THE EFFECTS OF AN INTEGRATED SAVINGS AND COMMUNITY BASED HEALTH EDUCATION PROGRAM AMONG OLDER ADULTS WITH HYPERTENSION: A QUASI-EXPERIMENTAL CONTROLLED STUDY

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ผลของโปรแกรมการออมเงินและการให้สุขศึกษาในชุมชน ในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง: การวิจัยกึ่งทดลอง

นางสาวเนตรนภา วงศ์กัน

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรดุษฎีบัณฑิต
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Thesis Title	THE EFFECTS OF AN INTEGRATED SAVINGS AND COMMUNITY BASED HEALTH EDUCATION PROGRAM AMONG OLDER ADULTS WITH HYPERTENSION: A QUASI-EXPERIMENTAL CONTROLLED STUDY
By	Miss Nethnapa Vongskan
Field of Study	Public Health
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เนตรนภา วงศ์กัน : ผลของโปรแกรมการออมเงินและการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง: การวิจัยกึ่งทดลอง (THE EFFECTS OF AN INTEGRATED SAVINGS AND COMMUNITY BASED HEALTH EDUCATION PROGRAM AMONG OLDER ADULTS WITH HYPERTENSION: A QUASI-EXPERIMENTAL CONTROLLED STUDY) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. สถิรกร พงศ์พานิช, 172 หน้า.

วัตถุประสงค์: เพื่อศึกษาประสิทธิผลของโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูงที่เขตสายไหม และคลองสามวา กรุงเทพมหานคร

รูปแบบและวิธีการศึกษา: ศึกษาในผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูงจำนวน 59 คน อายุระหว่าง 50-60 ปี โดยใช้รูปแบบการศึกษาแบบกึ่งทดลอง ทำการเก็บข้อมูลด้วยวิธีการให้ผู้ป่วยทำแบบสอบถาม สัมภาษณ์เชิงลึก และสนทนากลุ่ม โดยนำการพัฒนารูปแบบของโปรแกรมการออมเงินและการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูงมาใช้ทดลอง โครงการนี้ดำเนินการในพื้นที่เป้าหมายเป็นเวลา 6 เดือน หลังจากนั้นทำการประเมินโดยใช้สถิติ การสัมภาษณ์เชิงลึก และการสนทนากลุ่ม

ผลการศึกษา: ก่อนการใช้โปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชน ในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง พบว่า ผู้ป่วยโรคความดันโลหิตสูงส่วนใหญ่มีระดับความรู้เกี่ยวกับการควบคุมความดันโลหิตสูงอยู่ในระดับที่ดี มีทัศนคติในการควบคุมความดันโลหิตสูงอยู่ในระดับปานกลาง แต่มีพฤติกรรมควบคุมความดันโลหิตสูงอยู่ในระดับต่ำ อย่างไรก็ตามระดับความรู้เรื่องการควบคุมความดันโลหิตสูงมีความสัมพันธ์กับทัศนคติ และพฤติกรรมในการควบคุมความดันโลหิตสูงในทางบวกหลังการใช้รูปแบบโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนทั้งสองกลุ่มทดลอง ทำให้อาสาสมัครในกลุ่มทดลองสามารถควบคุมความดันโลหิตสูงได้ ในขณะที่กลุ่มควบคุมมีระดับความรู้หลังการใช้รูปแบบโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนไม่สัมพันธ์กับทัศนคติ และพฤติกรรมการควบคุมความดันโลหิตสูง นอกจากนั้นยังไม่พบว่าผลของโปรแกรมการออมเงินนั้นมีประสิทธิภาพในการลดความดันโลหิต

สรุปและอภิปรายผล: สรุปได้ว่า การให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูงนั้นสามารถเพิ่มความรู้เรื่องการควบคุมความดันโลหิต อาสาสมัครมีทัศนคติ และมีพฤติกรรมการควบคุมความดันโลหิตสูงมากขึ้น ทำให้อาสาสมัครสามารถควบคุมความดันโลหิตสูงได้

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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NETHNAPA VONGSKAN: THE EFFECTS OF AN INTEGRATED SAVINGS AND COMMUNITY BASED HEALTH EDUCATION PROGRAM AMONG OLDER ADULTS WITH HYPERTENSION: A QUASI-EXPERIMENTAL CONTROLLED STUDY. ADVISOR: ASSOC. PROF. SATHIRAKORN PONGPANICH, Ph.D., 172 pp.

Objectives: To examine the effectiveness of savings and health education model (SHE model) Program, which is an integrate savings and community based health education for older adults with hypertension at Sai Mai and Klong Sam Wa district, Bangkok, Thailand.

Methods: Of 59 older adults with stage II of hypertension were recruited, aged 50 - 60 years old. SHE model was developed based on integrated savings and community health education principle and was implemented into both experimental groups through six months. Measurement tools which consisted of six parts and in-depth interview were used to access the effectiveness of SHE model.

Results: Knowledge on hypertension no significant difference (p = .027) between the three groups pre intervention. Negative attitudes towards care and control (p = .108) had a positive correlate with practices (p = 203). Systolic blood pressure – negative attitudes and practices were inversely related to diastolic blood pressure (p = .017). However, knowledge, attitudes, and practices recorded improvements in all groups after intervention (p = .001), compared to the control group. Blood pressures were improvements (p = .001) resulted post intervention. Community savings funds and effects on blood pressure control no material impact recorded from quasi-experimental study.

Conclusion and discussion: Improved hypertension health education effects had the most significant impact in controlling the disease in the community. More intension efforts in health education such as widespread dissemination of information, greater depth of education, would have a large impact on this disease.

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

Academic Year: 2014 Advisor's Signature .....

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CHAPTER I
INTRODUCTION

1.1 Significance of the problems

By the year 2010, The Office of the Permanent Secretary for Public Health, Ministry of Public Health, Thailand (year 2003 – 2012) reported hypertension and cerebrovascular diseases is the fourth leading cause of death both male and female population (death rates per 100,000 population) in Thailand (The Office of the Permanent Secretary for Public Health, 2010).

Recent estimates from Lacent Journal reported approximately the number of people have high blood pressure worldwide around 1 billion and this number is expected to increases to 1.56 billion peoples in 2025 (Hypertension in Asia country, n.d). Two-third of this amount is in the developing country, and also adults people of the south-east Asia including Thailand have the one three older adult have high blood pressure condition.

One four adults people every a person being afflicted with hypertension. Hypertension can meet often in both developed and developing countries. In USA, nearly one in three older people has high blood pressure, but they are no hypertension symptoms and also don't know they have it. That cause of some people called high blood pressure is "***Silent Killer***."

The situation of hypertension in Asia country as "Singapore" presented one-third (32.8%) cause of death is cardiovascular diseases and stroke (Hypertension in Asia country, n.d).

In Thailand (June, 2012), hypertension reaching take the preservation in hospital tend to increase steadily in every a part of country compared with last 10 years (Bureau of policy and strategy, 2012). Hypertension prevalence rates per 100,000 populations("High blood pressure statistic," 2005) among Thai reaching from 259 to 1,349 populations from last 10 year. It means hypertension prevalence rate goes up 5 more times (5.21%) (Bureau of policy and strategy, 2012).

Why is hypertension a clinical concern?

Hypertension is one of dangerous diseases due to it can make heart work too hard. In addition, high blood pressure cause of risk factor of stroke and heart diseases. Furthermore, this "***Silent Killer***" disease can also cause of adults problems such as chronic kidney frailer, heart attack, other cardiovascular diseases, and also associated with a shortened life-expectancy. High blood pressure is the disease which meets often in older people. Therefore, high incidence rate of hypertension associated with increasing of the number of older population.

Increasing in the proportion of older persons (those age 60 years and above) in total population has occurred all over the world, presenting many countries including Thailand facing a major challenge (Institute for Population and Social Research, Mahidol University, & Thai Health Promotion Foundation, 2007; M. U. a. T. H. P. F. Institute for Population and Social Research, 2007). An important change of population ageing has a direct impact on the age structure of the population and consequence to health, which have extended the length of people's lives. The shift in the population age distribution has implication to support base for themes, such as requirement of long-term care facilities and provision of welfare benefits because they lose the capacity to help themselves or others (Mujahid & Siddhisena, 2009).

Furthermore, after retirement from work older person's economic security worth because they can no longer work in the formal sector. Although, in 2005, Thailand Labor Force Survey found that older population who work, do not over 40 hours per week. However, the 2005 Survey found older workers had a monthly income only 4,900 Thai baht per month (163 USD). Meanwhile, in the year 2001 Survey reported a slightly higher income of 5,500 Thai baht per month or around 183 USD (Institute for Population and Social Research et al., 2007). Although, the fact that these incomes are fairly low, only two-thirds of aging people who earned an income reported that their income was sufficient (Institute for Population and Social Research et al., 2007). However, not every older people have an income. The National Statistic Office's survey of the elderly in 2002 found that 90 per cent had an income from one source and another, while remaining 10 per cent did not have an income or did not answer the question. The per cent of source of aging income from - 40 per cent received it

from working, 35 per cent from a family member, only 25 per cent from interest, savings, pensions or welfare payments (Institute for Population and Social Research et al., 2007). Its mean people aged 60 and over have high economic dependency. Moreover, the pattern of Thai family role, current social and economic trends in the future likely that the role of aging population in the family will gradually weaken (Institute for Population and Social Research et al., 2007). Thailand is beginning to resemble countries with an ageing society like developed countries in Europe. Therefore, the proportion of older people living with adult children is likely to gradually decline. While, the reported from Institute for Population and Social Research, Mahidol University and Thai Health Promotion Foundation found low rate of savings have aroused concern among Thai aging.

Why incomes and savings in older person are important?

(Guan, 2008) explained about the experience from the Republic of Korea study show a small proportion of older persons cited social pension (3 per cent) and public assistance (9 per cent) as their source of income (Guan, 2008). In addition, more than half the older person perceived that they suffer from economic hardships, considering their expenditures. If family members did not give the assistance for older parents, their lives would be significantly more difficult from economic and health uncertainly. Because income and saving is essential to a secure life, especially for older people who are no longer able to work and no pension. As life expectancy is increasing, but elderly people still have difficulty finding appropriate employment, and so much spend increasing lengths of time without paid work (Institute for Population and Social Research et al., 2007). Without income and savings security older people cannot live securely. In addition, more recent research has also established a strong causal association running from health to aggregate economic performance (Lal & Consultants, 2005). Bloom, (Canning, and Sevilla, 2004) reported evidence from more than a dozen cross-country studies in India and all these studies show that health has positive and statistically significant effect on the rate of growth of GDP per capita (Lal & Consultants, 2005). In fact, the causal relationship does not run in only direction-from health to aggregate economic performance but there is strong case for considering a reverse link, running from wealth to health

(MOH India, 2005). Higher incomes potential permit individuals and societies to afford better nutrition, better health care and presumably, achieve better health (Lal & Consultants, 2005).

While, income and savings schemes are essential to an elderly people life because savings are a source of capital and provide the safety net when individuals and families are not able to help themselves. Furthermore, high savings can promote income security in late life, especially in rural area and reduce the potential impact on old-age (Knodel & Chayovan, 2007). However, Thailand has less experience with savings for old age and a sufficiently attractive savings mechanism has not yet been developed. The reason these people do not belong to any long-term savings scheme is probably because they lack any sort of surplus income to save, and because they lack information about savings (Institute for Population and Social Research et al., 2007). From these reason, there is a strong possibility that these people will lack income security after they retire.

In addition, older person has the relation with chronic health problems. Thus, their health problem makes them must pay high cost of health expenditure. Focused efforts to control chronic diseases can help older people to dramatically cut healthcare costs especially hypertension disease.

One important method to reductions in hypertension is provide health education program due to health education can motivate and empowering a person to take responsibility their own health. In addition, health education is the essence of community based health practice and the method to prevent the effect of human's health hazards on both individual and community, and also enhanced understanding of the impact of hypertension disease that context has on an individual's learning that can improved the health of the population. Therefore, this research aim to study the effects of an integrated savings and community based health education program among older adults with hypertension disease.

Expectedly, this study aims to study effects of an integrated savings and community based health education program among aging people with hypertension disease through six months. The investigations try to answer the improvement of knowledge of people that involve to Saving Health Education Model (SHE model) program and

also try to compare blood pressure between and during implementation the model both intervention and control groups. An understanding of the effectiveness of SHE model is useful in that it further illustrates the role of context in the saving and community based health education process. In addition, community based health education is a social process that must take into account the community in which the population functions, therefore, to achieve fully promoting health and assisting individuals to regain their health. Researcher expected, as a result of SHE model implementation that have the greatest potential for success must be controlled hypertension among aging group.

1.2 Research question

What is the effectiveness of "Savings and Health Education Model (SHE model)"?

1.3 Research Hypothesis

The program "Savings and Health Education Model (SHE model)" can improvement in blood pressure control among older adults in Sai Mai community.

1.4 Objective of the study

To examine the effectiveness of Savings and Health Education Model (SHE model) Program, which is an integrate savings and community based health education for older adults with hypertension.

1.5 Specific Objectives

1.5.1 To investigate improvement of knowledge, attitude and practices of people that involve to SHE model program

1.5.2 To compare blood pressure between intervention and control groups

1.5.3 To compare blood pressure between pretest and posttest implementation in both intervention and control groups

1.6 Operation definitions

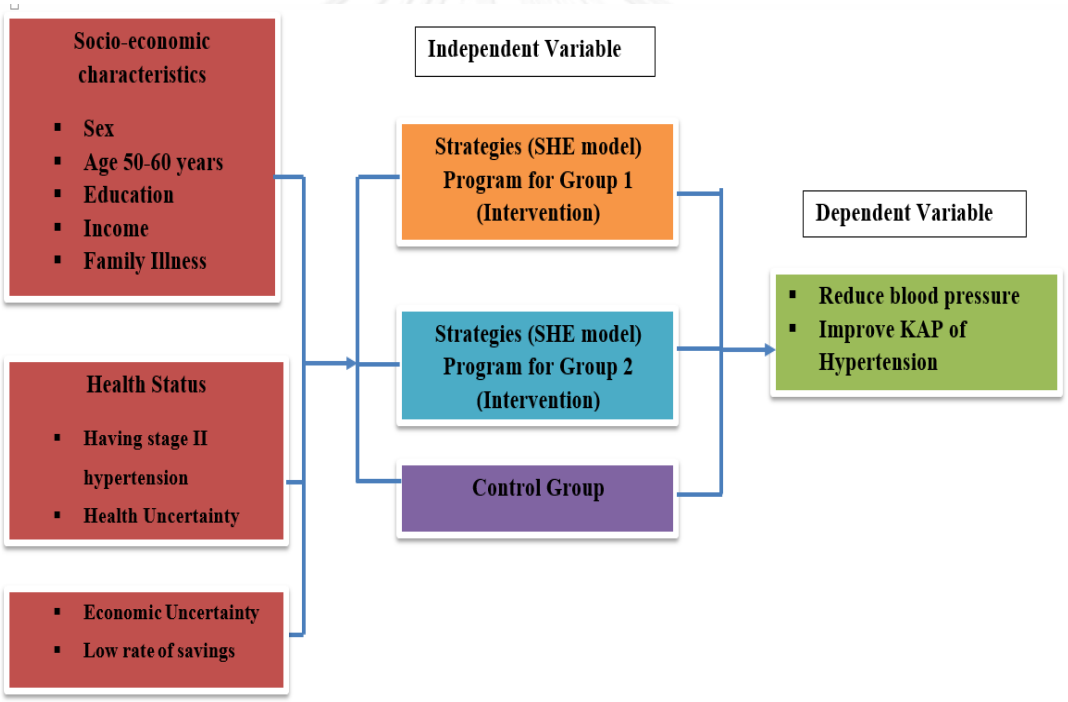
1.5.1. **Older Adults** refer to the age that is most often considered old, because that is when people become eligible for full Social Security benefits, Pension and Medicare.

1.5.2. **Savings** refer to Income that a person not spent or deferred consumption in a deposit account keep use the times of emergency rather than spending

1.5.3. **Community based Health Education** refer to health education program that promotes health and prevents hypertension disease within population's community

1.5.4. **Hypertension** refer to a persistent elevation of blood pressure that exceeds 140 mmHg systolic or greater and/or 90 mmHg diastolic or greater when individual measured with a sphygmomanometer

1.7 Conception framework



1.8 Scope of the study

Since the sample of this study will be collected from quantitative in Sai Mai district, Bangkok Province. The in-depth interviewed will be used to describe 10 participants again. The participants are only people age 50-60 year and over not generalized to other age group.

1.9 Usefulness

It is clear that more than half the aging people perceive that they suffer from hypertension disease and economic hardships, considering their health expenditures, especially for older people who are no longer able to work and no pension and did not give the assistance from family members; their live would be significantly more difficult. Therefore, this study expects to gain more understanding of the effectiveness of Savings Health Education Model (SHE model) Program, which is an integrate savings and community based health education for aging with hypertension. The findings of this study consequently should provide comprehensive understanding of the issues and hopefully could have benefits to aging's health conditions and well-being.

CHAPTER II
LITERATURE REVIEW

Literature review topics hear addresses several issues related to the study of an integrated savings and community based health education program among older adults with hypertension in attempts to understand the improvement of knowledge of people that involve to Saving Health Education Model (SHE model) program and also try to compare blood pressure between intervention and control groups.

The aging theoretical perspectives, hypertension disease, community based health education, three savings studies and current controversies, quasi-experiment, and other studies are reviewed. One issue that has beset the development of research on aging, not only vascular biology of aging-implications in hypertension, is an attempt to explain the definition of the biological aging theory.

2.1 Aging Theories

2.1.1 Biological aging theory

The purpose of this theory is to advance the development and application of the aging theory in order to a better understanding of the process of biological aging. Biological and physical change occurs in all members of a species if the people live long enough. As Austad, 2001 (Novak, 2009) defines biological aging as "a process of intrinsic, progressive, and generalized physical deterioration that occurs over time." Intrinsic aging mean the change that happen with internal body organs includes decreases in lung capacity, loss of brain cells, and hardened arteries (Novak, 2009). While, extrinsic aging mean changes that happen with external body organs in the body due to sunlight, smoking or noise (Novak, 2009). The scientist name Strehler, 1977 (cited in Novak, 2009) presents four criteria for intrinsic aging. First, aging is universal and it occurs in all members of a species if they live longer. Also, wrinkled skin in humans fits this definition. Then, true aging is basic to the organism. The results from this cause a person cannot undo it or stop it. Decreased lung elasticity falls into this category also. A third criterion is true aging is progressive (Novak, 2009). In addition, Strehler, 1977 (cited in Novak, 2009) explained debris accumulates in the cell over

time until the cell stops working. Finally criteria, discuss about true aging is deleterious. It leads to decline in physical function cause of the person facing risk of illness and lead to death.

From the attempt of extremely the scientist try to know what causes of intrinsic aging. Therefore, scientists have developed a number of theories to explain intrinsic aging are following:

- Programmed theories, and
- Error theories

Schneider, 1992 (cited in Novak, 2009) focus in one of two groups: first group, programmed theories locate the cause of aging in the action of inherited genes and the last group, is error theories mention about the cause of aging in the normal function of the body over time. Probably both of these causes play some role in aging. These two cause working together leads to decreases ability of the body to fight off internal and external threats cause of increased chance of death as the body age (Novak, 2009).

2.1.2 Programmed theories

The purposes of programmed theories try to explain that the same processes that cause animals to grow and thrive also lead to senescence and death and how this process might have occurred. Furthermore, scientists have found the strongest evidence for programmed senescence in the human body's cell.

In fact, human life being with a single fertilized cell. This cell divides many times from cell to cell to form the human body. Some cells such as brain cells and spinal cord cells stop dividing in youth. While, other cells such as intestinal cells and bloods cells divide throughout in human life (Novak, 2009). However, Hayflick and Moorehead, 1961 (cited in Novak, 2009) found cell division had a limit, a limit depending of the length of the telomeres, and limit differed for each species as scientists refer this evidence as the **Hayflick Limit**. In a 5-year study (cited in (Yang Z, 2009) Short telomeres and prognosis of hypertension) subjects with shorter telomeres were at higher risk of developing coronary artery disease, especially hypertension.

In addition, Tortoise cells divide 90 to 125 times before they die (Novak, 2009). For animal cells (chicken) divide fifteen to thirty-five times, and human embryo cells forty to sixty times (Novak, 2009). Furthermore, Hayflick and Moorehead, 1961 (cited in Novak, 2009) found the fact of older cells that the older the cell donor, have fewer times the cell could divide before death. It difference from younger people cells, for example, could divide about fifty times before they stopped (Novak, 2009). Based on Hayflick and Moorehead, 1961 (cited in Novak, 2009) findings cells from adult could divide only twenty times more before they died. Moreover, they found that before cell die, their structure and function change. They discovered that cells showed signs of aging after year of active division in the lab. Also cells took a longer time to double, gradually stopped dividing, accumulated debris, and in the end totally degenerated (Novak, 2009). The cells produce less energy, and make enzymes more slowly, also allow waste to fill up inside them. Finally, cells stop dividing. The biologist call this phase is **phase III phenomenon** (Novak, 2009).

From the study of Hayflick (1996), also found the results that;

(1) Cells undergo programmed decline,
(2) The rate of decline differs for each organism, and
(3) Genetic differences play a role in determining an organism's life span

While, Aldwin and Gilmer, 2004; also Sinclair & Howitz, 2006 (cited in Novak, 2009). They found the limit on cells division. They describe the process of **apoptosis**, is a genetic process that switches off the cell's ability to divide. That the strong reasons to suppose that this process controls growth and produces normal development. But it also leads to cell death and breakdown in the body over time (Novak, 2009).

In year 2006, Gavrilov and Gavrilova (cited in Novak, 2009) discussion about another genetic process that lead to physical aging. In addition, from the researcher's studies, they found some genes serve a positive function early in life. That the scientist call these phase is **pleiotropic genes** (Novak, 2009). A gene, for example, might order calcium production in 10 years old due to a younger person's body need calcium to build bones and teeth. As the same way, the same gene might lead to too much

calcium in 60 years old for the produce calcium deposits in the person's arteries (Novak, 2009).

Therefore, both apoptosis and pleiotropy phenomenon suggest that very system that served a crucial protective function early in life becomes a liability in old age when it works less effectively (Vern L. Bengtson, 1999). Aging occurs as a by the product of normal human development (Novak, 2009).

2.1.3 Endocrine and Immunological Theory

This theory tries to explain about endocrine and immunological systems. Glandular tissues in human body make up the endocrine system. They include the hypothalamus, pituitary gland, adrenal glands, ovaries, and testes. The functions of these glands secrete hormones into the bloodstream (Novak, 2009). Then hormones act on specific site in the human body. The respond of the endocrine system in both internal and external changes in the body and controls growth, metabolism, reproduction and also response to stress. Besides, Harman et al., 2000 (cited in Novak, 2009) said some time that the production of the sex hormones estrogen and testosterone tends to decrease as age. Another researcher, Bartke and Lane, 2001 (cited in Novak, 2009) also found the timing of hormonal release and the responsiveness of the tissue to hormones decline with age. These changes in hormonal activity can lead to change in sexual response. The report from Harman et al, 2000(cited in Novak, 2009) in year 2000 show that a decrease in testosterone in older man can lead to osteoporosis and broken bones.

In general, as people get older, the hormones' function decline and this is also the case for the hormone **aldosterone.** Its role is to regulate salt and water in the body, having an important impact on blood pressure. Multiple independent studies suggest that the malfunction of this hormone contributes broadly to the development of hypertension in old age (ongoing Framingham Offspring Study).

Meanwhile, the immune system also ages. It goes into a decline as early as age 20 as the thymus gland begins to shrink. By age 50 this gland has almost ceased to exist due to decline in T cells from the thymus gland and their decline in function lead to a reduced ability to fight infection and disease (Novak, 2009). Furthermore the immune system plays a role in mechanisms that contribute to inflammation in cardiovascular

disease, reported in atherosclerosis and hypertension. Different subsets of lymphocytes and their cytokines are involved in vascular remodeling and hypertensive renal disease as well as heart disease (Schiffrin EL, 2013). Summary, programmed theories attempt to explain about programmed change in the body may lead to age-related problems such as a higher risk of Alzheimer's disease, increased risk of cancer, and hardening of the arteries (Effros, 2001 cited in Novak, 2009). Furthermore, Effros reports that in cases where the number of antibodies stays high, their quality decreases and they lose their effectiveness cause of infections most of deaths in people over age 80 (Novak, 2009).

2.1.4 Error theories

This theories focus on aging as a by - product of errors or mistake within the human body consist of three major important theories. Some of this error comes from inside the cell and other from outside the cell.

2.1.5 Somatic Mutation Theory

Mutation theory mentions about the error of inside the cell, and link to mistakes that take place in the synthesis of protein. Due to the cell nucleus contains deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). Both DNA and RNA chemicals help maintain the body's structure and function (Novak, 2009). Both chemicals function are; DNA gets transcribed messenger to RNA (mRNA), while mRNA in turn oversees the creation of proteins that structure the cell, fight disease and keep the body in balance. From some scientist study found aging comes about due to mutations or charges in DNA (Masoro, 2006; Streams & Partridge, 2001 cited in Novak, 2009). In addition, DNA, RNA and proteins face constant attack from inside and outside the body. However, DNA can damage by X-ray as can chemicals in the body change also (Novak, 2009). In 1992, Schneider (cited in Novak, 2009) says that the cell has to cope with 100,000 oxidation lesions due to chemical attack in each day, each cell. Furthermore, damage to DNA can lead to mutations when the cell divides cause of changes in mRNA and in turn to damaged proteins. Due to mRNA and proteins help produce more proteins, errors compound. A large number of defective proteins would lead to cell and tissue death (Novak, 2009). Vijg, 2000 (cited

in Novak, 2009) study found increased DNA lesions and increased somatic mutations with age.

2.1.6 Cross-Linking Theory

The purpose of this theory explained the long term exposure of proteins to glucose (sugar) molecules cause of a process called **glycation** (Novak, 2009). Because glucose molecules attach themselves to proteins (Novak, 2009). This results in proteins binding together, or cross-linking (Gafni, 2001 cited in Novak, 2009). From this process increases with age. Also, cross-links toughen tissue and cause some of the damage associated with aging, including stiffened connective tissue, hardened arteries and loss of nerve and kidney function. While, foreign chemicals such as glucose and smoke can set up links between the DNA strands (Novak, 2009).

However, the body does have the way to combat cross-links with immune system. Immune system cells called macrophages seek out glucose molecules, engulf them, destroy them, and send them to the kidney for elimination. But this defense breaks down with age as kidney function declines and macrophages become less active (Effros, 2001 cited in Novak, 2009). As a result, cross-linking increase over time and accumulation of cross-links in the body ultimately cause to physical system breakdown.

2.1.7 Free Radicals Theory

Grune and Davies, 2001 (cited in Novak, 2009) describe about the "oxygen paradox" as human beings need oxygen to live due to the oxygen allows as to take energy from our foods. But oxygen can also damage cells and their contents. Source of oxygen production in the body damage is **Free radicals** that lead to aging (Novak, 2009). The damage system is free radicals are molecules that have an unpaired electron, a large number of free energy, and a tendency to bond with other molecules. In the same way, normal cell metabolism produces free radicals. These molecules can damage tissues and other molecules such as DNA, RNA and cell proteins (Austad, 2001; Sinclare & Howitz, 2006 cited in Mark Novak, 2009).

The action of Free Radicals

Free radicals act in three phases. First, the body produces free radicals. In the course of metabolism, an extra electron gets attached to molecular oxygen. Then, the free radical roams through the body and takes an electron from another molecule, this creates a new free radical (Novak, 2009). Therefore, this chain reaction produces harmful chemicals in the body. Finally, free radicals react with molecules like DNA or RNA. This ends the process but damages the cell (Novak, 2009).

In addition, Sinclairs and Howitz, 2006 (cited in Novak, 2009) found many sites in the cell are damages by free radicals. The DNA in mitochondria where oxidation takes place faces a high risk of damage (Sinclairs and Howitz, 2006 cited in Novak, 2009). Also the studies show that free radical damage to DNA increases rapidly with age. From this damage can lead to diseases like late onset diabetes, arthritis, cataracts, hypertension, and atherosclerosis. Furthermore, cell in the heart, brain, and skeleton also face a high risk of free radical damage because of the oxygen in the environments. Due to free radical attack can damage proteins, causes a change in the protein's structure and makes it unable to perform its function (Novak, 2009). Meanwhile, repair systems in older cells become less efficient and older cells produce fewer antioxidants (Aldwin & Gilmer, 2004 cited in Novak, 2009).

Free radicals also lead to an accumulation of chemical by products in cell. The study from Gordon and colleagues in 1974 argue that free radicals create large fatty molecules in the cells, they called this process is **lipofuscin**. These molecules show up as brown liver spots on the skin. And the lipofuscin symptom makes up about 6 to 7 percent of the human heart muscle and nearly 75 percent of the volume of nerve cells by age 90 (Strehler, 1977 cited in Novak, 2009). As lipofuscin take up more room in the cell, this process may interfere with the cell's antibody to create enzymes, release energy, and get rid of wastes (Novak, 2009).

Shringarpure and Davies, 1999 (Vern L. Bengtson, 1999) point out that when oxygen is metabolized, unpartnered electrons are discarded, causing damage to cells, DNA, and eventually body systems. However, the every process necessary for life such as respiration and metabolizing nutrients are oxidative (Vern L. Bengtson, 1999). In addition, Bengtson content that the accumulation of oxidative stress results in disease

and death. While, molecules in the body can absorb these free radicals and systems are adept at repairing such damage, the defense systems of the body are not completely effective and also weaken with age. The cumulative damage caused by free radicals over a lifetime and the weakened effectiveness of repair systems with aging putatively may cause a threat to survival. But there is little direct evidence that increased oxidative stress accelerates aging and shortens the length of life (Vern L. Bengtson, 1999). Nevertheless, a link has been shown that high blood pressure can be induced — and brought back to normal — by changing levels of highly reactive oxygen molecules called free radicals and nitric oxide, which currently is being studied for its role in cardiovascular diseases, hypertension and other functions in the body (Hypertension, Aug 4, 2000; 36, pages 141-2).

2.2 Hypertension disease

Overview

Ageing is associated with functional, structural and mechanical changes in arteries that closely resemble the vascular alterations in hypertension. Characteristic features of large and small arteries that occur with ageing and during the development of hypertension include endothelial dysfunction, vascular remodeling, inflammation, calcification and increased stiffness. Arterial changes in young hypertensive patients mimic those in old normotensive individuals. Hypertension accelerates and augments age-related vascular remodeling and dysfunction, and ageing may impact on the severity of vascular damage in hypertension, indicating close interactions between biological ageing and blood pressure elevation. Molecular and cellular mechanisms underlying vascular alterations in ageing and hypertension are common and include aberrant signal transduction, oxidative stress and activation of pro-inflammatory and pro-fibrotic transcription factors. Strategies to suppress age-associated vascular changes could ameliorate vascular damage associated with hypertension (Adam Harvey et al, 2015).

Today**,** hypertension is probably the most important public health problem in both developed and developing countries. It is common, asymptomatic, readily detectable, usually easily treatable, and often leads to lethal complications if their untreated. However, the number of undiagnosed and/or untreated patients was increase nearly

one in three older people in USA has high blood pressure, but they are no hypertension symptoms and also don't know they have it (www.healthststs.com, date October 10, 2012). In addition, Kasper (2005), also said that the number of undiagnosed patients with hypertension increased to nearly 33 percent; therefore, cause of increased cardiovascular mortality rate and the number of people with chronic diseases with untreated or poorly treated hypertension also steady increased.

Hypertension defined as a persistent elevation of blood pressure that exceeds 140 mmHg systolic or greater and/or 90 mmHg diastolic or greater when individual measured by a sphygmomanometer. The individuals have a hypertension significantly increased risk of cardiovascular when compared to those who have lower blood pressure levels (Weinberger, 2003). The method of measure blood pressure is blood pressure should be measured after the subject is seated for 5 minutes and with patient's arm at heart level. Environment effect with blood pressure a cold temperature can elevate pressure; therefore, room temperature should be normal. The blood pressure cuff size should be appropriate for arm circumference, if use a small cuff for adults arm size can produce an artificial elevation of blood pressure.

In this part, researcher review about epidemiology, risk factors, pathophysiology, hypertension in older persons, and dietary factors that reduce blood pressure is a final part of reviewed.

Epidemiology and Risk Factors of hypertension

Hypertension's prevalence is varies considerably based on demographic, cultural, geographic, nutrition, and also genetic factors. Especially, in industrial town found high prevalence more than in primitive cultures (Weinberger, 2003). The expert mentioned cause of high prevalence of hypertension related with change in traditional habits from a diet usually low in sodium and high in potassium and calcium due to hypertension is more common with a relatively high-salt, low-potassium and low-calcium diet typical of in town societies. The study that can support this evidence among the Samburu of Kenya showed native people diet is high in potassium but low in sodium, blood pressure levels are typically low or normal (Weinberger, 2003). Furthermore, in the same tribe when young men are recruited into Kenya army and give a high-sodium, low potassium diet, their blood pressure increases markedly.

However, when the young men return to their native lifestyle and diet after leaving from solider army found their blood pressure levels decrease to pre-army values. Another observation study that can support the diet/blood pressure was study in Japan. In the year 1970, Northern Japanese used salt intake highest in the world, averaging 15 to 20 g per day (Weinberger, 2003). Among these population also had highest prevalence of hypertension around 40 percent of adults. In addition, the leading cause of death was cerebral hemorrhage. Therefore, the government was responded by used public health campaign to educate the people both to reduce salt intake by changing some of the methods of preparing and preserving food, and to increase intake of potassium and calcium. The results of responded the campaign demonstrated show significant decrease in the prevalence of hypertension and stroke. But these observations do not directly implicate salt as the causative factor and not all people in a giving demonstrate blood pressure that is susceptible to these nutrition components. Other evidence to support that blood pressure changes in salt balance may increase with age (Weinberger, 2003). The prevalence of hypertension increase with age, that approximately 60 percent of Americans older than 60 years have an elevated blood pressure.

Obesity problem has also been link with hypertension. However, the mechanisms for this association are not clear. Associate factors such as stress, physical inactivity, and environment crowding are involved (Weinberger, 2003).

Different observed in the risk of developing hypertension are race. For example, African American has high prevalence as 40 percent more than Native Americans, Hispanic Americans, or Caucasians (Weinberger, 2003).

Genetic factor is a possible role has been identified because hypertension is more common in some families than in other. A major genetic component was confirmed through observations that this form of primary hypertension is more common in both members of identical twin pairs than in fraternal twins (Weinberger, 2003).

Pathophysiology of hypertension

Many pathophysiology factors have been implicated in the genesis of hypertension. Because of the human circulatory system is an intricate network of mechanisms

homeostasis of pressure and flow despite myriad perturbation (Weinberger, 2003). This system allows physiologic defense, at least temporarily such as shock, hemorrhage, over load of extracellular fluid volume, stress-induced changes, excessive fluid loss, and other potentially life-damage events (Weinberger, 2003). Thus, a sustained elevation of arterial pressure reflects a disturbance in the dedicate balance of factors that maintains this equilibrium (Weinberger, 2003). Some cause of hypertension occurred from an abnormality in a single component of blood pressure regulation is sometimes sufficient to upset the homeostatic balance. Most of people got primary hypertension; subtle abnormalities of more than one factor are related. Because many possible factors are related with primary hypertension and because its evolution is subtle identifying a single causal factor in most patients is usually difficult. Within this part reviews these factors by separating the components of blood pressure control into three general mechanisms;

- factors increasing extracellular fluid volume
- causing vasoconstriction, and
- influencing cardiac output

Three mechanisms approach can provide some degree of insight in different manifestation, consequences, and complications of elevated blood pressure and useful in understanding the pathology of hypertension.

