EFFECTIVENESS OF AN INTEGRATED LAUGHTER MILD PHYSICAL ACTIVITY AND DIETARY SELF-CONTROL PROGRAM IN HYPERTENSIVE PATIENTS PATHUM THANI THAILAND

Miss Luckwirun Chotisiri

A Dissertation Submitted in Partial Fulfillment of the Requirements
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ประสิทธิผลของการบูรณาการโปรแกรมหัวเราะ ออกกำลังกาย และการควบคุมอาหารด้วยตนเอง ในผู้ป่วยโรคความดันโลหิตสูง จังหวัดปทุมธานี ประเทศไทย

นางสาวลักษณ์วิรุฬม์ โชติศิริ

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Thesis Title	EFFECTIVENESS OF AN INTEGRATED LAUGHTER MILD PHYSICAL ACTIVITY AND DIETARY SELF-CONTROL PROGRAM IN HYPERTENSIVE PATIENTS PATHUM THANI THAILAND
By	Miss Luckwirun Chotisiri
Field of Study	Public Health
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ลักษณ์วิรุฬห์ โชติศิริ : ประสิทธิผลของการบูรณาการโปรแกรมหัวเราะ ออกกำลังกาย และการควบคุมอาหารด้วยตนเอง ในผู้ป่วยโรคความดันโลหิตสูง จังหวัดปทุมธานี ประเทศไทย (EFFECTIVENESS OF AN INTEGRATED LAUGHTER MILD PHYSICAL ACTIVITY AND DIETARY SELF-CONTROL PROGRAM IN HYPERTENSIVE PATIENTS PATHUM THANI THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ดร. เขมิกา ยามะรัต, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: รศ. ดร. นพ. วิโรจน์ เจียมจรัสรังษี, 162 หน้า.

โปรแกรมแอลพีดี (LPD program) ประกอบด้วยการจัดกลุ่มให้ความรู้เรื่องความดันโลหิตสูง การออกกำลังกาย และการควบคุมอาหารด้วยตนเอง ภายใต้ทฤษฎีความสามารถในการพึ่งตนเอง มีวัตถุประสงค์ทั่วไป เพื่อศึกษาประสิทธิผลของการบูรณาการโปรแกรมหัวเราะร่วมกับออกกำลังกาย และควบคุมอาหารด้วยตนเองในผู้ป่วยโรคความดันโลหิตสูง จังหวัดปทุมธานี ประเทศไทย โดยมีวัตถุประสงค์เฉพาะเพื่อเปรียบเทียบค่าความแตกต่างของความดันโลหิต ระดับไขมันในเลือด ความรู้ ทัศนคติ และการปฏิบัติตัวต่อโรคความดันโลหิตสูงระหว่างกลุ่มควบคุมซึ่งได้รับการดูแลตามมาตรฐานบริการของโรงพยาบาล และกลุ่มทดลองที่ได้รับโปรแกรมแอลพีดีร่วมกับการดูแลตามมาตรฐานบริการของโรงพยาบาล และเปรียบเทียบค่าความแตกต่างของความดันโลหิต ระดับไขมันในเลือด ความรู้ ทัศนคติ และการปฏิบัติตัวต่อโรคความดันโลหิตสูงก่อนและหลังเข้าร่วมกิจกรรมในโปรแกรมแอลพีดี มีผู้ป่วยความดันโลหิตสูง อายุ 50-80 ปี เข้าร่วมการวิจัยจำนวน 69 ราย แบ่งเป็นกลุ่มทดลองจำนวน 34 ราย และกลุ่มควบคุม 35 ราย กลุ่มทดลองได้รับโปรแกรมแอลพีดี ร่วมกับการบริการตามมาตรฐานของโรงพยาบาลติดต่อกันเป็นเวลา 6 เดือน ในขณะที่กลุ่มควบคุมได้รับบริการตามมาตรฐานของโรงพยาบาลตามปกติเท่านั้น และเปรียบเทียบผลของโปรแกรมแอลพีดีภายในกลุ่มทดลอง พร้อมทั้งสุ่มเลือกตัวแทนในกลุ่มทดลองเพื่อสัมภาษณ์เชิงลึก สรุปการศึกษาพบว่า ผลของโปรแกรมแอลพีดีช่วยให้ผู้ป่วยความดันโลหิตสูง ควบคุมค่าความดันโลหิต ระดับไขมันในเลือด (คอเลสเตอรอล แอลดีแอล และเอชดีแอล) มีความรู้ ทัศนคติ และการปฏิบัติตัวต่อโรคความดันโลหิตได้ดี

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2558 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

ลายมือชื่อ อ.ที่ปรึกษาร่วม .....

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LUCKWIRUN CHOTISIRI: EFFECTIVENESS OF AN INTEGRATED LAUGHTER MILD PHYSICAL ACTIVITY AND DIETARY SELF-CONTROL PROGRAM IN HYPERTENSIVE PATIENTS PATHUM THANI THAILAND. ADVISOR: ASST. PROF. KHEMIKA YAMARAT, Ph.D., CO-ADVISOR: ASSOC. PROF. DR. WIROJ JIAMJARASRANGSI, M.D., Ph.D., 162 pp.

The LPD program (L: laughter, P: mild Physical activity, D: Dietary self-control) is a nonpharmacological treatment, designed for hypertensive patients in community based-care which was based on the concept of self-efficacy. The general objective of this randomized control study was to develop an integrated laughter, mild physical activity, and dietary self-control program (LPD Program) for hypertensive patients in Pathum Thani, Thailand. The specific objectives of this research were to 1) compare the clinical parameters (blood pressure and serum lipid profile) between hypertensive patients in the intervention group and the control group, 2) to compare knowledge, attitude, and practice regarding hypertension between the intervention and control groups, 3) to compare the clinical parameters (blood pressure and serum lipid profile) within groups before and after implementation of the LPD Program, and 4) to compare knowledge, attitude, and practice regarding hypertension within groups before and after implementation of the LPD Program. The sample of this study was 69 participants, aged 50-80 years, were randomly assigned to the intervention groups (n = 34) and the control group (n = 35). The study examinations included blood pressure, total cholesterol, triglyceride, LDL, HDL, knowledge, attitude, and practice regarding hypertension. The concept of self-efficacy in the intervention group receiving the LPD program consisted of group health education, group exercise, and individual dietary self-control. Also, individual home visits and leaflets were utilized to remind each participant of the scheduled LPD program. The measurements of dependent variables were conducted three times: at baseline, after the intervention (three months), and during the follow-up period (6 months). In-depth interview was asked for LPD program sustainability before closing the study. Data were analyzed using Chi square, t-test, and repeated-measure ANOVA. The findings showed a significant improvement in clinical parameters (systolic blood pressure, cholesterol, LDL, and HDL) including KAP (knowledge, attitude, and practice regarding hypertension). It was concluded that the LPD program could enable hypertensive patients to control their blood pressure, improve serum lipid, increase knowledge, promote positive attitude, and enhance their practice to control hypertension.

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Student's Signature .....
Advisor's Signature .....
Co-Advisor's Signature .....

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ABBREVIATIONS

BMI	Body mass index
BP	Blood pressure
CAM	Complementary and Alternative Medicine
CKD	Chronic Kidney Disease
DASH	Dietary Approaches to Stop hypertension
DBP	Diastolic blood pressure
ENCORE	Exercise and Nutrition interventions for Cardiovascular health
HDL	High density lipoprotein
HELM	Hypertension Evaluation of Lifestyle and Management
HPH	Health Promoting Hospital
HT	Hypertension
HV	Home visit
LDL	Low density lipoprotein
LPD	Integrated Laughter Mild Physical Activity Dietary Self-Control Program
NCD	Non-communicable diseases
SES	Socioeconomic Status
SCT	Social Cognitive Theory
TC	Total Cholesterol
TG	Triglyceride
TYCB	Take control of your blood pressure
VHV	Village Health Volunteer
WC	Waist circumferences

CHAPTER I

INTRODUCTION

1.1 Background and rationale

Hypertension is one of the most important preventable causes of deaths in the world. The number of adults with hypertension over the age of 60 has more than doubled. As has been documented, the prevalence of hypertension in the Thai population was 5% in 1991, and the percentage increased to 21 % in 2004, with 10 million people being affected (Aekplakorn et al., 2012; Thawornchaisit et al., 2013). Moreover, a large proportion of deaths resulting from non-communicable diseases occur before the age of 60, and the frequency of these cases is rising, especially in low- and middle-income countries (Alwan, Armstrong, Cowan, Riley, & Organization, 2011). Medication and lifestyle modification should be prioritized to address the adverse effects of hypertension (Kearney et al., 2005; Krause, Lovibond, Caulfield, McCormack, & Williams, 2011; Potts, 2014; Sue V. Saxon, Mary Jean Etten, & Perkins, 2009). To date, several lifestyle modifications have been adopted to help control blood pressure. These include reduced sodium and fat intake, weight control, and moderate consumption of alcohol (Chobanian et al., 2003). This is evidenced by the Dietary Approaches to Stop Hypertension (Dash) Program, prescribed to obese people. The Dash diet (high in low-fat dairy products, fruits, and vegetables; low in fats; and rich in fiber), when paired with exercise, could significantly lower blood pressure and result in improved cardiovascular health (Blumenthal et al., 2010; Sacks et al., 2001). In brief, the Dash program can be administered to people with hypertension as a dietary approach to improve health (Sacks et al., 2001).

1.2 Rationale

Hypertensive patients mainly rely on medications, rather than lifestyle changes (e.g. exercise, dietary control) to address their condition with the numbers of hypertensive patients increasing each year. It then becomes important to increase

awareness regarding lifestyle-related diseases and promotion of lifestyle modification among hypertensive patients (Bureau of Policy and Strategy, 2012; Organization, 2009). Moreover, urbanization is an important factor in recent decades, as rapid economic growth, socioeconomic status, age, chronic conditions, and hypertension have been more notable among Thai populations (Bauer, Briss, Goodman, & Bowman, 2014; Bureau of Policy and Strategy, 2012; Thawornchaisit et al., 2013; Tiptaradol & Aekplakorn, 2012; Vathesatogkit, Woodward, et al., 2012). In fact, the Thai Ministry of Public Health has launched the Thailand Healthy Lifestyle Strategic Plan 2011-2020. The plan is to be implemented throughout all health promoting hospitals and primary care facilities under the WHO Thailand Country Cooperation Strategy (National Economic and Social Development Board & Mahidol University, 2012). As such, this study needs to integrate intervention programs that benefit hypertensive patients.

1.3 Research Gap

Various studies have implemented multi-dimensional interventions designed for hypertensive patients, and these consist of healthy diet, physical activity, and stress management including quitting smoking and limited alcohol consumption (Chobanian et al., 2003; Paorohit, 2014; Rujiwatthanakorn, Panpakdee, Malathum, & Tanomsup, 2011; Stewart, Yamarat, Neeser, Lertmaharit, & Holroyd, 2014; Thutsaringkarnsakul, Aungsuroch, & Jitpanya, 2012; Vathesatogkit, Sritara, et al., 2012). Many studies have shown the effectiveness of mind-body interventions, such as yoga, in reducing high blood pressure (Johnson, Edling, & Sethi, 2012; Paorohit, 2014; Saensak, Vutyavanich, Somboonporn, & Srisurapanont, 2013). Even mild physical activity (Motoyama et al., 1998) and Chinese exercises such as Tai Chi and Qi Gong are found to be alternative modalities for lowering blood pressure (M.-S. Lee, Lim, & Lee, 2004; M. S. Lee, Pittler, Guo, & Ernst, 2007; Tsai et al., 2003). Furthermore, other studies have shown that laughter results in physiological and psychological benefits to the cardiovascular system, respiratory system, immune system, and quality of life (Lebowitz, Suh, Diaz, & Emery, 2011; Miller & Fry, 2009). In addition, based on Bandura's self-efficacy theory, self-efficacy encourages participation in physical activity, hence suggesting potential use of these measures in

other contexts (Perkins, Multhaup, Perkins, & Barton, 2008). However, a research gap still exists. As a result, this study combined laughter techniques (Dolgoff-Kaspar, Baldwin, Johnson, Edling, & Sethi, 2012; Piyamanotham & Dudsadeemaytha, 2007), plus a Chinese exercise popular in Thailand called "Jinkangkong" (Prempree, 2011), sharing of information regarding blood pressure control, and promotion of improved dietary habits. Findings from the pilot study indicated laughter techniques, in combination with Jinkangkong, were effective in lowering systolic blood pressure after a 12-week intervention among old patients with mild hypertension (Chotisiri & Yamarat, 2014). However, the effects of integrated laughter and physical activity by eastern exercise "Jinkangkong," combined with a dietary self-control (referred to as the LPD program) are still unknown, and this may benefit lifestyle improvement of aging patients with hypertension.

1.4 Research question

What is the effectiveness of an integrated laughter, physical activity and dietary self-control program (LPD Program) among hypertensive patients in the community?

1.5 Research Objectives

1.5.1 General objective

To develop an integrated laughter, physical activity, and dietary self-control program (LPD Program) for hypertensive patients in Pathum Thani, Thailand

1.5.2 Specific objectives

1) To compare the clinical parameters (blood pressure and serum lipid profile) between hypertensive patients in the intervention group and the control group
2) To compare knowledge, attitude, and practice regarding hypertension between hypertensive patients in the intervention group and the control group

3) To compare the clinical parameters (blood pressure and serum lipid profile) of hypertensive patients within groups before and after implementation of the LPD Program

4) To compare knowledge, attitude, and practice regarding hypertension among hypertensive patients within groups before and after implementation of the LPD Program

1.6 Hypotheses

1) The mean clinical parameters (blood pressure and serum lipid profile) between hypertensive patients in the intervention group and the control group are different.
2) Knowledge, attitude, and practice regarding hypertension of hypertensive patients in the intervention group and the control group are different.
3) The mean systolic blood pressures, diastolic blood pressures, and serum lipid profile within groups before and after implementation of the LPD Program are different.
4) Knowledge, attitude, and practice regarding hypertension among hypertensive patients within groups before and after implementation of the LPD Program are different.

1.7 Expected outcomes

1) The LPD program can promote healthy lifestyles as a non-pharmacological therapy.
2) The LPD program will be useful in improving health in the community.
3) The LPD program can be generalized to be applied with people who have other chronic conditions such as diabetes, chronic pain, post-stroke, etc.

1.8 Conceptual framework

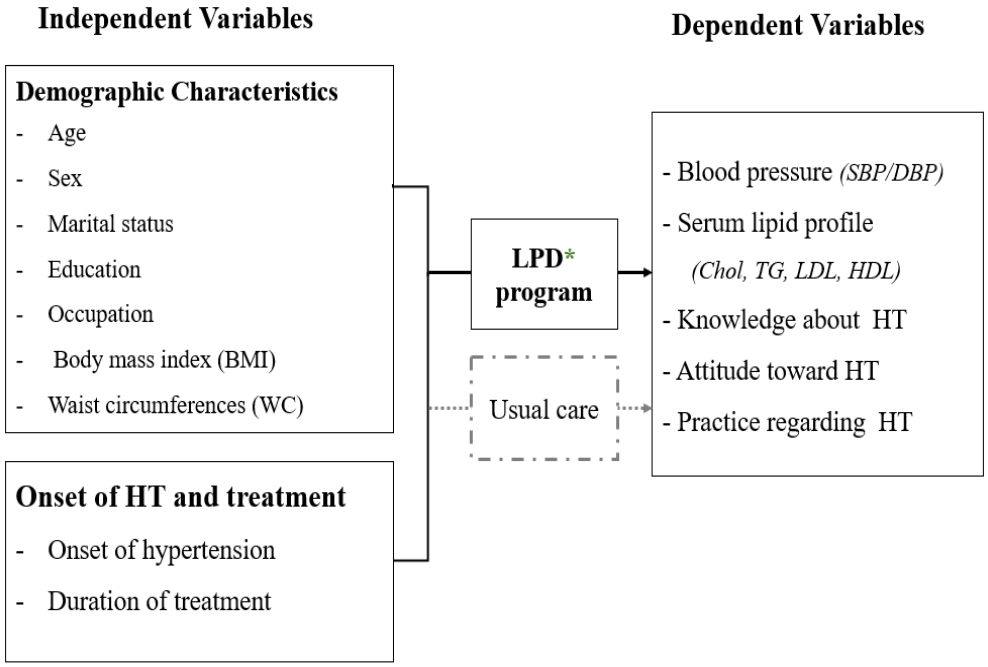


Figure 1-1: Conceptual framework

*** LPD program**

Part I. A three-month LPD program intervention

1) Group health education presentations
2) Group exercise by using laughter and Jinkangkong exercise developed by the researchers (Chotisiri & Yamarat, 2014)
3) Individual activity for dietary self-control based on a 20-item checklist
4) Home visit with a one-month interval

Part II. A three-month follow-up period by providing LPD leaflets each month after completion of Part I activities (Appendix A)

Usual care is routine health care services which all patients receive at the hypertension clinic at the Health Promoting Hospital.

1.9 Operational definitions

Age of patients is between 50 and 80 years old, as specified based on their Thai national identity card.

Blood pressure (BP) is defined as the peak blood on the blood vessels produced by transmission of left ventricular systolic pressure. Vascular tone and an intact aortic value maintain the diastolic blood pressure.

Body mass index (BMI) of participants is classified into underweight (< 18.5 mg/kg^2), normal weight (18.5-22.9 mg/kg^2), overweight (23.0-24.9 mg/kg^2), pre-obese (25.0-29.9 mg/kg^2), and obese (≥ 30.0 mg/kg^2), based on the Thai Ministry of Public Health's criteria which calculate the figures from weight in kilograms divided by height in square meters.

Dietary self-control is defined as an individual's restriction of high sodium food, high consumption of vegetables, a large amount of fiber intake, and adherence to a self-check with logbooks as assigned.

Educational level is defined as one of six groups of educational backgrounds indicated by the patients which are lower than primary education, primary education, early secondary education, high school education, vocational education, and undergraduate degree or higher.

Hypertension (HT) is defined as abnormally high blood pressure with either a systolic reading in excess of 140 mmHg and/or a diastolic reading in excess of 90 mmHg.

Hypertensive patient is defined as a patient already diagnosed with hypertension by a physician at the hypertension clinic of Buengkhamphroi Health Promoting Hospital, under Lamlukka District Hospital in Pathum Thani, Thailand.

KAP refers to participants' knowledge, attitude, and practice regarding past experiences with hypertension at the time of the interview.

K: Knowledge about hypertension, consisting of the disease and its complications, as well as hypertension self-care

A: Attitude towards hypertension, consisting of both negative and positive attitude

P: Practice regarding hypertension, consisting of healthy dietary intake, unhealthy dietary intake, physical activity and exercise, and relaxing activities.

Laughter is defined as an individual's positive emotional state. In this study, laughter is a couple of breaths in "O" and breath out "R" to warm up at the beginning of sessions before starting the main exercise using the breathing technique (Piyamanotham & Dudsadeemaytha, 2007).

LPD program is derived from the **L**aughter Mild **P**hysical activity and **D**ietary self-control program which consists of four activities: 1) group health education, 2) laughter by breathing technique combined with Jinkangkong exercise, 3) a dietary checklist, and 4) home visit.

Jinkangkong exercise refers to a Chinese exercise composed of eight original postures with mind concentration by counting while performing the movements (Prempree, 2011; Traimontree Bumrung, 2014). However, three simple postures were selected as main exercise in this study.

Marital status is defined as a person's relationship in the family which could be divided into four types: 1) single, 2) married, 3) widowed, and 4) divorced/separated.

Physical activity is defined as the lowest level of intensity exercise (< 3 METs or < 3.5 Kcal/min) (American College of Sports Medicine, 2013; CDC, 2014). In this study, the exercise comprises the use of laughter to warm up in addition to three postures of Jinkangkong followed by a cool down and slow breathing.

Occupation is classified into 5 groups: 1) housewives/housekeepers/no work/retirement, 2) agriculture/labor, 3) commercial group/private business, 4) private sector employee, and 5) government sector officer/state enterprise officer.

Onset of hypertension is defined as the appearance of high blood pressure detected by blood pressure measurement under physician diagnosed.

Self-efficacy is defined as a person's judgment of his/her capabilities to perform activities in the LPD program such as eating healthy food, performing exercise, and doing relaxing activities.

Serum lipid profile is defined as a group of four substances found in the blood consisting of Total cholesterol (TC), triglyceride (TG), low-density lipoprotein (LDL), and high-density lipoprotein (HDL).

Sex is defined as a genetic predisposition that influences blood pressure depending on gender. Both male and female participants were selected in this study.

Treatment of hypertension is defined as patients' reception of medication (diuretics, beta-blocker, ACE inhibitors, calcium channel blockers, alpha-adrenergic blockers, and/or arterial vasodilators) under the physician's supervision and with the doctor's appointment at Buengkhamphroi Health Promoting Hospital.

Waist circumference is regarded as an independent prediction of risk over and above that of BMI. Waist circumference measurement is particularly useful in patients who are categorized as normal or overweight on the BMI scale.

CHAPTER II

LITERATURE REVIEW

This chapter details chronic diseases and hypertension, the theoretical framework and application: theory of self-efficacy, laughter and laughter therapy, physical activity and exercise, exercise as therapy, Chinese martial arts and mild physical activity, Jinkangkong exercise, and relevant research related to the present study.

2.1 Chronic diseases and hypertension

The World health organization reported that hypertension is a serious public health problems which affect to cardiovascular and kidney diseases, the major cause of death and disability will take the lives of over 35 million people including many young people and those in middle age, also the whole number of population dying from noncommunicable diseases (NCDs) is higher than all infectious diseases (Strong, Mathers, Epping-Jordan, & Beaglehole, 2006). There is a dying prevalence from noncommunicable diseases among population the age 30 and 70 years, estimated to account for 71% of total deaths (World Health Organization, 2014b) which supported by a high prevalent cardiovascular risk factor can develop to other chronic problems, such as myocardial infarction and obesity whereas the treatment of hypertension has been shown to prevent cardiovascular diseases and to extend and enhance life, hypertension remains inadequately managed in worldwide (Campbell, Lackland, & Niebylski, 2014).

2.1.1 Definitions and assessment of hypertension

Blood pressure (BP) is measured by a two of the maximum pressure (systolic blood pressure; SBP) and the lowest pressure (diastolic blood pressure; DBP) in an artery for in the moment when the heart is beating, pumping and resting. Hypertension is an arbitrary level of BP defined to differentiate persons who have an increased risk of developing a morbid cardiovascular event. For adult as aged

18 and older systolic blood pressure (SBP) of 140 or above or a diastolic blood pressure (DBP) of 90 or above is identified hypertension (Chobanian et al., 2003).

Table 2-1: Classification of Blood Pressure for Adults (age ≥ 18 years)

BP Classification	SBP (mmHg)	DBP (mmHg)
Normal	< 120	and < 80
Pre-hypertension	120-139	or 80-89
Stage 1 hypertension	140-159	or 90-99
Stage 2 hypertension	≥160	or ≥ 100

SBP= systolic blood pressure; DBP= diastolic blood pressure
Source: Seven report of the Joint National Committee Prevention, Detection, Evaluation, and Treatment of high Blood Pressure (Chobanian et al., 2003)

2.1.2 Hypertension, risk factors and development of cardiovascular disease

The National High Blood Pressure Education Program presents the complete Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) reported that person older than 50 years with systolic blood pressure greater than 140 mmHg is a more important than diastolic blood pressure for cardiovascular risk factor (CVD), CVD risk doubles for each increment of 20/10 mm Hg when age up to 55 years (Chobanian et al., 2003). Also, cardiovascular disease is a major concern in Americans, people more than 7 million died of congestive heart failure and more than 15 million people in each year suffer from strokes of whom around 5.5 million die and a further 5 million are left permanently disabled and more than 100 million of American people suffer from hypertension (Chobanian et al., 2003; Stanton Newman, Elizabeth Steed, & Mulligan, 2008). Similarly in Thailand, the burden of disease of Thai populations is on the rise, this does not always mean that the years gained are lived in healthiness meanwhile chronic diseases and health risk factors such as diabetes and hypertension are major risk among adults and elderly (Aekplakorn et al., 2012; World Health Organization, 2014b).

According to public health issue in hypertension, healthcare providers have to evaluate patients' lifestyle and identify other risk factors or concomitant disorders that may affect prognosis and guide treatment as bellows (Benetos, Salvi, & Lacolley,

2011; Chobanian et al., 2003; Sue V. Saxon et al., 2009). The prevalence of high blood pressure associated with multiple health risk factors as below:

Age: Blood pressure tends to increase gradually with age, people over the age of 40, the risk of cardiovascular disease and high blood pressure doubled with each 20/10 mmHg (Chobanian et al., 2003). Also the relation between high blood pressure and mortality risk in age above 65 years and low diastolic blood pressure was associated with an increased all-cause mortality risk particular in very old (Post Hospers, Smulders, Maier, Deeg, & Muller, 2015).

Sex: Men are more likely to be hypertensive in early and middle age, and women are more likely to develop hypertension after age 55 likewise the study of sex differences in primary hypertension indicated that the sex chromosomes also play a role in and of themselves (Sandberg & Ji, 2012)

Heredity: A family history of hypertension and heart disease increases the risk of other family members also developing hypertension also ethnicity such as African-Americans have the highest incidence of hypertension and suffer from more cardiovascular and major organ complications than Caucasian

Diabetes: are especially prone to hypertension and cardio-vascular disease. When these co-exist the risk for complications is greater.

Obesity: Overweight individuals have a greater tendency to develop hypertension than those of average weight.

Alcohol: Excessive ingestion of alcohol increases the incidence of hypertension. Older persons with hypertension should limit their intake alcohol to one ounce per day (30 ml/day).

Smoking: Numerous research studies associate cardiovascular disease with smoking, and those with hypertension are at greater risk for cardiovascular disease.

High LDL (or total) cholesterol or low HDL: A diet high in lipids and cholesterol increases the incidence of atherosclerosis, which narrow blood vessels and causes both hypertension and cardiovascular disease.

High sodium intake: Sodium intake promotes fluid retention and increases the likelihood of developing hypertension.

Stress: Prolonged high stress may increase blood pressure. The length of time the stress exists, the intensity of the stress, and the individual's response to stress are all modifiable factors.

Sedentary lifestyle: Regular, systematic exercise can reduce blood pressure and weight as well as the risk of developing cardiovascular disease.

2.1.3 Assessment and management of hypertension

According to home self-monitoring of hypertension now can use home blood pressure (BP) self-measurement devices by themselves simply and more conveniently for long term and the conventional treatment of hypertension control is achieved with combination of medication. In contrast, non-pharmacologic interventions for high blood pressure include a wide array of measures, change lifestyle habit (weight reduction, reduce salt, increase high fiber of vegetable and fruits), regular exercise, stress management and control of smoking and alcohol drinking that can reduce blood pressure and enhance the efficacy of using hypertensive drugs for treatment (Stanton Newman et al., 2008). Therefore, hypertension control for all patients about the success or failure is challenge if patients have changed their lifestyle habits. For example, using various techniques to improve adherence to lifestyle changes in hypertension management shows as Table 2-2

Table 2-2: Techniques to improve adherence to lifestyle change in hypertension

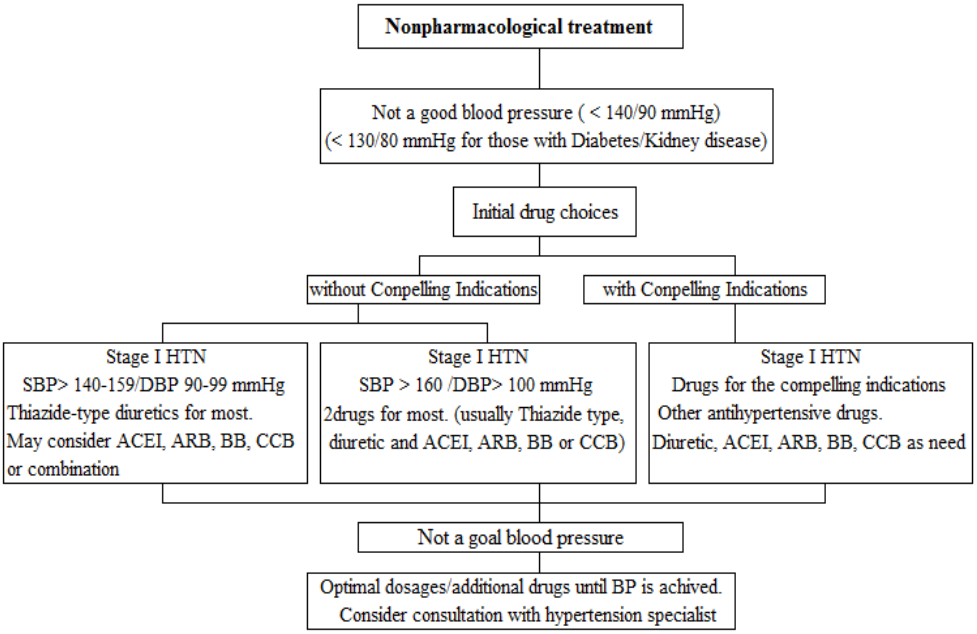
Targeted behavior	Intervention
Dietary regimens (Sodium restriction)	Self-monitoring of urine Spousal participation
Smoking cessation	Behavioral contracting Written educational materials Giving audiovisual materials Giving a projected coronary heart disease risk assessment
Exercise Regimens	Behavioral counseling

Targeted behavior	Intervention
	Educational counseling Behavioral contracting Self- monitoring of pulse rate Giving audiovisual material Relaxation training Giving a projected coronary heart disease risk assessment training for partner
Weight-loss regimens	Behavioral counseling Educational counseling Self-monitoring of pulse rate Relaxation training
lifestyle regimens	Behavioral counseling Educational counseling Written educational materials Telephone reminders Giving audiovisual materials

Source: summary of results (DiMatteo, Haskard-Zolnierek, & Martin, 2012; Stanton Newman et al., 2008).

