THESIS

THE EFFECT OF LIFESTYLE MODIFICATION PROGRAM ON BEHAVIOR CHANGE AND PHYSICAL CONDITIONS AMONG HYPERTENSIVE ELDERS IN NORTH BEKASI SUB-DISTRICT, WEST JAVA, INDONESIA

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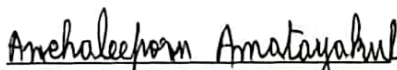
NENENG KURWIYAH IHWANUDIN

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The prevention and management of hypertension are major public health challenges; one of them is lifestyle modification. The purpose of this study was to evaluate the effect of lifestyle modification program on behaviour change and physical conditions in hypertensive elders. A quasi experimental design with pre and post-test in two groups as an intervention group and comparison group was employed in this study. A number of 29 hypertensive elders aged 60-70 years old for each group were randomly selected from 2 PHC. The intervention group received the lifestyle modification program in 8 weeks; while the comparison group received routine care. Data were collected by self-administered questionnaire and physical examination. Statistical analysis was performed by using mean, standard deviation, frequency, percentage, Paired t-test, and Independent Sample t-test.

The result showed that the mean scores of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy on overcoming barriers, and self-regulation in physical exercise and DASH eating plan of the intervention group were significantly higher than before participating lifestyle modification program ($p < .05$), the physical conditions including BMI, Blood pressure, Cholesterol, LDL, and Triglyceride decreased. Nevertheless, HR and HDL increased ($p < .05$). In conclusion, the lifestyle modification program has positive effect on behaviour change and physical conditions, it can be one of the most essential methods in chronic diseases prevention, cure and control as in hypertensive elders.

_____ Anchaleeporn Amatayakul 11 / 01 / 2015
Student's signature   Thesis Advisor's signature

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LIST OF ABBREVIATIONS

WHO	=	world health organization
RDBH	=	research and development bureau of health
JNC	=	joint national committee
DASH	=	dietary approach to stop hypertension
NHNES	=	national health and nutrition examination survey
SCT	=	social cognitive theory
BMI	=	body mass index
HDL	=	high density lipoprotein
LDL	=	low density lipoprotein
SBP	=	systolic blood pressure
DBP	=	diastolic blood pressure
CDC	=	center of disease control
AHA	=	American heart association
BHR	=	basic health research
PHC		primary health center
NHLBI	=	National heart, lung, and blood institute
ADL	=	activities daily living
DCQ	=	demographic characteristic questionnaire
HELM	=	hypertension evaluation of lifestyle and management knowledge
SCCPE	=	social cognitive construct to physical exercise questionnaire
SCCDASH	=	social cognitive construct to dietary approach to stop hypertension questionnaire
K	=	knowledge
SP	=	situational perception
SE	=	self-efficacy
OE	=	outcome expectation
SEOB	=	self-efficacy in overcoming barriers
SR	=	self-regulation

LIST OF ABBREVIATIONS (Continued)

CVI	=	content validity index
Cm	=	Centimeter
Bpm	=	beats per minute
MET	=	metabolic equivalent
HBM	=	health belief model
TPB	=	theory of planned behavior
PA	=	physical activity
MIE	=	moderate intensity exercise
HR	=	heart rate
Kg	=	kilogram
m	=	meter
mg/dl	=	milligram per deciliter
mmHg	=	millimeters of mercury
IDR	=	Indonesian rupiah
M	=	median
SD	=	standard deviation

THE EFFECT OF LIFESTYLE MODIFICATION PROGRAM ON BEHAVIOR CHANGE AND PHYSICAL CONDITIONS AMONG HYPERTENSIVE ELDERS

INTRODUCTION

Hypertension has been a significant health problem for elderly worldwide because it has become a common chronic disease for them, and a leading risk factor for many diseases which have been costly and has contributed to the morbidity and mortality rates (Frost and Ihab, 2006). World Health Organization [WHO] (2009) reported that hypertension was the third leading cause of death in the world. It caused almost 8 million deaths every year worldwide. Among these deaths, nearly 1.5 million of them were from South-East Asia Region (WHO, 2011). In Indonesia, around 31.7% of the total population suffered from hypertension, and it also became the third leading cause of death after stroke and tuberculosis (Research and Development Bureau of Health [RDBH], 2007). Considering West Java's growing elderly population, a rapid increase in the prevalence of this disease was expected and hypertension was considered to be one of the major diseases in outpatient hospitals and was a disease ranked as the top causes of death (Ministry of Health of West Java Province, 2010). The prevention and management of hypertension are major public health challenges, if blood pressure could be prevented or diminished, a great deal of hypertension, cardiovascular, and renal disease, as well as stroke might be prevented (Chobanian *et al.*, 2003).

Treatment of hypertension, composed of pharmacologic and non-pharmacologic treatments, aimed to keep lower blood pressure between <140/90mmHg and <130/80mmHg in elderly people with diabetes or chronic renal insufficiency (Aronow, 2008). Drug combination therapy should be offered early in the treatment and in the presence of subclinical organ damage, cardiovascular disease, renal disease, or diabetes with low doses titrated gradually with regular monitoring for side effects and adherenceto therapy (Gibson, 2009). Furthermore, the joint national

committee onprevention, detection, valuation and treatment of high blood pressure [JNC] suggested a lifestyle modification besides drug medication in the prevention and treatment of hypertension. There were five component lifestyle modifications that were recommended by the JNC for reducing blood pressure. The components were: losing weight, managing diet or the application of a combination of a Dietary Approach to Stop Hypertension [DASH], reducing salt intake, doing regular physical activity, limiting alcohol intake, and also quitting smoking (Chobanian, 2003).

Several studies (Fritz, and Kachur, 2009; Nguyen *et al.*, 2012; Acelajado, 2013), conducted in terms of lifestyle modification, had investigated that there were many influencing factors that provided an effective way to manage hypertension in elderly people. The most significant effective behavior was an exercise program and a diet approach to stop hypertension (Lin, 2007; Shin, 2009; Janney and Goldberg, 2010). In particular, the Dietary Approaches to Stop Hypertension [DASH] had played an important role in the handling of particular older people with hypertension. The DASH study demonstrated that blood pressure can be significantly reduced with an increase consumption of a high fiber and a low fat diet that consisted of fruits, vegetables, complex carbohydrates, and low fat dairy products (Karanja, 2004). Many experimental studies conducted on DASH showed good results for the participants who took part in this intervention, thus it led to a significantly lower blood pressure (Lin, 2007; Fernandez, 2008; Goldberg, 2010). However, the incidence of ineffective health maintenance was high among older adults, as evidenced by the lack of participation in healthy behavior such as exercise and healthy diets (Resnick, 2011). Approximately, 22% to 47% of older women and 18% to 37% of older men did not engage in regular exercise (Crane and Wallace, 2007; Hsia *et al.*, 2007; Rosamond *et al.*, 2008). According to the National Health and Nutrition Examination Survey [NHNES] (Diaz *et al.*, 2007), 11% to 63.3% of adults met healthy diet parameters. Meanwhile, 20% to 60% of older adults did not adhere to prescribe medications (DiMatteo, 2004). The low levels of lifestyle modification in older people with hypertension may have been a

function of individual, social and psychological factors (Didarloo *et al.*, 2011). Lifestyle modification was a complex behavior influenced by multiple factors within environmental, social, cultural, psychological, and cognitive domains (Springer *et al.*, 2006). The current challenges to health care provider, researcher, government official, and the general public is developing and implementing effective clinical and public health strategies that lead to sustained lifestyle modification (Appel *et al.*, 2003).

In West Java Indonesia, elderly people with hypertension were highly resistant to following lifestyle modifications although the health personnel had already discussed the importance of lifestyle modifications, and regardless that blood pressure was still high in some elderly with hypertension after taking antihypertensive medication (Ministry of Health of West Java Province, 2010). During this time, hypertensive patients tended to only rely on medication to keep low blood pressure, few of them participated in physical exercise, less consumed vegetables and fruits, but consumed salty foods and used monosodium glutamate [MSG] on cuisine, and consumed foods high in fat and also smoked tobacco product. Only 45% among elderly with hypertension followed the treatment and lifestyle modification Ministry of Health of West Java Province, 2013). The current situation, which had only a limited amount of time to give information about lifestyle modification without a structured meeting place or time, few study used any theoretical framework yet. Thus, educational information was established between the health care provider and elderly with hypertension so it could achieve a goal, such as understanding elderly with hypertension and lifestyle modification in detail, which could also be used to evaluate the sustainability of this program by observing changes in elderly hypertension with these types of hypertensive behaviors. Therefore, the intervention was based on the theory that was more effective in health related behaviors than those compared to intervention without theoretical framework, since developed intervention as well as guides could be used in the evaluation of the intervention (Plotnikoff *et al.*, 2008). In addition, the aspect that highly affected behaviors when nursing intervention of health behavior were interpersonal aspects that were best guided by the Social Cognitive Theory [SCT] (Resnick, 2011).

Social Cognitive Theory [SCT] was well recognized as a useful framework for designing lifestyle modification interventions (Glans *et al.*, 1997). According to Mahdizadeh *et al.* (2013), SCT proposed that personal, environmental, and behavioral factors operated as reciprocal, interacting determinants of each other. Thus, lifestyle modification behavior was considered within a dynamic, interacting causal system. Within the causal system, SCT identified cognitive processes as key mediators between external stimuli, such as an intervention, and behavior, such as lifestyle modification. Cognitive processes estimated the influences of an individual's ability to control lifestyle modification and its determinants (i.e., personal, environmental, and behavioral factors) (Bandura 1986). Personal factors that influenced lifestyle modification included the demographic variables, as well as the potential easiness to set up psychosocial variables such as self-efficacy, outcome expectations [OE], and self- regulation [SR]. According to Bandura (1986), the environment also played a key factor to the adherence to lifestyle modification which involved social support. Besides that the SCT (Bandura, 1997) mentioned that human motivation and action were regulated by forethought. This cognitive control of behavior was based on two types of expectations: (1) self-efficacy expectations, which were an individual's beliefs in their capabilities to perform a course of action to attain a desired outcome and (2) outcome expectancies, which were the beliefs that a certain consequence, will be produced by personal action. The theory of self-efficacy suggested that the stronger the individual's self-efficacy and outcome expectations, the more likely he or she will initiate and persist with a given activity.

The health education program about lifestyle modification was one of the most essential methods in chronic diseases prevention, cure and control as in elderly people with hypertension. It would be very important among those who were unwilling to change, and thus a health educational program was very important to recover these people (Mahdizadeh *et al.*, 2013). Therefore, the lifestyle modification program for elderly such as physical exercise, healthy food consumption, were important and essential to the elderly with hypertension based on the theoretical framework that must easily be used to evaluate and sustain the program in Indonesia especially West Java

because at the time there was no findings about the health education program that used theoretical framework and also the elderly population had still increased while leading to an increase number of people with hypertension in this population. A study conducted by Dewar *et al.* (2012) used SCT as a guiding intervention for adolescent diet behaviors which could be used to promote diet behaviors in adolescents. Another study conducted by Short *et al.* (2013) demonstrated the utility of SCT for guiding physical activity program among breast cancer survivors and the result was SCT could promote physical activity among breast cancer survivors, and also a study conducted by Mahdizadeh *et al.* (2013) applied SCT as a guide for the health education program on physical activity among diabetic women in Iran which showed physical activity could promote a healthy lifestyle among diabetic women.

Consequently, the researcher had analyzed that SCT construction of lifestyle modification program was appropriate and could be used for behavior adjustment among elderly people with hypertension. It was created self-efficacy expectations among the elderly that were hypertensive providing them with the ability to practice such behavior which also had an effect on their own health strengthening.

OBJECTIVES

This section explains the objectives of the study. The objectives of the study were divided into two parts; general objective and specific objectives.

1. General objective

The general objective of this study was to evaluate the effectiveness of the lifestyle modification program on behavior change and physical conditions based on SCT construction among hypertensive elders.

2. Specific objectives

2.1 To compare level of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation on physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Total Cholesterol, HDL, LDL, and Triglyceride between pre-test and post-test intervention of lifestyle modification program on behavior change and physical conditions in the intervention group.

2.2 To compare level of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation on physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Total Cholesterol, HDL, LDL, and Triglyceride between pre-test and post-test intervention of lifestyle modification program on behavior change and physical conditions in the comparison group.

2.3 To compare the level of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation on physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Total Cholesterol, HDL, LDL, and Triglyceride

between the intervention group and comparison group after intervention of lifestyle modification program on behavior change and physical conditions.

LITERATURE REVIEW

This part describes literature review of hypertension, and elderly relating to aging process and theory, lifestyle modification, the behavior theory to lifestyle modification, the application construct of Social Cognitive Theory to lifestyle modification, conceptual framework, and definitions of terms. The reviews of literature were as follows:

1. Hypertension

1.1 Definition of hypertension

The definition of hypertension used in many studies and textbooks are based on the Seventh Report of the Joint National Committee (JNC) on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. According to the consensus, hypertension in the elderly is established by demonstrating a systolic blood pressure (SBP) $\geq$ 140 mm Hg and/ or a diastolic blood pressure (DBP) $\geq$ 90 mm Hg on at least 2 occasions (Aronow *et al.*, 2011). Based on the JNC VII the hypertension stages has been classified into four classifications including the normal BP, pre hypertension, hypertension stage 1, and hypertension stage 2 (Chobanian, 2003) (for more details can be seen in table 1 on page 8). These classifications are useful in determining hypertension, in elderly. Similarly, Melchiors *et al.* (2010) defined hypertension in the elderly (aged 60 years and older) dealing with their present SBP $\geq$ 140 mm Hg and DBP $\geq$ 90 mm Hg. Briefly, this study focused on the elderly with hypertension in stage 1 and 2 with SBP $\geq$ 140 mm Hg and DBP $\geq$ 90 mm Hg. Therefore, hypertension in the elderly in this study refer to individual aged 60-70 years old who SBP level $\geq$ 140-160 mm Hg and DBP $\geq$ 90-100 mm Hg or stage 1 and 2 hypertension on at least 2 occasions by manual measurement.

Table 1 Classification of blood pressure based on the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High blood Pressure (JNC 7).

BP Classification	Systolic BP (mm Hg)		Diastolic BP (mm Hg)
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

Source: Chobanian (2003)

1.2 Causes of hypertension

Causes of hypertension can be classified based on primary (essential or idiopathic) and secondary hypertension. Primary hypertension refers to systemic hypertension of unknown cause which results from deregulation of normal homeostatic control mechanism of blood pressure. This type of hypertension occurs more than 95% of all cases. Secondary hypertension was systemic hypertension because of an underlying disorder such as renal disorder, endocrine disorder, and acute stresses (Sue, 2011). Some of the risk factors can influence the hypertension including age, gender, ethnicity, genetic, socioeconomic status, lower education, and life style (e.g. overweight, tobacco, alcohol, caffeine, dietary pattern, and physical inactivity) (Hajjar *et al.*, 2006; Aronow *et al.*, 2011; Miller, 2012). In older people, hypertension takes place because of aging process, secondary hypertension, and development of risk factors (Aronow *et al.*, 2011).

1.3 Signs and symptoms of hypertension

Hypertension or high blood pressure usually causes asymptomatic or no symptoms. It is labeled as a "silent killer" (Aronow *et al.*, 2011; Hartono, 2011). When an individual has extremely high blood pressure, there are common signs and

symptoms such as headache, dizziness, blurred vision, fatigue, nausea and vomiting, chest pain, and shortness of breath (Aronow *et al.*, 2011; Wedro, 2013).

1.4 Complications of hypertension

In most hypertension cases, cerebrovascular disease (stroke) is a common complication of hypertension (Fernandez *et al.*, 2008). Other complications can be coronary artery disease, heart failure, chronic kidney disease, and ophthalmologic impairment (Fernandez *et al.*, 2008).

1.5 Treatment of hypertension

The primary objective of hypertension treatment is to reduce BP in which SBP level to below 140 mm Hg and DBP level to below 90 mm Hg (Tan *et al.*, 2009). There are two kinds of treatment recommended to achieve the ultimate goal in hypertension treatment. They are lifestyle modification and pharmacological therapy. Lifestyle modification or non-pharmacological treatment may be necessary for preventing or treating milder forms of hypertension (Aronow *et al.*, 2011). Lifestyle modifications are as follows: smoking cessation, reduction in excess body weight and mental stress, increased physical activity, cessation of alcohol consumption, reduction of salt intake, and other dietary changes (Chobanian, 2003; Aronow *et al.*, and Meiner, 2011).

Pharmacological management is equally important for reducing BP. Initially, antihypertensive drugs should be started at the lowest dose and gradually increased depending on BP response. Some medications such as diuretics, beta adrenergic blockers, alpha adrenergic blocking agents, calcium antagonists, and angiotensin converting enzyme inhibitors are usually used in pharmacological management (Aronow *et al.*, 2011). Presently, most studies in health care including examine the impacts of medication treatment because most of antihypertensive drugs have side effects such as headaches, dizziness, arrhythmias, and fatigue (Yeung, 2006;

Joshi *et al.*, 2010; Aronow *et al.*, 2011). These conditions will increase hypertensive patients to abandon the treatment.

2. The Aging and Theory Process among Elderly

2.1 Definition of elderly

This part explains some definitions of the elderly. The elderly were individuals aged 50 years and older (Elioppoulus, 2010). Meiner, (2011) defined as someone who had a retirement age, that was 60 years old or more. Similarly, Crandell *et al.* (2012) explained that an older person was an individual aged 60 years and older. Additionally, elderly was a person who had reached the age of 60 years and over (Law of The Republic of Indonesia, 1998).

The people that were older than 65 years of age represented more than 12% of the population in United States (Elioppoulus, 2010). It was predicted that the growing number of people in this age group will total 17% of the population by 2020. Likewise, the percentage of elderly in nearly every nation had shown growth, this aging trend was particularly light in parts of Asia. Projections indicated that the portion of the population age 65 and older will more than triple in China, India, and Indonesia and more than double in Japan between 2000 and 2050 (United Nations, 2011). The number of people in the population that were 60 years old and above in Indonesia will increase from 18.1 million in 2010 to 29.1 million in 2020 or approximately 11.4% of the total population and 36 million in 2025. The current number of elderly has reached about 23 million (Indonesia Country Report, 2013). According to the data center and information ministry of health (2013), West Java included eleven provinces which higher elderly population. Rapidly increasing aging populations followed increased chronic diseases especially hypertension. Hypertension has been a significant health problem for elderly worldwide because it has been common chronic disease in elderly people, and a leading risk factor for many diseases which have been costly and has contributed to the morbidity and mortality rates (Frost and Ihab, 2006). Based on the Centre of Disease Control and prevention [CDC] (2007)

reported that, about 70% of people older than 65 years and about 80% of people older than 75 years in the world have been diagnosed with hypertension. This number will continue to increase globally due to an aging population, population growth, urbanization, and the high prevalence of the risk factors of obesity, diabetes mellitus, increased salt intake, hyperlipidemia, smoking, lack of physical activity, psychological factors, age and gender (World Health Organization [WHO], 2008). This condition has also been apparent in the Republic of Korea, the prevalence of hypertensive elderly increased in 2011 to about 29.2% (Moon *et al.*, 2013). Whereas, in Indonesia the elderly with hypertension based on Basic Health Research [BHR] (2007) was 22.3%. Considering West Java's growing elderly population, a rapid increase in the prevalence of this disease was expected and hypertension was considered to be one of the major diseases in outpatient hospital and was a disease ranked as the top causes of death (Department of Health West Java Province, 2010). As has been mentioned before, increased chronic diseases accordance with increasing aging populations. Aging process followed structure and function changing. To provide more specific information about elderly, a description below is given related to the aging process, and aging theory. Since most of definitions of elderly were 60 and over, this study used elderly who were between the aged of aged 60-70.

2.2 Aging process

Aging was viewed as a total process that begins at conception (Meiner, 2011). Meiner (2011), it was also mentioned that the aging process varied not only with individuals, but also within different body systems of some people because individuals had a unique genetic, social, psychology and economic factors involved in their lives. Various changes during the aging process demanded multiple adjustments that required stamina, ability, and flexibility. The common aging changes included the following changes to the body such as: cells, physical appearance, respiratory system, cardiovascular system, gastrointestinal system, urinary system, reproductive system, musculoskeletal system, neurological system, sensory organs (vision, hearing, taste and smell, touch,), endocrine system, integumentary system, immune system, and thermoregulation. The changes related to the cardiovascular system with increased age

involved increased thickness and stiffness of the heart valves due to sclerosis and fibrosis (Eliopoulos, 2010). The heart becomes dilated and a slight ventricular hypertrophy develops and the heart muscle is then less efficient and loses some of its contractile strength, causing a reduction in cardiac output when the demands on the heart were increased. Moreover, the end result of the arterial thickness and stiffness in older people considered part of aging process was the development of isolated systolic hypertension (Franklin, 2006). In addition, stiffening disease, an age related degeneration of the elastic elements of the thoracic aorta, was associated with a widening of brachial pulse pressure (Kass, 2005). This change was influenced by the phasic mechanical stresses imposed on the blood vessels that in turn were important to regulating smooth muscle tone, endothelial function, and vascular health. Besides, the heart typically will adapt when confronting higher systolic loads by both hypertrophy and ventricular stiffening, and higher ventricular and arterial stiffness provide essential implications to blood pressure liability and loading sensitivity. Besides that, the common aging process also caused changes to the mind such as: personality, memory, intelligence, learning, and attention span (Eliopoulos, 2010).

