chi-square test was used to examine the relationship the categorical data of the independent variables between groups.

4) The effects of intervention on the scores were assessed at five points during the study: at baseline, one month after the intervention, two months after the intervention, three months and nine months after the intervention in each group. At each subsequent evaluation point, the effect size of the intervention was measured with a difference-of-difference analysis using the equation:

Intervention effect = (mean score at follow-up – mean score at baseline) $_{\text{intervention}}$ – (mean score at follow-up – mean score at baseline) $_{\text{control}}$.

A linear mixed model analysis was constructed to test the statistical significance of the intervention effect at each follow-up time. The adjusted fixed-effects models included the main effects of intervention at each follow-up time and the intervention-time interactions for each follow-up time for each group. In these models, the interaction terms are equal to the intervention effects at the 3 follow-up times. A "repeated" statement, with an unstructured covariance type, was included to adjust for repeated within-subject measurements of outcomes at different times

3.11. Ethical consideration

The researcher explained the purpose of the study to all subjects who were participated in this study program. The participants were informed that they have the right to refuse to participate in the study and can stop their participation at any time. Then the researcher read the consent form to the participants and gave them to sign their name in the form. Participants were informed that all information obtain in connection with the study was remained as the confidential documents. If they have any questions, the researcher was available to answer the questions base on Ethic Committee of Chulalongkorn University.

CHAPTER IV

RESULTS

This quasi-experimental study with two experimental and two control groups have investigated the effectiveness of a Larval and Pupal Source Reduction Program (LSRP) on knowledge, perceived susceptibility, self-efficacy, larval survey practices, HI, CI, BI, and PI among the housewives and students, conducted in four villages of Plaipraya district, Krabi Province.

This chapter presents the results of analyzing both groups; the intervention and the control groups. It presents a quantitative data starting with descriptive statistics showing the results of socio-demographic characteristics. Then statistical analysis is used with independent t- test to examine the means difference of continuous data between groups and Chi-square test to test the correlation of categorical data between groups. Lastly, a Linear Mixed Model analysis was used to examine the mean difference of each follow-up time.

Research activities, including preliminary study, were carried out for 9 months during March 2012 until November 2012. The participants were 180 housewives and 180 students. Only experimental group were trained through LSRP. Data regarding knowledge, perceived susceptibility, self-efficacy, larval survey practices, HI, CI, BI and PI were collected before, during, and after the experiment. The study results are presented in 2 parts.

Part 4.1. The socio-demographic characteristic and the outcome measurement of the student group

4.1.1 First generation of student

4.1.2 Second generation of student

4.1.3 Both generations of student

Part 4.2. The socio-demographic characteristic and the outcome measurement of the housewife group

4.2.1 First generation of housewife

4.2.2 Second generation of housewife

4.2.3 Both generations of housewife

4.1 The socio-demographic characteristic and the outcome measurement of the student group

4.1.1 First generation of student

4.1.1.1 The socio-demographic characteristic

Socio-demographic characteristics of the first generation of student group are presented in Table 4.1. The participants were comprised of 45 intervention and 45 control students. Chi-square test for the categorical data was used to compare the characteristics between intervention and control groups. The socio-demographic characteristics of the first generation of student indicated that, most gender of intervention group was male of 53.27%, while most of gender for the control group was female of 55.56%. The gender had no statistical significant difference between intervention and control groups (p = .527). Most participants of both intervention and control groups had received the main source of DHF from the Village Health Volunteer (VHV) of 53.27% and 55.56% respectively, it had no statistical significant difference between intervention and control groups (p = .271). they had participated in the community meeting of 66.67% and 62.16% respectively, in addition most of participants had the DHF cases in their household of 75.78% and 79.92% respectively, they had no statistical significant difference between intervention and control group of p = .826 and p = .800 respectively. Most of them had no chemical spraying in their villages of 86.58% and 91.01% respectively, and it had no statistical significant difference between intervention and control group (p = .739). Most of participants in the intervention group had the DHF project in their villages of 82.2%, while, in the control group had the DHF project in their village of 44.4%, it had a statistical significant difference between intervention and control group (p < .001). Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between the intervention and control groups. The average age of the intervention and control groups were 13.62 ($\pm$1.007) and 13.31 ($\pm$0.557) years old, respectively. It was similar in age between groups (p= .074). In addition, the average family income of the intervention and control groups were 10,766.67 ($\pm$5259.84) and 9377.78 ($\pm$35166.45) baht, respectively. It was also similar in family monthly income between groups (p= .145).

Table 4.1 Socio-demographic characteristics of first generation of student

General Information	First generation of student				*p-value*
	Intervention		Control		
	n = 45	%	n = 45	%	
Sex					.527
- Male	24	53.27	20	44.44	
- Female	21	46.63	25	55.56	
Main Source of DHF information					.271
- VHV	24	53.27	25	55.56	
- PHO	10	22.22	10	22.22	
- School	11	24.41	7	15.55	
- Neighbors, TV	0		3	6.67	
Community meeting participation					.826
- Yes	30	66.67	28	62.16	
- No	15	33.33	17	37.74	
DHF project in the village					< .001
- Yes	37	82.2	20	44.4	
- No	8	17.8	25	55.6	
DHF History of household members					.800
- Yes	34	75.48	36	79.92	
- No	11	24.42	9	19.98	
Chemical spraying in the village					.739
- Yes	6	13.32	4	8.89	
- No	39	86.58	41	91.01	
Age	$\bar{x}$ 13.62	SD. $\pm$ 1.01	$\bar{x}$ 13.31	SD. $\pm$ .56	.074*
Monthly Income	$\bar{x}$ 10,766.67	SD. $\pm$ 5259.84	$\bar{x}$ 9,377.78	SD. $\pm$ 3516.45	.145*

Chi square test, *: Independent t-test

4.1.1.2 The outcome measurement of the baseline data of first generation of student

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between intervention and control groups. In Table 4.2, the total of DHF knowledge scores was 15. The average knowledge score in intervention group was 10.87 (±1.66) and control group was 11.40 (±1.39). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in intervention group was 31.69 (±2.20) and control group was 33.64 (±2.33). The total of DHF self-efficacy scores was 33. The average self-efficacy score in intervention group was 25.31 (±2.31) and control group was 25.69 (±2.88). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in intervention group was 19.16 (±1.52) and control group was 19.27 (±1.49). The knowledge scores, the self-efficacy scores and the practice scores were not significant difference between intervention and control groups of p = .102, .495 and .728, respectively, while, the perceived susceptibility scores was significant difference between intervention and control groups of $p < .001$, the perceived susceptibility scores in the control group was significantly higher than intervention group. In addition the HI score in intervention group was 96.67 (±12.61) and control group was 95.56 (±14.39). The CI score in intervention group was 26.29 (±6.69) and control group was 25.46 (±5.93). The BI score in intervention group was 303.33 (±94.39) and control group was 277.78 (±62.66). The PI score in intervention group was 178.89 (±67.83) and control group was 162.22 (±53.47). The HI scores, CI scores, the BI score and the PI scores were not significant difference between intervention and control groups of p = .698, .533, .134 and .199, respectively.

Table 4.2: Comparison of outcome variables of the baseline data between intervention and control groups of first generation of student.

Variables	First generation of student				*p-value*
	Intervention		**Control**		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	10.87	1.66	11.40	1.39	.102
Perception	31.69	2.20	33.64	2.33	<.001
Self-efficacy	25.31	2.31	25.69	2.88	.495
Practices	19.16	1.52	19.27	1.49	.728
HI	96.67	12.61	95.56	14.39	.698
CI	26.29	6.69	25.46	5.93	.533
BI	303.33	94.39	277.78	62.66	.134
PI	178.89	67.83	162.22	53.47	.199

: Independent t- test

4.1.1.3 The outcome measurement of the follow-up time testing for the effectiveness of a Larval and Pupal Source Reduction Program of first generation of student

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the differences between intervention effects at the different time, they are presented in Table 4.3 and Table 4.4, and Linear Mixed Model analysis was used to adjust confounding factors. For the first generation of student, the confounding factors used to adjust in the model were age, family income and the status of DHF project in the village. The intervention program had strongly effect to the knowledge by mean score changed 1.13 ($p = .002$) at one month after intervention, 1.43 ($p < .001$), 1.83 ($p < .001$) and 0.83 ($p = .042$) at two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.1). The perceived susceptibility, mean score changed 1.67 (p =

.009), 4.13 ($p < .001$), 4.47 ($p < .001$) and 1.27 ($p = .034$) at one month after intervention, two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.2). The self-efficacy, mean scores changed 1.44 ($p = .011$), 1.70 ($p = .001$), 1.65 ($p = .008$) at one month after intervention, two months after intervention, and three months after intervention, respectively, while, at the nine months after intervention, mean scores changed 1.26 ($p = .058$), it was not significant difference between intervention and control groups. The practices, mean score changed 2.66 ($p < .001$), 2.76 ($p < .001$), 3.04 ($p < .001$) at one month after intervention, two months after intervention, and three months after intervention, respectively, while, at the nine months after intervention, mean scores changed 0.77 ($p = .074$), it was not significant difference between intervention and control groups. The BI, mean score change -17.87 ($p = .270$), -28.37 ($p = .175$) and -37.10 ($p = .148$) at one month after intervention, two months after intervention, and three months after intervention, respectively, they were not significant difference between intervention and control groups, while, at the nine months after intervention, mean scores changed -55.61 ($p = .023$), it was significant difference between intervention and control groups. At one months after intervention until nine months after intervention, the HI mean score changed -1.78 ($p = .178$), -0.98 ($p = .654$), -3.30 ($p = .244$) and -3.73 ($p = .082$), the CI mean score changed -0.54 ($p = .729$), -1.81 ($p = .351$), -2.94 ($p = .181$) and -3.13 ($p = .217$), and the PI mean score changed -2.69 ($p=.883$), -43.58 ($p=.017$), -27.88 ($p = .120$) and -22.08 ($p = .199$), respectively, they were not significant difference between intervention and control groups, as shown in table 4.4.

Table 4.3: Mean of outcomes measurement by intervention status and follow-up time of first generation of student.

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
K	$\bar{x}$	12.91	12.33	13.42	12.58	13.78	12.58	12.76	12.48
	S.D.	0.85	0.83	0.97	0.66	0.82	0.54	0.61	0.59
PS	$\bar{x}$	34.76	34.68	37.44	35.02	38.16	35.33	35.67	36.32
	S.D.	2.28	1.57	1.88	1.71	1.99	1.55	1.07	0.77
SE	$\bar{x}$	27.18	26.12	27.49	26.20	27.87	26.69	27.09	26.09
	S.D.	2.29	2.70	1.78	2.52	1.58	2.05	1.39	0.83
P	$\bar{x}$	22.98	20.73	23.64	21.40	24.53	22.13	23.82	23.23
	S.D.	1.60	1.94	1.51	1.47	1.69	1.49	1.37	0.83
HI	$\bar{x}$	95.56	95.56	94.44	94.44	91.11	95.56	94.44	94.31
	S.D.	14.39	14.39	15.89	15.89	24.52	14.39	15.89	16.05
CI	$\bar{x}$	22.97	23.41	24.02	25.68	23.68	26.91	27.87	30.04
	S.D.	6.89	4.14	5.19	6.07	8.57	6.54	5.95	9.63
BI	$\bar{x}$	268.89	266.67	278.89	285.56	282.22	300.00	325.56	337.50
	S.D.	89.37	59.35	79.41	77.33	98.95	81.88	85.03	71.63
PI	$\bar{x}$	174.44	171.11	140.00	171.11	145.56	176.67	194.44	197.73
	S.D.	80.21	66.13	71.98	61.69	76.74	63.60	64.16	58.02

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.4: Effect size of outcomes measurement, by intervention status and follow-up time of first generation of student.

Variables	Intervention effect adjusted for confounding factors			
	1 month after intervention	2 months after intervention	3 months after intervention	9 months after intervention
	Mean Change (95%CI) *p-value*	Mean Change (95%CI) *p-value*	Mean Change (95%CI) *p-value*	Mean Change (95%CI) *p-value*
Knowledge	1.13 (0.44 to 1.83) .002	1.43 (0.76 to 2.09) < .001	1.83 (1.14 to 2.53) < .001	0.83 (0.03 to 1.63) .042
PS	1.67 (0.42 to 2.92) .009	4.13 (3.03 to 5.22) < .001	4.47 (3.32 to 5.62) < .001	1.27 (0.09 to 2.44) .034
Self-efficacy	1.44 (0.33 to 2.55) .011	1.70 (0.71 to 2.69) .001	1.65 (0.44 to 2.87) .008	1.26 (-0.05 to 2.57) .058
Practices	2.66 (1.56 to 3.75) < .001	2.76 (1.74 to 3.78) < .001	3.04 (2.11 to 3.98) < .001	0.77 (-0.08 to 1.62) .074
HI	-1.70 (-4.19 to 0.79) .178	-0.98 (-5.33 to 3.37) .654	-3.30 (-8.91 to 2.30) .244	-3.73 (-7.96 to 0.49) .082
CI	-0.54 (-3.65 to 2.56) .729	-1.81 (-5.65 to 2.03) .351	-2.94 (-7.27 to 1.39) .181	-3.13 (-8.13 to 1.87) .217
BI	-17.87 (-49.90 to 14.16) .270	-28.37 (-69.61 to 12.87) .175	-37.10 (-87.62 to 13.41) .148	-55.61 (-103.28 to -7.94) .023
PI	-2.69 (-39.15 to 33.76) .883	-43.58 (-79.24 to -7.92) .017	-27.88 (-63.15 to 7.39) .120	-22.08 (-56.04 to 11.87) .199

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility.

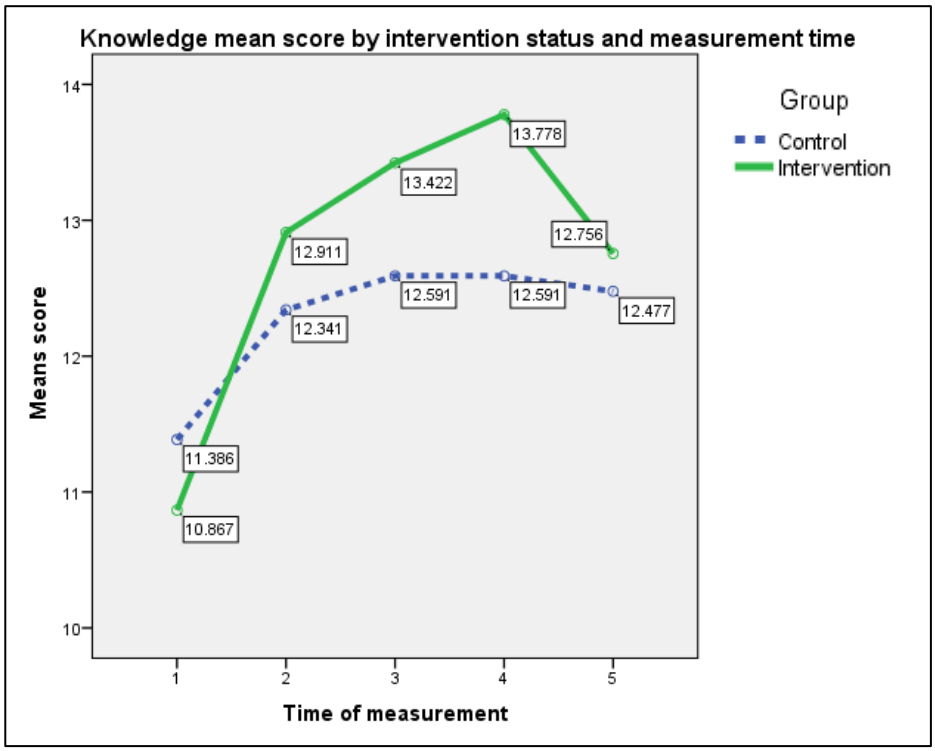


Figure 4.1: *Knowledge means score by intervention status and measurement time of first generation of student.*

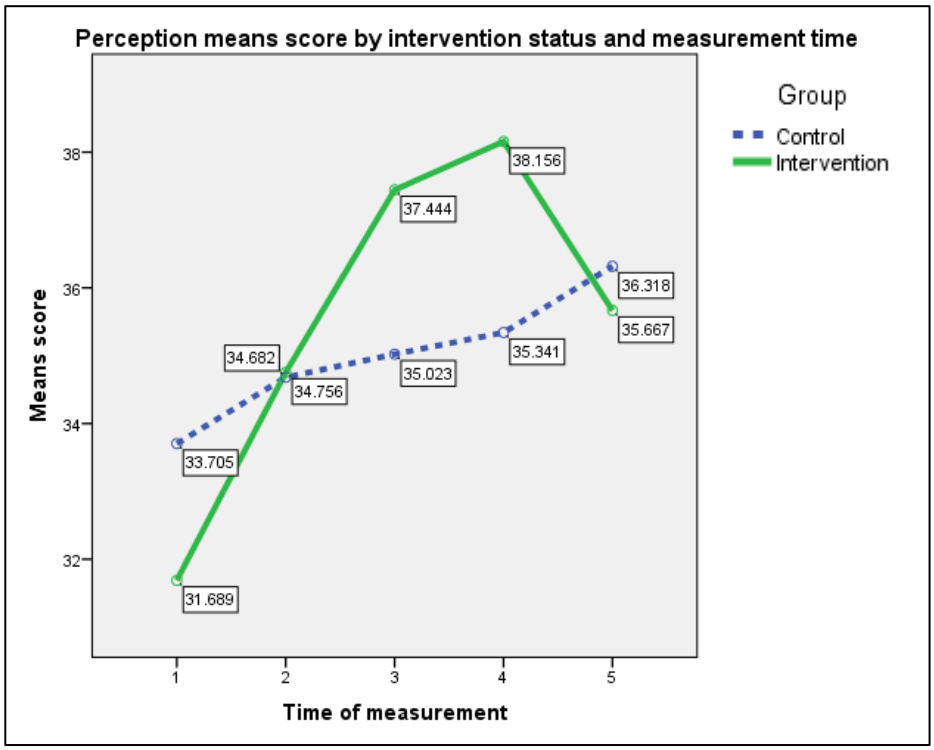


Figure 4.2: *Perceived susceptibility means score by intervention status and measurement time of first generation of student.*

4.1.2 Second generation of student

4.1.2.1 The socio-demographic characteristic

Socio-demographic characteristics of the second generation of student group are presented in Table 4.5. The participants were comprised of 45 intervention and 44 control students. Chi-square test for the categorical data was used to compare the characteristics between intervention and control groups. The socio-demographic characteristics of the second generation of student indicated that, most gender of intervention group was female of 57.8%, while most of gender for the control group was male of 52.3%. The gender had no a statistical significant difference between intervention and control groups (p = .399). Most participants of both intervention and control groups had received the main source of DHF from the school of 31.1% and 34.1% respectively, it had no statistical significant difference between intervention and control group (p = .744). they had participated in the community meeting of 51.1% and 56.8% respectively, in addition, most of participants had the DHF cases in their household of 62.2% and 70.5% respectively, they had no statistical significant difference between intervention and control groups of p = .589 and p = .411 respectively. Most of them had no chemical spraying in their villages of 60.0% and 63.6% respectively, and it had no statistical significant difference between intervention and control group (p = .724). Most of participants in the intervention group had the DHF project in their villages of 57.8%, while, in the control group had the DHF project in their village of 43.2%, it had no statistical significant difference between intervention and control group (p = .169). Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between the intervention and control groups. The average age of the intervention and control groups were 13.06 ($\pm$0.85) and 12.84 ($\pm$0.57) years old, respectively. It was not significant difference in age between groups (p= .132). In addition, the average family income of the intervention and control groups were 14,655.56 ($\pm$4419.51) and 15,693.18 ($\pm$4808.20) baht, respectively. It was also similar in family income between groups (p= .292).