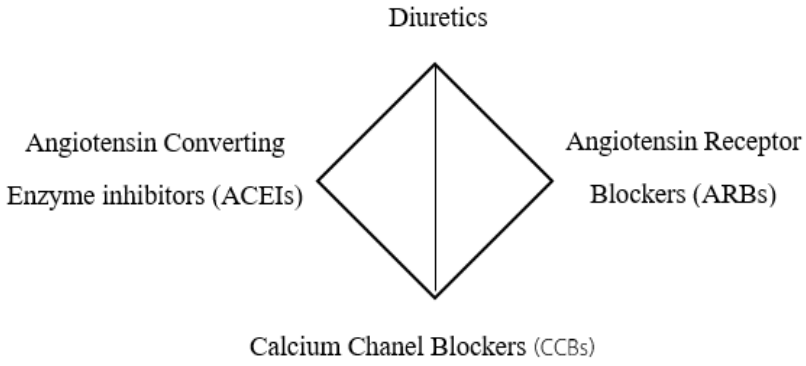
2.1.4 Treatment of hypertension

JNC7 guidelines recommended goal for hypertensive patients without complications is an average systolic BP of less than 140 mm Hg and a diastolic BP of less than 90 mm Hg. For patients with complications such as diabetes and renal disease should keep BP less than 130/80 mm Hg (Chobanian et al., 2003). Furthermore, one pathway of hypertension improvement project were designed to patients the psychosocial mediators and systems factors that may improve blood pressure, behavioral factors may influence patients' adherence to lifestyle recommendations and medications and also external factors such as dietary, environmental factors may affect how patients adhere to a healthy lifestyle that presented in figure 2-1 (L. Svetkey et al., 2005; L. P. Svetkey et al., 2009). Similarly, Thai hypertension society has recommended for lifestyle change or plus pharmacological treatment will appropriate for hypertensive patients who do not a goal therapy (Thai Hypertension Society, 2015).



Source: http://www.nhlbi.nih.gov/files/docs/guidelines/jnc7full.pdf

Figure 2-1: Guidelines on the treatment of hypertension



Source: http://www.thaihypertension.org/files/216_1.Hypertension_Guideline_2012.pdf(Thai Hypertension Society, 2015)

Figure 2-2: Thai guidelines for hypertension treatment

There are two categories for treatment of hypertension. First is pharmacological treatment which mainly under managed by physicians and pharmacists and the latter is non-pharmacological treatment know as lifestyle modification. Adoption of healthy lifestyles is critical for the prevention of high blood pressure that can reduce systolic blood pressure which includes weight

reduction, diets approaches to stop hypertension (DASH), salt restriction, exercise and moderation of alcohol consumption (Buranakitjaroen Peera et al., 2015; Chobanian et al., 2003; Lertsuwunseri & Sangwatanaroj, 2011). Adoption of healthy lifestyles is critical for the prevention of high blood pressure nonpharmacological treatment to prevent and manage hypertension and is an indispensable part of the management of those with hypertension.

Table 2-3: Nonpharmacological treatments to prevent and manage hypertension

Modification	Recommendation	Approximate range of BP Reduction
Weight reduction	Maintain normal body weight (BMI 18.5–24.9 kg/ m^2).	5-20 mmHg/10 kg
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat.	8 – 14 mmHg
Limited Sodium intake	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2 – 8 mmHg
Physical activity	Engage in regular aerobic physical activity such as brisk walking (≥ 30 minutes per day, most days of the week).	4 – 9 mmHg
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (eg: 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter-weight persons.	2 – 4 mmHg

Source: http://niaaa.nih.gov/sites/default/files/just_drinks_for_web.jpg

Source: Seven report of the Joint National Committee Prevention, Detection, Evaluation, and Treatment of high Blood Pressure (Chobanian et al., 2003)

2.2 Social Learning Theory: the theoretical framework and application

Social Learning Theory (formerly known as Social Cognitive Theory) or Bandura's Social Cognitive Theory (SCT) was used as the guiding framework as it provides a framework for analyzing human motivation, thought and action. Human behavior, according to Bandura, can be explained in terms of the triadic, reciprocal, determinism model in which personal factors, behavior and environment influence each other. In addition, SCT emphasizes personal factors in which cognition plays an important role. The Social Learning Theory suggests "behavior, cognitive and other personal factors, and environmental influences all operate interactively as

determinants of each other" while cognitive implies "a central knowing process in learning procedures," such that the theory "centers upon how people gain understandings of themselves and their environments and how they act in relation to those understandings". Almost all learning that results from direct experiences can occur by observing other individuals' behaviors and the consequences they must face for the choices they have made as in figure 2-3 showed the causal relationship between self-efficacy and outcome expectancies (Bandura, 1977).

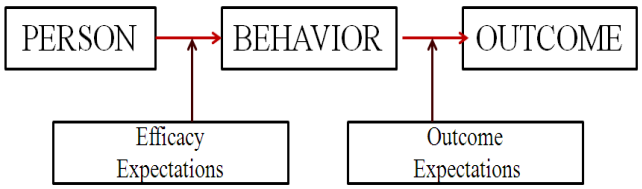


Figure 2-3: Diagramatic representation of the difference between efficacy expectations and outcome expectations

2.2.1 Theory of Self-Efficacy

Differentiated between two components of self-efficacy theory, the first is self-efficacy expectation and the other is outcome expectation. These two components are the major ideas of the theory. Self-efficacy expectations are judgments about what will happen if a given task is successfully accomplished. Self- efficacy and outcomes expectations were differentiated because individual can believe that a certain behavior will result in a specific outcome. However, they may not believe that they are capable of performing the behavior required for the outcome occur. Generally, it is anticipated that self-efficacy will have a positive impact on behavior. It must be recognized, however, that there are times when self- efficacy will have no or a negative effect on performance. Some research has found that there is a negative on self-reported personal goals on performance such that higher personal goals can cause poorer performance (Vancouver, Thompson, & Williams, 2001). High self- efficacy leads people to have a false sense of confidence and not put in as much effort as needed to perform. Self-efficacy which pertains to primary prevention is one's confidence ability to avoid any substance use in the first place.

1) Harm-reduction self-efficacy which pertains to the secondary prevention is one's confidences in being able to reduce the risk behavior after having become involved with tobacco or drugs.
2) Pre-action self-efficacy is an optimistic belief where an individual develops an intention to change
3) Maintenance self-efficacy is an optimistic belief about one's capability to deal with barriers that arise the maintenance period.
4) Recovery self-efficacy is related to coping self-efficacy pertains to one's conviction to get back on track after being stopped. The person trusts one competence to regain control after a setback or failure.

The concept of self-efficacy is receiving increasing recognition as a predictor of health behavior change and maintenance which is supported by the studies reviewed suggest strong relationships between self-efficacy and health behavior change and maintenance (Prochaska & Velicer, 1997).Various studies use social cognitive theory (SCT) predictor to observe specific behaviors such as physical inactivity and poorly dietary habits are difficult to change and intention needs to be supplemented by other which help to connect the intention-behavior gap (Schwarzer, 2008).

A study on hypertensive patients assessed the association between self-efficacy and self-care activities, chronic disease management requires the individual to perform varying forms of self-care behaviors and concluded that patients are knowledgeable about appropriate self-care behaviors are important factors in managing blood pressure control and hypertension self-care(Warren-Findlow, Seymour, & Huber, 2012). Similarly, a general measure of self-efficacy gives the opportunity to assess self-efficacy in a parsimonious way, if the study deals with the adoption of a general lifestyle, general stress adaptation, or overall compliance with a range of recommended healthy practice (Schwarzer, 2008). Self-efficacy in health were assessed and found that higher levels of self-efficacy were positively with better functioning in terms of daily activities mobility and quality of life (Walker, Payne, Jarret, & Ley, 2012). Furthermore, Bandura noted that self-efficacy should always

refer to the particular task or specific behavior that is being predicted (Bandura, 1997). Therefore, the prediction of behavior such as high fiber food consumption is a narrow range, high specificity of self-efficacy (Schnoll & Zimmerman, 2001)

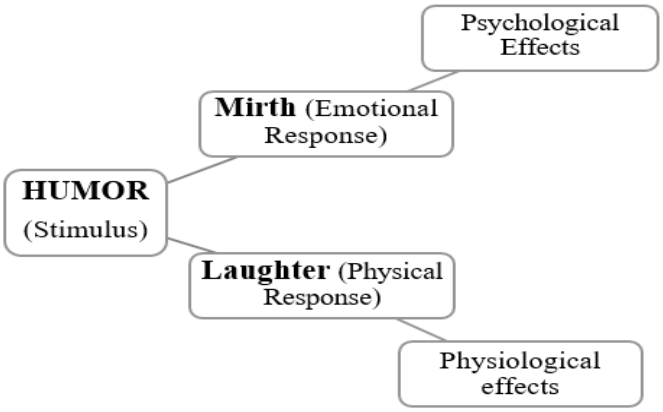
2.2.2 Self-efficacy to manage hypertension

This context will focus on the particular function that self-efficacy may have predicted health behavior change in chronic disease. Adherence to get hypertension knowledge for older patients with hypertension, adherences to perform exercise and adherences to control dietary and nutrition for hypertension. These complex nonpharmacological treatment has been found on self- efficacy e.g. getting adequate exercise, managing stress, and following a recommended diet were explained by self-efficacy beliefs measured on different times (Clark & Dodge, 1999; Schwarzer, 2008). The association between self-efficacy to manage hypertension can be prescribed as lists below:-

1. Having high blood pressure often means doing different tasks and activities to manage chronic condition.
2. How confident that hypertensive patients can do all the things necessary to manage high blood pressure on a regular basis?
3. How confident that hypertensive patients can judge when change in high blood pressure mean they should visit the physician?
4. How confident that hypertensive patients can do the different tasks and activities needed to manage high blood pressure so as to reduce the frequency to return to clinic?
5. How confident that hypertensive patients can reduce the emotional distress caused by high blood pressure so that it does not affect their everyday life?
6. How confident that hypertensive patients can do things other than just taking medication to reduce how much high blood pressure affects their everyday life?

2.3 Laughter and laughter therapy

Physiological and psychological well-being can be claimed by scientific evidence for health benefits of laughter. About 45 researches on non-pharmacological treatments have been published, those have examined the relation between laughter and multi-aspects of physical health, immunity, pain tolerance, blood pressure, longevity, and clinical illness (Martin, 2002). Among those nonpharmacological treatments, laughter is a noticeable psychotherapeutic intervention for depression and dementia patients, associated with positive emotional states, happiness and cardiovascular health (Sugawara, Tarumi, & Tanaka, 2010). It is cost-effective and it does not need any special space or special preparations (Takeda et al., 2010). The evidences on how humor and laughter influences physiological and psychological well-being such as muscle tension, cardio-respiratory functioning and various stress physiology measures (Bennett & Lengacher, 2008).



Source: Holistic Nursing (Dossey & Keegan, 2012)

Figure 2- 4: The Humor process and its psycho-physiological effects

Humor is a powerful coping mechanism that used to decrease fear, anxiety, and psycho-logical stress to improve the ability to cope with diseases while laughter, the physical response to perceived humor, has demonstrated positive effects on physical and psychological well-being (Berk, 2001). Humor is an effective therapeutic tool for caring older adults (Kruse & Prazak, 2006). Furthermore, the results of cardiology study found that patients with coronary disease were 40% less

likely to laugh than those with healthy hearts and the more people laughed the lower scores for anger and hostility (Miller & Fry, 2009). In addition, the results of the effects of laughter found that the heart rate elevated to 120 beats/minute, respiratory rate and depth and minute volume also increased while the residual volume decreased. Peripheral blood flow is increased due to vasodilatation. Systolic blood pressure is elevated laughter but no longer term effects because blood pressure falls down at resting after laughter stopped (R. A. Martin & Lefcourt, 2004). However, Hirosaki's study indicated that laughter and exercise program showed physiological and psychological health benefits particular in elderly who participate physical activity (Hirosaki et al., 2013).

Table 2-4: Physiological benefits of laughter

Benefits	Examples
Improve mental functioning	Increase interpersonal responses, alertness, and memory
Exercise and muscular relaxation	Exercises facial, chest, abdominal, and skeletal muscles. Moreover, Its help muscle relax, decreases muscle strain and reduce pain from arthritisand neuralgia.
Improve respiration	Pulmonary exercising and breathing can improve oxygen and blood circulation, relieves chronic respiratory problems and respiratory infection .
Stimulates circulation	Exercises the heart like aerobic exercise, followes by decreases in heart rate and blood pressure
Decreases stress hormone	Decrease stress hormone that can be harmful when chronically released.
Increases immune system	Increase the number and activity of natural killer cells to fight viral and bacterial infection.
Increases production of endophins	Decreases pain and produces a euphoric state without liquor, drugs or aerobic exercise

Source: The active ingredients in humor: psychological benefits and risks for older adults (Berk, 2001).

2.4 Physical activity and exercise

Physical activity is an important for people with high blood pressure. In 2008, of 31% adults aged 15 and over in worldwide were insufficiently active with more than 3 million deaths each year which are attributable to insufficient physical activity due to insufficient participation in physical activity leisure time and an increase in sedentary behavior occupational and domestic activities, increased urbanization has resulted in several environmental factors which may discourage participation in

physical activity such as violence, high-density traffic, low air quality, pollution, lack of parks, sidewalks and sports/recreation facilities (World Health Organization, 2009, 2013). Although previous guidelines for exercise advocated vigorous–intensity exercise to increase fitness (20 minutes three times a week), now many studies conclude that even 30 minutes five times per week of moderate-intensity exercise accrues health benefits (CDC, 2014). Also Global recommendations on physical activity guidelines are relevant to all population, they are relevant to individuals with specific health condition such as heart diseases and diabetes or with disabilities (World Health Organization, 2010). Being physically active is important for health, it shows one of indicators for global monitoring of progress towards reducing the impact of noncommunicable diseases. However, lack of physical activity has been identified as one of the factors contributing to high blood pressure and related deaths. Not staying physically active contributes to non-communicable diseases, particular in such activities is limited in low- and middle-income countries. While trends vary across regions and countries, figures have shown that mean systolic blood pressure has barely declined over the past three decades. Mean systolic blood pressure was highest in low- and middle-income countries (Alwan, 2011). In Thailand, it has been found prevalence of hypertension among Thais aged 15 or older increased from 5% in 1991 to 21% in 2004, a figure 15% higher than other countries (Aekplakorn et al., 2012; Policy, 2013; Rujiwatthanakorn et al., 2011). Also several studies have shown that less than 30% of Thais had exercised regularly since 1987 and the elderly exercised the least (The National Statistical Office, 2011). Therefore, the national response to non communicable diseases indicates an operational policy, strategy or action plan for adult risk factors such as raised blood pressure by promoted physical activity (World Health Organization, 2010, 2014a).

2.5 Exercise as therapy

The global mortality of physical inactivity has been indicated as the fourth leading risk factor causing an estimated 3.2 million deaths (World Health Organization, 2009). There are many evidences indicating that physical activity provides protection from cardiovascular disease (CVD) and it should be state that fitness and activity are important for people who are afflicted with CVD (Hardman &

Stensel, 2009). Exercise has been used extensively as a therapy is cardiac rehabilitation. Besides, it has been prevented to be effective for hypertension as a key non-pharmacological therapy. Comprehensive information concerning the role of exercise in treating hypertension is available in the American College of Sports Medicine Position Stand on exercise and hypertension (Wallace, 2003).

2.6 Chinese martial arts and Mild physical activity

There are categories to differentiate of Chinese martial arts which are distinctive differences in the training between different groups of the Chinese martial arts regardless of the type of classification. Most styles contain both hard and soft elements, regardless of their internal nomenclature. Analyzing the difference in accordance with **yin** and **yang** principles. Basic training may involve simple movements that are performed repeatedly and other examples of basic training are stretching, meditation, striking, throwing or jumping (Woodward, 2009). Furthermore, Yin-Yang theory expresses the Chinese belief that good health is the result of the balanced flow of **Qi** in the mind and the body. Yin and yang are opposite and create tension but are complementary. The interaction between yin and yang creates the flow of Qi and when these elements are equivalent the Qi is in balance. One purpose of Qigong is to balance yin and yang within the body. Strong movements are balanced with soft ones, leftward movements with rightward movements, and internal techniques with external techniques. Research has supported that Qigong and Tai Chi have beneficial effects on the body and that these are becoming famous holistic modalities in the United States. Qigong is a therapeutic Chinese practice that has been used for thousands of years to optimize and restore energy (Qi) to the body, mind and spirit. Elements of Buddhist and Taoist philosophies form the foundation of Qigong, which promotes health and vitality through gentle exercises for the breath, body, mind, and the voice (McCaffrey & Fowler, 2003).

Table 2-5: The Common Terminology of Qigong and Tai Chi

Key Terms	Definitions
Qi	In tradition Chinese medicine-Basic Life energy
Meridian	Channels or conduits through which Qi travels in the body
Yin/yang	Universal characteristics used to describe aspects of the natural world
Tai Chi Chuan	The physical movements practiced within Qigong
Taoism, Buddhism	Religious and social traditions that influenced Chinese philosophy and therefore Qigong
Nine Pearls	Connected areas in the body that should be relaxed through which Qi flows
Tan T'ien (Dan Dien)	Qi energy centers
Qigong Master	One who has studied Qigong philosophy, exercise, and training in how to teach Qigong and Tai Chi

Source: Qigong Practice. A Pathway to Health and Healing (McCaffrey & Fowler, 2003)

Mind-body exercises such as **Tai Chi** and **Qigong** are simply accessible. Tai Chi is a type of Qigong practice, the an ancient Chinese martial art with a set of slowly paced and smoothly connected movements of all body parts, emphasizes mind–body connection these movements (Palumbo, Wu, Shaner-McRae, Rambur, & McIntosh, 2012).

Qigong is a Chinese traditional daily exercise that includes gentle exercises for the breath, body, mind, and the voice which can alert some biological effects and some potential health benefits for patients with hypertension such as a session of Seated Qigong elicits a hypotensive response and may provide advantageous health benefits (Freeman et al., 2014).

A study of effects of a-10 week of Qi-training demonstrated that the practice of CDSB Qi-training on blood pressure, heart rate and respiration rate with special emphasis on the stabilization of cardiovascular system (M. S. Lee et al., 2000; M. S. Lee et al., 2007).

The study of Tai Chi Chuan and Qigong to compare cardiorespiratory responses to exercise among older Qigong participants and concluded that both exercises can enhance breathing and breathing in older individuals (Lan, Chou, Chen, Lai, & Wong, 2004).

2.7 Jinkangkong exercise

Tai Chi and Qigong are well known for producing beneficial health outcomes in adults, particularly in older people in Thailand. However, the author found "Jinkangkong exercise" from Thailand broadcast media which uses a similar pattern to that of "Tai Chi" and "Qigong" as they all used softly dynamic movements. The main characteristics of the postures involved in these exercises were slow, gentle, and simple moves. However, "Jinkangkong" seemed easier to practice for elderly persons. The author, therefore, approached a master trainer of Jinkangkong exercise to carry out an in-depth interview. The interviewed senior trainer was Mr. Bamrung Traimontree, a 74-year-old retired government official who was currently working as a volunteer trainer at Waroonprapa community and the Elderly's Quality of Life Development Center in Nonthaburi Municipality, Nonthaburi Province. The author also learned about this exercise by practicing the eight postures with Mr. Bamrung Traimontree as early as in 2013 when the pilot study was undertaken in Pathum Thani Province(Chotisiri & Yamarat, 2014). In 2015, with the snowball from Mr. Bamrung, the author approached the original master trainer of Jinkangkong named "Mr. Phairatt Tessawasdi," a 83-year-old trainer who possessed deeper understanding of the basic concepts of "Jinkangkong," "Tai Chi," and "Qigong," as well as other forms of exercise that were originated from Chinese martial art thousands of years ago and which have since been used with traditional Chinese medicines. During the interview, Mr. Phairatt, the master trainer, shared his background that, "I learned this exercise from an old Chinese man about nearly 30 years ago. I called him 'Ar-ling.' At that time, Ar-ling was around 65 years old. He looked skinny, and he looked just like other dominant Chinese characters, with a long beard and with traditional Chinese costumes. Ar-ling moved from his motherland to find better ways of life in Bangkok and had lived here for several years. However, at a later time, Ar-ling got sick with an unknown chronic condition. When his sickness was worsened, he sought assistance and met the physicians frequently. Then, he decided to return to his motherland for traditional Chinese treatment which included use of herbal medicines and lifestyle change. He had to perform Jinkangkong exercise until his clinical condition improved, and he again returned to Thailand. He moved to a new home in

Nonthaburi Province, and he still kept his physical fitness by doing the Jinkankong exercise regularly. He also usually advised people who were interested in this exercise." At that time, Mr. Phairatt was Ar-ling's neighbor, so he had a chance to learn to perform this exercise from him. Mr. Bamrung, who also lived in the same community, followed. They enjoyed exercising together with a small group of friends for several years after that. Unfortunately, Ar-ling moved again to somewhere else, and Mr. Phairatt also had to relocate for his career path. Therefore, Mr. Bamrung became the leader of the exercise group that remained in the community with only three to four members at that time. After he retired from his work, he became a full-time volunteer of Jinkangkong exercise training in his neighborhood community as well as at the Faculty of Sciences, Kasetsart University and the Elderly's Quality of Life Development Center in Nonthaburi Municipality.

Photo by Luckwirun Chotisiri (December 31, 2015)

Figure 2- 5: Jinkangkong postures, demonstrated by a senior trainer

The original exercise consisted of eight postures of gentle dynamic movements in a continuum from active physical exertion to subtle motions that were only slightly perceptible. Each posture of the Jinkangkong exercise is easy to perform, both in group and individually. All exercisers have to concentrate on bodily movements, by focusing their mind on counting together while performing each posture: 1, 2, and 3; 1, 2, 3, 4, and 5; or 1, 2, 3,…,10, followed by the word "stretching" or "*Yued-Sen*" in each posture throughout the session in order to retain their concentration and focus on different bodily organs such as the shoulders, arms, hands, fingers, knees, and legs, etc. Each posture should be repeated for five to ten

times, and the total session should last approximately 40 to 60 minutes. A study conducted by Prempree has yielded support to the Jinkangkong exercise, noting that the Jinkangkong exercise training promoted physical health and quality of life among older women after performing the 12-week Jinkangkong exercise (Prempree, 2011).

2.8 Relevant research related to the present study

According to previous studies on the self-efficacy theory and health behavior intervention, it was found that individual behavior may change in some parameters in hypertensive patients. This study, therefore, integrated the social cognitive learning theory and the theory of non-pharmacological therapy to develop an optimal program for hypertensive patients as follows:

As regards the effects of lifestyle modifications on hypertension including weight loss, reduced sodium intake, increased physical activity, and limited alcohol consumption, it was found that the participants who received established recommendations plus the Dietary Approaches to Stop Hypertension (DASH) were able to lower their blood pressure (BP) six month after program implementation with statistical significance. These hypertensive patients constituted a diverse group of people who were women, who had different ages and races, and who had different hypertension statuses. This study concluded that diverse groups of people can adopt multiple lifestyle changes that can lead to improved blood pressure control and reduced cardiovascular disease risks (L. Svetkey et al., 2005).

The study of long-term effects of socioeconomic status (SES) on progression of high blood pressure among Thais working at the Electricity Generating Authority of Thailand revealed that levels of income were negatively related to the progression of systolic blood pressure (SBP). It was also found that participants who had higher education had substantially lower increments in blood pressure (Vathesatogkit, Woodward, et al., 2012).

A survey undertaken at the hypertension outpatient clinic toward self-care and adherence to medication has noted that women who were users of complementary and alternative therapies (CAM) tended to have imperfect adherence to anti-hypertensive medication. Older and white British respondents were significantly more likely to

report perfect adherence. Moreover, nearly 45% of the respondents used blood pressure monitor which was not associated with gender, CAM use, or adherence to medication. It is worth noting that the present study found at higher rate of prevalence of CAM use in hypertensive patients than that reported in the UK population. It is important to acknowledge the self-care behavior of hypertensive patients in order to assess potential harm and encourage effective methods of self-care (Gohar, Greenfield, Beevers, Lip, & Jolly, 2008).

In another study, the improvement project for physicians and lifestyle modification was investigated. Physician intervention included Internet-based training, self-monitoring, and quarterly feedback reports, and there was a 20-week patient intervention by group sessions with a 12-month follow-up by telephone counseling, focusing on weight loss, Dietary Approaches to Stop Hypertension dietary pattern (DASH), exercise, and reduced sodium intake. The findings showed that combined physician and patient interventions could lower blood pressure, but the effects did not persist at 18 months. It was suggested that future studies focus on enhancing effectiveness and sustainability of these interventions (L. P. Svetkey et al., 2009).

A study of a self-management program on blood pressure control among patients with hypertension at risk for stroke indicated that the program was effective to enhance the subjects' knowledge regarding hypertension, as well as their self-management and control of their blood pressure (Rujiwatthanakorn et al., 2011).

Using multidisciplinary lifestyle intervention such as discussions, tests, group works, practical training, and written materials was also found to be effective to reduce high blood pressure in middle-aged employees with hypertension at a rehabilitation center (Mattila, Malmivaara, Kastarinen, Kivelä, & Nissinen, 2003).

A study of multidisciplinary lifestyle intervention for high blood pressure control indicated that training relaxation techniques followed each physical exercise session, food diary filled by the dietitian with discussions, tests, group works, practical training, and written materials could produce significant reductions in blood pressure among middle-aged employees with hypertension (Mattila et al., 2003). Likewise, a study of an integrated program of health education with individual counseling and

tailored exercise indicated that program intervention was effective to control systolic blood pressure, improve self-efficacy for exercise, and enhance health-related quality of life in community-dwelling older adults with hypertension (Park et al., 2011).

In a randomized controlled trial conducted to explore the effects of the "take control of your blood pressure" (TCYB) program, it was discovered that a tailored behavioral intervention to improve blood pressure control could increase self-reported medication adherence in patients with hypertension in the behavioral group from baseline to six months (Bosworth et al., 2008).

Another study of behavioral interventions for hypertension by means of a focus group indicated that patients' and their family members' views may help guide efforts to tailor behavioral interventions designed to improve hypertension self-management behaviors and hypertension control in minority populations (Flynn et al., 2013).

As regards findings of a modified relaxation technique to reduce systolic blood pressure in Thai postmenopausal women, effects of a long-term and combined relaxation therapy with antihypertensive agents are warranted in a large cohort of this population (Saensak et al., 2013).

A study of a six-month multicomponent lifestyle intervention program included motivational enhancement, social support provided by peer coaches, pedometer diary self-monitoring, and monthly nutrition and physical activity education sessions revealed that lifestyle interventions could control blood pressure among African-American communities people (Zoellner et al., 2014).

A study of the relationship between health behavior theories and self-efficacy in physical activity among African-American women with hypertension showed that hypertensive patients who were confident in overcoming barriers reported less worry about physical activity. However, social support and competing demands were not associated with self-efficacy. Based on the findings, this study suggested that self-efficacy should be made behavior specific and each measure should provide unique information (M. Y. Martin et al., 2008) so as to ensure effectiveness.

A systematic review of randomized controlled trials of lifestyle interventions has reported that patients with elevated blood pressure should follow a weight-reducing

diet, take regular exercise, and reduce salt intake and alcohol consumption. However, this study did not support relaxation therapies or intake of calcium, magnesium, or potassium supplements to reduce blood pressure (Dickinson et al., 2006).

A study on patient recall of receiving lifestyle advice was explored in relation to the proportion of overweight and hypertension by general practitioners (GPs) in Australia. The findings indicated that only patients who had received lifestyle advice from their doctors could achieve desired weight loss. However, hypertensive patients who received advice on less salt intake should receive re-enforcement of the benefits of lifestyle changes with respect to weight control and blood pressure control (Booth & Nowson, 2010).

The randomized controlled trail of stress reduction by using a transcendental meditation (TM program and mind-body intervention) and health education in the secondary prevention of cardiovascular disease confirmed that the TM program significantly reduced the risk for mortality, myocardial infarction, and stroke in coronary heart disease patients. These changes were associated with lower blood pressure and psychosocial stress factors. Based on such findings, it was suggested that the TM program be implemented to benefit secondary prevention of cardiovascular disease (Schneider et al., 2012).

A randomized controlled trial of a 12-week Tai Chi Chuan showed that it could reduce systolic blood pressure (SBP) (15.6 mm Hg) and diastolic blood pressure (DBP) (8.8 mm Hg). Moreover, cholesterol level decreased by 15.2 mg/dL and high-density lipoprotein cholesterol (HDL) increased by 4.7 mg/dL. Also, both trait anxiety and state anxiety were decreased (Tsai et al., 2003).

An intervention review noted that the effectiveness of Qi Gong for prevention of cardiovascular disease (CVD) was due to involved physical exercise, mind regulation, and breathing control, leading to reduction in stress. However, the study was designed to examine only short-term outcomes of Qi Gong. Thus, actual effects could not be attributed to the intervention. Furthermore, the study stated that the four values of serum lipid profile of those trials were examined, and favorable effects on high-density lipoprotein (HDL) cholesterol were identified (Hartley et al., 2015).

A study of relationships between health behavior theories and self-efficacy among African-American women confident in overcoming barriers to physical activity showed that sticking with physical activity was associated with reflection on how personal values corresponded to behavior. However, social support and competing demands were not associated with self-efficacy (M. Y. Martin et al., 2008).

A study of the development of self-efficacy scales for health-related diet and exercise behaviors found that self-efficacy scales for eating and exercise behaviors showed preliminary evidence of being reliable and valid (Sallis, Pinski, Grossman, Patterson, & Nader, 1988).

A study of predictors of physical activity in older adults with borderline hypertension indicated that gender, income, previous exercise experience, self-efficacy, and motivation were directly related to engagement with regular physical activity (PA) in older adults with borderline hypertension. Therefore, the study yielded a foundation for further studies and practice with the PA model (Y.-S. Lee & Laffrey, 2006).

A once-weekly combination of laughter and exercise program was found to be effective to increase bone mineral density and self-rated health with statistical significance and decrease HbA1c with statistical significance among community-dwelling elderly in Japan. Such a program, therefore, might have physiological and psychological health benefits for aging group. Laughter might be an effective strategy to motivate them to participate in physical activity (Hirosaki et al., 2013).

In a study undertaken to examine a non-pharmacological treatment of hypertension, it was noted that giving knowledge in health and nutrition strategies could promote adherence to dietary changes of adult women. Thus, the intervention was recommended for the treatment of hypertension in a community covered by Primary Health Care Unit to improve adherence to treatment of hypertensive patients (Ribeiro et al., 2011).

The American Heart Association has reported that well-established dietary modifications that could lower BP are those that enable hypertensive patients to reduce salt intake, lose weight, and have moderation of alcohol consumption. In those

hypertensive patients under medical treatment, lifestyle modifications, particularly a reduced salt intake, can further lower blood pressure. However, the current challenge is developing and implementing effective clinical and public health strategies that lead to sustained dietary changes among the entire population of hypertensive patients (Appel et al., 2006).

The ENCORE Study was to compare the DASH (Dietary Approaches to Stop Hypertension) diet alone or the DASH diet combined with a weight management program with usual diet controls among overweight-obese patients with high blood pressure. It was found that overweight or obese persons with above-normal BP who, did exercise and lost weight in addition to adherence to the DASH diet could achieve even larger BP reductions, greater improvements in vascular and autonomic functions, and less left ventricular mass (Blumenthal et al., 2010).