2.3 Aging theory

Theories of aging attempted to explain the phenomena of aging as it occurred over the life span (Meiner, 2011). These theories consisted of:

First, biological theories of aging fell into two groups that consisted of programmed theories and error theories. The programmed theories asserted that normal cells divided a limited number of times, that aging followed a biological timetable and may have represented a continuation of cycle that regulated childhood growth and development. Programmed longevity, endocrine, metabolic theory, and immunological theory were included in this theory. However, error theories were based on the idea that errors could occur in the transcription of the synthesis of deoxyribonucleic acid [DNA]. The human system that gradually impaired and led to a system that did not function at an optimum level. Free radical theory, cross-linkage theory, wear and tear theory were included in this theory.

Second, sociologic theories of aging - these theories focused on the changing roles and relationships that were part of these factors. In some respects, these sociologic theories related to various social adaptations in the lives of elderly. These theories consisted of disengagement theory, developmental task theories, continuity theories, age stratification theories, and person- environment theories. The disengagement theories stated that elderly withdrew from society and society supported this withdrawal. In activity or development task theories the elderly needed to be active to age successfully. Activity was necessary to maintain life satisfaction and self-concept. In continuity theories the elderly have responded to aging the same way they have responded to the environment.

Third, the psychological theories of aging stated that development does not end when the person reached an older age, but it remained a dynamic process throughout the life span of that person. These theories consisted of Maslow's hierarchy of human need, Jungs's theory of individualism, Erikson's eight stages of life, Peck's expansion of Erikson's theory, and selective optimization with compensation. The Maslow's hierarchy of human needs mentioned that each individual had an innate internal hierarchy of needs that motivated all human behavior. Jungs's theory of individualism mentioned that development was viewed as occurring throughout adulthood, with self- realization as the goal of personality development, so as an individual aged they were capable of transforming themselves into a more spiritual being. Erikson's eight stages of life stated that all people experienced eight psychosocial stages during the course of a life time. Each stage represented a crisis, where the goal was to integrate physical maturation and psychosocial demands. Peck's expansion of Erikson's theory described Erikson' theory but was divided into two stages. The selective optimization with compensation mentioned that physical capacity diminished with aged. An individual who aged successfully compensated for deficits through selection, optimization, and compensation.

In summary, the populations of elderly people with the high risk for hypertension disease related to the aging theory are the ones whose arterial blood vessels have decrease as they age due to the elasticity of their arteries. Normally the

heart pumps blood around the body through the blood vessels, but when the arteries become rigid the heart pumps blood around the body through the blood vessels with more force than normal; this is known as, elastic arteries. Blood pressure is the amount of force exerted on the artery walls by blood that is being pumped. Therefore, high blood pressure (hypertension) means that blood is pumping with more force than normal through the arteries. High blood pressure in this study was a condition which studied the blood vessel capacity of people that were aged 60 to 75 years old and were still able to do physical exercise and still had good functions related to cognition. This population was at a high risk for hypertension disease in relation to the aging theory.

3. Lifestyle Modification for Elderly People with Hypertension

Based on the JNC, which suggested that lifestyle modification could prevent complications and control blood pressure, there were five component lifestyle modifications that were recommended by the JNC for reducing blood pressure. The components were: losing weight, managing diet or DASH, reducing salt intake, doing regular physical activity, limiting alcohol intake, and also quitting smoking. From the several factors above, there were two main significant lifestyle factors to control or manage blood pressure for elderly people with hypertension such as physical exercise and diet modification to aid stopping hypertension.

3.1 Physical Exercise for elderly people with hypertension

Physical activity was important for elderly to maintain health, preserve the ability to perform activities of daily living [ADLs], and improve their general quality of life (Resnick, 2011). The benefits of physical activity included prevention of heart disease, a reduction of blood pressure, reduced risk of osteoporosis, promotion of appropriate weight, and promotion of more restful sleep (Schoenborn *et al.*, 2006). Besides, the physiologic benefits of regular physical activity were related to: increased HDL cholesterol levels, reduced blood pressure, increased cardiovascular functional capacity, decreased myocardial oxygen demand, lowered plasma insulin levels with improved glucose tolerance, decreased platelet adhesiveness and fibro lytic activity

(Keller *et al.*, 2003). Also, physical exercise provided strong protective benefits against every level of pathogenic events that resulted in coronary artery disease. Blood pressure, serum lipids, blood coagulation, cardiac reserve, and the dimensions of the arteries all directly benefits from exercise. Physical activity reduced unfavorable blood lipids and increased the HDL cholesterol. According to Resnick (2011), exercise preserved mobility by promoting muscle strength and joint flexibility, and it reduced the risk of falling by increasing agility. Elderly exercised for a variety of reasons (Schoenborn *et al.*, 2006). They exercised to have fun, socialize with friends and neighbors, and to simply feel better. Exercise was used to reduce stress, to promote relaxation, and together with a good nutritional program, to control weight.

3.1.1 Types of exercise

The National Institute on Aging (2010) recommended that exercise and physical activity fell into three categories or three types of exercise: aerobic, flexibility, and strength training.

Aerobic exercise - aerobic training was suggested or recommended for   elderly people to perform this type of exercise to promote health and fitness. The cardiopulmonary endurance could be enhanced by aerobic exercise, thus the ability of the heart, lungs, and blood vessels to deliver oxygen to all body cells could increase. Aerobic exercise included walking, jogging, cycling, swimming, rowing, tennis, and aerobic dancing. To achieve cardiac endurance, exercise must be performed long enough to require a continuous supply of oxygen, which puts a demand on the cardiopulmonary system to reach at least 55% of the maximum heart rate (Maximum heart rate = 220 – age, target heart rate = maximum heart rate x 75%, target heart rate range = 65% to 80% of maximum heart rate). Ideally, the heart rate should fall within the target heart rate range during exercise. Moreover, depending on the exercise, any activity should be done for at least 20 minutes, at least 3 days a week.

Flexibility exercise - the ability to freely move muscle and joints

through their range of motion was another part of physical fitness. Gentle stretching exercise helped to maintain flexibility of joints and muscles, stretching exercises for about 5 to 10 minutes before and after other exercises could reduce muscle soreness. Major muscle groups should be stretched at least twice weekly.

Strength training - strength and endurance were enhanced by exercise that challenged the muscles. The important elements of strength training were resistance and progression. Resistance could be achieved by lifting weights and the use of weight machines or isometric exercise such as push-up and pull-ups. The recommendations were for elderly people to exercise a muscle through a set of 8 to 12 repetitions at least twice weekly.

Elderly should begin an exercise program with a 10 to 15 minute warm up to achieve 75% of their maximum heart rate safety. For many people who wanted to progress quickly, this led to an increased chance of injuries. Walking was the best aerobic exercise for older adults. They could set their own pace, decided on the location and avoided injuries. When elderly began an exercise program, they should start with 5 to 10 minute of warm up, two or three times a week and gradually increased their program to the recommended 30 minutes four or five times a week (Lichtenstein *et al.*, 2006).

3.1.2 Intensity of exercise

Intensity of exercise - we could calculate how heavy or slow the exercise for elderly provided by the CDC and the AHA; for moderate-intensity physical activity, a person's target heart rate should be 50 to 70% of his or her maximum heart rate. This maximum rate was based on the person's age. An estimate of a person's maximum age-related heart rate could be obtained by subtracting the person's age from 220. For example, for a 60-year-old person, the estimated maximum age-related heart rate would be calculated as 220 -60 years = 160 beats per minute (bpm). 50% and 70% levels would be: 50% level: 160 x 0.50 = 80 bpm, and70% level: 160 x 0.70 = 112 bpm. Thus, moderate-intensity physical activity for a 60-year-old

person would require that the heart rate remained between 80 and 112 bpm during physical activity. For vigorous-intensity physical activity, a person's target heart rate should be 70 to 85% of his or her maximum heart rate. To calculate this range, follow the same formula as used above, except change "50 and 70%" to "70 and 85%". For example, for a 60-year-old person, the estimated maximum age-related heart rate would be calculated as 220 - 60 years = 160 beats per minute (bpm). The 70% and 85% levels would be: 70% level: 160 x 0.70 = 112 bpm, and 85% level: 160 x 0.85 = 136 bpm. Intensity of physical activity also can calculate based on Metabolic Equivalent (MET) per minutes/week. The total amount of physical activities of individuals in the previous week based on MET-min/week: MET is a unit used for estimating the consumed energy required for physical activities. All kinds of physical activities can be classified as a multiple of the amount of energy consumption at rest such as: walking measures 3.3 MET, moderate physical activity 4, and intense physical activity 8. In order to calculate the intensity of physical during a week, following formula was used:

- Walking MET-min/week = 3.3 x time of walking in minutes x days of walking.
- Moderate physical activity MET-min/week = 4 x time of moderate physical activity in minutes x days of performing physical activity
- Intense physical activity MET-min/week = 8 x time of intense physical activity in minutes x days of performing intense physical activity

Total amount of physical activity in the previous week = Walking MET-min/week + Moderate physical activity MET-min/week + Intense physical activity MET-min/week. Walking activity has reached to the minimum of 600 MET-min/weeks in the previous five day at least; the intensity of the physical activity was regarded as moderate. Intense physical activity if total consumed energy for the physical activity in at least three previous days has reached to 1500 MET-min/week or the total consumed energy during seven previous days for performing a combination of intense physical activity, moderate activity, and walking has reached to at least 3000 MET-min/week.

A study conducted by Shin, (2009) showed that an exercise program had significantly improved the effects of physical fitness, except for two variables:

heart beat and flexibility and also the exercise program had a positive effect on improving self-efficacy after an intervention exercise program that consisted of 4 weeks of education along with eight weeks of physical exercise. Furthermore, another study conducted by Sin (2005) reported, after using an intervention exercise program 3 times weekly, 50 minute per session for 12 weeks which resulted in the participants showing improved health outcomes on muscle strength, agility/balance, and blood pressure on group intervention (Sin, 2005). Several intervention studies (Syastria, 2006; Astari *et al.*, 2011; Setiawan *et al.*, 2012) conducted in Indonesia showed elderly people who did gymnastic exercise three times a week for 30 minutes over 12 week regularly had stable blood pressure levels.

3.2 Diet approach to stop hypertension for older people

Another lifestyle modification recommended by JNC was lifestyle modification by a combination of diet using the DASH to control or manage blood pressure which played an important role in the handling of the elderly people with hypertension. In the past, researchers tested various single nutrients, such as calcium and magnesium and their findings were not conclusive. Then, scientist tested nutrients as occur together in food. Its findings showed that blood pressure was reduced with an eating plan that was low in saturated fat, cholesterol, and total fat, and emphasizes fruits, vegetables, and low fat dairy foods; it also included whole grain products, poultry, and nuts. It reduced the amount of red meat, sweets, and sugar containing beverages. The plan was rich in magnesium, potassium, and calcium, as well as protein and fibre. This eating plan is known as the DASH eating plan (National Heart, Lung, and Blood Institute [NHLBI], 2003, 2004; 2006). Those types of food were associated with low blood pressure. The DASH study demonstrated that blood pressure could be significantly reduced with a diet abundant in fruits, vegetables, complex carbohydrates, and low fat dairy products (Karanja, 2004). According to the NHLBI (2003), the DASH eating plan was tested with other diet to reduce blood pressure such as low sodium intake; the result showed that reducing dietary sodium low blood pressure for both eating plans, but at each sodium level, blood pressure was low on the DASH eating plan compared to other eating plans.

The DASH eating plan was not designed to promote weight loss, but it was rich in lower calorie foods, such as fruits and vegetables which makes it lower in calories by replacing higher calorie foods with more fruits and vegetables. Increasing physical exercise when combined with a reduction in calories intake is essential to weight loss success which means it can also control body weight. A healthy body weight is currently defined as a body mass index [BMI] of 18.5 to 24.9 kg/m², overweight is a BMI between 25 and 29.9 kg/m², and obesity is a BMI $\geq$ 30 kg/m² (Powe, 2011). Currently, about one of third of adults are overweight, and an additional one third are obese (Lichtenstein *et al.*, 2006; Roberts and Barnard, 2005). Besides, the NHANES (2006) showed more than 65 million Americans had a BMI of more than 25 kg/m². BMI is calculated in kilograms per meter squared. Excess body weight increased cardiovascular risk factors by increasing LDL, blood pressure, blood glucose levels, and reducing HDL levels. Many experimental studies conducted on DASH showed the result of participants who attended to this intervention, blood pressure was significantly lowered (Rankins, 2005; Lin, 2007; Fernandez, 2008; Goldberg, 2010).

4. Related Behavioral Theory to Lifestyle Modification

Studies about lifestyle behavior are related with many behavioral models to guide intervention program; there are some studies that apply behavioral theory related to lifestyle modification including physical exercise and healthy diet, such as:

4.1 Social ecological theory or ecological perspective

The Ecological Perspective highlights the interaction between, and interrelationship between, factor within and across all levels of a health problem. The key of the Ecological Perspective is that behavior both affects and is affected by multiple level of influence, such as: interpersonal or individual factors, interpersonal factors, institutional or organizational factors, community factors, and public policy factors. At the individual level, characteristics such as knowledge, attitudes, beliefs, and personality traits all influence. At the interpersonal level, family, friends, and peers may have an equally important impact on physical exercise or healthy diet.

Institutional or organizational factor may include rules, regulations, policies, and informal structures that support or impede adequate or health promoting physical exercise and dietary intake. At the community level, social norms or standards often influence on elderly people's ability to adhere to a particular physical exercise and dietary strategy, especially if that strategy runs counter to prevailing social norms. Many public policy factors at the local, state, and federal level affect physical exercise and nutritional issues in elderly people (McElroy *et al.*, 1988).

4.2 The health belief model

The Health Belief Model (HBM) focuses on perception of individuals have of the threat posed by a health problem (susceptibility, severity), the potential benefits of avoiding the threat, and factor influencing the decision to act (barriers, cues to action, and self-efficacy). The key of this model is that for individuals to adopt a new health behavior or change their current health behavior, they have to: believe they are susceptible to the conditions, believe the conditions will have serious consequences, believe that changing their behavior will reduce their susceptibility to the condition or its severity, and believe costs of taking action (perceived barriers) are outweighed by the benefits. Health behavior change in this model is facilitated by specific factors that prompt action such as a reminder from one's provider (called a "cue to action) or when the individual is confident in their ability to successfully perform an action (called " self-efficacy) (Rosentock *et al.*, 1988).

4.3 Stages of change

The Stages of Change Model posits that behavior change is a process, not an event. This model asserts that a people attempt to change behavior, they move through five stages: pre contemplation, contemplation, preparation, action, and maintenance. In the pre contemplation stage, the individual has no intention of taking action. In the contemplation stage, the individual intends to take action. In the action stage, the individual has successfully changed behavior for a short period of time, whereas in the maintenance stage, the individual has changed behavior for a longer

period of time. The Stages of Change Model, in addition to emphasizing the process of behavior change, recommends stage-specific interventional strategies tailored to the where the person is in their transition from one behavior to another health promoting behavior (Prochaska and DiClemente., 2002).

4.4 The theory of meaningful learning

The Theory of Meaning Learning posits that each individual must construct his or her own understanding of concepts and relationships. While health care providers and others can assist an elderly in learning, the construction of meanings and understanding, and ultimately learning and behavior change, is a unique process that only each person can achieve on their own (Novak., 2003).

4.5 The information processing model

The Consumer Information Processing Model states that individuals must be exposed to comprehend, retain, and retrieve pertinent information in order to make a decision and engage in behavior change. In other words, health information is important but not sufficient for people to adopt healthful behaviors. Central assumptions of this model are that individuals have limitations in how much information they can process at one time, and information is more useable if combined into manageable. Individuals are more likely to use information if it is perceived as relevant to their situation, useful, new, and easy to use (McGuire., 1976).

4.6 Social cognitive theory

Social Cognitive Theory (SCT) posits that whether a person will change a health behavior depends on: self-efficacy, goals, and outcome expectancies. If individuals have a high level of confidence, they can change even when they are faced with many obstacles. If they are not confident about the behavior in question, they will be less motivated to act or to preserve through obstacles or challenges as they arise. Important elements of SCT include reciprocal determinism (the interaction of the

person, behavior, and the environment), behavioral capability (knowledge and skills needed to perform a particular behavior), expectations (the individual's anticipated outcome of the behavior), self-efficacy (confidence in one's ability to overcome the barriers encountered during behavior change), observational learning (watching the actions and outcomes of others' behavior), and reinforcements (factor that increase or decrease the likelihood of the desired behavior) (Bandura., 1986).

5. The Application Construct of Social Cognitive Theory to Lifestyle Modification

The Social Cognitive [SCT] was first known as social learning theory, which was developed by Bandura in 1977. It was renamed Social Cognitive Theory in 1986. Most theories of behavior popularly employed in health promotion had been concerned largely with initiating behavior and less about maintaining behavior (Simon, B *et al.*, 2012). However, maintenance of behavior change and not merely the initiation of behavior was really the goal in health promotion. It is the goal of the SCT to explain how people regulate their behaviors. This theory had been widely applied to health behavior with respect to prevention, health promotion, and modification of unhealthy lifestyles for many different risk behaviors. SCT emphasized what people think and its effect on their behavior.

SCT proposed that behavior could be explained in terms of triadic reciprocity between three key concepts which operated as determinants of each other. Reciprocal determinism formed the basic organizing principle of SCT. This important concept stated that there was a continuous, dynamic interaction between the individual, the environmental, and behavior. Thus, a change in one of these factors had an impact on the other two. SCT proposed that human behavior was the product of dynamic interplay of personal, behavioral, and environmental influences (Bandura, 1997). Bandura conceptualized influences on behavior that involved the concept of person in terms of basic human capacities that were cognitive in nature. Key concepts associated with the person included: personal characteristics, emotional arousal/coping, behavioral capacity, self-efficacy, expectation, expectancies, self-regulation,

observational/experiential learning, and reinforcement. Influences on behavior which involved the environment could be physical, social, cultural, economic, political in nature, or situational in nature. In SCT, the person's perceptions of the environment were referred to as situations; this key variable could facilitate or inhibit behavior. The Theory of Planned Behavior [TPB] by Ajzen in 1991 and SCT by Bandura in 1986 were identified as the most popularly applied theoretical models to Physical Activity [PA] promotion in cancer survivors. The study conducted by Courneya *et al.* (2007) mentioned that both of these theories had shown to be useful frameworks for understanding the PA behavior of cancer survivors. However, Short *et al.* (2013) mentioned SCT was considered as the most useful framework for informing the Move More for Life intervention which demonstrated that SCT accounted for greater variance in PA than TPB.
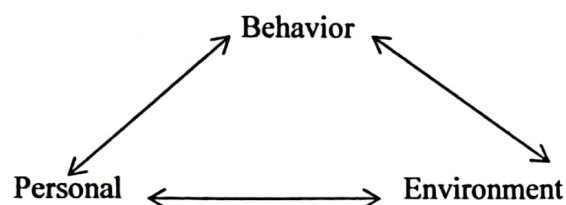
Figure 1 Triadic reciprocity between three key concepts which operated as determinants of each other of the Social Cognitive Theory from Bandura (1997).

