Effects of Group-Based Dietary Self-Management Program on Dietary Behaviors of Female Community Dwellers with Hypertension in Indonesia

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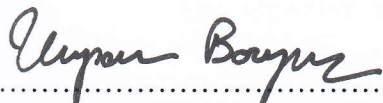**Copyright of Prince of Songkla University**

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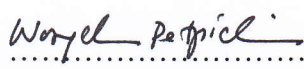
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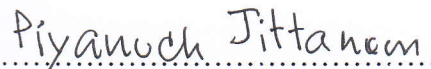**Major Program**   Nursing Science (International Program)
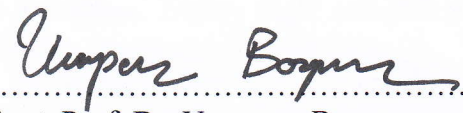

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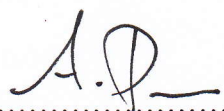
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ABSTRACT

The objective of this quasi-experimental study was to examine the effects of a group-based dietary self-management program on the dietary behaviors of community dwellers with hypertension in Indonesia. Eighty eight samples who met the inclusion criteria were recruited from the selected setting and were divided into the experimental and the control group (44 samples/group). The experimental group received a group-based dietary self-management program for four weeks, while the control group only received the handbook of dietary behaviors of hypertension when the study was completed. The group-based dietary self-management program was based on the self-management concept guided by Kanfer and Guylick-Buys (1991) that was incorporated with the group process. The components of the program included sharing of and reflecting on current dietary behaviors, an educational session, the comparison of behaviors and the reflection of obstacles, individual goal setting, and action planning. The dietary behaviors were measured in the first and the fourth week using the Dietary Behaviors for Hypertension Questionnaire (DBHQ) that was tested for its validity and reliability ($\alpha = 0.741$).

The results showed that there was a statistically significant difference of dietary behaviors of the experimental group before and after attending the group-based dietary self-management program (t= -11.315, df = 43, p < 0.05). In addition, there was also a statistically significant difference between the experimental group and the control group after attending the program (t = 9.231, df = 86, p < 0.05). These findings indicate that this group-based dietary self-management program effectively improves the dietary behaviors of community dwellers with hypertension in Indonesia. Therefore, it is recommended for nurses to implement the program guided by this study as the protocol in applying the group-based dietary self-management process, and conduct each step by considering their role as a facilitator, providing supportive material such as a handbook, and covering all content of dietary behavior for hypertension during the program.

Keywords: self-management, group, hypertension, dietary behaviors.

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I specially dedicate this achievement to my late mother and late father.

Arfiza Ridwan

CONTENTS

CONTENTS (continued)

CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Background and significance of the problem

        Hypertension is one of the important health challenges in many countries due to its high prevalence and strong association with other diseases, such as cardiovascular diseases (Committee on Public Health Priorities to Reduce and Control Hypertension, 2010). Approximately 8 million deaths each year are blood pressure related, with rates rising by 56.1% from 1994 to 2004 worldwide (Sood, Reinhart & Baker, 2007). In 2000, there were 972 million people living with hypertension worldwide and it is estimated that this number will increase to more than 1.56 billion by the year 2025 (Chockalingam, Campbell & Fodor, 2006). Meanwhile, according to a hypertension expert from the National Heart Center, Harapan Kita Indonesia, the prevalence of hypertension in Indonesia in people over the age of 35 years was more than 15.6 percent in the year 2004 (Healthy Life Journal, 2010).

        Hypertensive care in community nursing involves having a structured non-pharmacological treatment plan including counseling about lifestyle changes in regards to smoking, alcohol consumption, weight, diet, physical activity and stress management (Bengston & Drevenhorn as cited in Drevenhorn, Kjellgren & Bengston, 2005). It has been shown that there is no significant difference in knowledge gained between a standard education program and a behavioral program, however, a study by Campbell as cited in Wang & Abbot (2001), suggested that behavioral programs will have greater effect on changing self care behavior.

In the empirical studies, the behaviors that are often related with hypertension are diet modification, weight control, alcohol use, smoking, and physical activity (Hall, Rodin, Vallis & Perkin, 2009; Matlock et al., 2009; Park et al., 2010; Xue, Yao & Lewin, 2008). Meanwhile, according to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), the behaviors consist of weight reduction, Dietary Approaches to Stop Hypertension (DASH) eating plan, dietary sodium reduction, physical activity, and the moderation of alcohol consumption. Moreover, JNC 7 also recommended the person with hypertension to quit smoking (Chobanian et al., 2003). Persons with hypertension should be encouraged to adopt these behaviors, especially for those who have additional risk factors for cardiovascular disease and diabetes mellitus (Neaton et al.; Singer et al. as cited in Chang, McAlister, Taylor & Chan, 2003).

Nutritional status and the intake of many nutrients affect the incidence and severity of hypertension. It is why dietary behavior is necessary in order to promote, prevent, and manage the hypertension. A high intake of sodium chloride predisposes the consumer to hypertension as does an above moderate intake of alcohol. On the other hand, high intakes of potassium, polyunsaturated fatty acids, and protein, along with exercise and possibly vitamin D can lower blood pressure. Moreover, recent studies note that the DASH diet is one good way to prevent or ameliorate mild hypertension, because it provides the eating plan which is high in fruits, vegetables, and low-fat dairy products (Savica, Bellinghieri, & Kopple, 2010). However, sometimes lifestyle changes are not easily achieved (Ebrahim & Smith as cited in Drevernhorn et al., 2005).