A study of the effects of home-delivered Dietary Approach to Stop Hypertension (DASH) meals on diets in older adults with hypertension showed that an increase in compliance with dietary recommendations could be achieved after providing seven home-delivered therapeutic meals a week to noncompliant elderly patients with cardiovascular disease (Troyer, Racine, Ngugi, & McAuley, 2010).

The findings of a study on association between dietary behavior and risk of hypertension among Japanese male workers indicated that the respondents who did not eat meat frequently showed a higher risk of high blood pressure (OR = 1.26, 95% CI: 1.00–1.59). Therefore, it was concluded that meat and dairy product intake was associated with prevention of hypertension among Japanese male workers (Umesawa et al., 2013).

The perspectives of patients and family members in terms of facilitators and barriers to hypertension self-management have shed light on the hypertensive patients' favorable attitude toward family members' support and positive relationships with physicians. On the other hand, competing health priorities, lack of knowledge about hypertension, and poor access to community resources were barriers that influenced their hypertension self-management. Furthermore, family members also identified their participation in patients' visits to the physicians, discussions with the patients' physicians outside of visits), their own limited health knowledge, and

patients' lack of motivation to sustain hypertension self-management behaviors as barriers that hindered their efforts to support the patients' hypertension self-management. Therefore, patients' and their family members' views may help guide efforts to tailor behavioral interventions designed to improve hypertension self-of management behaviors and hypertension control in minority populations (Flynn et al., 2013).

The findings of a study conducted with patients with CKD on their target blood pressure goal showed that it was independently correlated with improved blood pressure control. The study also noted that optimizing blood pressure management may improve patients' knowledge of specific blood pressure targets (Wright-Nunes, Luther, Ikizler, & Cavanaugh, 2012).

A comparison of salty taste assessments revealed that the salty taste assessment scores had a significant negative correlation with nutrition knowledge. Furthermore, the salty taste assessment scores had a significant positive correlation with dietary attitude and dietary behavior in terms of preference for high-salt diets. In addition, dietary attitude and dietary behaviors were found to be associated with high-salt diets in various regions in Korea. Finally, dietary attitude and dietary behaviors were found to be associated with high-salt diets in different regions in Korea (Kim, Jung, & Lee, 2012).

A study of perception of hypertension management of patients and physicians in Asia including Thailand showed that patients' had less awareness of blood pressure control although they had a good level of knowledge. It was also reported that physicians may provide better care on a common understanding to control blood pressure (Rahman et al., 2015).

The findings regarding perceptions of hypertension treatment among patients with diabetes mellitus showed that the diabetic patients were more likely to accept hypertension as a disease, while hypertensive patients tended to see hypertension not as a chronic illness (Anthony, Valinsky, Gabriel, & Varda, 2012).

A cross-sectional survey of hypertensive patients reported that perception of hypertension, negative attitude and experiences such as lack of information, feeling of

hopelessness about their hypertension, and adverse effects of hypertension treatment on sexual functions were very common among hypertensive patients in primary healthcare settings (Jokisalo, Kumpusalo, Enlund, & Takala, 2001).

In an experimental study with random assignment to explore the effects of a supportive educational nursing intervention program on self-care abilities, self-care behavior, and quality of life of patients with advanced heart failure, it was discovered that self-care abilities did not change as a result of the intervention, but self-care behavior in the intervention group was higher than self-care behavior in the control group at the nine-month follow-up because the effect of the supportive educational intervention on quality of life was limited. However, the study recommended that a more intensive intervention be carried out to more clearly determine the effectiveness of the intervention on improvement of quality of life (Jaarsma et al., 2000).

In a survey of factors associated with self-care behaviors for hypertension among Korean Americans guided by the Social Cognitive Theory, a variety of demographic factors such as age, sex, marital status, occupation, knowledge, belief, self-efficacy in hypertension, and social support factors were examined. The findings showed that the respondents who were older, had longer duration of hypertension, and had higher self-efficacy to control hypertension were more likely to have higher self-care scores. Based on such findings, it was suggested that hypertension control self-efficacy be improved and modifiable personal factors be considered (J.-E. Lee et al., 2010).

In another study, the positive association between family social support and medication adherence was reported. It was suggested that regular blood pressure (BP) measurement should be developed for hypertension control. However, it is recommended that future studies should be focused on the effects of family social support, depression, anxiety, and self-efficacy on self-care behaviors (Hu, Li, & Arao, 2015).

A 14-item hypertension evaluation of lifestyle and management (HELM) scale consisted of 1) general hypertension knowledge, 2) lifestyle and medication management, and 3) measurement and treatment goals to assess hypertension knowledge and self-management skills. This study found that the HELM knowledge scores increased following the educational intervention from baseline to the 12-month

follow-up; however, there was no association with diastolic or systolic blood pressure. Therefore, the HELM provided a valid measure of the knowledge required for patients to take an active role in the chronic disease management of hypertension (Schapira et al., 2012).

A study of nutritional orientation as a non-pharmacological treatment was conducted to compare two intervention strategies regarding the adherence of hypertension in the community and in primary care. It was found that the intervention at the household level was more effective with regard to the adherence of individuals to non-pharmacological treatment of hypertension, in terms of reduction of clinical and behavioral risk parameters (Ribeiro et al., 2011).

Finally, Chin & Wong carried out a study and found that an eight-week sustained follow-up after a nurse consultation on hypertension had positive effects on blood pressure control and adherence to healthy lifestyle. However, telephone follow-up after such clinical intervention further augmented the effects of the clinic consultation (Chiu & Wong, 2010)

CHAPTER III
METHODOLOGY

This chapter details the research design, study area, population and sample, measurements and tools, ethical considerations to protect the rights of human subjects, data collection and intervention procedures, and data analysis.

3.1 Study Design

The effectiveness of an integrated laughter, mild physical activity, and dietary self-control program (known as the "LPD program") was assessed in a two-arm randomized controlled trial. The intervention group (LPD group) received their usual monthly services in addition to the LPD program for six months, whereas the control group received only their usual monthly services at Buengkhamphroi Health Promoting Hospital. All measurements were taken at baseline, three months, and six months, before the program closed.

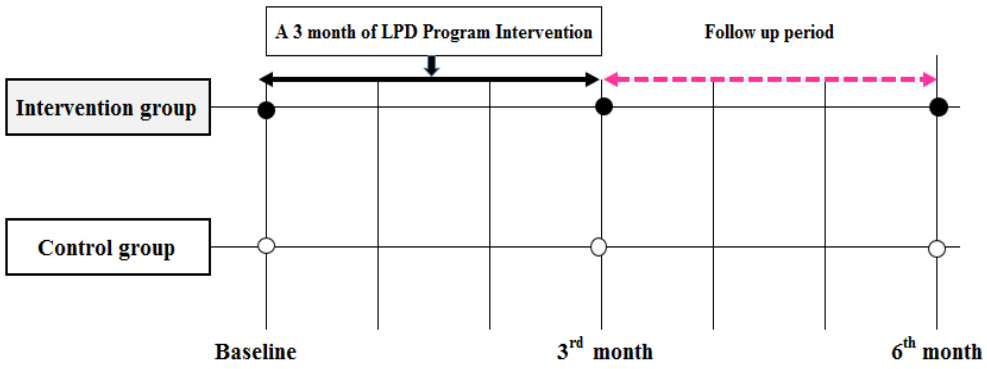


Figure 3- 1: The research design

3.2 Study area

3.2.1 Setting

Pathum Thani is located in central Thailand, north of the Bangkok metropolitan area. It comprises seven districts: 1) Muang, 2) Khlongluang, 3) Thanyaburi, 4) Nongsuea, 5) Ladlumkaeo, 6) Samkhok, and 7) Lamlukka (Pathum Thani, 2014). At present, rapid urbanization and the transition from rural life to a modern city life are reported as major contributors to increased high blood pressure that have be found to

be similar as other parts of Thailand (Jongkroy, 2009; Provit Data Center; Suriyawongpaisal, 2003).

The Lamlukka district was specifically selected for consideration in this study, as the Lamlukka Community Hospital is a good representative for healthcare providers of the secondary level organized by the Ministry of Public Health. This group of healthcare providers consists of 12 Health Promoting Hospitals, and each one provides healthcare services for up to 200 outpatients daily. This organization's mission is to alleviate congestion at the Lamlukka Community Hospital. Finally, the Buengkhamphroi Health Promoting Hospital was randomly selected to represent primary healthcare units, as shown in Figure 3-2 (Buengkhamphroi health promoting hospital, 2014; Pathum Thani Health Data Center, 2015).

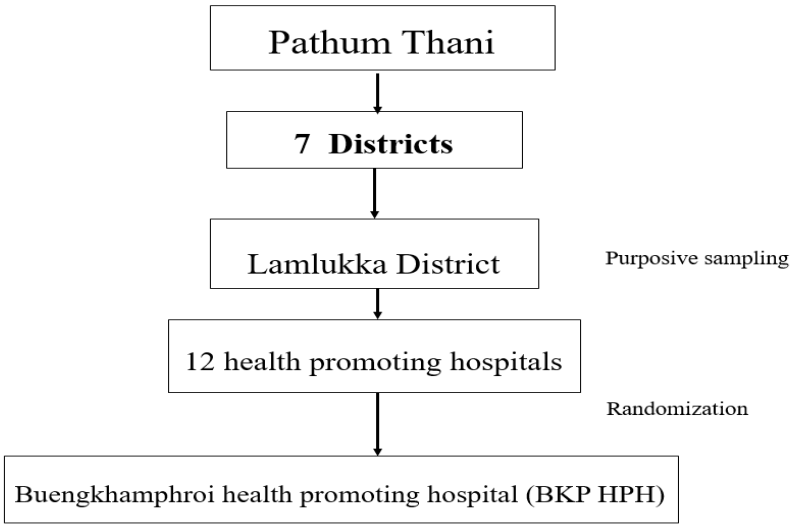


Figure 3- 2: The study area

3.2.2 Recruitment

3.2.2.1 The inclusion criteria

Participations in the study were included as follows:

1. Participants are men and women between the ages of 50 and 80.
2. Participants have previously been diagnosed by a physician with hypertension and are currently under medical treatment for the condition. The condition is subject to continual, scheduled, monthly follow-up care at a health-promoting hospital.

3. All participants began the LPD program intervention only after informed consent was obtained.
4. To reduce possible risks associated with the study, participants were tested for physical fitness to ensure that they would be able to perform a full exercise program.
5. We screened for stress levels using an online edition of the short form of stress assessment (ST5) from the Thailand Department of Mental Health (Department of Mental Health, 2011). Stress assessment scores were classified into four groups: 1) scores of 0–4 indicated mild stress, 2) scores of 5–7 indicated moderate stress, 3) scores of 8–9 revealed high stress, and 4) scores of 10-15 reflected severe stress. Professional healthcare staff and researchers tested all participants' eligibility. Those who scored 8 or below were recruited for the study.
6. Eligible participants were non-smokers and/or former smokers with at least six months smoke-free. They were non-drinkers, or consumed only a mild to moderate amount of alcohol, no more than two drinks per day in men or one drink per day in women and lighter weight persons (1 drink = 12 ounces regular beer, 10 ounces wine, or 3 ounces 80-proof whiskey) (Chobanian et al., 2003; Thai Hypertension Society, 2015).
7. Participants were able to communicate by reading, writing, or listening in order to answer the questionnaires and/or self-record their data.
8. If any participants had other interventions from healthcare services that could influence the present intervention, they were excluded because of co-intervention.

3.2.2.2 Exclusion Criteria

All participants who had been diagnosed with serious conditions that left them unable to perform exercise, those with uncontrolled blood pressure or persistent high blood pressure of more than 160/100 mmHg and clinically unstable, or other chronic conditions had to be evaluated by physician to determine that they could not enter an exercise program. They were referred to other hospitals for further treatment and excluded from the study.

3.3 Sample Size Calculation and Sampling Procedures

3.3.1 Sample size calculation

An appropriate sample size can be expected to detect the differences in primary outcomes between intervention and control groups with minimal errors. The sample size estimation for tests between two independent sample means is shown below (Sakpal, 2010).

The formula for calculating a sample size is

$$n = [(Z_{\alpha/2} + Z_{\beta})^2 \times 2(\sigma)^2]/ (\mu1 - \mu2)^2$$

Where

n = Sample size required in each group

$\mu1$ = Mean change in SBP from baseline to week 12 of control group (Park et al., 2011)

= 133.1_{wk12}-$130.3_{baseline}$

= 2.8

$\mu2$ = Mean change in SBP from baseline to week 12 of intervention group (Park et al., 2011)

= 122.3_{wk12} -$134.6_{baseline}$

= -12.3

$\mu1-\mu2$ = Clinically significant difference

= 2.8- (-12.3)

= 15.1

σ = Standard deviation = 15.4

$Z_{\alpha/2}$ = This depends on level of significance; for 5%, this is 1.96

Z_{β} = This depends on power; for 80%, this is 0.84

n = $[(1.96 + 0.84)^2 \times 2(15.4)^2]/ (15.1)^2$

= 17 (plus 30% dropout rate = 5.1)

= 17 + 5.1

= 22.1

The sample size calculation was based on differences in systolic blood pressure between the intervention and the control groups after 12 weeks (12.3). The standard deviation of changes in blood pressure for the control group was found to be 15.4 (Park et al., 2011). Based on the data, 17 participants per group were needed to detect this difference with alpha 0.05 two-sided and power of 0.80. We decided to make assumptions on two sides because the LPD program could have both negative and positive effects when compared to the group that did not receive the intervention.

3.3.2 Sampling procedures

As a part of the screening phase, participant recruitment began in January 2015 and was completed in March 2015. As Figure 3-3 shows, 202 chronic outpatients were screened for health assessment, given a physical fitness test, a stress test screening, lipid profile blood testing, and provided a consent form. A stratified random sample was used, and participants were randomly assigned to an age- and sex-matched pair running from the youngest to the oldest in the intervention and control groups. Fifty-eight participants did not meet the inclusion criteria. Of the 144 participants who were eligible for screening, 75 cases were excluded after recruitment due to health problems, other chronic conditions (n=35), screening criteria exclusion (n=26), and other reasons (n=14). In the end, 23 subjects were assigned to the control group and intervention group, respectively. Actually, 69 patients were enrolled as participants and then randomly allocated to the intervention group (n=34) or the control group (n=35), because the sample took into account a dropout rate of 30%, and the researcher added more participants to allow for other chronic problems and natural death due to old age.

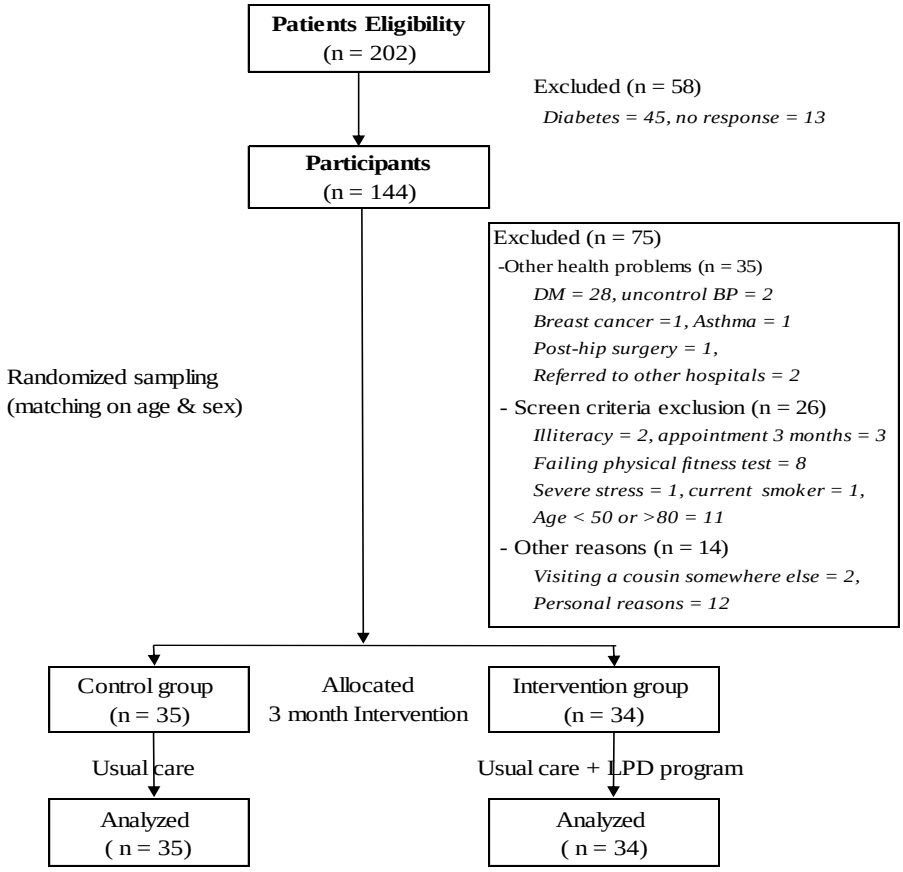


Figure 3- 3: Flowchart of the study design

3.4 The Data Collection Process

3.4.1 The screening phase

1) Invite patients to join a six-month-long LPD program.
2) Obtain human subjects' consent and personal medical history information.
3) For patients who met the inclusion criteria, the researcher and a sport clinician at the community hospital administered a physical fitness test (Department of Health, 2014; Saltzberg, Stroh, & Frishman, 1988), to ensure the patient was physically healthy enough to complete the full LPD program. This was given in conjunction with a stress test screening. A 30-minute-long questionnaire served as a pretest. All participants were randomly assigned into either the intervention group or the control group.

3.4.2 The intervention phase

1) At baseline, the third month after beginning the LPD program, all participants in both groups completed a 12-hour fasting period for a lipid profile blood test, anthropometric measurements, blood pressure, questionnaire, and logbook checklist.

2) The intervention group received a one-hour session of LPD program instruction, delivered between 8 and 9 AM on the second Tuesday of each month for three months. The control group received their usual care on the third and fourth Tuesdays of each month until completion of the program.

3) A home visit was completed each month, and all participants in the intervention group who received LPD program training were encouraged to use the LPD program at home, too.

3.4.3 The follow-up phase

1) Three months after beginning the LPD program, LPD leaflets were provided to all participants in the intervention group, in Months 4 and 5, to remind them to follow the activities in the program by themselves.

2) All participants in both groups received their usual care at the hypertension clinic.

3) Five representative participants in the intervention group were randomly selected by the criteria of blood pressure (which less than 140/90 or greater than 140/90 mmHg) for an in-depth interview about the LPD program.

4) Before closing the LPD program, at Month 6, all participants in both groups were again asked to complete a 12-hour fasting period before taking a serum lipid profile blood test, anthropometric measurements, blood pressure, questionnaire, and logbook checklist.

To sum up, the researcher served as the main coordinator of the LPD program and organized the program's process with the aid of the hospital's professional staff. The researcher took on the role of health educator, because of prior experience as a

nursing lecturer, and a multidisciplinary team made up of physicians, pharmacists, and public health staff oversaw the health education sessions. The first training featuring Jinkangkong exercises and was guided by the researcher with senior training team (Prempree, 2011; Traimontree Bumrung, 2014).

3.5 Instruments for Data Collection

3.5.1 Anthropometric instruments and serum lipid profile blood test

Anthropometric instruments for health assessment include medical equipment, standard scales (weighing scales with a height rod), a tape measure to assess waist circumference, and a digital blood pressure monitor (OMRON: Model HEM-7200). All equipment was calibrated before use for measurements throughout the entire program. The blood investigations for serum lipid profiling were organized under the laboratory center of the Lamlukka Community Hospital, in Pathum Thani Province.

Table 3-1: Anthropometric Measurement Values, Blood Pressure, and Serum Lipid Profile

Criteria	Normal value
Body mass index (BMI)	Calculated by weight in kilograms divided by the square of height in meters $BMI = \frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$ Underweight ≤ 18.5 Normal weight = 18.5-22.9 Overweight = 23.0 – 24.9 Pre-obese = 25.0-29.9 Obesity ≥ 30
Blood pressure (BP)	Using an automated blood pressure measurement device, blood pressure in this study should not exceed 160/100 mmHg with any treatment.

Category	SBP*		DBP**
Optimal	< 120	and	< 80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Mild hypertension (HT)	140-159	and/or	90-99
Moderate HT	160-179	and/or	100-109
Severe HT	≥ 180	and/or	≥ 110
Isolated systolic HT (ISH)	≥ 140	and	< 90

Criteria	Normal value
Serum Lipid Profile	Standard values of serum lipid profile: Cholesterol ≤ 200 mg/dL Triglyceride ≤ 150 mg/dL LDL ≤ 100 mg/dL. HDL (all) ≥ 40 mg/dL, Men ≥ 40 mg/dL Women ≥ 50 mg/dL Blood test was determined and organized by the community hospital's laboratory center.
Waist circumferences (WC)	The optimal waist circumferences for adults should not exceed 90 cm (36 inches) for men, or 80 cm (32 inches) for women

Source: Seven report of the Joint National Committee Prevention, Detection, Evaluation, and Treatment of high Blood Pressure (Chobanian et al., 2003); Guidelines in the Treatment of Hypertension 2015 (Thai Hypertension Society, 2015); Bureau of strategy and Policy, Ministry of Public Health, Thailand

3.5.2 Questionnaire

Based on the concept of self-efficacy theory, the study uses a questionnaire developed from the Thailand Healthy Lifestyle Strategy Plan 2011-2020 (National Economic and Social Development Board & Mahidol University, 2012). Food-based dietary guidelines for Thai was used (Sirichakwal & Sranacharoenpong, 2008). The questionnaire was used three times: 1) upon entering the study, 2) after three months in the LPD program, and 3) at the end of the study in the sixth month (see appendix C, D).

The questionnaire was divided into five parts:

1) General demographic characteristics: age, gender, marital status, education, and occupation. This part was asked only at baseline survey.

2) Knowledge about hypertension, consisting of: (a) diseases and their complications and (b) hypertension self-care. The internal consistency for this part was 0.70. The full score of knowledge was 10 points.

3) Attitude towards hypertension, consisting of ten items to assess negative and positive attitude. The Cronbach's alpha coefficient for this part was 0.75. The full score of attitude was 30 points.

4) Practice regarding hypertension, consisting of (a) healthy dietary intake, (b) unhealthy dietary intake, (c) physical activity and exercise, and (d) relaxing activities. A logbook checklist was also used to monitor participants in the LPD program

intervention each month, and at baseline, Month 3, and Month 6. The full score of practice was 60 points

Healthcare staff and the researchers made note of each patient's history of hypertension and treatment, anthropometric measurements, medical records for other chronic illnesses, health risk conditions, and pharmacological treatments.

3.5.3 The LPD program

Two sessions of the LPD program ran for six months each and involved the strategies and activities described below.

I. The intervention phase of a three-month-long LPD program included:

1) A 10-minute group health education session to improve knowledge about hypertension
2) A 10-minute discussion of dietary self-control using a logbook checklist of 20 items consisting of dietary intake, physical activity and exercise, and relaxing activities to encourage each participant.
3) A 40-minute group exercise training session composed of a laughter-based warm up, main exercise featuring a three-posture Jinkangkong exercise, and breathing exercises for cool down.
4) A monthly home visit

II. The follow-up phase of the three-month LPD program included:

1) LPD leaflets were distributed to all participants in the intervention group at Months 4 and 5 to remind them about the program.

Table 3- 2: LPD program at the intervention and follow-up phase

Month	Group education (10min)	Group Exercise(40 min)	Individual self-control (10 min)
The intervention phase of a 3-month-long LPD program			
I	1. Introduction to the program 2. Blood pressure reading	1. Introduction to physical activity 2. Exercise practice - Laughter - Jinkangkong - Deep breathing	Logbook
	*At home-individual visit I: to remind participants to follow the program		
II	1. Eating plan: High fiber, low fat, low salt, low sodium 2. Exercise: getting 150 mins. per week 3. Stress assessment	Repeated exercises from Month 1	Logbook
	**At home-individual visit II: to foster participants' following the program		
III	Complications due to high BP (stroke, heart disease, kidney disease)	Repeated exercises from Month 1	Logbook
The Follow-up phase of a 3-month-long LPD program			
IV-V	Usual care		LPD Leaflets
VI	Usual care		Logbook

*, ** Twenty minutes of home visits in the LPD program consisted of dietary checklists and exercise.

3.5.4 In-depth interview

The in-depth interviews evaluated the effectiveness of the LPD program at the sixth months of this study to confirm the strengths and weaknesses of the LPD program (see Appendix E). The questions asked in the interviews are listed below.

1. Which activities in the LPD program do you prefer and why?
2. How can you adhere to the LPD program (such as checking your blood pressure, eating healthy foods, coping with stressful conditions, etc.)?
3. What is your opinion of the LPD program logbook?
4. What do you think about the LPD program and its effect on your health?

3.6 Validity and Reliability

3.6.1 Content validity of the research instrument

Validity is an important criterion for evaluating methods of measuring variables. Validity refers to the soundness of the study's evidence, that is, whether the findings are unbiased, cogent, and well grounded. Validity also concerns the quality of the researcher's evidence regarding the effect of the independent variable on the dependent variable (Polit & Beck, 2008). Three experts from Chulalongkorn University evaluated the questionnaire's content validity. The questionnaire was marked or crossed for every item, and the in-depth interview form was checked to determine whether it was capable of measuring what it was supposed to address. Three experts' opinions yielded an Items-Objective Congruence Index–(IOC) was 0.73.

3.6.2 Reliability of the measuring instruments

Thirty elderly people with hypertension completed the questionnaire at the Ladlumkaeo Community Hospital in September 2014. These volunteers had characteristics similar to the participants in the intervention group. We used the Kuder-Richardson test (KR-20) to check the internal consistency of their knowledge about hypertension and found it to be 0.70. A Cronbach's alpha coefficient regarding participants' attitude indicated an acceptable score, 0.75 (see Appendix B).

3.7 Data Analysis

This study used the Statistical Package for the Social Sciences (version 16.0; SPSS, Inc., Chicago, IL) for the analysis of all data. Before selecting the most appropriate statistical tests, the chi-square and t-test were used to compare the distribution of variables (blood pressure, serum lipid profile, knowledge, attitude, and practice) between the intervention and the control groups.

Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to describe the participants' general characteristics, such as gender, marital status, education, and occupation.

Chi-square and independent t-tests were used to compare the differences in participants' general characteristics between the intervention and control groups.

A repeated-measure ANOVA was performed to evaluate the effects of the intervention when data did not violate the parametric assumptions. We compared blood pressure (SBP/DBP), serum lipid profile, knowledge, attitude, and practice between the intervention and the control groups at baseline, after intervention at Month 3, and as a follow-up at Month 6. We also used the Bonferroni correction to compare the differences between the two groups over time. The mean differences between the intervention and control groups were calculated with 95% confidence intervals. Analyses were adjusted for possible confounders, and the effect of modification was investigated using interaction terms between intervention groups and time. All confirmatory statistical tests had p values of less than 0.05.

For the in-depth interviews, a form of a triangulation approach was used to understand people's behaviors with various interpretations from different disciplines bringing a variety of perspectives to the analysis (Shih, 1998). We believe that the use of triangulation during the follow-up period confirmed the strengths and weaknesses of the LPD program.

3.8 Ethical considerations

The Ethical Review Committee for Research Involving Human Research Subjects and the Health Sciences Group from Chulalongkorn University (COA No. 178/2557) reviewed this study. The medical records for each patient were accessed with the agreement of the Director of the Buengkhamphroi Health Promoting Hospital, and participants completed consent forms before the program began. Furthermore, all participants received information about the research program, and the consent form specified that participants could withdraw at any time with no effect on their receipt of healthcare services from the hospital. The confidentiality of the patients and healthcare personnel was respected.

Based on the successful nature of this program in the intervention group, participants in the control group received the LPD program after the project was completed.

CHAPTER IV
RESULTS

This study was a randomized control trial which aimed to determine the effectiveness of an integrated laughter, mild physical activity, and dietary self-control program (LPD program) to control blood pressure and serum lipid profile and to improve knowledge, attitude, and practice among hypertensive patients of Buengkhamphroi Health Promoting Hospital, Lamlukka District, Pathum Thani Province, Thailand. The intervention group received both usual care and a six-month LPD program (laughter plus Jinkangkong exercise and dietary self-control with a logbook checklist), while the control group received only usual care or the standard services of the hypertension clinic at Buengkhamphroi Health Promoting Hospital. In this chapter, the study findings are presented as follows:

4.1 Baseline characteristics

4.1.1 Characteristic of the participants

Table 4-1 describes baseline characteristics of the intervention group. There were 34 participants, most of whom (73.5%) were female, and their mean age was 66.2±6.1 years old. More than half of them (58.8%) were married, 70.6% completed elementary education, and 85.2% were unemployed or retired or were housewives. Also, they were non-smokers (68.6 %) and did not drink alcohol (70.6 %). Their average body mass index (BMI) and waist circumferences (WC) were optimal to slightly higher than the normal range (BMI was 25.0±3.2 kg/m^2; WC was 92.4±8.8 cm for males and 85.2±9.3 cm for females, respectively). The mean duration of being diagnosed with hypertension was 9.4±3.7 years and the mean duration of taking medication was 8.8±3.2 years. Likewise, the 35 participants in the control group had similar characteristics at baseline. As such, it could be concluded that the participants in the intervention and control groups had similar characteristics at baseline.

Table 4-1: Baseline characteristics of the intervention and the control groups

Variables	Intervention (n = 34)		Control (n = 35)		p-value
	n	(%)	n	(%)	
Sex: female	25	(73.5)	25	(74.4)	0.85[(a)]
Marital status: married	20	(58.8)	25	(71.4)	0.45[(a)]
Education: elementary school	24	(70.6)	28	(80.0)	0.48[(a)]
Occupation:					
Housewives/unemployed/retired	30	(88.2)	24	(68.6)	0.12[(a)]
Non-smokers	24	(68.6)	26	(76.5)	0.75[(a)]
Non-alcohol drinkers	24	(70.6)	27	(77.1)	0.11[(a)]
Family history of HT: unknown	20	(58.8)	22	(62.9)	0.93[(a)]
Age (mean ± SD)	66.2	(6.1)	66.8	(6.8)	0.69[(b)]
Body Mass Index: BMI (kg/m^2) (mean ± SD)	25.0	(3.2)	24.5	(3.4)	0.52[(b)]
Waist circumferences: WC (cm)					
Men (mean ± SD)	92.4	(8.8)	88.1	(5.8)	0.22[(b)]
Women (mean ± SD)	85.2	(9.3)	86.0	(7.4)	0.74[(b)]
Duration of hypertension (years) (mean ± SD)	9.4	(3.7)	8.7	(3.2)	0.40[(b)]
Duration of taking medication (years) (mean ± SD)	8.8	(3.2)	8.3	(3.0)	0.46[(b)]

Significant at p-value < 0.05, (a) Chi-square, (b) = t-test

4.1.2 Clinical parameters at baseline survey

Table 4-2 describes the clinical parameters at the baseline survey, among 69 participants (34 participants in the intervention group and 35 participants in the control group). Their average systolic and diastolic BPs were 136.1±13.4 and 76.6±11.2 mmHg, and the average TC, TG, and LDL, were 211.6±31.8, 144.5±66.9, and 136.2±26.2 mg/dl, respectively. The average HDL for both sexes was 47.0±6.8 mg/dl. Also, the average HDL of male participants was 45.3±6.7 mg/dl, and that of female participants was 47.6±6.9 mg/dl, respectively. The average blood pressure and all values of serum lipid profile in the control group were not statistically significantly different.