Factors that influence extracellular fluid volume

Human body weight composes of fluid 55 to 60 percent of total body weight and around 40 percent of that fluid is in the extracellular compartment and the rest in intracellular (Weinberger, 2003). The major constituent of extracellular fluid is sodium, more than 90 percent of the osmotic effect in this fluid compartment. The extracellular compartment can be separated into interstitial fluid and circulating plasma volume. Exchange between interstitial fluid and plasma volume is influenced by the hydrostatic and osmotic pressures of each. In fact, blood pressure correlates more closely with plasma volume in healthy people but with interstitial fluid in hypertensive patients (Weinberger, 2003). Patients with hypertension have an increase in vascular resistance and vasoconstriction as well as decrease in compliance and elasticity of the vascular and rarefaction of capillary and tertiary arteriolar structure.

Therefore, the plasma volume can be constructed to be disproportionately increased for the reduced vascular capacity (Weinberger, 2003). In addition, ability of kidneys is a major determinant to excrete salt as the major osmolyte and, therefore, the water that follows through passive diffusion. Furthermore, the kidneys act selectively, serving as more than mere filters because sodium is a major determinant of fluid balance and nutrient exchange (Weinberger, 2003). Active role of the kidneys in handling sodium results from the large concentration gradient for sodium between extracellular (135 to 145 mmoL) and intracellular (3 to 30 mmoL) compartment. The cells are protecting against rupture that could result from the intrusion of sodium and the passive diffusion water (Weinberger, 2003).

In addition, some studies indicated that patients with hypertension have abnormalities in some of these systems, including some genetic abnormal such as sodium-lithium counter transport, is link to the pathogenesis of hypertension presumably by an increase in the intracellular sodium concentration (Weinberger, 2003). Sodium-hydrogen ion exchange is one of cellular transport system that implicated in hypertension. Abnormality of sodium transport system could be presenting change in intracellular pH that could then trigger other events and culminate in increased vascular tone (Weinberger, 2003).

Systemic Vascular Resistance

Blood vessel as a complex vascular organ with smooth muscle layers that have dynamic responses, and autocrine organ with receptors of a variety of vasoactive substance as well as being the site of production of factors such as endothelin (Weinberger, 2003). This part was explanations about why some antihypertensive drugs, were developed empirically with little or no understanding of how they worked, lower blood pressure. Sodium nitroprusside is a relaxant of vascular smooth muscle that used in hypertension treatment for the sophisticated interplay of endothelium and vascular smooth muscle (Weinberger, 2003).

Sympathetic nervous system is a participant in elevated blood pressure in many individuals. Systemic vascular resistance is the determined by the net effect of several factors acting on the blood vessel (Weinberger, 2003).

Cardiac Output

Cardiac output is a major influenced of blood pressure control by factors that also influence extracellular fluid volume and vascular resistance in figure 1.

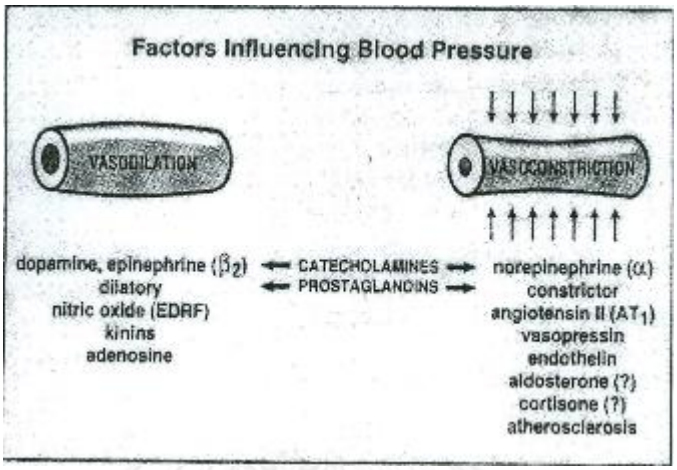


Figure 1: Factors that influence blood pressure

Source: Myron H. Weinberger, 2003

Circulating blood volume is an obvious component of cardiac output. In addition, heart rate and myocardial contractility are major determinant. Essential hypertension has its origins in increased sympathetic nervous system activity and increased cardiac output (Weinberger, 2003). The long-term observation study, show that initially normotensive subjects who developed hypertension could be identified before the rise in their blood pressure by increased pulse rate, also increased plasma norepinephrine levels, and insulin resistance, all manifestations of enhanced sympathetic nervous system activity and responsiveness (Weinberger, 2003).

Classification of blood pressure

The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC) recommends that for middle-aged and older hypertensive patients systolic blood pressure should be the primary target for staging of BP and initiation therapy (Elliott & Black, 2007). Also, hypertension rarely occurs in isolation and is usually present with other context of one or more CVD risk factors. Therefore, the JNC in recommending treatment for hypertension and report recommends some consideration of global risk factor for CVD. For initiation of therapy in clinical

practice guidelines, the conception of an artificial construct designed to assist clinicians and patients with treatment decisions as following table 1.

JNC 7 Blood Pressure Stage	Blood Pressure Range
Normal	SBP < 120 and DBP < 80 mm Hg
Prehypertension	SBP 120-139 or DBP 80-89 mm Hg
Stage 1 hypertension	SBP 140-159 or DBP 90-99 mm Hg
Stage 2 hypertension	SBP ≥ 160 or DBP ≥ 100 mm Hg

Table 1: Blood Pressure Staging System of the Seventh Report of the Joint National Committee on Present, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7)

Source: Henry R. Black and William J. Elliott, 2007

The scheme for classifying BP stages that show in table 2 from JNC VI to JNC 7, the committee elected to change the terminology for BP levels lower than the hypertensive range. Whereas BP < 120/<80 mm Hg had previously been termed "optimal" or it is now termed "normal." While, a new category of "prehypertension" was defined, including individuals with SBP of 120 to 139 or DBP of 80 to 89 mm Hg. Now classified hypertension as having stage 2 hypertension as all individuals with SBP of 160 or higher or DBP of 100 mmHg or higher.

Hypertension in older persons

Faster growing segments of the older population around the world including Thailand and account for the largest share of health care expenditure. In 1990, 13 percent of populations in United Stated were more than 65 years, and by the year 2040 the number of elderly people is expected to grow to 20 percent. Thailand will soon become an aging society. Over the past 20 years, in 1990, Thailand had about four million people aged 60 and over, making up about 7 per cent of the total population. 10 years later, the number of elderly people had risen to 6 million (Institute for Population and Social Research et al., 2007). In 2002, older persons in Thailand increased to 9.4 per cent and final survey in 2007 found this group rose to 10.7 per cent divided into male 49.1 percent and female 50.9 per cent (Institute for Population

and Social Research et al., 2007). By 2020, it will be 11 million, or 17 per cent of the total population of 65 million. Roughly one in six Thais will be 60 or over (Institute for Population and Social Research et al., 2007).

This rapid demography change can be difficult to manage chronic disease and allocate health care expenditure. Hypertension is common in elderly persons and cause of morbidity and mortality. Already, hypertension is the fourth cause of death both male and female in Thailand. Older adults with hypertension experience CVD at a rate two or three times greater than younger persons with the same SBP and DBP. Therefore, significantly elderly also have the greater prevalence of hypertension. Because the incidences of hypertension increase staidly with age, this number will certainly increase with the aging of Thailand population. A loss of elasticity of vascular tissues occurred with age, which contributes to increased vascular resistance and decrease cardiac contractility typically found in older hypertensive patients (Weinberger, 2003). Structural and functional changes in renal capacity, alterations in hepatic metabolism, and changes in sympathetic nerves system activity influence the development of hypertension in older person (Weinberger, 2003). Many older persons have metabolic problems for example, gout disease, DM, and lipid disorders that can be affected by the choice of antihypertensive drug therapy. Furthermore, some studies found the risk of dementia, Alzheimer's and vascular types may be associated with elevated blood pressure (Henry R. Black &William J. Elliott, 2007). Hypertension is clearly a powerful independent risk factor for stroke, heart failure, renal failure, atherosclerotic CVD and cause of death (Henry R. Black and William J. Elliott, 2007).

2.2.1 Leading cause of death and sex in Thailand

Table 2: provided the detail of leading cause of death divided by sex in Thailand during year 2003 to 2010.

Cause of death	2546 -2003	2547 -2004	2548 -2005	2549 -2006	2550 -2007	2551 -2008	2552 -2009	2553 -2010
Total	**610.31**	**629.48**	**635.69**	**624.57**	**624.87**	**628.54**	**620.76**	**645.71**
Diseases of heart	27.74	26.81	28.2	28.38	29.32	29.77	28.96	28.88
Accidents and poisonings	56.89	58.94	57.59	59.77	56.66	55.13	55.63	51.59
Malignant neoplasm, all forms	78.94	81.27	81.39	83.14	84.91	87.64	88.34	91.17
Hypertension and cerebrovascular diseases	34.53	34.79	29.22	24.41	24.29	24.67	24.66	31.42
Suicide, homicide and other injury	14.8	11.74	11.8	11.13	11.48	10.97	10.47	11.09
Diseases of liver and pancrease	13.03	11.98	14.57	14.37	13.92	13.82	13.49	13.8
Pneumonia and other diseases of lung	23.94	26.33	22.42	21.98	22.53	23	22.92	25.7
Nephritis, nephrotic syndrome and nephrosis	19.24	18.58	20.24	20.57	21.51	22.52	20.79	21.61
Tuberculosis, all forms	10.97	9.72	8.9	8.33	7.72	7.63	7.2	7.01
Human immunodeficieney virus (HIV) disease	26.84	18.35	12.78	10.46	8.77	7.41	6.38	5.71
Others	303.39	330.96	348.58	342.02	343.76	345.97	341.93	357.75

Table 2: Leading cause of death and sex (death rates per 100,000 population), Thailand 2003-2010

Source: The Office of the Permanent Secretary for Public Health, Ministry of Public Health, Thailand

Cause of death	2546 -2003	2547 -2004	2548 -2005	2549 -2006	2550 -2007	2551 -2008	2552 -2009	2553 -2010
Male	**711.47**	**727.39**	**734.5**	**720.76**	**715.48**	**718.79**	**712.45**	**742.02**
Diseases of heart	31.08	30.45	31.89	32.44	32.84	33.65	33.53	33.86
Accidents and poisonings	92.08	92.74	91.85	94.22	88.42	85.95	86.56	82.3
Malignant neoplasm, all forms	92.47	94.88	96.18	97.75	100.15	102.83	104.55	107.29
Hypertension and cerebrovascular diseases	**38.98**	**40.85**	**34.17**	**28.1**	**27.97**	**28.3**	**28.57**	**36.18**
Suicide, homicide and other injury	24.17	19.2	19.51	18.76	19.15	18.11	17.27	18.49
Diseases of liver and pancrease	18	16.67	20.72	20.27	19.81	19.56	19.25	19.6
Pneumonia and other diseases of lung	28.62	31.27	26.64	26.28	26.5	27.17	27.16	30.42
Nephritis, nephrotic syndrome and nephrosis	19.1	18.63	20.06	20.81	21.7	22.78	20.75	21.52
Human immunodeficieney virus (HIV) disease	34.09	23.84	16.49	13.69	11.26	9.34	8.32	7.39
Others	317.55	344.92	364.17	356.65	356.62	360.05	356	374.76
Female	**510.89**	**533.59**	**539.27**	**530.79**	**536.63**	**540.72**	**531.65**	**552.26**
Diseases of heart	24.46	23.25	24.6	24.43	25.89	25.99	24.52	24.06
Accidents and poisonings	22.3	25.85	24.16	26.2	25.74	25.15	25.58	21.78
Malignant neoplasm, all forms	65.63	67.95	66.96	68.89	70.06	72.86	72.58	75.53
Hypertension and cerebrovascular diseases	**30.16**	**28.87**	**24.38**	**20.8**	**20.7**	**21.14**	**20.86**	**26.81**
Suicide, homicide and other injury	5.59	4.44	4.28	3.7	4.01	4.03	3.85	3.9
Diseases of liver and pancrease	8.15	7.39	8.56	8.63	8.19	8.24	7.9	8.16
Pneumonia and other diseases of lung	19.34	21.48	18.31	17.79	18.67	18.95	18.79	21.11
Nephritis, nephrotic syndrome and nephrosis	19.37	18.53	20.42	20.34	21.33	22.26	20.82	21.69
Tuberculosis, all forms	6.68	5.58	5.07	4.94	4.46	4.3	4	3.9
Human immunodeficieney virus (HIV) disease	19.72	12.98	9.16	7.31	6.35	5.53	4.48	4.08
Others	**289.48**	**317.28**	**333.36**	**327.76**	**331.23**	**332.27**	**328.26**	**341.23**

Table 3 : Leading cause of death and sex (Death rate per 100,000 population), Thailand 2003-2010 (Cont.)

Source: The Office of the Permanent Secretary for Public Health, Ministry of Public Health, Thailand

2.2.2 An others study

2.2.2.1 Other study that related with this research is Knowledge, awareness, behavior (KAB) and control of hypertension among urban elderly in Western China, 2009. The aim of this research is to explore KAB and also control urban elderly's hypertension within two cities - Xi'ning and Chengdu (Xinping Zhang et al, 2009). The method of study is the researcher used 2-stage sampling for recruited the subjects (total 4,141) from 20 communities. In addition, they used a mercury sphygmomanometer, KAB questionnaire and other factors though face – to – face structured as a control blood pressure measurements for control elderly blood pressure. The results of this study recommended that all of participants keep awareness about their hypertension. Among these (32.1 %) had controlled blood pressure (BP<140/90 mmHg) and near half (48.2 %) had treatment and controlled blood pressure. Furthermore, this study showed a high proportion of hypertension populations had adequate knowledge on complication when compare to knowledge about HTN risk factors. The subjects who had controlled blood pressure were more knowledge about threshold, complications and risk factors of hypertension. Therefore, this study can scaling up patents with hypertension awareness, also they took medications and blood pressure measurements on regular basic with more inclination (Xinping Zhang et al, 2009).

2.2.2.2 Interesting research about hypertension management in the elderly at community, the study from C Jones, SH Simpson, D Mitchell, et al. The objective of this study is to improve public and health care provider awareness and management of hypertension by using a community based management as a name of "The Airdrie Community Hypertension Awareness and Management Program" (A-CHAMP). They trained volunteer peer health educator to manage BP screening at community (local pharmacies). The researchers recruited participants who have high blood pressure higher than SBP 159 and DBP 99 mmHg from their local pharmacies. Volunteer peer health educator identified the subjects that involve in the programs' cardiovascular risk factors. Participants assessed blood pressure with a validated automated device and management algorithm. All of subjects have elevated BP at the first time of initial this program and were invited to return to a follow up this program next four to six

months later. Study's finding found one third of participants (36.5%) had elevated blood pressure at the first time of implemented the program. Among these (71%) returned to follow up next four to six months later. More than half (56%) of subject reached targets for blood pressure. The mean (±SD) SBP decreased by 16.9 ± 17.2 mmHg compared with the first time of subjects visit. Therefore, this program can sustained improvement awareness, identified, and also managed aging with hypertension in Canada (C Jones et al, 2008).

2.2.2.3 The study from Stanford Center for Research in Disease Prevention and the Department of Medicine, Stanford University School of Medicine Stanford, CA by Stephen P. Fortmann et al. This study implemented the program for evaluate the effects of a community-wide health education program on cardiovascular risk factors, including blood pressure in two cities and in two of the three control cities in USA. The researcher team used the mass media, various community-based programs, and health professionals, to scaling up the participants to learn their blood pressure levels, stay in the care of a physician if hypertensive. In addition, the goal of this study tries to achieve to reduce weight, reduce intake dietary sodium, and also exercise regularly. Furthermore, physicians were encouraged to follow national hypertension treatment guidelines and were provided with a range of patient education materials. The results showed BP in intervention cities exhibited an overall SBP decline of 7.4 and 5.5 mmHg and also DBP decreased 5.0 and 3.7 mmHg. These declines changes between the treatment and control cities ranging from −1.1 to −3.8 mmHg. However, the subjects' magnitude change is not large. The results are significant from a public health perspective because they reflect changes in the overall community (Stephen P. Fortmann et al, 1990).

2.2.2.4 Other study from Hiroyasu Iso et al, in the year 1995. *This study recruited participants who* had no evidence of hypertensive end-organ defects. Then, they had screening blood pressures of SBP 140 to 179 mm Hg and/or DBP 90 to 109 mm Hg. But no difference in mean blood pressure between groups (148 to 150 mm Hg for mean SBP and 83 to 84 mm Hg for mean DBP). *Range of participants aged 35 to 69 years. The treatment group* took four education classes in the first 6 month and four classes during the next year. While, the control group took only two classes. *The*

aim of health education focused on reduced dietary sodium and increased milk intake, brisk walking, and, if necessary, reduction of alcohol and sugar intakes. The findings of this study recommend that *a*ntihypertensive medication was started less often in the treatment than in the control group at 1.5 years. Mean SBP was 5 to 6 mm Hg less in the treatment than in the control group at both 6 months and 1.5 years ($P<.05$). DBP and body mass index did not change significantly between groups. While, urinary sodium excretion declined in the treatment but not in the control group. However, the results of behavioral questionnaire showed sodium reduction and milk increase were greater in the treatment than the control group through time of the study. While, mean score of ethanol intake was reduced in the treatment group but not the control group at the end of this study. Therefore, the community-based hypertension control program was effective in reducing SBP levels by not used medication means during the first 6 months and maintaining the reduction for 1.5 years (Hiroyasu Iso et al, 2012).

2.2.2.5 Robert H. Schneider et al, study about stress reduction for hypertension control among older African Americans in 1995. The aim of this study is to test the short-term efficacy and feasibility of two stress education approaches with mild hypertension among older African Americans, in a primary care, inner-city health center. The researcher team screened 213 African American both male and female. Then, 127 participants aged 55 to 85 with DBP of 90 to 109 mm Hg, SBP of ≤189 mm Hg, and final baseline BP of ≤179/104 mm Hg were recruited. They used transcendental meditation and progressive muscle relaxation as mental and physical stress-reduction approaches for implemented to compare with a lifestyle modification education control program and with each other. The outcomes of measure found this program can changes in clinic DBP and SBP from baseline to final follow-up. Mental and physical stress-reduction patterns efficacy in reducing mild hypertension among older African Americans (Robert H. Schneider et al, 2008).

2.3 Community based health education Theory

Whit in this part has two purposes. The first part is to introduce to community based health education theory. Five commonly used theories contains a description of each theory were reviewed. The final part is offered with the details of method to teaching with group for improving health education program.

Griffiths, 1972 (cited in Karen Glanz et al., 1997) argued health education attempts to close the gap between what is known about optimum health practice and actually practiced. While, Simonds, 1976 (cited in Karen Glanz et al., 1997) defined health education as aimed at "bringing about behavior changes in individuals, groups, and larger populations from behaviors that are presumed to be detrimental to health, to behaviors that are conducive to present a future health." One strongest theory of health education is the Health Belief Model (HBM) this model was one to encourage people to take action toward positive health. Due to HBM model emphasizes the role of perceptions of patients to an illness and also the potential effectiveness in treatment, consideration which individuals' perceptions that they are vulnerable to illness that threatens their health. The goals of this model action on the part of individuals that could prevent the threat and eliminate possible illness.

Concept	Definition	Application
Perceived susceptibility	One's opinion of chances getting a condition	Define population at risk, risk level Personalize risk based on a person's characteristics or behavior Make perceived susceptibility more consistent with individual's actual risk
Perceived severity	One's opinion of how serious a condition and its squeals are	Specify consequences of the risk and the condition
Perceived benefits	One's opinion of the efficacy of the advised action to reduce risk or seriousness of impact	Define action to take: how, where, when; clarify the positive effects to be expected
Cues to action	Strategies to activate one's "readiness"	Provide how to information, promote awareness, employ reminder system
Self-efficacy	One's confidence in one's ability to take action	Provide training, guidance in performing action Use progressive goal setting Give verbal reinforcement Demonstrate desired behaviors Reduce anxiety

Table 4: Key concepts and definitions of the health belief model (HBM)

Source: Karen Clanz, Frances Marcus Lewis and Barbara K. Rimer, 1997

Perceived Susceptibility

Perceived susceptibility addresses to measures an individual's subjective perception of their contracting a health condition (Karen Glanz et al., 1997). For the patients who got the medicine this model need to established illness, and formulated individual's acceptance of the diagnosis, personal estimates of re-susceptibility, and also susceptibility to illness (Karen Glanz et al., 1997).

Perceived Severity

The dimension of perceived Severity concerning the seriousness of contracting an illness or leaving it untreated patients. Perceived severity includes evaluation of medical and clinical consequences such as morbidity, pain and death and concerning with social consequences also (Karen Glanz et al., 1997). Social consequences example, effects of condition to work, family life, and social relations. Both susceptibility and severity has been labeled with the "Perceived threat" (Karen Glanz et al., 1997).

Perceived Benefits

Although susceptibility to a perceived threat condition also believed to be serious dimension produces a force leading to be behavior, especially action taken will depend upon beliefs regarding the effectiveness of the various available actions in reducing the disease threat, therefore, termed the perceived benefits of taking health action (Karen Glanz et al., 1997). Another factor includes non-health related benefits for example, stop to smoking to save money or getting a mammogram to please a family member. Therefore, the individual exhibiting an optimal level of beliefs in both susceptibility and severity would not be expected to accept any recommended health action unless that action were perceived as potentially efficacious (Karen Glanz et al., 1997).

Perceived Barriers

Negative aspects of health action, the perceived barriers, may act as impediments to undertaking the recommended behavior. A kind of non-conscious cost-benefit analysis occurs, however, the individual weighs the action's expected effectiveness against perceptions that it may be expensive, dangerous, unpleasant, inconvenient,

time consuming, and so forth (Karen Glanz et al., 1997). Thus, the level of susceptibility and severity provide the energy or force to act and the perception of benefits provide a preferred path of action Rosenstock, 1974 cited in (Karen Glanz et al., 1997).

Cues to Action

Another dimension of HBM focused on the concept of cues that trigger action. As Hochbaum, 1958 (Karen Glanz et al., 1997) discussed that the readiness to take action (perceived susceptibility and perceived benefits) could be potentiated only other factors and cues factor such as bodily events and environmental events such as media publicity can instigate action. However, the study role of cues found cues action may ultimately prove to be important. Indeed, the concept of cues still is not clear, it has been difficult to study in explanatory surveys; cue might be as fleeting as conscious perception of a poster (Karen Glanz et al., 1997).

Other Variables

Other variable that will be affects with HBM such as demographic, socio-psychological, individual's perceptions and indirectly influence health-related behavior (Karen Glanz et al., 1997). Especially, socio-demographic factors such as educational level are believed to indirect effect on behavior by influencing the perception of susceptibility, severity, benefits, and barriers (Karen Glanz et al., 1997).

Self –Efficacy

Bandura (1977) suggested the concept of self-efficacy, or efficacy expectation as distinct from outcome expectation which Bandura believe must be added to the HBM for increase to explanatory power. Bandura defined outcome expectation as a person's estimate behavior will lead to certain outcomes, is similarly to HBM concept. Besides, Bandura defined self-efficacy as "the conviction that one can successfully execute the behavior required to produce the outcomes." However, from Bandura point of view lack off efficacy as a perceived barrier to taking a recommended health action.

Summary, HBM developed to explain health related behavior, focused on cognitive variables (Karen Glanz et al., 1997). This theory try to changes cognition about health

matter, but have often involved attempt to arouse individual's fear through threatening messages Leventhal, 1970 cited in (Karen Glanz et al., 1997). In order to protection motivation the theory (Rogers & Maddux, 1983), most persuasive communications are those that arouse fear and enhancing perceptions central to the HBM of the severity of the event, its likelihood of exposure to the event, and also the efficacy of responses to that threat (Karen Glanz et al., 1997). However, (Rogers & Maddux, 1983) also incorporated self-efficacy into his theory due to use this view to joint role of fear and reassurance in persuasive communications is generally accepted (Karen Glanz et al., 1997).

2.3.1 Theory of Planned Behavior (TPB)

This theory focus on theoretical constructs concerned with individual motivation factors as determinants of the likelihood of performing a specific behavior. Also, the assumption of the theory of planned behavior is based on behavior or the intention to behave in a certain way that determined by the individuals' attitude toward the behavior, subjective norms, and perceived behavior control over performance of the behavior (Robert J. Bensley and Jodi Brookins-Fisher, 2003). If the individual perceives that a given outcome will be a positive experience cause of positive viewed by others, therefore, not difficult to perform the person is more likely to exhibit that behavior.

Behavior change needs health educator to identify what a person's intension is regarding performing a prescribed behavior. Health educator could be done by identifying as following;

1. Attitude toward behavior such as why individual wish to perform the behavior and what expectation, both positive and negative behavior held regarding
2. Subjective norms for example, what others will think about behavior
3. Perceived behavioral control as, how difficult it will be to perform and maintain their behavior

However, if inventories of the individual's intentions are positive, there will be a better chance individual will perform the intended behavior.

The main construct of this theory is the concept of reasoned action. An individual needs to reason or critical thinking about an intended behavior. They call this process is a cognitive process discovering or finding reason.

2.3.2 Transtheoretical Model and Stages of Change

Source of this model occurred from a comparative analysis of leading theories of psychotherapy and behavior change. The stage of change model based on the assumption that behavior change is a process of and individual are level of motivation or readiness to change. Therefore, people at different stages in the process of change can benefit from different interventions. The important stage of changes is represents a temporal dimension used for a desired outcome are not generic due to individuals are not always at the same stage of readiness. The assumption of this model is people may relapse to a previous stage. Also, this model conceives behavioral change as a process involving progress through a series of five stages as following;

1. Precontemplation stage is characterized by people not interested to take action in changing behavior for example, smoker who are no intention to stopping in the next six months (Robert J. Bensley and Jodi Brookins-Fisher, 2003). People may be in this stage unaware of risk associated with their behavior because they are uninformed or underinformed about the consequences of their behavior (Karen Glanz et al., 1997). Both groups of uninformed and underinformed tend to avoid reading, talking, and thinking include denial, ignorance, or demoralization about their harm behavior.

2. ***Contemplation*** this stage the individual becomes aware that a personal problem therefore, they considers behavior change in someday such as smoker know that smoking is worth for their health and are considering quitting at some time but are not yet to stop to do so (Robert J. Bensley and Jodi Brookins-Fisher, 2003). Karen Clanz et al, characterize this phenomenon as a chronic contemplation procrastination.

3. ***Preparation*** in this stage people intend to take action in the immediate future. Individual preparing for and experimenting with behavior change such as joining a health education class, talking with their physician or consulting a counselor but lack

of self-efficacy to actively engage in the process. For example, smoker intends to stop smoking with in next month.

1. ***Action*** which stage individual have actively engaging in the behavior change process. People must attain to the criterion that professionals agree to sufficient to reduce risk behavior that cause of disease such as reducing daily smoking (reduce cigarette consumption) in order to stop it.

2. ***Maintenance*** is a stage of sustaining the behavior change over time. Individual work to prevent relapse. For example, ex-smoker who have been sustaining change for six months without release.

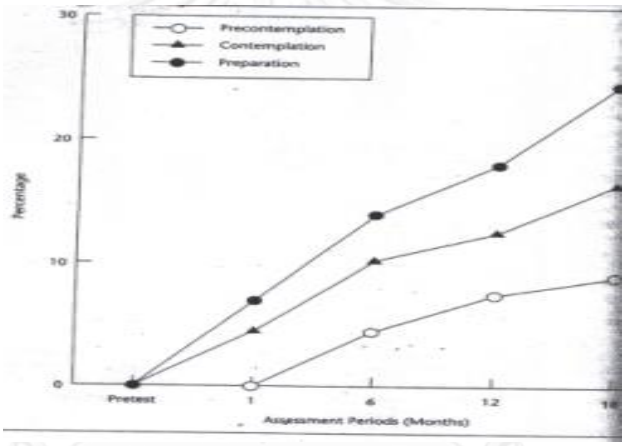


Figure 2: Show Point-Prevalent abstinence by stage of change
Source: Karen Clanz, Frances Marcus Lewis and Barbara K. Rimer, 1997

Summary, the individual in this model move through many stages in their try to change behaviors.

2.3.3 Social Cognitive Theory

Social Cognitive Theory is one of the most famous among health educators. Glanz and Rimer (cited in Robert J. Bensley and Jodi Brookins-Fisher, 2003) said that “in social learning theory, human behavior can explained in terms of a three-way” as following;

1. dynamic
2. reciprocal theory in which personal factors
3. environmental influences and behavior continually interact

The basic concept of social cognitive theory is that an individual not only learn about their own experiences, however they also observing the actions of others and the results of another person action. This theory consists of six concepts as following;

1. ***Reciprocal determinism*** explained that behavior changes can determined from an interaction between a person and their environment. The environment have influence a person in a healthy way. In the other hand, people can influence the environment so that it is more conductive to a healthy lifestyle such as some persons may experience environmental factors that are supportive of healthy, while other may not. If they are have negative, it may be necessary to change environment for provide opportunities for choosing healthy activity.

2. ***Behavioral capacity***, this concept focused on capability of perception of individual to change a behavior by providing the knowledge and skills to enact a desired behavior. Education is necessary to learn about healthy activity. While, skills also need to be developed.

3. ***Expectations*** means what a person expects as a result of modifying behavior. In other word, what they think the payoff will be. This is referred to as the positive value of the desired behavior. In expectation component would include expectations of improved physical appearance, becoming more physically fit, having more energy, and also being more disciplined. This is important early in a program before a person experiences results. Individual goals that are accomplished become rewards and are considered pleasurable.

4. ***Reinforcement*** is the response to a person's behavior that will increase the continuance behavior. Positive reinforcement would be experienced in how individual feel about the way they look and feel. Reinforcement of their expectations can motivate them to continue with the program.

5. ***Self-efficacy*** based on believing that individual has ability to take action and persist in one's pursuits. Accomplishing obtainable goals establishes individuals' degree of efficacy. A person who fails to accomplish predetermined goals become failed attempts cause of self-defeating behavior.

6. ***Observational learning*** is ability to learn by observing other. The person can observe success as well as failure and positive or negative effect of results.

2.3.4 Diffusion of Innovation Theory

Diffusion is defined as “the process by which an innovation is communicated among members of a social system” Roger, 1993 cited (Karen Glanz et al., 1997). The word ***differ*** refer to integrate, distribute or spread widely. While, ***innovation*** mean something that is new or different. If we applied this theory to health education-diffusion of innovation means an integrating innovation ideas, products, or programs that have proved to be successful into health education initiatives (Robert J. Bensley and Jodi Brookins-Fisher, 2003). Material for a new program are developed, innovation ideas and methodology become available that can improve the delivery of health education. This theory provides a process for disseminating and implementing innovations considered both individual and group change. The assumption of this theory has that widespread adoption and uptake of an innovation occur automatically.

2.3.5 Teaching with group

A group teaching is one of method for teaching a variety of topics in health promotion and health education. Teaching with group with the increased focus on self-management of chronic disease due to groups are often an effective way to deliver education. The advantage of groups can offer an opportunity for enhanced learning due to the member can sharing of information, brainstorming of their ideas and shared thinking, solution of health related issue and also challenging of assumptions and myths held by individual member. Groups can be establish any size from two on up, and the techniques of teaching will vary with the topic, type of group and size (Arlene J. Lowenstein, 2009).

Teaching Techniques

Teaching technique is very important to teach group at an appropriate level due to groups comprised of variety member age such as aging people, adolescents or children will be require different technique. In addition, a person learns better by doing than they learn by listening or lecture. When teaching about health behaviors, it is helpful to have members practice the skills we need them to develop and practice them in the context in which they are to be used (Arlene J. Lowenstein et al, 2009).

Successfully to teaching with groups need a skill that take knowledge of many aspects of process and group dynamics. Health educator should try to establishing trust an open with honest and routine is important for effective group function (Arlene J. Lowenstein, 2009).

2.3.6 An Others Study

2.3.6.1 The study that related to community health education by Yeon-Hwan Park et al, in 2011. The objective of the research is to examine the effectiveness of health aging and happy aging program that integrated community health education and exercise program for older adults who sick with the hypertension. The researchers randomly all subjects from one senior center for allocated to both treatment and control groups. The program of control hypertension consists of health education, tailored exercise and individual counseling for 12 weeks was implemented for intervention group. But other group has not. Topic of 12 weekly education sessions consists of week 1: introduction (no health-related activities), week 2: definition and symptoms of hypertension, week 3: the complication of hypertension, week 4: medication, week 5: checking blood pressure, week 6: diet, week 7: exercise, week 8: stress management, week 9: emergency care, week 10: smoking and alcohol, week 11: self- management strategy, week 12: program evaluation. The finding showed the systolic blood pressure of treatment group was significantly decreased compare with control group. Moreover, the scores of self-efficacy, exercise, vitality, general health, mental health and social function of intervention group were statistically higher than control group. Finally, this program was effective for control systolic blood pressure and also improving older adults with hypertension self-efficacy (Y.-H. P. e. al., 2011).

2.3.6.2 One health education program interested study from Maisha Douyon, et al, in Boston, Massachusetts, USA. The purpose of this study is provided free access to a program, organized physical activity combined with health education for adolescent girls after school program with low income families in order to reduce high risk behavior and strengthen schools, families, and community as a name of the GirlStars Program. They implemented this program in 2 public housing sites. The subjects met each week for 2 hour. The first hour dedicated to physical activity and second hour dedicated to health education. This program led by a resident assistant and the project coordinator. The results of this study showed that GirlStars program

can increased participants health knowledge, decision making, self-confidence, and skills. However, the rates of participants were low from factor that affected participation included lack of community support, safety concern, attrition in staff, interpersonal conflicts, and also conflicts with other activities (Maisha Douyon et al., 2010).

2.3.6.3 Interesting health education at the community based is the study about church-based education for African Americans with hypertension. The researcher provided the education outreach demonstration study for participants with high blood pressure in order to control their blood pressure at the church by registered nurses (RN) as a Church Health Educators (CHE). This study divided into two phases. Phase 1 - RNs were prepared the CHEs. For phase 2 – CHEs was taught the participants. The intervention program consists of bases of high blood pressure and high blood pressure management strategies were taught in eight 1-hour sessions. Major findings found subject was a significant increase in knowledge scores from start the program, intermediate, and post implemented the program. While, education, age and number of years with high blood pressure explained 49% of the variance associated with high blood pressure knowledge; SBP and mean arterial blood pressure significantly decreased from pretest to posttest1 and end of the program. Also, DBP significantly decreased from pretest to posttest1 only and the relationships were found among social support and DBP, and social support and MAP. Health education outreach program scaling - up their hypertension knowledge (Eva D. Smith, Sharon L. Merritt, & Minu K. Petel, 2010).