Health education was associated with improvements in knowledge about hypertension, while education combined with individualized support for patients to self-manage hypertension, including goal setting and monitoring to enhance patient self-management of hypertension, and family support in managing hypertension were associated with reductions in blood pressure levels and improvements in blood pressure control (Connell, Wolfe & McKevitt, 2008). Therefore, self-management is regarded as one way to help the client in improving their rehabilitative behavior. Self-management programs have been widely reported as one way to promote the ability in managing behavior and health outcomes for several chronic conditions. It emphasizes the clients' role in preventing diseases and therapeutic health caring activities that consist of organized learning experiences that are designed to facilitate the health-promoting behaviors (Warsi, Wang, LaValley, Avorn, & Solomon, 2004).

Several studies about group-based programs were reviewed. Even though there were only a few studies specific for hypertension, a group-based program has shown its effectiveness in several conditions such as chronic stroke (Pang, Harris, & Eng, 2006), chronic heart failure (Lofvenmark, Karlsson, Edner, Billing, & Mattiasson, 2010; Nilson, Westheim, & Risberg, 2008), diabetes (Bastiaens et al., 2009; Karlsen, Idsoe, Dirdal, Hanestad, & Bru, 2004), metabolic syndrome (Pettman, Buckley, Misan, Coates, & Howe, 2009), and in the elderly (Hajek, Humphrey, & McRobbie, 2010). Moreover, it is also found effective in a study about smoking cessation where the interaction-oriented group has been shown to improve treatment compliance and its outcome (Hajek et al. as cited in Hajek et al., 2010). The number of samples in each group ranged from 8 to 18 persons.

Those studies involved the health personnel such as nurses, therapists, physiotherapists, psychologists, counselors, dieticians, etc. Mostly, the programs were separated into several group sessions over a period of time. The programs offered several activities such as an educational session, reflection of experiences, goal setting, and monitoring. Using the group to treat patients with similar conditions is one method to improve throughput and provide a more cost-effective service. Group work was known for many years as an effective way in providing exercise therapy, educational programs (Gardiner; Hill, as cited in Cook, 2001), and problem solving ability and promoting healthy behaviors (Varekamp et al., 2009). Group learning fits the needs of adult learners where personal, social, and professional experiences are used along the process. In addition, social constructivist theorists believe that understanding is built within a social environment. It is built when individuals take part in talk and activity about shared problems or tasks (Pareles, Lockyer, & Fidler, 2002).

Indonesia is a large country with 13,670 islands spread throughout it. It has multiethnic societies with the total population consisting of approximately 50 ethnic groups (Djuwita, Purwantyastuti, & Kamso, 2003). Aceh is one of the provinces that is located on Sumatra Island, one of the biggest islands in Indonesia. Aceh lies at the mouth of two big rivers, namely Krueng Aceh and Krueng Daroy that enter the Indian Ocean which makes Aceh famous as a coastline area. The biggest local product of agriculture in this area is rice (New World Encyclopedia, 2008). As with the other ethnic groups on Sumatra Island, rice, fish, and coconut are the basic ingredients of the Aceh meals, while beef and chicken are mainly prepared for special occasions. Most of food items in Aceh can be cooked with coconut milk and the use

of coconut oil for cooking still can be found in this population (Lipoeto, MmedSci, Agus, Oenzil, Masrul, & Wattanapenpaiboon, 2001).

Aceh people uphold tradition in their community. It can be seen from the function of formal and informal structures within the community. They recognize the role of a religious leader and customary law in public life. In the community, these people mostly solve problems together and this creates close relationships within their neighborhood (Herman, 2011). Thus, this study has been expected to be suitable to be applied in Aceh since it offers the group process, in the implementation of the program, that takes place in the villages.

There were several studies of self-management conducted in Indonesia that focused on chronic disease. However, those studies applied the self-management concept for individuals in the hospital setting where the samples were patients with type 2 Diabetes Mellitus (Kurniawan, 2011; Primanda, 2011). Moreover, the study was conducted in a different area of Indonesia. For example, the study by Primanda (2011) was about the dietary behaviors of Yogyakarta people that cannot be generalize to Acehnese people. Thus, it is important to conduct a research study to examine the effect of group-based dietary self-management program on dietary behaviors of female community dwellers with hypertension in Indonesia in Aceh province, Indonesia to fill this gap.

Objectives of the study

1. To compare the dietary behaviors of female community dwellers with hypertension before and after attending a group-based dietary self-management program.

2. To compare the dietary behaviors of female community dwellers with hypertension who attend a group-based dietary self-management program and those do not attend a group-based dietary self-management program, after completing the program.

Research questions of the study

1. Are the dietary behaviors of female community dwellers with hypertension after attending a group-based dietary self-management program better than before attending a group-based dietary self-management program?