Table 4- 2: The clinical parameters of the intervention and the control groups at baseline survey

Measures	Intervention (n = 34)		Control (n = 35)		Δ^1	95% CI		p-value
	Mean	(SD)	Mean	(SD)		Lower	Upper	
SBP	136.1	(13.4)	139.6	(9.6)	-3.5	-9.1	2.1	0.22
DBP	76.6	(11.2)	80.8	(9.2)	-4.2	-9.2	0.7	0.09
CHOL	211.6	(31.8)	208.6	(35.6)	2.9	-13.3	19.3	0.72
TG	144.5	(66.9)	145.5	(52.5)	1.0	-29.8	27.8	0.94
LDL	136.2	(26.2)	134.6	(30.1)	-1.6	-12.1	15.1	0.82
HDL	47.0	(6.8)	46.7	(8.6)	-0.3	-3.4	4.0	0.87
Males(n 19)	45.3	(6.7)	50.7	(8.5)	-5.4	-12.8	2.1	0.53
Females(n 50)	47.6	(6.9)	45.0	(8.2)	2.5	-1.8	6.8	0.75

Δ^1 = mean differences, significant at p-value < 0.05, using t- test
SBP = systolic blood pressure, DBP = Diastolic blood pressure (mmHg)
CHOL = cholesterol, TG = triglyceride, LDL = low density lipoprotein (mg/dL)

4.1.3 Knowledge, attitude, and practice regarding hypertension at baseline survey

Table 4-3 describes knowledge, attitude, and practice regarding hypertension. There were no statistically significant differences among the overall scores of knowledge, attitude, and practice regarding hypertension between the intervention and the control group (p = 0.07, p = 0.45, and p = 0.37).

Table 4-3: Knowledge, attitude, practice regarding hypertension at baseline survey

Variables	Intervention (n = 34)		Control (n = 35)		p-value
	mean	(SD)	mean	(SD)	
Knowledge score (overall)	7.9	(1.1)	7.3	(1.5)	0.07
(1) Disease and its complications	3.8	(0.9)	3.5	(1.0)	0.22
(2) Hypertension self-care	4.1	(1.0)	3.9	(0.9)	0.47
Attitude score (overall)	27.7	(1.5)	27.4	(1.8)	0.45
Practice score (overall)	23.0	(3.0)	22.6	(2.3)	0.37
(1) Healthy dietary intake	6.0	(1.3)	6.1	(1.2)	0.64
(2) Unhealthy dietary intake	6.2	(2.2)	6.1	(1.7)	0.79
(3) Physical activity & exercises	2.6	(1.0)	2.3	(1.1)	0.40
(4) Relaxing activities	8.2	(1.0)	8.1	(0.9)	0.43

Variables	Intervention (n = 34) mean (SD)	Control (n = 35) mean (SD)	p-value

P-value < 0.05. Using t-test

4.2 Comparison of clinical parameters, knowledge, attitude, and practice between the intervention and the control groups

4.2.1. Comparison of blood pressure between the intervention and the control groups

4.2.1.1 Systolic blood pressure

There was a statistically significant difference in systolic blood pressure (SBP) between the intervention group and the control group at the six-month follow-up as shown in Figure 4-1 (p = 0.047).

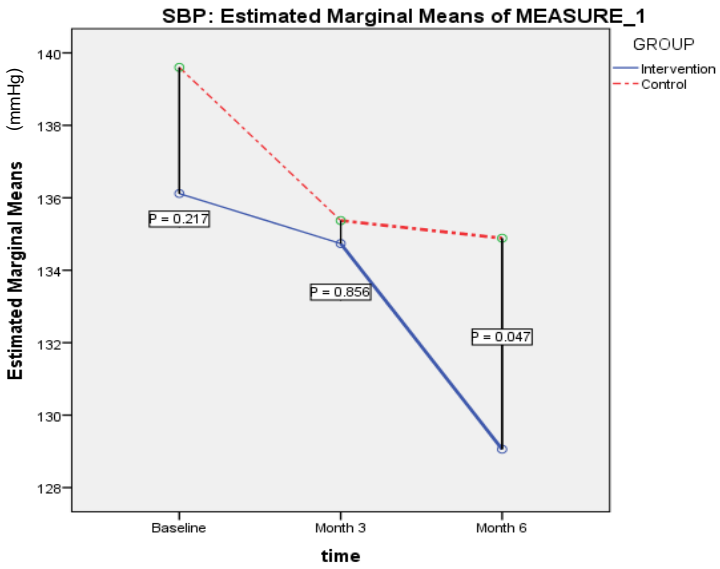


Figure 4-1: Comparison of SBP between the intervention and the control groups

4.2.1.2 Diastolic blood pressure

Figure 4-2 shows that there was a statistically significant difference in diastolic blood pressure (DBP) between the participants in the intervention group and the control group at the six-month follow-up (p = 0.036).

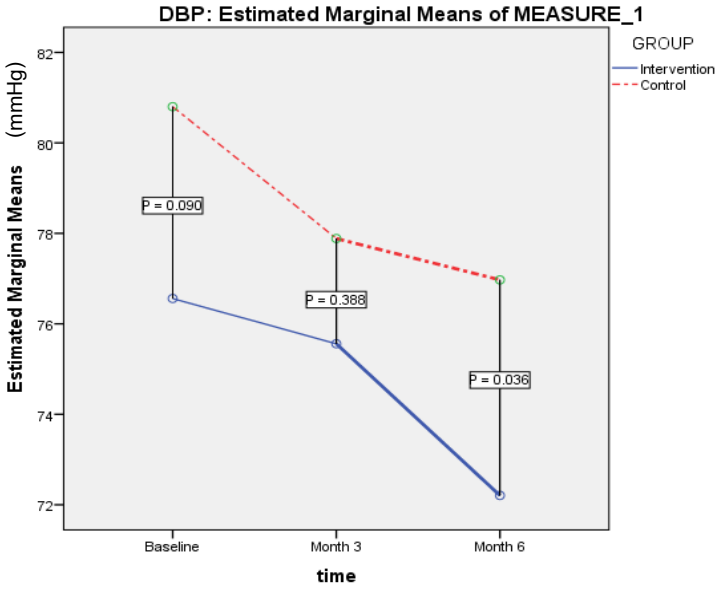


Figure 4-2: Comparison of DBP between the intervention and the control groups.

4.2.2 Comparison of serum lipid profile between the intervention and the control groups

4.2.2.1 Total cholesterol (TC)

As shown in Figure 4-3, there was statistically significant difference in total cholesterol (TC) between the intervention and the control groups at the six-month follow-up (p = 0.015).

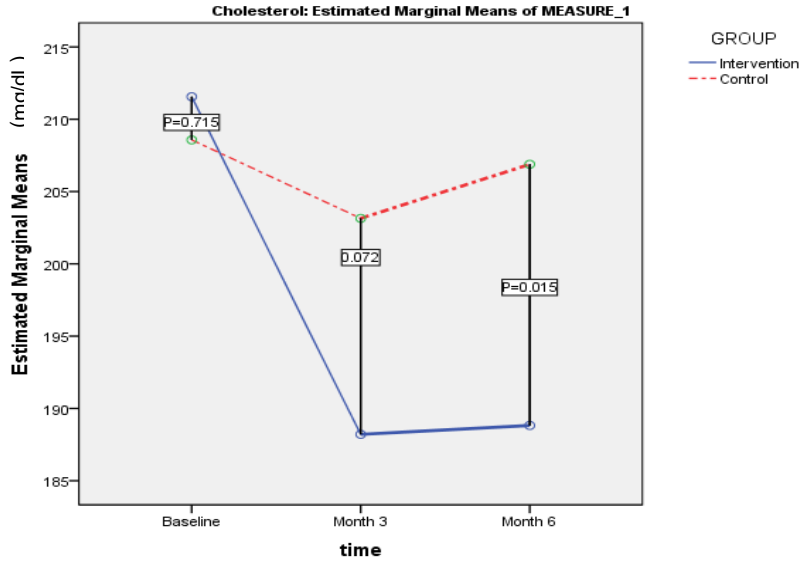


Figure 4-3: Comparison of TC between the intervention and the control groups

4.2.2.2 Triglyceride (TG)

According to Figure 4-4, there was no statistically significant difference in triglyceride (TG) between the intervention and the control groups at baseline, at the end of the three-month program, and six-month follow-up ($p > 0.05$).

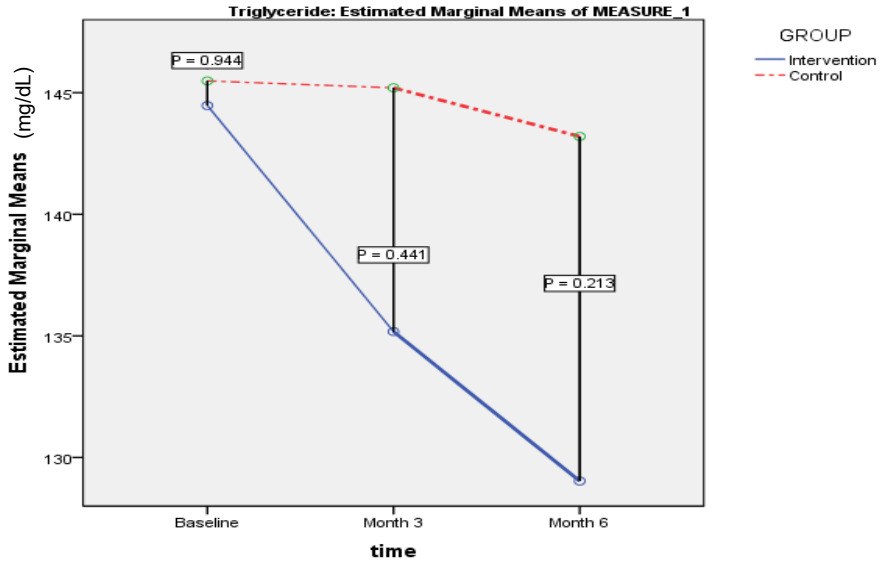


Figure 4-4: Comparison of TG between the intervention and the control groups

4.2.2.3 Low Density Lipoprotein (LDL)

Figure 4-5 shows that there was a statistically significant difference in LDL between the intervention and the control groups at the six-month follow-up ($p = 0.005$).

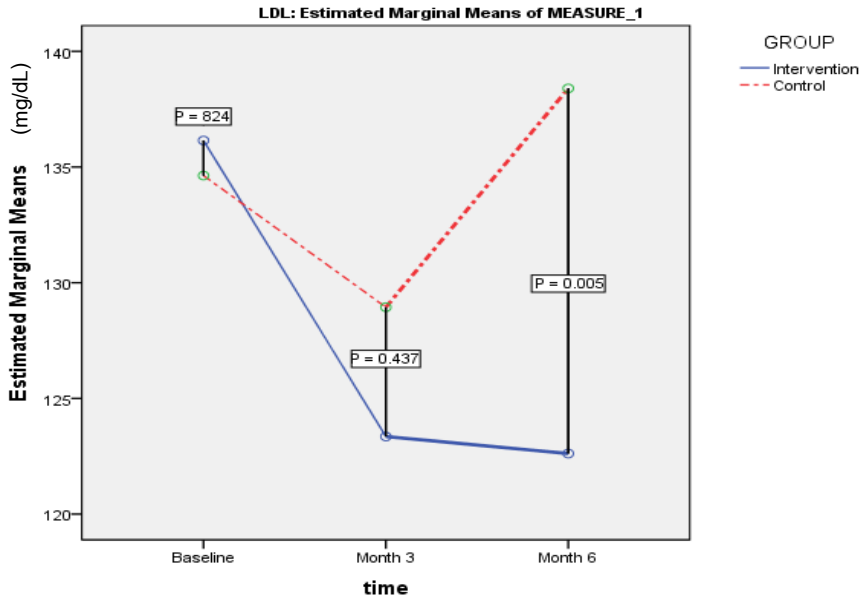


Figure 4-5: Comparison of LDL between the intervention and the control groups

4.2.2.4 High Density Lipoprotein (HDL)

As illustrated in Figure 4-6, there was a statistically significant difference in HDL between the intervention and the control groups at the six-month follow-up (p = 0.001).

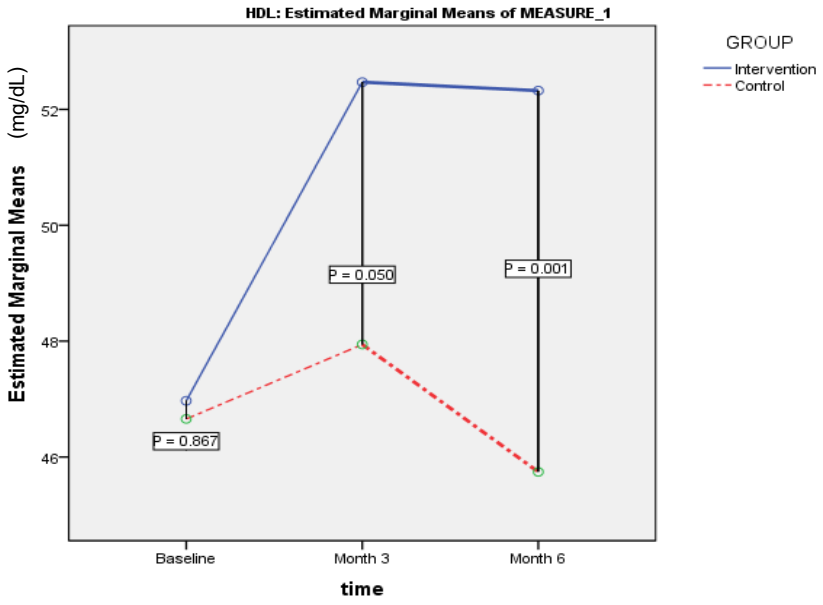


Figure 4-6: Comparison of HDL between the intervention and the control groups

4.2.3 Comparison of knowledge, attitude, and practice regarding hypertension between the intervention and the control groups

4.2.3.1 Knowledge about hypertension

Figure 4-7 depicts a statistically significant difference in knowledge about hypertension between the intervention group and the control group at the end of the three-month program and the six-month follow-up ($p < 0.001$ and $P < 0.001$, respectively).

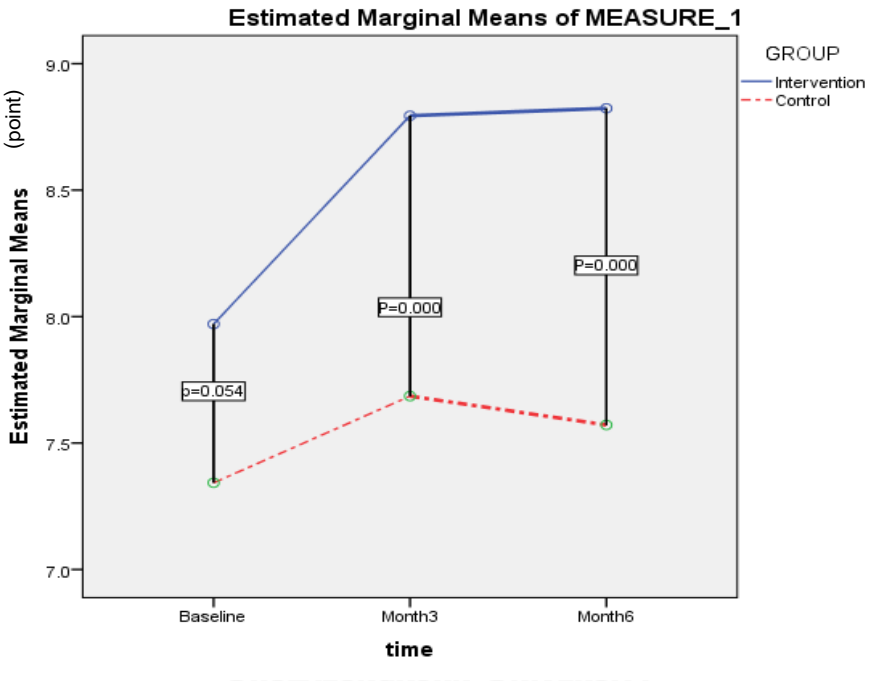


Figure 4-7: Comparison of knowledge about hypertension between the intervention and the control groups

4.2.3.2 Attitude towards hypertension

Changes overtime in attitude towards hypertension of the intervention group and the control group at baseline, the three-month LPD program, and the six-month follow-up are reported below.

In Figure 4-8, it could be seen that there were statistically significant differences between the intervention group and the control group when it came to attitude towards hypertension at the end of the three-month program and the six-month follow-up ($p = 0.013$ and $p = 0.008$, respectively).

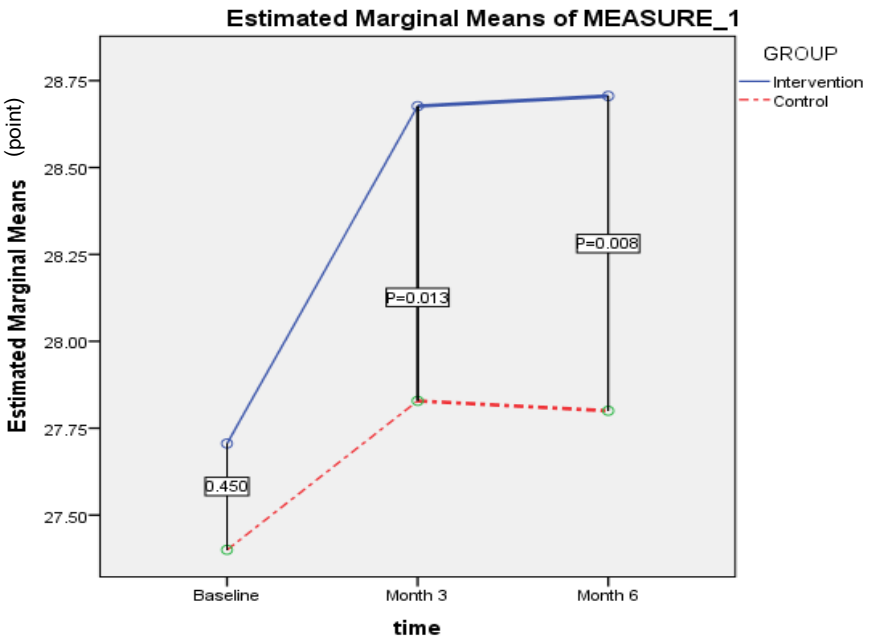


Figure 4-8: Comparison of attitude towards hypertension between the intervention and the control groups

4.2.3.3. Practice regarding hypertension

As depicted in Figure 4-9, there was a statistically significant difference in practice regarding hypertension between the intervention group and the control group at the six-month follow-up (p = 0.017).

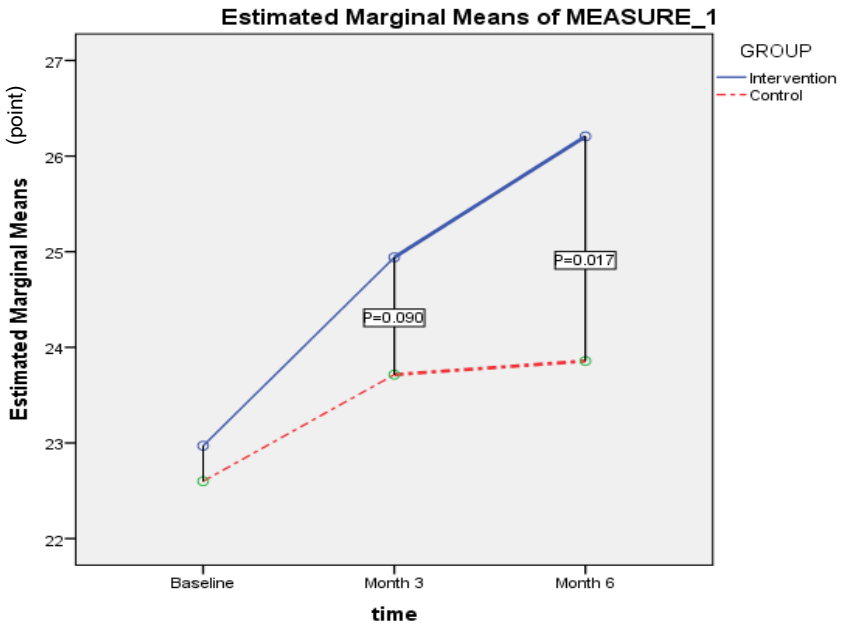


Figure 4-9: Comparison of practice regarding hypertension between the intervention and the control groups

4.3 Comparison of clinical parameters within groups before and after implementation of the LPD program at baseline, at the end of the three-month LPD program, and at the six-month follow-up

4.3.1 Comparison on blood pressure before and after implementation of the LPD program

4.3.1.1 Systolic blood pressure

There were statistically significant differences in systolic blood pressure (SBP) between baseline and the six-month follow-up (p=0.004), and between the end of the three-month program and the six-month follow-up (p= 0.029) in the intervention group. In contrast, there were no such statistically significant differences in systolic blood pressure of the control group measured at different times (Table 4-4).

Table 4-4: Pairwise of the different measurements of systolic blood pressure in the intervention and the control groups at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	1.4	-4.6	7.3	1.000
	Baseline	6 Months	7.0*	1.8	12.2	0.004
	3 Months	6 Months	5.7*	0.4	10.9	0.029
Control (n =35)	Baseline	3 Months	4.2	-1.6	10.1	0.252
	Baseline	6 Months	4.6	-0.4	9.7	0.088
	3 Months	6 Months	0.4	-4.7	5.5	1.000

Based on estimated marginal means. *. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparisons: Bonferroni.

4.3.1.2 Diastolic blood pressure

There were no statistically significant differences in diastolic blood pressure in the intervention group at baseline, at the end of the three-month program, and at the six-month follow-up as presented in Table 4-5. Also, there were no statistically significant differences in diastolic blood pressure of the participants in the control group measured at different times.

Table 4-5: Pairwise comparisons of the different measurements of diastolic blood pressure in the intervention and the control groups at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	1.0	-4.1	6.1	1.000
	Baseline	6 Months	4.3	-0.6	9.3	0.104
	3 Months	6 Months	3.3	-1.3	8.0	0.260
Control (n = 35)	Baseline	3 Months	2.9	-2.1	7.9	0.490
	Baseline	6 Months	4.1	-0.7	8.9	0.132
	3 Months	6 Months	1.2	-3.4	5.8	1.000

Based on estimated marginal means.
*. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

4.3.2 Comparison on serum lipid profile before and after implementation of the LPD program

4.3.2.1 Total cholesterol (TC)

According to Table 4-7, there were statistically significant differences in total cholesterol in the intervention group between baseline and at the end of the three-month program and between baseline and at the six-month follow-up (p = 0.021 and p = 0.014, respectively). However, there were no such statistically significant differences in total cholesterol of the participants in the control group.

Table 4-6: Pairwise comparisons of the different measurements of Total cholesterol in the intervention and the control groups at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	23.3*	2.7	43.9	0.021
	Baseline	6 Months	22.7*	3.7	41.7	0.014
	3 Months	6 Months	-0.6	-17.6	16.3	1.000
Control (n = 35)	Baseline	3 Months	5.4	-14.8	25.7	1.000
	Baseline	6 Months	1.7	-17.0	20.4	1.000
	3 Months	6 Months	-3.7	-20.5	13.0	1.000

Based on estimated marginal means.
*. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

4.3.2.2 Triglyceride

Table 4-7 indicates that there were no statistically significant differences triglyceride (TG) in the intervention group at baseline, at the end of the three-month program, and at the six-month follow-up (P > 0.05). Also, there were no statistically significant differences in triglyceride (TG) of the control group measured at different times.

Table 4-7 Pairwise comparisons of the different measurements of triglyceride in the intervention and the control groups at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[a]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	9.3	-23.2	41.8	1.000
	Baseline	6 Months	15.4	-11.8	42.7	0.509
	3 Months	6 Months	6.1	-20.5	32.8	1.000
Control (n = 35)	Baseline	3 Months	0.3	-31.8	32.3	1.000
	Baseline	6 Months	2.3	-24.6	29.2	1.000
	3 Months	6 Months	2.0	-24.2	28.2	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni

4.3.2.3 LDL

As illustrated in Table 4-8, there were no statistically significant differences in LDL of the intervention group and the control group measured at different times ($p > 0.05$).

Table 4-8: Pairwise comparisons of the different measurements of LDL of the intervention group and the control group at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[a]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	12.8	-5.6	31.2	0.278
	Baseline	6 Months	13.5	-1.9	29.0	0.106
	3 Months	6 Months	0.7	-13.1	14.6	1.000
Control (n = 35)	Baseline	3 Months	5.7	-12.5	23.8	1.000
	Baseline	6 Months	-3.8	-19.0	11.4	1.000
	3 Months	6 Months	-9.4	-23.1	4.2	0.284

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni

4.3.2.4 HDL

As shown in Table 4-9, there were statistically significant differences in HDL of the intervention group between baseline and at the end of the three-month program and between baseline and at the six-month follow-up ($p = 0.026$, $p = 0.023$).

However, there were no statistically significant differences in HDL of the control group measured at different times ($p > 0.05$).

Table 4-9: Pairwise comparisons of the different measurements of HDL of the intervention group and the control group at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	-5.5*	-10.5	-0.5	0.026
	Baseline	3 Months	-5.3*	-10.1	-0.6	0.023
	3 Months	6 Months	0.1	-4.7	5.0	1.000
Control (n = 35)	Baseline	3 Months	-1.3	-6.2	3.6	1.000
	Baseline	6 Months	0.9	-3.8	5.6	1.000
	3 Months	6 Months	2.2	-2.5	6.9	0.780

Based on estimated marginal means.
*. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

4.3.3 Comparison of knowledge, attitude, and practice regarding hypertension before and after implementation of the LPD program

4.3.3.1 Knowledge about hypertension

As shown in Table 4-11, there were statistically significant differences in knowledge about hypertension of the intervention group between baseline and at the end of the three-month program and between baseline and at the six-month follow-up ($p = 0.004$ and $p = 0.003$, respectively). However, there were no such statistically significant differences in knowledge about hypertension of the control group measured at different times ($p > 0.05$).

Table 4-10: Pairwise comparisons of the different measurements of knowledge about hypertension of the intervention and the control groups at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	-0.8*	-1.4	-0.2	0.004
	Baseline	6 Months	-0.8*	-1.5	-0.2	0.003
	3 Months	6 Months	-0.1	-0.5	0.5	1.000
Control (n = 35)	Baseline	6 Months	-0.3	-0.9	0.2	0.472
	Baseline	6 Months	-0.2	-0.8	0.4	1.000
	3 Months	6 Months	0.1	-0.4	0.6	1.000

Based on estimated marginal means.
*. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

4.3.3.2 Attitude towards hypertension

Table 4-12 reveals that there were statistically significant differences in attitude towards hypertension of the intervention group between baseline and at the end of the three-month (p = 0.009) and between baseline and at the six-month follow-up (P < 0.004). However, there were no such statistically significant differences in attitude towards hypertension of the control group measured at different times (p > 0.05).

Table 4-11: Pairwise comparisons of the different measurements of attitude towards hypertension in the time of measurements of the intervention group and the control group

GROUP	Time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	-0.9*	-1.7	-0.2	0.009
	Baseline	6 Months	-1.0*	-1.7	-0.3	0.004
	3 Months	6 Months	-0.1	-0.7	0.6	1.000
Control (n = 35)	Baseline	3 Months	-0.4	-1.2	0.3	0.509
	Baseline	6 Months	-0.4	-1.1	0.3	0.521
	3 Months	6 Months	0.1	-0.6	0.7	1.000

Based on estimated marginal means. *. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

4.3.3.3 Practice regarding hypertension

In Table 4-13, there were statistically significant differences in practice regarding hypertension of the intervention group between baseline and at the end of the three-month program, and between baseline and at the six-month follow-up ($P < 0.001$ and $p < 0.001$, respectively). On the other hand, there were no statistically significant differences in practice regarding hypertension of the control group measured at different times.

Table 4-12: Pairwise comparisons of the different measurements of practice regarding hypertension of the intervention group and the control group at different times of measurement

GROUP	time (I)	time (J)	Mean Difference (I-J)	95% Confidence Interval[b]		p-value
				Lower	Upper	
Intervention (n = 34)	Baseline	3 Months	-2.0*	-3.1	-0.8	0.000
	Baseline	6 Months	-3.2*	-4.7	-1.7	0.000
	3 Months	6 Months	-1.3	-2.9	0.4	0.209
Control (n = 35)	Baseline	3 Months	-1.1	-2.2	0.0	0.054
	Baseline	6 Months	-1.2	-2.7	0.2	0.116
	3 Months	6 Months	-0.1	-1.8	1.5	1.000

Based on estimated marginal means.
*. The mean difference is significant at the 0.05 level.
b. Adjustment for multiple comparison: Bonferroni

To sum up as shown in Table 4-13, when considering the effectiveness of the LPD program, it could be seen that there were statistically significant differences in clinical parameters (SBP, DBP, TC, LDL, and HDL) and KAP (knowledge, attitude, and practice regarding hypertension) between the intervention and the control groups. Furthermore, hypertensive patients in the intervention group showed significant improvement in their SBP, serum lipid profile (TC, and HDL), and KAP (knowledge, attitude, and practice regarding hypertension) after receiving the LPD program.