2.3.6.4 Other study from China related with health education at the community based is the study about: a health education in community-based study on the effect of nursed-led hypertension KAP Intervention. The objective of this research is to evaluate the knowledge, attitude and behaviors of community dwelling people towards to hypertension, and to evaluate the feasibility and effectiveness of a community-based intervention program in providing suggestion for nursing intervention. The researcher a quasi-experimental design to employed the data. In this study divided into three stages – first stage for basic investigation and analysis, in which the result was used to plan community-based intervention. Then, second stage they implemented a primary prevention of hypertension and health education program

within 6 months at the community. The third stage was evaluating effectiveness of the intervention by the change of KAP and blood pressure on hypertension at the start of the intervention and end of this program. Major findings of this study at baseline data showed that community people is unfamiliar to hypertension. More than half (61.0%) of participants were change the rate of awareness in hypertension. However, only one fourth (15.9%) rate of attitude in hypertension was changes. While, one third (32.4%) of the rate of practices in hypertension was changes. Therefore, the results of this study showed that this program is effective at the baseline.

After provided health education, intervention community area has significantly improved in the KAP than the control area. In addition, after provided hypertension health education, there was showed statistical significant between the control and treatment community in KAB. The knowledge level was improved from 61.0 percent to 74.7 percent. The attitude level increased from 15.9 percent to 31.6 percent. The practices level increased from 32.4 percent to 50.1 percent in the intervention community.

2.3.6.5 The research that related with community based health education theory is the study from Marianne C. Forsyth et al, they study about changes in knowledge, attitudes and behavior of women participating in a community outreach education program on breast cancer screening at community based. The main objective of this study is to increase the use of mammography and breast physical examination among older women. The period of provided outreach education program is 1 year and led by the project staff conducted in the community. The results of the study found more than half (68%) of subjects provided identifying data and completed pre- and post-session surveys. In addition, near half (40%) of participants completed a mail survey 6–12 months later. At implemented the program the researchers follow up the subject behavior therefore, screening behavior improved subsequent to the treatment area (Marianne C. Forsyth, 1992).

2.4 Savings studies and current controversies

This part aimed to explore the relationship between health and savings using another study however, focus on the pre- retirement working age though aging people. Several studies find the relationship between savings and health is likely to be simultaneous,

also willingness to save and health may be jointly related. May be positive related to health in that the people desire to save is expected to be correlated with actual savings. As the same time, negatively savings may be related with health in the sense that individual' may choose to invest less in health to save for other forms of consumption as explanations, people may not invest in prevention health measure such as gym memberships for exercise, routine doctor visits, low pesticide products and health supplements to save for other forms of future consumption. However, surprisingly the researcher found few studies of health and savings have in general limited. Therefore, the result of finding of the related studies had shown only seven studies.

2.4.1 Japan saving and aging situations

Japan's saving and investment rates are among the highest in the world and these high rates have played a valuable role (Dekle, 2005). The high saving has provided the funds needed to financial investment and outbreak. For example, investment in plant and equipment during high-growth agriculture. Furthermore, in the Japan the high investment has allowed Japan to incorporate the latest technologies into its production process, and has raised living standard through better public infrastructure, both in cities and in rural areas (Dekle, 2006).

Over the next several decades, Japan's population will be aging rapidly by 2015, 25 percent of the population will be 65 or over. The main purpose of this reviewed is to discusses the impact of demographic change on the Japanese saving balance (Dekle, 2006). Japan aging's population in year 2006 have lower savings rate from 30 percent of the Gross Domestic Product (GDP) to 19 percent of GDP in 2040. Likewise, Japan's total investment rate will decline from 28 percent of GDP today to about 22 percent of GDP in 2040 (Dekle, 2006). Also, given the more rapid decline in total savings in Japan. Furthermore, the trends and fluctuation in Japan saving depend on Japan GDP. Post –war both Japanese private and government savings rates are depicted in Table 5.

Year	Private saving	Government saving	Private investment	Public investment	Not export Supply
1955-73	14	10	17	7	-2
1974-79	26	3	21	9	-2
1980-90	26	5	21	7	2
1991-95	26	5	22	8	2
1996-99	28	2	20	8	2

Table 5: Japanese private and government saving, investment, and net export (in percent of GDP)

Source: Economic and Social Research Institute, Annual Report on the National Accounts, 1999 and 2001 edition cited in Dekle, 2006

Between 1955 to mid-1970s, Japan private savings rate rose steadily that the first peaking in 1978. The literature explained that the most important reason of high private saving rate is rapid economic growth related with oil crises. On the contrary, fall in private saving in the mid-year 1980s to the early 1990s due to robust consumption, stimulated by rising stock and land prices (Dekle, 2006). While, the mid-year 1990s Japan has had risen in private saving again related to the recessionary economy, increased unemployment, uncertainty, and pessimism, all raising precautionary savings. In addition, the literature suggest that the second most important reason for Japan's high private saving rate is the favorable age structure of the population due to early 1070s, the Japan's proportion of the aged over 65 was low, compared with working age population (age range 20-64) (Dekle, 2006). Furthermore, Horioka (1991, 1992) finds that adding dependency ratio to the equation including the level and growth of GDP raise. Therefore, the proportion of private savings rises from 65 to 75 percent in 1991 and 1992. Also, Horioka estimated that a one percentage point increase in the dependency rate was caused the private saving rate to decline by one percentage point (Dekle, 2006). Similarly, he estimated that the 12 percentage point increase in the dependency rate between 1975 and 1998 has decreased private saving by about 12 percentage points (Dekle, 2006).

2.4.2 Savings in Singapore's situations

Singapore requires people to save for their own retirement, which finance their social security systems, unlike most countries in the world (Asher, 1995). The method of saving is monthly deposits are paid both by employee and their employers and must not pay the tax. The institution through which the saving takes place is the Central Provident Fund (CPF). Also, the funds are used to finance a wide range of programs and options including allowing people to purchase homes, pay for health care, purchase life and disability insurance or save for retirement. From the results of this system Singapore reach 85 percent of the population live in home they own, that the highest ownership rate in the world (Asher, 1995). In addition, savings member maintain three accounts with the CPF:

- First account, spend 30 percentage points for ordinary account, which can be used to purchase a home, make certain investments or purchase certain types of insurance.
- Second account, 6 percentage points spend to Medisave account for medical expense
- Third account, 4 percentage points spend to the special account for old age and contingencies

Especially, Medisave account their provide funds for hospitalization during a person's working life and also during retirement. Furthermore, saving members can also join with the Medishield program, which provides catastrophic insurance coverage for medical bills (Asher, 1995).

Financing retirement pensions and health care expenses for the elderly in Singapore

Similarly, other countries in the world – Singapore expected to experience in the number of elderly and the proportion of the population who are aging. In 1990, Singapore have 8.5 percent of population age above 60 year and by the year 2030, will increasing 29.4 percent of the population is expected to be over 60 (Asher, 1995). From these reasons, Singapore's provident fund system, established in 1955 by the colonial government and this system has become the primary system of saving for Singaporeans (Asher, 1995).

How the Central Provident Funds Works?

General features of the fund:

- The accounts belong to individual. Deposits are cooperated with both employee and their employers and current deposits are 40 percent of wages up to 6,000 Dollar Singapore per month without tax.
- Members of CPF get annual account statements. Also CPF allows members check on their accounts' status at any time by telephone. Furthermore, members also can write to the fund at any time for information.
- Foreign workers, part time workers and contract workers are not covered because they are minority of workers will face financial difficulty due to their ability to save for retirement has been extremely limited.
- The accounts are portable, due to CPF remaining with the employee though job transition and the entire deposit belong to the member's estate at death and also account funds may to a limited degree, be share with members of the account holder's immediate family.

Therefore, Singapore is the country that have saving highest rate in the world, the Singapore's government has announced their country have 40 percent of saving followed by rates in Malaysia (22 percent) and Sri-lanka (20 percent) (Asher, 1995).

Components of the system

- Members should maintain three accounts with CPF as ordinary account, Medisave account and special account (40 percent of income).
- CPF used different accounts for different targeted purpose encourages members to spend money on some goods and services.

Retirement income

In Singapore people retired at age 55, when a CPF member reaches age 55, they are permitted to withdraw from the account all money. However, if a member sells this property, they must ensure that the CPF board gets the required minimum amount in cash (Asher, 1995). A member may dispose of the minimum sum in one of three ways:

- Obtain a fixed-term annuity from the CPF board. The board will pay a fixed-term amount to the member beginning at age 60 and can continuing until the account is exhausted
- Obtain an annuity from a private insurance company. The member can purchase a fix-term annuity or any annuity that pay until death from CPF-approved companies
- Place the funds in banks as fixed deposits.

Medisave account

For Medisave account usefully for hospitalization during a person's working life and retirement. The employee was paid 6 to 8 percent of their salary in a Medisave account, with a monthly maximum contribution of 360 dollar Singapore, until the balance reaches 17,000 dollar Singapore. Once that total is reached and maintained, additional contributions are automatically placed in an individual's Ordinary account (Asher, 1995). When members age 55, a minimum balance of 11,000 dollar Singapore must be left in the account pay medical bills during retirement. However, the government has limited to use of Medisave funds to hospital care, for example, members can use Medisave funds for psychiatric care, renal dialysis and chemotherapy but the member cannot use for OPD care, physicians 'fee, outpatient renal dialysis or long-term care. If money of the member runs short, family members can pool their Medisave funds balance to pay a hospital bill, and in some government hospital can allow patient to settle their bills from future Medisave deposit (Asher, 1995).

The Medishield option

Due to most Singaporeans can use their Medisave funds to smaller health care expenditure. Therefore, most accounts are not large enough to cover a catastrophic illness (Asher, 1995). In 1993, only two-fifths of those reaching age 55 had the required minimum Medisave balance (11,000 Dollar Singapore). Therefore, the government response by created the Medishield program in 1990 to provide catastrophic insurance that complements the Medisave program. Also, Medishield is neither need –based nor income-based. The annual premiums vary with age, and also

available to members up to age 70. However, in yearly claims limit of 20,000 Dollar Singapore and a lifetime limit of 70,000 Dollar Singapore (Asher, 1995).

Insurance options

From this program CPF have three types of insurance programs in system.

- First, the Home Protection Insurance Scheme (HPIS) provides required mortgage payment insurance for members purchasing public housing from CPF funds
- Second, the Dependents' Protection Insurance Scheme (DPIS) provides optional term insurance against death or permanent incapacity before age 55
- Third, the insurance provider is Medishield, the catastrophic coverage both scheme.

2.4.3 Village Banking and Maternal and Child Health: Evidence from Ecuador and Honduras

Stephen C. Smith from George Washington University, Washington, DC, USA, studies about health bank and credit only village bank in Ecuador and Honduras in the year 2002 as project name HOPE. Concept of HOPE project concerned of poor families many times cannot afford the nutritious foods, medicines, health services, or environmental conditions they need for protecting their health. As a result, HOPE sought to improve the health status of low-income mothers, and their infants and young children in Ecuador and Honduras, by creating 'village health banks' that combine loans and popular economic education with maternal and child health promotion activities. The results of this studies presents evidence that health practices do not improve automatically with greater wealth. In Honduras, results show that health bank participation is robustly associated with reduced subsequent conditional child diarrhea probability, but in no specification does credit-only bank participation have this effect. While, Ecuador, found a larger effect of credit-only banks. In both countries, health bank participation significantly raises subsequent healthcare over credit-only participation, and at least reduces the tendency to switch from breast-

feeding to bottle-feeding as income rises. However, the effects of health expenditures are ambiguous.

2.4.4 Alleviating poverty through microfinance: Village banking outcomes in Central America

Shon R. Hiatt and Warner P. Woodworth, studies impact of village banking on indigenous families in Central America in 2006. They provide small loans for the unemployed poor and also nongovernment organizations allocate their financial resources. The objective of this study was to observe what impact village banking may have on poverty. Therefore, they measured the socioeconomic and financial status of three groups as following:

1. New clients defined as those who had been in the program for less than a year and were only on their first or second loan

2. Current clients refer to those who had been in the program for more than a year, and

3. Ex-clients defined as those who had been in the program, but later withdrew

The researcher created a field survey instrument that obtained three types of measures:

1. **Socioeconomic criteria** were designed to measure the social impacts of poverty that are often overlooked when conducting economic analyses. Socioeconomic criteria consist of

- Food Security assessed the client's food quality and quantity
- Health measured the client's access to healthcare
- Housing measured the client's living standards
- Education measured the client's children's access to formal schooling
- Empowerment (women only) captured the female client's ability to voice her opinion in the home, receive respect, and take part in family decisions

- Social Capital (women only) measured the client's relationships with her neighbors and her ability to count on them in emergencies including trust, and support (Crowell, 2004).

2. **Daily per capita expenditure (DPCE)**, and

3. **Daily minimum wage equivalent (DMWE)**

These three criteria composed the study's poverty level indicators. The results of socioeconomic and economic findings found no significant differences among New, Current and Ex-Clients in the socioeconomic criteria. In addition, researcher also conducted a one-way analysis of variance test to analyze the economic criteria. Significant differences at the .05 level among the groups were noted in the daily per capita expenditure criterion, and in the daily minimum wage equivalent at the .10 level (Hiatt & P.Woodworth, 2006). Hence, the data indicated that some groups differed in the DPCE and DMWE measurements (Hiatt and P. Woodworth, 2006).

Conclusion, microfinance may have had a positive impact on poverty in the DPCE and DMWE economic criteria. According to economic measurements, Current Clients who have participated in their village bank for more than a year were observed to earn more money daily, and hence, were less poor, than those who had recently joined the microfinance program. Furthermore, this study found the client who stays in the microfinance program improve much more than those who leave (Hiatt and P. Woodworth, 2006). This article provide, microcredit appears to improve the lives of those who are poor by increasing their buying and investing capability, thus lifting them onto a higher economic plane. Accordingly, these small loans seem to positively affect poverty by creating entrepreneurship and greater self-reliance among the poor (Hiatt and P. Woodworth, 2006).

2.4.5 Economic well-being and morbidity of the elderly in Malaysia

Doris Padmini Selvaratnam, Norlaila Abu Baker, and Nor Aini Hj Idris from faculty of economics and Business, Universiti Kebengsaan Malaysia studies about socioeconomic status of the elderly relation to the level of morbidity. In addition, this study is based on a nationwide survey. 10 per cent of elderly total population was interviewed about socioeconomic and lifestyle information. Also self-reporting

methodology was used to obtain the answer from participants. Total elderly participants respondents are 1410 aged 60 and above were interviewed from 4 regions of Malaysia. Finding show that higher morbidity rate lowers once economic well-being.

2.4.6 The influence of individual health outcomes on individual savings behavior

The relationship between health and savings likely to two directions, the first one is good health leads to greater savings another is higher savings allows for wealth accumulation (Comfort F. Ricketts et al, 2013). This study conducted in the year of 2006 by Comfort F. Ricketts, Jon P. Rezek and Randall C. Campbell used data from the National Longitudinal Survey of Youth (NLSY79-2006) and the two stage least squares.

The main objective of this study was to investigate the relationship between health outcome and the willingness of individuals' age 41-50 years old to save focused on individual' actual savings as opposed to their desire to save. Indicators this essay wants to measure health perception (HP), physical component score (PCS), depress score (DS), mental component score (MCS) and the diagnosis of a variety of health problem (DHP) for analyze described as health outcome due to the researchers expected to know the different effects on savings behavior and also considering to a different measure for savings behaviors and willingness to save, which differs from actual savings distinguishes between willingness to save and the ability to save.

Perceived health status is a more subjective health measure that needs to compare to another one; such as, perception health may have a distinct effect on savings behavior. In term of physiological health of individuals, measured of physical component score or diagnoses illnesses, likely has a different effect on individual savings behavior when compared to the psychological health.

The model that predict the relationship between savings and health in this study used a two stage least squares approach (2SLS), and two reduced form equations for willingness to save (WTS) and health outcome (HO) are estimated.

$$WTS = \beta 0 + \beta 1 HOi + \beta 2 HOx\ Fi + \beta H\ Hi + \beta EEi + \beta D\beta i + \varepsilon 1$$

$$HO = \varphi n + \varphi 1 WTSi + \varphi HHi + \varphi EEi + \varphi DDi + \varepsilon 2$$

Both WTS and HO are the willingness to save, and health outcomes, respectively. And the data for analysis started from the year 2006 wave of the National Longitudinal Survey of Youth (NLSY79-2006), total survey of 12,686 both men and woman ages between 14 to 22 years old of first surveyed in 1979. Annual qualitative interviews were conducted in 1979 and 1994; and also subsequent interview have been employed biannually. However, the NYLS79-2006 were choose for this analysis due to it includes of individual' responses to a question focused to asking how much they would save if they sold an item for $10,000. The strongest of this data is unique because it captures an individual's willingness to save (WTS) habits more precisely than how much the person has been able to save. According to, WTS represents savings preference therefore; it is an important measure, which drives the actual savings of individual.

This finding of this study found there are different of health outcome between woman and men on the willingness of individual to save. Nevertheless, better health perception is positively related to willingness to save as same as higher physical and mental component score. While, diagnosed of major health problems and higher depression score are associated with a lower willingness to save. When asking about healthier individuals expecting longer lives and therefore, being more willing to save for retirement. In addition, this study recommended that improving the health status of individuals between ages 41-50 years old have important implications furthermore, the results suggested that woman in better mental and depressed score have a lower willingness to save but is not significantly related to male willingness to save.

2.4.7 Can village savings and loan groups be a potential tool in the malnutrition fight? Mixed method findings from Mozambique

Malnutrition has wide-ranging consequences worldwide and also poor maternal and child nutrition is the underlying cause of approximately 45% of child death (Aurelie Brunie et al, 2014) including this problem is a pervasive problem in sub-Saharan Africa that effect both individual and national developments. Therefore, Brunie et at, 2014 want to examines the impact of participation in village savings and loan (VSL) groups, alone and in combination with a rotating labor scheme named Ajuda Mutua or

AM, on household level and child nutrition outcomes located at Nampula Province in Mozambique country.

The study employed both quantitative and qualitative for finding an impact evaluation and exploration of the dynamics underlying nutrition outcomes. Three pair of districts was randomly allocated to two interventions (VSL or VSL + AM) or control group for longitudinal design in total 1,276 household surveyed of baseline data started in the year 2009. Difference in predisposition score matching model used to estimate programe impacts on months of food sufficiency and household dietary diversity score (HDDS) at the household level and on the individual dietary diversity score (IDDS) and also weight-for-age at the child level. In depth interview were use to completed the qualitative data with a subset of 36 VSL and 36VSL + AM participant in two district areas. Then transcripts used to analyze by using thematic analysis method in capturing the intricacies of meaning within a data set.

Survey data set found both interventions had a statistically, positive effect on months of food sufficiency. In addition, the HDDS was increased for VSL+AM households and their matched control group; however, the increase was smaller. But the difference in increase between the both groups was statistically significant. For child level of participation only VSL, the researcher was found it increase the IDDS. However, there was still no significant effect for weight-for age. While, mean values for two groups of the IDDS and HDDS remained low. Also, IDIs still confirmed that there were improvements in transitory and seasonal food insecurity during recurring periods of extreme scarcity. Due to the timing of the cycle, VSLs was provided subjects with an infusion of cash to purchase food among the hunger season. The mechanism of both AMs and VSLs used to cope with unexpected event through social support and loans. While, IDIs focused lack of money as a persistent challenge in access to food supplement home-grown staples for a diversified nutritional intake. Although, all parents to be realizing of the nutrition needs of children however, they faced financial obstruct in meeting them.

This study point out the potential of economic-strengthening activities such as VSLs can improve nutrition outcomes. Since the hunger season and economic constraints are occurred pervasive challenge to food security in rural areas of sub-Saharan Africa.

In addition, study finding also shown chronic dietary shortcomings related to persistent financial shock challenges and intra-household dynamics, and recommend that economic benefits do not automatically translate into improved child nutritional status directly, multi-sectoral strategies that span multiple levels of intervention from children to households and their supporting environment are recommended to solve this pervasive problem.

2.4.8 Savings groups as a socioeconomic strategy to improve protection of moderately and critically vulnerable children in Uganda

The study on savings groups as a socioeconomic strategy to improve protection of moderately and critically vulnerable children in Uganda by Massimo Lowicki-Zucca et al., was focused on analysis to the discussion of socioeconomic strategies for vulnerability reduction and protection of children used data from Statistical analysis of Village Savings and Loan Association Management Information System (VSLAs), 741 VSLAs was supported by the "Sustainable, Comprehensive Responses for Vulnerable Children and their Families" (SCORE) Project during the period 2012-2013, covering 13,327 households enrolled in two phases. First phase started on last quarter in year 2011 to first quarter in 2012 then corresponding second assessment in second quarter of 2013. Statistic Package of Social Sciences (SPSS) is measured to analysis the data.

This section had shown the results of analysis, considering that VSLA approach can be used to utilization for direct targeting of vulnerable members of the community and development, for reduction outbreak. Moreover, VSLA approach can be made more inclusive of the most disenfranchised members of the community without losing in efficiency or effectiveness. Besides, SCORE project data is strongly suggestive of a positive linkage between socioeconomic interventions and protection outcomes thereby emphasize the study.

2.4.9 Situation of saving in Thailand

From the Synthesis Assessment Report of ADB, 2013 found the illustrate of the demand and need for savings products in Thailand as follow;

The purposes of short term savings among Thai people for consumption smoothing and unplanned eventualities. Three fourth or 73% of adults who save indicated that they save for future living expenses. More than half, (68%) of adults who indicated that they put money aside for non-medical emergencies and only 25% of Thai adults who rely on savings to finance the damages caused by natural disasters (Asian Development Bank, 2013).

In term of medical and education saving purposes presented more than half (53%) of adults savers for future medical and only 25% savers for their education expenses.

Meanwhile, the research found that only 26% of Thai adults have long term savings for retirement with 37%of respondents rely on savings when retiring (Asian Development Bank, 2013).

Interestingly, only 17% of farmer indicated that they save for future farming expenses (Asian Development Bank, 2013).

Results of Asian Development Bank reported suggested that low rate of saving among Thai adults. In addition, results from eight studies of the influence of health and savings return a picture of great improvement between health and savings, most intervention provides and extremely shown an excellent saving platform for better health of vulnerable groups.

2.5 Quasi-Experimental design

Design's overview

The word "***Quasi"*** refer to in essence or sort of, therefore, a quasi-experiment is "a sort of experiment."

The design of a quasi-experimental is a type of evaluation which aims to determine whether a treatment or program intervention has the intended effect on a study includes a manipulated independent variable but lacks important control e.g. random assignment. A study used to estimate the causal impact of an intervention on the target group. This research design shares many similar with the traditional experimental design and randomized controlled trial but lack of the element of random assignment. With randomized assignment, subjects have the same chance of

being assigned to given treatment. However, a quasi – experimental design have assignment to give a treatment condition based on something other than random assignment depend on type of quasi-experimental research design. There are many types of quasi – experimental design and some types having different strengths, weaknesses and application. Here, will be argued only two types of these designs – pretest and posttest design and interrupted time-series design that used to examine the research.

2.5.1 Pretest and Posttest Design

This type is a single group of participants will be measured on the dependent variable both before and after give a treatment or manipulation of the independent variable. For example, a group of adolescents who have overweight is given a test of their attitudes toward junk foods. This is the pretest, then two weeks letter, researcher comes to school and present method of reduce junk food program. This is the treatment or intervention phases. Then, in another week, the adolescents are given another test of their attitudes toward junk foods. This is the posttest. However, the problem of this design is that pretest and posttest cannot be absolutely sure that a change in the dependent variable was caused by the manipulation of the independent variable such as something other than the method of reduce junk foods program might have occurred between the pretest and posttest that influenced the adolescents attitudes. It means even possible that having taken the pretest influenced their scores on posttest. One way to solve this problem can be augmented by adding a control group. For example, group of adolescents at another school who are not presented with the intervention group. If a group of no intervention also showed the same change in attitudes, it would not make sense to conclude that cause of change was due to the program. Another method to do it would be to start with a large sample population and then randomly assign participants to either an intervention group or a true control group. A true control groups is better because it can assume greater similarity between control group and intervention group. Also, that a pretest and posttest group with a true control group is an experiment and not a quasi-experiment.

2.5.2 Interrupted Time-Series Designs

The time series is one method for measurements of a variable taken at various points in time. For example, we could measure the moods of the adolescents change attitudes about reduce junk food consumptions in the class each day throughout the semester, and we could see how adolescents' attitudes changed (or did not change) over time. In an **interrupted time-series design**, a time series like this (the dependent variable) is interrupted (usually near the middle) by the manipulation of the independent variable. For example, if the researchers were interested in the effect of the reduce junk food consumption on adolescent's attitudes, they could start measuring adolescents' attitudes each day from the beginning of implementation through end of implementation phase. In analyzing the data, the researcher would want to see whether there was an increase positive attitude shortly after the program implementation.

This design is like a pretest-posttest design but with multiple pretests and multiple posttests. The advantage of this approach is that it provides greater confidence that the change in the dependent variable was caused by the manipulation and is not just a random fluctuation. For example, if adolescents' attitude bounced around from week to week—high some weeks and low some weeks—then the change between Weeks 7 and 8 might just be one of these random fluctuations. However, in fact that adolescents' attitude were consistently and then jumped right after the manipulation to be consistently makes it clear that the jump is not just a random fluctuation. The interrupted time series design also allows us to see how long the effect of the manipulation lasts. Like the pretest-posttest design, the interrupted time series design can be augmented with either a non-equivalent control group or a true control group.

Sometimes, the independent variable in an interrupted time series design is not manipulated; it just changes naturally. For example, research has shown that the number of suicides in the general population increases right after a particularly prominent suicide such as the suicide of a famous person. This has been shown by looking at the number of suicides for several weeks or months before the prominent suicide and then seeing how it changes immediately after the prominent suicide. This design includes no manipulation and also does not include any attempt to control

extraneous variables. Yet if the number of suicides suddenly increases after a prominent suicide, this seems like strong evidence of a causal connection—especially if this same result can be shown after many different prominent suicides.

Advantages of the design

- It can establish a causal relationship and offers the possibility to introduce and control the stimulus
  (i.e., manipulate the independent variable) at a specific time or to the specific groups
- It is the most powerful and least ambiguous test of causal hypotheses
- It can control many confounding extraneous variables
- It is typically easier to set up than experimental design which require random assignment of participants
- This design utilizing quasi-experimental designs minimized threats to external validity as national environments do not suffer the same problems of artificiality as compared to controlled laboratory setting
- Quasi-experiments are natural experiments, findings in one may be applied to other subjects and setting, allowing for some generalizations to be made about population.
- This method is efficient for longitudinal research that involves longer time periods which can be followed up in different environments

Disadvantages of the design

- It is unethical to expose people to a disease to evaluate the efficacy of a treatment
- The interpretation of quasi- experiment is often ambiguous in absence of random assignment
- The control allowed through the manipulation of the quasi-independent variable can lead to unnatural circumstances; although the dangers of artificiality are considerably less relative to true experiments (quasi-experimental designs are often chosen for field studies where the random

assignment of experimental subjects is impractical, unethical, or even impossible).

- Lack of random assignment in the quasi-experimental design method may allow studies to be more feasible, but this also poses many challenges for the investigator in terms of internal validity.
- The deficiency in randomization makes it harder to rule out confounding variables and introduces new threats to internal validity. Because randomization is absent, some knowledge about the data can be approximated, but conclusions of causal relationships are difficult to determine due to a variety of extraneous and confounding variables that exist in a social environment.

If the threats to internal validity are assessed, causation still cannot be fully established because the experimenter does not have total control over extraneous variables.

2.5.3 An others study

2.5.3.1 The study that support the quasi-experiment design from Vietnam by Nguyen QN, et al. They study about the effective of community-based comprehensive healthy lifestyle promotion on cardiovascular disease risk factors in a rural area of Vietnam. This study used quasi – experimental design to evaluated the impact of healthy lifestyle promotion program on CVD risk factors at community-based on hypertension management. A quasi-experimental study employed in two rural communities from 2006 to 2009. In the intervention area, a hypertensive-targeted management was integrated with a community-targeted health promotion. While, no intervention program implement at control area. The health promotion program focused on reducing alcohol consumption, smoking cessation, reducing salty diets, and encouraging physical activity. Repeated cross-sectional surveys in local population aged ≥ 25 years were undertaken to assess changes in BP and behavioral in both community before and after three year of intervention. The major findings found participants' physical inactivity and obesity increased over time during implemented intervention program at the community. However, there was a significant reduction in SBP and DBP (3.3 and 4.7 mmHg in women versus 3.0 and 4.6 mmHg in men

respectively). In addition, the health promotion program can decreased levels of salty diets but had insignificant impact on the prevalence of heavy alcohol consumption and daily smoking.

2.5.3.2 Another study that related with quasi –experimental design is the effects of a walking program among older Chinese American immigrants with hypertension led by Chiang CY and Sun FK from department of nursing, I-Shou University & I-Da hospital, Kaohsiung, Taiwan. The objective of this study is to examine the effects of eight weeks walking program with and without cultural modification. This study used a two groups, pretest and posttest of quasi-experimental design. Finding of this study found the walking program had no significant effects with participant's blood pressure. In addition, the results showed the individuals in the maintenance stage walked longer than those in the preparation stage. Furthermore, demographic data showed that subjects with a lower level of education walked more time per week, which contributed to lower systolic blood pressures among this group as compared with those with a higher level of education.

2.5.4 Health Belief Model Theory (HBM)

Health belief model developed to explain health-related behavior that focused on cognitive variable (Karen Glanz et al., 1997). Also these theory efforts to change cognitions about health matter and attempts to arouse individuals' fear though threatening messages (Leventha, 1970 cited in Karen Glanz et al., 1997). The health belief model components and their linkages are summarized in Figure 3.

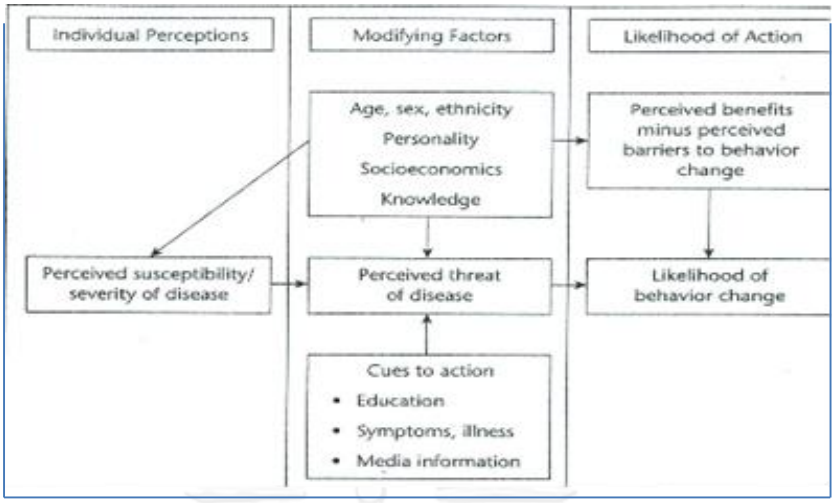


Figure 3: Health belief model components and linkages

Source: Karen Clanz, Frances Marcus Lewis and Barbara K. Rimer, 1997

Components of the HBM

From the survey of Hochbaum can explained HBN model, also this model have a power to extended its application beyond screening behaviors to include preventive actions, illness behaviors, and sick-role behaviors (Karen Glanz et al., 1997). In generally, a person believed that individuals will take action to ward off, to screen for, or to control an ill health condition if the person regard themselves as susceptible to the health condition, also if they believe it to have potentially serious consequences, or they have believe that a course of action available to them would be beneficial in reducing either their susceptibility to or the severity of the condition, and if they believe that the anticipated barriers to taking the action are outweighed by its benefits (Karen Glanz et al., 1997). The definitions in Figure 3 and the following commentary shows in the detail.

CHAPTER III
METHODOLOGY

3.1 Introduction

This chapter described the research methodology that used in the study for investigation. The geographical area where the study was conducted, the study design, the population and sample are also described. Furthermore, the instruments used to collect the data, including method of intervention are explained.

3.2 Research approach and designs

Both quantitative and qualitative methods were employed in this study. A quasi-experimental research design was used for this study over a period of six months. Also, this design was undertaken with the intention of testing null hypotheses. This research used quasi-experimental design to compared pretest and posttest for participants in Sai Mai community (intervention) site. Participants were selected by the stratified sampling selection. This study was divided a group of older adults into three groups. The first group has savings and community based health education focus on hypertension disease. The second group has only community based health education focus on hypertension disease. The third group has neither savings, nor community based health education, is the control group. The intervention was implemented during 6 months, blood pressure and knowledge, attitude, and practices (KAP) of hypertension of older adults were measured at the start of the intervention and after 3, 4, 5 and 6 month, and the results was analyzed. In addition, qualitative methods consist of in-depth interviews, analysis of the content of documents or artifacts, focus group discussions, and participant observation were used after 6 month. The researcher spent time and observed multiple points of view and explain effects of savings and community based health education in older adults with hypertension after 6 months.

3.3 Design overview

The design of this study is quasi-experiment used for the investigation. A quasi-experimental design is an experimental design that does not meet all the requirements

necessary for controlling the influence of extraneous variables and also not meet random assignment of subjects to group (Larry B. Christensen, 2004). In addition, the quasi - experimental design includes both the two experimental and the control groups were used in this study. The basic scheme in figure 4 shows that the experimental groups and the control groups have a pretest and posttest (after the treatment condition is administered to the experimental groups). The difference scores from three groups – pretest and posttest are then compared to determine if a significant difference exists. The design appears identical to the pretest and posttest experimental design.

Quasi-experimental design

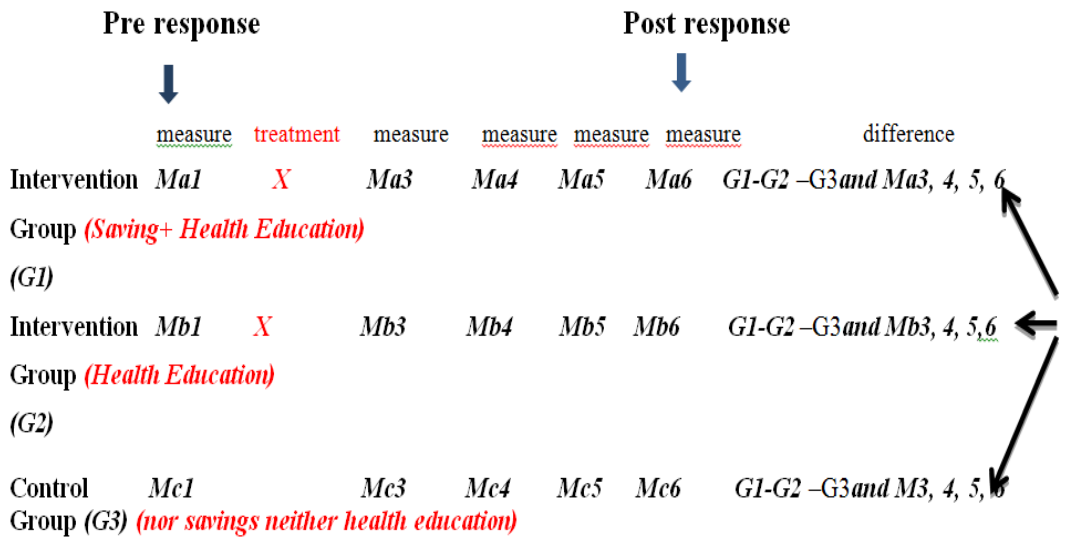


Figure 4: Quasi-experimental design

Consideration of the study design's choice

This design is used in social science research. Quasi-experimental designs are suitable to study a cause-and-effect relationship and when it is possible to introduce the experimental stimuli (www.ehow.com, date August 7, 2012).