Table 4.5 Socio-demographic characteristics of second generation of student

General Information	Second generation of student				*p-value*
	intervention		control		
	n = 45	%	n = 44	%	
Sex					.399
- Male	19	42.2	23	52.3	
- Female	26	57.8	21	47.7	
Main Source of DHF information					.744
- VHV	14	31.1	12	27.3	
- PHO	7	15.6	10	22.7	
- School	14	31.1	15	34.1	
- Neighbors, TV	10	22.2	7	15.9	
Community meeting participation					.589
- Yes	23	51.1	25	56.8	
- No	22	48.9	19	43.2	
DHF project in the village					.169
- Yes	26	57.8	19	43.2	
- No	19	42.2	25	56.8	
DHF History of household members					.411
- Yes	28	62.2	31	70.5	
- No	17	37.8	13	29.5	
Chemical spraying in the village					.724
- Yes	18	40.0	16	36.4	
- No	27	60.0	28	63.6	
Age	$\bar{x}$ 13.09	SD $\pm$ 0.85	$\bar{x}$ 12.84	SD $\pm$ 0.68	.132*
Monthly Income	$\bar{x}$ 14,655.56	SD $\pm$ 4419.51	$\bar{x}$ 15,693.18	SD $\pm$ 4808.20	.292*

Chi square test, *: Independent t-test

4.1.2.2 The outcome measurement of the baseline data of second generation of student

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between intervention and control groups. In Table 6, the total of DHF knowledge scores was 15. The average knowledge score in intervention group was 10.47 (±1.12) and control group was 10.89 (±1.22). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in intervention group was 32.40 (±1.89) and control group was 33.14 (±2.00). The total of DHF self-efficacy scores was 33. The average self-efficacy score in intervention group was 24.33 (±1.93) and control group was 24.61 (±2.49). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in intervention group was 24.82 (±0.98) and control group was 24.45 (±0.93). The knowledge scores, the perceived susceptibility score, the self-efficacy scores and the practice scores were not significant difference between intervention and control groups of p = .095, .078, .555 and .073, respectively. In addition the HI score in intervention group was 93.33 (±17.19) and control group was 92.05 (±18.49). The CI score in intervention group was 39.86 (±8.49) and control group was 43.45 (±8.89). The BI score in intervention group was 517.78 (±149.29) and control group was 573.86 (±185.68). The PI score in intervention group was 353.33 (±92.56) and control group was 348.86 (±100.86). The HI scores, the CI scores, the BI score and the PI scores were not significant difference between intervention and control groups of p = .734, .055, .121 and .828, respectively.

Table 4.6: Comparison of outcome variables of the baseline data between intervention and control groups of second generation of student.

Variables	Second generation of student				*p-value*
	Intervention		**Control**		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	10.47	1.12	10.89	1.22	.095
Perception	32.40	1.89	33.14	2.00	.078
Self-efficacy	24.33	1.93	24.61	2.49	.555
Practices	24.82	0.98	24.45	0.93	.073
HI	93.33	17.19	92.05	18.49	.734
CI	39.86	8.49	43.45	8.89	.055
BI	517.78	149.29	573.86	185.68	.121
PI	353.33	92.56	348.86	100.86	.828

: Independent t- test

4.1.2.3 The outcome measurement of the follow-up time, testing for the effectiveness of the DHF knowledge transfer via Buddy Method of second generation of student

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the differences between intervention effects at the different time, they are presented in Table 4.7 and Table 4.8, and Linear Mixed Model analysis was used to adjust confounding factors. For the second generation of student, the three confounding factors used to adjust in the model were age, family income and the status of DHF project in the village. The intervention program had effect to the knowledge by mean score changed 0.28 (p = .226), 0.65 (p = .029), 0.62 (p = .037) and 0.71 (p = .024) at one month after intervention, two months after intervention, three months after intervention and six months after intervention, respectively (Figure 4.3). The perceived susceptibility, mean score changed 0.17 (p = .550), 1.11 (p =

.006), 2.30 (p < .001) and 0.99 (p = .028) at one month after intervention, two months after intervention, three months after intervention and six months after intervention, respectively (Figure 4.4). The practices, mean score changed 0.01 (p = .965), 0.29 (p = .174), 0.37 (p = .125) and 0.49 (p = .045) at one month after intervention, two months after intervention, three months after intervention, and six months after intervention, respectively, they were significant difference between intervention and control groups at the end of study period (Figure 4.5). In addition the CI, mean score changed -2.52 (p = .170), 1.15 (p = .265), -5.55 (p = .002) and -4.27 (p = .043) at one month after intervention, two months after intervention, three months after intervention, and six months after intervention, respectively, they were also significant difference between intervention and control groups at the end of study period (Figure 4.6). While, the self-efficacy, mean scores changed -0.29 (p = .383), -0.39 (p = .366), -0.58 (p = .286) and 0.49 (p = .317) at one month after intervention, two months after intervention, three months after intervention, and six months after intervention, respectively, it was not significant difference between intervention and control groups. The BI, mean score changed 31.01 (p = .047), 69.44 (p = .015), -71.13 (p = .045), at one month after intervention, two months after intervention and three months after intervention, it was significant difference between intervention and control groups at the first three months, while, at the six months after intervention, mean score changed -46.50 (p = .163) it was not significant difference between intervention and control groups. In addition, the PI mean score changed 17.34 (p=.130), 4.76 (p=.665), -41.06 (p = .021) at one month after intervention, two months after intervention and three months after intervention, it was also significant difference between intervention and control groups at the first three months, while, at the six months after intervention, mean score changed -26.17 (p = .168), it was not significant difference between intervention and control groups. At one months after intervention until six months after intervention, the HI mean score changed 0.00 (p = 1.00), 0.00 (p = 1.00), 2.79 (p = .083) and 1.05 (p = .650), respectively, it was not significant difference between intervention and control groups, as shown in table 4.8.

Table 4.7: Mean of outcomes measurement by intervention status and follow-up time of second generation of student.

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
K	$\bar{x}$	11.64	11.82	12.60	12.36	13.73	13.48	12.91	12.55
	S.D.	0.65	0.45	0.84	0.61	0.65	0.59	0.76	0.69
PS	$\bar{x}$	34.33	34.84	36.47	36.05	38.76	37.14	36.56	36.18
	S.D.	1.31	1.49	0.97	1.28	1.00	1.36	0.73	0.99
SE	$\bar{x}$	25.42	26.00	26.69	27.45	28.36	27.75	27.27	27.25
	S.D.	1.74	1.53	1.18	1.17	0.91	1.56	0.84	0.84
P	$\bar{x}$	25.78	25.45	27.18	26.50	28.22	27.43	27.33	26.45
	S.D.	1.41	1.32	0.98	1.19	0.97	1.19	0.74	0.79
HI	$\bar{x}$	93.33	92.05	93.33	92.05	93.33	89.77	92.22	90.91
	S.D.	17.19	18.49	17.19	18.49	17.19	20.40	18.33	19.51
CI	$\bar{x}$	42.76	48.74	40.91	43.61	34.10	42.96	32.67	40.57
	S.D.	8.54	10.57	7.45	8.96	4.88	6.95	5.69	6.22
BI	$\bar{x}$	486.67	512.50	468.89	460.23	366.67	493.18	370.00	478.41
	S.D.	108.39	145.52	106.22	123.69	85.94	140.85	87.52	117.33
PI	$\bar{x}$	340.00	317.05	323.33	312.50	277.78	321.59	248.89	272.73
	S.D.	75.83	90.83	74.32	93.46	68.72	96.69	64.39	71.89

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.8: Effect size of outcomes measurement by intervention status and follow-up time of second generation of student.

Variables	Intervention effect adjusted for confounding factors							
	1 month after intervention		2 months after intervention		3 months after intervention		6 months after intervention	
	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*
Knowledge	0.28 (-0.17 to 0.73)	.226	0.65 (0.07 to 1.23)	.029	0.62 (0.04 to 1.20)	.037	0.71 (0.09 to 1.32)	.024
PS	0.17 (-0.39 to 0.73)	.550	1.11 (0.32 to 1.90)	.006	2.30 (1.44 to 3.16)	< .001	0.99 (0.11 to 1.89)	.028
Self-efficacy	-0.29 (-0.95 to 0.37)	.383	-0.39 (-1.26 to 0.47)	.366	-0.58 (-1.65 to 0.49)	.286	0.49 (-0.48 to 1.46)	.317
Practices	0.01 (-0.41 to 0.43)	.965	0.29 (-0.13 to 0.71)	.174	0.37 (-0.10 to 0.85)	.125	0.49 (0.01 to 0.98)	.045
HI	0.00 (-0.001 to 0.001)	1.00	0.00 (0.001 to 0.001)	1.00	2.79 (-0.37 to 5.97)	.083	1.05 (-3.49 to 5.58)	.650
CI	-2.52 (-6.15 to 1.10)	.170	1.15 (-0.89 to 3.19)	.265	-5.55 (-8.98 to -2.11)	.002	-4.27 (-8.40 to -0.14)	.043
BI	31.01 (0.41 to 61.61)	.047	69.44 (13.59 to 125.28)	.015	-71.13 (-140.49 to -1.75)	.045	-46.50 (-112.27 to 19.27)	.163
PI	17.34 (-5.19 to 39.87)	.130	4.76 (-17.04 to 26.57)	.665	-41.06 (-75.76 to -6.35)	.021	-26.17 (-63.61 to 11.27)	.168

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility

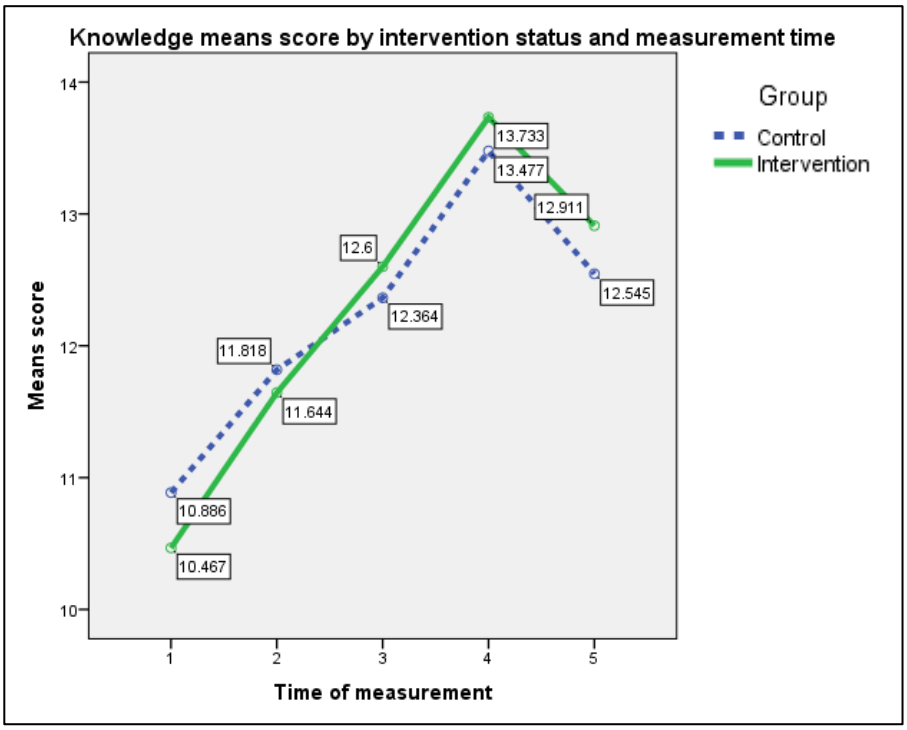


***Figure 4.3**: Knowledge means score by intervention status and measurement time of second generation of student.*

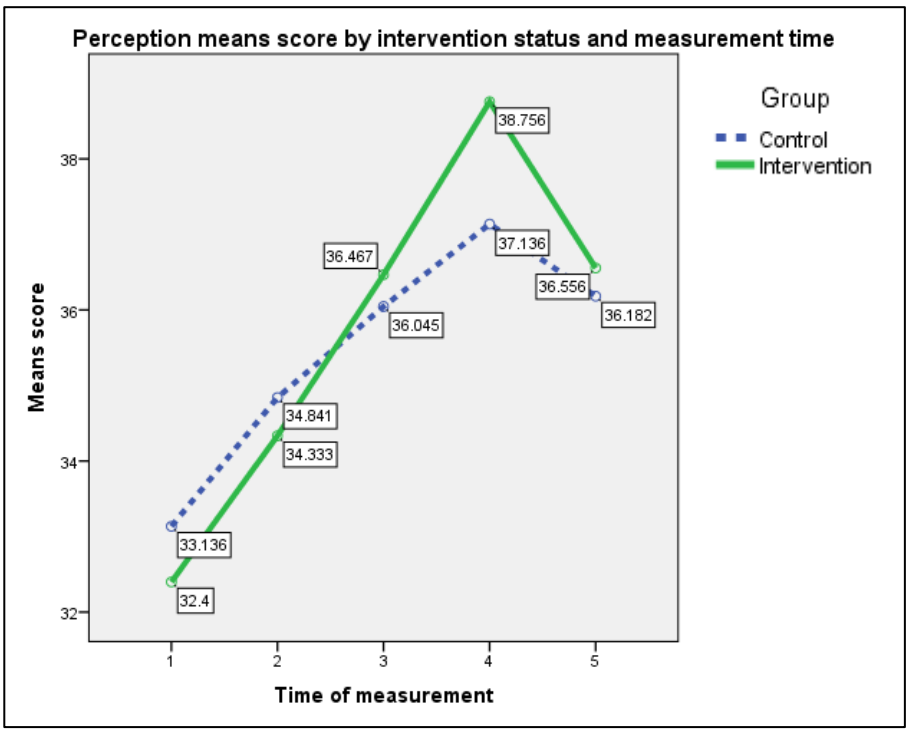


***Figure 4.4**: Perceived susceptibility means score by intervention status and measurement time of second generation of student.*

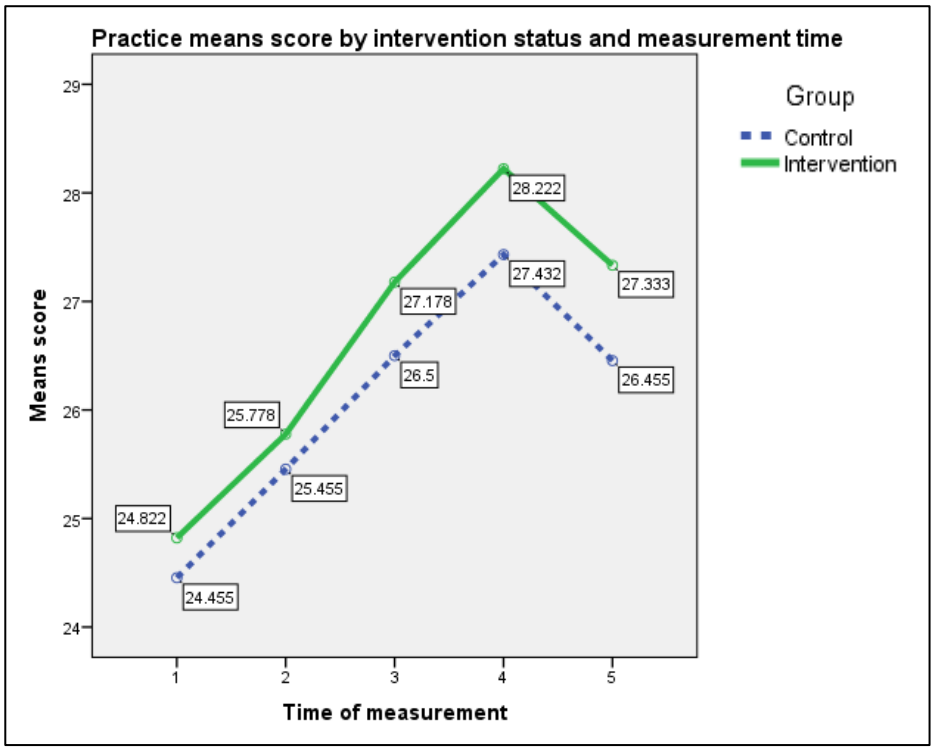


***Figure 4.5**: Practice means score by intervention status and measurement time of second generation of student.*

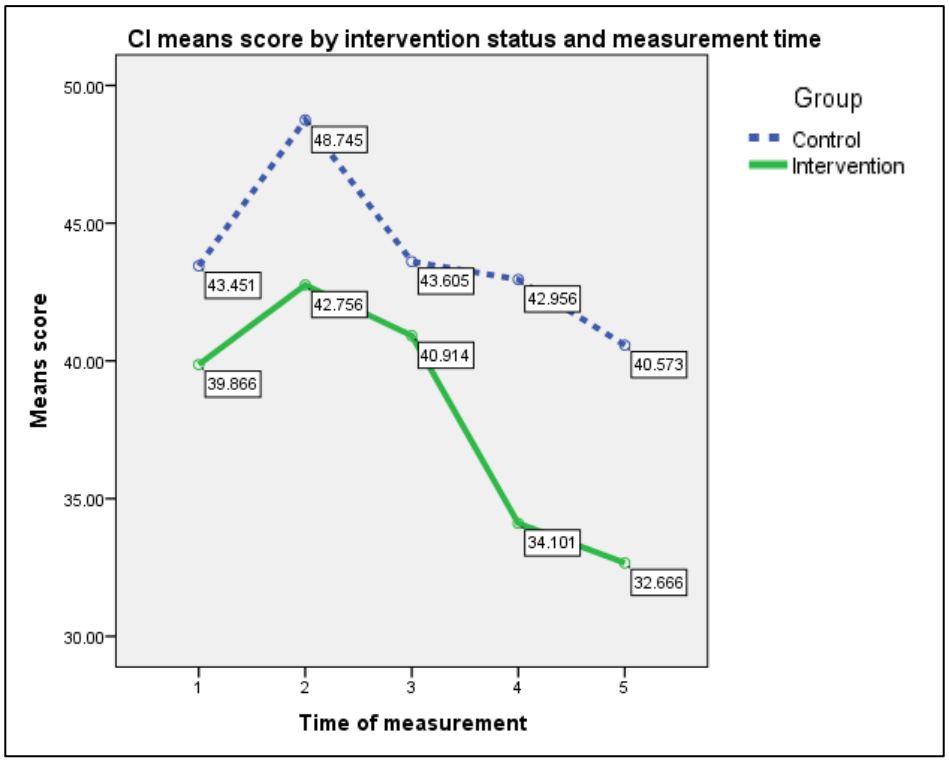


***Figure 4.6**: CI means score by intervention status and measurement time of second generation of student.*

4.1.3 Both generations of student

4.1.3.1 The socio-demographic characteristic

Socio-demographic characteristics of the intervention student group of both first and second generations are presented in Table 4.9. The participants were comprised of 45 first generation and 45 second generation students. Chi-square test for the categorical data was used to compare the characteristics between first and second generations. The socio-demographic characteristics of both generations of student indicated that, most gender of first generation was male of 52.3%, while most of gender for the second generation was female of 57.8%. The gender had no statistical significant difference between first and second generations (p = .399). Most participants of both generations had participated in the community meeting of 66.7% and 51.1% respectively, in addition, most of them had the DHF cases in their household of 75.6% and 62.2% respectively, they had no statistical significant difference between first and second generations of p = .134 and .172, respectively. Most participants had the DHF project in their villages of 82.2% and 57.8%, while, most of them had no chemical spraying in their villages of 86.6% and 60.0% respectively, they had a statistical significant difference between first and second generations of p =.011 and .004, respectively. Most participants of first generation had received the main source of DHF from the Village Health Volunteer of 53.3%, while, most participants of the second generation had received the main source of DHF from the school of 31.1%, there was statistical significant difference between first and second generations of p = .004. Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between the first and second generations. The average age of the first and second generations were 13.62 ($\pm$1.007) and 13.09 ($\pm$0.85) years old, respectively. It was significant difference in age between generations of p = .008. In addition, the average family monthly income of the first and second generations were 10,766.67 ($\pm$5259.84) and 14,655.56 ($\pm$4808.20) baht, respectively. It was also significant difference in family income between groups of p = .001, the monthly income in the second generation was significantly higher than the first generation.