Source: Bandura (1997)

The SCT construct of Bandura's theory (2004) had been described to be a useful application of SCT in health promotion, these were:

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┌─────────────────────────────┐
│         Knowledge           │
├─────────────────────────────┤
│    Outcome expectations     │
├─────────────────────────────┤
│    Outcome expectancies     │                    ┌──────────────┐
├─────────────────────────────┤                    │              │
│    Situational perception   │                    │    Health    │
├─────────────────────────────┤  ───────────────▶  │   Behavior   │
│        Environment          │                    │              │
├─────────────────────────────┤                    └──────────────┘
│       Self-efficacy         │
├─────────────────────────────┤
│  Self-efficacy in overcoming│
│         impediments         │
├─────────────────────────────┤
│   Goal setting or self-control│
├─────────────────────────────┤
│      Emotional coping       │
└─────────────────────────────┘
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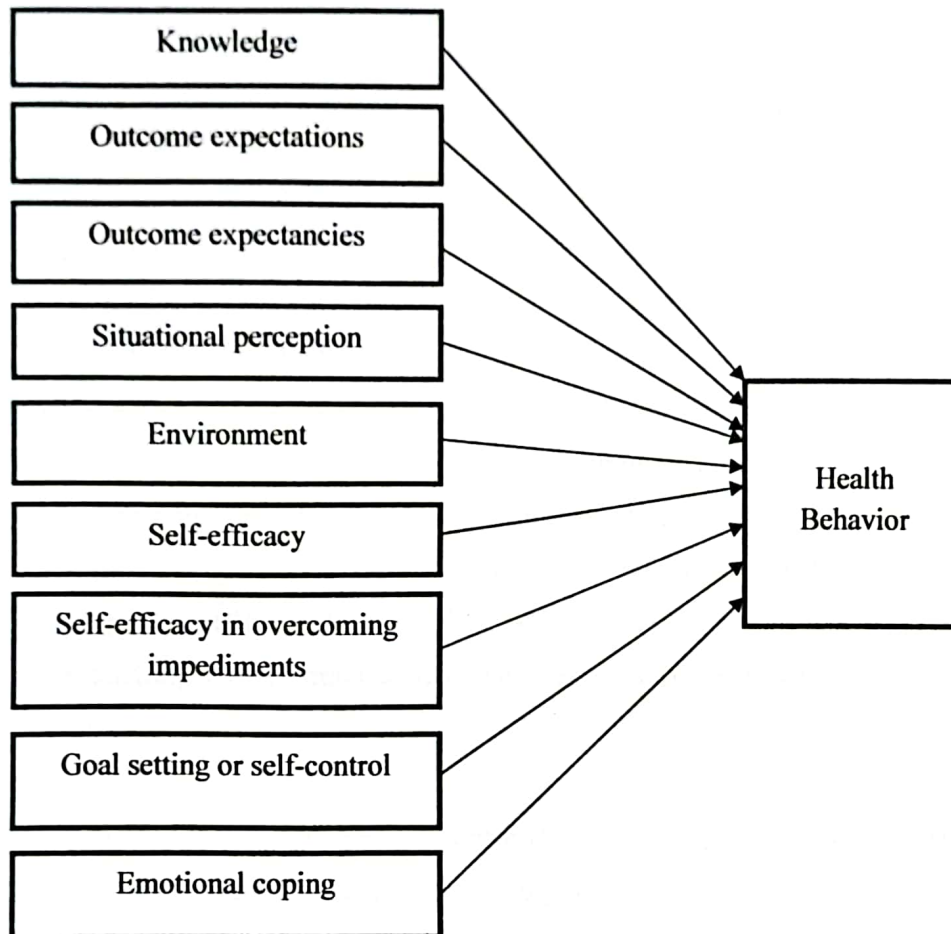
Figure 2 The construct of social cognitive theory by Sharma and Romas (2012)

According to SCT by Sharma and Romas (2012) the first component of SCT is knowledge which is learning facts and gaining insight related to an action, idea, object, person, or situation. Knowledge is an essential component for any behavior change. To modify knowledge, the health educator can provide information in the form of a lecture, a demonstration, or fact sheets on the topic. The second component of SCT is outcome expectations, which is the anticipation of the probable outcome that would occur as a result of engaging in the behavior under discussion. The third component of SCT is outcome expectancies, which refers to the value a person, or places on the probable outcomes that result for performing a behavior. The fourth component of

SCT is situational perception, which refers to how one perceives and interprets the environment. The fifth construct of SCT is environment, refers to the physical or social circumstances or conditions that surround a person. Whereas situational perception involves a person's interpretation of his or her surrounding, environment consists of the actual conditions. The sixth construct of SCT is self-efficacy, which is the confidence a person has in his or her ability to pursue a behavior. Self-efficacy is behavior specific and is in the present. It is not about the past or future. The seventh component of SCT is self-efficacy in overcoming impediments, which refers to the confidence that a person has in overcoming barriers while performing a given specific behavior or specific situation. The eight construct of SCT is goal setting or self-control, which refers to setting goals and developing plans to accomplish a chosen behavior. When one sets goals and develops concrete plans, behavior change becomes easier. The final component in SCT is emotional coping, which refers to the techniques employed by the person to control the emotional and physiological states associated with acquisition of a new behavior. The SCT provided overall variables to give more understanding of what components in the construct of the theory that is the determinant of changed behavior.

Several studies applied this construction of SCT, such as Hortz and Petosa (2008) which applied construct of this theory to identify the degree to which SCT construct targeted the Planning to Be Active Program intervention as mediators of behavior changes in moderate intensity exercise [MIE] in adolescents. In this study, behaviors related to moderate intensity exercise was influencing specifically the SCT variables of self-regulation, social situation, outcome expectancy values, and self-efficacy, this result was that SCT variables were effective in promoting changes in MIE. Short *et al.* (2013) applied this SCT theory by including self-efficacy, social support, intention, and outcome expectations as potential SCT determinants of Physical Activity behavior change. A study conducted by Mahdizadeh *et al.* (2013) also applied to the SCT theory which included self-efficacy, barrier efficacy, modeling, social support, environment, outcomes expectations and self-regulation as determinants of promoting physical activity behavior.

However, this study did not use the overall construct of the theory to rate the lifestyle modification behavior in the elderly who were hypertensive. Suggestions in the model included outcome expectancies, environment, and emotional coping because for outcome expectancies if we could achieve behavior which we expected and could be confident to perform specific behaviors it could also achieve what we want in outcome expectancies, if we had a good situational perception which could include what we perceived about environment, and also if we had self-efficacy to overcoming barriers we can use coping technique or emotional control that related to emotional and physiological states. This model was related to the phenomena as mentioned in the introduction in some parts. Particularly, age, gender, marital status, income, education level, religion, duration hypertension, was included in the demographic variables because these variables were associated with each individual who did not have equal responses in behavior, and as well as psychosocial variables of the person such as (1) Knowledge in physical exercise and diet, (2) Situational perception in physical exercise and diet, (3) Self-efficacy in physical exercise and diet, (4) The outcome expectation in physical exercise and diet, (5) Self-efficacy to overcoming barrier in physical activity and diet, (6) Self-Regulate in physical activity and diet, and (7) Physical conditions (blood pressure, resting heart rate, BMI, lipid level), these were personal factors. Social support was an environment factor.

To describe a better understanding about this conceptual framework, the table below described how we can apply SCT as a guide for the intervention for behavior changes on knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy overcoming barriers, and self-regulate of physical exercise and DASH as output in older people with hypertension to achieve optimal physical conditions as an outcome.

6. Conceptual framework
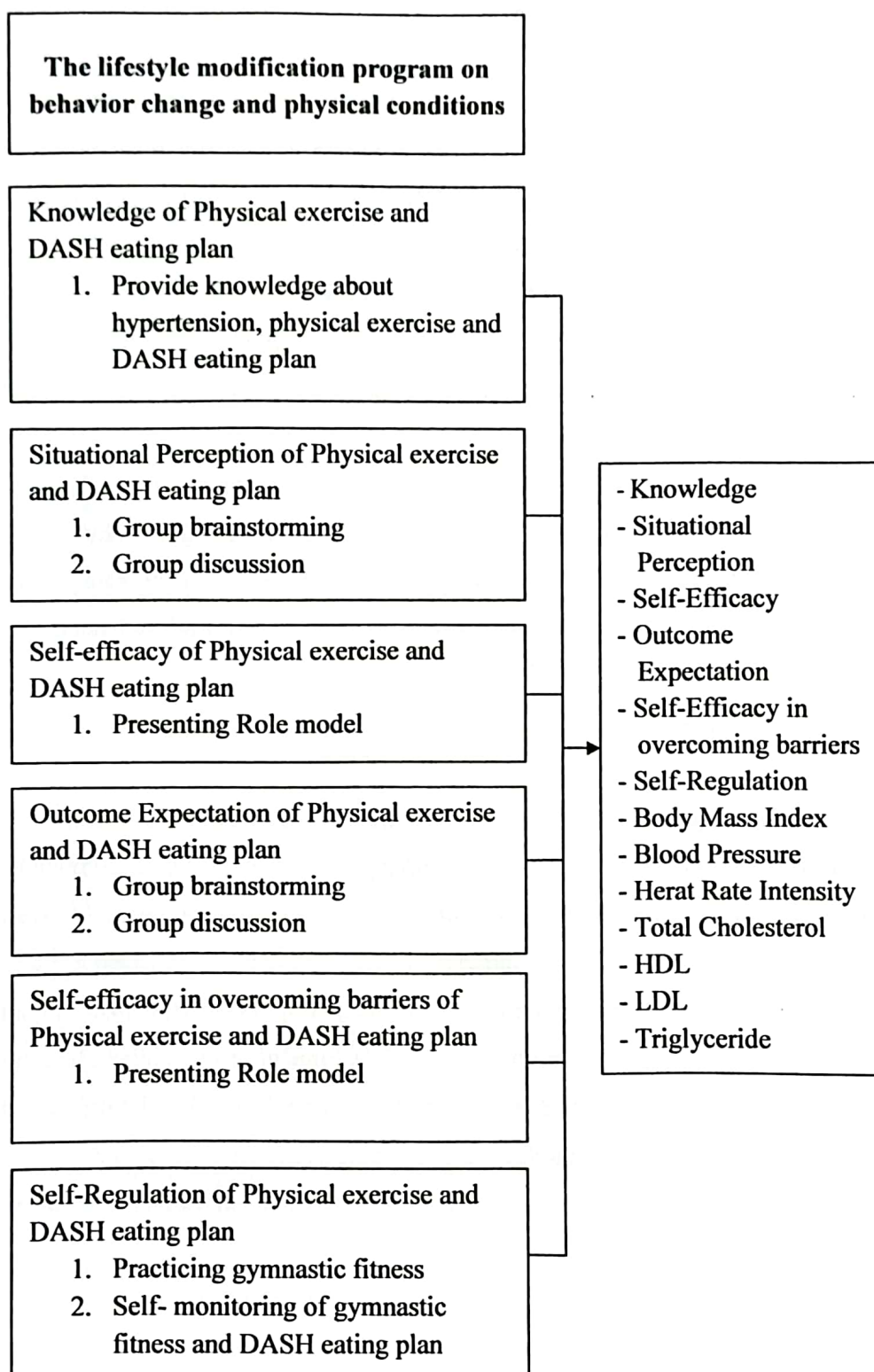
Figure 3 Conceptual framework of study

7. The Lifestyle Modification Program on Behavior Change and Physical Conditions

The intervention of this study represents six constructs of social cognitive theory of Sharma and Romas. The program aimed to increase the behavior change including knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation, and maintaining physical conditions including BMI, Blood pressure, HR Intensity, Total Cholesterol, HDL, LDL, and Triglyceride. Activities should be performed in order, starting from the awareness about problems being faced and the knowledge supporting awareness while they are facing the problems. Then it should be followed with adequate skills and motivation which could strengthen participants' confidence to perform the task properly. The next necessary thing is self- motivation and the supports from various parties. This will strengthen their self-regulation to maintained behavior change including physical exercise and DASH eating plan. The details of each activity and literatures related to the activities were described as follows.

7.1 Knowledge about hypertension, physical exercise, and DASH eating plan

Knowledge about lifestyle modification is lecture about hypertension, physical exercise, and DASH eating plan, myth and fact related lifestyle modification. According to health education, knowledge is an essential component for any behavior change. It is a necessary precondition for change, but often is not sufficient for making the behavior change (Sharma., 2012). Health education increased participants' knowledge of health and can inform about their health care and health care choices (Kecaci and Bulduk., 2012). The participants who had knowledge of the purpose of the treatment and how to monitor the progress of treatment goals will make the patient stronger participation in the management of the disease (Schapira *et al*., 2012).

7.2 Brainstorming and group discussion

Brainstorming and group discussion was a group activity in order to share

participants perceives and interprets the environment (Baranowski *et al.*, 2002). Any misperceptions hinder the behavior change. Thus efforts must be made to remove misperceptions and to promote social norms that are healthy.

7.3 Presenting role model

The existence of similarities with role model will improve elderly self-efficacy in specific ability, that they can achieve similar success in behavior change (Sharma., 2012). The secret of success to maintaining the specific behavior of these people will be shared to elderly who are struggling against physical exercise and healthy diet consume. This role model is given by elderly who have direct experience of live event related to physical exercise and healthy diet consume.

7.4 Practicing gymnastic fitness and self-record daily DASH eating plan

The person can setting goals and self-monitoring of specific behavior gymnastic fitness and DASH eating plan, when one sets goals and develop concrete plans, behavior change becomes easier (Sharma., 2012).

8. Social cognitive constructs in lifestyle modification program measurement

Social cognitive construct in lifestyle modification program measurement consisted of three measurement. There were Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) was developed by Schapira *et al.* (2012), Social cognitive construct to physical exercise questionnaire was developed by Plotnikoff et al. (2012), and Social cognitive construct to DASH eating plan questionnaire was developed by Dewar *et al.* (2012). The measurements can be used to assess the effects of the intervention in order to increase social cognitive constructs associated with behavior change. The measurements were first tried on hypertensive elders. The Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) originally consists of 11 items, with internal consistency .88, Social cognitive

construct to physical exercise questionnaire consists 43 items is a 5-point Likert Scale, with internal consistency .98, and Social cognitive construct to DASH eating plan questionnaire consists 27 items is a 6-point Likert Scale, with internal consistency .95. In the scope of cultural differences, habitual differences and character differences of the participants were modified according to the requirements for this study.

8. Operational definition

8.1 Elderly with hypertension is someone aged 60-70 years old whom diagnosed hypertension stage 1 and stage 2 by physician in PHC and who has SBP levels $\geq$ 140-160 mm Hg and DBP levels $\geq$ 90-100 mm Hg by manual measurement and taking anti-hypertensive medication. They lived in North Bekasi, West Java, Indonesia.

8.2 Lifestyle modification program is a series of educational programs on promoting lifestyle modification to behavior change and physical conditions on hypertensive elders. This program modified from social cognitive constructs (Sharma, 2012). The program was implemented for seven weeks, consists of five activities:

8.2.1 Knowledge about lifestyle modification is a lecturer about hypertension, physical exercise, and DASH eating plan, myth and fact related lifestyle modification. This activity evaluated by direct question and open question related hypertension, physical exercise, and DASH eating plan.

8.2.2 Group brainstorming is sharing activities related hypertension, physical exercise, and DASH eating plan among participants in the small group. This activity evaluated by observation of the participants' participation in the process brainstorming.

8.2.3 Group discussion is discussed activities related hypertension, physical exercise, and DASH eating plan among participants in the small group. This activity evaluated by observation of the participants' participation in the process discussion.

8.2.4 Presenting role model is the activity which presenting the model to share experience related hypertension and strategy to maintain their lifestyle including physical exercise and DASH eating plan. This activity evaluated by direct question and observation during activity.

8.2.5 Practicing gymnastic fitness is the gymnastic fitness activity together in the morning for 60 minutes three times a week leading by researcher. This activity evaluated by attendance of the participants in gymnastic fitness activity.

8.2.6 Self-monitoring of gymnastic fitness is an evaluation of gymnastic fitness activities undertaken by the participants by checking the monitoring sheets directly evaluated by researcher. This activity evaluated by attendance of the participants and monitoring sheets.

8.2.7 Self-monitoring of DASH eating plan is an evaluation of daily DASH eating plan undertaken by the participants by checking the monitoring sheets directly evaluated by researcher. This activity evaluated by attendance of the participants and monitoring sheets.

8.3 Social cognitive constructs to behavior change and physical conditions is the hypertensive elders ability to increase and maintain their lifestyle modification including physical exercise and DASH eating plan. The social cognitive construct on physical exercise and DASH eating plan is measured by three measurement including Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) by Schapira et al. (2012), Social cognitive construct to physical exercise questionnaire was developed by Plotnikoff et al. (2012), and Social cognitive construct to DASH eating plan questionnaire was developed by Dewar et al. (2012).

8.4 Physical conditions is the physical ability to participate in the activity efficiently, considering from resting heart rate, blood pressure, body mass index and LDL, HDL, total cholesterol and triglyceride level, measured by physical measurement as measured by laboratory.

MATERIALS AND METHODS

Materials

The material employed in this study consisted of two parts: 1) the instrument for data collection, and 2) the description of the lifestyle modification program on behavior change and physical conditions.

1. The instruments for data collection

The instruments for data collection consisted of 100 questions which included 5 parts: 1) Demographic characteristic questionnaire (DCQ), 2) Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) by Schapira *et al.* (2012), 3) Social Cognitive Constructs related to Physical Exercise questionnaire by Plotnikoff *et al.* (2012), 4) Social Cognitive Constructs related to DASH eating plan questionnaire by Dewar *et al.* (2012), and 5) Measuring the physical conditions including: BMI, HR Intensity, Systolic and Diastolic blood pressure, total Cholesterol, HDL, LDL, and Triglyceride.

The questionnaires measured Hypertension Evaluation of Lifestyle and Management Knowledge Scale, Social Cognitive Constructs related to Physical Exercise questionnaire, and Social Cognitive Constructs related to DASH eating plan questionnaire, were not available in Bahasa Indonesia version. Therefore, the three questionnaires for this study were translated by adapting the back translation for cross-cultural research method (Brislin, 1970) by three sworn translator after got the permission from the all authors to use the questionnaires.

Part 1: Demographic characteristic questionnaire (DCQ)

The Demographic Characteristic Questionnaire was developed by the researcher to collect participants' characteristic in intervention and comparison groups. The DCQ consisted of 2 parts: 1) Self-administered of participants consisted of 7

questions including age, gender, marital status, religion, education, duration of hypertension, and income, and 2) Physical Examination of participants which measured and recorded by researcher, consisted of 9 items including height/weight, BMI, HR intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride. The researcher revised and improved one items of the questionnaire based on their suggestion. The Content Validity Index for Scale (S-CVI) measured for content relevance that was 0.98 and for content clarity 0.95. The result met the criteria of Lynn's (1986) for content validity ≥ 0.90.

Part 2: Hypertension evaluation of lifestyle and management knowledge scale (HELM).

Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) was developed by Schapira *et al.* (2012), permission was given from the developer. The questionnaire consisted of 11 items that assessed feasible knowledge required to be an active participant in the self-management of hypertension. The component of the questionnaire comprised of 3 domains, including: general hypertension knowledge, lifestyle and medication management, and also monitoring and setting goals. Only one selected answer was allowed and the selected answer must be corresponded to the abilities of fact given or the participant's knowledge for the total of 11 items. Score was designed between 0-11 scores, with the criteria of giving score to be 0 if the answer given was wrong, and scored 1 if the answer was correct. All scores when concluded were score of knowledge per 1 participant. Interpretation of HELM was determined by mean score. Participants were considered as "High Knowledge" if the score $\geq$ mean of the total score. However, "low knowledge" if the score $<$ mean of the total score. The Hypertension Evaluation of Lifestyle and Management Knowledge Scale (HELM) was shown by good internal consistency (Cronbach alpha) 0.75 (Schapira *et al.*, 2012).

Part 3: Social cognitive construct to physical exercise questionnaire (SCCPE).

This questionnaire was developed by Plotnikoff *et al.* (2012) to measure the

construct of SCT including: Situational Perception (SP) construct which consisted of 8 items questions, to examined the participant's perception and interpretation social environment supporting to physical exercise. The questionnaire consisted of 8 items question. The questionnaire was rated on a 7-point Likert scale, defined as "1"strongly disagree, "2"moderate disagree, "3"slightly disagree, "4"neither agree or disagree, "5"slightly agree, "6"moderate agree, and "7"strongly agree. The total scores of SP were 56. Interpretation of SP construct was determined by mean score. Participants were "High SP" if the score ≥ mean of the total scores. However, "Low SP" if the score < mean of total scores. Over all social cognitive construct to physical exercise shown good internal consistency (Cronbach's alpha) 0.85 (Plotnikoff *et al.*, 2012).

Self-Efficacy (SE) constructs which consisted of single item question; participants were asked to rate confidence of participating in regular physical exercise. The score of SE was 5 with rated on a 5-point Likert scale, defined as "1"not at all confident, "2"slightly confident, "3"moderate confident, "4"very confident, and "5"extremely confident. Interpretation of SE was determined by score. Participants were "High SE" if the score was higher. However, "Low SE", if the score was low.

Outcome Expectation (OE) constructs which consisted of 16 item questions; participants were asked to respond of statements about various benefits of physical exercise. The questionnaire was rated on a 7-point Likert scale, defined as "1"strongly disagree, "2"moderate disagree, "3"slightly disagree, "4"neither agree or disagree, "5"slightly agree, "6"moderate agree, and "7"strongly agree. The total scores of SP were 80. Interpretation of OE construct was determined by mean score. Participants were "High OE" if the score ≥ mean of the total scores. However, "Low OE" if the score < mean of total scores.