3.4 Research Setting

This study was conducted in two areas - Klong Sam Wa district and Sai Mai district, Bangkok province, the Kingdom of THAILAND. Sai Mai district is divided into 3 administrative districts consisting of:

- Sai Mai
- O Ngoen
- Khlong Thanon

The border contacts with:

- North: Lumlukka district, Pathumthani province
- South: Bang Khane district, Bangkok province
- East: Klong Sam Wa district, Bangkok province and Lumlukka district, Pathumthani province
- West: Don Muang district, Bangkok province

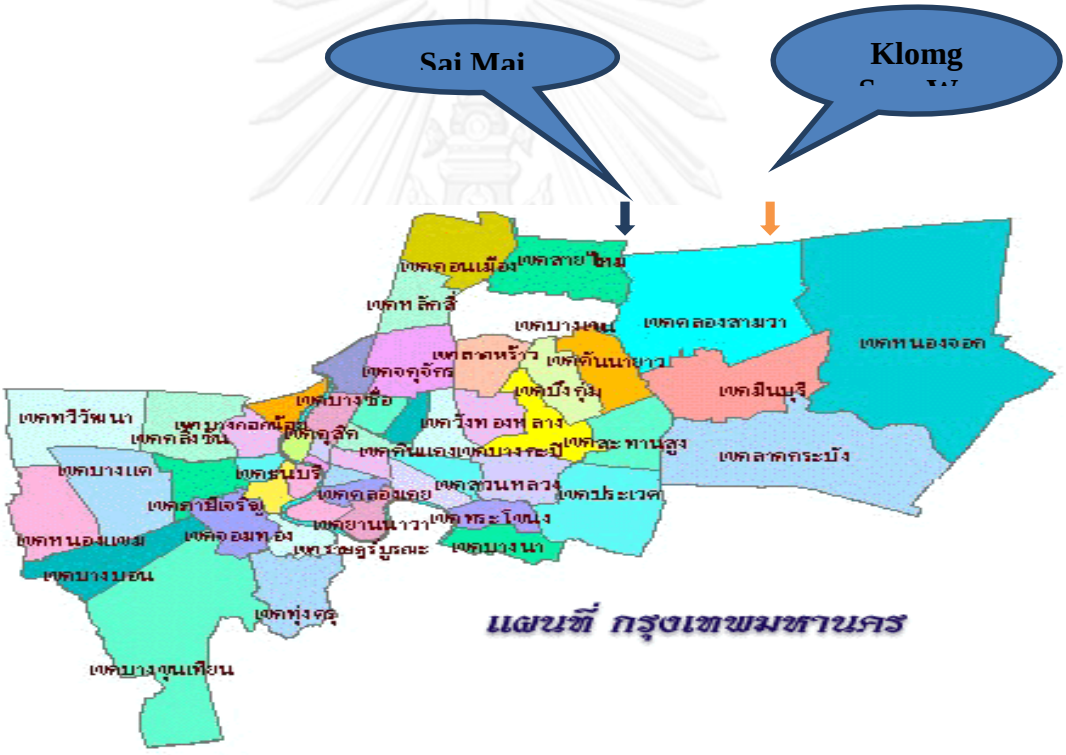


Figure 5 : Map of Bangkok province showing the research sites (Sai Mai and Klong Sam Wa district)

Source: www.google.com, date August 28, 2012

The total population of Sai Mai district is 178,637. Klong Sam Wa district has a population of 165,352 and 64,594 households. The majority of population in Sai Mai district is Thai.

Figure 6: Map of Sai Mai district showing the research intervention sites

Source: www.panteethai.com, date August 28, 2012

Sai Mai district was chosen to carry out the study of the intervention program. The district is located in the Bangkok province, central region of Thailand. The main groups are Thai. The same is valid for Klong Sam Wa district. While, Klong Sam Wa district is control setting.

3.5 The Study Population and Sample

The study population consisting only of people aged 50 - 60 years old. Simple random select samples of 44 subjects (in the two intervention groups) were selected from Sai Mai district. After implementation the subjects in group I of experimental study was drop out three people, together with group II of experimental was drop out four people. The selected sample of the control group 22 subjects was selected from Klong Sam Wa district. The sample sizes of 59 older adults were the total subjects to participate in the research and who met the sampling criteria during the six months period of data collection.

3.5.1 Inclusion criteria of group I:

The subjects included in the sample were selected with specific criteria as follows:

- Working Older Adult (male and female) 50-60 years
- Adults diagnosed with hypertension and taking medication but not regularly controlled for blood pressure (use data from medical record) or adults of stage II of hypertension
- Basic literacy skills
- Regular attendance at the Sai Mai Community saving fund (One Baht a day)
- Willing to participate and have the ability to pay

Exclusion criteria:

- People (male and female) unable to live and stay in this location during this 6 month's study
- Unable to communicate
- A person (male and female) who is not allowed to exercise

3.5.2 Inclusion criteria of group II:

The subjects included in the sample were selected with specific criteria as follows:

- Working Older Adult (male and female) 50-60 years
- Adults diagnosed with hypertension and taking medication but not regularly controlled for blood pressure (use data from medical record) or adults of stage II of hypertension
- Not attendance at Community saving fund (One Baht a day)
- Basic literacy skills
- Willing to participate

Exclusion criteria:

- People (male and female) unable to live and stay in this location during this 6 month's study
- Unable to communicate
- A person (male and female) who is not allowed to exercise

3.5.3 Inclusion criteria of group III:

The subjects included in the sample were selected with specific criteria as follows:

- Working Older Adult (male and female) 50-60 years
- Adults diagnosed with hypertension and taking medication but not regularly controlled for blood pressure (use data from medical record) or adults of stage II of hypertension
- Basic literacy skills
- Willing to participate

Exclusion criteria:

- People (male and female) unable to live and stay in this location during this 6 month's study
- Unable to communicate

3.5.4 Sample size estimation

The sample size was calculated based on Yeon-Hwan Park et al., study. Assuming the mean difference in intervention effective in control of diastolic blood pressure, change in blood pressure from baseline to 12 weeks follow-up between groups is 3 (mean ± SD) with 90% power at the 95% confidence interval. The sample size was calculated according to the equation $n = 2 (Z_{a} + Z_{1-\beta})^{2} \sigma^2 / (\mu_1 - \mu_2)$. In addition, pooled variance equation was calculated according to equation $S_p^2 = \frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}$. Therefore, the estimated sample size per group was 17.32 (Dupont and Plummer, 1990). Furthermore, taking into account for the expecting drop

outs during the experimentation and ensuring confidence, subjects were added for 30%. Finally, the sample size of this study was 22 cases for each group.

Solution $??^2$ = $S_p^2 = \frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}$

= $\frac{(18\text{-}1)(9.2)^2 + (22\text{-}1)(6.2)^2}{18+22-2}$

= $\frac{17\ (84.64) + 21\ (38.44)}{38}$

= $\frac{908.88}{38}$

= 23.91

Solution n_{each} = $\frac{2\ (Z_{a} + Z_{1-\beta})^2\ \sigma^2}{(\mu_1 - \mu_2)^2}$

= $\frac{2\ (1.96 + 1.28)^2\ 23.91^2}{2.8 - -12.3}$

= $\frac{2\ (3.84 + 1.63\ )\ 23.91^2}{15.1}$

= $\frac{261.57}{15.1}$

= 17.32

N = sample size (in each group)

Z_a = 1.96 (95% CI confidence interval)

$Z_{1-\beta}$ = 1.28 (90% power)

σ^2 = Variance of different (SD = 23.91), As the researcher did not have the observation in each subject, SD of DBP in 12th week of two groups will be used to evaluated the SD of DBP change in both groups giving = 23.91

$\mu_1 - \mu_2$ = The difference of change in blood pressure between the before and after experimental = 3 point (Y.-H. P. e. al., 2011)

The total sample size were 66

3.6 Stratified Sampling Technique

This study used a stratified sampling technique for sampling population because this technique to be more representation on several variables than a simple random sample. Up to this part, focus on stratified sampling technique. This method can obtain a greater degree of representativeness for decreasing the probable sampling error (Allen Rubin and Earl Babbie, 2001). As basic theory of sampling distribution, sampling error can reduced by two factors. First, a large sample produces a smaller sampling error than a small sample. Second factor is a homogeneous population produce sample with smaller sampling errors than dose a heterogeneous population. The stratified sampling is based on second factor in basic theory of sampling. Before selecting a sample from the total large population, the researcher chooses ensure that appropriate number of elements are drawn from homogeneous subsets of that population. The population is first divided into two groups or more subpopulation (strata). The strata can based on a single criterion for example age group, type of presenting the problem and so on. For example, population consists of males under 21, males 21 and over, female under 21, female 21 and over. In stratified random sampling, a simple random sample is taken from each strata and subsamples are joined to from the total sample (Hoyle, Harris, & Judd, 2002). Selected stratification variables can concerned primary that are presumably related to research variable that researcher want to represent accurately. As Rick H. Hoyle, Monica J. Harris and Charles M. Judd mentioned the methods of stratification in sampling very. One method is to sort the population elements into discrete group based on whatever stratification variables are used. The basic of the relative proportion of the population represented by a given group therefore, researcher should select randomly or systematically – a number of elements from that group that constitutes the same proportion of your desired sample size. For example, if population in the study is

older adults black compose of 2 percent of the participant and the researcher desire a simple of 1000 participants, then the researcher would select 20 older adults black.

Another method is to group cases as just described and then put those groups together in a continuous list. The researcher would select a systematic sample, with a random start, from the entire list. Given the arrangement of the list, a systematic sample would select proper numbers (Hoyle et al., 2002). As figure 7 show a graphic illustration of stratified, systematic sampling in this graphic lined up micro-population according to sex and race. Then, beginning with a random start of population number 3 and taken every 10^{th} person thereafter: 3, 13, 23……until 93.

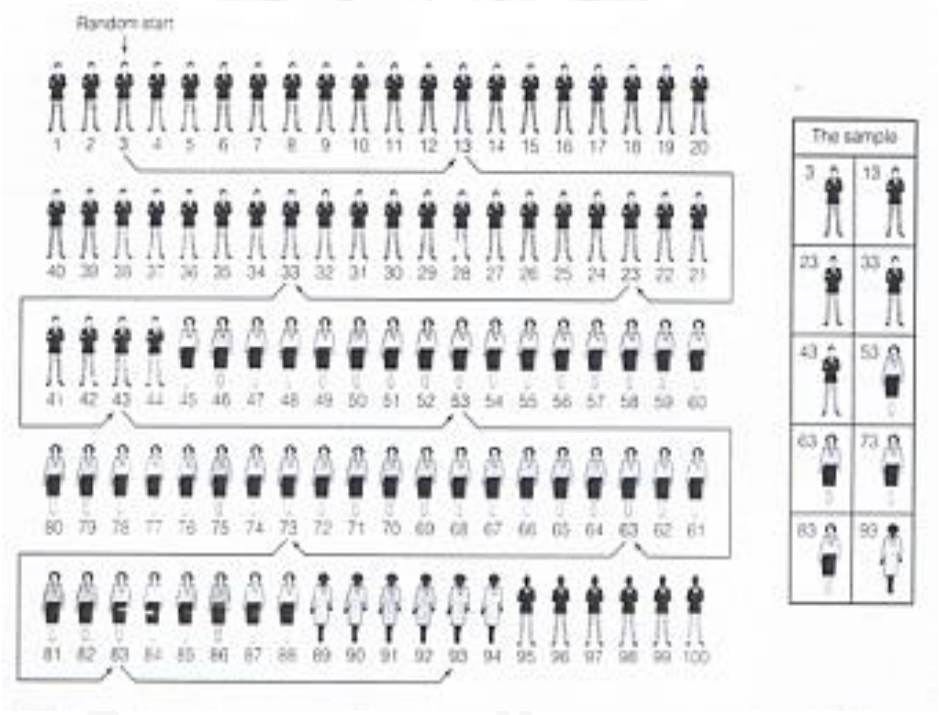


Figure 7: A Stratified, Systematic Sample with a random start

Source: Rick H. Hoyle, Monica J. Harris and Charles M. Judd, 2002

The general principle of this method is that if the study has reason to be lived that stratified according to a particular criterion or set of criteria will result in internally homogeneous strata, it is desirable to stratify. If the process of breaking down the population into strata likely to differ sharply from one another is costly, the researcher should to balance this cost against the cost of a comparable gain in precision obtained by taking a large simple random sample. This process potential in the decision of whether to stratify have, nothing to do with trying to make the sample a replica of the

population; the researcher should do only with the anticipated homogeneity of the defined strata with respect to the characteristics being studied and the comparative costs of the different methods of achieving precision. Both simple and stratified random samplings are representative sampling plans. Expect in arithmetic, there is no reason for sampling from the different strata in the same proportion; because even with respect to the criteria selected for stratification, it not necessary for the sample to reflect the composition of the population. Therefore, in sampling from a population in which the number of males and females, it is permission to sample. When this is done it is necessary to make adjustment to find the same score for the sample that will be the best estimate of the mean score of the total population of the male and female. That define this step is accomplished by "weighting" it contributes to the score for the total sample in proportion to the size in the population. If the various strata are sampled in constant proportion, the researcher should spare this bit of arithmetic because the various strata are already properly weighted.

Hear is several reasons for sampling the various strata in different proportions. Sometime not necessary to increase the proportion sampled from classes having small participants of case in order to guarantee that all these classes are sampled. For more understanding this reason these example provide more detail – if the researcher are planning a survey of patients who use hospital services volume in a given city in a given month, simple random sampling of hospital not lead to an accurate estimate of the total volume of services because a few very large hospital account for an extremely large proportion of the total services, and there is no guarantee that any of these large hospital would turn up in a simple random sample. For this problem, the research would stratify the population of hospital in term of some measure of their total volume of services. Perhaps only the four large hospitals would include all four of them in this study; in other words, the researcher would take a 100 percent of this stratum. Then, the researcher would reduce the accuracy of the estimate, no matter how carefully samples were taken from other strata. Conclusion, various strata would have to be appropriately weighted before estimating the total volume of services in the city.

Another one reason about larger proportion of these cases from one stratum than from other is that the researcher might want to subdivide the case within each stratum for further analysis. Again, that the cases of patient who use hospital services volume the researcher want to be able to examine separately the volume of use services by medical department, by surgery department and by other department. Even though these classifications are not taken into account in selecting the sample, it is clear that the researcher need a reasonable number of cases in each volume-of-use services stratum to make possible an analysis of different types of hospital within each stratum. If a given stratum has relatively few cases, so that sampling in the proportion used in other strata would not provide enough cases to serve as an adequate basic for this further analysis, the researcher might take a higher proportion of cases in this stratum.

This is another one major reason for varying the sampling proportion for different strata cannot be fully explained without going into the mathematical theory of sampling, but the principle role can be understood. Considerations with two strata, one of which is much more homogeneous with respect to the characteristics being studies than the other. For a given degree of precision, it will take a small number of cases to determine the strata of affairs in the first stratum than in the second. For extreme understanding, suppose there is reason to know that every case in a given stratum has the same score, the researcher could then determine how to represent the stratum in the total sample on the basic of a sample of one case. In large case the researcher not likely to have this information without also knowing what the common score is. But in less extreme cases the researcher can often anticipate the relative degree of homogeneity of heterogeneity of strata before carrying out the surveys.

In generally, the researcher can expect the greatest precision if the various strata are sampled proportionately to their relative variability with respect to the characteristics under study rather than proportionately to their relative sizes in the population. A special case of this principle is in sampling to determine the proportion of cases having a particular attribute, strata can anticipate that about half the cases will have the attribute and half will not should be samples more thoroughly than strata in expect a more uneven division. Therefore, in planning a stratified sample for predicting a

national election, using strata, the researcher should not plan to sample each state in proportion to its eligible population; it would be wiser to sample most heavily in the most doubtful states (Hoyle et al., 2002).

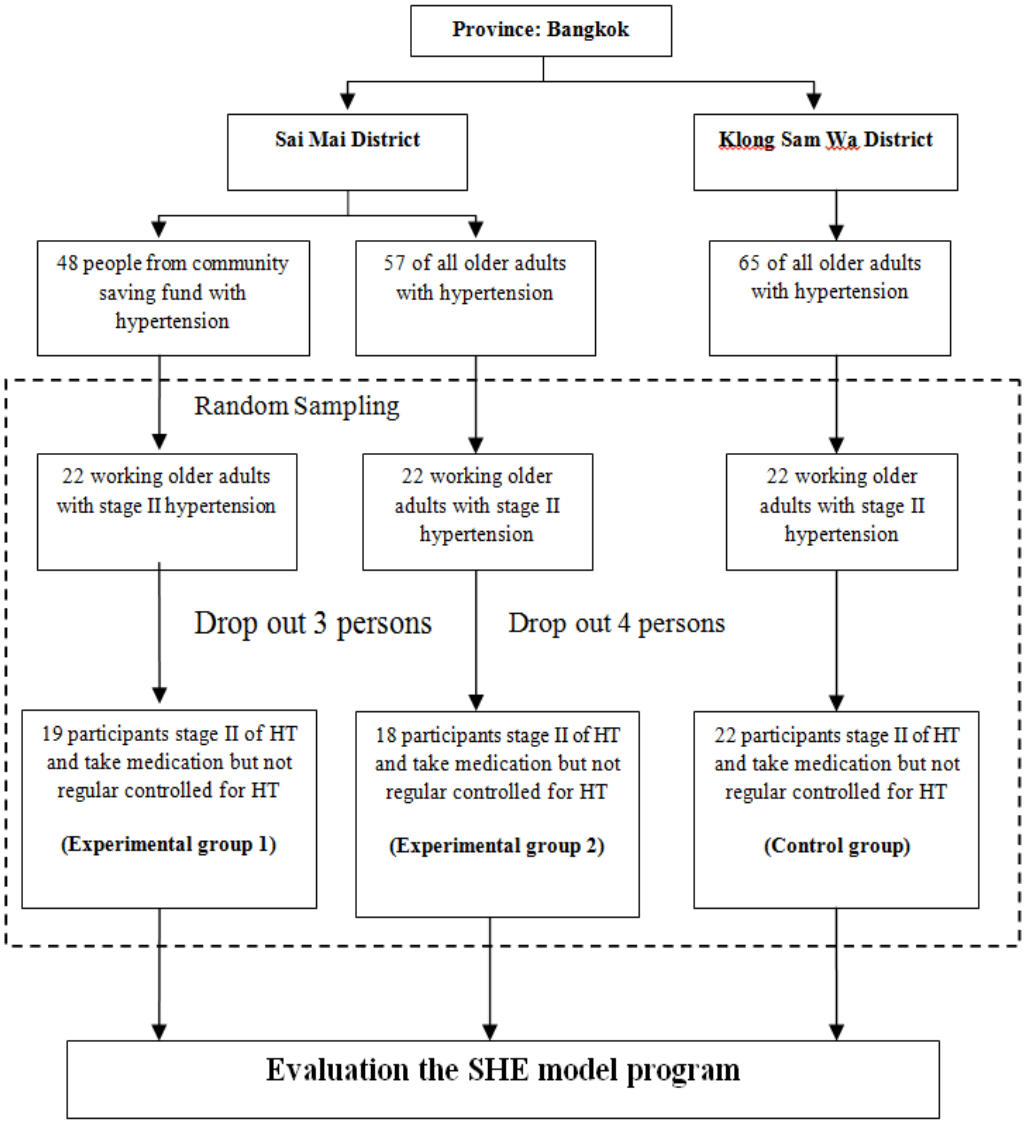
Advantage of Stratified Sampling

- Stratified sampling is essentially a practical than simple random sampling
- More precise estimates of population values can be obtained with the same sample size under the right conditions.

Disadvantage of Stratified Sampling

- Stratified sampling is not useful, if the population cannot be exhaustively partitioned into disjoint subgroups.

Sample and sampling method in this study



3.7 The study procedure

This study procedure consists of 3 basic steps as follow:

Step 1: Preparing period

Before employ the program of this study, building teamwork was established for supporting to implement and collect the data in each month, was instructor that provide health education in the community based, was observer, was in-depth interview, and focus group, was individual counseling, was exercise team to checklist the reports. Many teams were conducted in this study as follow;

Building teamwork

- **Health Educator team**, at least two leader of community who are trained about hypertension or chronic disease were chosen from health volunteer from Sai Mai district to be Health Educator for provide health education, savings strategies (2-11 modules), individual counseling technique, and the type of exercise activity was trained and informed them to understand the objective and the detail of each health education modules that necessary to provide to participant in this study.
- **In-depth interview and focus group discussion team**, at least two researchers were involved, one to facilitate the in-depth interview and the other for taking notes. The researcher was informed the team to understand the objective and trained them about the point of in-depth interview of 12 key informants in this study.
- **Participant observation team**, at least two researchers were involved. The researcher was informed the team to understand the objective and trained them about the point of observation the participants that involved in this study.
- **Individual counseling team**, at least two leader of community who are trained about hypertension or chronic disease were chosen from health volunteer from Sai Mai district for counseling the participants. The researcher was trained them about the technique of counseling hypertension disease.
- **Exercise activity team,** at least two exercise trainers were involved. The researcher was informed the team to understand the objective and selected the way exercise activity that is appropriate for older adults.
- **Blood pressure check and collect KAP questionnaire team**, at least five researchers were involved. The researcher was informed the team to understand the objective and trained them about the blood pressure measure with correct techniques that was measures all of participant in each month including baseline data collection.

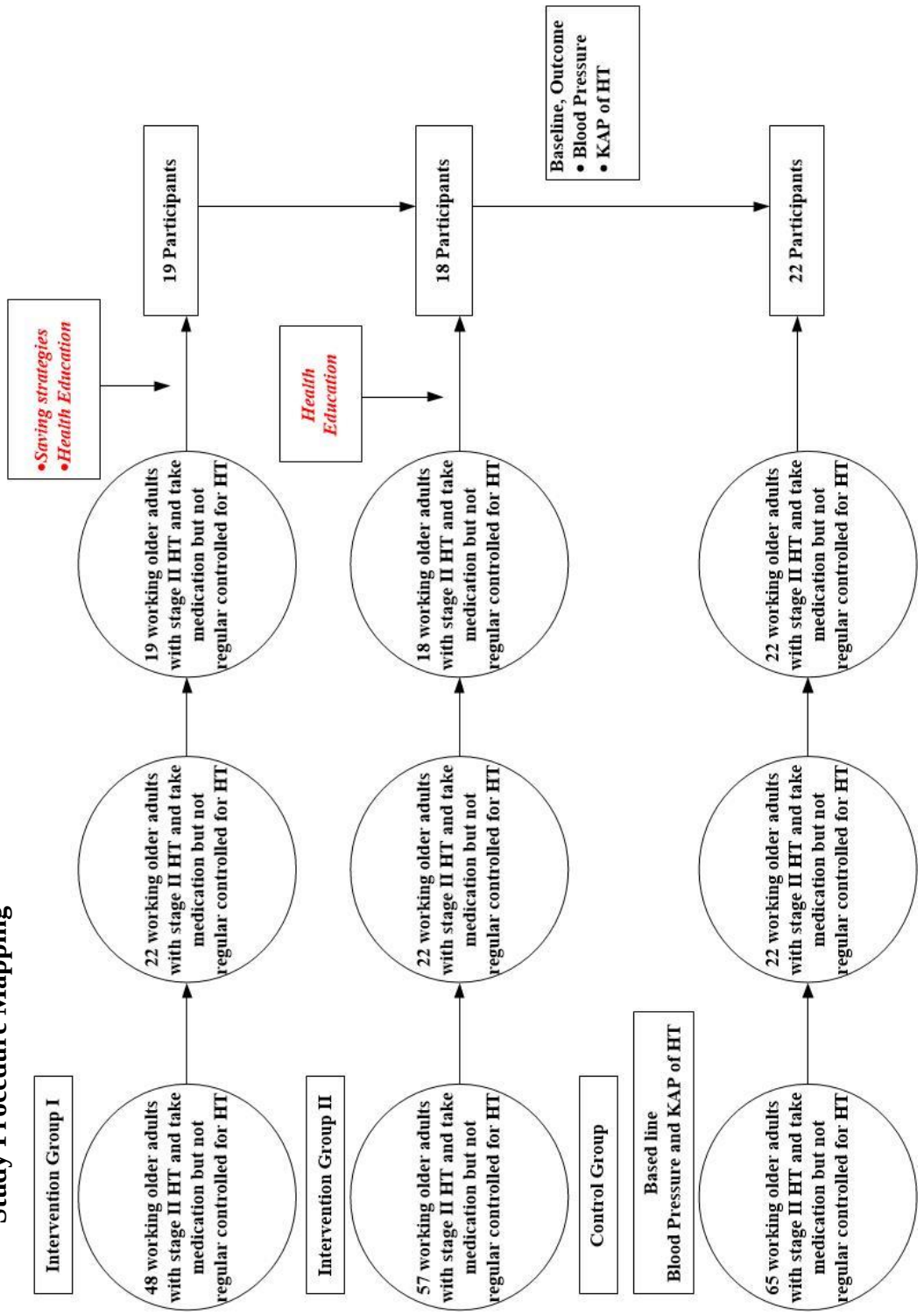
Step 2: Cooperate with the community savings fund committee

The researcher was negotiated with the Community saving fund's Committee for possible change of some regulations. In order to a member of this fund can perhaps borrow the deposit money with the Community saving fund for health expenditure. Changing will be done with the compliance of the Community saving fund Committee.

Step 3: Implementation and Evaluation the program

At this period, the SHE model program is ready implementation. Data collection activities plans were in place for evaluating the results, impact, limitation, and outcome of this program. Finally, the outcome evaluations was determined the effectiveness of SHE model program can improvement in blood pressure control among older adults in Sai Mai community.

Study Procedure Mapping



3.8 Research Intervention

The Savings and Health Education Model (SHE model) program was developed by the researcher using program evaluation research method. The major components consist of savings, community based health education, group health education, and counseling, components selected by extensive literature review for **group 1.** The 12 modules program consists of the introduction of the program, saving strategies (the participants in group 1 can borrow money but cannot borrow any amount higher than his/her deposit and not longer than one month, if a subject's borrowing exceed one month, the fire rate is 5.5 per cent per month until payback all of capita), group health education and individual counseling (one time at the 4th week) in Saturday or Sunday after provide health education led by leader of the community (at least two persons). The duration of teaching of each module is 40 minutes. The duration of exercise is 45 minutes or not less than 30 minutes. For place of teaching and exercise is a community sport ground of the community. After provided the health education the participants needed to make a quits, part II of questionnaire takes time about 40 minutes while, and other parts take time about 25 minutes. If the trainees do not pass the quits, the trainer was provided counseling/advising for the trainee in the course fail. The duration of provide counseling is 30 minute per module.

Furthermore, participants were attended the exercise activity (3 times per week on Friday, Saturday, and Sunday), was introduction and given knowledge for 2 days (12 modules) in Saturday and Sunday at the first intervention time of saving and community based group health education intervention.

Group 2 is the group with specific community based health education intervention. The program of implementation within this group is only community based health education without saving program. At the first time the researcher was provided introduction of SHE model program, group health education and individual counseling (one time at the 4th week) in Saturday or Sunday after provided health education led by leader of the community (at least two persons). The duration of teaching of each module is 40 minutes. The duration of exercise is 45 minutes or not less than 30 minutes. Place of teaching and exercise is community sport ground of the community. After provided the health education the participants needed to make a

quits, part II of questionnaire takes time about 40 minutes while, and other parts take time about 25 minutes. If the trainees do not pass the quits, the trainer was provided counseling/advising for the trainee in the course fail. The duration of provide counseling is 30 minute per module. Participants should attend the exercise activity (3 times per week on Friday, Saturday, and Sunday), and are given the knowledge, 2 days (11 modules) in Saturday and Sunday led by leader of the community (at least two persons).

Then the given the knowledge is repeated one time every month in Saturday and Sunday, especially the 10 modules (modules 3-12) led by the leader of the community (at least two persons) for both groups of intervention. Community leaders were chosen from health volunteers who are trained about hypertension disease or chronic disease.

For the saving program – participants were deposited the money of one Baht a day or 30 Baht per month. The government was also support this deposit with the one Bath a day or 30 Baht per month per participant and the Bangkok Metropolitan was also support this deposited with the one Baht a day or 30 Baht per month for each participant. Therefore, the member was got a total of 90 Baht per month. If a member is admitted to hospital, he/she will receive 300 Baht/visit (max two times per year). In case of death, after cremate the relative of a member will receive the amount of 8,000 Baht. This program is operating in the Sai Mai community under the name of "Community saving fund", however a member cannot borrow the money from this fund for his/her health expenses. Therefore, the researcher was negotiated with the Community saving fund's Committee for possible change of some regulations. Then, a member of this fund can perhaps borrow the deposit money with the Community saving fund for health expenditure. Changing will be done with the compliance of the Community saving fund Committee.

3.8.1 Qualification of a member for community saving fund:

1. A person who stay permanently in the Sai Mai district census records
2. A person who stay permanently in another district census records, with the following qualification:
   2.1 A person who's place of birth is Sai Mai district

2.2 Being a father, mother, or the relative of a person who stay in the Sai Mai district census records

2.3 A person who is a civil servant or a government officer at Sai Mai district

2.4 Being a father, mother, or the relative of a person mentioned in 2.3

3. No limit for sex, marital status and occupation
4. A person who fully agrees to follow the community saving fund regulations
5. Or any person accepted by the Community saving fund committee agree to a member

3.8.2 Applying as a member for community saving fund:

1. A person who is qualified in 3.6.1 (mentioned above) can send his/her application form to the coordination center near to a member's residence
2. A person who is qualified and having the community saving fund's committee agreement for membership will pay a one-off payment of 20 Baht at the beginning and the deposit of one Baht a day or 30 Baht (for one month latest at the first time)

3.8.3 The regulations of the money deposit:

1. A member chooses the mode of the money deposit one Baht a day or 30 Baht per month
2. A member is obliged to pay one Baht a day or 30 Baht per month, every first week at the beginning of month at the coordination center near to his/her residence
3. A member is obliged to pay one Baht a day or 30 Baht per month, until death or resignation from the Community saving fund
4. If a member who has not deposit the amount of the month, he/she will have to pay the double amount within the following month
5. If a member resigns from a community saving fund, the fund will pay back the entire amount a member has paid. Do not deduct part of the welfare free from the total amount that a member received from the fund.

3.8.4 Termination from membership of the fund:

1. Death
2. Resignation
3. A member who do not deposit the money within three months
4. Two third of community saving committee to the disqualification of the member agrees
5. A person who violate any regulations of the fund

However, any members who were terminated from the community saving fund can request to reinstate the membership, within 2 years of termination.

3.8.5 Right and duty of a member:

1. Write down the name of the beneficially of this community saving fund in the form provided or a member has to give the name of his/her dependents (family)
2. A member can attend a meeting and have the right to vote at the annual meetings
3. A member has to follow the community saving fund regulations
4. Can verify an account and all documents of the community saving fund
5. Can explore the opinion and make suggestions at the attention of the Community saving fund's committee and have a right to vote against any improper committee activities
6. Has the right for the benefit from fund as state in the community saving fund regulation

3.8.6 Regulations of borrowing money from community saving fund:

1. A member cannot borrow any amount higher than his/her deposit
2. Can borrow money for not longer than one month
3. If a member's borrowing exceed one month, the fine rate is 5.5 per cent per month until payback all of capital

3.8.7 Detail of the 12 modules. The health education program begins with the third module:

Module 1: Introduction (no health-related activities)

Module 2: Saving strategy

Module 3: Definition, risks, and symptoms of hypertension

Module 4: Complications of hypertension

Module 5: Medications

Module 6: Checking blood pressure

Module 7: Diet examples and demonstration

Module 8: Exercise and physical activity

Module 9: Stress management

Module 10: Emergency care

Module 11: Smoking and alcohol

Module 12: Program evaluation

Health messages for each cycle are printed in simple language on the reverse of each borrower's account book. Health messages focused on arousing individual's fear, in an effort to change people's approach and awareness to health matters.

Details	Objective	Expected outcome	Time of teaching
Module 1: Introduction	Understanding the program	Able to follow program correctly	1st time
Module2: Saving strategies	Understanding savings strategies and initiate steps of borrow and regulation of a member	Able to follow the community savings fund rules and regulations	Every week the beginning of month
Module 3: Definition, risks and symptoms of HT	Provide insight into pathophysiology of HT and identify HT symptoms	Understanding complete hypertension disease	
Module 4: Complications of HT	Scaling up patients awareness	Understanding possible risks and symptoms of HT	
Module 5: Medications	Correctly & regular medication Intake	Significant of regular use of Medication	
Module 6: Checking BP	Patients know the correct method of BP measuring	Able to check and control measuring BP is correct	
Module 7: Diet examples and demonstration	Patients know adequate cooking technique (less salt)	Better knowledge of healthy Cooking	
Module 8: Exercise	Weight reduction	Understanding the weight reduction – health connection	
Module 9: Stress management	Stress control	Self-management of stress reduction	
Module 10: Emergency Care	Understanding the basic principles of emergency care for saving life	Mastering emergency situation	
Module 11: Smoking and alcohol	Awareness of dangers smoking and alcohol consumption	Reduced or moderate smoking and drinking behavior	
Module 12: Program evaluation	Final check of the effectiveness and outcome	Understanding, acceptance and handing of the program	Every week the beginning of month

Table 6: Details of the 12 module objectives, outcome and time of teaching

Remark: The duration of teaching for each module is 40 minutes

Place of teaching: Place of teaching of both intervention groups is community ground sport of each community

Details of teaching	Nov 2013 (1st week) (Saturday)	Dec 2013 (1st week) (Saturday)	Jan 2014 (1st week) (Saturday)	Feb 2014 (1st week) (Saturday)	Mar 2014 (1st week) (Saturday)	Apr 2014 (1st week) (Saturday)
Module 1: Introduction	✓					
Module 2: Saving strategies	✓					
Module 3: Definition, risks and symptoms of HT	✓	✓	✓	✓	✓	✓
Module 4: Complications of hypertension	✓	✓	✓	✓	✓	✓
Module 5: Medications	✓	✓	✓	✓	✓	✓
Module 6: Checking BP	✓	✓	✓	✓	✓	✓
Module 7: Diet examples and demonstration	✓	✓	✓	✓	✓	✓
Module 8: Exercise and physical activity	✓	✓	✓	✓	✓	✓
Module 9: Stress management	✓	✓	✓	✓	✓	✓
Module 10: Emergency Care	✓	✓	✓	✓	✓	✓
Module 11: Smoking and alcohol	✓	✓	✓	✓	✓	✓
Module 12: Program evaluation	✓	✓	✓	✓	✓	✓
Exercises Activity	*	*	*	*	*	*
Individual counseling	1th week (Saturday) @	1th week (Saturday) @	1th week (Saturday) @	1th week (Saturday) @	1th week (Saturday) @	1th week (Saturday) @

Table 7: Details of the 12 modules and timeline of teaching for **group 1**(Intervention)

Remark:- * 3 days/ week/month, duration of exercise is 45 minutes per time (not less than 30 minutes) and duration of counseling is 30 minutes per module

- @ 1th week on Saturday

Details of teaching	Nov 2013 1st week (Sunday)	Dec 2013 1st week (Sunday)	Jan 2014 1st week (Sunday)	Feb 2014 1st week (Sunday)	Mar 2014 1st week (Sunday)	Apr 2014 1st week (Sunday)
Module 1: Introduction	✓					
Module 3: Definition, risks and symptoms of HT	✓	✓	✓	✓	✓	✓
Module 4: Complications of hypertension	✓	✓	✓	✓	✓	✓
Module 5: Medications	✓	✓	✓	✓	✓	✓
Module 6: Checking BP	✓	✓	✓	✓	✓	✓
Module 7: Diet examples and demonstration	✓	✓	✓	✓	✓	✓
Module 8: Exercise and physical activity	✓	✓	✓	✓	✓	✓
Module 9: Stress management	✓	✓	✓	✓	✓	✓
Module 10: Emergency Care	✓	✓	✓	✓	✓	✓
Module 11: Smoking and alcohol	✓	✓	✓	✓	✓	✓
Module 12: Program evaluation	✓	✓	✓	✓	✓	✓
Exercises Activity	*	*	*	*	*	*
Individual counseling	1th week (Sunday) @	1th week (Sunday) @	1th week (Sunday) @	1th week (Sunday) @	1th week (Sunday) @	1th week (Sunday) @

Table 8: Details of the 10 modules and timeline of teaching for **group 2** (Intervention)
Remark: - ***** 3 days/ week/month, duration of exercise is 45 minutes per time (not less than 30 minutes) and duration of counseling is 30 minutes per module
- @ 1th week on Saturday or Sunday

3.8.8 Baseline measure

Checking blood pressure and KAP of participants focus on hypertension disease was measured in two intervention groups and one control group led by the researcher team.