Table 4.9 Socio-demographic characteristics of both generations of student

General Information	Generation of students				*p-value*
	First generation		Second generation		
	n = 45	%	n = 45	%	
Sex					.399
- Male	24	53.27	19	42.2	
- Female	21	46.63	26	57.8	
Main Source of DHF information					.004
- VHV	24	53.27	14	31.1	
- PHO	10	22.22	7	15.6	
- School	11	24.41	14	31.1	
- Neighbors, TV	0		10	22.2	
Community meeting participation					.134
- Yes	30	66.7	23	51.1	
- No	15	33.3	22	48.9	
DHF project in the village					.011
- Yes	37	82.2	26	57.8	
- No	8	17.8	19	42.2	
DHF History of household members					.172
- Yes	34	75.6	28	62.2	
- No	11	24.4	17	37.8	
Chemical spraying in the village					.004
- Yes	6	13.32	18	40.0	
- No	39	86.58	27	60.0	
Age	$\bar{x}$ 13.62	SD $\pm$ 1.007	$\bar{x}$ 13.09	SD $\pm$ 0.85	.008*
Monthly Income	$\bar{x}$ 10,766.67	SD $\pm$ 5259.84	$\bar{x}$ 14,655.56	SD $\pm$ 4808.20	.001*

Chi square test, *: Independent t-test

4.1.3.2 The outcome measurement of the baseline data of both generations of student

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between experimental groups of both first and second generations. In Table 4.10, the total of DHF knowledge scores was 15. The average knowledge score in first generation was 10.87 (±1.66) and second generation was 10.47 (±1.12). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in first generation was 31.69 (±2.20) and second generation was 32.40 (±1.89). The total of DHF self-efficacy scores was 33. The average self-efficacy score in the first generation was 25.31 (±2.31) and the second generation was 24.33 (±1.93). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in the first generation was 19.16 (±1.52) and the second generation was 24.82 (±0.98). The knowledge scores and the perceived susceptibility scores were not significant difference between first and second generations of $p = .184$, and .104, respectively, while, the practice scores and the self-efficacy scores were significant difference between first and second generations of $p < .001$, and .032, respectively, the practice scores in the second generation was significantly higher than the first generation and self-efficacy scores in the first generation was significantly higher than the second generation. In addition, the HI score in the first generation was 96.67 (±12.61) and the second generation was 93.33 (±17.19). The CI score in the first generation was 26.29 (±6.69) and the second generation was 39.86 (±8.49). The BI score in the first generation was 303.33 (±94.39) and the second generation was 517.78 (±149.29). The PI score in first generation was 178.89 (±67.83) and the second generation was 353.33 (±92.56). The HI scores was not significant difference between the first and the second generations of $p = .297$, while, the CI scores, the BI score and the PI scores were significant difference between the first and the second generations of $p < .001$ in all three items. The CI scores, the BI score and the PI scores in the second generation were significantly higher than the first generation.

Table 4.10: Comparison of the outcome variables of the baseline data between first and second generations of student.

Variables	Generation of students				*p-value*
	First generation		Second generation		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	10.87	1.66	10.47	1.12	.184
Perception	31.69	2.20	32.40	1.89	.104
Self-efficacy	25.31	2.31	24.33	1.93	.032
Practices	19.16	1.52	24.82	0.98	<.001
HI	96.67	12.61	93.33	17.19	.297
CI	26.29	6.69	39.86	8.49	<.001
BI	303.33	94.39	517.78	149.29	<.001
PI	178.89	67.83	353.33	92.56	<.001

: Independent t- test

4.1.3.3 The outcome measurement of the follow-up time, testing for the effectiveness of a Larval and Pupal Source Reduction Program and Buddy Method of both generations of student

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the similarity between intervention effects at the different time between generations, been assessed only the significant difference variables at three months after intervention between intervention and control groups of the first generation, they are knowledge, perceived susceptibility, self-efficacy and practices as presented in Table 4.11 and Table 4.12, and Linear Mixed Model analysis was used to adjust confounding factors. For the first and the second generations of student, the six confounding factors used to adjust in the model were age, family income, the status of DHF project in the village, the history of DHF case in the household, the participation in the community meeting and the chemical spraying in the village. The intervention program had effect to the knowledge by mean score

changed 0.96 (p = .005) at one month after intervention, mean score difference 0.34 (p = .332), -0.37 (p = .305) and -0.54 (p = .149) at two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.7). The perceived susceptibility, mean score changed 1.25 (p = .009), 1.91 (p < .001), 0.09 (p = .849) and -0.37 (p = .505) at one month after intervention, two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.8). The self-efficacy, mean scores changed 1.04 (p = .039), 0.25 (p = .614), -0.58 (p = .290) and -0.67 (p = .221) at one month after intervention, two months after intervention, three months after intervention, and nine months after intervention, respectively (Figure 4.9), they were not significant difference between first and second generations. While, the practices, mean score changed 2.97 (p < .001), 2.11 (p < .001), 1.94 (p < .001) and 2.89 (p < .001) at one month after intervention, two months after intervention, three months after intervention, and nine months after intervention, respectively, it was significant difference between first and second generations, as shown in table 4.12.

Table 4.11: Mean of outcomes measurement by generation and follow-up time of both generations of student

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Generation1	Generation2	Generation1	Generation2	Generation1	Generation2	Generation1	Generation2
K	$\bar{x}$	12.91	11.64	13.42	12.60	13.78	13.73	12.76	12.91
	S.D.	0.85	0.65	0.97	0.84	0.82	0.65	0.61	0.76
PS	$\bar{x}$	34.76	34.33	37.44	36.47	38.16	38.76	35.67	36.56
	S.D.	2.28	1.31	1.88	0.97	1.99	1.00	1.07	0.73
SE	$\bar{x}$	27.18	25.42	27.49	26.69	27.87	28.36	27.09	27.27
	S.D.	2.29	1.74	1.78	1.18	1.58	0.91	1.39	0.84
P	$\bar{x}$	22.98	25.78	23.64	27.18	24.53	28.22	23.82	27.33
	S.D.	1.60	1.41	1.51	0.98	1.69	0.97	1.37	0.74

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.12: Effect size of outcomes measurement by generation and follow-up time of both generations of student

Variables	Intervention effect adjusted for confounding factors							
	1 month after intervention		2 months after intervention		3 months after intervention		9 months after intervention	
	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*
Knowledge	0.96 (0.29 to 1.63)	.005	0.34 (-0.35 to 1.04)	.332	-0.37 (-1.07 to 0.34)	.305	-0.54 (-1.29 to 0.19)	.149
PS	1.25 (0.31 to 2.18)	.009	1.91 (0.95 to 2.85)	< .001	0.09 (-0.90 to 1.09)	.849	-0.37 (-1.47 to 0.73)	.505
Self-efficacy	1.04 (0.05 to 2.02)	.039	0.25 (-0.72 to 1.22)	.614	-0.58 (-1.67 to 0.50)	.290	-0.67 (-1.76 to 0.41)	.221
Practices	2.97 (2.17 to 3.77)	< .001	2.11 (1.35 to 2.87)	< .001	1.94 (1.20 to 2.69)	< .001	2.89 (1.12 to 2.67)	< .001

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility.

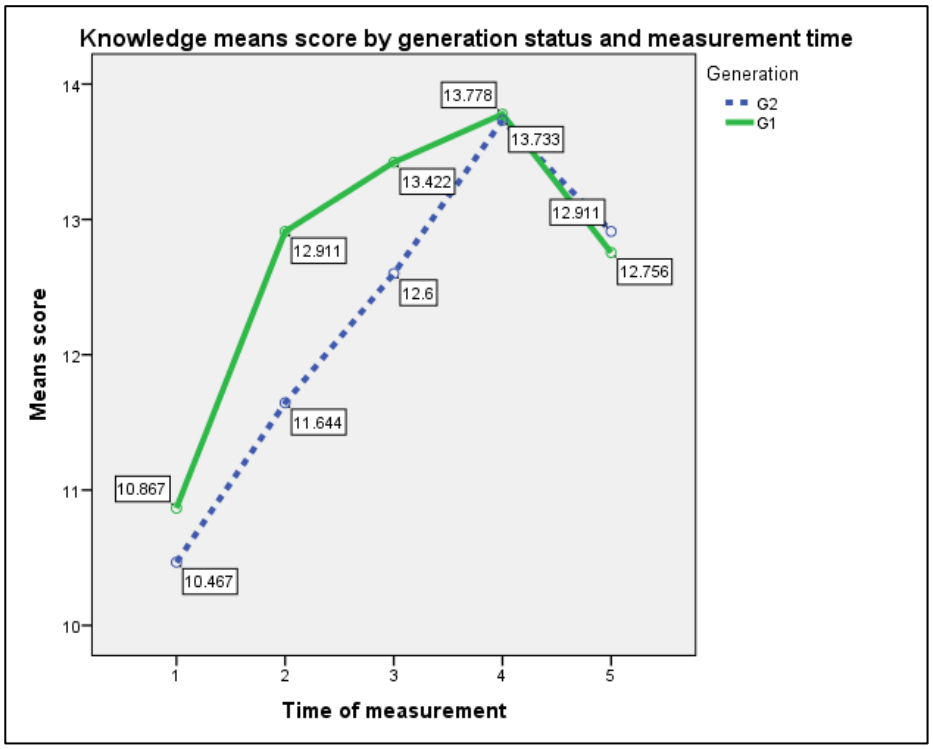


***Figure 4.7**: Knowledge means score by generation and measurement time of both generations of student*

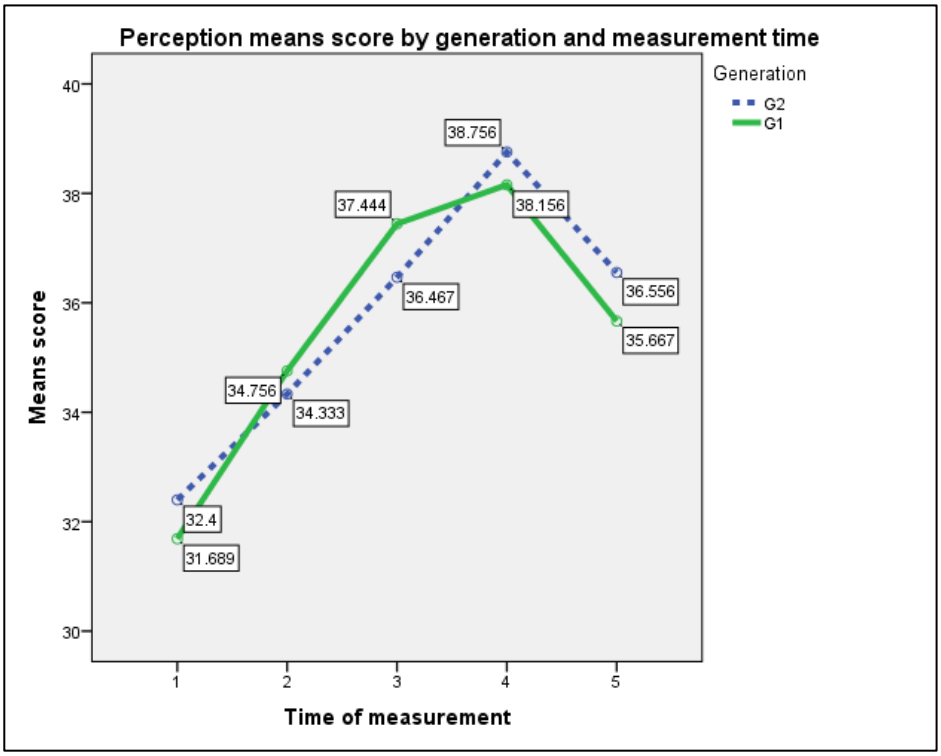


***Figure 4.8**: Perceived susceptibility means score by generation and measurement time of both generations of student*

***Figure 4.9**: Self-efficacy means score by generation and measurement time of both generations of student*

Part 4.2. The socio-demographic characteristic and the outcome measurement of the housewife group

4.2.1 First generation of housewife

4.2.1.1 Socio-demographic characteristics

Socio-demographic characteristics of the first generation of housewife group are presented in Table 4.13. The participants were comprised of 45 intervention and 45 control housewives. Chi-square test for the categorical data was used to compare the characteristics between intervention and control groups. The socio-demographic characteristics of the first generation of housewife indicated that, most education level of both intervention and control groups were primary level of 66.7%, and 51.1% respectively. The education level had no statistical significant difference between intervention and control groups (p = .134). Most participants of both intervention and control groups had received the main source of DHF from the village health volunteer of 75.6% and 53.3% respectively, most of them had been the member of health promoting club (HCM) of 53.3% and 55.6% respectively, most of

them had participated in the community meeting of 93.3% and 82.2% respectively, in addition, most of them, had the DHF project in their villages of 88.9% and 95.6% respectively. They were no significant difference between group of p = .075, .483, .108 and .434, respectively. Most occupation of both intervention and control groups were homemaker of 71.1%, and 93.3% respectively. The occupation had a statistical significant difference between intervention and control groups (p = .011). Most participants in the intervention group had no chemical spraying in their villages of 66.7% and 86.7% respectively, it had a statistical significant difference between intervention and control group (p = .025). Most participants of intervention group had DHF cases in their household of 91.1%, while, in the control group had no DHF case in their family of 71.1%, it was significant difference between intervention and control group of p = .029. Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between the intervention and control groups. The average age of the intervention and control groups were 37.58 ($\pm$7.27) and 35.27 ($\pm$5.99) years old, respectively. It was not significant difference in age between groups (p= .104). In addition, the average family income of the intervention and control groups were 14,155.56 ($\pm$8673.25) and 11,155.59 ($\pm$4934.59) baht, respectively. It was significant difference in family monthly income between groups (p = .048).

Table 4.13 Socio-demographic characteristics of first generation of housewife

General Information	First generation of housewife				*p-value*
	intervention		control		
	n = 45	%	n = 45	%	
Education					.134
- Primary	30	66.7	23	51.1	
- Secondary	15	33.3	22	48.9	
Occupation					.011**
- Homemaker	32	71.1	42	93.3	
- Un-skill labor	13	28.9	3	6.7	
Main Source of DHF information					.075
- VHV	34	75.6	24	53.3	
- PHO	4	8.9	10	22.2	
- Neighbors, TV	7	15.6	11	24.4	
Social status					.483
- CCM	10	22.2	5	11.1	
- VHV	6	13.3	7	15.6	
- Community Club	5	11.1	8	17.8	
- HCM	24	53.3	25	55.6	
Community meeting participation					.108
- Yes	42	93.3	37	82.2	
- No	3	6.7	8	17.8	
DHF project in the village					.434**
- Yes	40	88.9	43	95.6	
- No	5	11.1	2	4.4	
DHF History of household members					.029**
- Yes	41	91.1	13	28.9	
- No	4	8.9	32	71.1	
Chemical spraying in the village					.025
- Yes	15	33.3	6	13.3	
- No	30	66.7	39	86.7	
Age	$\bar{x}$ 37.58	SD $\pm$ 7.27	$\bar{x}$ 35.27	SD $\pm$ 5.99	.104*
Monthly Income	$\bar{x}$ 14,155.56	SD $\pm$ 8673.25	$\bar{x}$ 11,155.56	SD $\pm$ 4934.59	.048*

Chi square test, *: Independent t-test, **: Fisher's Exact Test

4.2.1.2 The outcome measurement of the baseline data of first generation of housewife

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between intervention and control groups. In Table 4.14, the total of DHF knowledge scores was 15. The average knowledge score in intervention group was 12.47 (±1.42) and control group was 12.42 (±0.99). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in intervention group was 33.51 (±2.99) and control group was 34.56 (±2.11). The total of DHF self-efficacy scores was 33. The average self-efficacy score in intervention group was 25.89 (±3.82) and control group was 27.09 (±4.08). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in intervention group was 21.31 (±2.05) and control group was 22.58 (±2.57), the knowledge scores, the perceived susceptibility score, and the self-efficacy scores were not significant difference between intervention and control groups of p = .797, .059, and .154, respectively. While, the practices score was significant difference between intervention and control groups of p = .011. In addition the HI score in intervention group was 95.56 (±14.39) and control group was 93.33 (±17.19). The CI score in intervention group was 27.23 (±7.59) and control group was 26.07 (±5.09). The BI score in intervention group was 290.00 (±88.29) and control group was 280.00 (±72.61). The PI score in intervention group was 186.67 (±65.19) and control group was 182.22 (±76.24). The HI scores, the CI scores, the BI score and the PI scores were not significant difference between intervention and control groups of p = .508, .398, .559 and .767, respectively.

Table 4.14: Comparison of outcome variables of the baseline data between intervention and control groups of first generation of housewife

Variables	First generation of housewife				*p-value*
	Intervention		**Control**		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	12.47	1.42	12.40	0.99	.797
Perception	33.51	2.99	34.56	2.11	.059
Self-efficacy	25.89	3.82	27.09	4.08	.154
Practices	21.31	2.05	22.58	2.57	.011
HI	95.56	14.39	93.33	17.19	.508
CI	27.23	7.59	26.07	5.09	.398
BI	290.00	88.29	280.00	72.61	.559
PI	186.67	65.19	182.22	76.24	.767

: Independent t- test

4.2.1.3 The outcome measurement of the follow-up time testing for the effectiveness of a Larval and Pupal Source Reduction Program of first generation of housewife

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the differences between intervention effects at the different time, they are presented in Table 4.15 and Table 4.16, and Linear Mixed Model analysis was used to adjust the confounding factors. For the first generation of housewife, the six confounding factors used to adjust in the model were education level, family income, occupation, the main source of DHF information, the history of DHF case in the household and the status of chemical spraying in the village. The intervention program had strongly effect at the first three months to the knowledge by mean score changed 0.42 (p = .040), 0.54 (p = .012), 0.76 (p = .003) and 0.47 (p = .234) at one month after intervention, two months after intervention, three months after

intervention and nine months after intervention, respectively. The perceived susceptibility, mean score changed 1.13 (p = .001), 1.58 (p < .001), 2.42 (p < .001) and 1.52 (p = .185) at one month after intervention, two months after intervention, three months after intervention and nine months after intervention, respectively. The self-efficacy, mean scores changed 1.12 (p = .070), 2.44 (p < .001), 2.15 (p = .007) and 0.30 (p = .790), at one month after intervention, two months after intervention, and three months after intervention, and nine months after intervention, respectively. The practices, mean score changed 1.69 (p < .001), 4.19 (p < .001), 4.33 (p < .001) and 1.41 (p = .088) at one month after intervention, two months after intervention, and three months after intervention and nine months after intervention, respectively. The knowledge score, the perceived susceptibility score, the self-efficacy score and the practices score were significant difference at the first three months after intervention between intervention and control groups, while, at the nine months after intervention, they were not significant difference between groups. The BI, mean score change 1.21 (p = .931), -37.90 (p = .014), -45.34 (p = .046) at one month after intervention, two months after intervention, and three months after intervention, respectively, they were significant difference between intervention and control groups at the first three months after intervention, while, at the nine months after intervention, mean scores changed -17.44 (p = .479), it was not significant difference between intervention and control groups. While, at one months after intervention until nine months after intervention, the HI mean score changed 0.00 (p = 1.00), 0.00 (p = 1.00), -0.31 (p = .903) and -3.10 (p= .403), the CI mean score changed -0.87 (p= .499), -3.51 (p= .011), -3.90 (p = .071) and -2.38 (p = .202), and the PI mean score changed 27.64 (p= .058), 6.10 (p = .756), -26.09 (p = .185) and -23.89 (p = .252), respectively, they were not significant difference between intervention and control groups, as shown in table 4.16.

Table 4.15: Mean of outcomes measurement by intervention status and follow-up time of first generation of housewife

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
K	$\bar{x}$	12.98	12.56	13.20	12.62	13.64	12.82	12.82	12.05
	S.D.	0.99	0.66	0.87	0.58	0.88	0.78	2.04	0.71
PS	$\bar{x}$	34.67	34.69	35.29	34.98	37.04	35.64	35.29	34.66
	S.D.	2.23	1.58	1.93	1.55	2.04	1.59	5.43	0.89
SE	$\bar{x}$	22.22	26.11	28.13	26.51	28.42	27.00	25.76	25.98
	S.D.	3.04	2.71	2.17	2.67	1.79	2.08	4.02	1.29
P	$\bar{x}$	22.96	22.64	26.29	23.53	27.24	24.40	24.29	23.86
	S.D.	1.71	1.82	1.34	1.50	1.51	1.75	3.82	1.15
HI	$\bar{x}$	95.56	93.33	95.56	93.33	93.33	93.33	95.56	95.45
	S.D.	14.39	17.19	14.39	17.19	20.23	17.19	17.91	14.54
CI	$\bar{x}$	24.84	24.54	23.41	25.21	18.86	23.05	30.23	33.08
	S.D.	4.97	4.24	6.64	5.19	7.81	5.24	5.42	5.60
BI	$\bar{x}$	277.78	268.89	252.22	272.22	206.67	252.22	353.33	377.27
	S.D.	72.74	58.67	81.85	75.79	95.11	76.09	91.95	83.15
PI	$\bar{x}$	173.33	134.44	156.67	142.22	108.89	137.78	162.22	187.50
	S.D.	64.49	58.21	86.34	54.31	72.53	57.56	57.56	65.70

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.16: Effect size of outcomes measurement by intervention status and follow-up time of first generation of housewife

Variables	Intervention effect adjusted for confounding factors							
	1 month after intervention		2 months after intervention		3 months after intervention		9 months after intervention	
	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*
Knowledge	0.42 (0.02 to 0.83)	.040	0.54 (0.12 to 0.96)	.012	0.76 (0.26 to 1.27)	.003	0.47 (-0.31 to 1.25)	.236
PS	1.13 (0.47 to 1.79)	.001	1.58 (0.75 to 2.41)	< .001	2.42 (1.14 to 3.69)	< .001	1.52 (-0.74 to 3.78)	.185
Self-efficacy	1.12 (-0.09 to 2.33)	.070	2.44 (1.15 to 3.73)	< .001	2.15 (0.62 to 3.68)	.007	0.30 (-1.85 to 2.46)	.780
Practices	1.69 (1.06 to 2.31)	< .001	4.19 (3.06 to 5.33)	< .001	4.33 (2.94 to 5.71)	< .001	1.41 (-0.22 to 3.04)	.088
HI	0.00 (0.00 to 0.00)	1.00	0.00 (0.00 to 0.00)	1.00	-0.31 (-5.43 to 4.81)	.903	-3.10 (-10.64 to 4.44)	.403
CI	-0.87 (-3.40 to 1.67)	.499	-3.51 (-6.20 to -0.81)	.011	-3.90 (-8.15 to 0.34)	.071	-2.38 (-6.06 to 1.31)	.202
BI	1.21 (-26.34 to 28.75)	.931	-37.90 (-67.86 to -7.94)	.014	-45.34 (-89.84 to -0.84)	.046	-17.44 (-66.19 to 31.31)	.479
PI	27.64 (-0.91 to 56.19)	.058	6.10 (-32.81 to 45.01)	.756	-26.09 (-64.89 to 12.71)	.185	-23.89 (-65.11 to 17.32)	.252

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility.