2. Are the dietary behaviors of female community dwellers with hypertension who attend a group-based dietary self-management program better than those who do not attend a group-based dietary self-management program, after completing the program?

Conceptual framework of the study

The group-based dietary self-management program in this study integrated the group process and the concept of self-management where the desired outcome is the better dietary behaviors according to the DASH eating plan. Group format has been proven as a cohesive and productive environment for the collaboration on the common goals (Hajek e `xt al., 2010). Groups are more effective when the members get to know each other, share information about experiences, give each other feedback, and see each other similarly (Wilkens & London, 2006). In evidence, it is shown that leaders of a group can enhance the function of the members (Mumford et al., as cited in Zhang, Tsui, & Wang, 2011). The leaders should

encourage the members in a supportive way and facilitate active participation of all group members to create cohesiveness. Group cohesiveness is essential to effective treatment because it can predict the successfulness of the session and group participation (Marshall & Burton, 2010).

Moreover, the group cohesiveness also depends on the health providers as the facilitator, so that the quality of the providers is necessary (Marshall et al., 2010). The health provider's role is to motivate the group, provide guidance of a task, and help the group in reflecting on the lesson learnt. The health provider helps to create a positive environment for the members to share information about themselves, give each other feedback, and resolve conflict among group members (Wilkens et al., 2006). The health providers who have skills, ability, and knowledge can improve the treatment effects compared to when these features are absent (Dowden & Andrew as cited in Marshall, et al.). Recommendations for the health providers in group treatment are 1) do not struggle against that members' resistance, 2) state the inconsistencies between their ambition and their behaviors, 3) avoid confrontation, 4) emphasize choices, provide open-ended questions (Miller & Rollnick as cited in Marshall), and encourage motivation (Kashdan & Finchman as cited in Marshall). Therefore, the group process will be integrated with the self-management process in this study.

According to Kanfer and Gaelick-Buys, there are three stages of self-management; self monitoring, self evaluation, and self reinforcement. Self-monitoring refers to the observation and recording of one's own behavior. This stage includes observation, monitoring and recording of behaviors and factors which influence health problems being eliminated. Self-evaluation is a task of comparing one's

behavior to the criteria, standards, and objectives that is intended to be reached. This stage consists of the decision to change or to accept the behaviors. Self-reinforcement is the individual's reaction towards the result of self evaluation. And after all processes, the individual will decide to maintain or change the existing behaviors. The individual will decide on new goal setting and action planning.

By incorporating the group process in the self-management concept, several interventions of the program were implemented for the targeted samples. The intervention reflected the three stages of self-management. Self-monitoring was done by encouraging all group members to share and reflect on their current dietary behaviors, self-evaluation was done by giving educational sessions and asking the sample to compare the current behaviors with the desired one, and self-reinforcement was done by setting the weekly goals and action plans. All of these interventions were conducted in group sessions that were attended by 8-12 samples.

This study used the DASH (Dietary Approach to Stop Hypertension) eating plan as the guideline for understanding dietary behaviors. This eating plan was specifically developed for preventing and managing hypertension. "This eating plan is rich in fruits, vegetables, fat-free or low fat and milk products, whole grains products, fish, poultry, beans, seeds, and nuts. It also contains less salt and sodium, sweet, added sugar and sugar-containing beverages, fats, and meats" (National Heart, Lung, and Blood Institute, 2011). Therefore, seven outcomes of dietary behaviors were assessed in this study; 1) consuming grain products, 2) consuming protein sources, 3) increasing the consumption of vegetables and fruits, 4) consuming calcium sources, 5) reducing fats and oils, 6) reducing salt and sodium, and 7) limiting the sweets and added sugar.

This study was conducted in the community setting where dwellers with hypertension live together. It involved the samples who live in the same community so that they can support each other in changing the desired behaviors. Figure 1 explains in detail the framework used in the present study.

Group-based dietary self management program			Dietary behaviors
Group process	**Stages of self-management**	**Group activity**	1. Consuming grain products 2. Consuming protein sources 3. Increasing the consumption of vegetables and fruits 4. Consuming calcium sources 5. Reducing fats and oils 6. Reducing salt and sodium 7. Limiting sweets and added sugar.
1. Group forming 2. Leader selection 3. Self-disclosure 4. Feedback 5. Motivation	Self-monitoring	1. Sharing of and reflecting on individual current dietary behavior	
	Self-evaluation	2. Educational session about hypertension and dietary behaviors. 3. Individual comparison of behavior and reflection of obstacles	
	Self-reinforcement	4. Individual goal setting and action planning 5. Follow up	

Figure 1 *Conceptual Framework Group-Based Self-Management Program for Community Dwellers with Hypertension*

Hypotheses

1. The dietary behaviors of female community dwellers with hypertension after attending a group-based dietary self-management program are better than before attending a group-based dietary self-management program.

2. The dietary behaviors of female community dwellers with hypertension who attend a group-based dietary self-management program are better than those who do not attend a group-based dietary self-management program, after completing the program.