Self-Efficacy in Overcoming Barriers (SEOB) constructs which consisted of 12 item questions; participants were asked to respond of statements about doing regular physical exercise over the next 6 months in different circumstances. The questionnaire was rated on a 5-point Likert scale, defined as "1"strongly disagree, "2" disagree, "3"neither agree nor disagree, "4"agree, and "5"strongly. The total scores of SEOB

were 24. Interpretation of SEOB construct was determined by mean score. Participants were "High SEOB" if the score ≥ mean of the total scores. However, "Low SEOB" if the score < mean of total scores.

Self-Regulation (SR) constructs which consisted of 7 item questions, participants were asked to respond of statements about what extent have concrete plans to doing regular physical exercise. The questionnaire was rated on a 5-point Likert scale, defined as "1"not at all, "2"a little, "3"somewhat, "4"quite a lot, and "5"completely. The total scores of SR were 24. Interpretation of SR construct was determined by mean score. Participants were "High SR" if the score ≥ mean of the total scores. However, "Low SR" if the score < mean of total scores.

Part 4: Social cognitive construct to dash eating plan questionnaire (SCCDASH).

This questionnaire developed by Dewar *et al.* (2012) to measure the construct of SCT including: Situational Perception (SP) construct which consisted of 4 items questions, participants were asked to respond of statements about their mental representation of the physical environment influencing their ability to eat healthy foods. The questionnaire was rated on a 6-point Likert scale, defined as "1"strongly disagree, "2"disagree, "3"slightly disagree, "4"agree slightly, "5"agree, and "6"strongly agree. The total scores of SP were 24. Interpretation of SP construct was determined by mean score. Participants were "High SP" if the score ≥ mean of the total scores. However, "Low SP" if the score < mean of total scores. Over all the social cognitive constructs to dash eating plans shown good internal consistency (Cronbach's alpha) ≥ 0.75 (Dewar *et al.*, 2012).

Self-Efficacy (SE) constructs which consisted of 7 item question, participants were asked to rate confidence in their ability to adopt and overcome barriers to healthy eating behavior. The questionnaire was rated on a 6-point Likert scale, defined as "1"strongly disagree, "2"disagree, "3"slightly disagree, "4"agree slightly, "5"agree, and "6"strongly agree. The total scores of SP were 42. Interpretation of SP construct

was determined by mean score. Participants were "High SE" if the score ≥ mean of the total scores. However, "Low SE" if the score < mean of total scores.

Outcome Expectation (OE) constructs which consisted of 5 item questions; participants were asked to respond of statements about various benefits of healthy eating. The questionnaire was rated on a 6-point Likert scale, defined as "1"strongly disagree, "2"disagree, "3"partly disagree, "4"partly agree, "5"agree, and "6"strongly agree. The total scores of OE were 30. Interpretation of OE construct was determined by mean score. Participants were "High OE" if the score ≥ mean of the total scores. However, "Low OE" if the score < mean of total scores.

Self-Efficacy in Overcoming Barriers (SEOB) constructs which consisted of 6 item questions, participants were asked to rate the frequency at which they rein-forced their own healthy eating behaviors through setting goals, self-monitoring and strategies for enhancing enjoyment in the past 3 months. The questionnaire was rated on a 5-point Likert scale, defined as "1"never, "2"rarely, "3"sometimes, "4"often, and "5"always. The total scores of SEOB were 30. Interpretation of SEOB construct was determined by mean score. Participants were "High SEOB" if the score ≥ mean of the total scores. However, "Low SEOB" if the score < mean of total scores.

Self-Regulation (SR) constructs which consisted of 5 item questions, participants were asked to indicate their intensions to eat healthy. The questionnaire was rated on a 4-point Likert scale, defined as "1"not at all true of me, "2"not very true of me, "3"somewhat true of me, and "4"very true of me. The total scores of SR were 20. Interpretation of SR construct was determined by mean score. Participants were "High SR" if the score ≥ mean of the total scores. However, "Low SR" if the score < mean of total scores.

Part 5: Physical conditions

Physical conditions measured by physical examination. The instruments for measured height and weight by centimeter and kilogram were carried out of each

participant. The result of measurement expressed in centimeter for height and kilogram for weigh. BMI was calculated by simple formula: the body weight in kilogram divided by square of the height in meter (i.e.body weight / square of height), and BMI unit is thus Kg/m². Measured blood pressure including systolic and diastolic blood pressure of the participants used manual sphygmomanometer after the participants taking rest for 15 minutes. HR Intensity calculated the pulse of radials artery in one minute, and result of Cholesterol, HDL, LDL, and Triglyceride recorded from medical record each participants at the PHC.

2. The description of the lifestyle modification program on behavior change and physical conditions

The lifestyle modification program on behavior change and physical conditions was developed by researcher to increase the social cognitive construct and to maintain good physical conditions in hypertensive elders. This program consisted of 5 activities undertaken during 7 weeks. The description of the program was following.

2.1 Activity 1: Brainstorming.

Brainstorming was adopted to explore and find out various experience of participants in the past related to lifestyle modification including physical exercise a and healthy diet, whether the perception of physical exercise and healthy diet, knowledge about physical exercise and healthy diet, physical exercise and healthy diet experience and experience when faced obstacle of physical exercise and healthy diet, brainstorming about perceives and interprets the environment of physical exercise and healthy diet, rectify misperception about physical exercise and healthy diet, and group discussion about physical exercise and healthy diet. Participants were able to express and share self-knowledge and self-experience about physical exercise and healthy diet. In this brainstorming activity, the participants were divided into small group of 5-6 participants. The researcher walked around to observe the activity and helped participants who had difficulties in discussing. All opinion and experiences were collected and summarized by the group.

2.2 Activity 2: Provided knowledge about hypertension, physical exercise and dash eating plan.

Knowledge is an essential component for any behavior change. This is learning facts and gaining insight related to an action, idea, object, person, or situation. Knowledge related to the hypertension, physical exercise and DASH eating plan was given to provide the knowledge and experience of the self-knowledge to the participants. Provided knowledge was divided into four parts, including knowledge on hypertension, knowledge on physical exercise and DASH eating plan, benefit and consequences of physical exercise and DASH eating plan, and understanding of myth and fact about hypertension, physical exercise and DASH eating plan. In this activity, the information delivered to the participant in classical setting. After researcher gave slide presentation, the participants asked question and discussion in the class.

2.3 Activity 3: Group Discussion

The participants divided into small group consisted of 5-6 persons each group. The group discuss about all of information that researcher give related to the topic (knowledge on hypertension, knowledge on physical exercise and DASH eating plan, benefit and consequences of physical exercise and DASH eating plan, and understanding of myth and fact about hypertension, physical exercise and DASH eating plan. The discussion session expected the participants to make decision, how to set goals and create self-monitoring related to the lifestyle modification.

2.4 Activity 4: Presenting Role Model

Presenting role model is one part from vicarious experience which participants learn through the success of others in order to perform a similar task. This activity expected the participant gets the knowledge from the model's experience; learn problem solving modeling, increase of awareness to lifestyle modification including physical exercise and healthy diet, and the motivation of participants to maintain lifestyle modification. Role model is similar to the participants, both in terms of age

and social environment. The model was a patient who had hypertension and can maintain blood pressure and other physical conditions. On this occasion, the model shared stories about their experiences when faced with an obstacle situation on lifestyle modification including physical exercise and healthy diet and also shared strategy to success for maintaining lifestyle modification. At the end of the session, participants were asked to be the model. This activity was evaluated by observation and direct questions about the comment of the participants to the role model experience.

2.5 Activity 5: Demonstration of gymnastic fitness

Demonstration of gymnastic fitness was by researcher. Hypertensive elders should do this regularly. This activity was evaluated by observation during the activity and the participants can re-demonstrated of the activity.

3. Validity and reliability of the instruments

3.1 Validity of the instrument

There are three instruments used in this study, including questionnaires, physical measurement, and lifestyle modification program on behavior change and physical conditions. The validation will be described separately as follows:

3.1.1 Validity of the questionnaires

Data collection was used the Hypertension Evaluation of Lifestyle and Management Knowledge scale (HELM) developed by Schapira *et al.* (2012, Social Cognitive construct related to Physical exercise questionnaire were developed by Plotnikoff *et al.* (2012), and Social Cognitive construct related to DASH eating plan questionnaire was developed by Dewar *et al.* (2012), and measured the physical conditions of participants including blood pressure, BMI, HR Intensity, Cholesterol, HDL, LDL, and Triglyceride. The instrument measured Hypertension Evaluation of

Lifestyle and Management Knowledge Scale, Social Cognitive Constructs related to Physical Exercise questionnaire, and Social Cognitive Constructs related to DASH eating plan questionnaire, were reviewed and validated by the following processes.

First, translations process of the questionnaires. Three steps for translation process of the questionnaires for cross-cultural research. First, the original questionnaires in English language were translated into Bahasa Indonesia by the first qualified translator. Second, a different translator did the back-translation from the questionnaire of the Bahasa Indonesia version of the English language version without had known the original version of the questionnaires. Third, another different translator translated the translated English version into Bahasa Indonesia version.

Second, content validity of the instrument was carried out by three expert consisting of two lectures who were in nursing science discipline (geriatric specialist), and one was community nurse who responsible of hypertensive elders in PHC in North Bekasi sub district, West Java province, Indonesia. The three experts validated the Bahasa Indonesia version of the questionnaires to ensure the content validity and language appropriateness by using the Content Validity Index (CVI) with scale of 1 to 4. According to (Burn and Grove, 2009), contains validity criteria acceptable if 0.80 of the expert assess on a scale of 3-4. Details of the questionnaire were examined in terms of relevance to the conceptual definitions of the social cognitive theory constructs and the clarify of each and every item was ensured, the clarify and the relevance of the instrument was ranged from 0.83-1.00 and finally the researcher had to pay attention to some of the details of the experts' recommendation and suggestions.

3.1.2 Validity of the lifestyle modification program on behavior change and physical conditions.

The lifestyle modification program on behavior change and physical conditions was modified by researcher. The program was also checked by three experts as a consultant on the construct and content validity. All the experts gave the

score in 3. The three experts requested to evaluate in every item of the instrument by using the Content Validity Index (CVI) with scale of 1 to 4. According to (Burn and Grove, 2009), contains validity criteria acceptable if 0.80 of the expert assess on a scale of 3-4. Details of the questionnaire were examined in terms of relevance to the conceptual definitions of the social cognitive theory constructs and the clarify of each and every item was ensured, the clarify and the relevance of the instrument was ranged from 0.83-1.00 and finally the researcher had to pay attention to some of the details of the experts' recommendation and suggestions.

3.2 Reliability of the instruments

In this study the questionnaire was tried out to 30 hypertensive elders with the similar characteristic to the target sample group of this study at Seroja PHC in North Bekasi sub district, West Java province. The internal reliability of hypertension evaluation of lifestyle and management knowledge scale of the study was evaluated and resulted with Cronbach's alpha coefficient of 0.89, the internal reliability of social cognitive theory construct in physical exercise for the study was evaluated and resulted with Cronbach's alpha coefficient of 0.98, the internal reliability of social cognitive construct in DASH eating plan for the study was evaluated and resulted with Cronbach's alpha coefficient of 0.95. The results showed that the instruments were acceptable as tools in this study (Burns and Grove, 2009).

The program was test as a pilot study before using. The pilot study was conducted in the same PHC but different group of the participants. For pilot study, it was tried out in the one session of the lifestyle modification program on behavior change and physical conditions. The selected session was important part of the program in promoting behavior change; the knowledge related hypertension, physical exercise and DASH eating plan, and presenting role model. After the pilot study, the researcher changed some steps based on feedback from participants. For example, they recommended making a role play which could be more effective in the class setting rather than usual presentation and making a small group for the discussion session. This pilot study was improved when being applied into the real intervention afterward.

Methods

This part describes research methodology which consisted of hypotheses, study design, population and sample, data collection and data analysis, and ethical consideration.

1. Hypothesis

Hypotheses were set according to the specific objectives of the study. The hypotheses were as follows:

1.1 Hypothesis 1: There is a significant difference of lifestyle modification program on behavior change and physical conditions before and after intervention in the intervention group.

1.2 Hypothesis 2: There is a significant difference of lifestyle modification program on behavior change and physical conditions between the intervention group and the comparison group.

2. Research design

This research was a quasi-experimental design with pre-test and post- test in two groups as an intervention group and comparison group was employed in this study with an aimed to evaluate the effects of lifestyle modification program on behavior change and physical conditions among hypertensive elders.

3. Population and samples

3.1 Population

The population was elderly with hypertension who have diagnosed by physicians. The participants were recruited at two Public Health Center; Seroja Public

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3. Population and samples

3.1 Population

The population was elderly with hypertension who have diagnosed by physicians. The participants were recruited at two Public Health Center; Seroja Public

Health Center and Teluk Pucung Public Health Center in the North Bekasi sub district, West Java, Indonesia.

3.2 Samples

3.1 Sample size

The selections of sample group from the population used the following method; Cohen's (1998) approach to power analyses was used. Based on the power analysis for the two independent t-tests, the calculation to determine the sample sizes of the intervention group as well as the comparison group, with the following parameters setting-the power of (1-β error probability) 0.80, a significant level α value of 0.50, and effective size of (Cohen d) 0.80, resulting the sample size of 26 for each group, and given an estimated dropout 20% (or 6 participants dropout in each group), the sample size for this study became 32 for each group. Therefore, the total sample size was 64 participants. In the beginning, 32 hypertensive elders were assigned to the intervention group with 3 participants afterwards dropout during the program for personal reason. Therefore, only 29 participant's hypertensive elders remained in the intervention group. Similarly with the comparison group, 3 participants were considered dropout, since they failed to return the questionnaire and also failed to come to the Public Health Center because 2 participants moved in another province to taking care their family and 1 person were hospitalized. Therefore, only 29 participant's hypertensive elders remained in the comparison group.

3.2 Sampling Method

The samples were selected by random sampling. There were two steps of selecting samples. First step, selected the PHC which were: 1) The Public Health Center which are under the office department of health in North Bekasi district, 2) Providing the same services, 3) The Public Health Center that never been conducted lifestyle modification program based on SCT construct, 4) Hypertensive elders in the Public Health Center has similarity in personal characteristic, 5) The Public Health

Center willing to support and participated in this research process. To avoid contamination of intervention, researcher randomly selected two Public Health Center in the North Bekasi sub district that were geographic distance in location. There were Seroja Public Health Center which was assigned as the intervention group and Teluk Pucung Public Health Center as the comparison group. The second step, the participants were selected from the population that met the inclusion criteria as follows: (1) Elderly was diagnosed with hypertension stage 1 and 2 by a physician at the Seroja and Teluk Pucung Public Health Centre in the North Bekasi sub district and taking anti hypertension medication, (2) Hypertensive elders of age between 60-70 years, (3) Participants have never participated in the lifestyle modification program based on SCT construct, (4) willing to participate in this study, (4) able to read and speak the Indonesian language, (5) should attend all of the sessions of the lifestyle modification program; should complete the pre-intervention and post-intervention questionnaire. Whereas, the exclusion criteria was: (1) the elderly people who were hypertension with severe cardiovascular problems, (2) the elderly people who were hypertension with disabilities, and (3) the elderly people who were hypertension but not intend to become active. The data collection was carried out from second week of August to first week of September 2014.

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┌─────────────────────────────┐
│ Public Health Center in the North │
│ Bekasi sub district (5 PHC) │
└─────────────────────────────┘
              │ Public Health Center by the criteria
              ▼
┌─────────────────────────────┐
│ Public Health Center in North │
│ Bekasi sub district which met │
│ these inclusion criteria (3 PHC) │
└─────────────────────────────┘
```

Simple random sampling

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┌─────────────────────┐        ┌─────────────────────┐
│ Seroja PHC as       │        │ Teluk Pucung PHC as │
│ Intervention group  │        │ comparison group    │
└─────────────────────┘        └─────────────────────┘
```

Participants who met the inclusion criteria

```
┌─────────────────────┐        ┌─────────────────────┐
│ 32 Hypertensive elders │     │ 32 Hypertensive elders │
└─────────────────────┘        └─────────────────────┘
```

Figure 4 The steps of selection the samples in this research

4. Data Collection

Data collection process consisted of two steps; preparation step and implementation step

4.1 Preparation step

The study was approved by Committee and Ethics Review Board (ERB) Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira, Bangkok, Thailand.

The permissions for data collection were obtained from the Board for National Unity and People's Protection (Kesbangpol) Bekasi District, and Head of two PHCs in North Bekasi district (Appendix G). After gaining the permission from the Head of PHCs, nurses who were responsible for the hypertensive elders' program in each PHC provided the name list of potential participants which met the inclusion criteria, for the researcher to contact him/her individually. Then, the researcher asked the potential participant for willingness to take part in the study, explained clearly about the study, and physical examination of them including measuring height, weight, systolic and diastolic blood pressure, heart rate, and calculated BMI. To obtain the additional data of the participant such as lipid profile, the researcher gained the nurses recorded from medical record of the participants. Each participant was informed the purposes study and given the opportunity to ask questions about the study when participants were not clear. Then the participants signed an informed consent. Data were collected at convenient locations for the individual sample, such as: PHCs and Integrated service post of elderly people (Posyandu lansia) by following all items in the self-administered questionnaire for two times. Each participant took 45 – 60 minutes. After data collection, data were checked per item to ensure that the samples answered the questionnaire completely.

4.2 Implementing step

In the implementation phase, researcher gave the questionnaire and measuring physical conditions to the participants and collected questionnaire after participants filled out the questionnaires.

1. During program implementation, participants in comparison group received routine health care related prevention and management of hypertension such as knowledge related to hypertension and it consequences.

2. Participants in the intervention group received the lifestyle modification program on behavior change and physical conditions consisting of 18 activities within 7 weeks. Times of activities set by the participants' agreements in order to avoid

disturbing usually activities of the participants. During the course of data collection and implementation of the program researchers found several problems including; a participant of the comparison group withdrew for personal reasons, as well as in the intervention group, one participant withdrew for personal reasons, and two participants did not take part in gymnastic fitness for 3 sessions , investigators went to the house and asked participants constraints or reasons why they do not come to gymnastic fitness, researchers provide an understanding of the benefits of gymnastic fitness back for their condition. To prevent the occurrence of similar events on other participants, the researchers was evaluated the end of gymnastic fitness activities by asking the participants' responses to the gymnastic fitness activities and remind them about the benefits of gymnastic fitness. After 7 weeks of this intervention program, the second data collection was conducted by researcher.

3. The different activities between two groups were presented in the figure 5 and table 2

PRE TEST

Distributing DCQ, HELM, SCCPE, SCCDASH, and Physical Examination including Height/Weight, BMI, HR Intensity, Systolic and Diastolic blood pressure, and record lipid profile from medical record of the participants in PHC.

Intervention Group

Comparison Group

Activity1
Brainstorming various experience and group discussion

Activity 2
Provided Knowledge about hypertension, physical exercise, and DASH eating plan

Health education related lifestyle modification regular basis

Activity 3
Presenting role model

Activity 4
Practicing gymnastic fitness and Self-monitoring of gymnastic fitness and DASH eating plan

POST TEST
DCQ, HELM, SCCPE, SCCDASH, and Physical Examination including Height/Weight, BMI, HR Intensity, Systolic and Diastolic blood pressure, and record lipid profile from medical record of the participants in PHC.