4.2.2 Second generation of housewife

4.2.2.1 Socio-demographic characteristics

Socio-demographic characteristics of the second generation of housewife group are presented in Table 4.17. The participants were comprised of 44 intervention and 43 control housewives. Chi-square test for the categorical data was used to compare the characteristics between intervention and control groups. The socio-demographic characteristics of the second generation of housewife indicated that, most education level of both intervention and control groups were secondary level of 65.9%, and 79.1% respectively. The education level had no statistical significant difference between intervention and control groups (p = .170). Most participants of both intervention and control groups had received the main source of DHF from the village health volunteer of 54.5% and 51.2% respectively, most of them had been the member of health promoting club (HCM) of 56.8% and 58.1% respectively, most of them had participated in the community meeting of 75.0% and 65.1% respectively, in addition, most of them had the chemical spraying in their villages of 61.4% and 74.4% respectively. They were no significant difference between group of *p* = .524, .424, .314 and .193, respectively. Most occupation of intervention group was homemaker of 52.3%, while, the control group was un-skill labor of 53.5%. The occupation had no statistical significant difference between intervention and control groups (p = .069). Most participants of both intervention and control groups had no DHF project in their villages of 63.6% and 74.4% respectively, and most of them had no DHF cases in their household of 52.3%, and 69.8%, respectively, they were not significant difference between intervention and control group of *p* = .277 and .095, respectively. Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between the intervention and control groups. The average age of the intervention and control groups were 33.89 ($\pm$6.21) and 35.14 ($\pm$6.75) years old, respectively. It was not significant difference in age between groups (p= .370). In addition, the average family monthly income of the intervention and control groups were 17,261.36 ($\pm$13043.25) and 18,181.39 ($\pm$13198.87) baht, respectively. It was not significant difference in family monthly income between groups (p = .744).

Table 4.17 Socio-demographic characteristics of second generation of housewife

General Information	Second generation of housewife				*p-value*
	intervention		control		
	n = 44	%	n = 43	%	
Education					.170
- Primary	15	34.1	9	20.9	
- Secondary	29	65.9	34	79.1	
Occupation					.069
- Homemaker	23	52.3	16	37.2	
- Un-skill labor	13	29.5	23	53.5	
- Farmer	8	18.2	4	9.3	
Main Source of DHF information					.524
- VHV	24	54.5	22	51.2	
- PHO	9	20.5	6	14.0	
- Neighbors, TV	11	25.0	15	34.8	
Social status					.424
- CCM	10	22.7	5	11.6	
- VHV	4	9.1	4	9.3	
- Community Club	5	11.4	9	20.9	
- HCM	25	56.8	25	58.1	
Community meeting participation					.314
- Yes	33	75.0	28	65.1	
- No	11	25.0	15	34.9	
DHF project in the village					.277
- Yes	16	36.4	11	25.6	
- No	28	63.6	32	74.4	
DHF History of household members					.095
- Yes	21	47.7	13	30.2	
- No	23	52.3	30	69.8	
Chemical spraying in the village					.193
- Yes	27	61.4	32	74.4	
- No	17	38.6	11	25.6	
Age	$\bar{x}$ 33.89	SD $\pm$ 6.21	$\bar{x}$ 35.14	SD $\pm$ 6.75	.370*
Monthly Income	$\bar{x}$ 17,261.36	SD $\pm$ 13043.97	$\bar{x}$ 18,181.39	SD $\pm$ 13198.87	.744*

Chi square test, *: Independent t-test

4.2.2.2 The outcome measurement of the baseline data of second generation of housewife

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between intervention and control groups. In Table 4.18, the total of DHF knowledge scores was 15. The average knowledge score in intervention group was 11.73 (±1.04) and control group was 11.26 (±1.35). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in intervention group was 35.16 (±2.84) and control group was 34.49 (±2.99). The total of DHF self-efficacy scores was 33. The average self-efficacy score in intervention group was 25.32 (±2.91) and control group was 26.47 (±3.03). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in intervention group was 22.39 (±2.03) and control group was 23.26 (±2.12), The knowledge scores, the perceived susceptibility score, the self-efficacy scores and the practice scores were not significant difference between intervention and control groups of p = .071, .286, .075 and .054, respectively. In addition the HI score in intervention group was 93.18 (±17.36) and control group was 91.86 (±18.68). The CI score in intervention group was 46.79 (±8.34) and control group was 50.76 (±12.76). The BI score in intervention group was 561.36 (±154.34) and control group was 529.07 (±161.18). The PI score in intervention group was 363.64 (±103.63) and control group was 346.51 (±99.64). The HI scores, the CI scores, the BI score and the PI scores were not significant difference between intervention and control groups of p = .733, .091, .342 and .434, respectively.

Table 4.18: Comparison of outcome variables of the baseline data between intervention and control groups of second generation of housewife

Variables	Second generation of housewife				*p-value*
	Intervention		**Control**		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	11.73	1.04	11.26	1.35	.071
Perception	35.16	2.84	34.49	2.99	.286
Self-efficacy	25.32	2.91	26.47	3.03	.075
Practices	22.39	2.03	23.26	2.12	.054
HI	93.18	17.36	91.86	18.68	.733
CI	46.79	8.34	50.76	12.76	.091
BI	561.36	154.34	529.07	161.18	.342
PI	363.64	103.63	346.51	99.64	.434

: Independent t- test

4.2.2.3 The outcome measurement of the follow-up time, testing for the effectiveness of the DHF knowledge transfer via Buddy Method of second generation of housewife

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the differences between intervention effects at the different time, they are presented in Table 4.19 and Table 4.20, and Linear Mixed Model analysis was used to adjust the confounding factors. For the second generation of housewife, the seven confounding factors used to adjust in the model were education level, occupation, the main source of DHF information, the social status, the history of DHF case in the household, the participation for the community meeting in the village, and the status of chemical spraying in the village. The intervention program had effect to the knowledge by mean score changed 0.11 (p = .631), 0.38 (p = .193), 0.52 (p = .100) and 0.57 (p = .046) at one month after intervention, two months after

intervention, three months after intervention and six months after intervention, respectively, it was significant difference between intervention and control groups at the end of study period (Figure 4.10). The self-efficacy, mean scores changed 0.23 (p = .610) at one month after intervention, mean scores changed 1.24 (p = .029) 1.85 (p = .005) and 1.76 (p = .014) at two months after intervention, three months after intervention, and six months after intervention, respectively, it was significant difference between intervention and control groups (Figure 4.11). The practices, mean score changed 0.61 (p = .013), 1.90 (p < .001), 2.34 (p < .001) at one month after intervention, two months after intervention, and three months after intervention, respectively, it was significant difference between intervention and control groups at the first three months, while, mean score changed 1.01 (p = .053) at six months after intervention, it was not significant difference between groups at the end of study period. The perceived susceptibility, mean score changed 0.17 (p = .752), 0.71 (p = .224), 0.94 (p = .201) and 1.04 (p = .134) at one month after intervention, two months after intervention, three months after intervention and six months after intervention, respectively, it was not significant difference between intervention and control groups. The BI, mean score changed -51.51 (p = .010), -119.98 (p < .001), -122.62 (p = .002), and -79.55 (p = .045) at one month after intervention, two months after intervention, three months after intervention and six months after intervention, it was significant difference between intervention and control groups (Figure 4.12). The CI, mean score changed -3.54 (p = .064), -5.85 (p = .019), -6.49 (p = .020) at one month after intervention, two months after intervention, and three months after intervention, respectively, it was significant difference between intervention and control groups at the first three months, while, at the six months after intervention, mean score changed -4.89 (p = .087). In addition, the PI mean score changed -89.31 (p <.001), -65.98 (p = .007), -92.51 (p = .001) at one month after intervention, two months after intervention and three months after intervention, it was significant difference between intervention and control groups at the first three months, while, at the six months after intervention, mean score changed -42.03 (p = .132). Both CI and PI were not significant difference between intervention and control groups at the end of study period. In addition, at one months after intervention until six months after intervention, the HI mean score changed -1.99 (p = .260), -1.56 (p = .542), 1.93 (p =

.549) and 3.33 (p= .415), respectively, it was not significant difference between intervention and control groups, as shown in table 4.20.

Table 4.19: Mean of outcomes measurement by intervention status and follow-up time of second generation of housewife

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
K	$\bar{x}$	12.20	11.56	12.45	11.56	13.25	12.19	12.89	11.77
	S.D.	0.56	0.63	0.55	0.59	0.81	0.82	0.66	0.61
PS	$\bar{x}$	37.98	37.26	39.82	38.70	40.32	38.88	39.00	37.53
	S.D.	1.65	1.93	1.35	1.58	1.01	1.16	0.78	1.08
SE	$\bar{x}$	27.34	28.47	28.57	28.79	29.70	29.33	27.70	27.51
	S.D.	1.95	1.58	1.37	1.26	1.17	1.76	1.03	0.79
P	$\bar{x}$	25.09	25.47	27.36	26.33	28.36	26.88	26.77	26.56
	S.D.	1.39	1.69	1.01	1.21	0.97	1.42	0.74	0.98
HI	$\bar{x}$	92.05	93.02	92.05	93.02	95.45	93.02	94.32	90.69
	S.D.	18.49	17.53	18.49	17.53	14.54	17.53	16.05	19.69
CI	$\bar{x}$	41.13	48.87	36.90	47.14	30.31	41.04	25.89	35.27
	S.D.	7.24	9.70	4.86	8.45	5.93	9.31	3.68	9.22
BI	$\bar{x}$	472.73	502.33	431.82	524.42	363.64	459.30	340.91	395.35
	S.D.	119.81	125.81	106.79	121.19	83.78	125.00	70.11	127.15
PI	$\bar{x}$	328.41	406.98	277.27	329.07	175.00	250.00	181.82	210.47
	S.D.	85.86	104.98	94.90	84.68	83.18	76.38	72.41	71.18

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.20: Effect size of outcomes measurement by intervention status and follow-up time of second generation of housewife

Variables	Intervention effect adjusted for confounding factors							
	1 month after intervention		2 months after intervention		3 months after intervention		6 months after intervention	
	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*
Knowledge	0.11 (-0.34 to 0.55)	.631	0.38 (-0.19 to 0.95)	.193	0.52 (-0.10 to 1.14)	.100	0.57 (0.01 to 1.13)	.046
PS	0.17 (-0.87 to 1.21)	.752	0.71 (-0.44 to 1.87)	.224	0.94 (-0.51 to 2.40)	.201	1.04 (-0.33 to 2.41)	.134
Self-efficacy	0.23 (-0.67 to 1.14)	.610	1.24 (0.13 to 2.35)	.029	1.85 (0.56 to 3.13)	.005	1.76 (0.36 to 3.16)	.014
Practices	0.61 (0.13 to 1.09)	.013	1.90 (1.20 to 2.61)	< .001	2.34 (1.46 to 3.22)	< .001	1.01 (-0.01 to 2.04)	.053
HI	-1.99 (-5.49 to 1.51)	.260	-1.56 (-6.62 to 3.50)	.542	1.93 (-4.46 to 8.31)	.549	3.33 (-4.76 to 11.42)	.415
CI	-3.54 (-7.34 to 0.22)	.064	-5.85 (-10.73 to -0.98)	.019	-6.49 (-11.96 to -1.03)	.020	-4.89 (-10.53 to 0.73)	.087
BI	-57.51 (-101.01 to -14.01)	.010	-119.38 (-184.45 to -54.30)	< .001	-122.62 (-196.99 to -48.25)	.002	-79.55 (-157.21 to -1.89)	.045
PI	-89.31 (-127.31 to -51.31)	< .001	-65.98 (-113.39 to -18.58)	.007	-92.51 (-145.33 to -39.69)	.001	-42.03 (-96.98 to 12.92)	.132

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility.

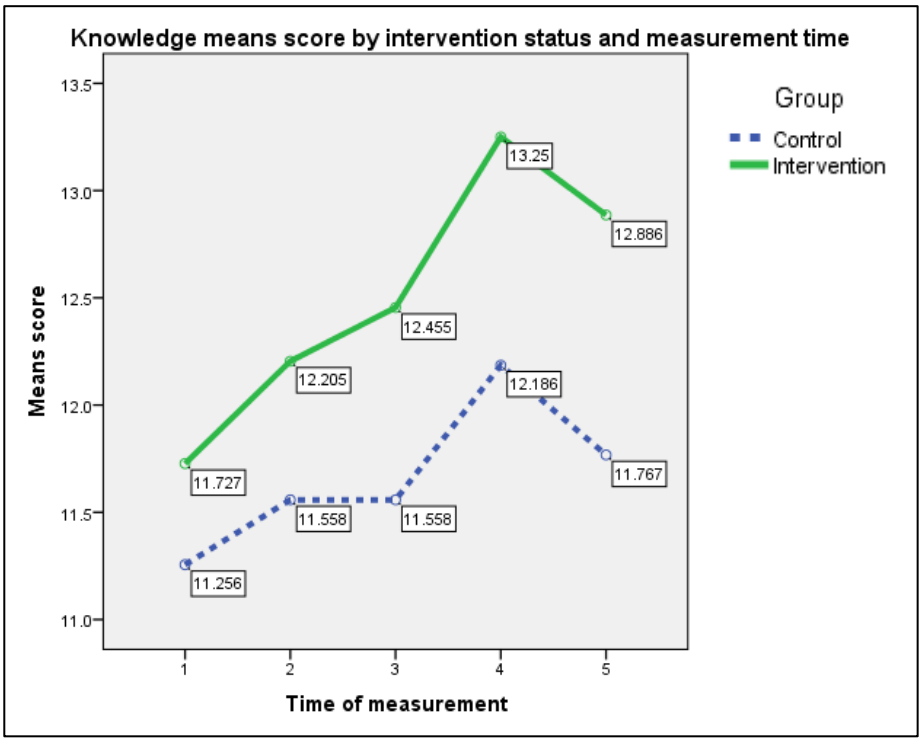


Figure 4.10: *Knowledge means score by intervention status and measurement time of second generation of housewife*

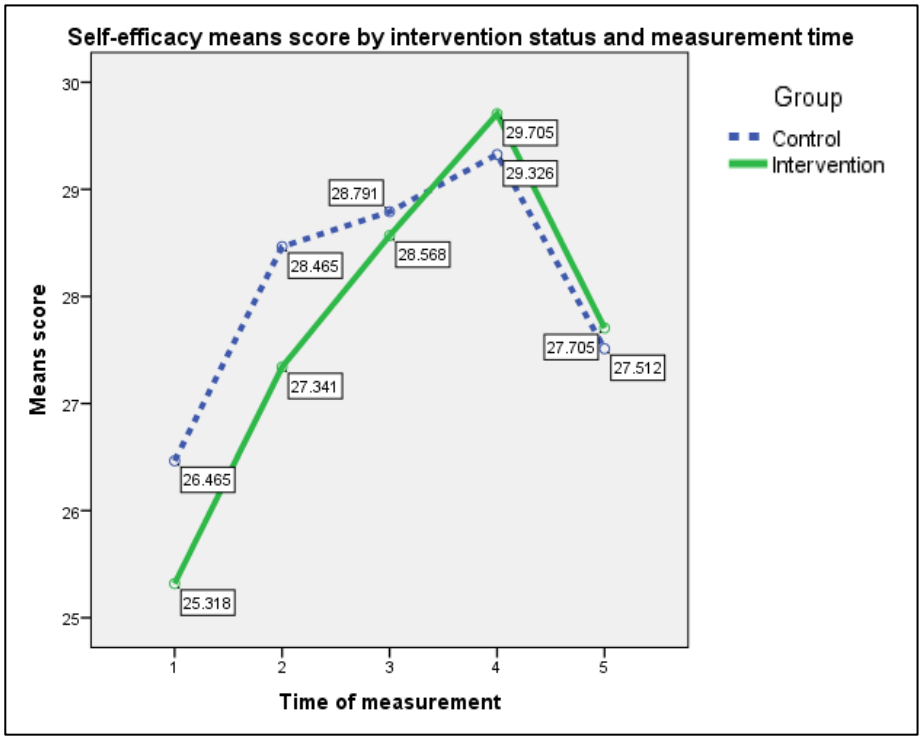


Figure 4.11: *Self-efficacy means score by intervention status and measurement time of second generation of housewife*

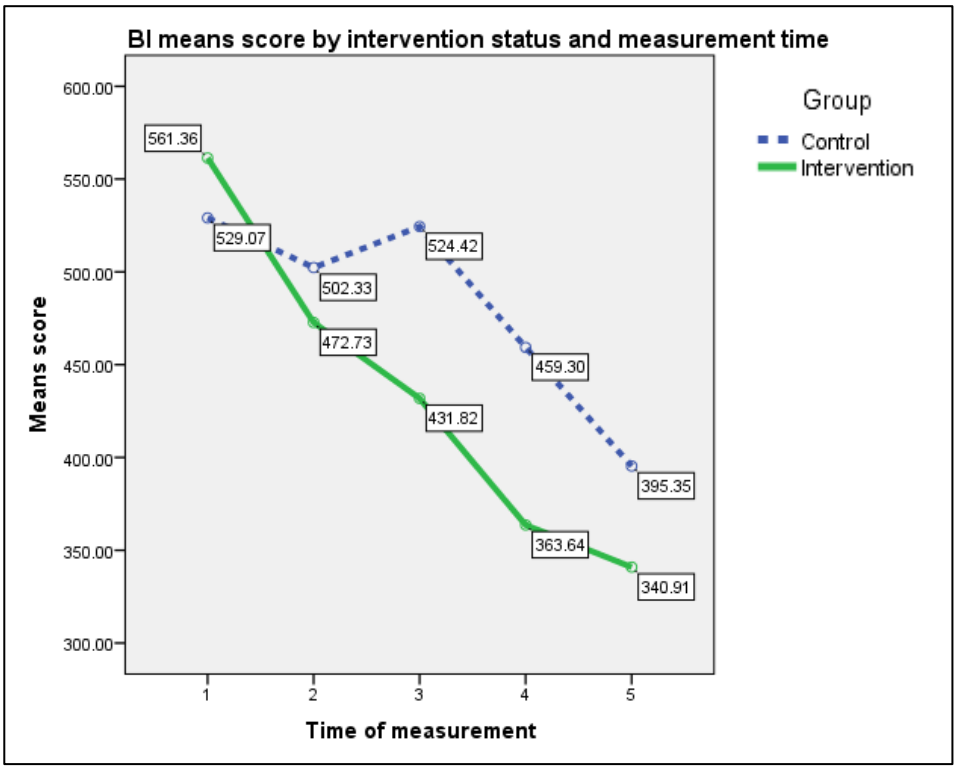


***Figure 4.12**: BI means score by intervention status and measurement time of second generation of housewife*

4.2.3 Both generations of housewife

4.2.3.1 Socio-demographic characteristics

Socio-demographic characteristics of the intervention housewife group of both first and second generations are presented in Table 4.21. The participants were comprised of 45 first generation and 44 second generation. Chi-square test for the categorical data was used to compare the characteristics between first and second generations. The socio-demographic characteristics of both generations of housewife indicated that, most education level of first generation was primary level of 66.7%, while, second generation was secondary level of 65.9%. The education level had a statistical significant difference between first and second generations (p = .002). Most occupations of both first and second generations were homemaker of 71.1% and 52.3%, respectively. The occupation had a statistical significant difference between first and second generations (p = .009). Most participants of both first and second generations had received the main source of DHF from the village health volunteer of 75.6% and 54.5% respectively, and most of them had been the member of health

promoting club (HCM) of 53.3% and 56.8% respectively. They were no significant difference between group of p = .104, and .938, respectively. Most participants of both first and second generations had participated in the community meeting of 93.3% and 75.0%, respectively, it was significant difference between first and second generations of p = .021. Most participants of first generation had DHF project in their villages of 88.8%, while, second generation had no DHF project in their villages of 63.6%, it was significant difference between generations of p = .001. Most participants of first generation had DHF case in their household of 91.1%, while, second generation had no DHF case in their household of 52.3%, it was significant difference between generations of p = .001. In addition, most participants of first generation had no chemical spraying in their villages of 66.7%, while, second generation had chemical spraying in their villages of 61.4%, it was significant difference between generations of p = .008. Independent t-test for continuous data was conducted to compare the mean of the personal characteristics between first and second generations. The average age of the first and second generations were 37.58 (±7.27) and 33.89 (±6.21) years old, respectively. It was significant difference in age between groups (p= .012). In addition, the average family monthly incomes of the first and second generations were 14,515.56 (±8673.25) and 17,261.36 (±13043.97) baht, respectively. It was not significant difference in family monthly income between generations (p = .188).