Definition of terms

The group-based dietary self-management program is a program that has been developed for dwellers who suffer from hypertension to improve their self-management behavior through a group-based program. This program is a four week program that consists of two group meetings. The group process is incorporated in self-management stages. The groups are formed by the participants themselves and the leader of each group is selected by themselves as well. In these groups, self monitoring is done by encouraging all group members to; 1) share and reflect on their current behaviors in regard to diet. Then, self-evaluation is done by; 2) educational session about hypertension and dietary behaviors that is followed by 3) comparing the current behaviors with the desired ones. Lastly, the self-reinforcement is done by 4) setting the weekly goals and action plan, and 5) follow up. In addition, the researcher provides a handbook of dietary behaviors for hypertension and goal setting for all group members. All members are free to give feedback and motivation to each other. The group leaders ensure that all members are actively participating during the session. Meanwhile, during the group session the researcher does not struggle against any member's resistance, avoids confrontation, emphasizes choices, asks open-ended questions, encourages motivation to improve behaviors, and provides information about hypertension and dietary behaviors.

Dietary behaviors are defined as several actions related to diet that are performed by community dwellers with hypertension in order to manage hypertension. These include; 1) consuming grain products, 2) consuming protein sources, 3) increasing the consumption of vegetables and fruits, 4) consuming calcium sources, 5) reducing fats and oils, 6) reducing salt and sodium, and 7) limiting sweets and added sugar. These behaviors will be measured twice, at the baseline and five weeks after the intervention by using the Dietary Behaviors of Hypertension Questionnaire (DBHQ) that has been developed by the researcher.

Significance of the study

A group-based dietary self-management program is one of the solutions to solve the hypertension problem in the community. This method reflects the importance of social support in improving dietary behavior for dwellers with hypertension. In previous studies, there were significant changes in the behavior of persons with chronic diseases after joining self-management programs.

The result of the study provides the empirical evidence of the effectiveness of the group-based dietary self-management program on dietary behaviors in female community dwellers with hypertension. The program incorporated the self-management process with the group process. It will provide benefit for the nurses and the community. It can be used as the guideline for nurses, especially community nurses in providing care for the community to improve their dietary behaviors. In detail, this study is beneficial for nurses in the community, nursing research, and for female community dwellers.

CHAPTER 2

LITERATURE REVIEW

The literature review is as follows:

1. Overview of hypertension

    1.1 Definition, classification, causes and effects of hypertension

    1.2 Management of hypertension

2. Concept of self-management

    2.1 Significance of self-management

    2.2 Definition and objectives

    2.3 Stages of self-management

3. Dietary behavior of hypertension

    3.1 Dietary behavior as study outcome

    3.2 DASH eating plan

    3.3 Indonesian dietary behaviors

4. Factors influencing dietary behaviors in persons with hypertension

5. Group-based dietary self-management program on dietary behaviors of community dwellers with hypertension

6. Summary

Overview of hypertension

The overview of hypertension consists of several parts namely definition, classification, causes and effects of hypertension, management of hypertension both pharmacologic and non-pharmacologic treatment.

Definition, classification, causes and effects of hypertension

There are many definitions of hypertension found in various sources. Due to its increasing development worldwide, this disease has been a popular term that has been discussed for many years. Moreover, several countries in the world have committees and research centers that are concerned about it. Hypertension is defined as a condition when the systolic blood pressure is greater than 140 mmHg and the diastolic is greater than 90 mmHg based on two or more correct measurements of blood pressure (Chobanian et al., 2003). The National Heart Lung Blood Institute (2011) defined hypertension as a serious condition leading to other conditions such a coronary heart disease, heart failure, stroke, kidney failure, and others. Hypertension occurs when the force of blood against the wall of arteries is in high tension and stays continuously high. Meanwhile, there is a new definition of hypertension according to WG-ASH (Writing Group of the American Society of Hypertension) that states that hypertension is not only a scale of threshold blood pressure values, but also a complex cardiovascular disorder. Therefore, it concerns the presence and absence of the risk factors of hypertension, target organ damage, physiological abnormalities in the cardiovascular system that caused by hypertension (Brookes, 2005).

Table 1 presents in detail the classification of blood pressure for adults according to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).

Table 1

Classification of blood pressure for adults (Chobanian et al., 2003)

BP classification	SBP mmHg	DBP mmHg
Normal	< 120	And < 80
Prehypertension	120-139	Or 80-89
Stage 1 hypertension	140-159	Or 90-99
Stage 2 hypertension	≥ 160	Or ≥ 100

According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, there are several identifiable causes of hypertension, namely chronic kidney disease, coarctation of the aorta, Cushing syndrome and other gluccocorticoid excess states including steroid therapy, drug-induced or drug-related, obstructive uropathy, pheochromocytoma, primary aldosteronism and other mineralocorticoid excess states, renovascular hypertension, sleep apnea, and thyroid or parathyroid disease (Chobanian et al., 2003).

Similarly, the National Heart Lung Blood Institute (2011) stated that the causes of hypertension are some medical problems, such as chronic kidney disease, thyroid disease, and sleep apnea, and also some medicines such as asthma medicines (for example, corticosteroids) and cold-relief products.