Table 4-13: Summary of findings regarding clinical parameters, knowledge, attitude, and practice regarding hypertension resulting from the LPD program

Groups / time / Variables	The intervention and the control group			The intervention group*		
	B	3	6	B: 3	B : 6	3:6
SBP	x	x	√	x	√	√
DBP	x	x	√	x	x	x
TC	x	x	√	√	√	x
TG	x	x	x	x	x	x
LDL	x	x	√	x	x	x
HDL	x	x	√	√	√	x
Knowledge	x	√	√	√	√	x
Attitude	x	√	√	√	√	x
Practice	x	x	√	√	√	x

* There were no statistically significant differences in the control group
B = baseline, 3 = the three-month LPD program, 6 = the six-month follow-up
√ =There were statistically significant differences ($p < 0.05$)
x = There were no statistically significant differences ($p > 0.05$)

4.4 In-depth interviews regarding sustainability of the LPD program at the follow-up period

To ensure the success of the LPD program intervention, the program booster was carried out at the hypertension clinic in the fourth month with distribution of a leaflet (see Appendix A) to remind the participants in the intervention group of the necessity to continuously adhere to the LPD program. Five representative participants in the intervention group were randomly selected by the criteria of blood pressure (which was less than 140/90 or greater than 140/90 mmHg) for an in-depth interview about the LPD program.

4.4.1 The characteristics of the interview participants

The characteristics of the interview participants were as follows: the three female participants were 65, 68, and 75 years old, while the two male participants were 67 and 74 years old. Most of them were married or widowed, were retired, and were non-smokers. As for alcohol consumption, the three females were non-alcohol

drinkers, whereas the two males were occasional drinkers with no greater than two drinks at a time. All of the participants visited the hypertension clinic at Buengkhamphroi Health Promoting Hospital on a monthly basis, and they were taking at least one antihypertensive drug. Before the interview session started, routine hypertensive measurement was administered. It was found that their mean systolic blood pressure was 129.4±16.0 mmHg and their mean diastolic blood pressure was 71.6±12.1 mmHg. Furthermore, their mean body mass index was 23.5±1.7 kg/m^2, their mean waist circumference was 89.5±7.8 cm in male participants and 83.3±3.1 cm in female participants. With regard to the four values of serum lipid profile, the mean TC levels, TG, and LDL were 185.0±31.1, 97.6±28.4, and 122.8±13.6 mg/dl, respectively. As regards their HDL, the mean HDL±SD was 50.0±7.1 mg/dl in male participants and 58.7±7.5 mg/dl in female participants.

4.4.2 Evaluation of the LPD program at the follow-up period

Before closing the LPD program, the interviews were conducted by the researcher, and each interview session for each participant lasted approximately 20-30 minutes to ensure elicitation of deeper understanding of LPD program activities, use of the logbook checklist for dietary self-control, and sustainability of the LPD program. Of four questions contained in the interview guideline were used to elicit data from the participants individually. Most of participants paid attention to the recommended activities only at the clinic where there were healthcare staff to assist them and indicated that the LPD program was useful to remind them of activity engagement. A part of physical activity and exercise, dietary self-control with the logbook, and home visit with leaflets were reflected as followed:

1) Physical activity and exercise

Most of the interviewees agreed that both laughter and Jinkangkong exercise were useful for their health. However, they stated that they had not paid attention to do well.

2) Dietary self-control with the logbook

Most of the interviewees indicated that using the logbook for dietary self-control was difficult for them because they tended to forget what they had eaten in the

past three days. However, two of the interviewees agreed that the logbook helped remind them to be concern with eating well.

3) Home visit and leaflets

All interviewees concluded that home visits were useful as they reminded them of activity engagement because patients were more likely to accept home visit as well as a good relationship with healthcare staff. However, they did not read leaflets without healthcare staff to remind them because it was better that patients and healthcare staff talked directly each other.

4.4.3 Sustainability of the LPD program

According to the interviews, the participants adhere to the LPD program at the six-month follow-up if there were healthcare staff to assist them as home visit. Using logbook for dietary self-control helped remind them to be concern with eating well. However, it seemed difficult to remember what they had eaten even a few days also a number of the participants discontinued their participation in the program due to various individual reasons.

CHAPTER V

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This study was a randomized, controlled trial that aimed to determine the effectiveness of an integrated laughter, mild physical activity, and dietary self-control (LPD) program to control blood pressure and improve serum lipid profile, knowledge, attitude, and practice among hypertensive patients of a primary care-based clinic in Thailand's Pathum Thani Province. The intervention group received both standard care and the LPD program, which comprised the dissemination of education, exercise, dietary self-control, motivation via home visits and leaflets, while the control group received only their standard care. Before the close of the study, five participants in the intervention group were interviewed to assess the LPD program's sustainability.

5.1 Summary of Research Findings

The study results showed participants in both groups had similar characteristics at baseline. Most were female, and their mean age was over 66. They were married, had completed elementary education, were unemployed or retired, or were housewives. Participants' average body mass index (BMI) and waist circumferences (WC) were optimal to slightly higher than the normal range for both sexes and in both groups. The average length of prescribed antihypertensive medication was nearly ten years. In conclusion, there were no statistically significant differences between the groups' baseline characteristics, clinical parameters (blood pressure and serum lipid profile), knowledge, attitude, or practice regarding hypertension.

5.2 Discussion

5.2.1 The Effect of LPD Program on Clinical Parameters

5.2.2.1 Blood pressure

The results of the study revealed a significant improvement in both systolic and diastolic blood pressure ($p < 0.05$) in the intervention group, compared to the control

group at the sixth-month follow-up period. These findings are consistent with studies that use a clinic's nurses and telephone follow-ups for blood pressure control and the adherence to healthy lifestyles (Bosworth et al., 2008; Chiu & Wong, 2010)(Bosworth et al., 2008; Chiu & Wong, 2010). Likewise, the Exercise and Nutrition interventions for Cardiovascular health (ENCORE) study confirmed that blood pressure can be reduced with the Dietary Approaches to Stop Hypertension (DASH) diet and/or exercise and weight loss, which help to control blood pressure (Blumenthal et al., 2010). This assumption is supported by a systemic review of randomized controlled trials of lifestyle interventions that found that, in order to address raised blood pressure, strict dietary control, limited salt intake, and restricted alcohol intake are required, in addition to increased levels of physical activity (Dickinson et al., 2006).

Examining between the intervention and the control groups after a three-month-long LPD program revealed no significant improvement in systolic and diastolic blood pressure ($p = 0.856$). Such findings were probably due to the fact that the participants in the intervention group might not have had the intention of adhering to the LPD program on their own. "I enjoy traveling to other places frequently, so I do not have time to follow your program," said one. Another participant commented, "I seldom do the LPD program because I believe that my health (blood pressure) is maintained for now." Their views are confirmed by their unchanged behaviors, individual reasons for not acting, and the related social environment (Hu, Li, & Arao, 2015). It is worth noting that, unfortunately, social environmental factors emerged during the intervention period. For example, during the summer, the participants may have enjoyed eating the sweet seasonal fruits that are abundant in Thailand, including mangoes, durians, and rambutans, all of which have a high sugar content. Many people prefer to eat sweet fruits because they come from their own gardens. In addition, during the month of April, the Thai people celebrate the Thai New Year, or Songkran (Water) Festival. As a result, the study participants may have enjoyed spending time with their family members, celebrating the festival and eating high-calorie foods, drinking beverages with high sugar content, and consuming alcohol. This possibility was supported by in-depth interview comments. "Sometimes I drink some alcohol in the evening after a meal, and [I] enjoy eating at Chinese buffets with my friends because it is my chance to see my old friends." Likewise, one of the

participants said, “I have a lot of work to do all day, taking care of my grandchildren when school is closed. I therefore sometimes feel stress, and I think my blood pressure is not good.” Such factors might have been barriers to the participants’ adherence to the intervention program. This is important to consider, because dietary intake is believed to be associated with the prevention of chronic diseases, particularly among individuals at elevated risk of disease.

On the other hand, the results among the intervention group revealed significant improvement in systolic blood pressure level between the baseline and sixth month, and third and sixth months of the LPD program ($p = 0.004$, $p = 0.029$). Health education through home visits, a part of the LPD program, played an important role based on self-efficacy in motivating patients to adhere to the LPD program. In addition, leaflets were sent to each participant during the Follow-up period to remind them follow the LPD activities. Consistent with comparative clinical trials of educational strategies and home visits, we noted that providing information along with home orientation allowed for a better understanding of individual intervention (Ribeiro et al., 2011; Mattila et al., 2003). Improving blood pressure control is not solely reliant on exercise, but it has been emphasized as an important factor, in combination with other lifestyle modifications, including weight control, sodium restriction, following a DASH diet, smoking cessation, and the moderation of alcohol consumption, for bringing about improvement (Blumenthal et al., 2010; Champagne, 2006; Chobanian et al., 2003). Furthermore, the LPD program used self-efficacy to persuade patients to attend a part of an intervention led by physicians and other professional healthcare staff whom the patients trusted (Bandura, 1977; Lee, Avis, & Arthur, 2007). In short, blood pressure levels among the intervention group were better than among the control group.

To sum up, the LPD program had a beneficial effect on blood pressure control among hypertensive patients. Thus, the first and the third hypotheses of the study, that blood pressure between the intervention and the control groups are different. Also, the participants who received the LPD program would show a significant improvement in systolic blood pressure, is supported.

5.2.2.2 Serum lipid profile

This study showed greater improvements in the TC, LDL, and HDL levels of the intervention group than in the control group. The positive effect of the LPD program in this study is consistent with previous studies that focused on education programs that aimed to lower LDL and to increase HDL through regular exercise (Hartley et al., 2015; Stewart, 2012). Similarly, other studies have shown support of exercise programs, reporting that LDL decreased while HDL increased after hypertensive patients participated in a 12-week tai chi training program (Tsai et al., 2003).

In addition, one part of the dietary self-control aspect of the LPD program's intervention contributed to maintaining TC and LDL in the intervention group, as compared to the control group. This was supported by a study of the diet and exercise habits of patients with diabetes, dyslipidemia, cardiovascular disease, or hypertension that found that most participants with food-modifiable chronic diseases reported that it is very important to eat less fat, based on their physician's advice, although doing so might be difficult (Neuhouser et al., 2002). However, these studies' results did not mention TG between two groups after a three-month tai chi program for middle age and elderly patients who take blood lipid medications (Lu & Kuo, 2012; Tsai et al., 2003). We can elaborate on the dietary self-control aspect of the LPD program based on a comment from a 74-year-old representative participant, "I eat many kinds of food, as my daughter bought/cooked to serve everyone in family, although I [was not always hungry], but I [know I] should eat before taking some medicines." Also, most participants were elderly (66.2 ± 6.1 years), so they might have a limited capacity to acquire healthy food by themselves. This is why the LPD program's advice mentioned taking care of food in both family and individual contexts. In addition, the current study found that many individuals' food intake often includes sweet fruits and local Thai desserts, such as kha-nom-Tom and kha-nom Sod-sai, which are mixed with coconut milk and flour, fried bananas coated with flour and coconut, and so on. Consistent with a study of dairy and non-dairy foods, the treatment did not have a significant effect on lipids (Maki et al., 2013).

The positive outcome of HDL levels in the intervention group was better than in the control group. This can be explained due to a session of exercise training and monitoring during home visits, along with encouraging participants via an LPD leaflet to remind them to adhere to the program on their own. The results' findings, in practice, emphasize the role of physical activity in improving HDL levels, when compared to the control group. One representative participant stated, "I actually breathe in-out and engage in one posture of Jinkangkong for exercise by myself." Likewise, a successful improvement of tai chi chuan training in elderly people after training for three months showed that they HDL-C levels increased significantly (Lu & Kuo, 2012; Tsai et al., 2003)

This study also found that the LPD program led to an improvement of TC and HDL between at baseline and third month ($p = 0.021$, $p = 0.026$), and between at baseline and sixth month ($p= 0.014$, $p = 0.023$). Based on the self-efficacy skills taught in the program, participants were willing to eat diets lower in sodium and to engage in exercise, following the LPD program and home visit. This was consistent with self-efficacy efforts to manage hypertension and may now be used to predict health behavior changes measured over time (Clark & Dodge, 1999; Kim et al., 2014; Schwarzer, 2008).

With the above in mind, the first and the third hypotheses of the study were supported: The average of TC LDL and HDL between the intervention and the control groups are different. Also, participants who received the LPD program showed significant differences in their serum lipid profile (TC and HDL).

5.2.2 The effect of LPD Program on Knowledge, Attitude, and Practice Regarding Hypertension

5.2.2.1 Changes in knowledge about hypertension

This study's findings showed that knowledge about hypertension was greater among the intervention group than among the control group ($p < 0.001$). This was also true for improvements in the knowledge scores about hypertension after receiving the LPD program within the intervention group between baseline and the third month and between baseline and the sixth month ($p = 0.004$, 0.003). These

results reflected the effectiveness of the LPD program for increasing participants' knowledge about hypertension. Moreover, we found that participants in the intervention group who obtained knowledge via their participation in the program had retained it at the sixth-month follow-up. This can be explained by the self-efficacy element of the program, which pertains to managing chronic conditions (Kim et al., 2014; Schwarzer, 2008). These findings were consistent with another study of an intervention program on the hypertension knowledge and lifestyles among rural Chinese adults age 35 and older. That study sought to improve long-term health outcomes and reduce hypertension prevalence (Huang et al., 2011). Likewise, a study of the development and validation of the hypertension evaluation of lifestyle and management knowledge scale (HELM) has suggested that knowledge assessment reflects basic understanding of diseases, as well as lifestyle and management issues related to hypertension, thus providing a robust measure of a patient's readiness to respond (Schapira et al., 2012). This is consistent with Ribeiro and colleagues' 2011 study that found an increase in knowledge about disease among both their experiment groups, the acquisition of knowledge about the disease, and ways to control blood pressure. Their study favors the adoption of an attitude that can influence health at the family and community levels. However, an increase in knowledge scores can be seen as an indicator of the effectiveness of the LPD program. The blood pressure rates of the intervention and the control groups were not different, which could be explained by the fact that a longer period is necessary to assess whether the intervention group truly controlled their blood pressure better than the control group by the sixth month of Follow-up. Moreover, participants were unchanged in their habits; they continued to eat high calorie foods, did not engage in regular home exercise sessions, and were busy taking care of children during the school holidays, between April and June.

Therefore, the second hypothesis of the study was supported: the participants in the intervention group showed a significant difference in their knowledge of hypertension compare to the control group. Also the fourth hypothesis of the study was supported: the participants who received the LPD program showed a significant difference (improvement) in their knowledge of hypertension.

5.2.2.2 Changes in attitude towards hypertension

The total scores of "attitude towards hypertension" in the intervention and control group obtained at baseline were statistically significant different from the scores obtained at the third and sixth months ($p = 0.013$, $P = 0.008$). For the intervention group, this finding might reflect the effectiveness of the LPD program on improving patients' attitude towards hypertension between baseline and the third month ($p < 0.009$), and between baseline and the sixth-month follow-up ($p < 0.004$). Moreover, the findings showed that the new attitude could be sustained up to the sixth month, when a follow-up visit occurred. This can be explained by patients' new concern for and heightened level of motivation about blood pressure, based on their direct experiences in the LPD program's interventions. The findings of the present study are consistent with the conclusion of Burke and colleagues' (2007) lifestyle program designed to encourage increased self-efficacy for the treatment of hypertensive patients through increased physical activity during the intervention period. Their subjects also received regular newsletters, which provided reinforcement of the concepts of the long term.

Likewise, a study of salty taste assessments and dietary behaviors associated with high-sodium diets in Korea found that salty taste assessment scores are significantly negatively correlated with nutrition knowledge and significantly positively correlated with dietary attitude and behaviors, in terms of preferences for high-sodium diets (Kim, Jung, & Lee, 2012). These findings are consistent with a study by Park (2011), which explored the effects of health education and exercise programs on older adults with hypertension. Park's findings indicated that the program was effective for controlling blood pressure and self-efficacy for exercise by using self-management and lifestyle modification techniques. Likewise, another study of health behavior theories and self-efficacy with reflection on how personal values was associated with self-efficacy (Martin et al., 2008).

Therefore, the second hypothesis of the study was supported: participants in the intervention group showed significant differences in their attitude towards hypertension when compare to the control group. And the fourth hypothesis of the

study was supported: participants who received the LPD program showed significant differences over time in their attitude towards hypertension.

5.2.2.3 Changes in practice for hypertension

Repeated measure ANOVA testing revealed that the scores of "practice for hypertension" among participants in the intervention group obtained at baseline, at the three-month intervention, and at the sixth-month follow-up were different with statistical significance. Such results reflected the effectiveness of the LPD program in increasing practice for hypertension, in terms of healthy diet and physical activity. They were also supported in part by a home visit during the intervention. As one participant noted in an in-depth interview during the Follow-up period, "using [a] logbook remind me to be concern about how to eat heathy foods and release my stress by breathing technique in LPD program." Likewise, a study on lifestyle modifications among hypertensive patients showed that the patients who took medication and who reduced their salt intake could lower their blood pressure levels even further (Appel et al., 2006). Furthermore, hypertension mitigation practice were also found to be sustained at the sixth-month follow-up. Similarly, a study of self-care and quality of life in patients with advanced heart failure to investigate the effects of a supportive educational intervention concluded that supportive educational nursing interventions were effective for improving self-care behaviors in patients with advanced heart failure (Jaarsma, 2000). Other studies found that exercise self-efficacy is a predictor of behavioral change and maintenance and blood pressure control (M. Y. Martin et al., 2008; Park et al., 2011; Tsai et al., 2003). The findings of the present study also indicated that the practice sub-scores, in terms of exercise and relaxing activities, after receiving the LPD program improved. Likewise, in a study on stress reduction via transcendental meditation and health education as a means of the secondary prevention of cardiovascular disease revealed that practice of mind-body intervention could significantly reduce the risks of mortality and cardiovascular disease by lowering blood pressure and psychosocial stress factors (Schneider et al., 2012). These results reflected that home visits, one of the important tools of the LPD program, can affect the adherence of individuals to the LPD program by using laughter, Jinkangkong exercises, and eating healthy foods. Moreover, the increases in

practice scores could be seen as an indicator of the effectiveness of the LPD program. Such a finding was consistent with the findings of anther randomized controlled trial that indicated that multidisciplinary lifestyle interventions featuring training on relaxation techniques and food diaries, along with discussions, could lead to significant reductions in blood pressure among middle-aged hypertensive patients (Mattila et al., 2003).

Therefore, the hypothesis of the study was supported, as it had been hypothesized that the participants who received the LPD program would show significant differences regarding their practice for dealing with hypertension. And the hypothesis of the study was supported, as it had been hypothesized that the participants who received the LPD program would show significant differences regarding their practice for dealing with hypertension.

5.2.3 Sustainability of the LPD Program

To ensure the success of the LPD program, we conducted in-depth interviews with some participants before the project's closing at the sixth month to achieve a deeper understanding of the sustainability of the LPD program. The study's findings indicated that patients were concerned about their blood pressure readings, eating less salt, and adding more vegetables to their diets. They also wanted to spend time relaxing and to use laughter as a relaxation technique and to sometimes engage in Jinkangkong exercise. On the other hand, some participants disliked using a logbook to record their activities because they found it difficult to recall information and fill it in by themselves. Surprisingly, we found two patients whose family members helped them to adhere to the LPD program; they all followed the LPD program's instructions, reminded participants about physician's appointments, consulted with them about laboratory reports, and encouraged them to exercise.

During the in-depth interviews, the participants suggested that healthcare staff should spend more time talking about treatments. For example, they should discuss up-to-date forms of treatment and possible complications related to chronic conditions. Such findings were consistent with the study of physicians' knowledge, attitude, and practice of pharmacologic treatments related to of hypertension. The

physicians who treated patients with hypertension need to know the indications and contraindications for particular antihypertensive therapies (Huse et al., 2001). Moreover, the study participants who were able to sustain the LPD program on their own said that "healthcare staff members should apply the program continually," because the skills they acquired from the LPD program have helped them to become more confident about participate in activities, such as exercise. One individual said, "when the nurses came to my home to recall me in which activities should do" It was helpful. This may be supported by: 1) home visits by trusted healthcare staff, which were an important booster for each individual's program participation, 2) the distribution of LPD leaflets to remind participants to follow the program, and 3) the LPD program whose exercise portion was appropriate for a group of elderly subjects and as part of a health education program led by a professional team from the Buengkhamphroi Health Promoting Hospital with whom participants had a good relationship. Likewise, a study of perspectives on the facilitators and barriers to hypertension self-management in urban African Americans has indicated that family members may help to guide patients' efforts to tailor behavioral interventions designed to control blood pressure (Flynn et al., 2013). Similar findings have also been reported in a study of the perceptions of hypertension treatment among patients with and without diabetes mellitus; that study found that hypertensive patients were most likely to adopt a treatment plan and adhere to a physician's suggestions based on their own understanding of hypertension (Anthony et al., 2012). Such findings were also in congruence with the hypertension improvement project study that suggested that combined physician and patient interventions could lower blood pressure, so an emphasis should be placed on enhancing the effectiveness and sustainability of suggested interventions (L. P. Svetkey et al., 2009). The study findings, that the LPD program could improve patients' efforts to control hypertension, are supported by the aforementioned previous studies.

5.3 Strengths and Weaknesses of the Study

The research design of this study was a randomized control trial (RCT); this is one of its strengths. Other strengths are as follows. A randomized, single-blind process was used to allocate participants by matching age and sex. Second, the

clinical parameters called for a highly valid measurement to detect variables' outcome as they related to patients' serum lipid profile. Third, none of the patients dropped out of the study. Fourth, there was a good relationship between the primary care-based professional healthcare staff and the patients. Therefore, this research smoothly encouraged them to adhere to the LPD program through the end of the sixth month. Finally, the LPD program's activities were pursued in cooperation with the full-time healthcare staff at Buengkhamphroi Health Promoting Hospital, and the researcher is as a member of the hospital team.

Despite the above, there were weaknesses associated with the present study; these may include expectations related to dietary self-control via a logbook checklist. This self-administered instrument required the participants to complete documents by themselves based on recollected information; the data entered may not be an accurate means of measurement, due to their lifestyle or personal habits. Further, it is noteworthy that the LPD program may have limited applications for patients who are more interested in spending time with their family members than adhering to the program's activities. This research was conducted over a three-month period that included the Songkran Water Festival (the Thai New Year), in April, which are times when the patients may have been focused on having a good time with their families and may have overlooked the necessity to adhere to the LPD program to control their blood pressure. It can be seen that culture, religion, and traditions have an influence on people living in community (Crawford, 2006; Wikler, 2002). Finally, the follow-up was conducted three months after the LPD program intervention ended, and this may have caused some participants to feel frustrated by their efforts to engage in more activities beyond than their usual self-care.

5.4 Conclusion

1) The clinical parameters SBP, DBP, TC, LDL, and HDL of the intervention group were better than the control groups. However, TG levels did not differ between the groups.

2) Knowledge, attitude, and practice regarding hypertension were better among the intervention group than in the control group.

3) The clinical parameters SBP, TC, and HDL were better after implementation in the intervention group, while DBP, TG, and LDL did not show improvement. The control group saw no differences during their three measurement times.

4) Knowledge, attitude, and practice regarding hypertension were better after implementation in the intervention group, whereas the control group saw no differences.

5.5 Recommendations for Further Study

The LPD program provided benefits for some values of patients' serum lipid profile (total cholesterol, LDL, and HDL) and improved knowledge, attitude, and practice among hypertensive patients, although the program alone could not control blood pressure well. Therefore, the development and use of an effective program should be based on culture and tradition, and participation, as outlined below:

1. Research time devoted to implementation should be extended for longer studies to more than six months, because it would better to observe long term effects due to behavioral changes.
2. Further research should be carried out with the time setting for implementation taken into careful consideration; annual cultural festivals in the community may affect patients' adherence to the LPD program.
3. Qualitative research should be done to explore the implementation of home visits on the promotion of behavioral changes in patients who have received the LPD program.
4. A study should be conducted to analyze and determine the cost-effectiveness of the LPD program's interventions.
5. Research should be undertaken to further explore the implementation of the LPD program in communities with other specific contexts, such as communities in urban areas.

5.6 Expected Benefits and Application of the Study Findings

We can conclude that the LPD program's interventions can enable hypertensive patients to improve their serum lipid levels, increase their knowledge, that it promotes a positive attitude, and that it enhances patients' practice for controlling hypertension. Nevertheless, a longitudinal study should be conducted to evaluate the long-term effects and sustainability of the LPD program. Once the effectiveness of the LPD program is confirmed, healthcare staff working in primary care settings should be encouraged to apply the program in their practice, for better care outcomes of their hypertensive patients.

APPENDIX A

LPD PROGRAM LEAFLET

Source: Bureau of Nutrition, Department of Health, Ministry of Public Health

a. Eat more fruits and vegetables to stay healthier

b. To warm up their body and mind by using Laughter for 5 minutes

c. Example of posture of Jinkangkong exercise for 30 minutes

Source: http://www.stkc.go.th/hilight/jikankong/jikankong.pdf

d. Deep breathing technique to cool down for 5 minutes.

APPENDIX B

THE INSTRUMENT EVALUATION

The questionnaire was tested by 30 elderly people with hypertension at the Ladlumkaeo Community Hospital in September 2014. These volunteers had characteristics similar to the participants in the intervention group. We used the Kuder-Richardson test (KR-20) to check the internal consistency of their knowledge about hypertension and found it to be 0.70. A Cronbach's alpha coefficient regarding participants' attitude indicated an acceptable score, 0.75. The detail in each items was presented in table below:

Knowledge about hypertension

Items		Internal consistency if Item Deleted
1	High blood pressure refer to the number as from 140/90 mmHg onward, or it will show either one or two numbers	0.6
2	High quantity of eating is a common symptom of hypertensive patient	0.7
3	Stroke/heart disease/ Renal failure are significant complications of hypertension.	0.7
4	Patients who well controlled blood pressure may not need to visit the physician regularly.	0.6
5	Eating instant foods, canned product or salted foods are not cause of high blood pressure	0.6
6	Regular physical activity (brisk walking, dancing, Chinese martial art) for 30 minutes/time, at least 3 times per week could help for blood pressure controlling.	0.6
7	If you are having difficulty of breathing, chest pain exercise, you have to rest.	0.6
8	Deep sleeping could reduce high blood pressure.	0.7
9	Preferable activities such as listening the music, travelling, breathing exercise could reduce high blood pressure.	0.6
10	Joining recreational activities could reduce high blood pressure.	0.6

Internal consistency	N of Items
0.7	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Internal consistency if Item Deleted
K01	14.4	8.8	.3	0.6
K02	14.3	9.6	.2	0.7
K03	14.0	9.6	.1	0.7
K04	14.1	9.1	.3	0.6
K05	13.9	8.6	.5	0.6
K06	14.1	7.8	.6	0.6
K07	14.1	8.3	.4	0.6
K08	14.1	9.4	.2	0.7
K09	14.1	7.8	.5	0.6
K10	14.2	8.0	.4	0.6

Attitudes towards hypertension

items		Internal consistency if Item Deleted
1	Only obese people could get high blood pressure	0.7
2	Taking medicine under doctor's prescription is the best way to control blood pressure.	0.7
3	When blood pressure is in normal level (less than 140/90 mmHg), no need to take medicine.	0.7
4	Taking excessive food does not affect to hypertension	0.7
5	Alcohol consumption has good effect for hypertensive patient.	0.7
6	Regular exercise could maintain blood pressure level.	0.7
7	Chinese martial art (Jinkangkong exercise) may be able to maintain blood pressure level.	0.7
8	Laughter may be able to control blood pressure level.	0.7
9	Regular sleeping less than 5 hours per day can caused of hypertension.	0.8
10	In case of having abnormal symptoms such as headache, blur vision, shortness of breath and nausea, you must immediately visit the doctor.	0.7

Reliability Statistics

Internal consistency	N of Items
0.7	10

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ATT1	22.9	9.1	0.5	0.7
ATT2	22.5	11.7	0.3	0.7
ATT3	22.2	12.7	0.3	0.7
ATT4	22.3	11.7	0.4	0.7
ATT5	22.7	10.5	0.6	0.7
ATT6	22.8	10.2	0.7	0.7
ATT7	22.9	10.7	0.5	0.7
ATT8	22.7	11.3	0.3	0.7
ATT9	22.5	12.9	0.2	0.8
ATT10	22.1	13.4	0.1	0.7

APPENDIX C

QUESTIONNAIRE (English)

This questionnaire comprise s of 5 parts as below:-

Part I General characteristics (5 items)

Part II Knowledge about hypertension (10 items)

Part III Attitude towards hypertension (10 items)

Part IV Practice regarding hypertension (20 items)

Part V History of illness and treatment (filled by staff)

++

Please check ✓ in round brackets only one answer

(In case of elders probably filled by health staff/ family care-givers/researcher)

Part I General characteristics

1. Age ……..years

2. Sex ( ) 1. Male ( ) 2. Female

3. Marital status

( ) 1. Single ( ) 2. Married

( ) 3. Widowed ( ) 4. Divorced/Separated

4. Education

( ) 1. Never been in school ( ) 2. Primary school

( ) 3. Secondary school ( ) 4. Vocational school

( ) 5. Bachelor degree ( ) 6. Higher/others.....

5. Occupation

( ) 1. Housewives/ housekeeper/no work/ retirement

( ) 2.Agriculture/ General employ

( ) 3. Commercial group/private sector

( ) 4. Private sector employee

( ) 5. Government sector officer/State enterprise officer

Part II. Knowledge about hypertension

Please mark ✓if it is true or false

	Items	**Yes**	**No**
1	High blood pressure refer to the number as from 140/90 mmHg onward, or it will show either one or two numbers		
2	High quantity of eating is a common symptom of hypertensive patient		
3	Stroke/heart disease/ Renal failure are significant complications of hypertension.		
4	Patients who well controlled blood pressure may not need to visit the physician regularly.		
5	Eating instant foods, canned product or salted foods wouldnot cause of high blood pressure		
6	Regular physical activity (brisk walking, dancing, Chinese martial art) for 30 minutes/time, at least 3 times per week could help for blood pressure controlling.		
7	If you are having difficulty of breathing, chest pain exercise, you have to rest.		
8	Deep sleeping could reduce high blood pressure.		
9	Preferable activities such as listening the music, travelling, breathing exercise could reduce high blood pressure.		
10	Joining recreational activities could reduce high blood pressure.		

Part III. Attitudes towards hypertension

Please mark with ✓ if it is agree, disagree or not sure

No.	Items	Level of attitudes		
		Agree	Dis agree	Not sure
1	Only obese people could get high blood pressure			
2	Taking medicine under doctor's prescription is the best way to control blood pressure.			
3	When blood pressure is in normal level (less than 140/90 mmHg), no need to take medicine.			
4	Taking excessive food does not affect to hypertension			
5	Alcohol consumption has good effect for hypertensive patient.			
6	Regular exercise could maintain blood pressure level.			
7	Chinese martial art (Jin Kang Kong) may be able to maintain blood pressure level.			
8	Laughter may be able to control blood pressure level.			
9	Regular sleeping less than 5 hours per day can caused of hypertension.			
10	In case of having abnormal symptoms such as headache, blur vision, shortness of breath and nausea, you must immediately visit the doctor.			