Figure 5 Activities of intervention group and comparison group

Table 2 Procedures of intervention for the intervention group and comparison group

Period	Intervention group	Comparison group
Week 1	Activity 1: Brainstorming (approximately 45-60 minutes) Group activity to brainstorming in order to build familiarity, and to clarify the goal of the lifestyle modification program. - Guiding sharing activity about participants' knowledge related to lifestyle modification, exploring and finding out various experience of participants in the past related to lifestyle modification including physical exercise and healthy diet, share self-knowledge about lifestyle modification and self- experience about lifestyle modification and developing the same perception and interpretation about lifestyle modification. - Guiding discussion among groups - Summarizing and made conclusion in same perception about the benefit and consequences of lifestyle modification Evaluation: the researcher observed the activity and participation of the participants in the group brainstorming.	The participants obtained the usual health education with regard to lifestyle modification used in regular basis in the PHC program

Table 2 (Continued)

Period	Intervention Group	Comparison Group
Week 2	Activity 2: Provide Knowledge about lifestyle modification (approximately 45 – 60 minutes). The researcher gave slide presentation about lifestyle modification (physical exercise and DASH eating plan) in order to enhance level of knowledge on hypertension, benefit and consequences of lifestyle	-
Week 2	Activity 3: Group Discussion (approximately 45-60 minutes). Group discussion about information that researcher give related to the topic (hypertension and lifestyle modification including physical exercise and DASH eating plan), discuss about problem solving when obstacle occur during implementing lifestyle modification. Evaluation: the researcher observed the activity and participation of the participants in the group discussion.	-
Week 3	Activity 4: Presenting Role Model (approximately 60 minutes). The researcher invite the elderly with hypertension who success in lifestyle modification as a model. The model shared stories about their experience when faced	-

Table 2 (Continued)

Period	Intervention Group	Comparison Group
	with an obstacle situation on lifestyle modification including physical exercise and healthy diet and also shared strategy to success maintaining lifestyle modification. Activity 5: Demonstration of Gymnastic fitness (approximately 60 minutes). Making demonstration of gymnastic fitness and the participants should return demonstrating gymnastic fitness. Evaluation: Researcher observed the participation of participants during the role model shared the experience strategy to success maintaining physical exercise and healthy diet and the strategy when faced with an obstacle situation. Researcher asked direct question to the participants about their comments and what they learned from the role models' experiences.	-
Week 4	Activity 5: Participants practicing gymnastic fitness three times a week with duration 60 minutes was leading by researcher and follow up of the daily DASH eating plan and discuss if the participants have any problem related DASH eating plan.	-
Week 5	Activity 5: Participants practicing gymnastic fitness three times a week with duration 60 minutes was leading by researcher and follow up of the daily DASH eating plan and discuss if the participants have any problem related DASH eating plan.	-

Table 2 (Continued)

Period	Intervention group	Comparison group
Week 6	Activity 5: Participants practicing gymnastic fitness three times a week with duration 60 minutes was leading by researcher and follow up of the daily DASH eating plan and discuss if the participants have any problem related DASH eating plan.	-
Week 7	Activity 5: Participants practicing gymnastic fitness three times a week with duration 60 minutes was leading by researcher and follow up of the daily DASH eating plan and discuss if the participants have any problem related DASH eating plan.	-
Week 8	The researcher conducted the second data collection by distributing the same questionnaire and measuring the physical conditions to both the intervention group and comparison group.	-

5. Data Analysis

Initially, data were checked and verified to ensure the accuracy for data entry and prevent the missing data. There were no missing data in this current study because the researcher checked after the participants were willing to answer all items of the instruments and physical examination. Data analysis was begun by generating descriptive statistics for participant's characteristics consisting of age, education, duration of hypertension in years, and monthly income in IDR analyzed to find the mean (M), standard deviation (SD). Gender, marital status, and religion were reported in terms of frequencies and percentages. Data were tested for normal distribution using Kolmogorov-Smirnov test ($p > .05$) and Skewness and Kurtosis with value 3.29 (Kim, H.Y., 2013). The mean scores of lifestyle modification consisting of knowledge,

situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation in physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride of participants in both groups before receiving lifestyle modification for intervention group were analyzed using Independent t-test. The differences of mean score of lifestyle modification consisting of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation in physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride within the same group were analyzed using paired t-test. While, comparison the differences of mean score of lifestyle modification consisting of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation in physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride between two groups was analyzed using independent t-test. For statistical analysis, the study used Statistical Packed for the Social Sciences (SPSS) version 17.0 for windows.

6. Ethical Consideration

Initially, the study approval had been obtained from ERB, Boromarajonani Bangkok, Thailand. Further permission was approved from the Board for National Unity and People's Protection (Kesbangpol) Bekasi District, and Head of two PHCs in North Bekasi district. Participants were given opportunities to determine whether they would voluntarily participate in the study. Equally important, the samples were assured that their right and confidentiality during the study were protected. The participants were informed before participating in this study. They were explained the objective, procedure, and benefit of study attached in the information sheet (see Appendix A). During that time they were allowed to ask any questions if they did not understand about the information and questionnaire. Also, they could withdraw and decline anytime. It would not affect to any health services for them in PHC. Information and

informed consent were translated into Bahasa Indonesia by an official translator (Appendix B) to ensure the accuracy of the translation before given to samples. The informed consent form was provided for each sample and made in two copies for the researcher and the sample to sign it (see Appendix B). Each copy of the informed consent form was kept by the researcher and the samples. After that, the participants were interviewed using structured interview following all items in the questionnaires and physical examination by researcher about 35-45 minutes. During the interview and physical examination, if the participants were uncomfortable, the researcher stopped the process and made a new appointment in the convenient time. However, in the present study, all participants were completely willing to participate in the interview and physical examination process.

After the interview and physical examination, the form was checked to ensure the completion of the information and the prevention of missing data. All participants' data were put in the electronic program. The data were kept in the program with the limited access. Only the researcher and the advisor could access to the data by using a password. A code number for each participant was used to protect their anonymity during data analysis. Participant's data were separated in each group. Hard copies of questionnaires were kept in a private place and safely locked. Additionally, the questionnaires would be kept for 3 years after the thesis defense, and then they will be destroyed. The electronic data will be kept with password access for future study. Furthermore, the results of the study were not specific for each participant. In other words, the findings of the study were presented in aggregation.

RESULTS AND DISCUSSION

Results

This chapter presents the results of the research by using the self-administrative questions form and physical examination for data collection before and after the intervention. The objective of this study was to determine the effect of lifestyle modification program on behavior change and physical conditions among hypertensive elders. The findings of the study were divided into four parts as follow:

1. Demographic characteristic of the participants.

2. The level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan of participants, and physical conditions consisted of BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride before intervention program.

3. The comparison of lifestyle modification program consisted of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan of participants, and physical conditions consisted of BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride within the intervention group and the comparison group before and after intervention.

4. The comparison of lifestyle modification consisted of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan of participants, and physical conditions

consisted of BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride between the intervention group and the comparison group before and after intervention.

1. Demographic Characteristics of the participants.

The participants of this study were hypertensive elders. There were 58 hypertensive elders in the sample, 29 hypertensive elders in the intervention group and 29 hypertensive elders in the comparison group. The characteristics of the participants in this study will be presented in the table 1.

Table 3 Median and Standard Deviation of demographic characteristics of participants (N=58).

Demographic Characteristics	Intervention Group (n=29)		Comparison Group (n=29)		t	*p*-value
	M	SD	M	SD		
Age	65.55	3.18	65.90	2.22	-.478	.63
Education (in Years)	9.10	2.34	6.34	3.76	3.354	.01
Duration of Hypertension (in Years)	4.38	1.64	4.41	1.50	-.084	.93
Monthly Income (Million) (in IDR)	1.40	3.3	1.33	3.3	.868	.39

Table 4 Frequency and percentage of demographic characteristics of participants

Demographic Characteristics	Intervention Group (n=29)		Comparison Group (n=29)		t	p-value
	N	%	N	%		
Gender						
Male	5	17.2	11	37.9	1.780	.08
Female	24	82.2	18	62.1		
Marital Status						
Married	18	62.1	19	65.5	.269	.79
Widow	11	37.9	10	34.5		
Religion						
Islam	29	100	27	93.1	-1.440	.16
Christian			2	6.8		

According to table 3 and 4, the mean age of the participants were 65.55 years old (SD=3.18) in the intervention group and 65.90 years old (SD=2.22) in the comparison group. Most of the participants in both groups were female and they were classified as married, and most of them were Muslim. The participant in the intervention group were completed nine years of education (SD=2.34), and the participants in comparison group were completed six years of education (SD=3.76). Most of the participants in both groups have been suffering from hypertension were less than 5 years (the Intervention group 4.38 years, SD= 1.64 and the comparison group 4.41 years, SD= 1.50). The average monthly incomes were IDR 1.40 and 1.33 million for the intervention group and the comparison group respectively. The participants in both groups were tended to only rely on medication to lower blood

pressure, so few of them participated in physical exercise, less consumed vegetables and fruits, but consumed salty foods and used monosodium glutamate [MSG] on cuisine, and consumed foods high in fat and also smoked tobacco product. Statistically, there were no significant differences of demographic characteristics between the intervention group and comparison group except education.

2. The Level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-control in physical exercise and DASH eating plan of participants.

Table 5 The level of Knowledge Hypertension Evaluation of Lifestyle and Management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation in physical exercise and DASH eating plan of participants in both groups before intervention (N= 58) using Independent t-test.

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
Knowledge	5.24	1.06	4.79	.98	1.68	.09
SP in PE	39.48	4.39	37.93	4.47	1.33	.18
SP in DASH	11.52	1.27	12.79	.73	-4.69	.00
SE in PE	3.69	.66	3.07	.79	3.23	.01
SE in DASH	18.93	.26	19.00	.00	-1.44	.16
OE in PE	61.45	2.63	59.45	1.33	3.66	.01
OE in DASH	20.03	.19	20.10	.72	-.49	.62

Table 5 (Continued)

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
SEOB in PE	34.76	2.06	33.14	1.09	3.74	.00
SEOB in DASH	12.48	1.75	11.14	1.30	3.33	.01
SR in PE	14.34	.55	14.38	.62	-.22	.82
SR in DASH	10.79	.82	10.45	.57	1.86	.07

Regarding table 5, mean score of Knowledge and SCT constructs including Situational perception, Self-regulation in Physical Exercise and DASH eating plan, Self-Efficacy in DASH eating plan, and Outcome Expectation in DASH eating plan in both groups almost the same and were not statistically significant differences between intervention group and comparison group with ($p > .05$), it means that, knowledge and SCT constructs in both groups were equal.

However, some of mean score of SCT constructs in both groups were significant different with ($p < .05$) including Situational Perception in DASH eating plan, Self-Efficacy in Physical Exercise, Outcome Expectation in Physical Exercise, and Self-Efficacy in Overcoming barriers in Physical Exercise and DASH eating plan, it means that mean score in both groups were not equal.

Table 6 Level of Physical Conditions in both groups before receiving intervention (N=58) using Independent t-test.

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
BMI	21.71	1.53	21.21	1.19	1.37	.18
HR Intensity	79.38	1.82	78.72	1.09	1.66	.10
Systolic BP	149.31	10.33	151.03	12.91	-.56	.58
Diastolic BP	92.07	5.59	91.72	6.02	.23	.82
Cholesterol	231.34	31.05	234.07	26.02	-.36	.72
HDL	51.52	12.48	45.41	7.67	2.25	.03
LDL	148.31	25.72	150.55	15.28	-.40	.69
Triglyceride	141.59	60.21	139.83	21.24	.15	.88

From the table 6, the mean score of the Physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride in both groups before intervention were not significantly different ($p >$ .05), this indicated that both groups were equal in level of physical conditions, except HDL level ($p < .05$).

3. The comparison of the level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan, and physical conditions within intervention group and comparison group before and after receiving intervention (N= 58).

Table 7 The comparison of the level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan within intervention group before and after receiving intervention (N=29), using Paired t –test.

	Intervention Group (n = 29)				t	*p-value*
	Before receiving intervention		After receiving intervention			
	M	SD	M	SD		
Knowledge	5.24	1.06	10.79	.41	-26.68	.01
SP in PE	39.48	4.39	48.34	1.42	-12.64	.01
SP in DASH	11.52	1.27	20.31	2.47	-20.83	.01
SE in PE	3.69	.66	5.00	.00	-10.69	.01
SE in DASH	18.93	.26	37.38	2.38	-40.42	.01
OE in PE	61.45	2.63	69.90	2.13	-19.20	.01
OE in DASH	20.03	.19	30.00	.00	-289.00	.01
SEOB in PE	34.76	2.06	50.34	1.57	-51.27	.01
SEOB in DASH	12.48	1.75	28.79	1.01	-60.92	.01
SR in PE	14.34	.55	29.86	2.48	-33.99	.01
SR in DASH	10.79	.82	20.00	.00	-60.58	.01

According to table 7, the result showed that, the difference between the two mean score of the lifestyle modification including Knowledge Hypertension

evaluation, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan within intervention group before and after receiving intervention were statistically significant ($p < .05$). It means that, the mean score of lifestyle modification of participants in the intervention group were improved than that before receiving lifestyle modification program.

Table 8 The comparison of level physical conditions within intervention group before and after receiving intervention (N=29), using Paired t-test.

	Intervention Group (n = 29)				t	p-value
	Before receiving intervention		After receiving intervention			
	M	SD	M	SD		
BMI	21.71	1.53	21.38	1.53	7.87	.01
HR Intensity	79.38	1.82	85.34	3.93	-9.07	.01
Systolic BP	149.31	10.33	136.21	6.22	9.91	.01
Diastolic BP	92.07	5.59	83.45	4.84	10.52	.01
Cholesterol	231.34	31.05	221.86	30.72	10.93	.01
HDL	51.52	12.48	54.00	12.04	-5.75	.01
LDL	148.31	25.72	145.28	25.62	7.99	.01
Triglyceride	141.59	60.21	142.31	60.85	-2.05	.05

Regarding table 8, the finding showed that, the difference between the two mean score of physical conditions of participants including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride within intervention group before and after receiving intervention were statistically

significant different ($p < .01$) meaning that, the mean score of physical conditions in the intervention group after receiving intervention program was less than that of physical conditions in the intervention group before receiving intervention program.

Table 9 The comparison of level of knowledge situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan within comparison group before and after (N=29), using Paired t-test.

	Comparison Group (n = 29)				T	p-value
	Before		After			
	M	SD	M	SD		
Knowledge	4.79	.98	3.83	.85	5.74	.01
SP in PE	37.93	4.47	38.76	3.60	-2.74	.01
SP in DASH	12.79	.73	13.14	.92	-2.28	.03
SE in PE	3.07	.79	3.34	.55	-2.51	.02
SE in DASH	19.00	.00	19.03	.19	-1.00	.33
OE in PE	59.45	1.33	59.69	1.34	-1.76	.09
OE in DASH	20.10	.72	20.76	1.70	-2.03	.06
SEOB in PE	33.14	1.09	33.21	1.05	-1.44	.16
SEOB in DASH	11.14	1.30	11.79	1.52	-3.49	.01
SR in PE	14.38	.62	14.76	.58	-4.14	.01
SR in DASH	10.45	.57	10.62	.56	-1.41	.17

According to the table 9, the finding showed that, the difference between the

two mean scores, most of the lifestyle modification including situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan within comparison group before and after were not statistically significant different ($p > .05$) meaning that, the mean score of Self-efficacy in physical exercise and DASH eating plan, Outcome expectation in Physical exercise, and Self-efficacy in overcoming barriers in physical exercise and DASH eating plan of participants in the comparison group were not changed. However, difference of mean scores of lifestyle modification including knowledge and situational perception in PE and DASH eating plan were statistically significant different ($p < .05$) meaning that the mean score of knowledge, situational perception in physical exercise and DASH eating plan of comparison group were changed without intervention.

Table 10 The comparison of level Physical Conditions within comparison group before and after (N=29) using Paired t-test.

	Comparison Group (n = 29)				t	p-value
	Before		After			
	M	SD	M	SD		
BMI	21.21	1.19	21.45	1.18	-5.82	.01
HR Intensity	78.72	1.09	79.41	1.27	-2.38	.02
Systolic BP	151.03	12.91	150.69	8.84	.239	.81
Diastolic BP	91.72	6.02	90.34	4.21	1.44	.16
Cholesterol	234.07	26.02	238.72	26.52	-11.19	.01
HDL	45.41	7.67	44.28	7.27	5.29	.01
LDL	150.55	15.28	155.45	16.59	-8.10	.01

Table 10 (Continued)

	Comparison Group (n = 29)				t	p-value
	Before		After			
	M	SD	M	SD		
Triglyceride	139.83	21.24	141.17	21.66	-1.69	.10

Regarding table 10, the finding showed that, most of the difference between the two mean score of physical conditions of participants including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride within comparison group before and after were statistically significant different ($p <$ .05) meaning that, the physical conditions before and after in the comparison group were changed. However, differences mean score of Systolic, Diastolic blood pressure and Triglyceride were not statistically significant different ($p > .05$) meaning that, the Systolic, Diastolic blood pressure and Triglyceride in the comparison group were not changed.

4. The comparison level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan between intervention group and comparison group before and after intervention (N=58).

Table 11 The comparison level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise between intervention group and comparison group before and after receiving intervention for intervention group (N=58) using Independent sample t-test

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
Knowledge Before	5.24	1.06	4.79	.98	1.68	.09
Knowledge After	10.79	.41	3.83	.85	39.78	.01
SP in PE Before	39.48	4.39	37.93	4.47	1.33	.19
SP in PE After	48.34	1.42	38.76	3.60	13.33	.01
SE in PE Before	3.69	.66	3.07	.79	3.23	.02
SE in PE After	5.00	.00	3.34	.55	16.13	.01
OE in PE Before	61.45	2.63	59.45	1.33	3.66	.01
OE in PE After	69.90	2.13	59.69	1.34	21.87	.01
SEOB in PE Before	34.76	2.06	33.14	1.09	3.74	.01
SEOB in PE After	50.34	1.57	33.21	1.05	49.01	.01
SR in PE Before	14.34	.55	14.38	.62	-.22	.82
SR in PE After	29.86	2.48	14.76	.58	32.01	.01
SP in DASH Before	11.52	1.27	12.79	.73	-4.69	.01
SP in DASH After	20.31	2.47	13.14	.92	14.69	.01
SE in DASH Before	18.93	.26	19.00	.00	-1.44	.16
SE in DASH After	3738	2.38	19.03	.19	41.35	.01
OE in Before	20.03	.19	20.10	.72	-.49	.62
OE in DASH After	30.00	.00	20.76	1.70	29.20	.01
SEOB in DASH Before	12.48	1.75	11.14	1.30	3.33	.01
SEOB in DASH After	28.79	1.01	11.79	1.52	50.09	.01

Table 11 (Continued)

	Intervention Group (n=29)		Control Group (n=29)		T	p- value
	M	SD	M	SD		
SR in DASH Before	10.79	.82	10.45	.57	1.86	.07
SR in DASH After	20.00	.00	10.62	.56	89.96	.01

According to the table 11, the finding of the comparison mean scores of lifestyle modification including knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan of participants in intervention group were greater than those participants in comparison group after receiving lifestyle modification program ($p < .05$).

Table 12 The comparison of level Physical Conditions between intervention group and comparison group before and after receiving intervention for intervention group (N=58) using Independent t-test

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
BMI Before	21.71	1.53	21.21	1.19	1.37	.18
BMI After	21.38	1.53	21.45	1.18	-.07	.95
HR Intensity Before	79.38	1.82	78.72	1.09	1.66	.10
HR Intensity After	85.34	3.93	79.41	1.27	7.68	.01
Systolic BP Before	149.31	10.33	151.03	12.91	-.56	.58
Systolic BP After	136.21	6.22	150.69	8.84	-7.22	.01
Diastolic BP Before	92.07	5.59	91.72	6.02	.23	.82
Diastolic BP After	83.45	4.84	90.34	4.21	-5.79	.01

Table 12 (Continued)

	Intervention Group (n=29)		Comparison Group (n=29)		t	p- value
	M	SD	M	SD		
Cholesterol Before	231.34	31.05	234.07	26.02	-.36	.72
Cholesterol After	221.86	30.72	238.72	26.52	-2.24	.03
HDL Before	51.52	12.48	45.41	7.67	2.25	.03
HDL After	54.00	12.04	44.38	7.27	3.72	.01
LDL Before	148.31	25.72	150.55	15.28	-.40	.69
LDL After	145.28	25.62	155.45	16.59	-1.79	.08
Triglyceride Before	141.59	60.21	139.83	21.24	.15	.88
Triglyceride After	142.31	60.85	141.17	21.66	.131	.89

Regarding table 12, the findings showed that, the comparison mean score of the physical conditions including HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, and HDL of participants in intervention group after receiving lifestyle modification program were less than those mean score of physical conditions of participants in comparison group ($p < .05$), except BMI, LDL, and Triglyceride ($p > .05$).

Discussion

This research was aimed to evaluate the effectiveness of the lifestyle modification program on behavior change and physical conditions among hypertensive elders in the Primary Health Centre of North Bekasi sub district, West Java, Indonesia. The result of this study indicated the effectiveness of the lifestyle modification program including knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-control in physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure,

Cholesterol, HDL, LDL, and Triglyceride among hypertensive elders was effective. The discussions of the results are presented in this chapter as ordered.

1. The effect of life style modification program including the level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-control in physical exercise and DASH eating plan.

This finding showed that the participants in the comparison group were not significant changes in level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-control in physical exercise and DASH eating plan between data recorded at baseline and at the end of intervention. On the other hand, the participants in the intervention group were significantly changed in level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-control in physical exercise and DASH eating plan which was affected to the physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride as outcome of the lifestyle modification program. These findings supported the hypothesis, whereby the level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-control in physical exercise and DASH eating plan of participants might have been influenced by the lifestyle modification program.

Knowledge is an essential component for any behavior change. It is a necessary precondition for change, but often is not sufficient for making the behavior change (Sharma., 2012). Provide knowledge with slide presentation about hypertension in elderly, physical exercise and DASH eating plan of participants in the intervention group to enhance their knowledge on hypertension evaluation of lifestyle and management and also provide knowledge of the risk and benefits of different health practices was required for behavior changes interventions of participants considered of

physical exercise and DASH eating plan. The findings showed that, the participants in the intervention group had higher level of knowledge hypertension evaluation of lifestyle and management than participants in comparison group after receiving life style modification program. This finding is consistent with previous research showing that, the participants who had knowledge of the purpose of the treatment and how to monitor the progress of treatment goals will make the patient stronger participation in the management of the disease (Schapira et al., 2012). Health education increased participants' knowledge of health and can inform about their health care and health care choices (Kecaci and Bulduk., 2012).