Besides the causes of hypertension, the National Heart Lung Blood Institute (2011) also mentioned the effects of hypertension on some organs of the human body,

namely the brain, heart, vascular system, eyes, and kidneys. In the brain, hypertension can cause a break in weakened blood vessels because of high pressure. It can later bleed in the brain and is the cause of a stroke. In the heart, hypertension can cause angina pectoris and heart attack. Normally, arteries bring oxygen to all muscles including the heart muscle. In the case of high blood pressure, the heart muscle cannot get enough oxygen and that can trigger pain (angina), and if the flow of blood is blocked, a heart attack results. In the vascular system, high blood pressure results in the stiffness that can lead to the problem of blood supply to the heart and kidneys. In the eyes, high blood pressure can cause blurred vision or otherwise impair the eyes which can result in blindness. Last, the kidneys can also be damaged by hypertension which leads to kidney failure.

Mayo Clinic staff (2011) also mentioned the same effects of hypertension in more detail, namely artery damage and narrowing, aneurysm, coronary artery disease, enlarged left heart, heart failure, transient ischemic attack (TIA), stroke, dementia, mild cognitive impairment, kidney failure, kidney scarring (glomerulosclerosis), kidney artery aneurysm, eye blood vessel damage (retinopathy), fluid buildup under the retina (choroidopathy), nerve damage (optic neuropathy), and also sexual dysfunction such as erectile dysfunction, a decrease in sexual arousal, vaginal dryness, and difficulty in achieving orgasms.

Management of hypertension

The goal of the management of hypertension is to prevent morbidity and mortality caused by hypertension by maintaining the blood pressure in the normal range (lower than 140/90 mmHg) (Smeltzer & Bare, 2004). Similarly, JNC 7 and

NHLBI also stated the same goal, but added more information for those who have diabetes or chronic kidney disease, the goal is to maintain blood pressure below 130/80 mmHg (Chobanian et al., 2003; National Heart Lung Blood Institute, 2011)

In this part, the management of hypertension is presented in two parts, namely pharmacological treatment and non-pharmacological treatment.

Pharmacologic treatment

Today, the medications of hypertension are easy to take for most people in the world. Besides the easiness to access, these medications also have low side effects. However, a person with hypertension must take medication under a physician's prescription. They should not adjust or stop the medicine by themselves. There are two ways the medications work: 1) remove extra fluid and salt from the body to lower blood pressure, and 2) slow down the heartbeat or relax and widen blood vessels (National Heart Lung Blood Institute, 2011).

The most well known and recommended medicines for hypertension are diuretics, beta blockers, ace inhibitors, angiotensin II receptor blockers, calcium channel blockers, alpha blockers, alpha-beta blockers, nervous system inhibitors, and vasodilators. Mostly, physicians prescribe a combination of two or more medications to achieve better results (Brown, Godsey, Foody & Lambert, 2010; Chobanian et al., 2003; National Heart Lung Blood Institute, 2011; Smeltzer et al., 2004).

Non-pharmacologic treatment

Non-pharmacological treatment of hypertension has now become popular issue due to the increasing recognition that medication only reduces, rather

than eliminating the risks for future problems (MacMahon & Rogers as cited in Matlock et al., 2006). From several studies, non-pharmacological treatment has shown that the sustained reduction of blood pressure can be achieved with lifestyle modifications. This results in the decrease of hypertension prevalence as well as the decrease in the risk of complications (Matlock et al.).

In some literature, non-pharmacological treatment is often called lifestyle modification. It has several benefits, such as reducing blood pressure, preventing or delaying the incidence of hypertension, enhancing antihypertensive drug efficacy, and decreasing cardiovascular risk (Chobanian et al., 2003).

Mostly, the lifestyle modification of hypertension refers to diet, weight reduction, physical activity/exercise, moderate alcohol consumption, and quitting smoking. Some literature also add stress management as one of the lifestyle modifications. According to NHLBI, the lifestyle modification of hypertension consists of following a healthy diet, being physically active, maintaining a healthy weight, stop smoking, managing stress and learning to cope with stress (National Heart Lung Blood Institute, 2011). Similarly, JNC 7 also stated the same things about non-pharmacological treatment for hypertension. Table 2 shows the lifestyle modifications to prevent and manage hypertension. It shows the type of modification, the recommendation and the approximate systolic blood pressure reduction (range) in detail.

Table 2

Lifestyle modification to prevent and manage hypertension (Chobanian et al., 2003)

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

Many researchers have been discussing lifestyle modifications frequently due to the powerful influence changes in lifestyle have in lowering blood pressure in hypertension patients. For example, for some people the effect of a 1600 mg sodium diet as recommended in the DASH eating plan is similar to the effect of a single drug therapy, and the combination of two lifestyle modifications can achieve even greater results (Chobanian et al., 2003). Similarly, NHLBI also gives the recommendation for hypertension persons to combine healthy lifestyle modifications

in order to achieve a better result than taking on only a single lifestyle modification. This can be started by doing one change then followed by other changes (National Heart Lung Blood Institute, 2011).

The following explanation presents the detail about the most common lifestyle modifications of hypertension that are discussed in many studies about self-management, namely diet, physical activity, and smoking cessation.

Diet. Since this study focuses on the dietary behavior of person with hypertension, the explanation about it will be presented in detail in another part.