3.8.9 Intermediate Intervention measure

After 3, 4, 5, and 6 month of implementation the blood pressure was measured in the three groups led by the researcher team.

3.8.10 End Intervention measure

Checking blood pressure, the evaluation of KAP of subjects, in-depth interview, and focus group discussions was employed at the end of the study (after 6 month) for understanding and conclusion of the hypertension controlled by the researcher team.

3.9 Data collection and Instruments

3.9.1 Quantitative research methodology

Questionnaires are the mainstay for research study. A questionnaire consists of six parts following:

Part I: Personal information questionnaire, 15 items (Appendix A)
Part II: Hypertension Knowledge questionnaire, 15 items (Appendix B)
Part III: Hypertension Attitude questionnaire, 15 items (Appendix C)
Part IV: Hypertension practice questionnaire, 15 items (Appendix D)
Part V: Self-care behavior questionnaire, 15 items (Appendix E)
Part VI: Hospital access services questionnaire, 12 items (Appendix F)
Part VII: Qualitative questionnaire, 8 items (Appendix G)
Part VIII: Rapid assessment questionnaire, 20 items (Appendix H)

Before the intervention, and after three, four, five and six month the questionnaires and blood pressure check were used in the three study groups. In addition, after provided the health education in each month the rapid assessment questionnaire was used to assessment the participants' knowledge. If the results of the questionnaire part II, III, IV, V and part VI that participants' response shows some missing in some part of the knowledge. Then, the researcher was concerned to encourage the health

education especially in the missing part by provided health education repeated until the participants understand. While, the outcomes of the questionnaire can used to test hypothesis in the three groups by its ability to measure data using statistics among large sample of the population in this study. However, quantitative cannot study things in a natural setting or discuss the meaning things have for different people as qualitative research does. Therefore, qualitative methodology was needed to use.

3.9.2 Addressing the place of conduct intervention (Group 1 and 2) and control group

Group 1 was conducted at Permsin community sport ground, Sai Mai district, Bangkok, Thailand. While, group 2 was conducted at Jittapawan 1 village' community sport ground, Sai Mai district, Bangkok, Thailand. In a similar, group 3 was conducted at community health center of KC1 village, Klong Sam Wa district, Bangkok, Thailand.

3.9.3 Standard Point Scores

Part I of questionnaire is personal information question consists of 15 items. The detail of this section consists of participants' demographic data including history illness, family history illness, hypertension treatment and saving status.

Part II of questionnaire is hypertension knowledge question consists of 15 items. This section, the questionnaire had 4 multiple – choice answers. The participants choose selected only one answer that correct. The answers were score as follow:

- Correct answer obtaining 1 score
- Incorrect answer obtaining 0 score
- Missing answer obtaining 0 score

Part III of this questionnaire is hypertension attitude questions consists of 15 items. These parts were measured about participants' attitude of hypertension disease on a 5 point Likert scale. The questions have a categorical scale ranging from "strongly agree" to "Don't know or no opinion" responses. The question was coded on a 4 point scale with a score of 0 for "Strongly disagree", a score of 1 for "not agree", a score of 2 for "not sure", a score of 3 for "agree" and a score of 4 for "strongly agree." For negative statements, a score of 0 for "strongly agree," a score of

1 for “agree,” a score of 2 for “not sure,” a score of 3 for “not agree”, and a score of 4 for “Strongly disagree.” The standard that used for the scores was mean ± standard deviation (SD). A 4 point scales were used for response ranging from “Not hard at all” to “Very hard.”

Part IV of this questionnaire is Self-care behavior question consists of 15 items. Within this part contained the statements that measured on a 5 point Likert scale. These questions have a categorical scale start ranging from “Regular activity,” to “Not activity.” The question was coded on a 4 point scale with a score of 0 for “No activity”, a score of 1 for “have activity once in a while”, a score of 2 for “have activity sometime”, a score of 3 for “have activity often time” and a score of 4 for “regular activity.” Cut of point used to categorize general attitude score as “High” with >80 percent correct attitude, “Moderate” with 60-79 percent, and “low” considered < 50 percent.

Part V of this questionnaire is hospital access services questions consists of 12 items. This section, the questionnaire had 3 multiple – choice answers. The participants choose selected more than one answer that correct. The answers were analyzed by Descriptive statistics.

Part VI of this questionnaire is qualitative questions consists of 8 items. This section, participants choose answer and transcribed by the researcher team.

Part VII of this questionnaire is rapid assessment questionnaire questions consists 20 items. This section, the questionnaire had 4 multiple – choice answers. The participants choose also selected only one answer that correct. The answers were score as follow:

- Correct answer obtaining 1 score
- Incorrect answer obtaining 0 score
- Missing answer obtaining 0 score

After consult with hypertension experts, four parts of quantitative questionnaires have item analysis (Difficulty and disciminant index) (Pavarasu, 2012). The item score of the part II’ questionnaire is 0.93, part III is 1, part IV is 1, and part V is 0.7.

3.9.4 Blood pressure measurement

In this part, are the details about blood pressure measurement equipment and techniques that are suitable to measured. The digital sphygmomanometer is the main equipment has been used for clinical subject blood pressure measured as show in Figure 8.

Digital Sphygmomanometer

Figure 8 : Digital Sphygmomanometer
Source: www.google.com, date 22 July 2015

The techniques of blood pressure measure that the researcher uses way of Medical Training and Simulation LLC, 2015 a recommendations for blood pressure measurement in humans and experimental Animal. This technique consists of all steps of measured as show in Appendix N.

Different factors have high influence the measurement of blood pressure. Therefore, considering using cuff and sphygmomanometer is important, poor equipment cause of misunderstanding of diagnosis. Standardize the measurement of blood pressure is essential that engaged to care patients with hypertension.

3.9.5 Blood Pressure Measurement's Standardize

- Blood pressure will be measure by the same person every time (at least two persons).
- A measure blood pressure by community leaders who are health volunteer and trained about hypertension disease or chronic disease.

- Blood pressure was measure at the same time (8 - 9 A.M.) every week the beginning of month at the first test and measures after 3 th, 4th, 5th and 6th month after 30 minute of provide health education in each month.

Sphygmomanometer's Standardize

In this part, the researcher was used digital sphygmomanometer's standardize from Rossmax International Ltd., Taiwan measurement that uses in this study as show the method of standardize in Appendix M. The digital sphygmomanometer's standardize led by certified equipment's technician who have certified from MOPH Thailand.

3.9.6 Qualitative research methodology

The nature of the research inquiry, an in-depth interview, focus group discussions, and participant observation for understanding the complex of SHE model program can improve blood pressure control among older adults in Sai Mai community. In this case the study was explored the influence of SHE model. Moreover, the aim of qualitative study is to explore formal and informal aspects of KAP of older adults after six months of SHE models implementation. Therefore, the study was applied qualitative approaches to understand these complex realities and was useful for answering "how the program "Savings and Health Education Model (SHE model)" can improve blood pressure control among older adults in Sai Mai community during 6 month intervention. In addition, the qualitative study was improved understanding of complex human issues, more important than the generalizability of the results. Furthermore, qualitative methods are "richer" than others and provided insight and understanding of the event to these people. As the researcher mentioned above three qualitative techniques were used. Each technique consists of the details as following:

In-depth interview methods

This study was used in-depth interview to acquire information. Interviewing involved face-to-face verbal interchange for understanding how SHE model program can improve in blood pressure control and increasing KAP of 24 key informants' perspective. As Normark. Denzin and Yvonnas S. Lincoln mentioned, interviews are everywhere (Lincoln, 2003) therefore, in this study in-depth interview was conducted at Sai Mai and Klong Sam Wa community savings fund center. The interview led by the researcher team (at least two researchers were involved, one to facilitate the in-

depth interview and the other for taking notes) only one time on Saturday or Sunday at the end of implemented the program.

Due to an interview are not neutral tools of data gathering but focus group discussion techniques leading to negotiated, contextually based results. Thus, the focus group is moving to encompass the how of participants can or cannot control their blood pressure and including to understanding the success or failure of SHE model program to increasing KAP of older adults with hypertension.

Focus group discussion methods

The two major techniques that used to collect qualitative data are participant observation and individual interviews. In discussing the focus group method allowed to research participants can share ideas. In addition, group participants can find the experience more gratifying and stimulating than individual interviews. Again the major concern of focus group discussion is about how of participants can or cannot control their blood pressure and including to understanding the success or failure of SHE model program to increasing KAP of older adults with hypertension. The focus group was conducted at community savings fund center at both setting of this study with 24 key informants only one time on Saturday or Sunday at the end of program, this session led by the researcher team (at least two researchers were involved, one to facilitate the discussion and the other for taking notes).

Observation methods

The purpose if observation is to described the participants who involved in study activities, and also the activities that take place in the study setting. The researcher used this technique to understand how the program "Savings and Health Education Model (SHE model)" can improve in blood pressure control among older adults in Sai Mai community within 6 months.

There are many way for gathering observation data for example, participant observation, field observation or direct observation. However, in this study focused on participant observation due to the research needed to understand how SHE model program can improve in blood pressure control and increasing KAP of participants. Participant observation will be employed multiple methods as following;

- note data from personal

- eyewitness observation with information gained from informal
- natural interview and informants' descriptions.

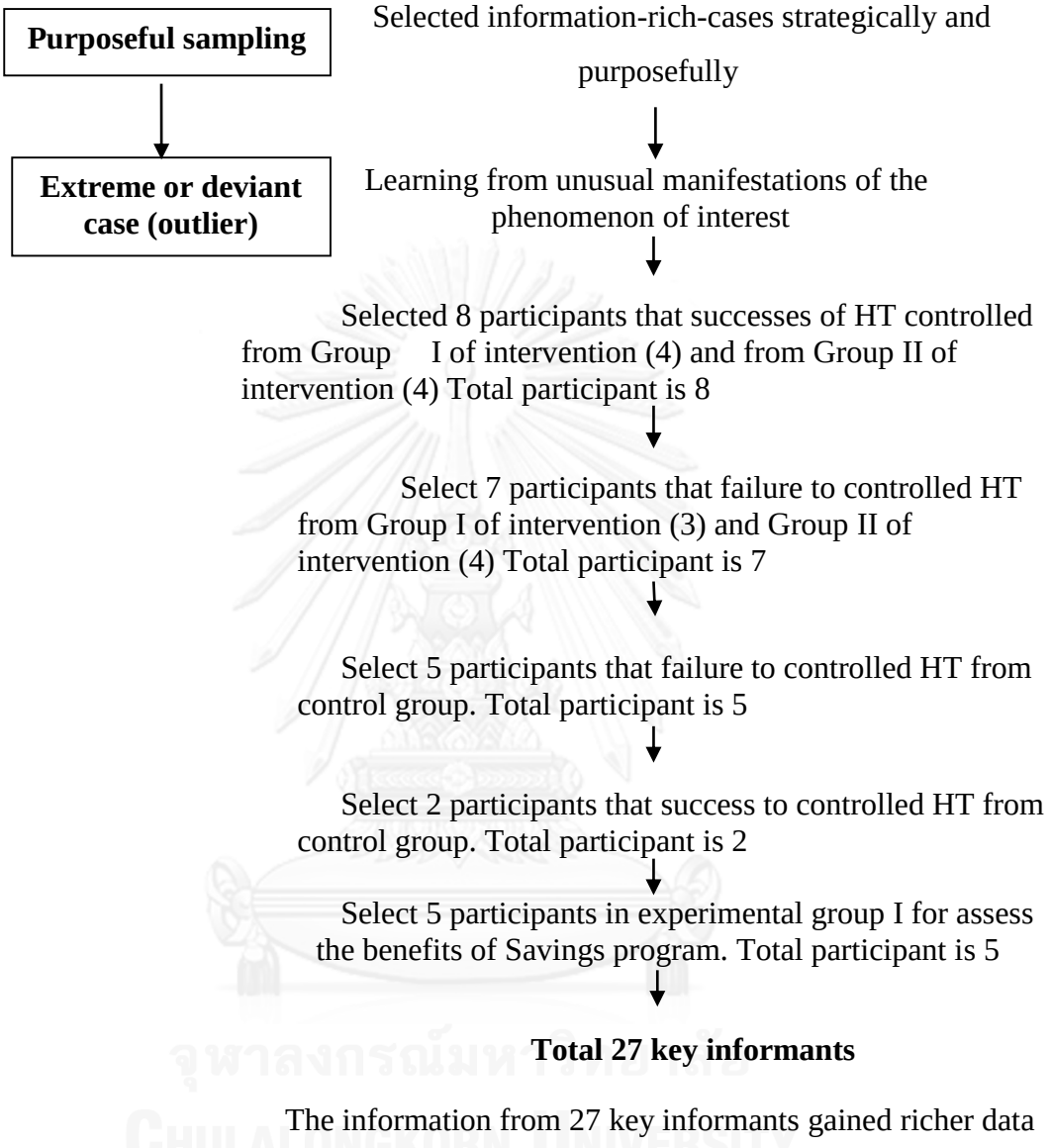
As the same time observing, the researcher team can talking with participants about whatever is happening in order to access personal hypertension knowledge and direct experience as resource to aid understanding and interpreting the program being evaluated. According Michel Quinn Patton, 1990 argued that the observation can occur in any setting where people are doing things e.g. communities, cultures, organization, streets, homes, or other places. Therefore, in this study participant observation was occurred at class room when the researcher team provides health education, at the canteen when participants take a lunch and at the exercise stadium when the participants join exercise activities through 6 months of the study led by the researcher team (at least two researchers was involved).

Qualitative Sampling Technique

The sampling methods of quantitative and qualitative are different. For qualitative inquiry typically focuses in depth on relatively small samples. While, quantitative methods typically depend on large sample selected randomly. Nor the techniques for sampling different, neither the logic of each approach is different.

Purposeful sampling some time call "purposive or judgment" was used in this study. Purposeful sampling focuses on selecting information-rich-cases, which a technique can serve and go out find the details (Patton, 1990). A purposeful sampling strategy was tells "was stories" about subjects successes and struggles, sometime even including a few stories about failures to balance. To enhance the credibility of this study, the researcher begins collecting evaluation information more systematically. Because this technique cannot generalize to the entire client population on the basic of 10 cases from each study, this method was able to tell the researcher that the stories they are reporting were randomly selected in advance of knowledge of how the outcome would appear and that the information collected was comprehensive. Therefore, this sampling technique is considerably greater than the personal. However, the purpose of a small random sample is credibility, not representativeness.

Sampling Strategies



The information from 27 key informants gained richer data

3.9.7 Item Analysis

In doing research, item analysis is important aspects of research designs and measurement techniques, in varying degrees, to planning and to judging the worth of the research.

Item analyses can a potential technique to researchers for the direction and improvement of training. Moreover, the items to be analyzed must be valid measures of training objectives. In addition, the items analysis must be diagnostic, that is, knowledge of which incorrect options trainee select must be a clue to the nature of the misunderstanding, and thus prescriptive of appropriate remediation. Therefore, the researcher who constructs the questionnaires may greatly scale up the effectiveness of the test items and test scores (Kelley, 1993). The pre-testing of the instrument for 31 cases was conducted in Lum Luk Ka district, Pathumthani Province, Thailand.

3.9.8 Data analysis

The primary data was collected using questionnaire and checking blood pressure. The descriptive statistic: Percentage, Mean, and SD were used to describe demographic data. In addition, Kruskal-Wallis test was used to comparison of the percentage of achievements of blood pressure post intervention among three groups. Furthermore, Scheffe statistic test and F-test were used to compare differences between groups, two treatment and control, during implementation of the program.

Likewise, in-depth interview, focus group discussion and observation to complement the data from the questionnaire. The interview was conducted by the researchers. In each interview session, at least two researchers were involved, one to facilitate the discussion and the other for taking notes. The interview used tape recorded after obtaining sing consent from each participant totally twenty –four people.

The record information was verified with notes and corrected for any missing points as well as for validity of the collect data. The simple checklist as show in Appendix P was prepared and used during the three qualitative techniques implement in two setting areas of study.

The method of analyzing in-depth interview and focus group discussion

This study was discussed about the method of qualitative analysis. Writing the case study of each person interviewed or each unit studies - each group discussion. Beginning with cross-case analysis – grouping together answers from different people and analyzing different perspectives on each questions guide in the interview. After finish analysis process, the tape recording was deleted.

The method of analyzing participant observation

The analysis of observational data is greatly facilitated by clarity about how it will be most helpful to present the findings. The strategies for analyzing include the following:

- **Chronology**: Describe what was observed chronologically, over time, to tell the story from beginning to the end
- **People**: In this study participant and groups is unit of analysis, then case studies of people or groups was the focus for case studies.
- **Process**: The data was organized to describe important process e.g., blood pressure control, the technique of healthy cooking or self – management of stress reduction.
- **Issues**: The observation was pulled together to illuminate key issues, often the equivalent of the primary evaluation the guide questions.

For the part of analysis, the field notes record is important the researcher was keep track of analytical insight that occur during data collection.

3.9.9 Ethic Consideration

This study was done under the guidance of Chulalongkorn University and Bhumibol Adulyadej hospital, Don Muang district, Bangkok, Thailand. The researcher must pay attention to the right of research subjects. Keep avoiding somatic and psychological effect on the participants, great precaution in every aspect will be taken. The researcher should explain the participants in the detail of the study including the research's objective, procedure, expected benefits and potential hazard of the study. The informed signed consents will be taken from the participants, especially these topics as follow: willingness to participation, freedom of withdrawal, and promise on confidentiality. Their names and data from the questionnaire will not be accessed because not only clinic code numbers will be used but also their actual data were kept by the principal investigator. Interview was carried out in convenience place like in private room at their community. They can access to final report or results of the study if desired. The assurance of data not to use for other purposes. Ethic approval was obtained from Chulalongkorn University (COA No.133/2015) and Bhumibol Adulyadej hospital on October 30, 2013, Don Muang district, Bangkok, Thailand.

CHAPTER IV
RESULTS

This chapter data analysis and results from a quasi-experimental study are presented. The data were collected and then processed in response to the problems posed in chapter one of this study. Three fundamental goals drove the collection of the data and the subsequent data analysis. Those goals were to investigate the effectiveness of the SHE model program can improvement in blood pressure control among the older adults in Sai Mai community? These objectives were accomplished. The findings presented in this chapter demonstrate the potential for merging theory and practice.

4.1 Results of quasi-experimental study

In total, 59 participants from Sai Mai 37(62.71%) and Klong Sam Wa districts 22(37.28%), Bangkok, Thailand were included in this study. Forty – six were woman and thirteen were men. The socio-demographic characteristics of participants are defined in Table 4.1. The age range between 55 to 60 years, with a mean age of 58.93 years old (SD = 1.957) and most of them were married (39%). The level of education among those subjects nearly 100 percentage were undergraduate (94.9%). More than half of participants are employment (59.6%) however 44.1% have a self-employed. Refer to, their average income per month in bath is 8,172.54 (272.43 USD).

There were no significant difference in the distribution of personal illness with four diseases (diabetes mellitus, high cholesterol, heart disease, and osteoarthritis) smoking and alcohol consumption, family illness, duration of sickness and weight between three groups as given in the Table 9.

Table 9: Basic demographic profile of study subjects of quasi-experimental study (N=59)

Variables	Gr.I N=19 (%)	Gr.II N=18 (%)	Gr.III N=22 (%)	Total N=59 (%)
Gender				
Male	2 (10.5%)	7(38.9%)	4(18.2%)	13 (22%)
Female	17 (89.5%)	11(61.1%)	18(81.8%)	46 (78%)
Age (mean ± SD)	58.05+2.147	58.83+1.543	58.32+2.102	58.93+1.95

Variables	Gr.I N=19 (%)	Gr.II N=18 (%)	Gr.III N=22 (%)	Total N=59 (%)
55-60	19 (100%)	18 (100%)	22 (100%)	7 59 (100%)
Marital status				
Single	1(5.3%)	-	4(18.2%)	5 (8.5%)
Married	4(21.1%)	11(61.1%)	8(36.4%)	23 (39%)
Separate/Divorce	-	2(11.1%)	1(4.5%)	3 (5.1%)
Widow	8(42.1%)	5(27.8%)	8(36.4%)	21 (35.6%)
Living together without being married	6(31.6%)	-	1(4.5%)	7 (11.9%)
Education				
Undergraduate	17(89.5%)	17(94.4)	22(100%)	56 (94.9%)
Postgraduate	2(10.5%)	1(4.5)	-	3 (5.1%)
Occupation				
Self-employ	12(63.2%)	5(27.8)	9(40.9%)	26 (44.1%)
Employ	7(36.8%)	13(72.2)	13(59.1%)	33 (55.9%)
Average Income (mean)	257.19 USD	339.53 USD	230.65 USD	272.43 USD
Diseases				
Disease with hypertension	19(100%)	18(100%)	22(100%)	59 (100%)
Disease with hypertension and DM	9(47.4%)	11(61.1%)	8(36.4%)	28 (47.5%)
Disease with hypertension and Heart	6(31.6%)	5(27.8%)	-	11 (18.6%)
Disease with hypertension and high cholesterol	13(68.4%)	9(50.0%)	6(27.3%)	28 (47.5%)
Disease with hypertension and Osteoarthritis	5(26.3%)	9(50%)	6(27.3%)	15(25.4%)
Weight (Mean)	5(26.3%)	4(22.2%)	6(27.3%)	15 (25.4%)
Smoking Consumption				
Current smoking	2(10.5%)	2(11.1%)	2(9.1%)	7 (11.9%)
Previous smoking	-	6(33.3%)	-	1 (1.7%)
Never smoking	17(89.5%)	10(55.6%)	19(86.4%)	51 (86.4%)
Alcohol Consumption				
Current alcohol consumption	3(15.8%)	2(11.1%)	6(27.3%)	11 (18.6%)

Variables	Gr.I N=19 (%)	Gr.II N=18 (%)	Gr.III N=22 (%)	Total N=59 (%)
Previous alcohol consumption	6(31.6%)	6(33.3%)	2(9.1%)	14 (23.7%)
Never drink	10(52.6%)	10(55.6%)	14(63.6%)	34 (57.6%)
Family Illness				
Family illness related with hypertension	10(52.6%)	10(55.6%)	8(36.4%)	28 (47.5%)
Duration of sickness (mean ± SD)	7.6+6.746	8.15+4.949	5+3.916	6.77+5.37

The result of Table 9 provides a comparison on selected the basic demographic and socioeconomic characteristics in hypertension patients. Between intervention groups and control group shown differed mean value with respect by family illness. Mean value of family illness and duration of sickness of both groups of intervention higher than control group. There was no significant difference in the mean value of personal disease (high cholesterol, diabetes mellitus and osteoarthritis), smoking, alcohol consumption and employment. Of personal illness found no participants in control group sick with heart disease.

We have argued that mean rank of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before and after implementation between three groups to capture most of data among three groups of this study. Data in Table 10 showed the mean rank of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before and after implementation between three groups.

Table 10: The results of mean rank of hypertension' knowledge, attitude, and practice including blood pressure before and after implementation between three groups

Variables	Gr I (Savings+Health Education		Gr II (Health Education)		Gr III (Control)	
	Pre	Post	Pre	Post	Pre	Post
Knowledge on hypertension	10.31	15	12.05	15	9.95	9.13
Attitude of hypertension	42.78	52.73	42.38	52.83	38.54	40.72
Practice of hypertension	35	46.31	34.94	47.66	30.90	33.77
Systolic Blood Pressure	166.84	131.68	162.72	130.28	170.73	158.64
Diastolic Blood Pressure	94.68	81.74	96.28	72.94	105.50	95.41

The results of table 10 presented mean rank score of hypertension' knowledge, attitude, and practice before implementation between three groups lower than after implementation SHE model program. However, systolic and diastolic blood pressure before implementation among three groups is higher than after implementation.

Table 11: Mean difference of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before implementation between three groups

Variables	Scheffe Test						
	(I) Group	(J) Group	Mean difference (J-I)	SD	p-value	F-test	p-value
Knowledge on hypertension	Gr1	- Gr2	-1.739	.819	.115	3.870	.027
	Gr1	- Gr3	.361	.780	.899		
	Gr2	- Gr3	2.101	.792	.036		
Attitudes of hypertension	Gr1	- Gr2	.400	2.305	.985	2.318	.108
	Gr1	- Gr3	4.244	2.195	.164		
	Gr2	- Gr3	3.843	2.227	.234		

Variables	(I) Group		(J) Group	Scheffe Test: Mean difference (J-I)	SD	p-value	F-test	p-value
Practices of hypertension	Gr1	-	Gr2	.055	2.743	1.000	1.638	.203
	Gr1	-	Gr3	4.090	2.611	.301		
	Gr2	-	Gr3	4.035	2.650	.321		
Systolic blood pressure	Gr1	-	Gr2	4.120	4.342	.640	1.823	.171
	Gr1	-	Gr3	-3.885	4.135	.645		
	Gr2	-	Gr3	-8.005	4.196	.171		
Diastolic blood pressure	Gr1	-	Gr2	-1.594	4.184	.930	4.369	.017
	Gr1	-	Gr3	-10.816	3.984	.031		
	Gr2	-	Gr3	-9.222	4.043	.083		

Result of mean difference of the knowledge on hypertension regarding care and control of patients with hypertension before intervention.

Knowledge on hypertension questionnaires were employed to ask to answer from participants a total of 15 questions. This questionnaire had 4 multiple – choice answers with the total score of 15 scores. The average knowledge score from respondents was 10.71(SD = 2.61). The knowledge score ranged from 6-15. Frothy respondents able to answered with a high level of the knowledge.

The association of hypertension' knowledge between three group before intervention by F-test showed a statistically results ($p \leq 0.027$) which means that at least one pair explains association in knowledge scores before implemented SHE model program as presented in Table 11.

Result of mean difference of the attitudes regarding care and control of patients with hypertension before intervention.

Attitude regarding care and control questionnaires were employed to ask to answer from participants a total of 15 questions. Attitude questions had 5 Likert scale answers with the total score of 60. The average attitude score from respondents was 41.08(SD = 7.16). The "higher attitude" score cut out point as 80 percentages or 48 scores. For

60-79 percentages was considered as “moderate attitude.” Lower attitude was considered as lower than 59 percentages.

With regard to attitude toward hypertension care and control as exhibited in the results of F-test, at the 5% significance level, indicated that not statistically significant difference (p = .108) among the mean score of subgroups with different levels of attitude before intervention as shown in the Table 11.

Result of mean difference of the practices regarding care and control of patients with hypertension before intervention.

With these part shows the results of the overall baseline data of practices regarding care and control of 59 respondents as described in Table 4.3. Practice questionnaires were employed to ask patients with stage II of hypertension with a total of 15 questions. Practice questions had 15 Likert scale answer the total score of 60. The average practice score from participants was 33.457(SD = 8.430). The “high level of practice” score cut out point as 80 percentages or 48 score. For 60-70 percentages was considered as “moderate attitude.” Lower attitude was considered as lower than 59 percentage or 35 scores.

The F-test showed at the 5% significance level, indicated that not statistically significant (p = .203) among the mean score of subgroups with different levels of practices before intervention as shown in the Table 11.

Result of mean difference of the systolic blood pressure of patients with hypertension before intervention.

In this part, we turn to presenting the results of the association of systolic blood pressure among three group before intervention by F-test showed a statistically results (p = .171) which means that at the 5% significance level, indicated that not statistically significant among the mean score of subgroups with different levels of systolic blood pressure before intervention as presented in the Table 11.

Result of mean difference of the diastolic blood pressure of patients with hypertension before intervention.

Is not likely that the systolic blood pressure, there is the association of diastolic blood pressure between three group before intervention by F-test showed a statistically results ($p \leq 0.017$) which means that at least one pair explains association in diastolic blood pressure before implemented SHE model program as outlined in Table 11.

After an assessment of the associations of knowledge, attitude, and practice through the systolic blood pressure and diastolic blood pressure before intervention among three groups needs as perceived key functionaries was highly revealing. A post-test questionnaire were employed to all respondents to assess their knowledge, attitude, and practice regarding hypertension care and control post intervention and other related aspects as indicated in the Table 12.

Table 12: Mean Difference of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure after implementation between three groups

Variables	(I) Group	(J) Group	Scheffe Test			F-test	p-value
			Mean difference (J-I)	SD	p-value		
Knowledge on hypertension	Gr1	Gr2	.000	.482	1.000	110.14	<.001
	Gr1	Gr3	5.863	.459	<.001		
	Gr2	Gr3	5.863	.466	<.001		
Attitudes of hypertension	Gr1	Gr2	-.096	3.032	.999	11.796	<.001
	Gr1	Gr3	12.009	2.887	<.001		
	Gr2	Gr3	12.106	2.930	<.001		
Practices of hypertension	Gr1	Gr2	-1.350	3.626	.933	9.960	<.001
	Gr1	Gr3	12.543	3.452	<.003		
	Gr2	Gr3	13.893	3.503	<.001		
Systolic blood pressure	Gr1	Gr2	1.406	4.953	.961	23.278	<.001
	Gr1	Gr3	-26.952	4.716	<.001		
	Gr2	Gr3	-28.359	4.786	<.001		

Variables	(I) Group		(J) Group	Scheffe Test			F-test	p-value
				Mean difference (J-I)	SD	p-value		
Diastolic blood pressure	Gr1	-	Gr2	8.529	3.301	.043	25.735	<.001
	Gr1	-	Gr3	-13.935	3.143	<.001		
	Gr2	-	Gr3	-22.465	3.190	<.001		

Result of mean different of the knowledge on hypertension regarding care and control of patients with hypertension after intervention.

The association of hypertension' knowledge between three group after intervention by F-test showed a statistically results ($p < 0.001$) which means that at least one pair explains association in knowledge scores after implemented SHE model program as exhibited in the Table 12.

Result of mean different of the attitudes regarding care and control of patients with hypertension after intervention.

The strong association of attitude toward hypertension care and control as exhibited in the results of F-test, showed a statistically results ($p < 0.001$) which means that at least one pair explains association in attitudes scores after implemented SHE model program as showed in the Table 12.

Result of mean different of the practices regarding care and control of patients with hypertension after intervention.

Similar to the association of the attitudes, the F-test of practices regarding care and control showed a statistically results ($p < 0.001$) which means that at least one pair explains association in attitudes scores after implemented SHE model program as showed in the Table 12.

Result of mean different of the systolic blood pressure of patients with hypertension after intervention.

Since, the results of the association of systolic blood pressure among three group after intervention by F-test showed a statistically results ($p < 0.001$) which means that at

least one pair explains association in systolic blood pressure after implemented SHE model program as presented in the Table 12.

Result of mean different of the diastolic blood pressure of patients with hypertension after intervention.

In final results, presenting the association of diastolic blood pressure among three group after intervention by F-test showed a statistically results ($p < 0.001$) which means that at least one pair explains association in diastolic blood pressure after implemented SHE model program as outlined in the Table 12.

Additionally, a comparison of the percentage of achievement of blood pressure post intervention among three groups as appeared in Table 13 for understanding the proportion in the level of blood pressure control achievement after intervention.

Table 13: Compare the percentage of achievement of blood pressure post intervention between three groups

Variable	Group	N	Achievement (%)	Mean Rank	p-value*
BP post intervention	Group I	19	11(57.9%)	32.58	0.001
	Group II	18	16(88.9%)	41.72	
	Group III	22	2(9.1%)	18.18	
Total		**59**			

* Kruskal Wallis statistic test

Results of a comparison of the percentage of achievement of blood pressure post intervention among three groups found both experimental groups have higher proportion 11(57.9%) and 16(88.9%) of blood pressure post intervention achievement than control group 2(9.1%) as shown in Table 13. The association between three groups by Kruskal Wallis statistically result p-value < 0.05 was significant.

Next part, the researcher present the results of savings program, since the researcher adopted the SHE model program at Sai Mai community. We only conducted savings program in the experimental group I. The finding data presented the percentage of savings pre and post intervention as appeared in Table 13.

Table 14: Compare the percentage of saving pre and post intervention among group I (Experimental N=19)

Variable	Pre – intervention		Pre – intervention	
	Number	%	Number	%
1. Within two months how many time the physician make an appointment with you?				
1.1 Physician never make an appointment to follow up	-	-	-	-
1.2 Always make an appointment and usually follow up	18	94.7%	19	100%
1.3 Never attend follow up with physician	1	5.3%	-	-
2. Within the last two months, Did you go to hospital for any reason?				
2.1 Hypertension	17	89.5%	19	100%
2.2 Other diseases	-	-	-	-
2.3 Never go to hospital	1	5.3%	-	-
3.Have you ever borrowed money from any fund for medical expense or cost of transportation when you go to follow up at hospital?				
3.1 Never borrow money	18	94.7%	18	94.7%
3.2 Always borrow money	1	5.3%	1	5.3%
4. How do you source the cost of medical expense, transportation to hospital expense or medical facility?				
4.1 Income such as salary	18	94.7%	18	94.7%
4.2 Loan fund	1	5.3%	-	-
4.3 Other source such as from family member	-	-	-	-
5. Are you going to follow up every time?				
5.1 Every time	13	68.4%	19	100%
5.2 Sometime	6	31.6%	-	-
6. When you are faced with health emergency problem and a financial crisis at the same time What would you do?				
6.1 Observed at home, not increase the cost	6	31.6%	19	100%
6.2 Borrow money from any fund such as community welfare fund for cost of follow up	5	26.3%	8	42.1%
6.3 Other reasons	8	12.1%	11	22.2%
7. Are you saving more?				
7.1 Saving same	15	78.9%	13	68.4%
7.2 Saving more	1	5.3%	4	21.1%
7.3 Not saving	1	15.8%	2	10.5%

Variable	Pre – intervention		Pre – intervention	
	Number	%	Number	%
8. Community savings fund' member and also you can borrow from the fund for medical expense or cost transportation when you go to hospital cause of you can use or access to health facility more?				
8.1 Less access than, compared with pre intervention	-	-	-	-
8.2 More access than, compared with pre intervention	7	36.8%	18	94.7%
8.3 Same access, compared with pre intervention	12	63.2%	1	5.3%
9. **Community savings fund' member and also you can borrow the fund for medical expense or cost transportation when you go to hospital cause of you comfortable to access to health facility more?**				
9.1 Less comfortable than, compared with pre intervention	-	-	-	-
9.2 More comfortable than, compared with pre intervention	10	52.6%	15	78.9%
9.3 Same comfortable, compared with pre intervention	9	47.4%	4	21.1%
10. Are you satisfied with the membership of community savings fund that you can borrow money or not?				
10.1 Satisfied	18	94.7%	19	100%
10.2 Not satisfied	1	5.3%	-	-
11. **Membership of community savings fund and you can borrow money return the benefits to you or not?**	18	94.7%	19	100%
11.1 Benefits than, compared with pre intervention	1	5.3%	-	-
11.2 Not benefits than, compared with pre intervention				
12. Do you think, you or ageing people should be savings for health benefits or not?				
12.1 Should be savings	16	84.2%	19	100%
12.2 Should not be savings	3	15.8%	-	-

The quasi-experimental study on the saving program provided an increased higher percentage of satisfaction, benefits, ability to access to health care services and the intention of savings money post intervention than before intervention, as outlined in Table 14. In addition, post intervention found no one will be loss follow up with the physician.