In other constructs of SCT, Bandura (2004) noticed the specified pathways through which social cognitive constructs influence health behavior. Specifically, self-efficacy operates both directly and indirectly, through outcome expectations, goals, and facilitators and barriers, to influence behavioral outcomes. These factors are proposed to interact such that individuals with higher level of self-efficacy have more positive expectations about what the behavior will bring about, set higher resulting in greater likelihood of engaging and maintaining specific behaviors (Bandura, 2004).

In this research, modify situational perception in physical exercise and DASH eating plan which refers to how the participant perceives and interprets the environment (Baranowski et al., 2002), the researcher created the activities consist of brainstorming about perception and interpretation of the environment of physical exercise and DASH eating plan, rectify misperception about physical exercise and DASH eating plan, and group discussion. Any misperceptions hinder the behavior change. Thus efforts must be made to remove misperceptions and to promote social norms that are healthy. These finding showed that the participants in the intervention group had higher level of situational perception than that of situational perception in comparison group after receiving life style modification program. Thus the participants in the intervention group had correct information about physical exercise and DASH eating plan making easier for them to promote healthy social norm related to physical exercise and DASH eating plan. This finding was consistent with previous study showing that the participants who get health education program on promoting physical

activity among diabetic women there were significant differences in the mean's construct of the social cognitive theory especially situational perception (Mahdizadeh et al., 2013).

Related to self-efficacy in physical exercise and DASH eating plan, the researcher modify by presenting elderly who success doing physical exercise regularly and healthy diet consumption as role model, and demonstrated gymnastic fitness in small group. This finding showed that, the participants in the intervention group had higher self-efficacy to perform gymnastic fitness 3 times a week at least 30 minutes and DASH eating plan than the participants in comparison group. Several studies showed that self-efficacy has been consistently associated with physical activity behavior (McAuley et al., 2007; Rogers et al., 2008). In other words the findings revealed that there were some other SCT constructs that influence to lifestyle modification program than those already mentioned above including Outcome expectations, Situational Perception, Self-Efficacy in overcoming barriers, and Self-Control.

Related Outcome expectation in physical exercise and DASH eating plan modify by brainstorming and group discussion of benefits gymnastic fitness and DASH eating plan. The finding showed that the participants in the intervention group had higher outcome expectation regarding gymnastic fitness and DASH eating plan than the participants in comparison group. Bandura (1986) suggested, if people achieve the outcomes they expected to when they set out to change their behaviors, they are likely to feel satisfied with their persistence for the newly acquired behavior. This findings was consistent with the previous research showing that the participant with higher outcome expectations have been shown to be related to greater physical activity participation (Son et al., 2009; Umstattd and Hallam, 2007; Mahdizadeh et al., 2013). Another study by Anderson et al. (2010) the result showed the positive relationship of Self-Regulation, Outcome expectations, and Social support to physical activity behavior. A study conducted by Plotnikoff et al. (2008) tested the effect of baseline SCT variables on 6 month physical activity behavior using the paths specified by Bandura (2004) in individuals with type I and type II diabetes, independently. They

founded specified relationship for direct effect of baseline outcome expectations on 6-month physical activity.

In terms of Self-efficacy in overcoming barrier, the researcher modified by presenting role model to demonstrate success of overcoming barriers of physical exercise and DASH eating plan. The finding showed the intervention group had higher level in self-efficacy in overcoming barriers than the participants in the comparison group, the intervention groups were confident in overcoming barriers related to gymnastic fitness and DASH eating plan while performing a given behavior. The study conducted by Mahdizadeh *et al*. (2013) showed that an increased commitment to barrier self-efficacy for physical activity in diabetic women were found to cause changes in physical activity within the intervention group. Other study conducted by White *et al*. (2011) showed that changes in self-efficacy were significantly related to residual changes in outcome expectations, self-efficacy in overcoming barriers, self-regulation, and physical activity and indirectly related to residual changes in physical activity through changes in physical and social outcome expectations.

The researcher modified Self-regulation by providing opportunities to participants in the intervention group for setting goals and self-monitoring of gymnastic fitness and DASH eating plan, when one sets goals and develop concrete plans, behavior change becomes easier. The finding showed the intervention group had higher level of self-regulation than the participants in comparison group, meaning that the participants in intervention group were able to setting goals related to gymnastic fitness and DASH eating plan and can create the concrete plans. This finding consistent with previous study showing that increasing self-regulation of modification program of physical activity behavior in adults (Macdonald., 2008). Several studies conducted in term of Self-regulation and showed that self-regulation, or the ability to monitor behavior in order to achieve goals had associated with regular exercise participation in older adults (Son *et al*., 2009; Umstattd and Hallam., 2007; Anderson *et al*., 2010).

2. The effect of life style modification program including the level of knowledge hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, self-regulation in physical exercise and DASH eating plan on Physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride level.

Controlling physical conditions level including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride might be improved by doing physical exercise at least 30 minutes 3 times a week and DASH eating plan consumption in a short period of 7 weeks. These findings were consistent with several previous studies which focus on 6 weeks on behavioral intervention to improve DASH dietary pattern and physical activity, the result showed at the end of the intervention Systolic and Diastolic blood pressure decreased, and BMI decreased (Golberg et al., 2010; Fernandez et al., 2008). The study conducted by Valente et al. (2011) showed that the participants who participated in resistance training to dietary and physical activity education in 30 minutes for 10 weeks had decreased body weight, percentage of body fat, BMI, blood pressure, and lipid profile (LDL, HDL, Triglyceride). According to AHA recommendation on diet and lifestyle revision (2006), it mentioned that improving diet and lifestyle is critical strategy component for cardiovascular diseases risk reduction including levels low LDL, Cholesterol, Triglyceride, high level HDL, increased HR Intensity, and maintain blood pressure. The ENCORE study of comparing the DASH diet alone and combination with physical exercise for 4 month had greater reduced blood pressure and increasing HR intensity (Blumenthal *et al.*, 2010). The study conducted by Blumenthal *et al.* (2010) combining the DASH diet, exercise, and caloric restriction resulted in significant reduction in blood pressure, BMI, and serum lipid. Moreover, the difference in physical exercise and diet pattern interventions between this study and another study could have influenced changes in physical conditions level.

Considering routine care was provided by different caregivers, the differences in knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy

in overcoming barriers, and self-regulation towards physical exercise and DASH eating plan were significant which may be caused by the relationship between health care providers and patients themselves. Health care providers might have important role of improving knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation and behavior changes (Jonas *et al.*, 2008).

Strength of study

This study had number of strengths. First, the study used the construct of SCT conceptual framework to guide the intervention program. Therefore, the aspect that highly affected behaviors when nursing intervention of health behavior was interpersonal aspect. Second, the study recruited participants from hypertensive elders using random sampling and separated PHC to avoid contamination from intervention group or comparison groups related to the intervention program.

Limitations of study

Even though this study has reached its aims, there were some unavoidable limitations. It is important to acknowledge some limitations in the present study. First, the intervention in this study was provided over an 7 week period which provided a lifestyle modification program on hypertensive elders at Public Health Centre in North Bekasi, with no continued follow up, which may not be a sustainable program. Second, the program is only focused for hypertensive elders, so that the program cannot be effective against other chronic diseases and other age group. Third, most of the participants were female hypertensive elders.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study is quasi-experimental research in the form of pre and post two group design. The objective of this study was aimed to evaluate the effectiveness of the lifestyle modification program on behavior change and physical conditions among hypertensive elders in North Bekasi sub district, West Java, Indonesia.

The researcher utilized constructs of Social Cognitive Theory as guideline in creation of activities for this research by selection of specific sample group. Elderly with stage I and stage II Hypertension from two the Public Health Care in the North Bekasi sub district have been selected by random sampling. Only hypertensive elders in the intervention group received lifestyle modification program and the research was operated by the researcher beginning from the second week of August until the first week of October 2014 for the total period of times at 7 weeks.

The lifestyle modification program given to the intervention group composed of: the creation of activities to promote knowledge related to hypertension evaluation of lifestyle and management, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation in physical exercise and DASH eating plan. The activities consisted of slide presentation, brainstorming, group discussion, presenting role model, provided opportunities for setting goals, and self-monitoring/self-recorded of physical exercise and DASH eating plan, and demonstrated exercise practice by researcher of gymnastic fitness.

The researcher created the lifestyle modification program for behavior health totally 7 times at 1 period each 60-120 minutes in the period of 7 weeks. The instruments used for collecting data were self-administered questionnaire and physical examination. Collecting data was totally made 2 times meaning before the intervention by collection of data from both groups. After participation in the activities accordance with program, first collection of data was made and following up the lifestyle program

together with practicing gymnastic fitness then the second collection of data was made using the same old questionnaire forms and physical examination then data was relined statistically analysis of SPSS for windows and general data was analyzed by the mean, median, frequency, percentage, comparing the difference mean score within intervention group and comparison group of knowledge, situational perception, self-efficacy, outcome expectations, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan before receiving lifestyle modification program and after receiving lifestyle modification program with the statistically Paired t-test and comparison mean score of knowledge, situational perception, self-efficacy, outcome expectations, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan between the intervention group and comparison group before and after intervention with the statistically Independent t-test.

The research conclusion could be summarized as follows:

1. The possibility of change score of knowledge, situational perception, self-efficacy, outcome expectations, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan in hypertensive elders, following their participation in the lifestyle modification program have been significantly higher than that of participants before their participation in the program, and the level of physical conditions including BMI, Systolic and Diastolic blood pressure, Cholesterol, LDL were decreased, and HR Intensity and HDL were increased, with statistically significant differences ($p < .05$), only Triglyceride not changing, while changes among participants in the comparison group has shown no significant difference.

2. The possibility of change score of knowledge, situational perception, self-efficacy, outcome expectations, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan in hypertensive elders receiving lifestyle modification program exhibited higher than those participants without receiving lifestyle modification program, and the level of physical conditions

including BMI, Systolic and Diastolic blood pressure, Cholesterol, LDL were decreased, and HR Intensity and HDL were increased in hypertensive elders who receiving lifestyle modification program than those without receiving lifestyle modification program with statistically significant differences ($p < .05$), only Triglyceride not changing across over time.

Recommendations

The study shown results that lifestyle modification program based on SCT constructs is a very useful intervention for promoting lifestyle modification for elders with hypertension. Based on the finding, the following recommendations should be given:

1. Nursing Practice

Health care provider should give lifestyle modification program based on SCT construct regularly to promote knowledge; correct interprets of situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan to maintain physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride. This program is feasible to encourage people with hypertension to take up physical exercise and healthy diet at community center. This intervention could be provided by any member of hypertension care team at community health center with minimal training in providing cognitive behavioral interventions related to hypertension to sustainability the program.

2. Nursing Education

According to research results, as reported that lifestyle modification program based on SCT constructs have positive effect to increase knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating health behavior and

physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride of hypertensive elders. It is advisable to support and encourage teaching and learning approach by providing information to student about the effective result of the intervention based on SCT construct. Nurse educators should incorporate lifestyle modification program intervention based on SCT construct in the theoretical and practical learning of nursing students in order to extend their knowledge and skills in hypertension management and the result of this study can be example in teaching class or some part of the lecture.

3. Nursing Administration

The nursing administrator should support and promote among nurses awareness of the importance to apply the lifestyle modification program, to implement planning in a more appropriate way, by carryout periodic training session for staff nurses. This study could be a model that the healthy setting could be used as a program in health care setting in large population and measure its effectiveness.

4. Future research

The results of the lifestyle modification program should be studied with a longer follow up period to evaluate the sustainability of knowledge, situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulation on physical exercise and DASH eating plan and physical conditions including BMI, HR Intensity, Systolic and Diastolic blood pressure, Cholesterol, HDL, LDL, and Triglyceride with a larger sample size of patients of hypertension.

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APPENDICES

Appendix A
Form of Patient/ Participant Information Sheet, Informed Consent Form in English

	Boromarajonani College of Nursing Nopparat Vajira	Form of Patient/ Participant Information Sheet

Title of research project: The Effect of Lifestyle Modification Program on Behavior change and Physical conditions among Hypertensive Elders in North Bekasi sub district, West Java, Indonesia, Indonesia.

Principle Researcher's Name: Neneng Kurwiyah Ihwanudin.

Position: Student in Master of Nursing Science (Family and Community) of Boromarajonani College of Nursing Nopparat Vajira, affiliated institution of Kasetsart University, Bangkok, Thailand

Office address: Fakultas Ilmu Keperawatan Universitas Muhammadiyah Jakarta, Jl. Cempaka Putih Tengah I/I Jakarta Pusat, Indonesia

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(Thailand) +66888363801

You are being invited to take part in a research project. Before you decide to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

This research project involves older people with hypertension to ask about their lifestyle including physical activity and diet that can impact of blood pressure, heart rate, body mass index, cholesterol, triglyceride, low density lipoprotein and hig density lipoprotein and also cognitive factor that influence to regulate or maintain physical activity and diet including personal information of older people, knowledge,situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulate.

The purpose of this research project is to evaluate the effectiveness of lifestyle modification program on affecting behavior change and physical conditions among hypertensive elders in Primary Health Center of North Bekasi sub district, West Java, Indonesia.

Details of Participant:

The characteristics of participants in this study are older people age 60-80 years with stage 1 hypertension as having diagnosed by a physician and receiving antihypertensive medication. They are residences in North Bekasi sub district, able to

read and speak in bahasa Indonesia, and they did not stay on hospitalized. They should be attending all of the session of the lifestyle modification program will be invited as potential participants, and ask for willingness to take part in the study. And they are agreeing to be participant in this study by signing in an informed consent form. However, the older people who with stage 1 hypertension with severe cardiovascular problems, they have disabilities and other problems (dementia), and they did not intend to become active will be excluded from this study. I plan to enroll about 64 participants from two PHC after got permission from Director of Health Department North Bekasi sub district to collect data. After that I will explain in detail about the study and screening cognitive function of them by scoring MMSE as part of criteria to recruit participants. After get the total number of potential participants (64 participants), I will divided the participant into two groups, 32 participants will be in each group in each PHC. The first PHC is as intervention group and second PHC as control group.

Procedure upon Participants:

First, you will receive the explanation from the researcher about the purpose, benefits, starting procedure, duration of the study, roles of the researcher and the participants. After you understand all information of the study, you are required to sign two copies of informed consent form, one for participant and one for researcher. Second, the researcher will measure your blood pressure, heart rate, weight, height, and record the result of lipid profile including cholesterol, triglyceride, low density lipoprotein and high density lipoprotein from medical record. Lastly, the researcher will ask questions about personal information, your knowledge, and situational perception, self-efficacy, outcome expectation, self-efficacy in overcoming barriers, and self-regulate of physical activity and DASH eating plan. It's will take time approximately ninety minutes. The effort to maintain behavior change expected can be achieved through the lifestyle modification program. The intervention will be given 2 times education session in two weeks about lifestyle modification program including physical exercise and DASH eating plan, each session 120 minute and 6 weeks for doing physical exercise 30 minute three times a weeks. The researcher will be paid for including you in this study including transportations and laboratories. In this study the participants does not know about the outcome of the intervention.

Researcher has guaranteed that procedures acted upon me would be exactly the same as indicated in the information. All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the PHC will have your name and address removed so that you cannot be recognized from it. Results of the study will be reported as whole picture. Any of personal information which could be able to identify will not appear in the report. After the end of the project personal data and blood sample will be destroyed.

Process of providing information

You will be provided this information by researcher. You will be

permitted to read the information and or researcher will read for you. Please provide yourself to participate in this study by signing the two copies of informed consent, each for you and researcher. All the information will be provided in to bahasa Indonesia.

Screening process found person not meet criteria

If the process of screening potential participants found a person not meet inclusion criteria and in need of help or advice, researcher will explain the criteria to be a participant for this research project and collaborate with health care provider in PHC provide help or advice for those person.

Use of medical record

This research project use medical record of PHC to find the potential participants after get permission from head of PHC, nursing who responsibility of the participant and also get permission from the participants.

Indicate Risk/Harm and Benefit

There is no risk involved in this study except your valuable time. If there is unpleasant and uncomfortable during answering the question, we will stop the question. You will be allowed to skip any questions if you feel uneasy to answer and researcher will provide time to take a rest if you feel tired to answer the questions. The patients with hypertension can do lifestyle modification program including physical activity and DASH eating plan to maintain blood pressure and this program not have contra indications with medication program for patient with hypertension except the patient who have severe hypertension cannot doing physical exercise because can make bad conditions such as stroke. The patients who take this program until finish hopefully can get benefits such as normal blood pressure and other physical condition. We hope that both (all) the treatments will help you. However, this cannot be guaranteed. The information we get from this study may help us to treat future older people with hypertension on non-pharmacologic treatment such as
lifestyle modification including physical exercise and DASH eating plan in North Bekasi sub district, West Java, Indonesia. Sometimes during the course of a research project, new information becomes available about the treatment/drug that is being studied. If this happens, researcher will tell you about it and discuss with you whether you want to continue in the study. If you decide to withdraw researcher will mak arrangements for your care to continue. If you decide to continue in the study you will be asked to sign an updated consent form.

Right of Refusal to Participate and Withdrawal

You are free to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a

reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive and it does not influence the services of PHC.

Available Sources of Information:

If you have any further questions or would like to obtain more information you may contact me as a principal researcher (Neneng Kurwiyah Ihwanudin), Master of Nursing Science Program, Boromarajonani College of Nursing Nopparat Vajira, affiliated institution of Kasetsart University Thailand, on following phone number +66888363801 (Thailand) or +6285691932921 (Indonesia). I can be reached at all the time. If I have new information regarding benefit on risk/harm, you will be informed as soon as possible. If you are not treated as indicated in the information sheet, you can report to the Ethics Review Committee for Research Involving Human Research Subjects, Boromarajo
nani College of Nursing Nopparat Vajira 681 Ramintra Road, Khannayao, Bangkok 10230, Thailand, Tel. 02-540-6500 ext 257, 246.

If you are willing to be the participant in this study, please fill in the participant consent form. In this great opportunity I would like to thank you for taking time to read this information sheet. Your participation in this study will be highly valued and much appreciated.

	Boromarajonani College of Nursing Nopparat Vajira	Form of Informed Consent Form

Principle Researcher's Name: Neneng Kurwiyah Ihwanudin
Contact address: Perumahan Villa Mas Indah blok C13 no 5 Harapan Baru- Bekasi Utara, West Java, Indonesia
Telephone: (Indonesia) +62-856-9193-2921   (Thailand) + 66888363801

I confirm that I have read and understand the information sheet date for the above study and have had the opportunity to ask questions and my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.

I understand that section of any of my medical notes may be looked at by responsible individuals from (company name) or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access to my records. I agree to take part in the above study. If I am not treated as indicated in the information sheet, I can report to the Ethics Review Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira 681 Ramintra Road, Khannayao, Bangkok 10230, Thailand, Tel. 02-540-6500 ext 257, 246. I also have received a copy of information sheet and informed consent form.

Sign……………………………….

(Neneng Kurwiyah Ihwanudin)
Researcher

Sign…………………………….

(……………………………………..)
Participant

Sign……………………………………

(………………………….................)

Witness

Appendix B
Questionnaires

DEMOGRAPHIC CHARACTERISTICT QUESTIONNAIRE (DCQ)

A.   Self Administered of participant

Instructions to fill in the questionnaire:

a.   All questions must be answer

b.   For question 6, and so on give mark ($\sqrt{}$) on the appropriate in the number provided.

1. Respondent number   : .... (by researcher)
2. Address   : ....

   Mobile phone/home phone   : ....