Table 4.21 Socio-demographic characteristics of both generations of housewife

General Information	Generation of housewife				*p-value*
	First generation		Second generation		
	n = 45	%	n = 44	%	
Education					.002
- Primary	30	66.7	15	34.1	
- Secondary	15	33.3	29	65.9	
Occupation					.009
- Homemaker	32	71.1	23	52.3	
- Un-skill labor	13	28.9	13	29.5	
- Farmer	0	0	8	18.2	
Main Source of DHF information					.104
- VHV	34	75.6	24	54.5	
- PHO	4	8.9	9	20.5	
- Neighbors, TV	7	15.6	11	25.0	
Social status					.938
- CCM	10	22.2	10	22.7	
- VHV	6	13.3	4	9.1	
- Community Club	5	11.1	5	11.4	
- HCM	24	53.3	25	56.8	
Community meeting participation					.021**
- Yes	42	93.3	33	75.0	
- No	3	6.7	11	25.0	
DHF project in the village					.001
- Yes	40	88.9	16	36.4	
- No	5	11.1	28	63.6	
DHF History of household members					.001**
- Yes	41	91.1	21	47.7	
- No	4	8.9	23	52.3	
Chemical spraying in the village					.008
- Yes	15	33.3	27	61.4	
- No	30	66.7	17	38.6	
Age	$\bar{x}$ 37.58	SD $\pm$ 7.27	$\bar{x}$ 33.89	SD $\pm$ 6.21	.012*
Monthly Income	$\bar{x}$ 14,155.56	SD $\pm$ 8673.25	$\bar{x}$ 17,261.36	SD $\pm$ 13043.97	.188*

Chi square test, *: Independent t-test, **: Fisher's Exact Test

4.2.3.2 The outcome measurement of the baseline data of both generations of housewife

Independent t-test for continuous data was used to compare the dependent variables of the baseline data between experimental groups of both first and second generations. In Table 4.22, the total of DHF knowledge scores was 15. The average knowledge score in the first generation was 12.84 (±1.42) and second generation was 11.73 (±1.04). The total of DHF perceived susceptibility scores was 45. The average perceived susceptibility score in first generation was 33.51 (±2.99) and second generation was 35.16 (±2.84). The total of DHF self-efficacy scores was 33. The average self-efficacy score in first generation was 25.89 (±3.82) and second generation was 25.32 (±2.91). The total of behavioral practices in DHF prevention and control scores was 33. The average practices score in first generation was 21.31 (±2.05) and second generation was 22.39 (±2.03). The knowledge scores, the perceived susceptibility scores and the practices score were significant difference between first and second generations of p = .006, .009 and .015, respectively, while, the self-efficacy scores was not significant difference between first and second generations of p = .431. In addition, the HI score in the first generation was 95.56 (±14.39) and the second generation was 93.18 (±17.36). The CI score in the first generation was 27.23 (±7.59) and the second generation was 46.79 (±8.34). The BI score in the first generation was 290.00 (±88.29) and the second generation was 561.36 (±154.34). The PI score in first generation was 186.67 (±65.19) and the second generation was 363.64 (±103.63). The HI scores was not significant difference between the first and the second generations of p = .484, while, the CI scores, the BI score and the PI scores were significant difference between the first and the second generations of $p < .001$ in all three items. The CI scores, the BI score and the PI scores in the second generation were significantly higher than the first generation.

Table 4.22: Comparison of outcome variables of the baseline data between intervention and control groups of both generations of housewife.

Variables	Generation of housewife				*p-value*
	First generation		Second generation		
	Mean	S.D.	**Mean**	S.D.	
Knowledge	12.47	1.42	11.73	1.04	.006
Perception	33.51	2.99	35.16	2.84	.009
Self-efficacy	25.89	3.82	25.32	2.91	.431
Practices	21.31	2.05	22.39	2.03	.015
HI	95.56	14.39	93.18	17.36	.484
CI	27.23	7.59	46.79	8.34	< .001
BI	290.00	88.29	561.36	154.34	< .001
PI	186.67	65.19	363.64	103.63	< .001

: Independent t- test

4.2.3.3 The outcome measurement of the follow-up time, testing for the effectiveness of a Larval and Pupal Source Reduction Program and Buddy Method of both generations of housewife

The Linear Mixed Model analysis was used for the continuous dependent variables, testing for the similarity between intervention effects at the different time between generations, been assessed only the significant difference variables at three months after intervention between intervention and control groups of the first generation, they are knowledge, perceived susceptibility, self-efficacy, practices and BI as presented in Table 4.23 and Table 4.24, and Linear Mixed Model analysis was used to adjust confounding factors. For the first and the second generations of housewife, the eight confounding factors used to adjust in the model were age, education level, occupation, the main source of DHF information, the history of DHF case in the household, the participation for the community meeting in the village, the

status of DHF project in the village and the status of chemical spraying in the village. The intervention program had effect to the knowledge by mean score changed 0.09 (p = .728), 0.16 (p =.627), -0.45 (p = .263) and -0.35 (p = .366) at one month after intervention, two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.13). The perceived susceptibility, mean score changed -1.37 (p = .033), -2.33 (p = .001), -1.38 (p = .152) and -0.67 (p = .498) at one month after intervention, two months after intervention, three months after intervention and nine months after intervention, respectively (Figure 4.14). The self-efficacy, mean scores changed -1.35 (p = .089), -0.81 (p = .341), -2.08 (p = .028) and -1.85 (p = .083) at one month after intervention, two months after intervention, three months after intervention, and nine months after intervention, respectively (Figure 4.15). The practices, mean scores changed -0.70 (p = .060), -0.25 (p = .729), -0.003 (p = .996) and -0.50 (p = .454) at one month after intervention, two months after intervention, three months after intervention, and nine months after intervention, respectively (Figure 4.16). The knowledge, the perceived susceptibility, the self-efficacy and the practices were not significant difference between first and second generations. While, the BI, mean score changed 107.60 (p < .001), 109.45 (p = .006), 158.26 (p = .002) and 313.69 (p < .001) at one month after intervention, two months after intervention, three months after intervention, and nine months after intervention, respectively, it was significant difference between first and second generations, as shown in table 4.24.

Table 4.23: Mean of outcomes measurement by generation and follow-up time of both generations of housewife

Variables		Follow-up one		Follow-up two		Follow-up three		Follow-up four	
		Generation1	Generation2	Generation1	Generation2	Generation1	Generation2	Generation1	Generation2
K	$\bar{x}$	12.98	12.20	13.20	12.45	13.64	13.25	12.82	12.89
	S.D.	0.99	0.55	0.87	0.55	0.88	0.81	2.04	0.66
PS	$\bar{x}$	34.67	37.98	35.29	39.82	37.04	40.32	35.29	39.00
	S.D.	2.23	1.65	1.93	1.35	2.04	1.01	5.43	0.78
SE	$\bar{x}$	26.22	27.34	28.13	28.57	28.42	29.70	25.76	27.70
	S.D.	3.04	1.95	2.17	1.37	1.79	1.17	4.02	1.03
P	$\bar{x}$	22.96	25.09	26.29	27.36	27.24	28.36	24.29	26.77
	S.D.	1.71	1.39	1.34	1.01	1.51	0.97	3.82	0.74
BI	$\bar{x}$	277.78	472.73	252.22	431.82	206.67	363.64	353.33	340.91
	S.D.	72.74	119.81	81.85	106.79	95.11	83.78	91.95	70.11

: Linear mixed model analysis,

K= knowledge, PS= Perceived Susceptibility, SE= Self-Efficacy, P= Practice

Table 4.24: Effect size of outcomes measurement by generation and follow-up time of both generations of housewife

Variables	Intervention effect adjusted for confounding factors							
	1 month after intervention		2 months after intervention		3 months after intervention		9 months after intervention	
	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*	Mean Change (95%CI)	*p-value*
Knowledge	0.09 (-0.46 to 0.66)	.728	0.16 (-0.48 to 0.80)	.627	-0.45 (-1.25 to 0.35)	.263	-0.35 (-1.12 to 0.42)	.366
PS	-1.37 (-2.62 to -0.11)	.033	-2.33 (-3.67 to -0.99)	.001	-1.38 (-3.29 to 0.52)	.152	-0.67 (-2.61 to 1.28)	.498
Self-efficacy	-1.35 (-2.91 to 0.21)	.089	-0.81 (-2.48 to 0.87)	.341	-2.08 (-3.92 to -0.23)	.028	-1.85 (-3.95 to 0.25)	.083
Practices	-0.70 (-1.43 to 0.03)	.060	-0.25 (-1.67 to 1.17)	.729	-0.003 (-1.48 to 1.47)	.996	-0.50 (-1.83 to 0.83)	.454
BI	107.60 (51.91 to 163.29)	< .001	109.45 (32.33 to 186.57)	.006	158.26 (62.03 to 254.49)	.002	313.69 (224.61 to 402.77)	< .001

: Linear mixed model analysis,

: **PS**= Perceived Susceptibility.

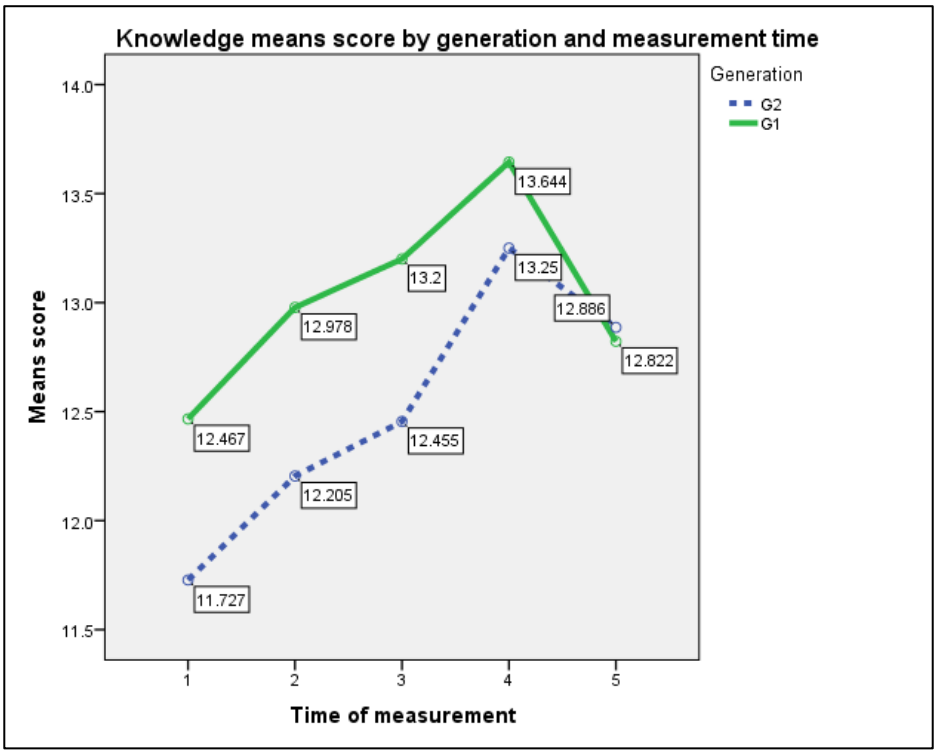


***Figure 4.13**: knowledge means score by generation and measurement time of both generations of housewife*

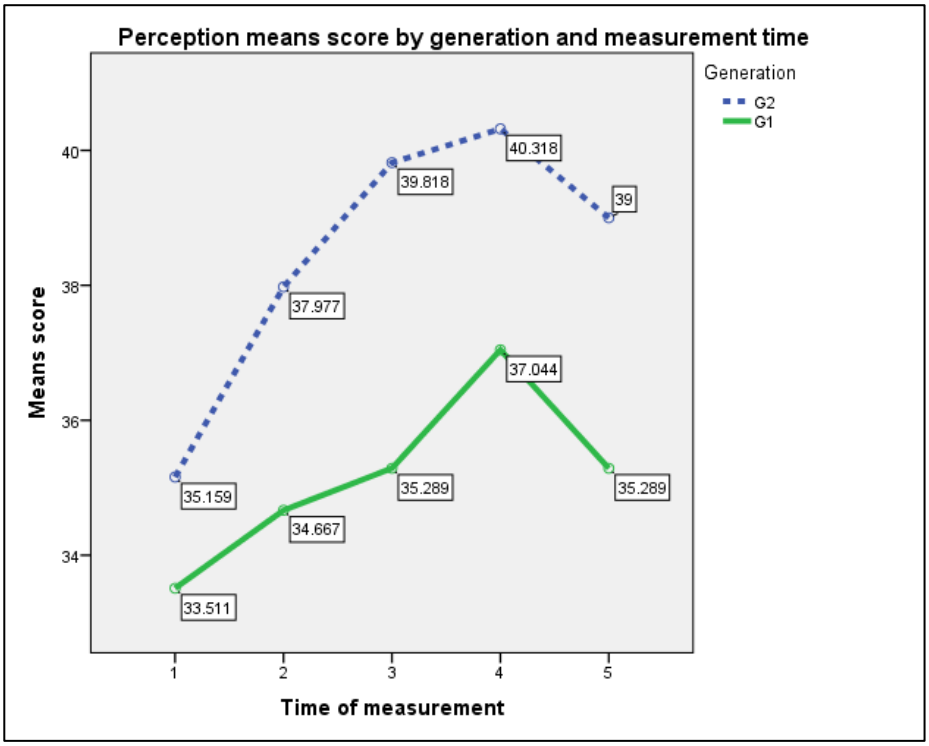


***Figure 4.14**: Perceived susceptibility means score by generation and measurement time of both generations of housewife*

***Figure 4.15**: Self-efficacy means score by generation and measurement time of both generations of housewife*

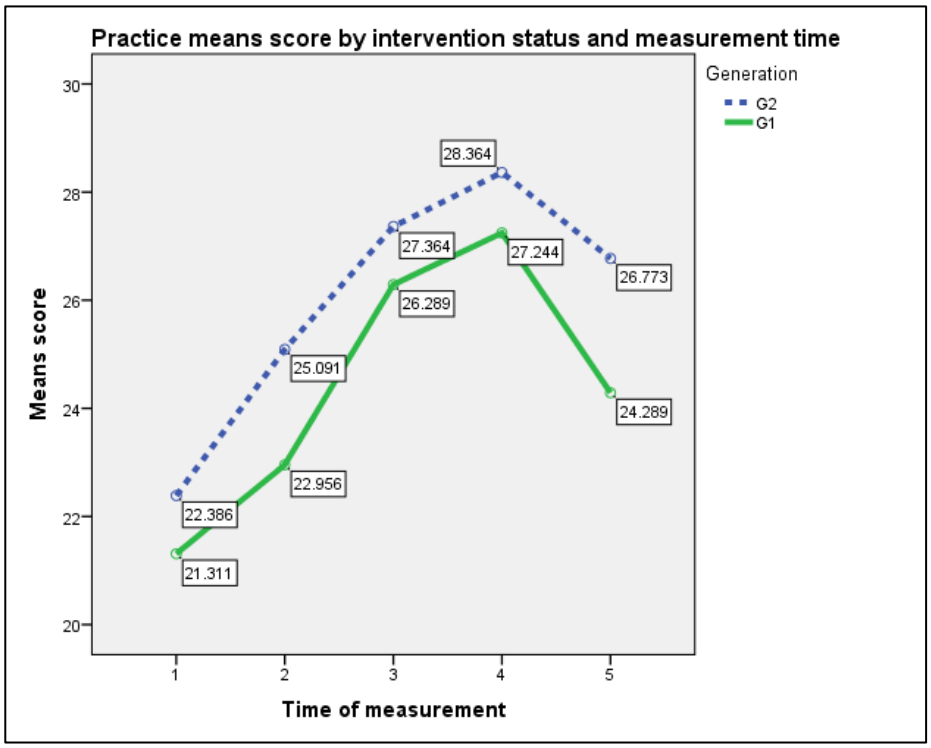


***Figure 4.16**: Practice means score by generation and measurement time of both generations of housewife*

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

This quasi-experimental study aimed to evaluate the effectiveness of the initiated Larval and Pupal Source Reduction Program (LSRP) on DHF knowledge, perceived susceptibility, self-efficacy, larval survey practices, House Index (HI), Breteau Index (BI), Container Index (CI) and Pupae Index (PI) among the housewives and students, in Krabi Province. The research was conducted with the expectation of the outcome might be useful for the community without DHF in order to sustain vector control activities. Source reduction through community participation is the most promising method for a sustainable, long-term control program, and it was the fundamental control strategy of DHF. The main participants were 180 housewives and 180 students in the community of Plaipraya district which were purposive random sampling with a high DHF incidence area. In this chapter are present a brief description of the major findings and the relationship between the results of the study compared to the related studies.

A Linear Mixed Model analysis was a good way to test the effectiveness of the intervention for repeated measurement, which made a strength evidence to believe that the result was not over estimation, given more trustworthiness (Geert verbeke, 2000).

According to the first objective of this study which was to study the change in knowledge, perception, and self-efficacy regarding the prevention and control of DHF among the students and housewives after the LSRP implementation. The result in the first generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of knowledge, perceived susceptibility, and self-efficacy of the experimental group were significantly higher than the control group. In addition, at nine months after LSRP the result found that, the mean score of the knowledge and perceived susceptibility were still significantly higher than the control group, while, the mean score of self-efficacy of experimental group was not better than control group. These finding was

consistent with Patipat study (Patipat, 2001) which knowledge and perception were evaluated among village leaders, housewives and students in Khonkaen Province. They found a majority of knowledge and perception of the participants were significantly improved after intervention. In addition, the result of this study in the second generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after the knowledge transfer via buddy method. The mean score of knowledge and perceived susceptibility of the experimental group were significantly higher than the control group. In addition, at six months after the knowledge transfer via buddy method, found that, the mean score of the knowledge and perceived susceptibility were still significantly higher than the control group, while, the mean score of self-efficacy of experimental group was not better than control group all through study period. While, the result in both generations of student indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations, at the first three months after the LSRP and knowledge transfer via buddy method between generations. The results indicated that, the mean score of knowledge, perceived susceptibility and self-efficacy between first and second generations were similar. In addition, at nine months after intervention, found that, the mean score of the knowledge, perceived susceptibility and self-efficacy were still similar between generations.

The result in the first generation of housewife indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of knowledge, perceived susceptibility, and self-efficacy of the experimental group were significantly higher than the control group. While, at nine months after LSRP, found that, the mean score of the knowledge, perceived susceptibility, and self-efficacy were not significant difference between experimental and control group. These finding was different with Jittasirinuvatra study (Jittasirinuvatra, 2003) which knowledge and attitude were evaluated among health volunteers and community leaders in Lamae District, Chumporn Province. They found a majority of knowledge of the participants were significantly improved after intervention. In addition, the result of this study in the second generation of housewife indicated that, the intervention effect when adjusted for the confounding

factors, at the first three months after the knowledge transfer via buddy method. The mean score of self-efficacy of the experimental group were significantly higher than the control group, while, the knowledge and perceived susceptibility were not significant difference between experimental and control groups. In addition, at six months after the knowledge transfer via buddy method, found that, the mean score of the knowledge and self-efficacy of experimental group were significantly higher than the control group, while, the mean score of perceived susceptibility was not significant difference between experimental and control group. While, the result in both generations of housewife indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations, at the first three months after the LSRP and knowledge transfer via buddy method between generations. The mean score of knowledge and perceived susceptibility between first and second generations were similar, while, the self-efficacy was significant difference between first and second generation. In addition, at nine months after intervention, found that, the mean score of the knowledge, perceived susceptibility and self-efficacy were similar between first and second generations.