4.2 The results of In-Depth interview and Focus Group Discussion

In-Depth interviews were conducted after quantitative data collection at the final month of implementation the SHE model program (Post intervention) to provide valuable information for the program. The researcher set up interview with five groups. The first group consisted of eight participants from the both intervention groups who succeeded in controlling their blood pressure. The second group comprised four subjects from both experimental groups who were somewhat less of succeeded in controlling their blood pressure. The third group consisted of three patients with hypertension from the control group who still have high blood pressure and four patients who had normal blood pressure. The last group interviewed five patients from the experimental in group 1 for access to the benefits of community welfare fund.

The researcher and team re-explained the purposes of the interview, why the participants has been chosen, that all information would be kept confidential. During each interview the researcher team used a tape recorder and a note taker. The duration of each interview was approximately 60 minutes or until gaining the information-rich with respect to the purposes of the study. In-Depth interview' question consisted of 8 open-end questions as exhibited in Appendix E. After interview, the researcher team summarized key information immediately. Then, information given in interview was verified. The final steps were data analysis and dissemination of findings.

Theme

The knowledge gained from the project effects on your health or behavior or not?

- *This project very helpful*
- *One participant can quit take anti-lipidema drug.*
- *Now, they eating more carefully. Cause they understood how to eat with is not cause of high blood pressure.*
- *Their weight loss and no headache at all.*

Theme

This project will be changing your behavior or not after receiving the knowledge and participating with this project?

- *Yes, now they add a less of fish sauce.*
- *They will drink less.*
- *They exercise every morning and evening. Despite to the project is completed but, they still continue to exercise.*
- *Before they jointed with this project they didn't know sweet dessert and curry were a cause of high blood pressure. But now they know and eat its less.*
- *They will try not to stress.*

Theme

Are they will be bringing the knowledge into practice or not?

- *We still want to continue this activity. Because not only we get exercise but the children have exercise too.*
- *Sure! They will be put the knowledge into practice.*

Theme

What is the main cause of your blood pressure control was achieved?

- *The knowledge that your team provided to us.*

Theme

Are you satisfied with the membership of community savings fund where you can borrow money or not?

- *Satisfied*
- *It's Okay! It can be used when emergency arises.*
- *Only one participant not satisfied with membership of savings fund because it will take us further into debt.*
- *Its good, if we need to borrow we can borrow from community savings fund in state of neighbor*

Theme

Are membership of community welfare fund and able to borrow fund causing your health problem or not?

- *Not problem*

Theme

Is the knowledge gained from the project suitable with your disease?

- *Very suitable!*
- *It very good. Before joining with the project we never known more details like this*

Theme

Do you want to know more details of other diseases?

- *Yes! Sure, they need to know about diabetes mellitus, kidney disease, high cholesterol, and heart disease*

This section examines the causes of difficulty to control their blood pressure among the control group. We conducted focus group discussion at KC 1 village, Klong Sam Wa district, Bangkok, Thailand with seven subjects who cannot bring their blood pressure back to normal level. In our framework, we used three open-ended questions and observation techniques for finding the rich of information. The causes of the difficulty to control their blood pressure are presented below.

Theme

Do you know about high blood pressure?

- *Yes! High blood pressure must not eat salty foods and also to control blood pressure too*
- *They know patient with hypertension need to quit drinking.*
- *From their experienced; if less of sleep then high blood pressure will be increased*

Theme

Why can't you control your blood pressure while taking anti-hypertensive drugs?

- *They were wake up since 2 A.M. to go shopping at the market and prepare food for sales (Papaya salad' and Pork roasted with sticky rice' Merchant). After preparation everything finished, then continue to sell papaya salad. They rarely sleep including a papaya merchant and must cook and test salty food dishes before selling daily.*

- *One patient had three big accidents. After I moved to another community. She don't continue with treatment. Now, she taking care her nephew throughout the day. Therefore, not enough time to follow up at hospital.*

- *One patient addicted with Mitragyna Speciosa or Kratom, he chewed it until he sleep. He believes Kratom help his work longer especially, in the sunshine. His addiction more than twenty years.*

- *One patient sleepless at night more than twenty-five years; usually sleeps at 5 A.M daily. Also, used sleeping pill through twenty years until now.*

- *One patient have not been to follow up at hospital on time according to he often want to control construction site at another place.*

Theme

Are you exercising regularly?

- *Not yet, we did not have enough time to do it.*

In this data below shown, an examination of the causes of controls their blood pressure among the control group. We conducted in-depth interview with three patients who were able to achieve to reducing their blood pressure. The group presented other reasons for controlled their blood pressure as set out in the table.

Theme

Can you tell me why you can control your blood pressure?

- *After they joined the project, the doctor and team measured our blood pressure, and they felt scared when their blood pressure were high. So, they tried taking medicine on time regularly.*

- *Health center staff visited their village and provided chronic disease knowledge. They asked them about hypertension. Health center staff suggested taking medicine on time regularly. Then, they tried to do as they said because I feared the complication of hypertension.*

Of this group, we conducted an in-depth analysis of four subjects who couldn't control their blood pressure to a normal stage among both experiment groups as summarized in the data below.

Theme

Can you tell me why you can't control your blood pressure with a normal stage?

- *They still drinking occasionally too much*.
- *One patient could not reduce her stress*.
- *One patient suffered abdominal pain for the last two weeks. After receiving pain-killing drugs from hospital, the pain symptoms have not gone away.*

In the final part of qualitative assessment, we conducted focus group discussion with five subjects who participated in experimental groups I. The findings are summarized below.

Theme

Membership of community savings fund allows the member to borrow money for medical expense or transportation cost when you go to follow up return the benefits? Is it easier to access health care services or not?

- *If changing the rules of return benefits us, it's Okay*
- *The community savings fund should return the benefits to the members, while the members were still alive as a form of money. Then, we can be increased the cost of health investment in our life.*
- *It would be great, if our family member got sick and we can borrow money from the fund for them.*

Theme

Are you satisfied with the membership of community savings fund that allows the member to borrow money for medical expense or transportation cost when you go to follow up return the benefits? Is it easier to access to health care services or not?

- *Satisfied!*
- *Yes! Sure*
- *It's great*

CHAPTER V
DISCUSSION, CONCLUSION, & RECOMMENDATION

This purpose of this chapter is to summarize the study that was conducted, review the prevalence of hypertension, assess the aims of the research including a restatement of the research questions, and the appropriateness of theory used in research, and also a summary of the study results, conclusions and discussion.

5.1 Prevalence of hypertension

Thailand has the burden of NCDs by international standard. Using 2009 statistics, NCDs cause of death over 300,000 or 73% of all adults in Thailand a high proportion by international standard (Foundation, 2015). Results from another survey in 2009, found 21.4% of Thai adults had hypertension. However, patients' perception of their blood pressure, the rate of access to health care services, and the needed for blood pressure control is relatively low (Foundation, 2015). A 2010 report showed hypertension and cerebrovascular disease are the fourth leading cause of death in both male and female population (death rates per 100,000 populations) in Thailand (Foundation, 2015). Especially, in Bangkok, Thailand found higher percentage of patients with hypertension who were treated but uncontrolled located at Bangkok area than other regions as details in Table 15.

Table 15: Percentage of patients who diagnosed with hypertension, received treatment and the result of treatment divided by region

Total	**Religion**					
	North	**Central**	**East**	**South**	**Bangkok**	**Total**
	N=1,554	**N=1,708**	**N=1,154**	**N=1,500**	**N=776**	**N=6,692**
No Diagnosis	48.3	51.6	58.1	51.2	36.9	50.3
Diagnosis but no treatment	7.6	5.6	10.1	14.4	8.7	8.7
Treatment but uncontrolled	20.4	21.9	15.1	17.7	26.4	20.7
Treatment and controlled	23.7	21.0	16.7	16.6	28.1	20.9

Therefore, this study expected to gain more understanding of their knowledge, attitude, and practice regarding hypertension care and control, and the advantages of an integrated savings and community based health education for older adults with

hypertension. The results of this study consequently were provided a comprehensive understanding of these issues, as detailed following;

5.2 Discussion

1. The association of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before implementation between three groups Sai Mai and Klong Sam Wa district, Bangkok, Thailand.

The first specific objective of this study was to investigate the improvement in knowledge, attitudes, and practices of people involved in the SHE model program. The quasi-experimental study reported before we adopted this program the proportion of patients among both experimental groups and control group are statistically significant p = .027 with meaning basic knowledge on hypertension among three groups is not different despite health promotion and education by Bangkok Metropolitan Administration especially, with the control group.

In terms of attitudes towards care and control of hypertension, we found the people who have high level of attitude before intervention shown negative association p = .108. Generally this study found that, with patients who had low levels of attitudes towards care and control before intervention was due to low levels of knowledge on hypertension. Low levels of knowledge on hypertension do not encourage patients to take action to deal with hypertension.

Similarly, the respondents' level of practice prior to the SHE program before implementation presented the negative association p = .203. Here again, low levels of knowledge on hypertension seem to be the reason for low levels of practices.

The negative attitudes and practice before launch of the SHE model program were consistent with pre systolic blood pressure values. The association of systolic blood pressure pre intervention among three groups by Scheffe test was not significant p = 0.171.

Negative attitudes and practices correlated with generally higher their systolic blood pressures. However, the report found diastolic blood pressures did not correlate with negative attitudes and practices.

The present finding is consistent with studies from Seychelles Island (Indian Ocean); a middle-income country (Line Aubert et al., 1997) and Mumbi, India (Hemant Mahajan, Yasmeen Kazi, Bhuwan Shrm, GD Velhal, 2012), and Pragnesh Parmar, et al., (2014).

(Aubert et al., 1997), the Seychelles Island stated that among 1067 adults who had a hypertension problem, only half of them were aware of their hypertension condition. Only 34 % were treated and, just 10% took blood pressure control measures. While, they had good basic knowledge to hypertension determinants and consequences. Additionally, favorable outcome expectations, higher attitudes, and appropriate practices of hypertension were found in a smaller proportion among those respondents.

In the context of (H. M. e. al., 2012) study, poor knowledge (83.4%), attitudes (69.11%), and practices (73.24%) was shown among 340 participants at Shivaji Nagar urban, Mumbai, India. The information from study supported, most of subjects had associated co-morbidities, as indicated by the study. Their lack of awareness about hypertension was a cause of poor practices and is the main reason for high blood pressure. Therefore, this study recommended that the Department of Preventive and Social Medicine needed to encourage health services such as health education regarding risk factors of hypertension.

Data available from another India study the Pragnesh Parmar, et al., (2014) conducted at Gandhinagar, Gujarat city; India showed that most of subjects were aware about the causes, symptoms and complications of hypertension. However, the results indicated poor attitudes in that part of the survey, and only 45.2% had a positive attitude towards exercise. Only 20.6 % of participants had their blood pressure checked and only 17% of subjects were able to answer 50 % of practice questions correctly (Pragnesh Parmar, 2012).

Results from our quasi-experimental study suggested that health education; appropriate practices for hypertension, together with a healthy lifestyle were serious concerns in the reduction of hypertension among patients. Key issues that require additional focus include interventions from health experts in advising patients with hypertension and appropriate health education targeting the practices of hypertension,

promoting salt and stress reduction, and encouraging appropriate exercise at community level, in order to control and prevent hypertension complications, and to help establish a healthier lifestyle among patients.

2. The correlation between hypertension' knowledge, attitudes, and practices and blood pressures after implementation, among the three groups at Sai Mai and Klong Sam Wa district, Bangkok, Thailand.

The main aim of this paper was to assess the correlation between knowledge, attitudes, and practices of hypertension, and blood pressure control post intervention. The evaluation of the implementation of SHE model program in this part was the answer to first, second and third specific objectives. Since intervention was completed; the evaluation process between two experimental groups and the control group was conducted for measuring the effectiveness of the intervention. Key indicator performances of the effectiveness of this program are primary outcomes and secondary outcomes. The primary outcome was improved hypertension' knowledge, attitude, and practice after intervention. The secondary outcome was blood pressure control, measured in both experimental and control groups before and after intervention.

The findings can explain that the association of knowledge on hypertension after we adopted this program was the statistically significant p = .001, meaning basic knowledge on hypertension among three groups was not different.

Regarding attitudes towards care and control of hypertension, the quasi-experimental study reported that the correlation of attitudes among three groups after intervention showed positive association p = .001. Here we found health education reinforced positive attitudes to hypertension and encourage patients to take action in reducing hypertension.

The respondents' level of practice prior to the SHE model program after implementation presented the positive association p = .001. Patients with low or negative attitudes towards hypertension had poor perception and low levels of practice, compared with those who had positive or better attitudes and consequent higher levels of practice in dealing with the problem.

Blood pressure control was stronger with those who had positive attitudes and practices, than those who had negative attitudes and practices. The association of systolic and diastolic blood pressure post intervention among the three groups by Scheffe test was significant p = .001.

All results of the associations of knowledge, attitude, and practice were consistent with three articles from which our quasi-experimental study was based; it is evident that additional community health education has an association with decrease in blood pressure. Three studies consist of the study from K.S.Roopa and G.Rama Devi (2004), Marian Michel (2013), and Mohamad Ali Babace Beigi, et al. (2014) are explained as follows;

K.S.Roopa and Devi (2004) studies the impact of existing knowledge, attitude, and practice for prevention and management of elderly people's hypertension by developing a module education program and providing necessary hypertension information to improve their health and quality of life at Karnataka, India. The results of this study found that the score of post test on knowledge, attitude, and practice regarding hypertension were higher than the pre intervention. Furthermore, this study suggested that it is possible to make respondents keep awareness of controlling their blood pressure by stress management by dealing with distressful emotions, using community based resources, and self-management (K.S.Roopa & Devi, 2004).

By the year 2013, a study by Marian Michel was conducted to observe how increased physical activity with a DASH diet require affected the blood pressure of pre stage of hypertension and hypertensive rural African-Americans adults in the United Stage of America. Researchers provided only physical exercise for the first experimental group. The second experimental group used physical exercise plus the DASH diet compared with the control group through 12 weeks. The strengths of the Marian Michel studied suggested that 86% of respondents increased consumption of plant-based nutrition. Nearly half of participants or 43% decreased dietary saturated fats and 57% of those reported increased physical activities. Among these, 43% decreased their systolic blood pressure by 8-10 mm Hg (Michel, 2013).

In another study, Mohamad Ali Babace Beigi, et al., (2014) assessed the effect of health education program on hypertension management with 100 hypertensive

patients at Shiraz Health Heart House. The aim of the study was to examine the effectiveness of the short term health education program provided to respondents on the level of knowledge, lifestyle change and blood pressure control provided individually by trained medical staff. The program included the meaning of hypertension, and the method to control HTN including symptoms and complications of HTN. After that, medication adherences and nutritional and exercise counseling by medical experts was provided. The researcher divided participants in to ten groups and follow up thought three months. After collecting data by questionnaires, the respondents were interviewed again for completed the post test program. In addition, blood pressure was measured. Results of this study presented lifestyle changes are difficult to achieve. The key success seems to be the knowledge of HTN that results from lifestyle modification. Achievements notwithstanding, much more improvement of blood pressure post intervention was a major remained in the study (Mohamad Ali Babace Beigi, 2014). The association of the achievement of blood pressure post intervention by Kruskal Wallis statistic test among three groups was significant.

The findings are affected by many factors such as ensure the necessary hypertension knowledge, adequacy of health education programs, adequacy of motivation the participants, intensity and consistency of the counseling program, stress reduction, hypertensive medication, emergency care, smoking and alcohol consumption program including community co-operations, and close links with our research team. Especially, adequacy of health education programs was the main contributory factors in blood pressure reduction consists of definition, risks, complications and symptoms of hypertension, collect and regular medication intake, collect method of blood pressure measuring, adequate cooking techniques (less salt), weight reduction, stress control, basic principles of emergency care for saving life, and awareness of danger smoking and alcohol consumption. It is interesting to note that the dietary and exercise modules are very imposing under the SHE program. Therefore, high level of knowledge, positive attitudes and practices were possible in both communities at Sai Mai district compared with control group at Kong Sam Wa district, Bangkok, Thailand.

All findings of the association of knowledge, attitude, and practice were consistent with the theory of health belief model (HBM) of (Karen Glanz et al., 1997) and teaching with group method of Arlene J. Lowenstein et al (2009). Health belief model theory has concluded that the effectiveness to change cognition about health matters is attempts to arouse individuals' fear through threatening messages Leventha, 1970 cited in (Karen Glanz et al., 1997). As most of respondents understood the positive benefits of the SHE model program to offset a threat, behavior changed. Similarly, teaching with group method suggested that this technique increased focus on self-management of chronic disease in the groups is often an effective way to deliver education. The advantage of groups can offer an opportunity for enhanced learning due to the members sharing information, brainstorming their ideas and shared thinking, solution of health related issues, and also challenging of assumptions and myths held by individual members (Arlene J. Lowenstein, 2009). After the respondents perceived the threatening messages and increased their self-management of chronic disease according to groups teaching techniques, their knowledge increases. Then, increasing knowledge will lead to positive attitudes and increased good practices. Our findings are consistent with the studies in Thailand from Pantip Sangprasert and Netip Pradujkanchana (2010), and Nipart Boongun and Rujira Dungsong, 2012.

Pantip Sangprasert and Netip Pradujkanchana (2010), argued that the effectiveness of health promotion behavior program (HPBP) among hypertensive patients in Thai at Pathum Thani province, central Thailand. The health promotion behavior program consisted of respiratory and exercise practical skills, health education program, care giver suppor, telephone counseling and home visits during 8 weeks. The results found the experiment group had higher mean scores than the control group in several aspects including health perception status and stress management behaviors. Additionally, the experimental group had lower mean scores in waist circumference, respiratory rate, and diastolic blood pressure than the control group. The improvement after the treatment was shown only in health perception status and stress-management behaviors. While, waist circumference were decreased mean scores as same as respiratory rate, systolic and diastolic blood pressure. This study recommended HPBP

for home visit nurses with hypertensive patients (Sangprasert & Pradujkanchana, 2010).

(Niparat Boongun, 2012), studied the effectiveness of health education program by using protection social support and motivation theory for the prevention of kidney disease among hypertensive patients. All sixty patients divided to two groups. Health education had been provided to experimental group by using protection social support and motivation theory though five weeks and six weeks for protection social support theory. The results of this study suggested that health education program for the experimental group improved behavior among hypertensive patients better than the control group.

3. The influence of savings program to control blood pressure among patient with hypertension stage I

The savings program survey results did not increase the potential of decrease blood pressure. Only health education programs influenced control of blood pressure and increased knowledge, attitude, and practice on hypertension. Results from focus group discussions found all subjects among group I lived not far from Bhumibol Adulyadej hospital. In addition, the community and family center under Bhumibol Adulyadej hospital was located close to the Sai Mai community. Therefore, the patient had no difficulty in accessing health services.

However, this study found most of them 18(94.7%) stated that with membership of community savings funds' they can borrow the money from the fund for medical expense or cost of transportation when they go to follow up at hospital or when faced with a financial crisis. In addition, all of them were satisfied with the membership of community saving fund, if it changed the rules regarding return of benefits. The community saving fund should return the benefits to the members, while the members were still alive in the form of money. Then, they can be increase the cost of health investment in their life as indicated from the focus group discussion.

4. Results of in-depth interview and focus group discussion

Using the in-depth interview and focus group discussion methodologies we sought more information about blood pressure control. Results of in-depth interview and

focus group discussion found that blood pressure control among patients diagnosed with stage II of hypertension had different influences on knowledge, attitudes, and practices. Specifically, respondents who were successful in controlling their blood pressure after intervention had high attitudes and were very concerned as to the practice. This finding support the idea that perceived positive outcomes of diet control, regular exercise, and stress reduction will control hypertension. Additionally, all subjects among both experimental groups had a high level of knowledge about hypertension after intervention according to their being trained continually with ongoing consultation each month. After questionnaire checking was complete, if some subjects do not understand a topic, the research team has provided advice and consultation to the respondents. However, it is less clear whether this had any impact in savings program. Our findings suggest that significant improved in hypertension knowledge and attitudes results in less intention in appropriate practices. Participants, who are not fully practiced in reducing high blood pressure, may lead to complications with their hypertension.

5. Impact of integrated savings and community based health education or SHE program

In both groups of experimental respondents after intervention score on knowledge, attitudes, and practices regarding hypertension care and control were higher than pre intervention scores. Furthermore, systolic blood pressure and diastolic blood pressure of the both experimental group respondents after intervention were reduced than before implemented SHE model. From the finding of the present study it can be concluded that it is possible to make older adults had attitude and behavior changed including aware the way to control their severe hypertension while, there are not facings with hypertension complications. All of them were satisfied with this program. One respondent (a woman) from experimental group II even stopped taking anti-hyperlipiddemic drugs after the fourth month of joining activities with our study.

The challenge was in finding appropriate methods to motivate patient to be interested a developing skills, knowledge and attitudes in solving their hypertension problem solving. Inadequate knowledge is at the root of this health problem. Community leaders and health practitioners in the part have had little training on hypertension.

Hence, the SHE model program was implemented in the communities. Currently local leaders now get trained and received current information on hypertension. It is recommended to increase the capacity of local leaders on hypertension control. Medical practitioners from a variety of disciplines should be aware of the crucial role they play in health education.

6. Sustainability of integrated savings and community based health education or SHE program

Most of people perceived positive outcomes from the SHE model program for hypertension control. After our team left the communities, the community exercise programs continued and were given an Owners Wisdom for Aging People Award on individual and silver award form Sport Excellence on community level in health promotion from Bangkok Metropolitan Administration (BMA), Bangkok, Thailand.

5.3 Limitations of this study

Apart from the fact, there are several limitations of this study that should be noted as follows;

1. Limitations of the experimental group; the setting of the community health education center is nearby Bhumibol Adulyadej hospital, Sai Mai district, Bangkok, Thailand. As mentioned above, community and family center under Bhumibol Adulyadej hospital located at Sai Mai community therefore, the patients had easier access to health services. So, all subjects among group II of the experimental group did not incur the cost of transportation or other medical cost. So, the savings program had less impacte on blood pressure control.

2. Limitation of control; our quasi-experimental study was conducted under Bangkok Metropolitan Administration (BMA)' community health center responsibility. Therefore, this study was by an uncontrolled external confounder such as the information of control high blood pressure from other sources that the community can access likes operates through chronic disease mobile clinics, family visit program, or health education at community by BMA' staffs etc.

3. In our framework, this research plan was to exercise in the morning before we adopted the SHE program at both communities. However, we had difficulty in

doing this because of subjects were not available due to work, and child care commitments. So, the exercise program was conducted at 5 to 6 P.M. three days a week through six months. This is perhaps minor limitation of this study.

5.4 Conclusion

By living a healthy lifestyle, we can help keep our blood pressure in a healthy range and lower our risk for heart disease and stroke as mention in the previous chapters. Although hypertension is preventable, it is important to know that it requires adequate knowledge and skills by patients and sufferers. Understanding the definition of high blood pressure, the DASH diet for hypertensive people, the need for proper and regular exercise, stress reduction, emergency care, medication, and limiting smoking and alcohol consumption, all these measures will assist an effective hypertension control. As the World Health Organization has advocated health education**,** consciously instructed people have access to opportunities for learning to improve health literacy, developing appropriate life skills, and improving knowledge of disease management among individuals and the community. This is consistent with our study. Our three main conclusions concern the following:

First, focusing on blood pressure control among patients with stage II of hypertension was affected by the significant increase in the knowledge, attitude, and practice of hypertension when compared with the control group.

Second, the rationale for focusing on savings program may not significantly decrease blood pressure among patients with stage II of hypertension when compared with experimental group I. Nevertheless, the savings program was satisfied for the older adults from the result of in-depth interview and focus group discussion, despite some concerns especially of financial nature.

Thirdly, and most importantly, the SHE model program seems to be effective for control of high blood pressure by providing health education at a community based level. It offers a positive educational outcome in enhancing the knowledge, attitude, and practice in hypertensive patients.

5.5 Recommendation for further research

Based on the finding of this study as stated in chapter IV, we recommend further research under two different scenarios as following:

1. Integrated savings and community based health education programs among patients with hypertension in the remote areas.

2. Further research should consider conducting studies in other diseases and different age groups, especially among children and other vulnerable groups.

5.6 Recommendation for health policy

As stated in chapter II there is likely a positive correlation between savings and health. Conversely, negative savings may be related with poorer health in the sense that individuals may choose to invest less in health to save for other forms of consumption. Results from this study suggested that the community should take advantage of community savings funds and the funds should return the benefits to members while member are still alive. Then, they can eventually use these benefits to continue investment in their health during the time of economic crisis, or when an emergency happens in their life in order to enhancing access to health care among those with disease or chronic disease.

Promotion of a community savings fund among elderly should be expanded to include savings in other age groups such as working-age groups; or pre-retirement groups. However, if the health policy maker wanted to seriously invest in health, a universal savings plan should be introduced. If this is not possible, then at least a plan for patients suffering from chronic disease should be introduced.

The SHE model creates a greater commitment and supports the changing of behavior in hypertension care and control for all respondents. Community based health education activities might include disseminating accurate information and dispelling myths about definition, risks, complications and symptoms of hypertension. Furthermore, community based activities might control the regular medication intake, correct method of blood pressure measuring, adequate cooking techniques (less salt), weight reduction, stress control, basic principles of emergency care for saving lives, and awareness of consequences of smoking and heavy alcohol consumption. There is

an important need for health policy maker to plan the intervention carefully in all details as an effective and long lasting hypertension control program will not be successful without proper education, encouragement and motivation of hypertensive patients in order to reduce an unhealthy lifestyle, making their healthy measures becoming a habit. Furthermore their family members have to be more actively involved in the intervention program for active support. The organization of social mobilization events and community participation will rise hypertension awareness and promote healthy lifestyle habits in the future.

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APPENDIX

Appendix A

แบบประเมินความรู้ เจตคติ และพฤติกรรมที่เกี่ยวกับโรคความดันโลหิตสูง

Cluster No……

บ้านเลขที่.....หมู่ที่.....แขวง.....เขต.....จังหวัดกรุงเทพฯ

ส่วนที่ 1: ข้อมูลทั่วไป

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมาย / ลงในช่องที่กำหนด หน้าข้อที่ท่านเลือก

1.เพศ □1.ชาย □ 2.หญิง

2. สถานภาพสมรส

□ 1.โสด □ 2.สมรสถูกต้องตามกฎหมาย □ 3.หย่า/แยกกันอยู่

□4. หม้าย □ 5.อยู่ด้วยกันไม่จดทะเบียนสมรส □ 6.อื่นๆ……..

3. ระดับการศึกษา

□0. ไม่ได้เรียน

□1. ประถมศึกษา

□2. มัธยมศึกษาตอนต้น/ปวช.

□3. มัธยมศึกษาตอนปลาย/ปวส.

□4. ปริญญาตรี

□5. สูงกว่าปริญญาตรี

□6. อื่น ๆ ระบุ……

4. อาชีพ

□ 0.ไม่ได้ประกอบอาชีพ

□ 1.ประกอบอาชีพ (อาชีพหลัก)

□ 1.ข้าราชการเกษียณ □ 2.ค้าขาย □ 3.เกษตรกร

□ 4.รับจ้าง □ 5.ธุรกิจส่วนตัว/เจ้าของธุรกิจ

□ 6.เจ้าของห้องเช่า/บ้านเช่า □ 7.อื่นๆ (ระบุ).....

5. รายได้

□ 0.ไม่มี

□ 1. มี .....บาท/เดือน

(โปรดระบุแหล่งของรายได้ และระบุได้มากกว่า 1 ข้อ)

□ 1. เงินเดือนประจำ .....บาท/เดือน

□ 2. ค่าจ้าง (รายวัน/ชิ้น/งวด) .....บาท/เดือน

□ 3. ลูกหลานให้ .....บาท/เดือน

□ 4. ญาติ .....บาท/เดือน

□ 5. คนรู้จักให้ใช้จ่าย .....บาท/เดือน

□ 6. เพื่อนบ้าน .....บาท/เดือน

□ 7. รัฐสงเคราะห์ให้รายเดือน .....บาท/เดือน

□ 8. งานเกษตร ปลูกพืช เลี้ยงสัตว์.....บาท/เดือน

□ 9. อื่นๆ (ระบุ) …… .....บาท/เดือน

6. โรคประจำตัว (ที่วินิจฉัยโดยแพทย์) หรือไม่

□ 0. ไม่มี / ไม่ทราบ

□ 1.มี (ตอบได้มากกว่า 1 ข้อ)

□ **1. โรคหัวใจและหลอดเลือด**

□ 1.รักษาหายขาดแล้ว □ 2.กำลังรักษา □ 3.ไม่ได้รักษา

□ **2. โรคไขมันในเลือดสูง**

□ 1.รักษาหายขาดแล้ว □ 2.กำลังรักษา □ 3.ไม่ได้รักษา

□ **3. โรคความดันโลหิตสูง**

□ 1.รักษาหายขาดแล้ว □ 2.กำลังรักษา □ 3.ไม่ได้รักษา

□ **4. โรคเบาหวาน**

□ 1.รักษาหายขาดแล้ว □ 2.กำลังรักษา □ 3.ไม่ได้รักษา

□ **5. กลุ่มโรคกระดูกและข้อ**

□ 1.รักษาหายขาดแล้ว □ 2.กำลังรักษา □ 3.ไม่ได้รักษา

□ **6. อื่นๆระบุ……**

7. □1.น้ำหนัก.....กิโลกรัม □2. ส่วนสูง.....เซนติเมตร

8. ท่านสูบบุหรี่

□1. ไม่เคยสูบบุหรี่

□2. สูบบุหรี่ ปริมาณที่สูบ.....มวน/วัน

□ 1.เคยสูบแต่ปัจจุบันเลิกแล้ว เลิกมา .....ปี

□ 2.ปัจจุบันสูบ (กรณีที่สูบกรุณาตอบคำถามดังต่อไปนี้)

8.1 ความถี่ในการสูบ .....ครั้ง /วัน

8.2 จำนวนบุหรี่ที่สูบ.....มวน/วัน

9. ท่านดื่มสุรา (รวมหมายถึง เหล้า เบียร์ ไวน์ สาโท อุ เหล้าพื้นบ้านอื่นๆ ฯลฯ)

□ 0.ไม่เคยดื่มเลย

□ 1.เคยดื่มแต่เลิกแล้ว เลิกมา .....ปี

□ 2.ปัจจุบันดื่ม

9.1 ความถี่ในการดื่ม

□ 1.น้อยกว่า 1 ครั้งต่อเดือน □ 2. 1-3 ครั้งต่อเดือน

□ 3. 1-5 วันต่อสัปดาห์ □ 4. 6-7 วันต่อสัปดาห์

9.2 ปริมาณที่ดื่มในแต่ละครั้ง (เลือกตอบเป็นเบียร์ข้อ ก เลือก เหล้า ข้อ ข เพียงข้อเดียว)

ก. ถ้าเทียบปริมาณเป็นเบียร์

□ 1.1-1.5 กระป๋อง □ 2. 2-3 กระป๋อง

□ 3. 4-5 กระป๋อง □ 4. 5-7 กระป๋อง

□ 5. 7 กระป๋อง ขึ้นไป

ข. ถ้าเทียบปริมาณเป็นเหล้า

□ 1. 2-3 ฝา □ 2. ¼ แบน

□ 3. 1/2 แบน □ 4. ¾ แบน

□ 5. 1 แบนขึ้นไป

10. บุคคลในครอบครัวมีผู้ป่วยด้วยโรคความดันโลหิตสูง (ที่วินิจฉัยโดยแพทย์) หรือไม่

□0. ไม่มี

□1. มี (โปรดเลือกข้อข้างล่าง)

□1.พ่อ / แม่ □2.สามี / ภรรยา

□3. ญาติ □4. อื่น ๆ ระบุ.....

11.ระยะเวลาที่ท่านป่วยเป็นโรคความดันโลหิตสูง (โปรดระบุจำนวน).....ปี.....เดือน

12. ระยะเวลาที่ท่านรับประทานยารักษาโรคความดันโลหิตสูง (โปรดระบุจำนวน)..... .ปี.....เดือน

13.โปรดระบุชื่อยารักษาโรคความดันโลหิตสูงทั้งหมดที่ท่านรับประทาน

1.....

2.....

3.....

14. นอกจากโรคความดันโลหิตสูงแล้ว ท่านมีโรคแทรกซ้อนอื่นๆ หรือไม่

□0. ไม่มี

□1. มี (โปรดเลือกข้อข้างล่าง)

□1.โรคหลอดเลือดสมอง อัมพฤกษ์ อัมพาต

□2. โรคหัวใจ

□3. โรคไต

□4. อื่น ๆ ระบุ.....

15.ท่านออมเงินด้วยวิธีใด (ตอบได้มากกว่า1 ข้อ)

□ 0.ไม่มีเงินออม

□ 1.สมาชิกกองทุนสวัสดิการชุมชน (ออมวันละ 1 บาท)

□ 2. ฝากธนาคาร

□ 3. ประกันชีวิต

□ 4. พันธบัตรรัฐบาล

□ 5. สลากออมสิน

□ 6. ซื้อหุ้น

□ 7. อื่นๆ(ระบุ).....