Physical activity. One of the most common lifestyle modifications of hypertension is physical activity. Physical activity can reduce total cholesterol and bad cholesterol (low density lipoprotein or LDL) and raises the good cholesterol (high density lipoprotein or HDL) (WebMD, 2010). It is also known that by doing physical activity, the persons who suffer from hypertension may control their blood pressure, have more energy, and feel fresh.

Physical activity is defined as an activity that is performed intentionally to raise the blood pulse for at least 30 minutes by several choices of activity such as cycling, walking, or swimming (Drevenhorn et al., 2007). Consistency of physical activity is necessary to obtain health benefits (Saelens et al., 2000). The American Heart Association (AHA) and the U.S. Surgeon General recommend 30 minutes of physical activity on most days of the week (WebMD, 2010).

A study conducted in a Chinese population measured physical activity by examining the walking, swimming, and relaxation habits of the subjects (Siu,

Chan, Poon, Chui & Chan, 2007). Meanwhile, in a study in Sweden, the researcher separated physical activity into three levels; 1) no regular exercise, 2) intermediate, when participants practice twice a week by cycling/walking to work place ≥ 5 km; or once a week by cycling/walking to work place ≥ 3 km, and 3) high, when participant practice regular exercise more than twice a week (Drevenhorn et al., 2007).

In conclusion, from the studies above we can see that physical activity is one of the most common behavioral modifications in controlling hypertension. There are various kinds of activity used to enhance physical activity such as cycling, walking, swimming, relaxation, and vigorous activity. From the literature review, several standards were found to determine the level of physical activity in patients with hypertension.

Smoking. Smoking has a strong relationship with cardiovascular problems, including hypertension. In a 13 year cohort study in the Mediterranean, Spain, the researcher identified and estimated the risk factors which increase the risk of cardiovascular disease. From the study it is known that smoking behavior is the leading risk for cardiovascular events such as angina pectoris, strokes, and acute myocardial infarction. Therefore, it is important to promote a healthy life by avoiding smoking (Huerta, Tormo, Gavrila, & Navarro, 2010).

The strong relationship between smoking and hypertension is because smoking can increase blood pressure, decrease exercise tolerance and increase the tendency for blood to clot. It even can be worse when it is combined with other risk factors (American Heart Association, 2011)., WebMD (2010) mentioned that the nicotine present in tobacco can decrease the oxygen to the heart, increase blood

pressure and heart rate, increase blood clotting, and damage cells that line the coronary arteries and other blood vessels.

Concept of self-management

The self-management concept for chronic conditions is underpinned from the psychological and behavioral science literature based on the notion of an individual's ability to control and manage health and illness effectively (Lorig et al.; Fries et al. as cited in Embrey, 2006). An individual's perception of his or her own ability affects his or her choices and behavior, and consequently dictates whether the individual is likely to achieve or avoid the desired goal (Hughes as cited in Embrey).

The self-management concept and its related theories comprise of a definition and objectives, stages, rational, and related theories of self-management.

Significance of self-management

A review of an evidence-based medicine database has been conducted, and the result has shown that counseling reduces the risk factors in high-risk hypertension persons but lifestyle changes are not easily achieved (Ebrahim & Smith as cited in Drevernhorn et al., 2005). Related to the lifestyle changes that are not easily achieved, the self-management concept has several rationales. First, many changes are not acceptable by people surrounding the clients; therefore the client must be able to become a cooperative observer, reporter, and change agent in this case. Second, it is difficult to change behavior and the client's acceptance of the goals and procedure therapy is a basic motivational requirement. And finally, the utility of self-management program is not only for removing situation-specific symptoms, but also

set coping strategies, the ability to access situations, and anticipate behavioral outcomes, to help the client avoid future problems more effectively than in the past (Kanfer et al., 1991).

Definition and objectives

The self-management concept has been widely defined in various meanings. It is different in health education and promotion concept, because it assists the participant in self-management behavior in managing diseases. This concept is often promoted in chronic diseases including hypertension, asthma, diabetes, etc. (Lorig & Holman, 2003; Warsi, Wang, LaValley, Avorn, & Solomon, 2004). Similarly, Lorig and colleagues focused on self-management primarily in chronic conditions compared to the risk and protective factors of a disease (Ryan & Sawin, 2009). Self-management emphasizes the importance of the clients' responsibility by encouraging rehabilitative experiences to increase responsibility for their behavior, deal with the environment, and plan for the future (Kanfer et al., 1991). Self-management is a process of changing several aspect of one's own behaviors. The process consists of goal selection, information collection, information processing and evaluation, decision making, action, and self-reaction (Creer, 2000)

Self-management refers to the ability of a person with a chronic condition to manage the symptoms, treatment, physical and psychosocial consequences, and lifestyle changes. Its efficacy is including the ability to monitor one's condition and to affect the cognitive, behavior, and emotional responses which is important to maintain quality of life (Sol, Bijl, Banga, and Visseren, 2005).

Nodhturft (as cited in Embrey, 2006) stated that the objectives of self-management are cognitive symptom management, problem solving, decision making, and promoting healthy behavior. Meanwhile, Kanfer et al. (1991) described three outcomes of self-management: 1) to help the client to achieve a more effective interpersonal cognitive and emotional behavior; 2) to change the clients' perception and evaluative attitudes towards problems; 3) to alter stressed or hostile environments, or to cope by accepting it as inevitable.