According to the second objective of this study which was to study change in practices in the prevention and control of DHF among the students and housewives after the LSRP implementation. The result in the first generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of practices of the experimental group was significantly higher than the control group. These finding was consistent with Jittasirinuvatra study (Jittasirinuvatra, 2003) which practice was evaluated among health volunteers and community leaders in Lamae District, Chumporn Province. They found a majority of behavior of the participants were significantly improved after intervention. At nine months after LSRP, found that, the mean score of practices was not different between experimental and control group. In addition, the result in the second generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after the knowledge transfer via buddy method. The mean score of practices of the experimental group was not different between experimental and control group. While, at six months after the

knowledge transfer via buddy method, found that, the mean score of the practices of the experimental group was significantly higher than the control group. These finding was consistent with Patipat study (Patipat, 2001) which practice was evaluated among village leaders, housewives and students in Khonkaen Province. They found a majority of practice of the participants were significantly improved after intervention. While, the result of this study in both generations of student indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations. At the first three months and nine months after the LSRP and knowledge transfer via buddy method between generations. The mean score of practices between first and second generations was different between generations all through study period.

The result in the first generation of housewife indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of practices of the experimental group was significantly higher than the control group. While, at nine months after LSRP, found that, the mean score of practices was not significant difference between experimental and control group. In addition, the result in the second generation of housewife indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after the knowledge transfer via buddy method. The results indicated that, the mean score of practices of the experimental group was significantly higher than control group. While, at six months after the knowledge transfer via buddy method, found that, the mean score of the practices was not significant difference between experimental and control group. While, the result in both generations of housewife indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations. At the first three months and nine months after the LSRP and knowledge transfer via buddy method between generations. The mean score of practices between first and second generations was similar between generations all through study period.

According to the third objective of this study which was to assess the House Index (HI), Breteau Index (BI), Container Index (CI) and Pupae Index (PI) between the experimental and comparison groups after the LSRP implementation. The result

in the first generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of the HI, CI, BI and PI were similar between experimental and control group. In addition, at nine months after LSRP, found that, the mean score of the HI, CI and PI were similar between experimental and control groups. While, the mean score of BI of experimental group was significantly lower than control group. These finding was consistent with Jittasirinuvatra study (Jittasirinuvatra, 2003) which HI, CI and BI were evaluated among community leaders in Lamae District, Chumporn Province. They found a majority of BI was significantly reduced after intervention. In addition, the result in the second generation of student indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after the knowledge transfer via buddy method. The mean score of CI, BI and PI of the experimental group was significantly lower than control group. In addition, at six months after the knowledge transfer via buddy method, found that, the mean score of the CI of experimental group was still significantly lower than control group. While, the mean score of BI and PI were similar between experimental and control group. The HI was not similar between experimental and control group all through study period. While, the result in both generations of student indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations. At the first three months and nine months after the LSRP and knowledge transfer via buddy method between generations. The results indicated that, at the first generation of student, there were no the mean score of outcome variables of the HI, CI, BI and PI were significant difference between experimental and control groups. Therefore, we could not analyze the different of HI, CI, BI and PI between generations of student.

The result in the first generation of housewife indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after LSRP. The mean score of the HI, CI, and PI were not significant difference between experimental and control group, while, the mean score of BI of the experimental group was significantly lower than control group. In addition, at nine months after LSRP, found that, the mean score of the HI, CI, BI and PI were not significant difference between experimental and control groups. In addition, the result in the

second generation of housewife indicated that, the intervention effect when adjusted for the confounding factors, at the first three months after the knowledge transfer via buddy method. The mean score of CI, BI and PI of the experimental group was significantly lower than control group. In addition, at six months after the knowledge transfer via buddy method, found that, the mean score of the BI of experimental group was still significantly lower than control group. While, the mean score of CI and PI were similar between experimental and control group. The HI was similar between experimental and control group all through study period. These finding was different with Butraporn study (Butraporn, 2003) which HI, CI and BI were evaluated among village leaders and women group in Chaiyapum Province. They found a majority of HI, CI and BI was significantly reduced after intervention. While, the result of this study in both generations of housewife indicated that, the intervention effect when adjusted for the confounding factors, testing for the similarity of outcome variables between first and second generations. At the first three months and nine months after the LSRP and knowledge transfer via buddy method between generations. The mean score of BI between first and second generations was significant difference between generations all through study period.

The effectiveness of a Larval and Pupal Source Reduction Program (LSRP)

Student group

After the implementation of LSRP intervention for three months, the results indicated that, the LSRP has improved the knowledge, perceived susceptibility, self-efficacy, and practices regarding DHF prevention and control in the student group. In addition, after the implementation of LSRP for nine months, the results showed that, it was still improved the knowledge and perceived susceptibility of the experimental group of student. This finding indicated that, the LSRP has affect to the self-efficacy, and practice regarding DHF prevention and control in the student group for three months after intervention better than nine months after intervention. While, the LSRP was not affect to the HI, CI, BI and PI for both after intervention for three months and nine months. These finding was consistent with Roongtiwa study (Roongtiwa, 2001) which knowledge, attitude, practice, HI, CI and BI were evaluated among grand 4 to grade 6 primary school students in Prommanee District, Nakornnayok

Province. They found a majority of knowledge, attitudes, practice and larval indices of the participants were significantly improved after intervention.

Housewife group

After the implementation of LSRP intervention for three months, the results indicated that, the LSRP has improved the knowledge, perceived susceptibility, self-efficacy, and practices regarding DHF prevention and control in the housewife group. While, after the implementation of LSRP for nine months, the results showed that, they had no variables was improved. This finding indicated that, the LSRP has affect to the Knowledge, perceived susceptibility, self-efficacy practices regarding DHF prevention and control in the housewife group only for three months after intervention it was not achieved for nine months after intervention. In addition, the LSRP was affect to the BI after intervention for three months, while, it was not affect to the BI after intervention for nine months, this finding indicated that, the LSRP was affect to BI only for three months after intervention in the housewife group.

The effectiveness of the knowledge transfer via Buddy Method

Student group

After the implementation of the knowledge transfer via buddy method intervention for three months, the results indicated that, the buddy method has improved the knowledge and perceived susceptibility in the student group. In addition, after the implementation of buddy method for six months, the results showed that, it was improved the knowledge, perceived susceptibility and practices regarding DHF prevention and control of the experimental group of student. This finding indicated that, the buddy method was affect to the knowledge, perceived susceptibility and practices regarding DHF prevention and control in the student group for six months after intervention better than three months after intervention. In addition, the buddy method was affect to the CI, BI and PI after intervention for three months, while, after intervention for six months the buddy method was affect to only the CI. This finding indicated that, the buddy method was affect to the CI, BI and PI in the student group for three months after intervention better than six months after intervention. These finding was consistent with Mie Mie Han study (Mie Mie Han, 2009) which knowledge, attitude and practice were evaluated among secondary school students in Nong-Kheam District, Bangkok Province. They found significant

associations between knowledge on dengue infection with preventive behavior on DHF among participants. It was recommended that the education program should be continued and intensified with emphasis on improve the knowledge of the students on prevention and control practice.

Housewife group

After the implementation of the knowledge transfer via buddy method intervention for three months, the results indicated that, the buddy method has improved the self-efficacy and practices regarding DHF prevention and control in the housewife group. In addition, after the implementation of buddy method for six months, the results showed that, it was improved the knowledge and self-efficacy of the experimental group of housewife. This finding indicated that, the buddy method was affect to the practices regarding DHF prevention and control in the housewife group for three months after intervention better than six months after intervention. In addition, the buddy method was affect to the CI, BI and PI after intervention for three months, while, after intervention for six months the buddy method was affect to only the BI. This finding indicated that, the buddy method was affect to the CI, BI and PI in the housewife group for three months after intervention better than six months after intervention.

The effectiveness of both LSRP and Knowledge transfer via Buddy Method

Student group

After the implementation of the LSRP and knowledge transfer via buddy method between generations for three months, the results indicated that, the knowledge, perceived susceptibility and self-efficacy between generations in the student group were similar. In addition, after the implementation of buddy method for six months, the results showed that, the knowledge, perceived susceptibility and self-efficacy were still similar between generations of student. This finding indicated that, the buddy method could be used to transfer the knowledge, perceived susceptibility and self-efficacy between generations in the student group for both three months and six months after intervention.

Housewife group

After the implementation of the LSRP and knowledge transfer via buddy method between generations for three months, the results indicated that, the knowledge, perceived susceptibility and self-efficacy between generations in the housewife group were similar. In addition, after the implementation of buddy method for nine months, the results showed that, the knowledge, perceived susceptibility, self-efficacy and practices regarding DHF prevention and control were similar between generations of housewife. This finding indicated that, the buddy method could be used to transfer the knowledge, perceived susceptibility and self-efficacy between generations in the housewife group for both three months and nine months after intervention, in addition, the buddy method had affected to the practices regarding DHF prevention and control been similar between generations of housewife group after intervention for nine months.

A majority result of this study found that the knowledge, perceived susceptibility, self-efficacy in the experimental group were better than control groups, in addition, the result indicated that, they were similar between generations of both student and housewife. The knowledge, perceived susceptibility and self-efficacy were learning skill thinking and talking, they were not difficult to learn. The finding was consistent with Nutawadee Woranetesudatip study. (Nutawadee, 2003). While, the achievement proportion of the practices in housewife group was better than student, because, the practice was the action part. For the housewife group, they had enough knowledge, perceived susceptibility and self-efficacy to done, they usually were concerned about the safety of their family members, especially their children. Due to the nature of the duties of housewives, they usually have enough free time to take care of their local village environment which is beneficial because it reduces the risk of DHF infection (Meesuk, 2004). For student group, they had enough knowledge, perceived susceptibility, self-efficacy they were early teenage, they usually loving in spree, thus, they had free time less than housewife. The finding was consistent with Manu Taluengpet study. (Taluengpet, 2004). For CI, BI and PI in the housewife group were better than student group it was the sequence of the practice regarding DHF prevention and control. In addition, the results found that, the CI, BI and PI of experimental group were better than control group at three months after

intervention in all study period of both housewife and student groups. After intervention for three months the researcher measured monthly basis, so, the participants feel to compulsory to be done, while, at nine months and six months after intervention of first and second generation, respectively. They had been free from measurement, thus, they could be loose themselves to do. The finding was consistent with Nutavadee Woranetesudatip (Woranetesudatip, 2003) and Kaesinee Junthasiriyakorn's study. (Junthasiriyakorn, 2004). In addition, the results indicated that, the HI of both student and housewife group was not much difference in all study period, since, HI was the community indicator (Therawiwat, 2002), it was inappropriate for the individual household. Although, most of the CI, BI and PI were significant difference between groups, but, CI and BI of the result were still higher than the national maximum target of Ministry of Public Health, for CI =10, and BI=50 (MoPH, 2002). One important thing was the hard rain during study period. Significant improvement in knowledge, perception, self-efficacy, and larval survey practice scores were achieved for the experimental groups of both students and housewives. CI, BI, and PI decreased and were lower than for the baseline data. Results of this study suggested that LSRP could improve the DHF prevention and control in the village.

Knowledge transfer via buddy method was success for the knowledge, perceived susceptibility and self-efficacy of both student and housewife groups. In addition, for the practices in housewife group was similar between generations, the reason as mentioned above, they usually have enough free time to do something including talking with their neighbors (Therawiwat, 2002) which was beneficial for buddy method. This was the important issue of the effectiveness of LRSP and the knowledge transfer via buddy method they were the answer of the question of how to sustain it in the community and how to generalize to another area. Sustainable should be considered to extend the risk communication model which coverall community by the trained participants. This method was consistent with Tsuyoshi Kawakami's study (Tsuyoshi et.al, 2005). They used WIND (Work Improvement in Neighbourhood Development) training the farmer volunteers, then, the trained farmer volunteers trained the neighboring farmers and expand their networks. For generalizability, risk communication should be applied into the formal education.

5.2 Conclusion

1. A Larval and Pupal Source Reduction Program (LSRP) improved the knowledge, perceived susceptibility, and self-efficacy and practice regarding DHF prevention and control in the student at the first three months after intervention. While, at nine months after intervention, LSRP improved the knowledge and perceived susceptibility. In the student, the LSRP improved the output variables for a short time period better than long time period.

2. The knowledge transfer via buddy method improved the knowledge, perceived susceptibility, CI, BI and PI in the student at the first three months after intervention. While, at six months after intervention, buddy method improved the knowledge, perceived susceptibility, practice and CI. In the student, the knowledge transfer via buddy method improved the output variables for a short time period better than long time period. In addition, the buddy method improved the practice at six months better than three months after intervention.

3. For both LSRP and buddy method improved the knowledge, perceived susceptibility and self-efficacy at the first three months and nine months after intervention in student. Both interventions could be used to transfer the knowledge about DHF between generations in the student. While, the practice regarding DHF prevention and control was different between generations. Both interventions were not affected to improve the practice regarding DHF prevention and control in student.

4. A Larval and Pupal Source Reduction Program (LSRP) improved the knowledge, perceived susceptibility, self-efficacy, practice and BI in the housewife at the first three months after intervention. While, at nine months after intervention, there were no outcome variables was different between groups. In the housewife, the LSRP improved the output variables for a short time period better than long time period.

5. The knowledge transfer via buddy method improved the self-efficacy practice, CI, BI and PI in the housewife at the first three months after intervention. While, at six months after intervention, buddy method improved the knowledge, self-efficacy and BI. In the housewife, the knowledge transfer via buddy method improved the outcome variables for a short time period better than long time period.

In addition, the buddy method improved the knowledge at six months after intervention better than three months after intervention.

6. For both LSRP and buddy method improved the knowledge, perceived susceptibility and practice at the first three months after intervention in housewife. In addition, at nine months after intervention, both interventions improved the knowledge, perceived susceptibility, self-efficacy and practice. Both interventions could be used to transfer the knowledge about DHF between generations in the housewife. In addition, the practice regarding DHF prevention and control was also similar between generations. Both interventions were affected to improve the practice regarding DHF prevention and control in housewife.

5.3 Limitation of the study

This study was conducted for 9 month to measure the effectiveness of the intervention. During the study there was the rainy unseasonable. It effected to HI, CI, BI and PI, although, most of the CI, BI and PI were significant difference between groups, but, CI and BI of the result were still higher than the national maximum target of Ministry of Public Health.

For DHF incidence was decreased during the study period of both student and housewife groups (Appendix C). We could not concluded that was the effected of the intervention, since, we was not included the DHF cases into the analysis. This study period was not enough to do that.

5.4 Recommendations

5.4.1 Recommendations of the research results

This study made the research climate had been the most natural of the participants, especially, sharing an experience on monthly basis within group and between generations based on their time schedule available. For knowledge transfer between generations of both student and housewife, found that, knowledge, perception and self-efficacy were not difference between generations, in addition, in housewife group the practice was not difference between generations. This method could be adapted for the other jobs or the other activities in the community. It was the success method for the sustainable. While, in the student group, found that, the

practice was difference between generations, it should be find the appropriate way to convince them to do.

5.4.2 Recommendations for further study

1. The future study, for larvae survey, the household should be grouped for 5-6 households per group for HI analysis, while, CI, BI and PI were no problem for analysis.

2. Should be added the environmental factors, for example, rainfall, relative humidity and temperatures, to be an appropriate data and be included for analysis as the covariate in the model of Linear Mixed Model analysis.

3. Should be studied more than one year, if we need to be analyzed the effectiveness of the intervention, is there any affect to DHF cases or not, the appropriate study period is more than two years.

4. Should be collected both quantitative and qualitative data about behavioral practices in DHF prevention and control among participants.

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Appendices

Appendix A

Appendix A. Questionnaire & Larvae record Survey Form (English)

Interview Questionnaire for DHF Prevention and Control

Direction: Please mark ✓ in the provided box ☐ or fill in the blank if applicable

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PART I: Socio-demographic Information

1. Present Local Address: Household No. …….……Village……...…
   Sub-district Plaipraya , Plaipraya district Krabi Province.
2. Sex ☐ Male ☐ Female
3. Age..……Years
4. Marital Status
   ☐ Single ☐ Married ☐ Widow/ Divorce/ Separate
5. Your highest educational level:
   ☐ Primary ☐ Secondary
   ☐ Vocational ☐ Diploma
   ☐ Bachelor degree ☐ Other Specify…….……
6. Your Main Occupation:
   ☐ Unemployed ☐ Student ☐ Homemaker
   ☐ Unskilled Labor ☐ Farming ☐ Gov. Officer
   ☐ Others Specify …….
7. Average Family Income ……..…….Baht/ Month
8. What are the main sources of DHF information or health information that you're usually received?
   ☐ Community Leader ☐ SAO Member ☐ Relatives
   ☐ Neighbors ☐ VHV ☐ Public Health Officer
   ☐ Newspaper ☐ Radio ☐ TV
   ☐ Others Specify ……..

9. What is/are your present social status in the community?

☐ Community Committee Member

☐ VHV

☐ Community Club Member: Specify …….……...

☐ Others Specify ……..

10. Did you or any one of your household members have DHF?

☐ None ☐ Yes Whom? Specify …….

11. Last year, did your village have community meeting to inform about DHF prevention and control?

☐ None ☐ Yes …….……. Times

☐ Who were responsible for the meeting Specify ……..

12. Last year, did your village have any projects or activities about controlling of Aedes mosquitoes?

☐ No ☐ Yes

If No, What projects or activities do you need for your village and how does to be involved? …….**.....**

If Yes, Specify what kind of projects or activities ……**....**……..

How did you or your household member be involved in the project?

Specify ……...…….

13. Last year, was there any chemical spraying or fogging for killing Aedes mosquitoes in the village?

☐ No ☐ Yes

PART II: Knowledge regarding DHF

Direction: Please mark ✓ in the provided space according to your knowledge.

Detail	Yes	No
1. DHF is an infectious disease caused by dengue virus, Aedes mosquito is the vector.		
2. DHF is a mosquito-borne disease in the two species of *Aedes aegypti* and *Aedes albopictus*.		
3. Symptoms of DHF are high and continuous fever, gum bleeding, haematemesis and/or melena.		
4. The DHF in which severe case are shock manifested by rapid and weak pulse with narrowing of the pulse pressure or hypotension, with the presence of cold, clammy skin and restlessness.		
5. DHF patients should take aspirin to reduce fever.		
6. The Aedes mosquito life cycle has four phases: 1. Egg 2. Larvae 3. Pupae 4.Adult. The duration from egg to adult mosquito about 7-10 days.		
7. Aedes Mosquitoes usually lay their eggs about 140 eggs in stagnant and water and the upper of container.		
8. Group at risk of DHF is most common in the children and elderly.		
9. Continuing destruction of mosquito breeding sources of all households can prevent and control of DHF to the best results because it is low spending and such a few labor.		
10. Loading abate sand granule to kill mosquito larvae in water containers once they have control them throughout the year.		
11. The monthly destruction of larvae by using salt, detergent or vinegar to put into the saucer of larder can prevent the DHF.		
12. When the officials spray chemicals to eradicate mosquitoes, the doors and windows should be closed for 30 minutes.		
13. Fogging is the best way to prevent and control of DHF.		
14. The campaign to destroy the mosquito breeding sources in every week can prevent the DHF.		
15. Aedes mosquitoes are usually living in the afternoon.		

PART III: Perceived susceptibility to DHF

Direction: Please mark ✓ in the provided space of each item according to the respondent's perception

Detail	**Agree**	**Uncertain**	**Disagree**
1. Households have the container with water such as tires, plastic bottles, cans, broken shell are the source of mosquito breeding.			
2. Immediately cover the jar thoroughly after each use to prevent mosquitoes from breeding can prevent the DHF.			
3. Outer leaves with water such as coconut, lily leaf, banana leaf and bamboo are a good source of mosquito breeding.			
4. Person whom once bitten by infected mosquito cannot get DHF			
5.Without DHF prevention and control the children can be infected			
6. Destroying the *Aede Egypti* breeding site only in the family that has the children and elderly is the best way of DHF prevention in community			
7. It's cannot DHF epidemic with one DHF case in our community			
8. The recurrent of DHF is more serious than the first time			
9. DHF in children is more severe than other ages.			
10. DHF cases if do not treated properly can cause to complications and death.			
11. Children can get DHF same as other ages.			
12. Person whom got DHF cannot be twice.			
13. DHF case can make a waste time and a high cost to treat			
14. The strong person cannot get DHF.			
15. Sleeping in the mosquito net at the day time will be safe from DHF.			