3. Duration of hypertension: .... (years)

4. Age   : .... (years old)

5. Income   : IDR............................../month

6. Gender   : 1. Male   2. Female

7. Marital status   : 1. Single   2. Married
                                  3. Widow   4. Divorced

8. Education (Years)   : 1 2 3 4 5 6 7 8 9 10 11
                                  12 13 14 15 16 17 18 19 20 21

9. Religion   : 1. Moslem   2. Christian
                                  3. Buddhism   4. Hinduism

B. Physical Examination of participants, measured and record (by researcher)

1. Height/ Weight   : ....centimeter/kilogram
2. BMI   : ....Kg/m²
3. HR Intensity   : ....x/minute
4. Systolic blood pressure : ....mmHg
5. Diastolic blood pressure : ....mmHg
6. Cholesterol   : ....
7. HDL   :
8. LDL   :
9. Triglyceride   :

HYPERTENSION EVALUATION OF LIFESTYLE AND MANAGEMENT
KNOWLEDGE SCALE

Please give mark (√) on the correct answer according to your opinion

1. A person considered to have hypertension if the person BP is 140/90 or higher in two different occasion:

   a. True   b. False

2. Most people found hypertension feel discomfort:

   a. True   b. False

3. Hypertension don't need medication if they do exercise regularly:

   a. True   b. False

4. Uncontrolled hypertension can cause these following:

   a. Pulmonary disease (lung cancer)   c. High Cholesterol

   b. Kidney failure   d. Diabetic

5. These things can increase the risk of hypertension:

   a. Gaining weight (7kg)   b. drink 2 cup of coffe or > more

   c. smoking 1 pack

6. Which of the following statements about measuring Blood Pressure is TRUE:

   a. Always take Blood pressure medication after eat time

   b. Blood pressure medication works better during sleep time

   c. Blood pressure medication is not working if the person drink alcohol

7. A man 60 years old is having obesity with hypertension. He drinks 1 bottle of beer and 4 cup of coffee in a day. He adds salt to almost all his food. Which of the following changes have more probability for lowering the blood pressure:
   a. Lost body weigh10kg   b. stop drinking alcohol   c. less caffeine coffee

8. Which of the following changes have more probability for lowering the blood pressure :

   a. Eat more fruits, vegetables   b. Avoid spicy food

   b. Drinking alchohol every day   d. Drink tea or herbal coffee

9. Which one of the following statements about exercise and blood pressure is TRUE?

   a. People who's sitting everyday will not get benefit from the exercise

   b. Exercise for 30 minute every day minute will lower the BP more than just exercise 30 minutes in 3 days per week .

   c. Weight lifting must be avoid by people with hypertension

   d. While exercising, you have to increase the heart beat at least 100 pulse per minute to increase the blood pressure.

10. A man admitted his blood pressure was140/78mm after being checked in the pharmacy clinic, 144/66 mmHg at his family doctor's office and 132/74mmHg when checked at his home. Which of these following statements are true?

    a. This is a common situation when there is variation in reading the blood pressure

    b. Reading the highest blood pressure is the right one

    c. Reading the lowest BP is the right one

    d. The person can measure his or her own blood pressure and ensure that the BP is normal.

11. Blood pressure is measured in two numbers, the big one on the top and the small number below. Normally it's written big/small. If someone said that their BP's target is 126/76, do they achieving their target?

    a. If the upper number is under 126 and the lower number is under 76

    b. If the upper number is under 126 or if the lower number is higher than 76

    c. If the lower number is under 76 or if the upper is higher than 126

    d. When the average upper and lower is <100

SOCIAL COGNITIVE CONSTRUCT RELATED TO PHYSICAL EXERCISE

QUESTIONNAIRE

Situational Perception

How do you agree or disagree about the following statements, give mark (√) on the appropriate in the coloum provided according to your opinion. Score 1= Strongly Disagree 2= Disagree 3= Tend to Disagree 4= neither Agree or Disagree 5= Tend to Agree 6= Agree 7= Strongly Agree

No	Do you agree that for the next following 6 months	Agreement						
		1	2	3	4	5	6	7
1.	Most people in my neighborhood suggest me to do exercise regularly							
2.	My social neighborhood will agree if I do exercise regularly							
3.	My Doctors and Nurses suggest me to exercise regularly							
4.	My doctor and nurse will agree if do the exercise regularly							
5.	Most of my family member will participate in this regular exercise							
6.	Most of my friends participate in regular physical activity							
7.	People in my neighborhood are likely to help me participate in regular exercise							
8.	I feel that someone in my social network will provide the support I need in order to to exercise regularly							

Self-Efficacy

Please give mark (√) on the appropriate in the coloum provided according to your opinion. Score 1 = Not at all confident, 2 = slightly confident, 3 = moderate confident, 4 = very confident, 5 = extremely confident

No	Statement	Confidence				
		1	2	3	4	5
1.	How confident are you are capable of participating in regular physical activity?					

Outcome Expectation

Please read the following statements about physical activity and indicate how much you agree or disagree with each statement by give mark (√) on the appropriate in the coloum provided. Score 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

No	Statement	Agreement				
		1	2	3	4	5
1.	Will make me feel better physically					
2.	Will make my mood better in general					
3.	Will help me feel less tired					
4.	Will make my muscle stronger					
5.	Is something I will enjoy doing					
6.	Will give me a sense of personal accomplishment					
7.	Will make me more alert mentally					
8.	Will improve my endurance in performing my daily activities					
9.	Will help me reduce tension or manage stress					
10.	Will make me feel more confident about my health					
11	Will take too much of my life					
12.	Will cost too much money					
13.	Will decrease my chances of having further hypertension complications					
14.	Will help control my blood pressure					
15.	Will cause me physical injury					
16.	Will help me control my weight					

Self-Efficacy in Overcoming Barriers

The questions ask how confident you are about doing regular physical activity over the next 6 months in different circumstances. Give mark (√) on the appropriate in the coloum provided according to your opinion. Score 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

No	I am confident that I can join the exercise	Agreement				
		1	2	3	4	5
1.	When I am not too tired					
2.	When I am in a bad mood or feeling depressed					
3.	When I have to do it by my self					
4.	When it becomes boring					
5.	When I can't notice any improvement in my fitness					
6.	When I have money other demands on my time					
7.	When I feel a little stiff or sore					

8.	When the weather is bad					
9.	When I have to get up early, even on weekends					
10.	When I have hypertension complications					
11	When I have to find different activities due to hypertension complications					
12.	When I feel a little ill					

Self-Regulation

The next questions ask what extend do you have concrete plans about doing regular physical activity. Give mark (√) on the appropriate in the coloum provided according to your opinion. Score 1 = not at all, 2 = a little, 3 = somewhat, 4 = quite alot, 5 = completely

No	To what extend do you have concrete plans for	Concrete Plans				
		1	2	3	4	5
1.	When you will do regular physical activity					
2.	Where you will do regular physical activity					
3.	How you will do regular physical activity					
4.	How often you will do regular physical activity					
5.	With whom you will do regular physical activity					
6.	What to do if something should keep you from doing regular physical activity					
7.	What to do if you miss a physical activity session					

SOCIAL COGNITIVE CONSTRUCT RELATED TO DIETARY BEHAVIOR
QUESTIONNAIRE

Situational Perception

The questions ask how much agree or disagree with each statement. Give mark (√) on the appropriate in the coloum provided according to your answer. 1 = strongly disagree, 2 = disagree, 3 = disagree slightly, 4 = agree slightly, 5 = agree, 6 = strongly agree

No	Do you agree that:	Agreement					
		1	2	3	4	5	6
1.	There are healthy snack available to eat at home						
2.	There are healthy drink available (sugar free, low fat milk) at home						
3.	Fruits is always available to eat (including fresh, canned, or dried fruit) at home						
4.	Vegetables are always available to eat (including fresh, frozen or canned vegetables) at home						

Self-Efficacy

Give mark (√) on the appropriate in the coloum provided according to your answer.
1 = strongly disagree, 2 = disagree, 3 = disagree slightly, 4 = agree slightly, 5 = agree, 6 = strongly agree

No	Whenever I have a choice of the food to eat	Agreement					
		1	2	3	4	5	6
1.	I find it difficult to choose low-fat foods						
2.	I find it easy to choose a healthy snack when I eat between meals						
3.	I believe I have knowledge and ability to choose/prepare healthy snack						
4.	I find it difficult to choose healthy meals/snack when I am eating out with my family						
5.	I find it easy to eat at least 3 servings of fruit each day						
6.	I find it easy to eat at least 4 servings of vegetables/salad each day						
7.	I find it easy to have healthy portion sizes during meals						

Outcome Expectations

Please tick (√) one option to indicate how much you agree or disagree with each benefit. Options 1 = strongly disagree, 2 = disagree, 3 = partly disagree, 4 = partly agree, 5 = Agree, 6 = strongly agree

No	Statement	Agreement					
		1	2	3	4	5	6
1.	Healthy eating can reduce my risk for same illnesses and disease (e.g. heart disease, diabetes, some cancer etc.).						
2.	Healthy eating can help me to feel better physically						
3.	Healthy eating can help me to control my weight						
4.	Healthy eating (e.g. not skipping meals) can help to improve my concentration						
5.	Healthy eating can help me to feel more energetic throughout the day						

Self-efficacy in overcoming barriers Scale

Give mark (√) on the appropriate in the coloum provided according to your answer. In the past 3 month.....The options are 1 = never, 2 = rarely, 3= sometimes, 4= often, 5= always

No	Questions	Choice				
		1	2	3	4	5
1.	.... did you choose reduced-fat were available (e.g. little milk, reduced fat)					
2.	......rather than choose sugary drinks such as fruit juice or soft drink, did you choose water or sugar free drinks such as diet soft drink?					
3.	.....did you leave food on your plate once you felt full during a meal?					
4.	.....did you prepare healthy snacks and meals for yourself that were that were low fat and low sugar?					
5.	.....did you try preparing new recipes for meals and snacks hat were low in fat and low in added sugar?					
6.	....did you do things to make eating fruits and vegetables more enjoyable (e.g. try a new recipe or blend fruit to make a fruit smooth)?					

Self-Regulation

Give mark (√) on the appropriate in the coloum provided according to your answer in the next 3 months do you.....Options 1 = not at all true of me, 2 = not very true of me, 3 = some what true of me, 4 = very true of me

No	Questions	Choice			
		2	3	4	5
1.	.....intend to eat at least 3 servings of fruit each day?				
2.	....intend to eat least 4 servings of vegetables/ salad each day?				
3.	...intend to choose low-fat foods and drinks whenever you have a choice?				
4.	...intend to choose drinks and foods that are low sugar whenever you have choice?				
5.	....intend to eat healthier portion sizes during meals (e.g. not eating too much)?				

Appendix C
Reliability and result of statistic test

Appendix Table C1 Reliability statistic of Knowledge and SCT construction in Physical Exercise and DASH eating plan Questionnaires all items (N=30)

	N	%	Cronbach's Alpha	N of items
Case valid Knowledge	30	100	.89	11
Case valid Situational Perception in Physical Exercise	30	100	.98	8
Case Valid Self-Efficacy in Physical Exercise and DASH eating plan	30	100	.95	8
Case valid Outcome Expectation in Physical Exercise	30	100	.99	16
Case valid Self-Efficacy in Overcoming Barriers in Physical Exercise	30	100	.98	12
Case valid Self-Regulation in Physical Exercise	30	100	.98	7
Case valid Situational Perception in DASH eating plan	30	100	.99	4
Case valid Outcome Expectation in DASH eating plan	30	100	.99	5
Case valid Self-Efficacy in Overcoming Barriers in DASH eating plan	30	100	.98	6
Case valid Self-Regulation in DASH eating plan	30	100	.93	5

Appendix Table C2 Independent sample test of SCT Construction in Physical Exercise and DASH eating plan and Physical conditions between groups before intervention

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences	Lower	Upper
K	Equal variance assumed	.009	.926	1.676	56	.099	.448	.267	-.087	.984
	Equal variance not assumed			1.676	55.66	.099	.448	.267	-.088	.984
SP in PE	Equal variance assumed	.094	.760	1.333	56	.188	1.552	1.164	-.781	3.884
	Equal varian ce not assumed			1.333	55.98	.188	1.552	1.164	-.781	3.884
SE in PE	Equal variance assumed	.477	.493	3.225	56	.002	.621	.192	.235	1.006
	Equal variance not assumed			3.225	54.09	.002	.621	.192	.235	1.006

Appendix Table C2 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	t	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences	Lower	Upper
OE in PE	Equal variance assumed	5.316	.025	3.402	56	.001	1.897	.557	.780	3.013
	Equal variance not assumed			3.402	43.68	.001	1.897	.557	.773	3.020
SEOB in PE	Equal variance assumed	6.348	.015	3.737	56	.000	1.621	.434	.752	2.490
	Equal variance not assumed			3.737	42.56	.001	1.621	.434	.752	2.49
	Equal variance assumed	1.682	.200	-.883	56	.381	-.138	.156	-.451	.175
	Equal variance not assumed			-.883	54.99	.381	-.138	.156	-.451	.175

Appendix Table C2 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means						95% Confidence Interval of the Differences	
		F	Sig	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences		Lower	Upper
SP in DASH	Equal variance assumed	3.050	.086	-4.694	56	.000	-1.276	.272		-1.820	-.731
	Equal variance not assumed			-4.694	44.511	.000	-1.276	.272		-1.824	-.728
SE in DASH	Equal variance assumed	9.677	.003	-1.440	56	.155	-.069	.048		-.165	.027
	Equal variance not assumed			-1.440	28.000	.161	-.069	.048		-.167	.029
OE in DASH	Equal variance assumed	4.302	.043	1.000	56	.322	.034	.034		-.035	.104
	Equal variance not assumed			1.000	28.000	.326	.034	.034		-.036	.105

Appendix Table C2 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	t	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences	Lower	Upper
SEOB in DASH	Equal variance assumed	1.272	.264	2.453	56	.017	1.034	.422	.190	1.879
	Equal variance not assumed			2.453	54.233	.017	1.034	.422	.189	1.880
SR in DASH	Equal variance assumed	3.348	.073	1.930	56	.059	.345	.179	-.013	.703
	Equal variance not assumed			1.930	46.681	.060	.345	.179	-.015	.704

Appendix Table C3 Independent sample test of SCT Construction in Physical Exercise and DASH eating plan and Physical conditions between group after intervention

		Levene's test for Equality of Variance		t-test for Equality of Means						95% Confidence Interval of the Differences	
		F	Sig	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences		Lower	Upper
K	Equal variance assumed	12.445	.001	39.260	56	.000	7.034	.179		6.676	7.393
	Equal variance not assumed			39.260	39.911	.000	7.034	.179		6.672	7.397
SP in PE	Equal variance assumed	15.350	.000	13.331	56	.000	9.586	.719		8.146	11.027
	Equal variance not assumed			13.331	36.511	.000	9.586	.719		8.129	11.044
SE in PE	Equal variance assumed	144.554	.000	16.129	56	.000	1.655	.103		1.450	1.861
	Equal variance not assumed			16.129	28.000	.000	1.655	.103		1.445	1.865

Appendix Table C3 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	t	Df	Sig (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
OE in PE	Equal variance assumed	.735	.395	21.794	56	.000	10.310	.473	9.363	11.258
	Equal variance not assumed			21.794	48.465	.000	10.310	.473	9.359	11.261
SEOB in PE	Equal variance assumed	5.214	.026	49.005	56	.000	17.138	.350	16.437	17.839
	Equal variance not assumed			49.005	48.916	.000	17.138	.350	16.435	17.841
SR in PE	Equal variance assumed	44.454	.000	32.423	56	.000	15.379	.474	14.429	16.330
	Equal variance not assumed			32.423	31.656	.000	15.379	.474	14.413	16.346

Appendix Table C3 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences	Lower	Upper
SP in DASH	Equal variance assumed	22.628	.000	14.687	56	.000	7.172	.488	6.194	8.151
	Equal variance not assumed			14.687	35.571	.000	7.172	.488	6.182	8.163
SE in DASH	Equal variance assumed	70.752	.000	41.354	56	.000	18.345	.444	17.456	19.233
	Equal variance not assumed			41.354	28.340	.000	18.345	.444	17.437	19.253
SEOB in DASH	Equal variance assumed	4.073	.048	50.877	56	.000	17.310	.340	16.629	17.992
	Equal variance not assumed			50.877	48.669	.000	17.310	.340	16.626	17.994

Appendix Table C3 (Continued)

		Levene's test for Equality of Variance		t-test for Equality of Means					95% Confidence Interval of the Differences	
		F	Sig	t	Df	Sig (2-tailed)	Mean Difference	Std. Error Differences	Lower	Upper
SR in DASH	Equal variance assumed	2588.444	.000	101.631	56	.000	9.552	.094	9.363	9.740
	Equal variance not assumed			101.631	28.000	.000	9.552	.094	9.359	9.744

Appendix Table C4 Dependent sample test of SCT Construction in Physical Exercise and DASH eating plan and Physical conditions of the intervention group

		Paired Differences					t	Df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences				
					Lower	Upper			
Pair 1	BMI before-after	.32862	.22491	.04176	.24307	.41417	7.868	28	.01
Pair 2	HR Intensity before-after	-5.966	3.540	.657	-7.312	-4.619	-9.074	28	.01
Pair 3	Systolic BP before-after	13.103	7.123	1.323	10.394	15.813	9.906	28	.01
Pair 4	Diastolic BP before-after	8.621	4.411	.819	6.943	10.299	10.524	28	.01
Pair 5	Cholesterol before-after	9.483	4.672	.868	7.706	11.260	10.930	28	.01
Pair 6	HDL before-after	-2.483	2.324	.432	-3.367	-1.599	-5.753	28	.01
Pair 7	LDL before-after	3.034	1.907	.380	2.257	3.812	7.995	28	.01
Pair 8	Triglyceride before-after	-.724	1.121	.354	-1.449	.001	-2.045	28	.05

Appendix Table C4 (Continued)

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		Paired Differences					t	Df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 9	Knowledge before-after	-5.552	1.121	.208	-5.978	-5.125	-26.675	28	.01
Pair 10	SP in PE before-after	-8.862	3.777	.701	-10.299	-7.425	-12.635	28	.01
Pair 11	SE in PE before-after	-1.310	.660	.123	-1.561	-1.059	-10.687	28	.01
Pair 12	OE in PE before-after	-8.448	2.369	.440	-9.349	-7.547	-19.203	28	.01
Pair 13	SEOB in PE before-after	-15.586	1.637	.304	-16.209	-14.964	-51.273	28	.01
Pair 14	SR in PE before-after	-15.517	2.459	.457	-16.452	-14.582	-33.989	28	.01

Appendix Table C4 (Continued)

		Paired Differences					t	Df	Sig.(2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 16	SE in DASH before-after	-18.448	2.458	.456	-19.383	-17.513	-40.417	28	.01
Pair 17	OE in DASH	-9.966	.186	.034	-10.036	-9.895	-289.000	28	.01
Pair 18	SEOB in DASH	-16.310	1.442	.268	-16.859	-15.762	-60.919	28	.01
Pair 19	SR in DASH	-9.207	.819	.152	-9.518	-8.896	-60.575	28	.01

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Appendix Table C5 Dependent sample test of SCT Construction in Physical Exercise and DASH eating plan and Physical conditions of the comparison group

		Paired Differences					t	Df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	BMI before-after	-.23690	.21924	.04071	-.32029	-.15350	-5.819	28	.01
Pair 2	HR Intensity before-after	-.690	1.561	.290	-1.283	-.096	-2.380	28	.02
Pair 3	Systolic BP before-after	.345	7.784	1.445	-2.616	3.306	.239	28	.81
Pair 4	Diastolic BP before-after	1.379	5.158	.958	-.583	3.341	1.440	28	.16
Pair 5	Cholesterol before-after	-4.655	2.240	.416	-5.507	-3.803	-11.189	28	.01
Pair 7	LDL before-after	-4.897	3.255	.604	-6.135	-3.658	-8.101	28	.01
Pair 8	Triglyceride before-after	-1.345	4.295	.798	-2.979	.289	-1.686	28	.10

Appendix Table C5 (Continued)

		Paired Differences					t	Df	Sig.(2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 9	Knowledge before-after	1.034	1.017	.189	.648	1.421	5.477	28	.01
Pair 10	SP in PE before-after	-.828	1.627	.302	-1.447	-.209	-2.739	28	.01
Pair 11	SE in PE before-after	-.276	.591	.110	-.501	-.051	-2.512	28	.01
Pair 12	OE in PE before-after	-.034	.499	.093	-.224	.155	-.372	28	.71
Pair 13	SEOB in PE before-after	-.069	.258	.048	-.167	.029	-1.440	28	.16
Pair 15	SP in DASH	-.345	.814	.151	-.654	-.035	-2.281	28	.03
Pair 16	SE in DASH	-.034	.186	.034	-.105	.036	-1.000	28	.33
Pair 18	SEOB in DASH	-.034	.186	.034	-.105	.036	-1.000	28	.33

Appendix D
Intervention Program

Appendix D7

LIFESTYLE MODIFICATION PROGRAM BASED ON SCT CONSTRUCT ON BEHAVIOR CHANGE AND PHYSICAL CONDITIONS AMONG HYPERTENSIVE ELDERS

Content

Introduction

Activities 1. Brainstorming

Activities 2. Health Education

Activities 3. Group Discussion

Activities 4. Presenting Role Model

Activities 5. Demonstration of Gymnastic Fitness

Activities 6-17. Pr

acticing of Gymnastic Fitness

Introduction

Hypertension has been a significant health problem for elderly people worldwide because it has become a common chronic disease for them, and a leading risk factor for many diseases which have been costly and has contributed to the morbidity and mortality rates (Frost and Ihab, 2006). Treatment of hypertension composed of pharmacologic and non-pharmacologic (Aronow, 2008). In term of non-pharmacologic treatment of hypertension is lifestyle modification.