Appendix B

ส่วนที่ 2: แบบทดสอบความรู้เกี่ยวกับโรคความดันโลหิตสูง

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมายวงกลมหน้าข้อที่ท่านเลือก

1.ข้อใดกล่าวถึงโรคความดันโลหิตสูงได้ถูกต้องที่สุด

ก. โรคความดันโลหิตสูงเป็นโรคติดต่อร้ายแรง

ข. โรคความดันโลหิตสูงเกิดจากเชื้อโรค

ค. โรคความดันโลหิตสูงสามารถป้องกันได้ หรือรักษาให้หายขาดได้

ง. โรคความดันโลหิตสูงเป็นโรคที่ไม่อันตราย ไม่ต้องรักษาก็หายขาดได้

2.ข้อใดไม่ใช่สาเหตุของการเกิดโรคความดันโลหิตสูง

ก. ความอ้วน และอายุที่มากขึ้น

ข. ทำงานหนัก

ค. มีความเครียดเรื้อรัง

ง. ได้รับยาหรือสารบางชนิด

3.ข้อใดเป็นสาเหตุสำคัญที่ส่งเสริมให้เกิดโรคความดันโลหิตสูง

ก. ทำงานหนัก

ข. รับประทานอาหารรสเค็ม

ค. พักผ่อนน้อย

ง. รับประทานยาแก้ปวดเป็นประจำ

4.ภาวะแทรกซ้อนที่เกิดขึ้นได้กับผู้ป่วยโรคความดันโลหิตสูงได้แก่ข้อใด

ก. เส้นเลือดในสมองแตก/ตีบ/ตัน อัมพาต

ข. โรคเครียด

ค. ตับอักเสบ

ง. โรคข้อและกระดูก

5.ข้อความใดกล่าวถูกต้อง

ก. ผู้ป่วยโรคความดันโลหิตสูงควรงดออกกำลังกายทุกชนิด เพราะทำให้หัวใจทำงานหนักมากขึ้น

ข. ผู้ป่วยโรคความดันโลหิตสูงควรงดออกกำลังกายเพราะจะเหนื่อยเกินไป

ค. ผู้ป่วยโรคความดันโลหิตสูงสามารถออกกำลังกายได้โดยไม่มีข้อยกเว้น

ง. ผู้ป่วยโรคความดันโลหิตสูงสามารถออกกำลังกายได้ อย่างเหมาะสม

6.ข้อใดคืออาการสำคัญของโรคความดันโลหิตสูง

ก. อาการปวดศีรษะ ตาพร่ามัว

ข. เบื่ออาหาร น้ำหนักลด

ค. คลื่นไส้ นอนไม่หลับ

ง. ปวดศีรษะด้านเดียว ปวดท้อง

7.ข้อใดเป็นเหตุผลสำคัญในการรักษาโรคความดันโลหิตสูง

ก. เพื่อควบคุมความดันโลหิต ป้องกันภาวะแทรกซ้อน

ข. เพื่อจะได้หายขาดจากโรคความดันโลหิตสูง

ค. เพื่อจะได้ไม่ต้องรับประทานยาต่อ

ง. เพื่อจะได้ไม่ต้องควบคุมอาหารอีก

8.ถ้ามีอาการข้างเคียงจากการใช้ยาควบคุมความดันโลหิต เช่น หน้ามืด เป็นลม คลื่นไส้ อาเจียน ผู้ป่วยควรปฏิบัติอย่างไร

ก. ปรึกษาคนในครอบครัว

ข. รีบไปพบแพทย์

ค. ลดปริมาณยาเอง

ง. สังเกตอาการไว้ก่อน

9.ผู้ป่วยความดันโลหิตสูงควรปฏิบัติตนอย่างไร เพื่อให้มีสุขภาพดี

ก. รับประทานอาหารและนอนพักผ่อนมากๆ

ข. ทำงานหนัก เพื่อให้ได้เงินมารักษาตัวเอง

ค. ควบคุมอาหารและออกกำลังกายเป็นประจำ

ง. รับประทานยานอนหลับ เพื่อให้ความดันโลหิตลดลง

10.เวลาหงุดหงิด ไม่สบายใจ หรือเกิดอาการเครียดผู้ป่วยความดันโลหิตสูงควรปฏิบัติอย่างไร

ก. อยู่ในห้องคนเดียว

ข. พูดคุยปรับทุกข์กับคนในครอบครัว หรือผู้ที่ไว้ใจ

ค. รับประทานยาคลายเครียด

ง. โวยวาย เพื่อระบายอารมณ์

11.ผู้ป่วยโรคความดันโลหิตสูงควรเลือกรับประทานอาหารประเภทใด

ก. ขาหมูติดมัน หมูสามชั้น หนังไก่

ข. ปลาเค็ม เนื้อเค็ม ไข่เค็ม น้ำบูดู น้ำปู ปลาร้า

ค. แกงเขียวหวาน มัสมั่น กล้วยบวชชี บัวลอย ลอดช่อง

ง. ผักสด และผลไม้ ลดอาหารไขมันสูง

12.อาหารประเภทใดเหมาะกับผู้ป่วยโรคความดันโลหิตสูง

ก. อาหารประเภทนึ่ง

ข. อาหารประเภททอด ผัด

ค. ปลาผัดน้ำมันหอย

ง. ยำปลาทอดกรอบ

13.ผู้ป่วยโรคความดันโลหิตสูงควรใช้เวลาออกกำลังกายแต่ละครั้งอย่างน้อยนานเท่าใด

ก. 15 นาที

ข. 30 นาที

ค. 60 นาที

ง. นานเท่าที่ผู้ป่วยต้องการออกกำลังกาย

14.การปฏิบัติตนของผู้ป่วยโรคความดันโลหิตสูงที่ไม่เหมาะสม คือ ข้อใด

ก. ผู้ป่วยโรคความดันโลหิตสูงต้องทานยาลดความดันโลหิตทุกราย

ข. ผู้ป่วยโรคความดันโลหิตสูงควรไปพบแพทย์ตามนัด

ค. ผู้ป่วยโรคความดันโลหิตสูงควรควบคุมอาหาร และออกกำลังกายเป็นประจำ

ง. ผู้ป่วยโรคความดันโลหิตสูงควรหลีกเลี่ยงความเครียด

15. โรคความดันโลหิตสูง คือ ความดันตั้งแต่ 140/90 มิลลิเมตรปรอทขึ้นไปใช่หรือไม่

ก. ใช่

ข. ไม่ใช่ ควรเป็นระดับความดันตั้งแต่ 120/80 มิลลิเมตรปรอทขึ้นไป

ค. ไม่แน่ใจ

ง. ไม่ทราบ

Appendix C

Question asked to measure Knowledge, attitude, and practice (KAP) of hypertension patient.

Knowledge on hypertension regarding to care and prevention in study participants (total 15 questions)

Knowledge questions had four multiple choice answers. Check only one choice in each question. Correct answers are checked below. Correct answers received one point. While incorrect answers received zero points. Minimum and maximum possible total scores = 0 and 15, respectively.

1. Which the following statement about hypertension is the most accurate? 1. Hypertension is a serious communicable disease 2. High blood pressure caused by the germs √ 3. High blood pressure can be prevented 4. High blood pressure is a disease that is not hazardous, it can cured without treatment
2. Which is not the cause of the high blood pressure? 1. Fat and age √ 2. Hard work 3. Chronic Stress 4. Received some drug/substance
3. What is one of the main causes that promote high blood pressure? 1. Hard work √ 2. Eating salty food 3. Insufficient leisure time 4. Regular intake nonsteroidal anti-inflammatory drugs (NSAIDs) drugs
4. Which is one of the complications that can occur with the patient high blood pressure? √ 1. Cerebrovascular disease 2. Stress 3. Hepatitis 4. Osteosclorosis
5. Which is the correct statement? 1. The patient with hypertension should refrain all kind of exercises because it risk heart attacks 2. The patient with hypertension should refrain from all kind of exercises, it he is tired 3. The patient with hypertension can exercise with no exceptions √ 4. The patient with hypertension can exercise at with the appropriate level
6. What are the main symptoms of hypertension? √ 1. Headache and vertigo 2. Loss of appetite and weight loss 3. Nausea and insomnia 4. Headache on one side of head and abdominal pain

7. What is one of the most important reasons to control hypertension?
√ 1. To prevent the complications from hypertension
2. To cure hypertension
3. Not to have to take medication
4. Not to have to control the diet

8. After experiencing side effects such as nauseas, vomiting or vertigo, and so on. What should the hypertension patient do?
1. Consults with the family' member
√ 2. Go to hospital and consults with the specialist
3. Reduce the quantity of medication to themselves
4. Accepted the side effects

9. What should the hypertension' patient do for a healthy in lifestyle?
1. Eat and sleep very much
2. Hard work to get more money to cure yourself
√ 3. Dietary control and exercise on a regular basis
4. Taking a sleeping pill for blood pressure decreases

10. If the hypertension' patient is faced with frustrated, uncomfortable or symptoms of stress, How should be cope?
1. Stay in the room by himself
√ 2. Confide in people in their family or someone they trust
3. Take stress' medicine
4. Cry to relieve the mood

11. What kind of the appropriate diet should the hypertension' patient select?
1. Fried chicken
2. Salty fish
3. Sweet dessert
√ 4. Fresh vegetables, fruit, and low cholesterol diet

12. Which type of food is appropriate for the hypertension' patient?
√ 1. Steam and soup food
2. Fried food
3. Oily food
4. Creamy salad

13. How long per time should a hypertension' patient take exercise?
1. 15 minutes
√ 2. 30 minutes
3. 60 minutes
4. As long as the patient want to exercise

14. Which one is not necessary appropriate to treat hypertension?
√ 1. All hypertension' patient must take medicine
2. The hypertension patient should be follow up regularly
3. The hypertension patient should control food and exercise on a regular basis
4. The hypertension patient should be avoid stress

15. If blood pressure is ≥ 140/90 mm.Hg., Is this hypertension?
√ 1. Yes it is
2. No, it should be ≥ 120/80 mm.Hg.
3. Not sure
4. Do not know

Appendix D

ส่วนที่ 3: เจตคติเกี่ยวกับโรคความดันโลหิตสูง

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมาย / ลงในช่องที่กำหนด

ข้อคำถาม	เห็นด้วยอย่างยิ่ง 4	เห็นด้วย 3	ไม่แน่ใจ 2	ไม่เห็นด้วย 1	ไม่เห็นด้วยอย่างยิ่ง 0
1. คุณคิดว่าผู้ที่ดื่มเครื่องดื่มที่มีแอลกอฮอล์ และสูบบุหรี่ มากเป็นประจำ เสี่ยงต่อการเป็นโรคความดันโลหิตสูง					
2. คนที่เป็นโรคความดันโลหิตสูงจะมีโอกาสเป็นโรคหัวใจและหลอดเลือดได้มากกว่าคนที่ไม่เป็นโรคความดันโลหิตสูง					
3. ถ้าไม่ได้รักษาโรคความดันโลหิตสูงอย่างถูกต้อง จะทำให้อายุสั้น หรือพิการ					
4. คนที่เป็นโรคความดันโลหิตสูงควรควบคุมน้ำหนักไม่ให้อ้วน					
5. การควบคุมน้ำหนักเป็นเรื่องยาก ไม่จำเป็นต้องปฏิบัติเพราะไม่มีความเกี่ยวข้องกับโรคความดันโลหิตสูง					
6. การเลือกรับประทานอาหารไขมันน้อย และไม่รับประทานอาหารรสเค็มทำให้เป็นภาระแก่ครอบครัว และเป็นเรื่องยุ่งยากทำให้เสียเวลา					
7. คุณคิดว่าการออกกำลังกายควรทำเพียงบางโอกาสที่มีเวลาว่างก็เพียงพอ					
8. คนที่เป็นโรคความดันโลหิตสูงไม่จำเป็นต้องควบคุมอาหารหรือออกกำลังกาย ถ้ารับประทานยาตามแพทย์สั่งอย่างสม่ำเสมอ					
9. ผู้ป่วยที่โรคความดันโลหิตสูงไม่จำเป็นต้องมาพบแพทย์เพราะสามารถหาซื้อยารับประทานเองได้					
10. การหยุดรับประทานยาลดความดันโลหิตสูงเพียงบางมื้อ ไม่มีผลต่อความดันโลหิต					
11. ภายหลังการรักษาเมื่อรู้ว่าอาการดีขึ้นแล้ว ก็สามารถหยุดยาได้เองตามที่ต้องการ					
12. คุณเชื่อว่าเมื่อเครียดและวิตกกังวลมากจะทำให้ความดันโลหิตสูงได้					
13. ไม่ว่าจะดูแลสุขภาพดีอย่างไร ก็ไม่สามารถเลี่ยงภาวะแทรกซ้อนจากโรคความดันโลหิตสูง					
14. ถ้าไม่รับประทานอาหารรสเค็มการควบคุมความดันโลหิตสูงจะได้ผลดี					
15. คนที่อ้วนมากเสี่ยงต่อการเกิดโรคความดันโลหิตสูงได้มากกว่าคนปกติ					

Appendix E

Attitude to hypertension regarding care and prevention in study participants (total 15 statements)

Check only one choice for each statement. (Positive-direction statements were scored from 4 points for "strongly agree" to 0 point for "strongly disagree." Negative-direction statements were scored from 0 point for "strongly agree" to 4 points for "strongly disagree." Minimum and maximum possible total scores = 0 and 60, respectively)

Statements	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree	Direction of Question
1. You think that the person who drinks alcohol and smokes regularly are at risk of hypertension disease.						Positive
2. Hypertension patients will more likely suffer cardiovascular disease than other.						Positive
3. If people do not cure high blood pressure correctly then short lifespan or other disability will results.						Positive
4. Hypertension' patients should practice weight and obesity control.						Positive
5. Weight control is difficult. Does not need to be performed because there is no association with hypertension.						Negative
6. Low fat and low salt diets are difficult, make a family uncomfortable and are a waste of time.						Negative
7. You think that exercise should be done only occasionally when time permits.						Negative
8. Hypertension' patients do not need to control food or exercise, if the medication as prescribed is regularly taken.						Negative
9. Patients with hypertension do not need to follow up with a doctor because they can buy drugs to take for themselves.						Negative
10. Stop all anti-hypertension medication a few meals have no effect on blood pressure.						Negative
11. After treatment, if hypertension' symptoms better the patient can stop medicine, as it is not needed.						Negative

Statements	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree	Direction of Question
12. You believe that stress and anxiety can cause high blood pressure.						Positive
13. Even with good health care, you won't be able to avoid complications from high blood pressure.						Negative
14. If you avoid salty foods, the measures taken to control high blood pressure will work better.						Positive
15. Obese people run more risk of hypertension than normal people.						Positive

Appendix F

ส่วนที่ 4 แบบสอบถามพฤติกรรมการดูแลตนเอง

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมาย / ลงในช่องที่กำหนดให้ตรงกับการปฏิบัติของท่านมากที่สุด โดยในแต่ละข้อให้ท่านเลือกตอบเพียงคำตอบเดียว โดยการเลือกตอบมีเกณฑ์ดังนี้

เป็นประจำ	หมายถึง	ปฏิบัติทุกวัน หรือ 7 วัน /สัปดาห์
บ่อยครั้ง	หมายถึง	ปฏิบัติตั้งแต่ 5-6 วัน/สัปดาห์
บางครั้ง	หมายถึง	ปฏิบัติตั้งแต่ 1-4 วัน /สัปดาห์
นานๆ ครั้ง	หมายถึง	ปฏิบัติเพียง 1 วัน / สัปดาห์
ไม่ปฏิบัติ	หมายถึง	กิจกรรมในข้อนั้นท่านไม่เคยปฏิบัติเลย

ข้อคำถาม	เป็นประจำ (7 วัน/สัปดาห์) 4	บ่อยครั้ง (5-6 วัน/สัปดาห์) 3	บางครั้ง (3-4 วัน/สัปดาห์) 2	นานๆ ครั้ง (1 วัน/สัปดาห์) 1	ไม่ปฏิบัติ 0
พฤติกรรมด้านการรับประทานอาหาร					
1. ท่านมักจะเติมเครื่องปรุงประเภท น้ำปลา ซีอิ๊ว ซอส ลงในอาหารระหว่างการรับประทานอาหาร					
2. ท่านรับประทานผักและผลไม้					
3. ท่านดื่มน้ำอย่างน้อยวันละ 6-8 แก้ว					
4. ท่านรับประทานขนมหวาน ขนมกรุบกรอบ					
5. น้ำอัดลม น้ำหวาน					
6. ท่านรับประทานอาหารประเภทผัด หรือทอด					
พฤติกรรมด้านการออกกำลังกาย					
7. ท่านออกกำลังการสัปดาห์ละ 3 ครั้ง					
8. ท่านออกกำลังกายอย่างต่อเนื่องครั้งละอย่างน้อย 30 นาทีขึ้นไปต่อครั้ง					
9. ท่านออกกำลังกายโดยการเดิน วิ่งเหยาะ แก่วงแขน เป็นเวลา 30 นาทีขึ้นไปต่อครั้ง					
10. ท่านมักจะออกกำลังกานเพื่อควบคุมน้ำหนักให้อยู่ในเกณฑ์ปกติ					
พฤติกรรมด้านการจัดการกับความเครียด					
11. เมื่อเกิดปัญหา จะคิดหาวิธีแก้ไขปัญหา และพยายามควบคุมสถานการณ์ให้ได้					
12. พยายามมองปัญหาอย่างรอบคอบ ปราศจากอคติ					
13. พยายามระบายความเครียด หรือเหตุการณ์ที่เกิดขึ้นด้วยการ สวดมนต์ นั่งสมาธิ ทำจิตใจให้สงบ					
14. ท่านเตรียมพร้อมที่จะรับสถานการณ์ที่เลวร้ายที่สุด					
15. ให้กำลังใจตัวเองว่าทุกสิ่งทุกอย่างจะดีขึ้น					

Appendix G

Practice to hypertension regarding care and prevention in study participants (total 15 statements)

Check only one choice for each statement. (Positive-direction statements were scored from 4 points for "7 days/week' practice" to 0 point for "Do not practice." Negative-direction statements were scored from 0 point for "Do not practice" to 4 points for "7 days/week' practice." Minimum and maximum possible total scores = 0 and 60, respectively)

Statements	7 days/ Week	5-6 days /Week	3-4 days /Week	1 day/ Week	Do not practice	Direction of Question
1. You usually add fish sauce, soy sauce, seasoning sauce into food during a meal.						Negative
2. You consume fruits and vegetables. How often?						Positive
3. You drink for at least 6-8 glasses a day of water.						Positive
4. You eat sweet dessert and snack.						Negative
5. You drink sweet beverages.						Negative
6. You eat fried or deep fried food.						Negative
7. You are exercise 3 times per week.						Positive
8. You exercise at least 30 minutes at a time or more per session.						Positive
9. You are exercise by walking, jogging or running, and so on 30 minutes or more at a time.						Positive
10. You are usually exercised for weight control in a regular basis.						Positive
11. When you are faced with problem, do you find a solution and try to cope with the situation.						Positive
12. You are try to solve the problem with careful though and without bias.						Positive
Statements	**7 days/ Week**	**5-6 days /Week**	**3-4 days /Week**	**1 day/ Week**	**Do not practice**	**Direction of Question**
13. You are try to release the stress or the events that occur with calming meditation or stop thinking about the problem.						Positive

Statements	7 days/ Week	5-6 days /Week	3-4 days /Week	1 day/ Week	Do not practice	Direction of Question
14. You are preparing to face with the worst situation.						Positive
15. You are try to cheer up, so that everything will be better.						Positive

Appendix H

ส่วนที่ 5: แบบสอบถามเกี่ยวกับพฤติกรรมการไปใช้บริการที่โรงพยาบาล / สถานพยาบาล

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมาย / หน้าข้อที่ท่านเลือก และโปรดระบุจำนวนครั้งของการเข้ารับบริการ

1. ภายใน 2 เดือนที่ผ่านแพทย์นัดคุณไปตรวจสุขภาพกี่ครั้ง และคุณไปตรวจสุขภาพตามแพทย์นัดกี่ครั้ง
   - □1. แพทย์ไม่เคยนัดไปตรวจสุขภาพ
   - □2. เคยนัดไปตรวจสุภาพ……ครั้ง (โปรดระบุจำนวนครั้ง)
     และเคยไปตรวจตามแพทย์นัด……..ครั้ง (โปรดระบุจำนวนครั้ง)
   - □3. ไม่เคยไปตรวจสุขภาพตามแพทย์นัด
     เนื่องจาก……..……(โปรดระบุสาเหตุ)
2. ภายใน 1 เดือนที่ผ่านมาคุณไปใช้บริการที่โรงพยาบาล / สถานพยาบาลด้วยสาเหตุใด
   - □1. โรคความดันโลหิตสูง
   - □2. พาญาติไป
   - □3. โรคอื่นๆ (โปรดระบุ)…….
3. คุณเคยกู้ยืมเงินจากกองทุนใดหรือไม่ เพื่อเป็นค่าใช้จ่ายในการเดินทาง / ค่ารักษาพยาบาล เมื่อคุณไปใช้บริการที่โรงพยาบาล/สถานพยาบาล
   - □0. ไม่เคยกู้ยืมเงิน
   - □1. ถ้าเคยกู้ยืมเงิน ท่านกู้ยืมเงินจากแหล่งทุนใด (โปรดระบุชื่อสถาบันการเงินที่ท่านใช้บริการ และโปรดระบุจำนวนเงินที่ท่านกู้……/ เดือน หรือ ครั้ง
4. ค่าใช้จ่ายในการักษาพยาบาล หรือค่าใช้จ่ายในการเดินทางไปโรงพยาบาล / สถานพยาบาลที่คุณใช้มาจากแหล่งใด
   - □1. รายได้ประจำ เช่น เงินเดือน
   - □2. กู้ยืมจากกองทุน
   - □3. อื่นๆ…….
5. คุณไปพบแพทย์ตามกำหนดทุกครั้งหรือไม่
   - □1. ไปทุกครั้ง
   - □2. ไม่ทุกครั้ง เพราะ……(โปรดระบุสาเหตุ)
6. เมื่อเกิดการเจ็บป่วยฉุกเฉินขึ้น ในขณะที่คุณมีปัญหาด้านการเงินคุณจะทำอย่างไร
   - □1. สังเกตุอาการอยู่ที่บ้าน เพื่อไม่เป็นการเพิ่มค่าใช้จ่าย
   - □2. กู้ยืมเงินจากแหล่งทุนที่อยู่ในชุมชน เช่น กองทุนสวัสดิการชุมชน เพื่อไปพบแพทย์
   - □3. อื่นๆ…….
7. คุณออมเงินมากขึ้นหรือไม่
   - □1. ออมเท่าเดิม
   - □2. ออมมากขึ้น(โปรดระบุจำนวน)……/เดือน

8. การเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงินได้ทำให้คุณไปใช้บริการที่โรงพยาบาล / สถานพยาบาลมากขึ้นหรือไม่

□0. น้อยลง (ระบุเหตุผล)…….

□1. มากขึ้น (ระบุเหตุผล)…….

□2. เท่าเดิม

9. การเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงินได้ทำให้คุณไปใช้บริการที่โรงพยาบาล / สถานพยาบาลสะดวกขึ้นหรือไม่

□0. สะดวกน้อยลง (ระบุเหตุผล)…….

□1. สะดวกมากขึ้น (ระบุเหตุผล)…….

□2. สะดวกเท่าเดิม

10. คุณพอใจกับการเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงิน หรือไม่

□1. พอใจ

□2. ไม่พอใจ (โปรดระบุสาเหตุ)……...

11. การเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงินได้เป็นประโยชน์กับคุณหรือไม่

□1. เป็นประโยชน์

□2. ไม่เป็นประโยชน์ (โปรดระบุสาเหตุ)……...

12. ท่านคิดว่าตัวท่านเองหรือผู้สูงอายุท่านอื่นๆ ควรมีการออมเงินเพื่อให้เป็นประโยชน์ต่อสุขภาพหรือไม่

□ 0.ไม่ควรมีการออมเงิน เพราะ (ตอบได้มากกว่า 1 ข้อ)

□ 1. รายได้น้อย

□ 2.การออมเงินไม่มีประโยชน์

□ 3.ไม่มีความจำเป็นหรือไม่มีปัญหาด้านการเงิน

□ 4. มีภาระเรื่องค่าใช้จ่ายสูง

□ 5.อื่นๆ (ระบุ).....

□ 1.ควรมีมีการออมเงิน เพราะ (ตอบได้มากกว่า 1 ข้อ)

□ 1.ไม่ต้องการเป็นภาระของบุตรหลานด้านการเงิน

□ 2. ต้องการมีความปลอดภัยด้านการเงิน

□ 3.เผื่อไว้ใช้ยามฉุกเฉิน

□ 4. การเป็นสมาชิกกองทุนสวัสดิการชุมชนทำให้มีสังคมกับคนอื่นจะได้ไม่เหงา

□ 5.อื่นๆ (ระบุ).....

Appendix I

Question asked to measure health services at hospital and community savings fund of hypertensive patient.

1. Within two months how many time the physician make an appointment with you?

1.1 Physician never make an appointment to follow up

1.2 Always make an appointment and usually follow up

1.3 Never attend follow up with physician

2. Within the last two months, Did you go to hospital for any reason?

2.1 Hypertension

2.2 Other diseases

2.3 Never go to hospital

3. Have you ever borrowed money from any fund for medical expense or cost of transportation when you go to follow up at hospital?

3.1 Never borrow money

3.2 Always borrow money

4. How do you source the cost of medical expense, transportation to hospital expense or medical facility?

4.1 Income such as salary

4.2 Loan fund

5. Are you going to follow up every time?

5.1 Every time

5.2 Sometime

6. When you are faced with health emergency problem and a financial crisis at the same time What would you do?

6.1 Observed at home, not increase the cost

6.2 Borrow money from any fund such as community welfare fund for cost of follow up

6.3 Other reasons

7. Are you saving more?

7.1 Saving same

7.2 Saving more

7.3 Not saving

8. Community savings fund' member and also you can borrow from the fund for medical expense or cost transportation when you go to hospital cause of you can use or access to health facility more?

8.1 Less access than, compared with pre intervention

8.2 More access than, compared with pre intervention

8.3 Same access, compared with pre intervention

9. **Community savings fund' member and also you can borrow the fund for medical expense or cost transportation when you go to hospital cause of you comfortable to access to health facility more?**

9.1 Less comfortable than, compared with pre intervention

9.2 More comfortable than, compared with pre intervention

9.3 Same comfortable, compared with pre intervention

10. Are you satisfied with the membership of community savings fund that you can borrow money or not?
10.1 Satisfied
10.2 Not satisfied
11. **Membership of community savings fund and you can borrow money return the benefits to you or not?**
11.1 Benefits than, compared with pre intervention
11.2 Not benefits than, compared with pre intervention
12. Do you think, you or ageing people should be savings for health benefits or not?
12.1 Should be saving
12.2 Should not be saving

Appendix J

แนวคำถามที่ใช้ในการสัมภาษณ์เชิงลึก

1. ความรู้ที่ได้รับจากการเข้าร่วมโครงการมีผลต่อสุขภาพและพฤติกรรมคุณอย่างไร
2. คุณคิดว่าจะเปลี่ยนพฤติกรรมหรือไม่หลังจากได้รับความรู้จากการเข้าร่วมโครงการ
3. คุณคิดว่าจะนำความรู้ไปปฏิบัติหรือไม่อย่างไร
4. อะไรทำให้คุณสามารถคุมความดันโลหิตให้อยู่ในระดับปรกติได้
5. คุณพอใจกับการเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงิน หรือไม่
6. การเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงินทำให้เกิดปัญหา หรืออุปสรรคต่อสุขภาพคุณ หรือไม่
7. ความรู้ที่คุณได้รับเหมาะสมกับผู้ป่วยโรคความดันโลหิตสูงหรือไม่
8. คุณต้องการความรู้เพิ่มเติมเรื่องใดอีกหรือไม่
9. คุณทราบเรื่องโรคความดันโลหิตมาก่อนหรือไม่
10. อะไรทำให้ไม่คุณสามารถคุมความดันโลหิตให้อยู่ในระดับปรกติได้ในขณะที่คุณรับประทานยาอยู่
11. คุณออกกำลังกายเป็นประจำหรือไม่
12. ทำไมคุณสามารถคุมความดันโลหิตให้อยู่ในระดับปรกติได้
13. ทำไมคุณไม่สามารถคุมความดันโลหิตให้อยู่ในระดับปรกติได้
14. การเป็นสมาชิกกองทุนสวัสดิการชุมชนและสามารถกู้ยืมเงินได้มีผลต่อสุขภาพอย่างไร

Appendix K

Question asked to for gained rich of information from in-depth interview and focus group discussion.

1. The knowledge gained from the project effects on your health or behavior or not?
2. Do you think that will be changing your behavior or not after receiving the knowledge and participating with this project?
3. Do you think, you will be bring the knowledge into practice or not?
4. Do you think, what is the main cause of your blood pressure control was achieved?
5. Are you satisfied with the membership of community **savings** fund where you can borrow money or not?
6. Membership of community **savings** fund and able to borrow fund causing your health problem or not?
7. Is the knowledge gained from the project suitable with your disease?
8. Do you want to know more details of other diseases?
9. Do you know about high blood pressure?
10. Why can't you control your blood pressure while taking anti-hypertensive drugs?
11. Are you exercising regularly?
12. Can you tell me why you can control your blood pressure?
13. Can you tell me why you can't control your blood pressure with a normal stage?
14. Membership of community **savings** fund allows the member can borrow money for medical expense or transportation cost when you go to follow up return the benefits, easier to access to health care services or not?
15. Are you satisfied with the membership of community **savings** fund that allows the member can borrow money for medical expense or transportation cost when you go to follow up return the benefits, easier to access to health care services or not?

Appendix L

ส่วนที่ 7: แบบทดสอบความรู้เกี่ยวกับโรคความดันโลหิตสูง (หลังให้ความรู้)

คำชี้แจง โปรดอ่านข้อความแต่ละข้ออย่างรอบคอบ แล้วเลือกตอบโดยทำเครื่องหมายวงกลมหน้าข้อที่ท่านเลือก

1.ข้อใดกล่าวถึงโรคความดันโลหิตสูง ***ผิด***

ก. โรคความดันโลหิตสูงเกิดจากความเครียด และการรับประทานอาหารรสเค็ม

ข. โรคความดันโลหิตสูงเป็นโรคติดต่อร้ายแรง

ค. โรคความดันโลหิตสูงสามารถป้องกันได้ หรือรักษาให้หายขาดได้

ง. โรคความดันโลหิตสูงเป็นโรคที่เกิดผู้สูงอายุเท่านั้น

2.สาเหตุของการเกิดโรคความดันโลหิตสูงที่ถูกต้องที่สุด คือข้อใด

ก. พักผ่อนน้อย

ข. ทำงานหนัก

ค. มีความเครียดเรื้อรัง ความอ้วน และอายุที่มากขึ้น

ง. เป็นโรคติดต่อจากบุคลหนึ่ง ไปสู่อีกบุคคลหนึ่ง

3.โรคความดันโลหิตสูง คือ ความดันตั้งแต่ 140/90 มิลลิเมตรปรอทขึ้นไปใช่หรือไม่

ก. ใช่

ข. ไม่ใช่ ควรเป็นระดับความดันตั้งแต่ 120/80 มิลลิเมตรปรอทขึ้นไป

ค. ไม่แน่ใจ

ง. ไม่ทราบ

4.ข้อใด ***เป็น*** สาเหตุสำคัญที่ส่งเสริมให้เกิดโรคความดันโลหิตสูง

ก. ทำงานหนัก

ข. รับประทานอาหารรสเค็ม

ค. ป่วยเป็นโรคเรื้อรังมานาน

ง. สุขภาพไม่ดี

5.ข้อใด ไม่ใช่ ภาวะแทรกซ้อนที่เกิดขึ้นได้กับผู้ป่วยโรคความดันโลหิตสูง

ก. หลอดเลือดหัวใจอุดตัน กล้ามเนื้อหัวใจตายเฉียบพลัน

ข. มีปัญหาทางสายตา

ค. ตับอักเสบ

ง. เส้นเลือดในสมองแตก/ตีบ/ตัน อัมพาต

6.ข้อใด ***ไม่ใช่*** อาการของโรคความดันโลหิตสูง

ก. อาการปวดศีรษะ เลือดกำเดาไหล

ข. ตาพร่ามัว มึนงง

ค. หัวใจเต้นผิดจังหวะ และปวดท้องอย่างรุนแรง

ง. แน่นหน้าอก เหนื่อยง่าย

7.อาการข้างเคียงของโรคความดันโลหิตสูงในข้อใดที่ ***ไม่ต้อง*** รีบไปพบแพทย์

ก. ปวดศีรษะอย่างรุนแรง ชาแขนขาครึ่งซีก

ข. เจ็บหน้าอกด้านซ้ายอย่างรุนแรง

ค. รับประทานอาหารได้น้อยลง

ง. บวม ปัสสาวะไม่ออก

8.ข้อใดกล่าวถูกต้องที่สุดสำคัญในการใช้ยารักษาโรคความดันโลหิตสูง

ก. เพื่อควบคุมความดันโลหิต และป้องกันภาวะแทรกซ้อนผู้ป่วยต้องรับประทานยาตามแพทย์สั่ง ห้ามหยุดยาเอง

ข. การรับประทานยารักษาโรคความดันโลหิตสูงอย่างต่อเนื่อง อาจทำให้เป็นโรคความดันโลหิตต่ำ

ค. หากลดอาหารรสเค็มได้ ก็ไม่จำเป็นต้องรับประทานยาลดความดันโลหิตสูง

ง. ถ้าหากมีอาการปวดศีรษะ ตาพร่ามัว มึนงง ให้รีบรับประทายยารักษาโรคความดันโลหิตสูงเพิ่มเป็น 2 เท่าทันที

9.การปฏิบัติตนของผู้ป่วยโรคความดันโลหิตสูงที่ ***เหมาะสม*** คือ ข้อใด

ก. ผู้ป่วยโรคความดันโลหิตสูงที่รับประทานยาตามแพทย์สั่ง ไม่จำเป็นต้องลดอาหารรสเค็ม

ข. ผู้ป่วยโรคความดันโลหิตสูงสามารถสูบบุหรี่ได้

ค. ผู้ป่วยโรคความดันโลหิตสูงควรควบคุมอาหาร และออกกำลังกายเป็นประจำ

ง. ผู้ป่วยโรคความดันโลหิตสูงไม่จำเป็นต้องพักผ่อน

10.เมื่อเกิดอาการเครียดผู้ป่วยความดันโลหิตสูง ***ไม่ควร*** ปฏิบัติอย่างไร

ก. หางานอดิเรกทำเพื่อลดความเครียด

ข. พูดคุยปรับทุกข์กับคนในครอบครัว หรือผู้ที่ไว้ใจ

ค. อยู่ในห้องคนเดียว และรับประทานยาคลายเครียด

ง. สงบสติอารมย์ด้วยการสวดมนต์ นั่งสมาธิ

11.ผู้ป่วยโรคความดันโลหิตสูงควรเลือกรับประทานอาหารประเภทใด

ก. ขาหมูติดมัน หมูสามชั้น หนังไก่

ข. ปลาเค็ม เนื้อเค็ม ไข่เค็ม น้ำบูดู น้ำปู ปลาร้า

ค. แกงเขียวหวาน มัสมั่น กล้วยบวชชี บัวลอย ลอดช่อง

ง. ผักสด และผลไม้ ลดอาหารไขมันสูง

12.อาหารประเภทใด ***ไม่เหมาะ*** กับผู้ป่วยโรคความดันโลหิตสูง

ก. อาหารประเภทนึ่ง

ข. อาหารประเภททอด ผัด

ค. ผักสด และผลไม้

ง. อาหารประเภทยำต่าง ๆ

13.ข้อความใดกล่าวถูกต้อง

ก. การออกกำลังกายเป็นประจำจะช่วยทำให้น้ำหนักไม่เพิ่มสูงขึ้น ช่วยลดความเสี่ยงโรคความดันโลหิตสูงได้

ข. ผู้ป่วยโรคความดันโลหิตสูงห้ามออกกำลังกายเพราะจะทำให้เกิดความดันโลหิต สูงเพิ่มมากขึ้น

ค. ความเครียด ไม่ใช่ สาเหตุส่งเสริมให้เกิดโรคความดันโลหิตสูง

ง. ผู้ป่วยโรคความดันโลหิตสูงสามารถรับประทานอาหารได้ตามใจชอบ

14.ข้อใดกล่าว ***<u>ถูกต้อง</u>*** เกี่ยวกับการออกกำลังกายของผู้ป่วยโรคความดันโลหิตสูง

ก. ผู้ป่วยโรคความดันโลหิตสูง ***<u>ห้าม</u>*** ออกกำลังการเพราะจะทำให้ความดันโลหิตสูงเพิ่มมากขึ้น

ข. ผู้ป่วยโรคความดันโลหิตสูง ควรออกกำลังการอย่างน้อยครั้งละ 30 นาทีขึ้นไป

ค. ผู้ป่วยโรคความดันโลหิตสูงไม่ควรออกกำลังการเพราะจะทำให้หัวใจเต้นผิดจังหวะ

ง. ผู้ป่วยโรคความดันโลหิตสูงสามารถออกกำลังกายนานเท่าที่ผู้ป่วยต้องการ

15. ผู้ป่วยโรคความดันโลหิตสูงควรออกกำลังกายอย่างน้อยสัปดาห์ละกี่วัน

ก. 1 วัน

ข. 2 วัน

ค. 3 วัน

ง. ไม่ทราบ

16. ชนิดของการออกกำลังการในข้อใดที่ ***<u>ไม่เหมาะสม</u>*** กับผู้ป่วยโรคความดันโลหิตสูง

ก. โยคะ

ข. รำมวยจีน ไทเก็ก

ค. ฟุตบอล

ง. รำกระบอง

17.ท่านคิดว่า การสูบบุหรี่ เป็นประจำเป็นสาเหตุสำคัญที่ส่งเสริมให้เกิดโรคความดันโลหิตสูง หรือไม่

ก. ใช่

ข. ไม่ใช่

ค. ไม่แน่ใจ

ง. ไม่ทราบ

18. ท่านคิดว่า การดื่มหล้าเป็นประจำ เป็นสาเหตุสำคัญที่ส่งเสริมให้เกิดโรคความดันโลหิตสูง หรือไม่

ก. ใช่

ข. ไม่ใช่

ค. ไม่แน่ใจ

ง. ไม่ทราบ

19. ท่านคิดว่าข้อใดเป็นวิธีวัดความดันโลหิตที่ ***<u>ถูกต้อง</u>***

ก. วัดความดันโลหิตทันทีที่ผู้ป่วยมาถึงโรงพยาบาล

ข. ผู้ป่วยสามารถนั่งวัดความดันโลหิตท่าใดก็ได้

ค. วัดความดันโลหิตที่แขนขวาเท่านั้น

ง. ให้ผู้ป่วยนั่งพักอย่างน้อย 5 นาทีก่อนวัดความดันโลหิต

20. ท่านคิดว่าข้อใดเป็นวิธีวัดความดันโลหิตที่ ***<u>ไม่ถูกต้อง</u>***

ก. วัดความดันโลหิตที่แขนซ้ายในท่าขนานกับหัวใจ

ข. วัดความดันโลหิตในขณะที่ผู้ป่วยนั่งในท่าที่สบาย เท้าแนบพื้น

ค. วัดความดันโลหิตในห้องที่มีอุณหภูมิสูง

ง. ใช้ cuff ขนาดใหญ่วัดความดันโลหิตให้เด็ก

Appendix M

Sphygmomanometer's Standardize

Procedure No. 424-20081015-01 (Major)

Special Precautions

WARNING: Mercury and its vapors are toxic. All workers who use, clean, or maintain mercury sphygmomanometers should understand the properties of mercury and its associated hazards and should be instructed in safe handling procedures. The room used for sphygmomanometer calibration and repair should be well-ventilated and reserved for the exclusive task of handling mercury; traffic though the area should be limited. There should be no smoking, drinking, or eating in the room. The floor should not be carpeted, and a workbench should be equipped with troughs to collect mercury spills. Personnel should remove all jewelry, especially gold or gold-plated jewelry (mercury readily combines with gold) and should wear a mercury-vapor respirator and disposable gloves. In high – use area, worker should wear disposable wear disposable gowns and shoe coverings to minimize skin and clothing contamination, which can increase worker exposure and carry mercury to other areas of the healthcare facilities.