PART IV: Self-Efficacy in DHF

Direction: Please mark ✓ in the provided space of each item according to the respondent's self-efficacy

Detail	Agree	Uncertain	Disagree
1. I can keep the house clean to prevent the mosquito breeding sources.			
2. I can destroy the container with water such as tires, plastic and any source of mosquito breeding source in and around my house.			
3. I can destroy the larvae by using salt, detergent or vinegar into the saucer of pantry, every week.			
4. I can tell the health worker if I find the DHF case in our village.			
5. I can explore and get rid of the mosquito breeding sources every week and can participate in activities for every opportunity.			
6. I can participate in mosquito larvae control activity to protect everyone from DHF.			
7. I can transfer the knowledge about the DHF to my family members and neighbors.			
8. I can mobilize the resources and collaboration to prevent and control of DHF.			
9. I can carry out the assigned program / project to prevent and control of DHF.			
10. I can summarize and report the results of prevention and control of DHF.			
11. I can participate in the dengue hemorrhagic fever control activity during an outbreak.			

PART V: Behavioral practices to prevent and control of DHF

Direction: Please mark ✓ in the provided space of each item according to the respondent's behavioral practice

Activities	Regular	Sometimes	Never
1. You have to explore and destroy mosquito breeding sources, both in house and surrounding every week.			
2. You have to put Abate sand granule in the water containers in house and surrounding every 3 months.			
3. You have to clean the house in order not to be a source of mosquito breeding.			
4. You put detergents, salt or vinegar into the saucer of pantry every week.			
5. You replace the water in flower pot saucer, vase and water container for pets every week.			
6. You replace the water and clean the water container in the bathroom and toilets every week.			
7. You always closed the jar after use immediately to prevent mosquitoes breeding.			
8. Sleeping on the daytime you always protect yourself from mosquito bites, such as sleeping in mosquito nets, using fan or applying mosquito repellent.			
9. You have to get rid of the mosquitoes by spraying.			
10. You transfer the knowledge about the DHF to family members and neighbors.			
11. You participate in the control of dengue hemorrhagic fever during an outbreak.			

Larval Record Survey form

Direction: Respondent has to survey Aedes larval for each water-holding containers and record the numbers of containers that found Aedes larval in the space provided.

1. Does your house have the following mosquito breeding places?

1.1 Jars storing water either for drinking or other purposes **inside house?**

☐ Yes: (numbers) ……. Jars

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Cover with lid and put abate sand granule		
2	Cover with lid		
3	Uncover but put abate sand granule		
4	Uncover and no putting abate sand granule		

1.2 Jars storing water either for drinking or other purposes **outside house**?

☐ Yes: (numbers) ……. Jars

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Cover with lid and put abate sand granule		
2	Cover with lid		
3	Uncover but put abate sand granule		
4	Uncover and no putting abate sand granule		

1.3 Large jars or tanks storing water **outside house**?

☐ Yes: (numbers) ……. Jars

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Cover with lid and put abate sand granule		
2	Cover with lid		
3	Uncover but put abate sand granule		
4	Uncover and no putting abate sand granule		

1.4 Cement water storage casings

☐ Yes: (numbers) …….casings

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Put abate sand granule		
2	Using guppy for the control of Aedes larval		
3	Do nothing		
4	Others		

1.5 Water storage tank/ stuffs in the toilets?

☐ Yes: (numbers) …….tanks

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Cover with lid and put abate sand granule		
2	Cover with lid		
3	Uncover but put abate sand granule		
4	Uncover and no putting abate sand granule		

1.6 Saucer of pantry

☐ Yes: (numbers) …….traps

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Put abate sand granule		
2	Using cooking salt or other chemical		
3	Do nothing		
4	Others		

1.7 Vase or glass/ bowl or the like for growing green plants

☐ Yes: (numbers) …….vases

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Put abate sand granule		
2	Using other chemical		
3	Do nothing		
4	Others		

1.8 Flower pot plate

☐ Yes: (numbers) …….plates

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Put abate sand granule		
2	Using other chemical		
3	Do nothing		
4	Others		

1.9 Discarded tyres near the house

☐ Yes: (numbers) …….tyres

☐ No

No.	Activity	Total Number	No. of positive (+Ae. Larvae)
1	Specific activities for controlling larvae		
2	Do nothing		

1.10 Other discarded things eg. tin, bottle, can, coconut shell, etc

☐ Yes: (numbers) …….discarded things

☐ No

No.	Items	Total Number	No. of positive (+Ae. Larvae)
1	tin cans bottles		
2	coconut shells		
3	Others		

Appendix B

Appendix B. Questionnaire & Larvae record Survey Form (Thai)

..../……../…….

แบบสอบถามงานวิจัย

โปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรคไข้เลือดออก ในชุมชน จังหวัดกระบี่

คำชี้แจง : โปรดใส่เครื่องหมาย ✓ ลงในช่อง ☐ หรือเติมข้อความที่ตรงกับความเป็นจริงในช่องว่าง

ส่วนที่ 1 : ข้อมูลทั่วไป

1. **ที่อยู่ปัจจุบัน : เลขที่**……. **หมู่ที่** …… **ตำบล** ปลายพระยา **อำเภอ** ปลายพระยา **จังหวัด** กระบี่

2. **เพศ** ☐ ชาย ☐ หญิง

3. **อายุ**..……ปี

4. **สถานภาพการสมรส**

☐ โสด ☐ สมรส / คู่ ☐ หม้าย / หย่า / แยกกันอยู่

5. **ระดับการศึกษาสูงสุด**:

☐ ประถมศึกษา ☐ ม.3

☐ ม.6 / ปวช. ☐ อนุปริญญา / ปวส.

☐ ปริญญาตรี ☐ อื่น ๆ (ระบุ)……..……..

6. **อาชีพหลักของท่าน**:

☐ นักเรียน ☐ แม่บ้าน ☐ รับจ้างทั่วไป

☐ เกษตรกร ☐ ข้าราชการ ☐ ว่างงาน

☐ อาชีพอื่น ๆ (ระบุ) …….

7. **โดยทั่วไปท่านได้รับข้อมูลข่าวสารเกี่ยวกับโรคไข้เลือดออกจากแหล่งใด?**

☐ ผู้นำชุมชน ☐ สมาชิก อบต. ☐ หอกระจายข่าว

☐ เพื่อนบ้าน ☐ อสม. ☐ เจ้าหน้าที่สาธารณสุข

☐ หนังสือพิมพ์ ☐ วิทยุ ☐ โทรทัศน์

☐ แหล่งอื่น ๆ (ระบุ) ……..

8. **รายได้โดยเฉลี่ยของครอบครัว** ……บาท/ เดือน

9. **สถานภาพทางสังคมของท่านในปัจจุบัน**

☐ เป็นกรรมการกองทุนหมู่บ้าน ☐ เป็น อสม.

☐ สมาชิกชมรมในหมู่บ้าน : (ระบุ) ……..…… ☐ ไม่มี

☐ อื่น ๆ (ระบุ) ……..

10. **ท่านหรือสมาชิกในบ้านเคยป่วยเป็นโรคไข้เลือดออกหรือไม่?**

☐ ไม่เคย ☐ เคยป่วย : จำนวน……คน

11. **ในระยะ 1 ปี ที่ผ่านมา หมู่บ้านของท่านได้มีการจัดประชุม อบรมเกี่ยวกับการป้องกันและควบคุมโรคไข้เลือดออกหรือไม่**

☐ ไม่มี / ไม่ทราบ ☐ มี : จำนวน ……..…… ครั้ง

12. **ในระยะ 1 ปี ที่ผ่านมา หมู่บ้านของท่านได้มีโครงการหรือกิจกรรมเกี่ยวกับการป้องกันและควบคุมโรคไข้เลือดออกหรือไม่**

☐ ไม่มี / ไม่ทราบ

ท่านอยากให้มีโครงการหรือกิจกรรมอะไรเกี่ยวกับโรคไข้เลือดออกบ้าง (ระบุ)

……

☐ มี

โครงการหรือกิจกรรมอะไร ……

ท่านหรือสมาชิกในบ้านได้มีส่วนร่วมอย่างไรบ้าง……

13. **ในระยะ 1 ปี ที่ผ่านมา หมู่บ้านของท่านได้มีการฉีดพ่นสารเคมีเพื่อฆ่ายุงพาหะนำโรคไข้เลือดออกหรือไม่?**

☐ ไม่มี / ไม่ทราบ ☐ มีการฉีดพ่นสารเคมี

ส่วนที่ 2: ความรู้เกี่ยวกับโรคไข้เลือดออก

คำชี้แจง : โปรดทำเครื่องหมาย ✓ ในช่องว่างหลังข้อความ ตามที่ท่านคิดว่า ข้อความนี้ **ถูก** หรือ **ผิด** ซึ่งสามารถเลือกตอบได้เพียงคำตอบเดียว

ข้อความ	ถูก	ผิด
1. โรคไข้เลือดออกเป็นโรคติดต่อที่เกิดจากเชื้อไวรัสเด็งกี่ มียุงลายเป็นพาหะ		
2. ยุงที่เป็นพาหะนำโรคไข้เลือดออกในประเทศไทย มี 2 ชนิด คือ ยุงลายบ้าน กับยุงลายสวน		
3. อาการของโรคไข้เลือดออกคือ มีไข้สูง มักตรวจพบจุดเลือดออกตามผิวหนัง		
4. ผู้ที่ป่วยเป็นโรคไข้เลือดออกในรายที่มีอาการรุนแรง จะมีอาการช็อค ไข้สูง กระสับกระส่าย มือเท้าเย็น รอบปากเขียว ชีพจรเต้นเร็ว ปวดท้อง		
5. ผู้ป่วยโรคไข้เลือดออกควรให้ยาแอสไพรินเพื่อลดอาการไข้		
6. วงจรชีวิตยุง จะมี 4 ระยะ คือ 1.ไข่ 2.ลูกน้ำ 3.ตัวโม่ง 4.ยุงตัวเต็มวัย ใช้ระยะเวลาจากไข่จนถึงยุงตัวเต็มวัย ประมาณ 7-10 วัน		
7. ยุงลายจะวางไข่ในน้ำนิ่ง ใส เหนือขอบภาชนะเก็บน้ำ โดยจะวางไข่ได้ครั้งละมาก ๆ ประมาณ 140 ฟอง		
8. กลุ่มที่เสี่ยงต่อการเป็นโรคไข้เลือดออกได้มากที่สุดได้แก่ เด็กและผู้สูงอายุ		
9. การทำลายแหล่งเพาะพันธุ์ลูกน้ำยุงลายอย่างต่อเนื่องทุกหลังคาเรือนเป็นการป้องกันและควบคุมโรคไข้เลือดออกที่ได้ผลดีที่สุดเพราะไม่สิ้นเปลืองค่าใช้จ่าย ใช้แรงงานเพียงเล็กน้อย		
10.การใส่ทรายอะเบทเพื่อฆ่าลูกน้ำยุงลายในภาชนะเก็บกักน้ำแค่ครั้งเดียวก็สามารถควบคุมลูกน้ำยุงลายได้ตลอดทั้งปี		
11.การทำลายลูกน้ำโดยใช้เกลือแกง, ผงซักฟอก หรือน้ำส้มสายชู ใส่ลงในจานรองขาตู้กับข้าวทุกเดือน สามารถป้องกันการเกิดโรคไข้เลือดออกได้		
12.เมื่อเจ้าหน้าที่มาพ่นสาเคมีกำจัดยุงแล้ว ควรปิดประตูหน้าต่างอบไว้ประมาณ 30 นาที		
13.การพ่นหมอกควันเป็นการป้องกันและควบคุมโรคไข้เลือดออกที่ได้ผลดีที่สุด		
14.การรณรงค์เพื่อทำลายแหล่งเพาะพันธ์ลูกน้ำยุงลายทุก ๆ 7 วัน จะช่วยป้องกันโรคไข้เลือดออกได้		
15. ตามปกติยุงลายจะออกหากินในตอนกลางวัน ประมาณช่วงบ่าย		

ส่วนที่ 3: การรับรู้เกี่ยวกับโรคไข้เลือดออก

คำชี้แจง: โปรดทำเครื่องหมาย ✓ ในช่องว่างหลังข้อความ ตามความรู้สึกของตัวท่านเองต่อข้อความในแต่ละข้อ ซึ่งสามารถเลือกตอบได้เพียงคำตอบเดียว

ข้อความ	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
1. บ้านที่มีเศษวัสดุที่มีน้ำขัง เช่น กะลา กระป๋อง ยางรถยนต์ ขวดพลาสติกแตก เป็นแหล่งเพาะพันธุ์ลูกน้ำยุงลายได้ดี			
2. การปิดฝาโอ่งน้ำทันที อย่างมิดชิด หลังจากใช้น้ำทุกครั้งเพื่อไม่ให้ยุงลายมาวางไข่ ช่วยป้องกันโรคไข้เลือดออกได้			
3. กาบใบไม้ที่มีน้ำขัง เช่น กาบมะพร้าว, ใบต้นพลับพลึง, กาบใบต้นกล้วย, กระบอกไม้ไผ่ เป็นแหล่งเพาะพันธุ์ลูกน้ำยุงลายได้ดี			
4. ผู้ที่ถูกยุงลายมีเชื้อโรคไข้เลือดออกกัดเพียงครั้งเดียวไม่ทำให้ป่วยเป็นโรคไข้เลือดออกได้			
5. บุตรหลานของท่านมีโอกาสป่วยด้วยโรคไข้เลือดออกได้ ถ้าไม่มีการป้องกันและควบคุมแหล่งเพาะพันธุ์ลูกน้ำยุงลาย			
6. การทำลายแหล่งเพาะพันธ์ยุงลาย ทำเฉพาะบ้านที่มีเด็กและผู้สูงอายุเท่านั้นก็สามารถป้องกันโรคไข้เลือดออกในชุมชนได้ เนื่องจากเป็นกลุ่มที่เสี่ยงต่อการเป็นโรคไข้เลือดออก			
7. การที่มีผู้ป่วยโรคไข้เลือดออกในหมู่บ้านเพียงคนเดียวไม่สามารถก่อให้เกิดการระบาดของโรคได้			
8. ผู้ที่ป่วยด้วยโรคไข้เลือดออกเมื่อป่วยซ้ำ จะมีอาการรุนแรงกว่าครั้งแรก			
9. เด็กที่ป่วยเป็นโรคไข้เลือดออกจะมีอาการรุนแรงมากกว่าวัยอื่น ๆ			
10. ผู้ป่วยที่มีเป็นโรคไข้เลือดออก ถ้าไปรักษาไม่ถูกวิธีทำให้เกิดโรคแทรกซ้อน เสียชีวิตได้			
11. เด็กมีโอกาสป่วยเป็นโรคไข้เลือดออกได้เหมือนกับวัยอื่น ๆ			
12. ผู้ที่เคยป่วยเป็นโรคไข้เลือดออกแล้วจะไม่มีโอกาสป่วยซ้ำ			
13. คนที่ป่วยเป็นโรคไข้เลือดออก จะทำให้เสียเวลาและสิ้นเปลืองค่าใช้จ่ายในการดูแลรักษา			
14. ผู้ที่มีสุขภาพแข็งแรงจะไม่มีโอกาสป่วยเป็นโรคไข้เลือดออก			
15. การนอนกางมุ้งตอนกลางวันสามารถป้องกันโรคไข้เลือดออกได้			

ส่วนที่ 4: การรับรู้ถึงความสามารถของตนเองในการป้องกันและควบคุมโรคไข้เลือดออก

คำชี้แจง : โปรดทำเครื่องหมาย ✓ ในช่องว่างหลังข้อความ ตามความรู้สึกของตัวท่านเองต่อข้อความในแต่ละข้อ ซึ่งสามารถเลือกตอบได้เพียงคำตอบเดียว

ข้อความ	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
1. ฉันสามารถจัดเก็บบ้านเรือนให้สะอาดเรียบร้อยเพื่อไม่ให้เป็นแหล่งเพาะพันธุ์ลูกน้ำยุงลาย			
2. ฉันสามารถกำจัดแหล่งเพาะพันธุ์ลูกน้ำยุงลายและเศษวัสดุที่มีน้ำขังทั้งในบ้านและบริเวณบ้านได้ เช่น ยางรถยนต์ กะลา เปลือกหอย เป็นต้น			
3. ฉันสามารถทำลายลูกน้ำ โดยใช้เกลือแกง ผงซักฟอก หรือน้ำส้มสายชูใส่ลงในจานรองขาตู้กับข้าว ได้ทุกสัปดาห์			
4. ฉันสามารถแจ้ง/ส่งต่อข้อมูลให้เจ้าหน้าที่สาธารณสุขทราบเมื่อฉันพบว่ามีผู้ป่วยในหมู่บ้าน			
5. ฉันสามารถสำรวจและกำจัดแหล่งเพาะพันธ์ลูกน้ำยุงลายได้ทุกสัปดาห์และสามารถเข้าร่วมกิจกรรมรณรงค์ทุกครั้งที่มีโอกาส			
6. ฉันสามารถเข้าร่วมในการควบคุมลูกน้ำยุงลายเพื่อให้ทุกคนในหมู่บ้านไม่ป่วยด้วยโรคไข้เลือดออก			
7. ฉันสามารถให้คำแนะนำเกี่ยวกับการป้องกันและควบคุมโรคไข้เลือดออกแก่สมาชิกในครัวเรือนและเพื่อนบ้านได้			
8. ฉันสามารถระดมทรัพยากรและประสานความร่วมมือในการดำเนินงานป้องกันและควบคุมโรคไข้เลือดออกได้			
9. ฉันสามารถดำเนินกิจกรรมตามแผนงาน/โครงการ ในการป้องกันและควบคุมโรคไข้เลือดออกที่ได้รับมอบหมายได้			
10. ฉันสามารถสรุปและรายงานผลการดำเนินงานป้องกันและควบคุมโรคไข้เลือดออกได้			
11. ฉันสามารถเข้าร่วมดำเนินการควบคุมโรคไข้เลือดออกในช่วงที่มีการระบาดได้			

ส่วนที่ 5 : การปฏิบัติในการป้องกันและควบคุมโรคไข้เลือดออก

คำชี้แจง : โปรดทำเครื่องหมาย ✓ ในช่องว่างหลังข้อความ ตามการปฏิบัติของตัวท่านเองต่อกิจกรรมในแต่ละข้อ ซึ่งสามารถเลือกตอบได้เพียงคำตอบเดียว

กิจกรรม	ทำประจำ	ทำบางครั้ง	ไม่ได้ทำ
1. ท่านมีการสำรวจและทำลายแหล่งเพาะพันธุ์ลูกน้ำยุงลายทั้งในบ้านและรอบ ๆ บ้านทุก 7 วัน			
2. ท่านมีการใส่ทรายอะเบทในภาชนะเก็บน้ำภายในบ้านและบริเวณรอบๆ บ้าน ของท่าน ทุก 3 เดือน			
3. ท่านมีการจัดเก็บบ้านเรือนให้สะอาดเรียบร้อยเพื่อไม่ให้เป็นแหล่งเพาะพันธุ์ลูกน้ำยุงลาย			
4. ท่านใช้เกลือแกง ผงซักฟอก หรือน้ำส้มสายชูใส่ลงในจานรองขาตู้กับข้าว ทุกสัปดาห์			
5. ท่านเปลี่ยนน้ำจานรองกระถางต้นไม้ แจกันดอกไม้และอ่างใส่น้ำให้สัตว์เลี้ยงทุกสัปดาห์			
6. ท่านเปลี่ยนถ่ายน้ำ ขัดล้าง ภาชนะเก็บน้ำในห้องน้ำและห้องส้วม ทุก 7 วัน			
7. ท่านปิดฝาโอ่งน้ำทันทีอย่างมิดชิด หลังจากใช้น้ำทุกครั้ง เพื่อไม่ให้ยุงลายมาวางไข่			
8. เวลานอนตอนกลางวันท่านได้มีการป้องกันยุงกัด เช่น นอนกางมุ้งหรือนอนในห้องมุ้งลวด, มีมุ้งครอบกันยุง, เปิดพัดลม หรือทายากันยุง			
9. บ้านของท่านมีการกำจัดยุงโดยการฉีดพ่น ยากันยุง			
10. ท่านได้แนะนำความรู้เกี่ยวกับโรคไข้เลือดออกแก่บุคคลในครอบครัวและเพื่อนบ้าน			
11.ท่านเข้าร่วมดำเนินการควบคุมโรคไข้เลือดออกในช่วงที่มีการระบาด			

แบบสำรวจลูกน้ำยุงลาย

คำชี้แจง : ให้ผู้สำรวจ ใช้บันทึกผลการสำรวจลูกน้ำยุงลายที่ตรวจพบลงในช่องว่างหลังกิจกรรมตามประเภทของภาชนะที่มีน้ำขัง

1. บ้านของท่านมีภาชนะแต่ละประเภทที่สามารถเป็นแหล่งเพาะพันธุ์ลูกน้ำยุงลายเหล่านี้หรือไม่?