Part IV. Practice regarding hypertension (with logbooks checklist)

Definition

1) **Dietary intake** is defined as individual consumption pattern, focus on main course and beverage regularly (excluded meal taste) in the past 7 days

2) **Physical activity & Exercise** is defined as physical movement in routine household chores activities such as sweeping, doing laundry, cleaning bathrooms, gardening for at least 20 minutes at a time, for 5-7 days of the week. Furthermore, aerobic exercise for 10 minutes per time, add up to 30 minutes a day, for 3 times of the week such as brisk walking, arm swing, Chinese martial art (Jinkangkong exercise), etc.

3) **Relaxing activities** is defined as individual seeking leisure activities to manage your mind such as get plenty of rest, go outside for leisure travel, watching TV, reading magazine, exercise by breathing technique (laughter), etc.

Date…….. No ……

Please check ✓ your response on scale in the past 7 days

List	Average (day(s))			
	0	**1-2**	**3-4**	**5-7**
1. How often do you eat vegetable/fibre such as water Spinach, ivy gourd, collard greens, others?				
2. How often do you take at least of drinking water for 1 litter/day (= 8 glasses/day)?				
3. How often do you eat sweet fruit such as lambutan, durian, longan, mango, others?				
4. How often do you eat dessert/Thai dessert / sugary beverage such as sticky rice with coconut milk and mango, Thai-custard (Kanom Mor kaeng)?				
5. How often do you eat high fat food such as fried eggs, fried fish, Chinese doughnut, others?				

List	Average (day(s))			
	0	1-2	3-4	5-7
6. How often do you eat high energy main course such as stewed pork leg with rice, chicken with rice, curry with coconut milk, others?				
7. How often do you eat seafood (shrimp, lobster, squid, others)?				
8. How often do you eat pickled food such as pickled crab, salted fish with salt, pickled oyster, etc?				
9. How often do you eat preserve food such as, can food, instant noodle, fermented vegetable/fruit, others?				
10. How often do you limit dip-sauce/fish-sauce/salt on your dish?				
11. How often do you work household chores for 30 minutes at a time such as sweeping, cleaning, doing laundry, gardening?				
12. How often do you exercise by brisk walking/ jogging/ arm swing for at least 30 minutes?				
13. How often do you perform Chinese exercise (Jinkangkong Exercise) for at least 30 minutes?				
14. How often do you practices breathing technique?				
15. How often do you play laughter for breathing exercise?				
16. How often do you go outside leisure activity such as Bhudhist ordination ceremony, wedding party?				
17. How often do you get good sleep?				
18. How often can you solve any problems?				
19. How often do you control your temper although you feel upset?				
20. How often do you have any leisure time such as watching TV/listening to songs/leisure travel, others?				

Part V. History of illness & treatment

1. Are you currently a smoker?

   ( ) No (proceed to No.4) ( ) Yes ( ) Ex-smoker

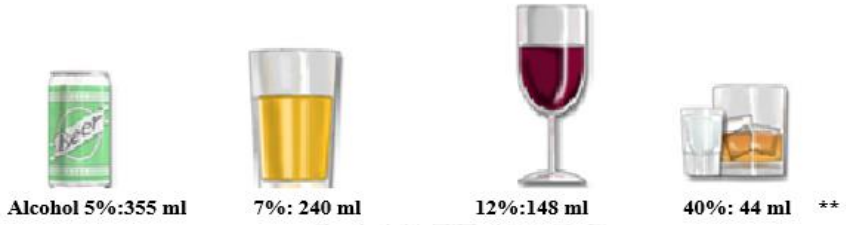
2. How many cigarettes do you smoke a day? .....piece(s)/day

3. How often do you smoke in the past 7 days? .....day(s)

4. Do you consume alcohol beverage?

   ( ) No *(Proceed to No.8)* ( ) Yes

5. If "YES" please check ✓ under the picture



(** Data from NCD, MOPH, Thailand:1 glass = 1 bottle of Beer/ 1 glass of Rice wine/1 glass of wine/ 1 bottle of Spy)

6. How much alcohol beverage that you drink a time? ……glass(es)/bottle(s)

7. How often do you drink alcohol beverage in the past of week? ……days

8. Do you have family history of hypertension?

   ( ) No ( ) not sure ( ) Yes

   *If **"YES",** please tick (you can check more than one box that it up to family member)*

   □ Father/ mother □grandfather/grandmother □ other……

9. Did you are diagnosed to be hypertension? ( ) No Yes ( )

10. Onset of Hypertension …… years ……months

11. Your Hypertension treatment started on ……Years ……months

12. Do you take anti-hypertensive drugs regularly? ( ) No ( ) Yes

13. Do you have other chronic diseases?

    ( ) Yes, please specified ( ) No

    □ Diabetes □ Heart disease □ Kidney disease

    □ Stroke □ Arthritis □ Other……

Medical Record fill by healthcare staff /Researcher

Personal data

Height…….. cms Body weight……Kgs BMI……kg/M ^{2}

Waist circumference.……cms BP……/..……..mmHg PR.....BPM

Serum blood test: Date……..…

FBS ……mg%

Total cholesterol ……mg/dL

Triglyceride ……mg/dL

HDL ……mg/dL

LDL ……mg/dL

MEDICATION CARD

HN……..	**DATE……**
Anti-hypertensive drug(s)	
(Vitamin, supplement etc.)	

QUESTIONNAIRE

(For month 3 and month 6)

1. Knowledge about hypertension

Please mark ✓if it is true or false

	Items	**Yes**	**No**
1	High blood pressure refer to the number as from 140/90 mmHg onward, or it will show either one or two numbers		
2	High quantity of eating is a common symptom of hypertensive patient		
3	Stroke/heart disease/ Renal failure are significant complications of hypertension.		
4	Patients who well controlled blood pressure may not need to visit the physician regularly.		
5	Eating instant foods, canned product or salted foods wouldnot cause of high blood pressure		
6	Regular physical activity (brisk walking, dancing, Chinese martial art) for 30 minutes/time, at least 3 times per week could help for blood pressure controlling.		
7	If you are having difficulty of breathing, chest pain exercise, you have to rest.		
8	Deep sleeping could reduce high blood pressure.		
9	Preferable activities such as listening the music, travelling, breathing exercise could reduce high blood pressure.		
10	Joining recreational activities could reduce high blood pressure.		

2. Attitude towards hypertension

Please mark with ✓ if it is agree, disagree or not sure

No.	Items	Level of attitudes		
		Agree	Dis agree	Not sure
1	Only obese people could get high blood pressure			
2	Taking medicine under doctor's prescription is the best way to control blood pressure.			
3	When blood pressure is in normal level (less than 140/90 mmHg), no need to take medicine.			
4	Taking excessive food does not affect to hypertension			
5	Alcohol consumption has good effect for hypertensive patient.			
6	Regular exercise could maintain blood pressure level.			
7	Chinese martial art (Jinkangkong exercise) may be able to maintain blood pressure level.			
8	Laughter may be able to control blood pressure level.			
9	Regular sleeping less than 5 hours per day can caused of hypertension.			
10	In case of having abnormal symptoms such as headache, blur vision, shortness of breath and nausea, you must immediately visit the doctor.			

3. Practice regarding hypertension (with logbooks checklist)

Definition

4) **Dietary intake** is defined as individual consumption pattern, focus on main course and beverage regularly (excluded meal taste) in the past 7 days

5) **Physical activity & Exercise** is defined as physical movement in routine household chores activities such as sweeping, doing laundry, cleaning bathrooms, gardening for at least 20 minutes at a time, for 5-7 days of the week. Furthermore, aerobic exercise for 10 minutes per time, add up to 30 minutes a day, for 3 times of the week such as brisk walking, arm swing, Chinese martial art (Jinkangkong exercise), etc.

6) **Relaxing activities** is defined as individual seeking leisure activities to manage your mind such as get plenty of rest, go outside for leisure travel, watching TV, reading magazine, exercise by breathing technique (laughter), etc.

Date…….. No ……

Please check ✓ your response on scale in the past 7 days

List	Average (day(s))			
	0	**1-2**	**3-4**	**5-7**
1. How often do you eat vegetable/fibre such as water Spinach, ivy gourd, collard greens, others?				
2. How often do you take at least of drinking water for 1 litter/day (= 8 glasses/day)?				
3. How often do you eat sweet fruit such as lambutan, durian, longan, mango, others?				
4. How often do you eat dessert/Thai dessert / sugary beverage such as sticky rice with coconut milk and mango, Thai-custard (Kanom Mor kaeng)?				
5. How often do you eat high fat food such as fried eggs, fried fish, Chinese doughnut, others?				

List	Average (day(s))			
	0	1-2	3-4	5-7
6. How often do you eat high energy main course such as stewed pork leg with rice, chicken with rice, curry with coconut milk, others?				
7. How often do you eat seafood (shrimp, lobster, squid, others)?				
8. How often do you eat pickled food such as pickled crab, salted fish with salt, pickled oyster, etc?				
9. How often do you eat preserve food such as, can food, instant noodle, fermented vegetable/fruit, others?				
10. How often do you limit dip-sauce/fish-sauce/salt on your dish?				
11. How often do you work household chores for 30 minutes at a time such as sweeping, cleaning, doing laundry, gardening?				
12. How often do you exercise by brisk walking/ jogging/ arm swing for at least 30 minutes?				
13. How often do you perform Chinese exercise (Jinkangkong Exercise) for at least 30 minutes?				
14. How often do you practices breathing technique?				
15. How often do you play laughter for breathing exercise?				
16. How often do you go outside leisure activity such as Bhudhist ordination ceremony, wedding party?				
17. How often do you get good sleep?				
18. How often can you solve any problems?				
19. How often do you control your temper although you feel upset?				
20. How often do you have any leisure time such as watching TV/listening to songs/leisure travel, others?				

APPENDIX D

QUESTIONNAIRE (Thai)

ส่วนที่ 1 ข้อมูลทั่วไป (5 ข้อ)

ส่วนที่ 2 ความรู้เกี่ยวกับโรคความดันโลหิตสูง (10 ข้อ)

ส่วนที่ 3 ทัศนคติและการดูแลสุขภาพในโรคความดันโลหิตสูง (10 ข้อ)

ส่วนที่ 4 การปฏิบัติตัวต่อโรคความดันโลหิตสูง (20 ข้อ)

ส่วนที่ 5 ประวัติความเจ็บป่วยที่เกี่ยวข้องและการตรวจรักษา (สำหรับเจ้าหน้าที่บันทึก)

++

คำชี้แจง โปรดทำเครื่องหมาย ✓ หรือกรอกข้อมูลลงในช่องว่างที่ตรงกับความเป็นจริง *(เจ้าหน้าที่หรืออาสาสมัครสาธารณสุขประจำหมู่บ้าน หรือญาติผู้ป่วยสามารถบันทึกแทนในกรณีที่ผู้ให้ข้อมูล ไม่สามารถกรอกข้อมูลเองได้)*

ส่วนที่ 1 ข้อมูลทั่วไป

1. อายุ .....ปี

2. เพศ ( ) 1. ชาย ( ) 2.หญิง

3. สถานภาพสมรส

( ) 1. โสด ( ) 2. สมรส ( ) 3. หม้าย ( ) 4.หย่า/แยก

4. การศึกษาสูงสุด

( ) 1. ไม่ได้เรียน ( ) 2. ประถมศึกษา ( ) 3. มัธยมศึกษา/ปวช

( ) 4. อนุปริญญา/ปวส ( ) 5. ปริญญาตรี ( ) 6. อื่นๆ.....

5. อาชีพ

( ) 1.ไม่ได้ทำงาน/แม่บ้าน/พ่อบ้าน/ เกษียณอายุ/ ข้าราชการบำนาญ

( ) 2. เกษตรกรรม/รับจ้างทั่วไป ( ) 3.ค้าขาย/ ธุรกิจส่วนตัว

( ) 4. ทำงานบริษัทเอกชน ( ) 5.ข้าราชการ/รัฐวิสาหกิจ

ส่วนที่ 2 ความรู้เกี่ยวกับโรคความดันโลหิตสูง

คำชี้แจง โปรดทำเครื่องหมาย ✓ที่ท่านเห็นว่า **ใช่** หรือ **ไม่ใช่**

	คำถาม	ใช่	ไม่ใช่
1	**ความดันโลหิตสูง** คือ ความดันฯ ที่วัดได้ ตั้งแต่ 140/90 มมปรอท ขึ้นไป เป็นค่าใดค่าหนึ่ง หรือทั้ง 2 ค่า ใช่หรือไม่		
2	อาการที่พบทั่วไปในโรคความดันโลหิตสูง คือ กินเก่ง หิวบ่อย เหงื่อออกตัวเย็น เป็นต้น ใช่หรือไม่		
3	หลอดเลือดสมองตีบ/ตัน/แตก หัวใจหนาตัวจนตีบ/ตัน หรือไตวายเป็นภาวะแทรกซ้อนสำคัญจากความดันโลหิตสูง ใช่หรือไม่		
4	เมื่อผู้ป่วยควบคุมความดันฯ เป็นปกติแล้ว ไม่จำเป็นต้องไปพบแพทย์ตามนัด ใช่หรือไม่		
5	การกินอาหารแปรรูป/ดองเค็ม เช่น อาหารหมักเค็ม อาหารกระป๋อง บะหมี่กึ่งสำเร็จรูป เป็นต้น **ไม่**ทำให้ความดันโลหิตสูง ใช่หรือไม่		
6	การเดินเร็ว/เต้นรำ/รำมวยจีน/รำไม้พลอง เป็นต้น เป็นเวลา 30 นาทีอย่างต่อเนื่อง สัปดาห์ละ 3 ครั้ง ช่วยควบคุมความดันฯได้ ใช่หรือไม่		
7	**ในขณะออกกำลังกาย** หากท่านมีอาการผิดปกติ เช่น ใจสั่น เจ็บแน่นหน้าอก ต้องหยุดพักทันที ใช่หรือไม่		
8	การนอนหลับสนิท ช่วยให้ความดันฯ ลดลงได้ ใช่หรือไม่		
9	การมีกิจกรรมที่ชื่นชอบ เช่น ฟังเพลง ท่องเที่ยว ฝึกหายใจช้าๆ มีผลให้ความดันฯ ลดลงใช่หรือไม่		
10	การร่วมกิจกรรมสังสรรค์ มีความสุข-สบายใจ มีผลให้ความดันเลือดลดลงได้ ใช่หรือไม่		

ส่วนที่ 3 ทัศนคติและการดูแลสุขภาพต่อโรคความดันโลหิตสูง

คำชี้แจง โปรดทำเครื่องหมาย √ ในช่องที่ตรงกับความคิดเห็นของท่านมากที่สุด

รายการ		เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ
1	ท่านคิดว่า **คนอ้วนเท่านั้น ที่**เป็นความดันโลหิตสูง			
2	ท่านคิดว่า การควบคุมความดันฯ ที่ดีที่สุด คือ **กินยาตามหมอสั่ง** เท่านั้น			
3	ท่านคิดว่า ไม่จำเป็นต้องกินยาควบคุมความดันฯ แล้ว เมื่อวัดความดันฯ ได้ค่าปกติ (ต่ำกว่า 140/90 มมปรอท)			
4	ท่านคิดว่า การกินอาหารตามใจปาก ไม่มีผลต่อโรคความดันโลหิตสูง			
5	ท่านคิดว่า **การดื่มเหล้า เบียร์** เป็นผลดีต่อผู้ที่เป็นความดันโลหิตสูง			
6	ท่านคิดว่า การออกกำลังกาย จะช่วยควบคุมความดันให้เป็นปกติ ในผู้เป็นความดันโลหิตสูงได้			
7	ท่านคิดว่า**การรำมวยจีน** ช่วยควบคุมความดันฯ ได้			
8	ท่านคิดว่า **อารมณ์ขัน** การหัวเราะ ผ่อนคลาย ช่วยควบคุมความดันฯ ได้			
9	ท่านคิดว่า **การนอนน้อยกว่า 5 ชั่วโมง/วัน** มีผลทำให้ความดันโลหิตสูง			
10	**หาก**ท่านมีอาการผิดปกติ เช่น ปวดมึนศีรษะ ปวดตุบๆ บริเวณท้ายทอย ตาพร่ามัว คลื่นไส้ ท่านจะรีบไปพบแพทย์ทันที			

ส่วนที่ 4 การปฏิบัติตัวต่อโรคความดันโลหิตสูง

คำจำกัดความที่เกี่ยวข้อง

1) **การบริโภค** หมายถึง การรับประทานอาหารและเครื่องดื่มต่างๆ ในมื้อหลักๆ จนรู้สึกอิ่ม (ไม่นับรวมการชิม) โดยปฏิบัติประจำวันในช่วงระยะ 7 วันที่ผ่านมาจนถึงวันที่จดบันทึก

2) **การออกกำลังกาย** หมายถึง พฤติกรรมการปฏิบัติหรือกิจกรรมและการเคลื่อนไหวร่างกายของท่านในงานประจำวันจนเหงื่อซึมเช่น ถูบ้าน ขัดพื้น โดยใช้เวลา 20 นาทีอย่างต่อเนื่องโดยปฏิบัติสะสมเฉลี่ย 5- 7 วันหรือกิจกรรมทางกายใดๆอย่างต่อเนื่องแบบแอโรบิค แบ่งปฏิบัติครั้งละไม่น้อยกว่า 10 นาทีโดยไม่หยุดพัก โดยสะสมรวมเวลาไม่น้อยกว่า 30 นาทีต่อวัน ปฏิบัติกิจกรรมอย่างสม่ำเสมออย่างน้อยจำนวน 3 ครั้งต่อสัปดาห์ เช่น แกว่งแขน รำมวยจีน เป็นต้น

3) **การพักผ่อน** หมายถึง พฤติกรรมหรือการแสดงออกของท่าน ในการเสริมสร้างความสุข ความสงบทางจิตใจ โดยผ่านกิจกรรมต่างๆ เช่น การท่องเที่ยวนอกสถานที่เพื่อการพักผ่อน ดูทีวี อ่านหนังสือ ฝึกหายใจแบบผ่อนคลาย เป็นต้น

วันที่.....เลขที่.....

โปรดทำเครื่องหมาย √ การบริโภค ออกกำลังกาย และการพักผ่อน ใน 7 วันที่ผ่านมา

รายการ	จำนวนวัน/สัปดาห์			
	0	1-2	3-4	5-7
1. ท่านกินผักใบเขียวต่างๆ เช่น ผักบุ้ง ผักโขม ตำลึง คะน้า ผักหวาน กวางตุ้ง เป็นต้น				
2. ท่านดื่มน้ำอย่างน้อยวันละ 1 ลิตรต่อวัน (= 8 แก้ว)				
3. ท่านกินผลไม้**รสหวานจัด**ที่มีตามฤดูกาล เช่น เงาะ ลิ้นจี่ ทุเรียน ลำไย น้อยหน่า ขนุน มะม่วงสุก ฯลฯ				
4. ท่านกินขนมหวานๆ เช่น ข้าวเหนียวมะม่วง-ทุเรียน ขนมต้ม ขนมหม้อแกง ฯลฯ				
5. ท่านกิน**อาหารทอดๆ** เช่น ไก่ทอด หนังปลาทอด เนื้อทอด หมูทอด ปาท่องโก๋ กล้วยทอด มันทอด ฯลฯ				
6. ท่านกินอาหารมันๆ (ไขมันสูง) เช่น ข้าวขาหมู ข้าวมันไก่ แกงมัสมั่น แกงกะทิ เป็นต้น				
7. ท่านกินอาหารทะเล เช่น กุ้ง ปู ปลาหมึก				
8. ท่านกินอาหารทะเลทำเค็ม เช่น ปูดอง ปลาเค็ม หอยดอง				
9. ท่านกินอาหารประเภทกระป๋อง บะหมี่กึ่งสำเร็จรูป ผัก-ผลไม้ดองเค็ม เป็นต้น				
10. ท่านได้จำกัดการเติม **“น้ำปลา/น้ำปลาพริก/ซ้อส/เกลือ/ซีอิ๊ว”** ในจานข้าวพร้อมรับประทาน				
11. ท่านใช้เวลาว่างประจำวัน เช่น ปลูกพืช-ผักกินได้ รดน้ำพรวนดิน แต่งสวน เป็นต้น หรือทำงานบ้าน เช่น กวาดบ้าน ถูบ้าน รีดผ้า แต่งบ้าน เป็นต้น				
12. ท่านเดินเร็ว/วิ่งเหยาะๆ/แกว่งแขน หรือกิจกรรมที่คล้ายคลึงกัน เป็นเวลา 30นาทีต่อวัน				
13. ท่านออกกำลังกาย เช่น เต้นแอโรบิก รำไม้พลอง โยคะ รำมวยจีน เป็นเวลา 30 นาทีต่อวัน				

รายการ	จำนวนวัน/สัปดาห์			
	0	1-2	3-4	5-7
14. ท่านบริหารปอดโดยหายใจเข้า-ออกช้า หัวเราะโอ อา เป็นต้น				
15. ท่านออกกำลังกายจนรู้สึกว่าหัวใจเต้นแรงขึ้น ชีพจรแรงขึ้น หายใจแรงขึ้น และมีเหงื่อซึม				
16. ท่านร่วมกิจกรรมสังสรรค์ต่างๆ กับสมาชิกในบ้าน/ เพื่อน/ เพื่อนบ้าน/ชมรมต่างๆ เป็นต้น				
17. ท่านเข้านอนตามเวลาและนอนหลับสนิท				
18. ท่านปรึกษาพูดคุยกับสมาชิกในบ้าน/เพื่อนสนิท/บุคคลที่ท่านไว้ใจ เมื่อเครียด วิตกกังวล หรือไม่สบายใจ				
19. ท่านควบคุมภาวะอารมณ์ได้ เมื่อรู้ว่า หงุดหงิด/โมโห/ ไม่พอใจ				
20. ท่านดูทีวี/ฟังเพลง/ท่องเที่ยว ฯลฯ เพื่อการพักผ่อน				

ส่วนที่ 5 ประวัติความเจ็บป่วยและการรักษา

1. ปัจจุบัน ท่านสูบบุหรี่หรือไม่

   ( ) ไม่สูบ ( ) เคยสูบ แต่เลิกแล้ว ( ) สูบ โปรดระบุจำนวน .....มวน/วัน

2. กรณีที่ท่านสูบ ท่านสูบเป็นระยะเวลานานเท่าใด .....ปี.....เดือน

3. ในระยะ 7 วันที่ผ่านมา ท่านสูบบุหรี่เป็นจำนวนกี่วัน .....วัน

4. ปัจจุบัน ท่านดื่มเครื่องดื่มแอลกอฮอล์หรือไม่ ( )ไม่ดื่ม ( ) ดื่ม แต่เลิกแล้ว

5. กรณีที่ท่านดื่ม โปรดทำเครื่องหมายถูก✓ ตามรูปภาพ

*(** ข้อมูลจากสำนักโรคติดต่อ 1 แก้ว คือ เบียร์ 1 กระป๋อง สาโท 1 แก้ว/ ไวน์ 1 แก้ว/ สปาย 1 ขวด/ สุราไม่ผสม/หล้าขาว 1 เป๊ก / สุราผสม 2 แก้ว มีตัวอย่างภาพประกอบ)ที่มา: แนวทางการรักษาโรคความดันโลหิตสูงในเวชปฏิบัติทั่วไป (สมาคมความดันโลหิตสูงแห่งประเทศไทย, 2557)*

ภาพ: http://niaaa.nih.gov/sites/default/files/just_drinks_for_web.jpg

6. กรณีที่ท่านดื่ม ท่านดื่มเป็นระยะเวลานานเท่าใด .....ปี.....เดือน

   ปริมาณที่ดื่มโดยเฉลี่ยต่อครั้ง. .....แก้ว**

บันทึกการตรวจโดยเจ้าหน้าที่/นักวิจัย

ข้อมูลส่วนบุคคล

ความสูง ……ซม น้ำหนัก……กก ดัชนีมวลกาย…กก/ม^2

รอบเอว ……ซม ความดัน ……มม ปรอท ชีพจร.....ครั้งนาที/

ผลการตรวจเลือด : วันที่ ……..…

FBS ……mg%

Total cholesterol ……mg/ dL

Triglyceride ……mg/ dL

HDL ……mg/ dL

LDL ……mg/ dL

บันทึกการใช้ยา

HN**.....** วันที่บันทึก.....

รายการยา	
ยาควบคุมความดันโลหิต	
ยาอื่นๆ (วิตามิน อาหารเสริม เป็นต้น)	

แบบสอบถาม

(สำหรับการติดตามข้อมูล เดือนที่ 3 และเดือนที่ 6)

1. ความรู้เกี่ยวกับโรคความดันโลหิตสูง

คำชี้แจง โปรดทำเครื่องหมาย ✓ที่ท่านเห็นว่า **ใช่** หรือ **ไม่ใช่**

	คำถาม	ใช่	ไม่ใช่
1	**ความดันโลหิตสูง** คือ ความดันฯ ที่วัดได้ ตั้งแต่ 140/90 มมปรอท ขึ้นไป เป็นค่าใดค่าหนึ่ง หรือทั้ง 2 ค่า ใช่หรือไม่		
2	อาการที่พบทั่วไปในโรคความดันโลหิตสูง คือ กินเก่ง หิวบ่อย เหงื่อออกตัวเย็น เป็นต้น ใช่หรือไม่		
3	หลอดเลือดสมองตีบ/ตัน/แตก หัวใจหนาตัวจนตีบ/ตัน หรือไตวายเป็นภาวะแทรกซ้อนสำคัญจากความดันโลหิตสูง ใช่หรือไม่		
4	เมื่อผู้ป่วยควบคุมความดันฯ เป็นปกติแล้ว ไม่จำเป็นต้องไปพบแพทย์ตามนัด ใช่หรือไม่		
5	การกินอาหารแปรรูป/ดองเค็ม เช่น อาหารหมักเค็ม อาหารกระป๋อง บะหมี่กึ่งสำเร็จรูป เป็นต้น **ไม่**ทำให้ความดันโลหิตสูง ใช่หรือไม่		
6	การเดินเร็ว/เต้นรำ/รำมวยจีน/รำไม้พลอง เป็นต้น เป็นเวลา 30 นาทีอย่างต่อเนื่อง สัปดาห์ละ 3 ครั้ง ช่วยควบคุมความดันฯได้ ใช่หรือไม่		
7	**ในขณะออกกำลังกาย** หากท่านมีอาการผิดปกติ เช่น ใจสั่น เจ็บแน่นหน้าอก ต้องหยุดพักทันที ใช่หรือไม่		
8	การนอนหลับสนิท ช่วยให้ความดันฯ ลดลงได้ ใช่หรือไม่		
9	การมีกิจกรรมที่ชื่นชอบ เช่น ฟังเพลง ท่องเที่ยว ฝึกหายใจช้าๆ มีผลให้ความดันฯ ลดลงใช่หรือไม่		
10	การร่วมกิจกรรมสังสรรค์ มีความสุข-สบายใจ มีผลให้ความดันเลือดลดลงได้ ใช่หรือไม่		

2. ทัศนคติและการดูแลสุขภาพต่อโรคความดันโลหิตสูง

คำชี้แจง โปรดทำเครื่องหมาย √ ในช่องที่ตรงกับความคิดเห็นของท่านมากที่สุด

รายการ		เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ
1	ท่านคิดว่า **คนอ้วนเท่านั้น ที่**เป็นความดันโลหิตสูง			
2	ท่านคิดว่า การควบคุมความดันฯ ที่ดีที่สุด คือ **กินยาตามหมอสั่ง** เท่านั้น			
3	ท่านคิดว่า ไม่จำเป็นต้องกินยาควบคุมความดันฯ แล้ว เมื่อวัดความดันฯ ได้ค่าปกติ (ต่ำกว่า 140/90 มมปรอท)			
4	ท่านคิดว่า การกินอาหารตามใจปาก ไม่มีผลต่อโรคความดันโลหิตสูง			
5	ท่านคิดว่า **การดื่มเหล้า เบียร์** เป็นผลดีต่อผู้ที่เป็นความดันโลหิตสูง			
6	ท่านคิดว่า การออกกำลังกาย จะช่วยควบคุมความดันให้เป็นปกติ ในผู้เป็นความดันโลหิตสูงได้			
7	ท่านคิดว่า**การรำมวยจีน** ช่วยควบคุมความดันฯ ได้			
8	ท่านคิดว่า **อารมณ์ขัน** การหัวเราะ ผ่อนคลาย ช่วยควบคุมความดันฯ ได้			
9	ท่านคิดว่า **การนอนน้อยกว่า 5 ชั่วโมง/วัน** มีผลทำให้ความดันโลหิตสูง			
10	**หาก**ท่านมีอาการผิดปกติ เช่น ปวดมึนศีรษะ ปวดตุบๆ บริเวณท้ายทอย ตาพร่ามัว คลื่นไส้ ท่านจะรีบไปพบแพทย์ทันที			

3. การปฏิบัติตัวต่อโรคความดันโลหิตสูง

คำจำกัดความที่เกี่ยวข้อง

1) **การบริโภค** หมายถึง การรับประทานอาหารและเครื่องดื่มต่างๆ ในมื้อหลักๆ จนรู้สึกอิ่ม (ไม่นับรวมการชิม) โดยปฏิบัติเป็นกิจวัตรประจำวันในช่วงระยะ 7 วันที่ผ่านมาจนถึงวันที่จดบันทึก
2) **การออกกำลังกาย** หมายถึง กิจกรรมและการเคลื่อนไหวร่างกายของท่านในงานประจำวันจนเหงื่อซึมเช่น ถูบ้าน ขัดพื้น โดยใช้เวลา 20 นาทีอย่างต่อเนื่องโดยปฏิบัติสะสมเฉลี่ย 5- 7 วันหรือกิจกรรมทางกายใดๆอย่างต่อเนื่องแบบแอโรบิค แบ่งปฏิบัติครั้งละไม่น้อยกว่า 10 นาทีโดยไม่หยุดพัก โดยสะสมรวมเวลาไม่น้อยกว่า 30 นาทีต่อวัน ปฏิบัติกิจกรรมอย่างสม่ำเสมออย่างน้อยจำนวน 3 ครั้งต่อสัปดาห์ เช่น แกว่งแขน รำมวยจีนยืดเส้นแบบจินกังกงเป็นต้น
3) **การพักผ่อน** หมายถึง การแสดงออกของท่านในการเสริมสร้างความสุข ผ่านกิจกรรมต่างๆ เช่น การท่องเที่ยวนอกสถานที่ ดูทีวี อ่านหนังสือ ฝึกหายใจแบบผ่อนคลาย (หายใจ โอ-อา) เป็นต้น

วันที่.....เลขที่.....