Lifestyle modification including physical exercise and healthy diet are one of the important aspects of healthy lifestyle, which has essential role in reducing the burden of disease and death, and has important roles in hypertensive people.). Furthermore, the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure [JNC] suggested a lifestyle modification besides drug medication in the prevention and treatment of hypertension. There were five component lifestyle modifications that were recommended by the JNC for reducing blood pressure. The components were: losing weight, managing diet or the application of a combination of a Dietary Approach to Stop Hypertension [DASH], reducing salt intake, doing regular physical activity, limiting alcohol intake, and also quitting smoking (Chobanian, 2003). The current challenges to health care provider, researcher, government official, and the general public is developing and implementing effective clinical and public health strategies that lead to sustained lifestyle modification (Appel, L.J, 2003).

The health education program about lifestyle modification was one of the most essential methods in chronic diseases prevention, cure and control as in elderly people with hypertension. Health education increased participant's knowledge of health and can inform about their health care and health care choice (Kecaci and Bulduk, 2012). Therefore, the intervention was based on the theory that was more effective in health related behaviors than those compared to intervention without theoretical framework,

since developed intervention as well as guides could be used in the evaluation of the intervention (Plotnikoff et al., 2008). In addition, the aspect that most affected behaviors when nursing intervention was used to effect health care behavior were the interpersonal aspects that were best guided by the Social Cognitive Theory [SCT] (Resnick, 2011). According to Resnik (2011) mentioned that the interpersonal aspect was the most affected behavior change, therefore the intervention program was more effective if presented in various activities.

Activities 1: Brainstorming
Expected outcomes: Participants were able to express and share self-knowledge and self-experience about physical exercise and healthy diet in the past.

Objectives	1. To explore and find out various experience of the participants in the past related to lifestyle modification including physical exercise and healthy diet, whether the perception of physical exercise and healthy diet 2. To explore knowledge about physical exercise and healthy diet, physical exercise and healthy diet experience and experience when faced obstacle of physical exercise and healthy diet, brainstorming about perceives and interprets the environment of physical exercise and DASH eating plan of the participants.
Materials	Sound system
Time	45 – 60 minutes
Process	1. Divided the participants into 5 groups and explained the objectives of the activities. 2. Asked a representative participants from each group was share various experience in the past related to lifestyle modification including physical exercise and healthy diet, whether the perception of physical exercise and healthy diet, knowledge about physical exercise and healthy diet, physical exercise and healthy diet experience and experience when faced obstacle of physical exercise and healthy diet. 3. Asked about perceives and interprets the environment of physical exercise and DASH eating plan of the participants.

Activities 2: Provided Knowledge about hypertension and lifestyle modification including physical exercise and healthy diet for elderly people.

Topics: 1. Hypertension on elderly people
2. Physical exercise on hypertensive elders
3. DASH eating plan

Expected outcomes: 1. Participants were enhancing the level of knowledge related to hypertension and lifestyle modification including physical exercise and healthy diet for elderly.
2. Participants were increase understanding about benefit and consequences of lifestyle modification for hypertensive elders.
3. Participants were more understand the myth and fact about hypertension and lifestyle modification.

Objectives	1. To enhance the level of knowledge related to hypertension and lifestyle modification including physical exercise and healthy diet (DASH) eating plan of the participants. 2. To enhance understanding about benefits and consequences of physical exercise and DASH eating plan of the participants.

	3. To provide the partcipants making dicission about lifestyle choice based on their knowledge which the researcher was give related to the topic.
Materials	Slide presentation and sound system
Time	60 – 120 minutes

Process	1. Described the activities to be carried out and the objectives of the activities.
	2. Asked some questions which related to the topic:
	"What is hypertension?"
	"How does high blood pressure affect our health?"
	"Can high blood pressure be effectively controlled?"
	"How can physical exercise and diet help control high blood pressure?"
	"How to begin following physical exercise and the DASH eating plan?"
	3. Explained related to the topic:
	  a) Hypertension in elderly people
	  b) Physical Exercise
	  c) DASH eating plan
	4. Explained benefits and consequences of the physical exrcise and DASH eating plan.
	5. Asked the participants' experiences when they doing physical exercise and healthy diet.
	"Did you ever doing physical exercise and healthy diet?"
	"What your feel especially on your blood pressure?"

The Material

HIGHER BLOOD PRESSURE AND LIFESTYLE MODIFICATION

High blood pressure is a disease that often on elderly people and required comprehensive treatment and handling for long time. High blood pressure can controlled by modify healthy lifestyle including physical exercise regularly and DASH eating plan.

A. High blood pressure on Elderly people
1. What is high blood pressure?

Blood pressure is the force of blood against your artery walls as it circulates through your body. Blood pressure normally rises and falls throughout the day, but it can cause health problems if it stays high for a long time. High blood pressure can lead to heart disease and stroke—leading causes of death in the world. Classification of blood pressure based on the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High blood Pressure (JNC 7)

BP Classification	Systolic BP (mm Hg)		Diastolic BP (mm Hg)
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

2. How is high blood pressure diagnosed?

Your doctor measures your blood pressure by wrapping an inflatable cuff with measure a pressure around your arm to squeeze the blood vessels. Then he or she listens to your pulse with a stethoscope while releasing air from the cuff. The measures the pressure in the blood vessels when the heart beats (systolic) and when it rests (diastolic).

3. Are you at risk?

One in three adults has high blood pressure—that's an estimated 67 million people. Anyone, including children, can develop it. Several factors that are beyond your control can increase your risk for high blood pressure. These include your age, sex, and race or ethnicity. But you can work to reduce your risk by eating a healthy diet, maintaining a healthy weight, not smoking, and being physically active.

4. What are the signs and symptoms?

High blood pressure usually has no warning signs or symptoms, so many people don't realize they have it. That's why it's important to visit your doctor regularly. Be sure to talk with your doctor about having your blood pressure checked. When an individual has extremely high blood pressure, there are common signs and symptoms such as headache, dizziness, blurred vision, fatigue, nausea and vomiting, chest pain, and shortness of breath.

5. How is it treated?

If you have high blood pressure, your doctor may prescribe medication to treat it. Lifestyle changes, such as the ones listed above, can be just as important as taking medicines. Talk with your doctor about the best ways to reduce your risk for high blood pressure.

B. Physical exercise on Elderly people

Physical activity was important for older adults to maintain health, preserve the ability to perform activities of daily living [ADLs], and improve their general quality of life. Regular cardio exercise is important for any age group, but elderly people probably have the most to gain from starting (or continuing) an exercise

program. Not only does cardio strengthen your heart and lungs, it gives you more energy, sharpens your mind, helps you manage your weight, can reduce symptoms of anxiety and depression, and may even keep you young.

1. Types of Exercise

For elderly people who want to stay healthy and independent, the National Institutes of Health (NIH) recommend four types of exercises:
- **Strength exercise,** build elderly people muscles and increase your metabolism, which helps to keep your weight and blood sugar in check.
- **Balance exercise,** build leg muscles, and this helps to prevent falls. Many of elderly people broken hips and many of them falling is often the cause of those fractures. Balance exercise can help you stay independent by helping you avoid the disabilities that could result from falling.
- **Stretching exercise,** can give you more freedom of movement, which will allow you to be more active during your senior years. Stretching exercises alone will not improve your endurance or strength.
- **Endurance exercise,** are any activity—walking, jogging, swimming, biking, even raking leaves—that increases your heart rate and breathing for an extended period of time. Build up your endurance gradually, starting with as little as 5 minutes of endurance activities at a time.

To achieve cardiac endurance, exercise must be performed long enough to require a continuous supply of oxygen, which puts a demand on the cardiopulmonary system to reach at least 55% of the maximum heart rate (Maximum heart rate = 220 – age, target heart rate = maximum heart rate x 75%, target heart rate range = 65% to 80% of maximum heart rate). Ideally, the heart rate should fall within the target heart rate range during exercise. Moreover, depending on the exercise, any activity should be done for at least 20 minutes, at least 3 days a week.

2. Intensity of Exercise

Moderate intensity cardio, for 30 minutes, 5 days a week for moderate-intensity physical activity, a person's target heart rate should be 50 to 70% of his or her maximum heart rate.

Vigorous intensity cardio, for 20 minutes, 3 days a week for vigorous-intensity physical activity, a person's target heart rate should be 70 to 85% of his or her maximum heart rate.

3. Benefits of Physical Exercise

The benefits of physical activity included prevention of heart disease, a reduction of blood pressure, reduced risk of osteoporosis, promotion of appropriate weight, and promotion of more restful sleep, increased HDL cholesterol levels,

increased cardiovascular functional capacity, decreased myocardial oxygen deman, promoting muscle strength and joint flexibility, and it reduced the risk of falling by increasing agility.

C. DASH eating plan on Elderly people

1. What is the DASH eating plan?

The diet plan is to reduce blood pressure as much as some medications. DASH focus focuses on increasing servings of fruits, vegetables, and lowfat dairy products, while decreasing sodium and saturated fat. DASH is rich in magnesium, potassium, and calcium, as well as protein and fiber.

2. Who should follow the DASH eating plan?

Any adult person who wants to eat healthier can follow the DASH eating plan, it contains no hard to-follow recipes or special foods. However, DASH was developed for those who have or are at risk for high blood pressure. It is especially good for those patients who are motivated to reduce their cardiovascular health risk in a natural and healthy way.

3. How do I start?

The great thing about the DASH eating plan is that you don't need to invest a lot of money in special products. You don't need to spend all your time fixing hard to follow recipes or special foods just for you. This is an eating plan your whole family can participate in and everything you will need is in your local grocery store.

4. DASH Eating Plan

The DASH eating plan

Food Group	Servings/Day	
	1.600 Calories	2.000 Calories
Grains and grain product	6	7-8
Vegetables	3-4	4-5
Fruits	4	4-5
Lowfat or fat free dairy foods	2-3	2-3
Meats, poultry, and fish	1-2	2 or less
Nuts	3 per week	4-5 per week
Fats and oils	2	2-3
Sweets	2 per week	5 per week

Activities 3: Group Discussion.

Topics: 1. Hypertension on elderly people
2. Physical exercise on hypertensive elders
3. DASH eating plan

Expected outcomes: 1. Participants were able to make decision about lifestyle
modification for them self.
2. Participants were able to set goals and creat self-monitoring
related lifestyle modification.

Objectives	1. To enhance the ability of the participants to make disicions about their life related to lifestyle modification. 2. To enhance the ability of the problem solving when obstacle occurred during implementing lifestyle modification.
Materials	Sound system and handout slide presentations
Time	60 – 120 minutes
Process	1. Described the activities to be carried out and the objectives of the activities. 2. The participants divided into 6 group 3. The researcher gives the same problem situation for each group then they were discussing to solve the problem based on all information that they have. 4. Invite a representative participant from each group to presenting the results of group discussion.

Activities 4: Presenting Role Model

Expected outcomes: 1. The participants were learn problem solving from the model.
2. Increasing awareness of the participants to doing physical exercise and DASH eating plan
3. Increasing motivation of the participants to maintain physical exercise and DASH eating plan.

Objectives	1. To enhance the ability of the problem solving when obstacle occurred during implementing lifestyle modification. 2.To increasing awareness of the participant to doing physical exercise and DASH eating plan 3. To increasing motivation of the participant to maintain physical exercise and DASH eating plan regularly.
Materials	Sound system
Time	60 – 90 minutes
Process	1. Described the activities to be carried out and the objectives of the activities. 2. Described the mechanism of the activities

	3. Introduced the role model to the participants. 4. The role model was similar to the participants in term of age, social environment, who had hypertension and can maintain blood pressure and other physical conditions. 5. The role model was sharied stories about their experience when faced with an obstacle situation when physical exercise and DASH eating plan. 6. The role model was shared strategy to success for maintaining the lifestyle modification. 7. Question and answer session, participants were asked to the model.

Activities 5: Demonstrated of gymnastic fitness

Expected outcomes: 1. The participants were applied gymnastic fitness regularly.
2. The participants were maintaining their lifestyle modification including physical exercise and DASH eating plan after the program.
3. The participants were controlled their blood pressure and other physical conditions.

Objectives	1. To encourage the participants' awareness to do physical exercise and DASH eating plan regularly. 2. To increasing awareness the participants to maintaining lifestyle modification. 3. To controlled blood pressure and other physical conditions increasing motivation of the participant to maintain physical exercise and DASH eating plan regularly.
Materials	Sound system
Time	60 – 90 minutes
Process	1. Described the activities to be carried out and the objectives of the activities. 2. Demonstrated gymnastic fitness cribed the mechanism of the activities 3. The participants returned demonstrate gymnastic fitness. 7. Provide an opportunity for participants to express feelings related to this activity.

Appendix D2

Recorded of Physical Conditions testing by researcher

	Week 4	Week 5	Week 6	Week 7	Week 8
Blood Pressure					
Heart Rate Intensity	–				
Second time result of					
BMI					
Cholesterol					
HDL					
LDL					
Triglyceride					

Appendix D3

Participation recorded on Physical Exercise

Please give (√) related to participation on gymnastic fitness a day per week and how minutes

| Activity | First Month | | | Second month | | | | | | | | | | | | |
| | 4 | | | 5 | | | 6 | | | 7 | | | 8 | | |
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Gymnastic Fitness															
Total minutes															

Appendix D4

Daily DASH eating plan

Did I have at least.........

2-3 servings of dairy food (milk) today?
If no, what can I add to get at least 2-3 serving tomorrow?
8-10 were servings of fruits and vegetables today? If no, what could I add to get 4-5
servings each of fruits and vegetables tomorrow?

Week		Dairy Foods				Fruits				Vegetables			
4	M												
	T												
	W												
	TH												
	F												
	S												
	S												
5	M												
	T												
	W												
	TH												
	F												
	S												
	S												
6	M												
	T												
	W												
	TH												
	F												
	S												
	S												
7	M												
	T												
	W												
	TH												
	F												
	S												
	S												

Appendix E
Letter of recommendation

No. 0209.0932/ ๗ ๗๑

Boromarajonani College of Nursing Nopparat Vajira
681 Raminha Road, Kannayao, Bangkok 10230
THAILAND

16 July 2014

Walikota Bekasi cq Kepala Kesbangpol
Jl. Jendral Ahmad Yani No. 1
Bekasi

Subject: Letter of support for data collection of Mrs. Neneng Kurwiyah Iwanudin

Dear Walikota Bekasi cq Kepala Kesbangpol

I am writing to you to ask your support for Mrs. Neneng Kurwiyah Iwanudin is currently a student attending Master of Nursing Science in Family and Community Health Nursing (International Program) at Boromarajonani College of Nursing Nopparat Vajira (BCNNV), an Affiliated Institution of Kasetsart University, Thailand. As a part of this program, The student must fulfill the requirement of her thesis, entitled "The Effect of Lifestyle Modification Program on Behavior change and Physical conditions among Hypertensive Elders in North Bekasi sub district, West Java, Indonesia".

Currently, The thesis proposal of Mrs. Neneng Kurwiyah Iwanudin has been approved by the research committee and BCNNV Ethics Review committee. Therefore, I would like to ask your support for Mrs. Neneng Kurwiyah Iwanudin to conduct data collection for her study during July-September 2014.

I would be most grateful for your cooperation and support to this student. If you have any queries regarding this matter please feel free to contact Dr. Sunanta Thongpat the Deputy Director of Graduate study, at sunanta.t@bcnnv.ac.th or +66-85-2511633

Yours Sincerely,

Monthana Hemchayat

Monthana Hemchayat
Director Boromarajonani College of Nursing Nopparat Vajira

Graduate study
Tel: (66 21 540-6500 Ext. 215, 220

Dipindai dengan CamScanner

No.0203.0932/414

Boromarajonani College of Nursing Nopparat Vajira
681 Ramintra Road, Kannayao, Bangkok 10230
THAILAND

16 July 2014

Head of Public Health Center of Seroja
Jl. Delima No 21
Kelurahan Harapan Jaya- Kec. Bekasi Utara

Subject: Letter of support for data collection of Mrs. Neneng Kurniyah Ihwanudin

Dear   Head of Public Health Center of Seroja

I am writing to you to ask your support for Mrs. Neneng Kurniyah Ihwanudin is currently a student attending Master of Nursing Science in Family and Community Health Nursing (International Program) at Boromarajonani College of Nursing Nopparat Vajira (BCNNV), an Affiliated Institution of Kasetsart University, Thailand. As a part of this program, The student must fulfill the requirement of her thesis, entitled "The Effect of Lifestyle Modification Program on Behavior change and Physical conditions among Hypertensive Elders in North Bekasi sub district, West Java, Indonesia".

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Yours Sincerely,

Monthana Hemchayat

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16 July 2014

Head of Public Health Center of Teluk Pucung
JL Perjuangan
Kelurahan Teluk Pucung Kec. Bekasi Utara

• Subject: Letter of support for data collection of Mrs. Neneng Kurwiyah Ihwanudin

Dear Head of Public Health Center of Teluk Pucung

I am writing to you to ask your support for Mrs. Neneng Kurwiyah Ihwanudin is currently a student attending Master of Nursing Science in Family and Community Health Nursing (International Program) at Boromarajonani College of Nursing Nopperat Vajra (BCNNV), an Affiliated Institution of Kasetsart University, Thailand. As a part of this program, The student must fulfil the requirement of her thesis, entitled "The Effect of Lifestyle Modification Program on Behavior change and Physical conditions among Hypertensive Elders in North Bekasi sub district, West Java, Indonesia".

Currently, The thesis proposal of Mrs. Neneng Kurwiyah Ihwanudin has been approved by the research committee and BCNNV Ethics Review committee. Therefore, I would like to ask your support for Mrs. Neneng Kurwiyah Ihwanudin to conduct data collection for her study during July-September 2014.

I would be most grateful for your cooperation and support to this student. If you have any queries regarding this matter please feel free to contact Dr. Sunanta Thongpat the Deputy Director of Graduate study, at sunanta.t@bcnnv.ac.th or +66 85-2511633

Yours Sincerely,

Monthana Hemchayat

Monthana Hemchayat
Director Boromarajonani College of Nursing Nopparat Vajra

Graduate study
Tel: (66 2) 540 6500 Ext. 213, 220

Re: permission to use the instrument "The Development and Validation of the Hypertension Evaluation of Lifestyle and Management Knowledge Scale"

From

- Marilyn Scapira

To

- Neneng Kurwiyah Ihwanudin

Hi, yes we are happy to have you use this tool. I am cc'ing our research staff that can connect you with the website with the tool available. Please let us know how the work goes.

Sincerely,

Marilyn Schapira

Re: permission to use the instrument Physical Activity based on SCT Construct

From

- Dr. Ron Plotnikoff

To

- Neneng Kurwiyah Ihwanudin

Hi Neneng, yes you get permission to translate and use this instrument, please cite my paper on your citation.

Best wishes,

Ron Plotnikoff

Re: permission to use the instrument DASH eating plan based on SCT Construct

From

- Dr. Ron Plotnikoff

To

- Neneng Kurwiyah Ihwanudin

Hi Neneng, yes you get permission to translate and use this instrument, please cite my paper on your citation.

Best wishes,

Ron Plotnikoff

LIST OF EXPERTS

Three experts were review the content validity of the instruments for this study:

1. Syamsul Anwar, SKM., M.Kep, Sp.Kep.kom

   Nursing Lecturer of Nursing Program, Departement of Geriatric University of Muhammadiyah Jakarta, Indonesia.

2. Nunung Nurhayati, S.Kep., M.Kep, Sp.Kep.kom

   Nursing Lecturer of Nursing Program, Departement of Geriatric University of Muhammadiyah Jakarta, Indonesia.

3. Siti Rahayu, S. Kep., Ns.

   Community Nurse, Department of Geriatric Nursing, Primary Health Center (PHC) of North Bekasi, West Java, Indonesia.

Two experts were translating of the instruments:

1. Mr. Dale Beneth

   English Lecturer at Kasetsart University, Bangkhen, Thailand

2. Mr. Adhia Nugraha

   English authorized translator of Examination and Language Research Based on Al-Qur'an.

CURRICULLUM VITAE

NAME   : Mrs. Neneng Kurwiyah Ihwanudin

BIRTH DATE   : March 14, 1975

BIRTH PLACE   : Indramayu

EDUCATION   :

YEAR	INSTITUTE	DEGREE/DILOMA
1997	AKPER RSIJ	Amd.Kep.(Nursing Diploma)
2000	Indonesia University	B.Sc. (Nursing)

POSITION/TITLE   : Lecturer

WORK PLACE   : FIK- Universitas Muhammadiyah Jakarta

SCHOLARSHIP/AWARDS   : Indonesia Government Scholarship 2012-2014