Qualitative tasks

Chassis/Housing.

Examine the exterior of the unit for cleanliness and general physical condition. Be sure that plastic housings are intact, that necessary assembly hardware is present and tight, and that there are no sign of spilled liquids or other serious abuse. Examine mercury column tubes for cracks. Remove damaged tubes from service, even if not currently leaking or affecting performance, to avoid the possibility of mercury spills. Examine aneroid gauge housings for dents and loose parts.

Mount.

If the unit is mounted on a stand or cart, examine the condition of the mount. If it is attached to a wall or rests on a shelf, check the security of this attachment.

Casters/Brakes.

If the unit moves on casters, check their condition. Look for accumulations of lint and thread around the casters, and be sure that they turn and swivel, as appropriate. Check the operation of brakes and swivel locks, if the unit is so equipped.

Tubes/Hoses/Bulb.

Check the condition of all tubing and hoses and the bulb. Be sure that they are not cracked, kinked, or dirty. Replace loose or cracked tubing.

Fittings/Connectors.

Examine all fittings and connectors for general physical condition.

Filters.

Check the condition of mercury column filters. Replace as needed and indicate on the inspection form.

Bleed Valve.

It should be possible to quickly and accurately adjust the bleed valve to a rate of 2 to 3 mmHg/sec. Pressurize the system and check the valve to see if it can be easily adjusted to this bleed rate. A bleed valve with a damaged seat will open too quickly, and it will difficult to adjust the rate accurately.

Indicators/Displays.

Meter and scale marking should be clear and easy to read, and the cover glass on an aneroid gauge should be intact.

Zero Pressure Setting.

With no pressure in the cuff, the aneroid gauge or mercury level should zero (±1 mm Hg). If a mercury manometer does not read zero, add or remove mercury carefully unit it does.

WARNING: Mercury is toxic. Replace aneroid gauges that con not be reset to read zero.

Labeling.

Check that all necessary placards, labels, conversion charts, and instruction cards are present and legible.

Cuffs.

Use of n improperly sized cuff can cause significant measurement errors. Clinical personnel should be instructed never to substitute an improper cuff lack of one of proper size. Record the cuff size that are either stored with the manometer or are readily available (e.g. at a nearby nursing station) on the inspection form. There should be correspond to physical characteristics of the patients on whom the instrument is likely to be used (e.g. smaller cuffs in a pediatric area). All cuff should be clean and in good condition with no torn stitching. Look for signs of degradation or cracking of the bladder. Check that Velcro closures hold firmly.

Gauge/Column.

Ensure that the pointer of an aneroid gauge falls smoothly throughout it scale and does not stick or bind. In a mercury manometer, the glass tube and mercury should be clean. Check that the mercury column rises and moves smoothly. Mercury "dancing" or "clinging" to the walls of the tube indicates a dirty tube and filter. If the tube appears dirty, remove it and clean it with an oversized pipe cleaner. Before removing the glass tube for cleaning, be sure that all the mercury is in the reservoir either by tilting the unit or, on some units, by unlatching the locking mechanism. Replace dirty mercury.

WARNING: Mercury is toxic.

Quantitative tasks.

Pressure Leakage.

Wrap the cuff around a simulated limb (coffee can or pipe, 3 to 4 in diameter). Close the bleed valve, and inflate the cuff to about the maximum scale indication. Read the scale indicator after 1 min to determine the rate of pressure loss in mm Hg/min. This rate should not exceed 15 mm Hg/min. If it does, recheck all fitting, especially Luer taper fittings, and repeat the task.

Pressure Accuracy.

(This task need not be done on mercury sphygmomanometers except when the glass tube has been replaced). Check the accuracy of aneroid gauges. Connect the blood pressure set to a pressure gauge or meter using a Y-connector, as show in the test setup in figure10.

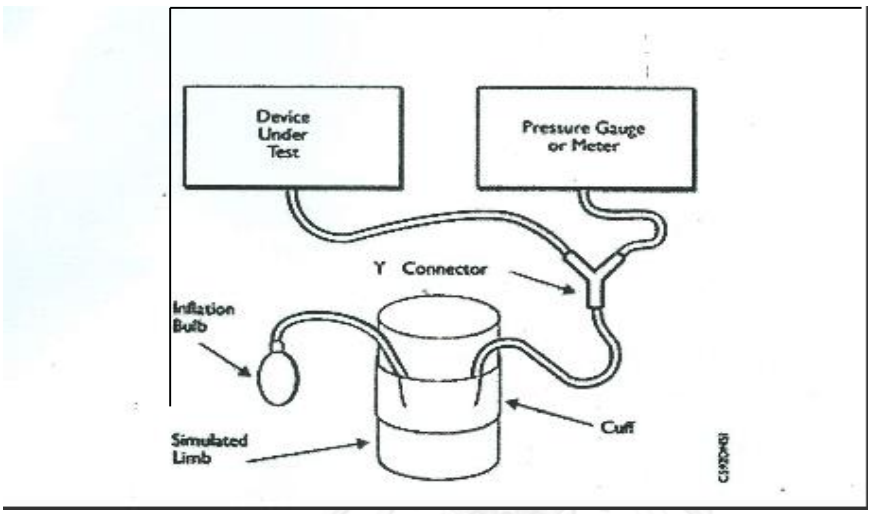

Figure 9: Connect the blood pressure set to a pressure gauge or meter using a Y-connector

Source: BiomedicalBenchmark TM 2008 ECRI Institute.

Inflate the system to 200 mm Hg on the gauge or meter and record the reading of the unit under testing. It should be differ by more than 3 mm Hg from the true pressure. Aneroid gauges should be accurate in all positions which they are likely to be held while being read. Repeat the test for pressure of 120 and 60 mmHg. Record pressures only when the system is at equilibrium (i.e., the pressure is not varying).

Preventive Maintenance

Clean.

Clean exterior and mercury tube, if needed.

Lubricate.

Lubricate casters, swivel wall mount.

Replace.

Replace mercury column filters and mercury, if dirty.

Appendix N

Simple steps to an accurate reading

There are a few simple steps that the researcher can follow to be sure that the researcher can get an accurate reading of patient's blood pressure by Blood Pressure Association UK, 2008 and The American Heart Association (AHA).

Before the researcher take patients' blood pressure reading

Many things can make human blood pressure rise for a short time. Make sure the patient is relaxed (allow at least a five minute rest before a reading) and is sitting in an upright position with their upper arm positioned so that it is level with their heart. This step can use a table or armrest to make this more comfortable for patient. The patient's feet should be flat on the floor, if possible. Talking or chewing gum increases blood pressure so the patient should refrain from talking during the reading. Be sure to remove any excess clothing that might overlap with the BP cuff or constrict blood flow in the arm. Do not measure patients' blood pressure within 30 minutes of drinking caffeine or smoking.

Choose the proper BP cuff size

Steps in the process for acquiring an accurate blood pressure reading is one step that most important. If possible, measure your patient's arm circumference (typically in centimeters) to determine the appropriate cuff size. Most blood pressure cuffs should have the RANGE measurement on the label. In addition, most BP cuffs have a range area located on the inside of the cuff. If do not have a tape measure, this step can simply wrap the cuff around the patient's arm and use the INDEX line to determine if the patient's arm circumference falls within the range area.

Place the BP cuff on the patient's arm

Another important factor for acquiring an accurate blood pressure reading is proper BP cuff placement. First, palpate/locate the brachial artery. Position the BP cuff so that the ARTERY marker points to the brachial artery. Wrap the BP cuff snugly around the arm making sure that the cuff is a couple of centimeters above the elbow crease and is not in contact with any clothing.

Figure 9: Position the BP cuff
Source:www.Bloodpressureuk.org/BloodPressureandyou/Homemonitoring/Howtomeasure, date 25 July 2015

How to take human blood pressure using a digital blood pressure monitor

1. Put the cuff on following the instructions that show in above picture

2. Make sure patient relaxed and comfortable. If patient are anxious or uncomfortable, this will make patient blood pressure rise temporarily.

3. When the researcher is taking patients reading, keep still and silent. Moving and talking can affect with patient reading.

4. Take readings, each about two minutes apart, and then work out the value. Keep taking reading until stop falling, and then use this as patients reading.

5. Record patient's reading, either in the memory of digital blood pressure or on computer or paper.

Double check for accuracy

The American Heart Association (AHA) recommends taking a reading with both arms and averaging the readings. To check the pressure again for accuracy wait about five minutes between readings. Typically, blood pressure is higher in the mornings and lower in the evenings. If the blood pressure reading is a concern or masked or white coat hypertension is suspected, a 24 hour blood pressure study may be required to assess the patient's overall blood pressure profile.

Appendix O

Questions	Responses to the question	Code of respondent
1. The knowledge gained from the project effects on your health or behavior or not?	**Very helpful, the doctor at the hospital didn't told us anything yet. Only said that still high blood pressure and on drugs. Then makes an appointment to follow up next month.**	**CS 1**
	Yes-yes the doctor told me same.	**CS 2**
	I waited to meet a doctor half a day in each time, but nobody even taught like this. Only said do not eat salty.	**CS 3**
	If I did not participant, I cannot pretend to have stopped salty food. Usually, I eat bread every morning with coffee.	**CS 4**
	You know, now that I've quit take anti-…..drug.	**CS 5**
	My weight loss and no headache at all.	**CS 6**
	I think so.	**CS 7**
	Now, I am eating more carefully. I am still known how to eat with is not cause of high blood pressure.	**CS 8**
	I want to exercise continue if, this project is completed, there will be a further exercise or not?	**CS 6**
	Now, I am exercise every morning and evening. If, this project is completed, how we will do?	**CS 7**
	We will try to find another project to support or donations to help with the travel expense to dance teacher. (Leader of community)	**(Leader of community)**
Questions	**Responses to the question**	**Code of respondent**
2. Do you think that will be changing your behavior or not after receiving the knowledge and participating with this project?	*Now, we just add a less fish sauce.*	CS 8
	I exercise every morning and evening. Despite to the project is completed but, I still continue to exercise.	CS 7
	I will drink less.	CS 2
	I tried to tell my husband to stop eating Western diets style. But he still eats Western food.	CS 1
	I intend to continue exercising.	CS5
	Before I jointed with this project I didn't know sweet dessert and curry were a cause of high blood pressure. But now I know and eat it less.	CS4
		CS3

Questions	Responses to the question	Code of respondent
1. The knowledge gained from the project effects on your health or behavior or not?	· **Very helpful, the doctor at the hospital didn't told us anything yet. Only said that still high blood pressure and on drugs. Then makes an appointment to follow up next month.**	**CS 1**
	· **Yes-yes the doctor told me same.**	**CS 2**
	· **I waited to meet a doctor half a day in each time, but nobody even taught like this. Only said do not eat salty.**	**CS 3**
	· **If I did not participant, I cannot pretend to have stopped salty food. Usually, I eat bread every morning with coffee.**	**CS 4**
	· **You know, now that I've quit take anti-…..drug.**	**CS 5**
	· **My weight loss and no headache at all.**	**CS 6**
	· **I think so.**	**CS 7**
	· **Now, I am eating more carefully. I am still known how to eat with is not cause of high blood pressure.**	**CS 8**
	· **I want to exercise continue if, this project is completed, there will be a further exercise or not?**	**CS 6**
	· **Now, I am exercise every morning and evening. If, this project is completed, how we will do?**	**CS 7**
	· **We will try to find another project to support or donations to help with the travel expense to dance teacher. (Leader of community)**	**(Leader of community)**

Questions	Responses to the question	Code of respondent
	· *I will try not to stress.*	

Questions	Responses to the question	Code of respondent
3. Do you think, you will be bring the knowledge into practice or not?	· *Sure! I will be put my knowledge into practice.*	CS7
	· *If the community has an activity on, I will be participating.*	CS4
	· *We still want to continue this activity. Because not only we get exercise but the children have exercise too.*	CS5 CS8
	· *Other neighbors who are in poor health conditions would joint in activities, if there are further events.*	CS2
	- *Now, others people come to join dancing and exercise with us more.*	CS1

Questions	Responses to the question	Code of respondent
	- I will try to motivate my husband to join activities	

Questions	Responses to the question	Code of respondent
4. Do you think, what is the main cause of your blood pressure control was achieved?	*- The knowledge that the doctors teach us.*	CS2
	- As I said, I waited to meet a doctor half a day in each time, but nobody ever taught like this. I find out more details of high blood pressure control when I participate in this project.	CS3
	- We just know that patients with high blood pressure should avoid eating bread and fermented foods.	CS5
	- I think so.	CS4
Any more information?	*- I answered like them.*	CS8
	-If we want to know other diseases can you teach us?	CS7

Questions	Responses to the question	Code of respondent
5. Are you satisfied with the membership of community welfare fund where you can borrow money or not?	*- Satisfied*	CS1
	- Its Okay! It can be used when emergency arises.	CS3
	- For me, I am not agreed with them because it will take us further into debt.	CS 5
	- Borrow money but pay debt and interest back, Umm!	CS8
	- Its good, if we need to borrow we can borrow from community fund in state of neighbor	CS6

Questions	Responses to the question	Code of respondent
6. Membership of community welfare fund and able to borrow fund causing your health problem or not?	*- Not problem*	CS6
	- They allow us can borrow fund why still be a problem?	CS3
	- No problem, doctor	CS2
	- People who did not pay money back there is trouble! I am joking!	CS4

Questions	Responses to the question	Code of respondent
7. Is the knowledge gained from the project suitable with your disease?	*- Very suitable!*	CS5
	- Doctor, it very good. Before joining with the project we never known more details like this	CS8
	- Will this project be continued?	CS7
	- If we want to know other diseases can your team teach us?	CS6
	- Ouch! Before joining this project I never expected that my blood pressure will be controlled. Now my headache symptoms are gone.	CS2

Questions	Responses to the question	Code of respondent
	- I think so	CS1

Questions	Responses to the question	Code of respondent
8. Do you want to know more details of other diseases?	*- Yes! Sure, DM we need to know about diabetes mellitus* *- Kidney disease also* *- Many years ago, I had high blood pressure then, I was blind right eye. Why? I want to know also.* *- I want to know about high cholesterol and heart disease*	CS3 CS8 CS6 CS7

Questions	Responses to the question	Code of respondent
1. Do you know about high blood pressure?	*- Yes! High blood pressure must not eat salty foods.* *- Yes!* *- And also to control blood pressure too* *- I known patient with hypertension need to quit drinking. But Can low blood pressure patient drink beer? Someone said, if drink beer the blood pressure will be normal.* *- My experienced; if less of sleep then high blood pressure will be increased* *- Yes! Yes, I think so* *- I had headache too when less of sleep* *- The physician and nurse only said, patient must not eat salty foods and on treatment regularly. Nobody tell me more! I known only things*	KK1 KK2 KK3 KK4 KK5 KK6 KK7 KK8

Questions	Responses to the question	Code of respondent
2. Why can't you control your blood pressure while taking anti-hypertensive drugs?	*- I am taking drugs every day. But we were wake up since 2 A.M. to go shopping at the market and prepare food for sales. (Papaya salad' Merchant) After preparation everything finished, then continue to sell papaya salad. She rarely sleeps. (Her husband' said)* **Observation Noted:** The results from observation found she is a papaya merchant and must cook and test salty food dishes before selling daily. Also, every papaya salad plate is cooked with higher proportion of monosodium glutamate. *- When I was a child, I had three big accidents. The last was a head injury. After that headaches continue until now. The physician told me I have high blood pressure, and on treatment for a short time. After I moved to Klong Sam Wa community I don't continue with treatment. Now, I am taking care my nephew throughout the day. Therefore, not enough time to follow up at hospital.* **Noted from community health volunteer:** She often has frequent headaches and usually asked paracetamol at community health center.	KK 1 KK 2

Questions	Responses to the question	Code of respondent
3. Are you exercising regularly?	**Observation noted:** She takes care of a two year old girl during interview and every time that she came to participate with project.	
	- *My husband' addicted with Mitragyna Speciosa or*  *Kratom, he chewed it until he sleep. After he wakes up he needs to chew it immediately. Because he works all day in the sunshine and is a farmer it is hard work. He believes Kratom help his work longer especially, in the sunshine. His addiction more than twenty years. However, before he go to follow up one night he stopped to used it until follow up completed he will chew it again. Therefore, the results of his blood pressure when measurement at hospital somewhat not higher than measurement at community health center.*	KK 3
	Observation noted: He have darkening of the skin color of his face. He has withdrawal symptoms, sweating, and a little bit confusion including he have a sign of *attention deficit hyperactivity disorder* or ADHD.	
	- *I am sleepless at night more than twenty-five years; usually sleep at 5 A.M daily. Also, used sleeping pill through twenty years until now.*	KK 4
	- *I am wake up since 3 A.M. cause preparation food for sales. (Pork roasted with sticky rice' Merchant) After preparation everything finished, then continue to sell Pork roasted with sticky rice until 11 A.M. I rarely sleep also.*	KK 5
	Observation noted: Through six month of study we met her at the morning market every time that we came to follow up her blood pressure.	
	- *I like to eat papaya salad very much. We usually eat it every day. Additional, my family very likes to eat stewed pork leg on rice.*	KK 6
	Observation noted: She and her family members very fat. Her weight is 85 while, she is only 155 cms high. During visits to her family we found her husband smokes in the house. She is a second hand smoker for more than fifteen years.	
	- *I have not been to follow up at hospital on time according to I often want to control construction site at another place.*	KK 7
	Observation noted: We usually found him in neighborhood drinking regularly.	
	- *Not yet, we did not have enough time to do it*	KK 5
	- *Working was tried*	KK 1
	- *Taking care my grandchild all day gives no time to do another thing. During her sleep we need to cleansing house or other housework.*	KK 2
	- *I usually go to control construction site at another place. Can't get home on time. Then, I don't have time to exercise.*	KK 7
	- *Sometime the sewing work accelerates to factory, we have to work all day and less of sleep. Then, we do not have time to exercise.*	KK4

Questions	Responses to the question	Code of respondent
1. Can you tell me why you can control your blood pressure?	*- After I joined the project, the doctor and team measured my blood pressure, and I felt scared when my blood pressure were high. So, I tried taking medicine on time regularly.* *- You and your team visited and measured my blood pressure every month. My blood pressure is not improved. When I went to follow up at hospital, I took hypertension brochures to read at home. I tried to follow the advice in the brochures.* *- In the last three week, health center staff visited our village and provided chronic disease knowledge. I asked them about hypertension. They suggested taking medicine on time regularly. I tried to do as they said because I feared the complication of hypertension.*	KA2 KA3 KA1

Questions	Responses to the question	Code of respondent
Can you tell me why you can't control your blood pressure with a normal stage?	*- I am still drinking occasionally too much* *- I drink too, but I try to stop* *- I could not reduce my stress because I was worried about my nephew. Grandson is a teenager. He gets home very late at night. I on the news on television a student is hit and killed every week. This causes me stress. Our family has only one child.* **Observation noted:** During in-depth interview process in this evening (07.00 P.M.), her face looks serious. *- I have suffered abdominal pain for the last two weeks. I don't know why? After receiving pain-killing drugs from hospital, the pain symptoms have not gone away. Now, I cannot walk cause of severe pain.* **Observation noted:** During in-depth interview process in the Sunday morning (10.00 A.M.), her face looks suffering from severe pain. She had tears on her face and she cannot sit down. She was in bed and had difficulty in moving. Therefore, our team suggested her son take her to Pain clinic, Ramathibodi hospital, Bangkok, Thailand.	KE1 KE2 KE3 KE4

Questions	Responses to the question	Code of respondent
1. Membership of community welfare fund allows the member to borrow money for medical expense or transportation cost when you go to follow up return the benefits? Is it easier to access health care services or not?	*- If changing the rules of return benefits us, it's Okay!* *- The community welfare fund should return the benefits to the members, while the members were still alive as a form of money. Then, we can be increased the cost of health investment in our life.* **Observation noted:** Lawyer said *- It would be great, if the community welfare fund allows us to receive a loan without interest* **Observation noted:** All of us laughed *- It would be great too, if my grandson and family member got sick and we can borrow money from the fund for them.* *- I agree with you*	K1 K2 K3 K4 K5

Questions	Responses to the question	Code of respondent
2. Are you satisfied with the membership of community welfare fund that allows the member to borrow money for medical expense or transportation cost when you go to follow up return the benefits? Is it easier to access to health care services or not?	- *Satisfied!* - *Yes! Sure* - *It's great* **Observation noted:** All of them satisfied	K1 K2 K3

Appendix P

แบบฟอร์มการสังเกตแบบมีส่วนร่วม

หัวข้อเรื่องที่สังเกต……

รหัสประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย……..

จุดประสงค์ที่สังเกต……..

กลุ่มทดลองที่ 1 ☐ กลุ่มทดลองที่ 2 กลุ่มค☐ม ☐

บันทึกสิ่งที่สังเกต……..

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ลงชื่อผู้สังเกต……..

วันที่……

Appendix Q

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่……..

วันที่…….เดือน……พ.ศ……

รหัสประชากรกลุ่มตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย……

ข้าพเจ้าซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการ: ประสิทธิผลของโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง: การศึกษากึ่งทดลอง

ชื่อผู้วิจัย: นางสาวเนตรนภา วงศ์กัน นิสิตปริญญาเอก วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

ที่อยู่ที่ติดต่อที่ทำงาน: วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย ชั้น 10
อาคารสถาบัน 3 ซอยจุฬาฯ 62 ถนนพญาไท แขวงวังใหม่ เขตปทุมวัน กทม. 10330

ที่อยู่ที่ติดต่อที่บ้าน: 35/47 หมู่บ้านกาเด้นวิลล่า The 4 season ถนนชลมาศพิจารณ์ ตำบลลาดสวาย
อำเภอลำลูกกา จังหวัดปทุมธานี 12150

โทรศัพท์ที่ทำงาน: 0-2590-1389 โทรศัพท์มือถือ: 082-9630094 Email: nvongskan@gmail.com

ข้าพเจ้าได้ทราบรายละเอียดเกี่ยวกับที่มา และวัตถุประสงค์ของการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากงานวิจัยเรื่องนี้ และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้วว่าข้าพเจ้าจะได้รับการวัดความดันโลหิต ร่วมฟังการให้สุขศึกษาเรื่องโรคความดันโลหิตสูงเดือนละ 1 ครั้ง หากท่านไม่เข้าใจรายละเอียดเรื่องโรคความดันโลหิตสูง นักวิจัยจะอธิบายรายละเอียดจนกว่าท่านจะเข้าใจ และออกกำลังกายสัปดาห์ละ 3 วัน ตลอดระยะเวลา 6 เดือน ตลอดจนสามารถกู้ยืมเงินจากกองทุนออมทรัพย์วันละ 1 บาทได้

การอบรมจะจัดขึ้นที่ศูนย์สุขภาพชุมชนเพิ่มสิน ทุกวันเสาร์ต้นเดือน วันละ 4.30 ชม. เริ่มตั้งแต่ 08.30 - 13.00 น.

การออกกำลังกายจะจัดขึ้นที่สุขภาพชุมชนเพิ่มสิน ทุกวันจันทร์ พุธ ศุกร์ วันละ 45 นาที เริ่มตั้งแต่เวลา 17.00 - 17.45 น.

ข้าพเจ้าจึงสมัครใจเข้าร่วมโครงการวิจัยนี้ โดยที่ข้าพเจ้ามีสิทธิถอนตัวออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็นความลับ โดยจะนำเสนอเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

ข้าพเจ้ายินดีเข้าร่วมการวิจัยครั้งนี้ ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ…….. **ลงชื่อ……**

(……..) **(……)**

ผู้วิจัยหลัก **ผู้มีส่วนร่วมในการวิจัย**

ลงชื่อ……

(.....)

Appendix R

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่……..

วันที่…….เดือน……พ.ศ……

รหัสประชากรกลุ่มตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย……

ข้าพเจ้าซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการ: ประสิทธิผลของโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง: การศึกษากึ่งทดลอง

ชื่อผู้วิจัย: นางสาวเนตรนภา วงศ์กัน นิสิตปริญญาเอก วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

ที่อยู่ที่ติดต่อที่ทำงาน: วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย ชั้น 10
อาคารสถาบัน 3 ซอยจุฬาฯ 62 ถนนพญาไท แขวงวังใหม่ เขตปทุมวัน กทม. 10330

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อำเภอลำลูกกา จังหวัดปทุมธานี 12150

โทรศัพท์ที่ทำงาน: 0-2590-1389 โทรศัพท์มือถือ: 082-9630094 Email: nvongskan@gmail.com

ข้าพเจ้าได้ทราบรายละเอียดเกี่ยวกับที่มา และวัตถุประสงค์ของการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากงานวิจัยเรื่องนี้ และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้วว่าข้าพเจ้าจะได้รับการวัดความดันโลหิต ร่วมฟังการให้สุขศึกษาเรื่องโรคความดันโลหิตสูงเดือนละ 1 ครั้ง หากท่านไม่เข้าใจรายละเอียดเรื่องโรคความดันโลหิตสูง นักวิจัยจะอธิบายรายละเอียดจนกว่าท่านจะเข้าใจ และออกกำลังกายสัปดาห์ละ 3 วัน ตลอดระยะเวลา 6 เดือน

การอบรมจะจัดขึ้นที่ศูนย์สุขภาพชุมชนจิตภาวรรณ 1 ทุกวันอาทิตย์ต้นเดือน วันละ 4.30 ชม. เริ่มตั้งแต่ 08.30 - 13.00 น.

การออกกำลังกายจะจัดขึ้นที่สุขภาพชุมชนจิตภาวรรณ 1 ทุกวันอังคาร พฤหัส และศุกร์ วันละ 45 นาที เริ่มตั้งแต่เวลา 17.00 - 17.45 น.

ข้าพเจ้าจึงสมัครใจเข้าร่วมโครงการวิจัยนี้ โดยที่ข้าพเจ้ามีสิทธิถอนตัวออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็นความลับ โดยจะนำเสนอเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

ข้าพเจ้ายินดีเข้าร่วมการวิจัยครั้งนี้ ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ……..
(……..)
ผู้วิจัยหลัก

ลงชื่อ……
(……)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ……
(……)

Appendix S

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่……..

วันที่…….เดือน……พ.ศ……

รหัสประชากรกลุ่มตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย……

ข้าพเจ้าซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการ: ประสิทธิผลของโปรแกรมการออมเงิน และการให้สุขศึกษาในชุมชนในกลุ่มผู้สูงอายุที่ป่วยด้วยโรคความดันโลหิตสูง: การศึกษากึ่งทดลอง

ชื่อผู้วิจัย: นางสาวเนตรนภา วงศ์กัน นิสิตปริญญาเอก วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

ที่อยู่ที่ติดต่อที่ทำงาน: วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย ชั้น 10
อาคารสถาบัน 3 ซอยจุฬาฯ 62 ถนนพญาไท แขวงวังใหม่ เขตปทุมวัน กทม. 10330

ที่อยู่ที่ติดต่อที่บ้าน: 35/47 หมู่บ้านกาเด้นวิลล่า The 4 season ถนนชลมาศพิจารณ์ ตำบลลาดสวาย
อำเภอลำลูกกา จังหวัดปทุมธานี 12150

โทรศัพท์ที่ทำงาน: 0-2590-1389 โทรศัพท์มือถือ: 082-9630094 Email: nvongskan@gmail.com

ข้าพเจ้าได้ทราบรายละเอียดเกี่ยวกับที่มา และวัตถุประสงค์ของการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากงานวิจัยเรื่องนี้ และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้วว่าข้าพเจ้าจะได้รับการวัดความดันโลหิตเดือนละ 1 ครั้ง ตลอดระยะเวลา 6 เดือน

การวัดความดันโลหิตจะทำการวัดที่ศูนย์ดูแลเด็กเล็กหน้าชุมชน ทุกวันเสาร์ที่ 2 ของเดือนตลอด 6 เดือนเริ่มตั้งแต่เวลา 08.30 - 09.20 น.

หลังเสร็จสิ้นโครงการทีมนักวิจัยจะสอนสุขศึกษาเรื่องโรคความดันโลหิตให้ผู้เข้าร่วมโครงการทุกท่าน หากท่านไม่เข้าใจรายละเอียดเรื่องโรคความดันโลหิตสูง นักวิจัยจะอธิบายรายละเอียดจนกว่าท่านจะเข้าใจ

ข้าพเจ้าจึงสมัครใจเข้าร่วมโครงการวิจัยนี้ โดยที่ข้าพเจ้ามีสิทธิถอนตัวออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็นความลับ โดยจะนำเสนอเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

ข้าพเจ้ายินดีเข้าร่วมการวิจัยครั้งนี้ ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ……..
(……..)
ผู้วิจัยหลัก

ลงชื่อ……
(……)
ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ……
(.....)

Appendix T

Budgets of study

- Participants' transportation 44 persons X 100 Baht X 2 times X 6 months = 52,800 Baht
- Per diem for instructor 500 Baht X 6 times X 2 persons = 6,000 Baht
- Instructor's transportation 100 Baht X 6 times X 2 persons = 1,200 Baht
- Refreshment 55 persons X 150 baht X 6 months = 49,500 Baht
- Sphygmomanometer measurement = 5,000 Baht
- Per diem for certified equipment's technician (For Sphygmomanometer's standardize) 600 X 6 times = 3,600 Baht
- Per diem for exercise's trainer 250 X 12 times X 6 months = 18,000 Baht
- Researcher team's transportation = 15,000 Baht
- Questionnaire 70 sheets X 25 Baht X 5 times = 8,750 Baht
- Field's equipments = 10,000 Baht
- Miscellaneous = 5,000 Baht

Total = 174,850 Baht

Appendix U

Timeline of study

Details	Nov. 2013	Dec. 2013	Jan. 2014	Feb. 2014	Mar. 2014	May. 2014	Jun. 2014	Jul. 2014	Aug. 2014	Oct. 2014	Sep. 2014	Nov. 2014
1.Building team	←	→										
2. Cooperate with the community savings fund committee	←					→						
3. Implementation • Baseline data collection • Intervention							←	→				
							←					→
4.Evaluation									←			→

VITA

Name: Nethnapa Vongskan

Date and Place of Birth: Lopburi, March 9, 1989

Nationality: Thai

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Mobile: +6628 2963 0094 E-mail: nvongskan@gmail.com

Education

Diploma of Nursing science:Boromarajonani Collage of Nursing, Bamrasnaradure,Date of graduation March 15,1996

Bachelor of Arts (English):Rajabhat Suan Dusit University Bangkok, Thailand,Date of graduation November 29, 2000

Bachelor of Nursing Science:Sukhothai Thammathirat Open University Bangkok, Thailand,Date of graduation November 1, 2004

Master of Art (Medical and Health Social Sciences):Mahidol University, Thailand ,Date of graduation June 13, 2009

Graduate:Studying Doctor of Philosophy program in Public Health at Chulalongkorn University (International Program) Bangkok, Thailand. (Status: Ph.D Candidate),Date of Admission June 2009 – Present