โปรดทำเครื่องหมาย √ การบริโภค ออกกำลังกาย และพักผ่อน ในระยะ 7 วันที่ผ่านมา

รายการ	จำนวนวัน/สัปดาห์			
	0	1-2	3-4	5-7
1. ท่านกินผักใบเขียวต่างๆ เช่น ผักบุ้ง ผักโขม ตำลึง คะน้า ผักหวาน กวางตุ้ง เป็นต้น				
2. ท่านดื่มน้ำอย่างน้อยวันละ 1 ลิตรต่อวัน (= 8 แก้ว)				
3. ท่านกินผลไม้**รสหวานจัด**ที่มีตามฤดูกาล เช่น เงาะ ลิ้นจี่ ทุเรียน ลำไย น้อยหน่า ขนุน มะม่วงสุก ฯลฯ				
4. ท่านกินขนมหวานๆ เช่น ข้าวเหนียวมะม่วง-ทุเรียน ขนมต้ม ขนมหม้อแกง ฯลฯ				
5. ท่านกิน**อาหารทอดๆ** เช่น ไก่ทอด หนังปลาทอด เนื้อทอด หมูทอด ปาท่องโก๋ กล้วยทอด มันทอด ฯลฯ				
6. ท่านกินอาหารมันๆ (ไขมันสูง) เช่น ข้าวขาหมู ข้าวมันไก่ แกงมัสมั่น แกงกะทิ เป็นต้น				
7. ท่านกินอาหารทะเล เช่น กุ้ง ปู ปลาหมึก				
8. ท่านกินอาหารทะเลทำเค็ม เช่น ปูดอง ปลาเค็ม หอยดอง				
9. ท่านกินอาหารประเภทกระป๋อง บะหมี่กึ่งสำเร็จรูป ผัก-ผลไม้ดองเค็ม เป็นต้น				
10. ท่านได้จำกัดการเติม **"น้ำปลา/น้ำปลาพริก/ซ้อส/เกลือ/ซีอิ๊ว"**ในจานข้าวพร้อมรับประทาน				
11. ท่านใช้เวลาว่างประจำวัน เช่น ปลูกพืช-ผักกินได้ รดน้ำพรวนดิน แต่งสวน เป็นต้น หรือทำงานบ้าน เช่น กวาดบ้าน ถูบ้าน รีดผ้า แต่งบ้าน เป็นต้น				
12. ท่านเดินเร็ว/วิ่งเหยาะๆ/แกว่งแขน เป็นเวลา 30นาทีต่อวัน				
13. ท่านออกกำลังกาย เช่น เต้นแอโรบิก รำไม้พลอง โยคะ รำมวยจีน เป็นเวลา 30 นาทีต่อวัน				
14. ท่านบริหารปอดโดยหายใจเข้า-ออกช้า หัวเราะโอ อา เป็นต้น				
15. ท่านออกกำลังกายจนรู้สึกว่าหัวใจเต้นแรงขึ้น ชีพจรแรงขึ้น				

รายการ	จำนวนวัน/สัปดาห์			
	0	1-2	3-4	5-7
หายใจแรงขึ้น และมีเหงื่อซึม				
16. ท่านร่วมกิจกรรมสังสรรค์ต่างๆ กับสมาชิกในบ้าน/ เพื่อน/ เพื่อนบ้าน/ชมรมต่างๆ เป็นต้น				
17. ท่านเข้านอนตามเวลาและนอนหลับสนิท				
18. ท่านปรึกษาพูดคุยกับสมาชิกในบ้าน/เพื่อนสนิท/บุคคลที่ท่านไว้ใจ เมื่อเครียด วิตกกังวล หรือไม่สบายใจ				
19. ท่านควบคุมภาวะอารมณ์ได้ เมื่อรู้ว่า หงุดหงิด/โมโห/ ไม่พอใจ				
20. ท่านดูทีวี/ฟังเพลง/ท่องเที่ยว ฯลฯ เพื่อการพักผ่อน				

บันทึกการตรวจโดยเจ้าหน้าที่/นักวิจัย ครั้งที่ .....

ข้อมูลส่วนบุคคล

ความสูง ……ซม น้ำหนัก……กก ดัชนีมวลกาย…กก/ม^2

รอบเอว ……ซม ความดัน …….มม ปรอท ชีพจร.....ครั้งนาที/

ผลการตรวจเลือด : วันที่ ……..…

FBS ……mg%

Total cholesterol ……mg/ dL

Triglyceride ……mg/ dL

HDL ……mg/ dL

LDL ……mg/ dL

บันทึกการใช้ยา

HN**.....** วันที่บันทึก.....

รายการยา	
ยาควบคุมความดันโลหิต	
ยาอื่นๆ (วิตามิน อาหารเสริม เป็นต้น)	

APPENDIX E

IN-DEPTH INTERVIEW GUIDELINE

Objective: To assess LPD program in hypertensive patients

Interviewer: Researcher

Assistants: Healthcare staff of Buengkhamphroi Health Promoting Hospital

Interveiwee: Randomly selected of five participants in the intervention group

Place: Buengkhamphroi Health Promoting Hospital (BKP- HPH)

Time: 30 minutes/person (August-September, 2015)

Questions:

1. Which activities in the LPD program do you prefer and why?

   …….

   …….

2. How can you adhere to the LPD program (such as checking your blood pressure, eating healthy foods, coping with stressful conditions, etc.)?

   …….

   …….

3. What is your opinion of the LPD program logbook?

   …….

   …….

4. What do you think about the LPD program and its effect on your health?

   …….

   …….

APPENDIX F

RESULTS

1. Distribution of the participant characteristics at baseline survey

In Table 1, there were no statistically significant differences all variables of general characteristics at baseline survey between the intervention and the control group ($p > 0.05$).

Table 1: Distribution of general characteristics at baseline survey

Variables	Intervention (n34)		Control (n35)		p-value
	n	(%)	n	(%)	
Sex					0.85
Men	9	26.5	10	(25.6)	
Women	25	(73.5)	25	(74.4)	
Age					0.75
51-60 years	7	(20.6)	6	(17.1)	
61-70 years	17	(50.0)	18	(51.4)	
71-80 years	10	(29.4)	11	(31.4)	
Mean (SD)	66.1	(6.08)	66.8	(6.83)	
Marital status:					0.98
Single	5	(14.7)	3	(8.6)	
Married	20	(58.8)	25	(71.4)	
Widowed/Divorced/ Separated	9	(26.5)	7	(20.0)	
Educational level					0.06
Elementary school	24	(70.5)	28	(79.5)	
Secondary school/ Vocational school	9	(26.5)	7	(20.5)	
Bachelor degree	1	(3.0)	0	(0.0)	
Occupation					0.22
Unemployed/retired	29	(85.3)	24	(68.6)	
Employed	5	(14.7)	11	(31.4)	
Smoking status					0.50
Non smoker	26	(76.5)	25	(71.4)	
Ex-smoker > 1 year	8	(23.5)	10	(28.6)	

Variables	Intervention (n34)		Control (n35)		p-value
	n	(%)	n	(%)	
Alcohol drinking					0.76
Non drinker	26	(76.5)	25	(71.4)	
Occasional drinker	5	(14.8)	3	(8.6)	
Ex-drinker > 1 year	1	(2.9)	3	(8.6)	
One drink a day	2	(5.8)	4	(11.4)	
Family history of hypertension					0.93
No	2	(5.9)	0	(0.0)	
Farther/mother	12	(35.3)	13	(37.2)	
Unknown	20	(58.8)	22	(62.9)	
Duration of hypertension (years)					0.95
≤10 years	26	(76.5)	26	(74.3)	
>10 years	8	(23.5)	9	(25.7)	
Mean (SD)	9.0	(3.8)	9.1	(3.1)	
Duration of taking medication (years)					0.71
≤10 Years	27	(79.4)	28	(80.0)	
>10 years	7	(20.6)	7	(20.0)	
Mean (SD)	8.9	(3.3)	8.2	(3.07)	
Height (cm)					
Men; Mean (SD)	167.8	(4.5)	166.2	(4.3)	0.45
Women; Mean (SD)	156.6	(4.7)	155.9	(5.8)	0.63
Body weight (kg)					
Men (n=19); Mean (SD)	71.0	(9.2)	69.2	(10.1)	0.71
Women(n=50); Mean (SD)	61.1	(8.9)	59.2	(8.9)	0.45
Body mass index (kg/m^2)					
Men (n=19); Mean (SD)	25.2	(3.4)	25.0	(3.0)	0.88
Women (n=50); Mean (SD)	24.9	(3.2)	24.4	(3.7)	0.61
Waist circumferences (cm)					
Men (n=19); mean (SD)	91.9	(9.1)	88.6	(5.9)	0.36
Women(n=50); mean (SD)	86.6	(8.1)	84.6	(8.6)	0.40

2. Distribution of knowledge about hypertension at baseline survey

In table 2, there were no statistically significant differences all items of hypertension knowledge at baseline survey between the intervention and the control group ($p > 0.05$).

Table 2: Distribution of knowledge about hypertension at baseline survey

Items	Score	Intervention group (n=34) n	(%)	Control group (n=35) n	(%)	p-value
1. High blood pressure refer to the number as from 140/90 mmHg onward, or it will show either one or two numbers	1	24	(70.6)	22	(62.9)	0.50
	0	10	(29.4)	13	(37.1)	
2. High quantity of eating is a common symptom of hypertensive patient	1	19	(55.9)	21	(60.0)	0.73
	0	15	(44.1)	14	(40.0)	
3. Stroke/heart disease/ renal failure are significant complications of hypertension.	1	33	(97.1)	31	(88.6)	0.18
	0	1	(2.9)	4	(11.4)	
4. Patients who well controlled blood pressure may not need to visit the physician regularly.	1	27	(79.4)	26	(74.3)	0.62
	0	7	(20.6)	9	(25.7)	
5. Eating instant foods, canned product or salted foods are not cause of high blood pressure	1	22	(64.7)	25	(71.4)	0.56
	0	12	(35.3)	10	(28.6)	
6. Regular physical activity (brisk walking, dancing, Chinese martial art) for a 30 minute a day, at least 3 times/week could help for BP controlling.	1	28	(82.4)	26	(74.3)	0.42
	0	6	(17.6)	9	(25.7)	
7. If you are having difficulty of breathing/chest pain, you have to rest.	1	30	(88.2)	33	(94.3)	0.38
	0	4	(11.8)	2	(5.7)	
8. Sleeping well could reduce high blood pressure.	1	29	(85.3)	29	(82.9)	0.78
	0	5	(14.7)	6	(17.1)	
9. Preferable activities such as listening the music, travelling, breathing exercise could reduce high blood pressure.	1	29	(85.3)	23	(65.7)	0.06
	0	5	(14.7)	12	(34.3)	
10. Joining entertain activities could reduce high blood pressure.	1	27	(79.4)	24	(68.6)	0.31
	0	7	(20.6)	11	(31.4)	

3. Attitude towards hypertension at baseline survey

In table 3, there were no statistically significant differences all items of hypertension attitudes at baseline survey between the intervention and the control group ($p > 0.05$).

Table 3: Distribution of attitude towards hypertension at baseline survey

	Items	level	Intervention group (n =34)		Control group(n =35)		p-value
			n	(%)	n	(%)	
1	Only obese people could get high BP	neutral	10	(29.4)	13	(37.1)	0.50
		disagree	24	(70.6)	22	(62.9)	
2	Taking medicine under doctor's prescription is the best way to control BP.	neutral	18	(52.9)	17	(48.6)	0.72
		disagree	16	(47.1)	18	(52.4)	
3	When blood pressure is in normal level (less than 140/90 mmHg), no need to take medicine.	neutral	8	(23.5)	15	(42.9)	0.09
		disagree	26	(76.5)	20	(57.1)	
4	Taking excessive food does not affect to hypertension	neutral	15	(44.1)	9	(25.7)	0.11
		disagree	19	(55.9)	26	(74.3)	
5	Alcohol consumption has good effect for hypertensive patient.	neutral	11	(32.4)	22	(62.9)	0.54
		disagree	23	(67.6)	2	(5.7)	
6	Regular exercise could maintain BP level	agree	34	(100.0)	33	(94.3)	0.16
		neutral	0	(00.0)	2	(5.7)	
7	Chinese martial art (Jinkang kong) may be able to maintain BP level.	agree	29	(85.3)	28	(80.0)	0.82
		neutral	5	(14.7)	7	(20.0)	
8	Laughter may be able to control BP level.	agree	30	(88.2)	26	(74.3)	0.11
		neutral	4	(11.8)	9	(25.8)	
9	Regular sleeping less than 5 hours per day can caused of hypertension.	agree	30	(88.2)	30	(74.3)	0.97
		neutral	4	(11.8)	5	(14.3)	
10	In case of having abnormal shortness of breath, nausea, you must immediately visit doctor.	agree	34	100.0)	35	(100)	0.32

BP = blood pressure

p-value < 0.05. p-value of the each item was calculated by Chi square test for nominal data P value of sum score was calculated by independent t test

4. Practices regarding hypertension at baseline survey.

In table 4, there were no statistically significant differences all items of practice at baseline survey between the intervention and the control group ($p > 0.05$).

Table 4: Distribution of practice regarding hypertension at baseline survey

Items	Day(s)	Intervention (34)		Control (n35)		P value
		n	(%)	n	(%)	
1. Eating a lot of vegetable/fiber such as water Spinach, ivy gourd, collard greens, etc.	5-7	21	(61.8)	17	(48.6)	0.28
	3-4	13	(38.2)	18	(51.4)	
	1-2	0	(0.0)	0	(0.0)	
	0	0	(0.0)	0	(0.0)	
2. Drinking a lot of water for at least 1 liter per day or 8 glasses per day	5-7	13	(38.2)	20	(57.4)	0.17
	3-4	17	(50.0)	12	(34.3)	
	1-2	4	(11.8)	3	(8.6)	
	0	0	(0.0)	0	(0.0)	
3. Dipping or adding sauces, fish sauce, or salt into meals	5-7	0	(0.0)	0	(0.0)	0.82
	3-4	7	(20.6)	6	(17.1)	
	1-2	23	(67.6)	25	(71.4)	
	0	4	(11.8)	4	(11.4)	
4. Eating sweet fruits such as mango rambutan, durian, longan, etc.	5-7	0	(0.0)	0	(0.0)	0.85
	3-4	2	(5.9)	0	(0.0)	
	1-2	23	(67.6)	27	(77.1)	
	0	9	(26.5)	8	(22.9)	
5. Eating high calorie desserts or drinking sugary beverages such as sticky rice with coconut milk and mango	5-7	4	(11.8)	7	(20.0)	0.91
	3-4	9	(26.5)	5	(14.3)	
	1-2	19	(55.9)	20	(57.1)	
	0	2	(5.9)	3	(8.6)	
6. Eating high fat food such as fried eggs, fried fish, Chinese doughnut, etc.	5-7	2	(5.9)	0	(0.0)	0.84
	3-4	5	(14.7)	9	(25.7)	
	1-2	23	(67.6)	21	(60.0)	
	0	4	(11.8)	5	(14.3)	
7. Eating high energy main dishes such as stewed pork leg with rice, Hainanese chicken rice, curry with coconut milk, etc.	5-7	0	(0.0)	0	(0.0)	0.40
	3-4	0	(0.0)	1	(2.9)	
	1-2	23	(67.6)	18	(51.4)	
	0	11	(32.4)	16	(14.3)	
8. Eating seafood such as shrimp, lobster, crab, squid, etc.	5-7	0	(0.0)	0	(0.0)	0.31
	3-4	5	(14.7)	4	(11.4)	
	1-2	18	(52.9)	26	(74.3)	
	0	11	(32.4)	5	(14.3)	
9. Eating pickled foods such as pickled crab, salted fish, pickled oyster, etc.	5-7	0	(0.0)	0	(0.0)	0.74
	3-4	1	(2.9)	0	(0.0)	
	1-2	5	(14.7)	6	(17.1)	
	0	28	(82.4)	29	(82.9)	
10. Eating preserved foods such as canned food, instant noodle, fermented vegetables/fruits, etc	5-7	4	(11.8)	1	(2.9)	0.31
	3-4	9	(26.5)	10	(28.6)	
	1-2	15	(44.1)	16	(45.7)	
	0	6	(17.6)	8	(22.9)	

Items	Day(s)	Intervention (34)		Control (n35)		P value
		n	(%)	n	(%)	
11. Doing household chore for 30 minutes at a time such as sweeping, cleaning, doing laundry, gardening, etc.	5-7	0	(0.0)	0	(0.0)	0.35
	3-4	4	(11.8)	10	(28.6)	
	1-2	29	(85.3)	22	(62.9)	
	0	1	(2.9)	3	(8.6)	
12. Usually exercising for at least 30 minutes such as brisk walking, jogging, swinging arms, etc.	5-7	2	(5.9)	1	(2.9)	0.19
	3-4	9	(26.5)	6	(17.1)	
	1-2	17	(50.0)	18	(51.4)	
	0	6	(17.6)	10	(28.6)	
13.Doing Jinkangkong exercise for at least 30 minutes	0	34	(100)	35	(100)	1.00
14. Using breathing technique	5-7	0	(0.0)	0	(0.0)	0.53
	3-4	0	(0.0)	0	(0.0)	
	1-2	9	(26.5)	7	(20.0)	
	0	25	(73.5)	28	(80.0)	
15. Using laughter for breathing exercise	0	34	(100)	35	(100)	1.00
16. Going outside to do leisure activities such as attending a Buddhist ordination ceremony, going to a party, etc.	5-7	0	(0.0)	0	(0.0)	0.90
	3-4	0	(0.0)	0	(0.0)	
	1-2	16	(47.1)	17	(48.6)	
	0	18	(52.9)	18	(51.4)	
17. Sleeping well at night	5-7	32	(94.1)	28	(80.0)	0.08
	3-4	2	(5.9)	7	(20.0)	
	1-2	0	(0.0)	0	(0.0)	
	0	0	(0.0)	0	(0.0)	
18. Solving problems/overcoming frustration	5-7	30	(88.2)	32	(91.4)	0.67
	3-4	4	(11.8)	3	(8.6)	
	1-2	0	(0.0)	0	(0.0)	
	0	0	(0.0)	0	(0.0)	
19. Controlling emotions/managing stress	5-7	25	(73.5)	30	(85.7)	0.21
	3-4	9	(26.4)	5	(14.3)	
	1-2	0	(0.0)	0	(0.0)	
	0	0	(0.0)	0	(0.0)	
20. Doing leisure time activities: watching TV, listening to songs, travelling, reading magazines, etc.	5-7	4	(11.8)	3	(8.6)	0.28
	3-4	25	(73.5)	23	(65.7)	
	1-2	5	(14.7)	9	(25.7)	
	0	0	(0.0)	0	(0.0)	

P value* < 0.05. P value of the each item was calculated by Chi square test for nominal data
P value of sum score was calculated by independent t test

5. The difference of clinical parameters between the intervention and the control groups by repeated measure ANOVA

5.1 Blood pressure

5.1.1 Systolic blood pressure

Table 5, there was statistically significant difference of systolic blood pressure (SBP) between the intervention group and the control group ($p < 0.001$). For within subjects, there was statistically significant difference between measurements ($p < 0.01$). Interaction, there was no statistically significant difference between measurement of SBP depending on group ($p = 0.419$).

Table 5: Repeated measure ANOVA of systolic blood pressure (SBP) between the intervention group and the control group

Source of variation	SS	df	MS	F	P value
Between subjects					
Intervention	3770162.8	1	3770162.8	1.2	0.000
Within group (error) (between group error)	21515.1	67	321.1		
Within groups					
Time	1184.3	2	592.2	6.9	0.001
Intervention x Time	238.0	2	119.0	1.4	0.251
Intervention x Within group (error) (Within subject error)	11407.3	134	85.1		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 6, there was statistically significant differences of systolic blood pressure (SBP) between the intervention group and the control group at Follow-up of the sixth months ($p < 0.05$).

Table 6: Pairwise comparison of the different measurements of systolic blood pressure (SBP) between the intervention and the control groups

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	-3.5	2.8	-9.0	2.1	0.217
3 Months	Intervention	Control	-0.6	3.5	-7.6	6.3	0.856
6 Months	Intervention	Control	-5.9*	2.9	-11.7	-0.1	0.047

Based on estimated marginal means.

*. The mean differences is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5.1.2 Diastolic blood pressure

In Table 7, there was statistically significant difference of diastolic blood pressure between the intervention group and the control group ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p < 0.05$). Interaction, there was no statistically significant difference between measurement which depend on group ($p>0.05$).

Table 7: Repeated measure ANOVA of diastolic blood pressure between the intervention group and the control group

Source of variation	SS	df	MS	F	P value
Between subjects					
Intervention	1216342.2	1	1216342.2	7391.7	0.000
Within group (error) (between group error)	11025.1	67	164.5		
Within groups					
Time	577.6	2	288.8	4.1	0.018
Intervention x Time	56.8	2	28.4	0.4	0.665
Intervention x Within group (error) (Within subject error)	9309.3	134	69.5		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

Table 8, there was statistically significant differences of diastolic blood pressure between the intervention group and the control group the sixth –month Follow-up ($p < 0.05$).

Table 8: Pairwise comparison of the different measurements of diastolic blood pressure (DBP) between the intervention and the control groups.

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	upper	
Baseline	Intervention	Control	-4.2	2.5	-9.2	-9.2	0.090
3 months	Intervention	Control	-2.3	2.7	-7.7	-7.7	0.388
6 Months	Intervention	Control	-4.5*	2.1	-8.7	-8.7	0.036

Based on estimated marginal means.

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5.2 Serum lipid profile

5.2.1 Total cholesterol (TC)

In Table 9, there was statistically significant difference between the intervention group and the control group ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p < 0.05$). Interaction, there was no statistically significant difference between measurement of Total cholesterol depending on group ($p>0.05$).

Table 9: Repeated measure ANOVA of Total cholesterol between the intervention and the control group

Source of variation	SS	df	MS	F	p-value
Between subjects					
Intervention	8377734.7	1	8377734.7	7.1	0.000
Within group (error) (between group error)	79148.9	67	1181.3		
Within groups					
Time	8300.0	2	4150.0	4.1	0.018
Intervention x Time	4450.3	2	2225.2	2.2	0.114
Intervention x Within group (error) (Within subject error)	135156.4	134	1008.6		
Total					

SS: Sum of square, df: Defree of Freedom, MS: Mean square suares

Table 10, there was statistically significant differences of Total cholesterol (TC) between the intervention group and the control group the sixth months follow-up ($p < 0.05$).

Table 10: Pairwise comparison of the different measurements of Total cholesterol between the intervention and the control groups.

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	3.0	8.2	-13.3	19.3	0.715
3 Months	Intervention	Control	-14.9	8.2	-31.3	1.4	0.072
6 Months	Intervention	Control	-18.1*	7.5	-32.4	-3.7	0.015

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5.2.2 Triglyceride (TG)

Table 11, there was statistically significant difference of triglyceride (TG) between the intervention group and the control group ($p < 0.001$). For within subjects, there was no statistically significant difference between measurements ($p > 0.05$). Interaction, there was no statistically significant difference between measurement which depend on group ($p > 0.05$).

Table 11 Repeated measure ANOVA of triglyceride (TG) between the intervention group and the control group

Source of variation	SS	df	MS	F	P value
Between subjects					
Intervention	4081131.1	1	4081131.1	1.0	0.000
Within group (error) (between group error)	263713.7	67	3936.0		
Within groups					
Time	2715.7	2	1357.8	0.6	0.565
Intervention x Time	1560.3	2	780.1	0.3	0.720
Intervention x Within group (error) (Within subject error)	317038.7	134	2366.0		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 12, there was no statistically significant differences of triglyceride (TG) between the intervention group and the control group at baseline, third months and the sixth months follow-up ($p > 0.05$).

Table 12 Pairwise comparison of the different measurements of triglyceride (TG) between the intervention and the control groups.

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[a]		p-value
					Lower	Upper	
Baseline	Intervention	Control	-1.0	14.4	-29.8	27.8	0.944
3 Months	Intervention	Control	-10.0	12.9	-35.8	15.8	0.441
6 Months	Intervention	Control	-14.2	11.3	-36.7	8.3	0.213

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

5.2.3 Low Density Lipoprotein (LDL)

In Table 13, there was statistically significant difference between the intervention group and the control group ($p < 0.001$). For within subjects, there was no statistically significant difference between measurements ($p > 0.05$). Interaction, there was no statistically significant difference between measurement of LDL which depend on group ($p > 0.05$).

Table 13 Repeated measure ANOVA of LDL between the intervention and the control groups

Source of variation	SS	df	MS	F	p-value
Between subjects					
Intervention	3534332.6	1	3534332.6	4.8	0.000
Within group (error) (between group error)	49203.5	67	734.4		
Within groups					
Time	2947.9	1.8	1640.0	2.0	0.140
Intervention x Time	2608.4	1.8	1451.1	1.8	0.173
Intervention x Within group (error) (Within subject error)	97067.0	120.4	806.0		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 14, there was statistically significant differences of LDL between the intervention group and the control group the sixth months follow-up period ($p < 0.05$).

Table 14 Pairwise comparison of the different measurements LDL between the intervention group and the control group

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	-1.0	14.4	-12.0	15.1	0.824
3 Months	Intervention	Control	-10.0	12.9	-19.9	8.7	0.437
6 Months	Intervention	Control	-14.2	11.3	-26.6	-5.0	0.005

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5.2.4 High Density Lipoprotein (HDL)

Table 15 describes the significant difference of HDL between the intervention group and the control group ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p<0.01$). Interaction, there was no statistically significant difference between measurement of HDL depending on group ($p>0.05$).

Table 16 Repeated measure ANOVA of HDL between the intervention group and the control group

Source of variation	SS	df	MS	F	p-value
Between subjects					
Intervention	490526.2	1	490526.21	6.0	0.000
Within group (error) (between group error)	5506.0	67	82.2		
Within groups					
Time	409.6	2	204.9	3.1	0.050
Intervention x Time	352.1	2	176.1	2.6	0.075
Intervention x Within group (error) (Within subject error)	8945.3	134	66.7		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 17, there was statistically significant differences of HDL between the intervention and the control groups at the sixth month follow-up ($p < 0.01$).

Table 17 Pairwise comparison of the different measurements of HDL between the intervention group and the control group

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	-1.0	14.4	-3.4	4.0	0.867
3 Months	Intervention	Control	-10.0	12.9	0.0	9.0	0.050
6 Months	Intervention	Control	-14.2	11.3	2.6	10.5	0.001

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

6. The difference in knowledge, attitudes and practices between the intervention group and the control group by repeated measure ANOVA

6.1 Change overtime on knowledge about hypertension

Table 18, there was statistically significant difference on knowledge about hypertension between the intervention group and the control group ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p<0.01$). Interaction, there was no statistically significant difference between measurement on knowledge which depend on group ($p>0.05$)

Table 18: Repeated measure ANOVA on knowledge about hypertension between the intervention group and the control group

Source of variation	SS	df	MS	F	P-value
Between subjects					
Intervention	13333.0	1	13333.0	5.1	0.000
Within group (error) (between group error)	175.6	67	2.6		
Within groups					
Time	15.3	2	7.7	8.5	0.000
Intervention x Time	4.0	2	2.0	2.2	0.108
Intervention x Within group (error) (Within subject error)	120.8	134	0.9		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 19, there was statistically significant differences on hypertension knowledge between the intervention group and the control group at third months and the sixth-months follow-up ($p < 0.001$, $P<0.001$).

Table 19 Pairwise comparison of the different measurements of knowledge about hypertension between the intervention and the control groups.

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	0.6	0.3	-0.0	1.3	0.054
3 Months	Intervention	Control	1.1*	0.2	0.6	1.6	0.000
6 Months	Intervention	Control	1.2*	0.3	0.6	1.9	0.000

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

6.2 Change overtime of attitude towards hypertension

In Table 20, there was statistically significant difference on attitudes between the intervention and the control groups ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p<0.01$). Interaction, there was no statistically significant difference between measurement of attitudes depending on group ($p>0.05$)

Table 20: Repeated measure ANOVA of hypertension attitudes between the intervention group and the control group

Source of variation	SS	df	MS	F	P-value
Between subjects					
Intervention	162253.9	1	162253.9	4.4	0.000
Within group (error) (between group error)	248.0	67	3.7		
Within groups					
Time	20.7	2	10.3	7.2	0.001
Intervention x Time	3.6	2	1.8	1.3	0.285
Intervention x Within group (error) (Within subject error)	191.9	134	1.4		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

In Table 21, there was statistically significant differences between the intervention group and the control group of attitudes at the third month and the sixth month follow-up ($p < 0.05$, $P < 0.01$).

Table 21: Pairwise comparison of the different measurements of attitude towards hypertension between the intervention and the control groups

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	0.3	0.4	-0.5	1.1	0.450
3 Months	Intervention	Control	0.8*	0.3	0.2	1.5	0.013
6 Months	Intervention	Control	0.9*	0.3	0.2	1.6	0.008

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

6.3 Change overtime on practice regarding hypertension

In Table 22, there was statistically significant difference between the intervention group and the control group ($p<0.001$). For within subjects, there was statistically significant difference between measurements ($p<0.001$). Interaction, there was no statistically significant difference between measurement of practices depending on group ($p>0.05$).