Stages of self-management

The models of self-management and self regulation have been discussed over the years to find differences, however, the use of these concepts sometimes are interchangeable in the application (Creer, 2000). Several studies use the process of self-regulation to engage in self-management behavior (Ryan et al., 2009; Scheurs, Colland, Kuijer, Ridder & Elderen, 2003).

Kanfer et al. (1991) initiated three stages of self regulation in self-management; 1) self monitoring, 2) self evaluation, and 3) self reinforcement. Meanwhile, self regulation as proposed by Bandura as cited in Ryan et al. (2009) includes goal setting, self-monitoring, reflective thinking, decision making, planning and action, self evaluation, and cognitive responses associated with health behavior change. Similarly, Creer (2000) stated that the self-management process consists of goal selection, information collection, information processing and evaluation, decision making, action, and self-reaction.

Self monitoring refers to the involvement of that is intentionally attended to by the clients. This strategy is influenced by social values and personal

experience (Kanfer et al., 1991). It is essential to the successful self-management of a problem. There are three suggestions in performing self monitoring; 1) patients should only monitor the targeted phenomena of behaviors, 2) patients should use objective measurements in monitoring the behaviors or responses, and 3) there should be a clear period of time that is directed by health providers (Creer, 2000).

Self evaluation is the comparison between what one is doing and what one ought to be doing based on the criteria of standards that he/she had made (Kanfer et al., 1991). There are several steps in this stage: 1) the patient must know the difference that occurs, 2) the standard must be established, 3) patients are able to judge the situation and compare it to the standard, 4) patients must learn to evaluate any changes that happen in terms of prior conditions, and 5) contextual factors must be considered, such as environmental, physical, cognitive, and behavioral elements (Creer, 2000).

Meanwhile, self reinforcement refers to how clients reinforce himself/herself cognitively and emotionally in the changing behavior that he/she is aiming to achieve. The result of this stage may make the person decide to change their standard to a better one or to set again the new goals for the future (Kanfer et al., 1991).

The self-management model by Kanfer et al. (1991) emphasizes the attributional process of self-regulation. The first step is by creating the goal directed behavior or goal setting. Goal setting is very useful to orient the clients about the vague reaction of currently unsatisfactory situations. The clients start to think about desirable behaviors and build the motivation to attain these behaviors. Next, those behaviors will be observed by the client themselves. In this self-observation step, the

clients will check whether they can control the behaviors or not. If so, they will further ask themselves whether these behaviors are important for them or not. After answering these two questions in the self-observational step, the clients start to evaluate their performance. In this step, the clients evaluate themselves by comparing their performance with the criterion in the goal setting stage. Then, they give reinforcement both positive and negative. If there are discrepancies between the performance and the criterion, they start to find information that directs to the action plan. In the action plan step, some possible strategies and pathways are examined that work toward the desired goals.

Dietary behaviors in persons with hypertension

In this part, the dietary behaviors of hypertension are explained in three parts; dietary behavior as an outcome, the DASH eating plan, and Indonesian dietary behaviors.

Dietary behavior as study outcome

Several studies about hypertension use dietary behavior to assess the effect of the intervention. In a study in Shanghai, diet was assessed by asking the intake of food items that participants consumed in the last three months before the intervention, one month after the intervention, and four months after the intervention. The food items that asked consist of meat, vegetables, and fruits. The calculation was calculated per day (Xue et al., 2008). Another study looking at assessing diet behavior by using the Daily Living Diary and asking the participant to fill out 3-4 days of their food intake for each week, including the weekend (Fanaian et al., 2010).

There is also a study which has diet as one of outcomes. The diet habits were assessed before the program and 15 months after the program. The habits that were assessed were reducing the intake of energy-rich food, choosing light dairy products and low-fat cheese, choosing cooking oil high in mono- and/or poly-unsaturated fat (olive or rape oil), eating fish more often, eating chicken rather than pork and beef, choosing bread and cereals rich in fibers, cutting off visible fat, choosing low-calorie delicatessen products, eating more fruit, vegetables and root vegetables and distinguishing between weekdays and special occasions (Drevenhorn et al., 2007).

To sum up, diet is one of behaviors that is used in hypertension management. Several studies used this behavior as one of the outcomes. However, there are several ways to assess this behavior. Different studies have different standards and items in assessing this outcome.

DASH eating plan

DASH eating plan is one of the well-known ways in improving the dietary behavior of hypertension persons. DASH stands for Dietary Approaches to Stop Hypertension. The key of DASH is to include the rich nutrient foods containing potassium, magnesium, protein, fiber, and calcium that are associated with lowering the blood pressure. "This eating plan is low in saturated fat, cholesterol, and total fat and that emphasizes fruits, vegetables, and fat-free or low-fat milk and milk-products. It also includes grain products, fish, poultry, and nuts. It is reduced of meat, sweets, added sugars, and sugar-containing beverages" (National Heart, Lung, and Blood Institute, 2011).