1.1 ตุ่มบรรจุน้ำเพื่อบริโภคและอุปโภคภายในบ้าน

☐ มี : (จำนวน) ……. ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ปิดฝาและใส่ทรายฆ่าลูกน้ำ			
2	ปิดฝาแต่ไม่ใส่ทรายฆ่าลูกน้ำ			
3	ไม่ปิดฝาแต่ใส่ทรายฆ่าลูกน้ำ			
4	ไม่ปิดฝาและไม่ใส่ทรายฆ่าลูกน้ำ			

1.2 ตุ่มบรรจุน้ำเพื่อบริโภคและอุปโภคภายนอกบ้าน

☐ มี : (จำนวน) ……. ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ปิดฝาและใส่ทรายฆ่าลูกน้ำ			
2	ปิดฝาแต่ไม่ใส่ทรายฆ่าลูกน้ำ			
3	ไม่ปิดฝาแต่ใส่ทรายฆ่าลูกน้ำ			
4	ไม่ปิดฝาและไม่ใส่ทรายฆ่าลูกน้ำ			

1.3 ตุ่มหรือโอ่งบรรจุน้ำขนาดใหญ่ภายนอกบ้าน

☐ มี: (จำนวน) ……. ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ปิดฝาและใส่ทรายฆ่าลูกน้ำ			
2	ปิดฝาแต่ไม่ใส่ทรายฆ่าลูกน้ำ			
3	ไม่ปิดฝาแต่ใส่ทรายฆ่าลูกน้ำ			
4	ไม่ปิดฝาและไม่ใส่ทรายฆ่าลูกน้ำ			

1.4 อ่างบัวหรือท่อซีเมนท์บรรจุน้ำเพื่อกิจกรรมต่าง ๆ

☐ มี: (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ใส่ทรายฆ่าลูกน้ำ			
2	ใส่ปลากินลูกน้ำ			
3	ไม่ได้ทำกิจกรรมใด ๆ			
4	อื่น ๆ			

1.5 ถังหรือภาชนะบรรจุน้ำในห้องน้ำ

☐ มี : (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ปิดฝาและใส่ทรายฆ่าลูกน้ำ			
2	ปิดฝาแต่ไม่ใส่ทรายฆ่าลูกน้ำ			
3	ไม่ปิดฝาแต่ใส่ทรายฆ่าลูกน้ำ			
4	ไม่ปิดฝาและไม่ใส่ทรายฆ่าลูกน้ำ			

1.6 จานรองขาตู้กับข้าว

☐ มี : (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ใส่ทรายฆ่าลูกน้ำ			
2	ใส่เกลืองแกงหรือสารเคมีอื่น ๆ			
3	ไม่ได้ทำกิจกรรมใด ๆ			
4	อื่น ๆ			

1.7 แจกันดอกไม้หรือพลูด่าง, แก้วน้ำที่ศาลพระภูมิหรือหิ้งพระ

☐ มี : (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ใส่ทรายฆ่าลูกน้ำ			
2	ใส่สารเคมีอื่น ๆ ฆ่าลูกน้ำ			
3	ไม่ได้ทำกิจกรรมใด ๆ			
4	อื่น ๆ			

1.8 อ่างล้างเท้าหรือจานรองกระถางต้นไม้

☐ มี : (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ใส่ทรายฆ่าลูกน้ำ			
2	ใส่สารเคมีอื่น ๆ ฆ่าลูกน้ำ			
3	ไม่ได้ทำกิจกรรมใด ๆ			
4	อื่น ๆ			

1.9 ยางรถยนต์ที่ไม่ได้ใช้

☐ มี: (จำนวน) …….เส้น

☐ ไม่มี

ลำดับ	กิจกรรม	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ใส่ทรายฆ่าลูกน้ำหรือวิธีอื่น ๆ			
2	ไม่ได้ทำกิจกรรมใด ๆ			

1.10 เศษภาชนะที่ไม่ได้ใช้ เช่น ขวดน้ำ, แก้วน้ำ กระป๋อง, กะลา, ถ้วย หรือภาชนะอื่น ๆ

☐ มี : (จำนวน) …….ใบ

☐ ไม่มี

ลำดับ	ภาชนะ	จำนวนทั้งหมด	จำนวนที่มีลูกน้ำ	จำนวนที่มีตัวโม่ง
1	ขวดน้ำ, แก้วน้ำ, กระป๋อง, ถ้วยชาม			
2	กะลา			
3	อื่น ๆ			

Appendix C

Appendix C. DHF incidence rate

DHF incidence rate, year 2007-2013

Village	Year						Jan-Mar
	2007	2008	2009	2010	2011	2012	2013
6 Bang-hean	1642.71	596.42	1192.84	505.05	575.82	385.36	191.20
9 Na-suan	2739.73	503.36	671.14	464.53	490.99	323.62	160.51
1 Pak-nam	1562.50	3418.80	854.70	409.84	414.94	404.86	398.41
3 Pak-ya	1572.33	4368.93	970.87	415.37	460.83	452.49	440.53

Source: Plaipraya District of Public Health Office, 2007-2013

Appendix D

Appendix D. Ethic Committee Approval Certificate

AF 01-12

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย
อาคารสถาบัน 2 ชั้น 4 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330
โทรศัพท์: 0-2218-8147 โทรสาร: 0-2218-8147 E-mail: eccu@chula.ac.th

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COA No. 093/2555

ใบรับรองโครงการวิจัย

โครงการวิจัยที่ 008.2/55	:	โปรแกรมการลดแหล่งเพาะพันธ์ลูกน้ำยุงลายเพื่อความยั่งยืนในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่
ผู้วิจัยหลัก	:	นายเรวัต รักเกื้อ
หน่วยงาน	:	วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ได้พิจารณา โดยใช้หลัก ของ The International Conference on Harmonization – Good Clinical Practice (ICH-GCP) อนุมัติให้ดำเนินการศึกษาวิจัยเรื่องดังกล่าวได้

ลงนาม.....
(รองศาสตราจารย์ นายแพทย์ปรีดา ทัศนประดิษฐ)
ประธาน

ลงนาม.....
(ผู้ช่วยศาสตราจารย์ ดร.นันทรี ชัยชนะวงศาโรจน์)
กรรมการและเลขานุการ

วันที่รับรอง : 20 มิถุนายน 2555 **วันหมดอายุ** : 19 มิถุนายน 2556

เอกสารที่คณะกรรมการรับรอง

1) โครงการวิจัย
2) ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัยและใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย
3) ผู้วิจัย
4) แบบสอบถาม

เลขที่โครงการวิจัย 008.2/55
วันที่รับรอง 20 มิ.ย. 2555
วันหมดอายุ 19 มิ.ย. 2556

เงื่อนไข

1. ข้าพเจ้ารับทราบว่าเป็นการผิดจริยธรรม หากดำเนินการเก็บข้อมูลการวิจัยก่อนได้รับการอนุมัติจากคณะกรรมการพิจารณาจริยธรรมการวิจัยฯ
2. หากใบรับรองโครงการวิจัยหมดอายุ การดำเนินการวิจัยต้องหยุด เมื่อต้องการต่ออายุต้องขออนุมัติใหม่ล่วงหน้าไม่ต่ำกว่า 1 เดือน พร้อมส่งรายงานความก้าวหน้าการวิจัย
3. ต้องดำเนินการวิจัยตามที่ระบุไว้ในโครงการวิจัยอย่างเคร่งครัด
*4. ใช้เอกสารข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย ใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย และเอกสารเชิญเข้าร่วมวิจัย (ถ้ามี) **เฉพาะที่ประทับตราคณะกรรมการเท่านั้น***
5. หากเกิดเหตุการณ์ไม่พึงประสงค์ร้ายแรงในสถานที่เก็บข้อมูลที่ขออนุมัติจากคณะกรรมการ ต้องรายงานคณะกรรมการภายใน 5 วันทำการ
6. หากมีการเปลี่ยนแปลงการดำเนินการวิจัย ให้ส่งคณะกรรมการพิจารณารับรองก่อนดำเนินการ
7. โครงการวิจัยไม่เกิน 1 ปี ส่งแบบรายงานสิ้นสุดโครงการวิจัย (AF 03-12) และบทคัดย่อผลการวิจัยภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น สำหรับโครงการวิจัยที่เป็นวิทยานิพนธ์ให้ส่งบทคัดย่อผลการวิจัย ภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น

Appendix E

Appendix E. Informed consent in Thai

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย สำหรับนักเรียนและกลุ่มแม่บ้าน

(กลุ่มควบคุม หมู่ที่ 1, หมู่ที่ 3 ตำบลปลายพระยา)

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ ประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย….....

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย ..โปรแกรมการลดแหล่งเพาะพันธ์ลูกน้ำยุงลาย ในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่

ชื่อผู้วิจัย …นายเรวัต รักเกื้อ……..

ที่อยู่ที่ติดต่อ 60 หมู่ 1 ตำบลทับปริก อำเภอเมือง จังหวัดกระบี่ 81000

โทรศัพท์ .....087 282 1007.....

ข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงผู้เข้าร่วมการวิจัยโดยตลอด และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้าจึงสมัครใจเข้าร่วมในโครงการวิจัยนี้ ตามที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย โดยข้าพเจ้ายินยอม

1. ยินดีตอบแบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคล ความรู้ และพฤติกรรมในการดำเนินการป้องกันและควบคุมโรคไข้เลือดออกในชุมชน จำนวน 3 ครั้ง ครั้งละประมาณ 20-30 นาทีโดยไม่ได้รับค่าตอบแทน

2. ยินดีสำรวจแหล่งเพาะพันธ์ลูกน้ำยุงลายภายในบ้านและบริเวณบ้านพักอาศัยของตนเอง จำนวน 5 ครั้ง ครั้งละประมาณ 20-30 นาที โดยไม่ได้รับค่าตอบแทน

ข้าพเจ้ามีสิทธิ**ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-8147, 0-2218-8141 โทรสาร 0-2218-8147 **E-mail: eccu@chula.ac.th**

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารชี้แจงผู้เข้าร่วมการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ.....
(.....นายเรวัต รักเกื้อ.....)
ผู้วิจัยหลัก

ลงชื่อ.....
(.....)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ.....
(.....)
พยาน

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย สำหรับนักเรียนและกลุ่มแม่บ้าน

(กลุ่มทดลอง หมู่ที่ 6, หมู่ที่ 9 ตำบลปลายพระยา)

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ ประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย….....

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย ..โปรแกรมการลดแหล่งเพาะพันธ์ลูกน้ำยุงลาย ในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่

ชื่อผู้วิจัย …นายเรวัต รักเกื้อ……..

ที่อยู่ที่ติดต่อ 60 หมู่ 1 ตำบลทับปริก อำเภอเมือง จังหวัดกระบี่ 81000

โทรศัพท์ .....087 282 1007.....

ข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงผู้เข้าร่วมการวิจัยโดยตลอด และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้าจึง**สมัครใจ**เข้าร่วมในโครงการวิจัยนี้ ตามที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย โดยข้าพเจ้ายินยอม

1. ยินดีตอบแบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคล ความรู้ และพฤติกรรมในการดำเนินการป้องกันและควบคุมโรคไข้เลือดออกในชุมชน จำนวน 3 ครั้ง ครั้งละประมาณ 20-30 นาทีโดยไม่ได้รับค่าตอบแทน

2. ยินดีเข้ารับการฝึกอบรม 1 ครั้ง เป็นระยะเวลา 3 วัน โดยในการอบรมจะได้รับเงินค่าพาหนะไม่ต่ำกว่า 100 บาท ต่อวัน และได้รับการจัดเลี้ยงอาหารกลางวันและอาหารว่างในวันที่ไปอบรม

3. ยินดีสำรวจแหล่งเพาะพันธ์ลูกน้ำยุงลายภายในบ้านและบริเวณบ้านพักอาศัยของตนเอง จำนวน 5 ครั้ง ครั้งละประมาณ 20-30 นาที โดยไม่ได้รับค่าตอบแทน

4. ยินดีหรืออนุญาตให้ผู้วิจัยบันทึกเทปหรือถ่ายภาพ เพื่อใช้ประกอบการวิเคราะห์ข้อมูล โดยไม่มีการเผยแพร่ภาพดังกล่าวสู่สาธารณะ และเมื่อเสร็จสิ้นการวิจัยแล้ว เทปและภาพทั้งหมดจะถูกทำลายทันที

ข้าพเจ้ามีสิทธิ**ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-8147, 0-2218-8141 โทรสาร 0-2218-8147 **E-mail: eccu@chula.ac.th**

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารชี้แจงผู้เข้าร่วมการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ.....
(.....นายเรวัต รักเกื้อ.....)
ผู้วิจัยหลัก

ลงชื่อ.....
(.....)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ.....
(.....)
พยาน

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

สำหรับผู้ปกครองของนักเรียนชั้น ม.2, ม.3 และผู้อยู่ในปกครอง (กลุ่มทดลอง)

ทำที่.....

วันที่ .....เดือน.....พ.ศ. .....

เลขที่ ประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย….....……

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้เกี่ยวข้องเป็น (โปรดระบุเป็น พ่อ/แม่/ผู้ปกครอง/ผู้ดูแลของ (ชื่อผู้มีส่วนร่วมในการวิจัย) .....) ขอแสดงความยินยอมให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย .โปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรค

ไข้เลือดออกในชุมชน จังหวัดกระบี่.....

ชื่อผู้วิจัย ……นาย เรวัต …รักเกื้อ…….……..

ที่อยู่ที่ติดต่อ .....60..ม.1...ต.ทับปริก..อ..เมือง...จ..กระบี่.....

โทรศัพท์ .....0872821007.....

ข้าพเจ้าและผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ ข้าพเจ้าได้อ่านรายละเอียดในเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัยโดยตลอด และ**ได้รับคำอธิบาย**จากผู้วิจัย **จนเข้าใจเป็นอย่างดี**แล้ว

ข้าพเจ้าจึง**สมัครใจและยินยอม**ให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ ภายใต้เงื่อนไขที่ระบุไว้ในเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย *-ได้ตอบแบบสอบถามการวัดความรู้ การรับรู้และการป้องกันตนเองจากการเป็นโรคไข้เลือดออก ทั้งก่อนและหลังการทดลองใช้โปรแกรม จำนวนทั้งสิ้น 3 ครั้ง โดยไม่ได้รับค่าตอบแทน, -เข้ารับการฝึกอบรมโปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรคไข้เลือดออกในชุมชน จังหวัดกระบี่ เป็นเวลา 3 วัน จำนวน 1 ครั้ง โดยจะได้รับเงินค่าพาหนะไม่ต่ำกว่า 100 บาทต่อวัน รวมถึงผู้วิจัยจะจัดเลี้ยงอาหารกลางวัน และออกสำรวจแหล่งเพาะพันธุ์ลูกน้ำยุงลายในบริเวณบ้านของตนเองทุกวันศุกร์สุดท้ายของเดือนและลงบันทึกในแบบสำรวจ จำนวน 5 ครั้ง โดยใช้เวลาในการสำรวจ ครั้งละประมาณ 20-30 นาที โดยไม่ได้รับค่าตอบแทน และเมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับผู้มีส่วนร่วมในการวิจัยจะถูกทำลาย*

ข้าพเจ้ามีสิทธิให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าหรือเป็นความประสงค์ของผู้ที่อยู่ในปกครอง/ในความดูแล **ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบต่อการเรียน ต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆที่เกี่ยวข้องกับผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลจากการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้า

หากผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-8147, 0-2218-8141 โทรสาร 0-2218-8147 **E-mail: eccu@chula.ac.th**

ข้าพเจ้าและผู้ที่อยู่ในปกครองเข้าใจข้อความในข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัยและหนังสือยินยอมโดยตลอดแล้ว ได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ.....
(.....นายเรวัต รักเกื้อ.....)
ผู้วิจัยหลัก

ลงชื่อ.....
(.....)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ.....
(.....)
พยาน

ลงชื่อ.....
(.....)
พ่อ/แม่/ผู้ปกครอง/ผู้ดูแล

หมายเหตุ

ในกรณีที่มีผู้มีส่วนร่วมในการวิจัยอายุระหว่าง 8-17 ปี ต้องลงนามให้ความยินยอมร่วมกับบิดา/มารดาหรือผู้ปกครอง (Assent)

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย
สำหรับผู้ปกครอง ของนักเรียนชั้น ม. 2, ม.3 และผู้อยู่ในปกครอง (กลุ่มควบคุม)

ทำที่.....
วันที่ .....เดือน.....พ.ศ. .....

เลขที่ ประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย…..……

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้เกี่ยวข้องเป็น (โปรดระบุเป็น พ่อ/แม่/ผู้ปกครอง/ผู้ดูแลของ (ชื่อผู้มีส่วนร่วมในการวิจัย) .....) ขอแสดงความยินยอมให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย .โปรแกรมการลดแหล่งเพาะพันธุ์ลูกน้ำยุงลาย เพื่อความยั่งยืนในการป้องกันโรค ไข้เลือดออกในชุมชน จังหวัดกระบี่.....

ชื่อผู้วิจัย ……นาย เรวัต …รักเกื้อ……..

ที่อยู่ที่ติดต่อ .....60..ม.1...ต.ทับปริก..อ..เมือง...จ..กระบี่.....

โทรศัพท์ .....0872821007.....

ข้าพเจ้าและผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ ข้าพเจ้าได้อ่านรายละเอียดในเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัยโดยตลอด และ**ได้รับคำอธิบาย**จากผู้วิจัย **จนเข้าใจเป็นอย่างดี**แล้ว

ข้าพเจ้าจึง**สมัครใจและยินยอม**ให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ ภายใต้เงื่อนไขที่ระบุไว้ในเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย *-ได้ตอบแบบสอบถามการวัดความรู้ การรับรู้และการป้องกันตนเองจากการเป็นโรคไข้เลือดออก จำนวนทั้งสิ้น 3 ครั้ง โดยไม่ได้รับค่าตอบแทน และออกสำรวจแหล่งเพาะพันธุ์ลูกน้ำยุงลายในบริเวณบ้านของตนเองทุกวันศุกร์สุดท้ายของเดือนและลงบันทึกในแบบสำรวจ จำนวน 5 ครั้ง โดยใช้เวลาในการสำรวจ ครั้งละประมาณ 20-30 นาที โดยไม่ได้รับค่าตอบแทน และเมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับผู้มีส่วนร่วมในการวิจัยจะถูกทำลาย*

ข้าพเจ้ามีสิทธิให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าหรือเป็นความประสงค์ของผู้ที่อยู่ในปกครอง/ในความดูแล **ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบต่อการเรียน ต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆที่เกี่ยวข้องกับผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลจากการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้า

หากผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-8147, 0-2218-8141 โทรสาร 0-2218-8147 **E-mail: eccu@chula.ac.th**

ข้าพเจ้าและผู้ที่อยู่ในปกครองเข้าใจข้อความในข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัยและหนังสือยินยอมโดยตลอดแล้ว ได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารข้อมูลสำหรับกลุ่มประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ.....
(.....นายเรวัต รักเกื้อ.....)
ผู้วิจัยหลัก

ลงชื่อ.....
(.....)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ.....
(.....)
พยาน

ลงชื่อ.....
(.....)
พ่อ/แม่/ผู้ปกครอง/ผู้ดูแล

หมายเหตุ

ในกรณีที่มีผู้มีส่วนร่วมในการวิจัยอายุระหว่าง 8-17 ปี ต้องลงนามให้ความยินยอมร่วมกับบิดา/มารดาหรือผู้ปกครอง (Assent)

VITAE

NAME	Mr.Rewat Rugkua
DATE OF BIRTH	February 28, 1973
PLACE OF BIRTH	Krabi Province, Thailand
JOB POSITION	Public Health Officer, Operational Level
WORK ADDRESS	Krabi Provincial Public Health Office, Thailand
E-MAIL ADDRESS	mornoy007@hotmail.com

EDUCATION BACKGROUND:

2009-2012	Doctor of Philosophy in Public Health, College of Public Health Sciences, Chulalongkorn University, Thailand
2006-2009	Master of Science (Environmental Education) Surathani Rachabhad University, Thailand
1998-2001	Bachelor of Public Health Khonkaen University, Thailand
1992-1994	Certicate of Public Health Sirindhorn College of Public Health, Yala Province Ministry of Public Health, Thailand

PRESENTATION EXPERIENCE:

October 2-4, 2012	Oral Presentation Entitled “Implementation of Larval & Pupal Source reduction Program (LSRP) in Prevention and control of Dengue Haemorrhagic Fever (DHF) in Community of Krabi Province, Thailand”