Table 22: Repeated measure ANOVA of practice regarding hypertension between the intervention group and the control group

Source of variation	SS	df	MS	F	P - value
Between subjects					
Intervention	119686.0	1	119686.0	5.9	0.000
Within group (error) (between group error)	1344.8	67	20.1		
Within groups					
Time	182.1	2	91.1	15.3	0.000
Intervention x Time	33.9	1.7	19.9	2.8	0.071
Intervention x Within group (error) (Within subject error)	799.4	114.0	7.0		
Total					

SS: Sum of square, df: Degrees of Freedom, MS: Mean square squares

Table 23, there was statistically significant differences on practices to hypertension between the intervention group and the control group the sixth months follow-up ($P < 0.05$)

Table 23: Pairwise comparison of the different measurements of practice regarding hypertension between the intervention and the control groups.

time1	GROUP (I)	GROUP (J)	Mean Difference (I-J)	SE	95% Confidence Interval[b]		p-value
					Lower	Upper	
Baseline	Intervention	Control	0.4	0.6	-0.9	1.7	0.571
3 Months	Intervention	Control	1.2	0.7	-0.2	2.6	0.090
6 Months	Intervention	Control	2.3*	1.0	0.4	4.3	0.017

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

7. In-depth interviews regarding sustainability of the LPD program at the follow-up period

To ensure that the success of the LPD program intervention in the intervention group of the necessity to continuously adhere to the LPD program. We randomly selected participants in the intervention group if blood pressure was or greater than 140/90 mmHg and participants who were well controlled of blood pressure less than 140/90 mmHg. Of four questions contained in the interview guideline were used to elicit data from the participants individually and five participants paid attention to the recommended activities only at the clinic where there were healthcare staff to assist them and indicated that the LPD program was useful to remind them of activity engagement. A part of physical activity and exercise, dietary self-control with the logbook, and home visit with leaflets were reflected as follows:

7.1 The characteristics of the interview participants

Table 24: The characteristics of five representative interviewees at month 6

Variables	**n = 5**
Sex, Age (year)	
Men (67,74)	2
Women (65, 68,75)	3
Marital status:	
Widowed	1
Married	4
Occupation: Unemployed/retired	5
Smoking status: Non smoker	5
Alcohol drinking	
Non drinker	3
≤ 2 drinks, occasional time	2
Body mass index (kg/m^2)	
Men: Mean (SD) 23.5±0.2	2
Women: Mean (SD) 23.4±2.4	3
Waist circumferences (cm)	
Men: Mean (SD) 89.5±7.8	2
Women: Mean (SD) 83.3±3.0	3
Blood pressure (mmHg)	
SBP ≥ 140 (129± 16.0)	3
DBP > 90 (71 ±12.1)	1
Serum Lipid profile (mg/dL)	
TC: Mean (SD) 185.0±31.1	5
TG: Mean (SD) 97.6±28.4,	5
LDL: Mean (SD) 122.8±13.6	5
HDL	
Men: Mean (SD) 50.0±7.1	2
Women: Mean (SD) 58.7±7.5	3

7.2 Evaluation of the LPD program at the follow-up period

All interviewees trusted in physician's knowledge to help them to manage their blood pressure well. Therefore, this part describes physical activity and exercise, dietary self-control with the logbook, home visit, and leaflets as follows:-

7.2.1 Physical activity and exercise

Most of the interviewees stated that both laughter and Jinkangkong exercise were useful for their health. They described their opinions on exercise as follows:

- A 75-year-old female participant stated, "*I can do the laughter, a part of LPD program, because it is easy to do by myself. Of course, I like it*"
- A 65-year-old female participant described, *"I sometimes perform only the first posture of the exercise to 'elevate both arms and stretch' because I remember it well and it is easy to do. Also, I can do the 'laughter' because it makes me happy when I burst out 'ha-ha-ha.'"*
- A 67-year-old male participant shared his opinion, *"I usually perform a set of three postures in the morning as you have taught me because I normally exercise every day. Also, all postures are easy to do and they can be done without exerting too much energy."*
- A 68-year-old female participant indicated, *"I like all postures of Jinkangkong exercise; it is gentle for my knees."*
- A 74-year-old male participant stated, *"I like working out to the end of the session to cool down with breathing-in and breathing-out because it is good for my ventilation."*
- A 68-year-old female participant shared her opinion, *"I do only the breathing technique to exercise because I have not much time."*

7.2.2 Dietary self-control with the logbook

Most of the interviewees indicated that using the logbook for dietary self-control was difficult for them because they tended to forget what they had eaten in the past three days. However, two of the interviewees agreed that the logbook helped remind them to be concern with eating well, as exemplified below:

- A 65-year-old female participant stated, *"I expect that my blood pressure will not go up because I take medication on time. I also try to limit salty food intake as you have guided me to, but I eat a lot."*
- A 67-year-old male participant and a 68-year-old female participant indicated that using the logbook remind them to be concerned with eating healthy food and doing relaxing activities such as watching TV.
- A 67-year-old male participant described, *"…Sometimes I drink and enjoy eating Chinese buffet because I think it is my chance to see my friends. Therefore, I have to tick both the healthy food box and the unhealthy food box in the logbook, but it is not the complete truth."*
- A 68-year-old female participant stated, *"I sometime did the program after I returned to the clinic for the physician's appointment or after the home visit when you guided me on what to do. However, there was one more thing; that is, I just forgot!"*
- A 75-year-old female participant agreed that using the logbook was difficult for her without staff assistance because it was hard to recall information and fill it out by herself. Furthermore, one of the participants said that *"I am afraid I can't do it by myself well because it takes too much of my time."*
- A 74- year-old male participant stated that, *"I eat every menu I can. Do you know, when people get into their old age like me, the taste of food is not working well. For example, I have a lot of sweet fruits in my own garden. I love to eat jackfruit and other kind of fruits, I have lost some of my teeth, and it is now hard for me to chew. Thus, your logbook does not work for me to keep track of my food intake because I eat whatever I can. I also have a bottle of beer before my meal because it helps boost my appetite and I can eat more food."*

7.2.3 Home visit and leaflets

All interviewees concluded that home visits were useful as they reminded them of activity engagement as described below:

- A 67-year-old male participant explained that, *"I like it when the nurses came to my house to remind me of which activities I should do. Therefore, I try to follow your program to reduce salt and to exercise."*
- A 68-year-old female participant stated, *"Healthcare staff asked me about the leaflets to remind me of the activities in the LPD program. I can follow them by looking at some pictures included in the leaflets."*

However, they did not read leaflets without healthcare staff to remind them.

7.3 Sustainability of the LPD program

According to the interviews, the participants seemed to adhere to the LPD program at the six-month follow-up only if there were healthcare staff to assist them. A number of the participants discontinued their participation in the program due to various personal reasons, as shown below:

7.3.1 Decision to continue the LPD program

- A 75-year-old female participant explained why she did not adhere to the program, *"I enjoy traveling to other places frequently, I did not pay attention to exercise, so I do not have time to follow the LPD program for now."*
- A 74-year-old male participant indicated, *"I did not continue the program. I only take the medication and return to the clinic as the physician has told me to. I think my blood pressure should not be high."*
- A 68-year-old female participant indicated, *"I have a lot of household chores to do all day such as taking care of my grandsons especially when school closed. Anyway, I can do it if there are healthcare staff members to remind me, and it is better when a nurse visits me at home."*

7.3.2 End of participation in the LPD program

- A 67-year-old male participant explained, *"I know from the LPD program that guide me on how to keep myself physically active, how to eat healthy food and so on, Of course, it is easy to carry on LPD program because I appreciate healthcare staffs who work hard for patients like me. Even I have stopped the LPD program, I can still perform self-care for better health from watching TV media, looking for supplements, and so on"*

- A 65-year-old female participant agreed that family members should be encouraged to participate in the program to help patients in their families adhere to the program activities such as following the physician's instruction, reminding the patients of the physician's appointments, and seeking consultation on the laboratory reports, etc.

APPENDIX G

MANUAL OF LPD PROGRAM

คู่มือโปรแกรมหัวเราะ ออกกำลังกาย และควบคุมอาหารด้วยตนเองสำหรับผู้ป่วยความดันโลหิตสูง

โรงพยาบาลส่งเสริมสุขภาพตำบลบึงคำพร้อย ม.11 ต. บึงคำพร้อย อ. ลำลูกกา จ. ปทุมธานี

ร่วมกับ

วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

พ.ศ. 2558

กำหนดการ

ครั้งที่ 1	**เดือนที่ 1**
08.30-09.00 น.	ลงทะเบียน
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00-09.30 น	เรียนรู้ด้วยกัน “สุขภาพกับโรคความดันโลหิตสูง”
09.30-10.10 น	กิจกรรม หัวเราะ ยืดเส้นออกกำลัง ผ่อนคลายหายใจ
10.10-10.30 น	แนะนำสมุดบันทึกควบคุมอาหารด้วยตนเอง
ครั้งที่ 2	**เดือนที่ 2**
08.30-09.00 น.	ลงทะเบียน
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00 -09.10 น	คุยกัน “คุณทำได้”
09.10-09.30 น	เรียนรู้ด้วยกัน “ลดเค็ม ลดมัน เพิ่มผักเส้นใย”
09.30-09.50น	กิจกรรม กินไปบันทึกตาม
09.50-10.30 น	กิจกรรมหัวเราะ ยืดเส้นออกกำลัง
ครั้งที่ 3	**เดือนที่ 3**
08.30-09.00 น.	ลงทะเบียน
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00 –09.20 น	คุยกันก่อน “เราทำได้”
09.20-09.30 น.	เรียนรู้ด้วยกัน “ประเมินความเครียดแบบง่ายๆ”
09.30-09.50 น.	กิจกรรม กินไปบันทึกตาม
09.50-10.20 น.	กิจกรรม หัวเราะ ยืดเส้นออกกำลัง
10.20-10.30 น	สิ้นสุดกิจกรรม
	จัดเก็บแบบสอบถาม และนัดหมายเจาะเลือด

กำหนดการติดตามผล

ครั้งที่/เวลา	**รายการ**
ครั้งที่ 1	เดือนที่ 4 ติดตามผลครั้งที่ 1
08.30 - 09.00 น.	ลงทะเบียน
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00 - 09.10 น	ติดตาม กินไปบันทึกตาม
	แจกแผ่นพับรายบุคคล
09.10 – 10.10 น.	คัดเลือกตัวแทนเพื่อสัมภาษณ์เชิงลึก
ครั้งที่ 2	เดือนที่ 5 ติดตามผลครั้งที่ 2
08.30 - 09.00 น.	ลงทะเบียน
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00 - 09.10 น	ติดตาม กินไปบันทึกตาม
	แจกแผ่นพับรายบุคคล
09.10 – 10.10 น.	นัดหมายเจาะเลือด และสุ่มเลือกนัดสัมภาษณ์รายบุคคล
ครั้งที่ 3	เดือนที่ 6 กำหนดปิดโครงการ
06.30 – 08.00 น.	ลงทะเบียน เจาะเลือด
	ชั่งน้ำหนัก วัดส่วนสูง ดัชนีมวลกาย รอบเอว ความดันโลหิต
09.00-12.00	เก็บแบบสอบถาม

คำนำ

สมุดบันทึกนี้ จัดทำขึ้นสำหรับให้ผู้ป่วยความดันโลหิตสูงได้บรรลุเป้าหมายในการควบคุมอาหารด้วยตนเอง ประกอบด้วยกิจกรรมเกี่ยวกับการบริโภคอาหาร การออกกำลังกาย อารมณ์และการพักผ่อน โดยสอดแทรกความรู้และการดูแลสุขภาพสำหรับ เป็นแนวทางหนึ่งในการควบคุมความดันฯ และลดความเสี่ยงการเกิดภาวะแทรกซ้อน

ด้วยความปรารถนาดี

นางสาว ลักษณ์วิรุฬม์ โชติศิริ
นิสิตหลักสูตรสาธารณสุขศาสตรดุษฎีบัณฑิต(นานาชาติ)
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย พ.ศ. 2558

ความรู้เกี่ยวกับโรคความดันโลหิตสูง

ความดันโลหิตสูง ระดับความดันเลือดที่วัดได้สูงกว่า หรือเท่ากับ

140/90 มม.ปรอท

อาการของโรค

ระยะแรกมักไม่มีอาการ บางรายจะมีอาการปวดศีรษะบริเวณท้ายทอย มีอาการตอนเช้า เวียนศีรษะ มึนงง ตาพร่า อ่อนเพลีย เลือดกำเดาไหล

อันตรายที่ควรระวัง หากปล่อยทิ้งไว้นานๆ ไม่รักษา จะทำให้ สมอง หัวใจ ตา ไต ถูกทำลายจนเสื่อมสภาพ

ปัจจัยที่มีผลต่อการเกิดโรคความดันโลหิตสูง

ภาพโดย ลักษณ์วิรุฬห์ โชติศิริ, 2557

การดูแลสุขภาพสำหรับผู้ที่เป็นความดันโลหิตสูง

หลักสำคัญ คือ การตรวจรักษาตามแพทย์นัด และรับประทานยาต่อเนื่อง และปรับเปลี่ยนพฤติกรรมประจำวันอย่างเหมาะสม รู้จักเลือกรับประทานอาหารที่เหมาะสมกับโรค ควบคุมน้ำหนักตัว หมั่นออกกำลังกาย จัดการอารมณ์ที่ดี พักผ่อนเพียงพอ งด ละ เลิก เหล้า บุหรี่ แอลกอฮอล์ ของมึนเมา จะช่วยส่งเสริมให้ร่างกายแข็งแรง

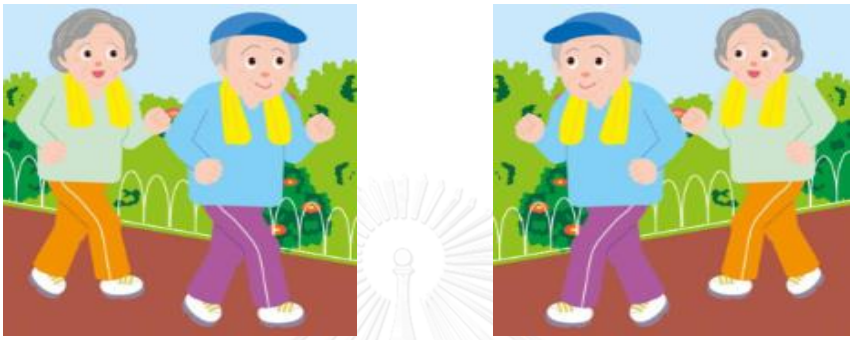
กิจกรรมในการควบคุมอาหารด้วยตนเองในโปรแกรมฯ นี้ การวางเป้าหมายของการมีส่วนร่วมภายใต้หลักการ

“ลดเกลือ ลดเค็ม ลดมัน เพิ่มผักเส้นใย”

ที่มา http://nutrition.anamai.moph.go.th/temp/publication/tong1.jpg

การออกกำลังกาย

การออกกำลังกายที่ง่ายๆ คือ **“การเดิน”** ลดโอกาสเสียชีวิตทุกสาเหตุ



ที่มา http://www.seesketch.com/sketch_file/28/xYRBZaFk1Kq6D.jpg

ตัวอย่างการออกกำลังกายในชีวิตประจำวัน

ระดับ	ตัวอย่าง
เบา	- เดินรอบๆ บ้าน เดินในที่ทำงาน
	- ล้างจาน รีดผ้า จัดเตรียมอาหาร
	- เล่นดนตรี วาดภาพ
	- การรำมวยจีนยืดเส้นแบบจินกังกง
ปานกลาง	- ว่ายน้ำ แบดมินตัน ตีปิงปอง เต้นลีลาศ
	- กวาดบ้าน ขัดห้องน้ำ ล้างรถ ใช้เวลา 1 ชั่วโมง
	- เดิน ระยะทาง 5-7 กิโลเมตรใช้เวลา 1 ชั่วโมง
หนัก	- เดิน เป็นระยะทางเกินกว่า 7 กิโลเมตร ใน 1 ชั่วโมง
	- งานที่ใช้แรง เช่น เก็บเกี่ยวข้าว ขุดดิน ขุดทราย โดยทำต่อเนื่องนาน 1 ชั่วโมง

ขั้นตอนในการออกกำลังกาย

3.1 อบอุ่นเตรียมพร้อมร่างกาย	ใช้เวลา 5 -10 นาที
3.2 ช่วงออกกำลัง	ใช้เวลา 20-30 นาทีต่อเนื่อง
3.3 คลายอุ่นร่างกาย	ใช้เวลา 5 นาที

การออกกำลังกายแบบตะวันออก

การออกกำลังกายแบบตะวันออก เช่น โยคะ ไท้เก๊ก ชี่กง มีงานวิจัยสนับสนุนว่า ช่วยลดความดันโลหิตและระดับน้ำตาลในเลือดได้

การออกกำลังกายแบบจินกังกง เผยแพร่จากอาจารย์จางสื่อช่วน นักพรตเต๋า แห่งประเทศจีน มีความโดดเด่นในการยืดเส้น หมุนเอ็น บิดเอ็น และดึงเอ็น มีทั้งหมด 8 ท่า ผู้วิจัยคัดเลือกเฉพาะท่าที่มีความเหมาะสมแลปลอดภัยกับผู้ป่วยความดันโลหิตสูงจำนวน 3 ท่า และนำไปฝึกปฏิบัติเองได้ง่ายๆ แต่ละท่าจะทำซ้ำ ๆ พร้อมกับการเปล่งเสียงนับ 1, 2, 3, …เป็นจังหวะๆ ใช้เวลารวม 40-50 นาที ควรเลือกสถานที่ที่มีอากาศถ่ายเทสะดวก สงบ จิตจะมีสมาธิ

ผู้วิจัยได้พัฒนาโปรแกรมการออกกำลังกายยืดเส้นแบบจินกังกงในผู้สูงอายุที่เจ็บป่วยด้วยโรคความดันโลหิตสูง โดยจัดให้ออกกำลังกายยืดเส้นแบบจินกังกงดั้งเดิมจำนวน 8 ท่า ความถี่สัปดาห์ละครั้ง ใช้เวลาครั้งละ 60 นาทีอย่างต่อเนื่อง เป็นระยะเวลา 3 เดือนติดต่อกัน พบว่า ความดันค่าบน (systolic blood pressure) ลดลง

การหัวเราะ มีคำกล่าวว่า “หัวเราะต่อเนื่อง 15-20 นาที ช่วยให้หัวใจได้ออกกำลังกาย 3-5 นาทีแล้ว” การหัวเราะ ไม่จำเป็นต้องใช้เหตุผล เพราะเป็นการ

ออกเสียง เปล่งเสียง หรือหลักการทำงานของสมองซีกขวาเกี่ยวกับ อารมณ์ ความรู้สึก จินตนาการ ศิลปะ และการสร้างสรรค์ ในขณะที่สมองซีกซ้าย คือ การใช้ความคิด เหตุผล ตลอดทั้งระเบียบแบบแผน

หัวเราะบำบัด หมายถึง การออกกำลังภายใน หรือ การขยับขับเคลื่อนเส้นประสาทของสรีระร่างกายทั้งภายในภายนอกอย่างเป็นจังหวะ รู้สึกตัว (วัลลภ ปิยะมโนธรรม, 2550) โดยมีเคล็ดลับการหัวเราะบำบัด คือ การให้เส้นประสาทสรีระทางกายทุกระบบ มีการขยับเขยื้อน ขณะที่กาย และจิตต้องเป็นหนึ่งเดียว

ดัชนีมวลกาย* กับ อ้วนลงพุง

ใช้วงล้อดัชนีมวลกาย นำค่าตัวเลขส่วนสูงหน่วยเป็นเซนติเมตร และน้ำหนัก หน่วยเป็นกิโลกรัม หมุนให้ค่าน้ำหนักและส่วนสูงอยู่ในตำแหน่งเดียวกัน แล้วอ่านค่าที่ลูกศรชี้ไปยังตัวเลขในช่องที่เป็นสีต่างๆ ที่แสดงบนหน้าปัทม์

ที่มา : www.spprosupply.org ภาพโดย ลักษณ์วิรุฬห์ โชติศิริ, 2557

การแปลความหมายตามวงล้อประเมินสุขภาพ

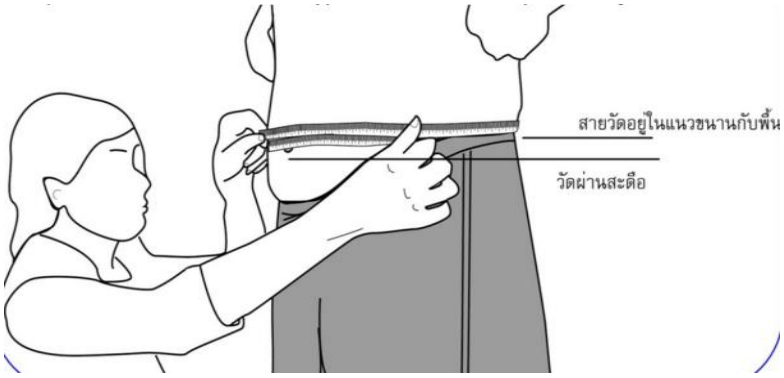
น้อยกว่า 18.5	= สีเหลือง	ผอม น้ำหนักน้อยไป
18.5 - 22.9	= สีเขียว	ปกติ
23.00 -24.9	= สีเขียว	ปกติ (ถึงท้วม)
25.0 – 29.9	= น้ำหนักเกิน (ถึงอ้วน)	
30.0-39.9	= อ้วน (ถึงอ้วนอันตราย)	
40.0 ขึ้นไป	= อ้วนมาก(อ้วนอันตราย)	

รอบเอว การเพิ่มขึ้นของเส้นรอบเอวแสดงถึงโอกาสการเกิดภาวะไขมันในเลือดสูง ความดันโลหิตสูงโรคหัวใจและหลอดเลือด รวมทั้งเบาหวาน มากขึ้นเป็นลำดับ วิธีการวัดแสดงตามภาพ โดยวัดในจังหวะหายใจออก

เส้นรอบเอวที่เหมาะสมในผู้ใหญ่

เพศผู้ชาย ไม่ควรเกิน 90 เซนติเมตร หรือ 36 นิ้ว

เพศหญิง ไม่ควรเกิน 80 เซนติเมตร หรือ 32 นิ้ว



ที่มา http://www.ipensook.com/ipensook/images/appico/article/waist_circumference.jpg

บันทึกการตรวจร่างกาย

มม ปรอท	วันที่	วันที่	วันที่	วันที่	วันที่	วันที่	วันที่	
200								
190								
180								
170								
160								
150								
140								
130								
120								
110								
100								
90								
80								
70								
60								
50								
0								
ชีพจร								ครั้ง/นาที
หายใจ								ครั้ง/นาที
น้ำหนัก								กิโลกรัม
ความสูง								เซนติเมตร
ดัชนีมวลกาย								กก/$ม^2$
เส้นรอบเอว ช<90 ญ<80								เซนติเมตร

ออกแบบโดย ลักษณ์วิรุฬห์ โชติศิริ(2557)

สมุดบันทึก

คำจำกัดความ

1) **การบริโภค** หมายถึง การรับประทานอาหารและเครื่องดื่มต่างๆ ในมื้อหลักๆ จนรู้สึกอิ่ม (ไม่นับรวมการชิม) โดยปฏิบัติประจำวันในช่วงระยะ 7 วันที่ผ่านมา ถึงวันที่จดบันทึก

2) **การออกกำลังกาย** หมายถึง กิจกรรมและการเคลื่อนไหวร่างกายในงานประจำวันจนเหงื่อซึม เช่น ถูบ้าน ขัดพื้น โดยใช้เวลา 20 นาทีอย่างต่อเนื่องโดยปฏิบัติสะสมเฉลี่ย 5- 7 วันหรือ แบ่งปฏิบัติครั้งละไม่น้อยกว่า 10 นาทีโดยไม่หยุดพัก สะสมไว้ 30 นาทีต่อวัน ปฏิบัติให้สม่ำเสมอจำนวน 3 ครั้งต่อสัปดาห์ เช่น รำมวยจีนยืดเส้นแบบจินกังกง เป็นต้น

3) **การพักผ่อน** หมายถึง การแสดงออก หรือ การเสริมสร้างความสุข ผ่านกิจกรรมต่างๆ เช่น การท่องเที่ยว การพักผ่อนตามความชอบ ดูทีวี อ่านหนังสือ ฝึกหายใจแบบผ่อนคลาย (หายใจ โอ-อา) เป็นต้น

วันที่.....
ครั้งที่.....

ตัวอย่างสมุดการบันทึกกิจกรรมฯ

โปรดทำเครื่องหมาย ✓ ตามรายการ ในช่วง 7 วันที่ผ่านมา

รายการ	จำนวนวัน/สัปดาห์			
	0	1-2	3-4	5-7
1. ท่านกินผักใบเขียวต่างๆ เช่น ผักบุ้ง ผักโขม ตำลึง คะน้า ผักหวาน กวางตุ้ง เป็นต้น				
2. ท่านดื่มน้ำอย่างน้อยวันละ 1 ลิตรต่อวัน				
3. ท่านกินผลไม้รสหวานจัดที่มีตามฤดูกาล เช่น เงาะ ลิ้นจี่ ทุเรียน ลำไย น้อยหน่า ขนุน มะม่วงสุก ฯลฯ				
… … …				
20. ท่านดูทีวี/ฟังเพลง/ท่องเที่ยว เพื่อการพักผ่อน				

ภาพโดย ลักษณ์วิรุฬห์ โชติศิริ(2557)

APPENDIX H

PHYSICAL FITNESS TEST

ตัวอย่างแบบคัดกรองสมรรถภาพทางกาย

วัตถุประสงค์ เพื่อประกอบการพิจารณาความพร้อมทางร่างกาย

ฐานทดสอบ	เกณฑ์ผ่าน	ผลการทดสอบ		ผลการประเมิน	
		ครั้งที่ 1	ครั้งที่ 2	ครั้งที่ 1	ครั้งที่ 2
1. ลุก นั่ง ยืน ในเวลา 30 วินาที	8 ครั้งขึ้นไป (นับจำนวนครั้ง)				
2. ลุกนั่งจากเก้าอี้ และเดินไป-กลับ ระยะทาง 8 ฟุต	$\leq$ 9 วินาที (จับเวลา)				

(ที่มา: กองออกกำลังกายเพื่อสุขภาพ กรมอนามัย กระทรวงสาธารณสุข, 2554)

APPENDIX I

STRESS ASSESSMENT

ตัวอย่างแบบประเมินความเครียด (ST-5)

เพื่อประกอบการพิจารณาการคัดเลือกผู้เข้าร่วมการวิจัย

โดยให้คะแนน 0-3 ตามความรู้สึกของของผู้ประเมิน ดังนี้

คะแนน	0	หมายถึง	แทบไม่มี
คะแนน	1	หมายถึง	เป็นบางครั้ง
คะแนน	2	หมายถึง	บ่อยครั้ง
คะแนน	3	หมายถึง	เป็นประจำ

ข้อที่	ในระยะ 2-4 สัปดาห์	คะแนน			
		0	1	2	3
1.	มีปัญหาการนอน นอนไม่หลับหรือนอนมาก				
2.	มีสมาธิน้อยลง				
3.	หงุดหงิด/กระวนกระวายใจ/ว้าวุ่นใจ				
4.	รู้สึกเบื่อ เซ็ง				
5.	ไม่อยากพบปะผู้คน				

ที่มา : กรมสุขภาพจิต กระทรวงสาธารณสุข http://www.dmh.go.th/test/qtest5/

หมายเหตุ *ระดับความเครียดมากขึ้นไป ถือว่ามีความเสี่ยง* **รวม..... คะแนน**

การแปลผล และคำแนะนำในประเมินความเครียด กรมสุขภาพจิต (ST-5)

1. เครียดน้อย (0-4 คะแนน) เป็นความเครียดในชีวิตประจำวัน ซึ่งแต่ละคนสามารถปรับตัวได้เองไม่เกิดปัญหาสุขภาพของตนเอง และท่านสามารถช่วยดูแลบุคคลอื่น ๆ ในครอบครัวและชุมชนได้

2. เครียดปานกลาง (5-7 คะแนน) ในภาวะวิกฤต หรือภัยพิบัติฯ จะทำให้บุคคลต้องเตรียมพร้อมในการจัดการกับปัญหาต่าง ๆ จนทำให้เกิดความเครียดเพิ่มขึ้นในระดับปานกลาง ซึ่งยังถือว่าเป็นปกติเพราะทำให้เกิดความกระตือรือร้นในการเผชิญปัญหา

3. เครียดมาก (8-9 คะแนน) ในภาวะวิกฤตหรือภัยพิบัติต่าง ๆ อาจทำให้เกิดการตอบสนองที่รุนแรงขึ้นชั่วคราว ซึ่งมักจะลดมาเป็นปกติหลังเหตุการณ์ อย่างไรก็ตามท่านควรมีการจัดการกับความเครียดดังต่อไปนี้

1) การฝึกการหายใจคลายเครียด
2) การพูดคุยกับคนใกล้ชิด สวดมนต์ไหว้พระ การช่วยเหลือผู้อื่นที่ประสพปัญหา จะช่วยให้ความเครียดลดลง
3) การมีความหวังว่า เราจะฝ่าฟันอุปสรรคหรือปัญหาครั้งนี้ไปได้และมองเห็นด้านบวก เช่น ช่วยรักษาชีวิตไว้ได้ มีคนเห็นใจ และมีการช่วยเหลือจากฝ่ายต่าง ๆ
4) มองข้ามความขัดแย้งเก่า ๆ ในอดีตและช่วยให้ชุมชนผ่านวิกฤตไปได้
5) ภายใน 2 สัปดาห์ ท่านควรไปพบแพทย์ เพื่อประเมินซ้ำว่า ความเครียดลดลงหรือไม่ เพราะความเครียดที่มากและต่อเนื่อง อาจนำไปสู่โรควิตกกังวล ภาวะซึมเศร้า และเสี่ยงต่อการฆ่าตัวตายได้ ซึ่งจะต้องได้รับการรักษาจากแพทย์

4.เครียดมากที่สุด (10-15 คะแนน) เป็นความเครียดที่รุนแรงซึ่งส่งผลกระทบต่อภาวะร่างกาย ทำให้อ่อนแอ เจ็บป่วยง่าย และต่อภาวะจิตใจจนอาจทำให้เกิดโรควิตกกังวล ภาวะซึมเศร้า และเสี่ยงต่อการฆ่าตัวตายจะต้องได้รับการรักษาจากแพทย์ทันที และได้รับการดูแลต่อเนื่องไปอีก 3-6 เดือน

APPENDIX J

CERTIFICATE OF APPROVAL

AF 01-12

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

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COA No. 178/2557

ใบรับรองโครงการวิจัย

โครงการวิจัยที่ 185/57 : ประสิทธิผลของการบูรณาการโปรแกรมการหัวเราะ ออกกำลังกาย และควบคุมอาหารด้วยตนเอง สำหรับผู้ป่วยความดันโลหิตสูงในชุมชน จังหวัดปทุมธานี ประเทศไทย

ผู้วิจัยหลัก : นางสาวลักษณ์วิรุฬห์ โชติศิริ

หน่วยงาน : วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

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

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

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

วันที่รับรอง : 9 ธันวาคม 2557 **วันหมดอายุ** : 8 ธันวาคม 2558

เอกสารที่คณะกรรมการรับรอง

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

หนังสือรับรองของคณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1
เลขที่โครงการวิจัย 185/57
วันที่รับรอง - 9 ธ.ค. 2557
วันหมดอายุ - 8 ธ.ค. 2558

เงื่อนไข

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

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APPENDIX

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