The DASH eating plan is now familiar to physicians in giving this recommendation for hypertension and pre-hypertension patients. It has been proven in many studies to lower blood pressure including several studies that have been sponsored by the National Institute of Health (NIH) under the U.S. Department of Health and Human Services. Moreover, the DASH eating plan is also endorsed by the National Heart, Lung, and Blood Institute - NHLBI (one of the National Institutes of Health of the US Department of Health and Human Services), the American Heart Association (AHA), the 2010 Dietary Guidelines for Americans, US guidelines for the treatment of high blood pressure, and the DASH diet formed the basis for the USDA MyPyramid (Heller, 2011).

It is also often used as the content of a program about diet for hypertension, such as a study in a cardiac patient club in Shanghai, where it was delivered in the self-management program (Xue et al., 2008). In a longitudinal observational study in the US, 2,834 employees were recruited into the DASH for Health program to provide weekly articles about healthy nutrition via the internet. This study was conducted for 12 months to see the benefits of the DASH eating plan on weight, blood pressure, and dietary habits. The results showed significantly lowered body weight by 4.2 lbs lowered systolic pressure by 6.8 mmHg, lowered diastolic pressure by 2.1 mmHg, and 26% of the samples still actively use the program due to its easiness (Moore et al., 2008).

There is no requirement of special foods in the DASH eating plan, therefore it contains easy-to-follow recipes. It is presented in a certain number of daily servings from different kinds of food groups. In arranging the DASH eating plan, it depends on the number of calories that are used each day by an individual to make it

balance. The calories used depend on the age and activity of the individual follower. Therefore, before arranging the eating plan, individuals must understand what level of physical activity they are in.

After determining in which level of physical activity the individual is, he or she should consider the daily calorie needs according to gender, age, and the activity level. The next step is following the DASH eating plan that provides the number of servings from each group of foods to eat every day based on the daily calorie needs level . Table 3 presents the information about the DASH eating plan which is categorized in food groups to make it easier to understand. It explains the serving/calorie needs, serving size, example of food items, and significance of each food group.

Table 3

Following the DASH Eating Plan (National Heart, Lung, and Blood Institute, 2011)

Food group	Serving per day			Serving sizes	Example and notes	Significance of each food group to the DASH Eating Plan
	1,600 calories	2,000 calories	2,600 calories			
Grains*	6	6–8	10–11	1 slice bread 1 oz dry cereal 1/2 cup cooked rice, pasta, or cereal	Whole wheat bread and rolls, whole wheat pasta, English muffin, pita bread, bagel, cereals, grits, oatmeal, brown rice, unsalted pretzels /and popcorn	Major sources of energy and fiber
Vegetables	3–4	4–5	5–6	1 cup raw leafy vegetable 1/2 cup cut-up raw or cooked vegetable 1/2 cup vegetable juice	Broccoli, carrots, collards, green beans, green peas, kale, lima beans, potatoes, spinach, squash, sweet potatoes, tomatoes	Rich sources of potassium, magnesium, and fiber
Fruits	4	4–5	5–6	1 medium fruit 1/4 cup dried fruit	Apples, apricots, bananas, dates, grapes, oranges, grapefruit,	Important sources of potassium, magnesium, and fiber

Food group	Serving per day			Serving sizes	Example and notes	Significance of each food group to the DASH Eating Plan
	1,600 calories	2,000 calories	2,600 calories			
				1/2 cup fresh, frozen, or canned fruit 1/2 cup fruit juice	grapefruit juice, mangoes, melons, peaches, pineapples, raisins, strawberries, tangerines	
Fat-free or low-fat milk and milk products	2–3	2–3	3	1 cup milk or yogurt 11/2 oz cheese	Fat-free (skim) or low-fat (1%) milk or buttermilk; fat-free, low-fat, or reduced-fat cheese; fat-free or low-fat regular or frozen yogurt	Major sources of calcium and protein
Lean meats, poultry, and fish	3–6	6 or less	6	1 oz cooked meats, poultry, or fish 1 egg‡	Select only lean; trim away visible fats; broil, roast, or poach; remove skin from poultry	Rich sources of protein and magnesium
Nuts, seeds, and legumes	3 per week	4–5 per week	1	1/3 cup or 11/2 oz nuts 2 Tbsp peanut butter 2 Tbsp or 1/2 oz seeds 1/2 cup cooked legumes (dry beans and peas)	Almonds, hazelnuts, mixed nuts, peanuts, walnuts, sunflower seeds, peanut butter, kidney beans, lentils, split peas	Rich sources of energy, magnesium, protein, and fiber
Fats and oils∫	2	2–3	3	1 tsp soft margarine 1 tsp vegetable oil 1 Tbsp mayonnaise 2 Tbsp salad dressing	Soft margarine, vegetable oil (such as canola, corn, olive, or sunflower), low-fat mayonnaise, light salad dressing	The DASH study had 27 percent of calories as fat, including fat in or added to foods
Sweets and added sugars	0	5 or less per week	< 2	1 Tbsp sugar 1 Tbsp jelly or jam 1/2 cup sorbet, gelatin 1 cup lemonade	Fruit-flavored gelatin, fruit punch, hard candy, jelly, maple syrup, sorbet and ices, sugar	Sweets should be low in fat

*   Whole grains are recommended for most grain servings as a good source of fiber and nutrients

‡   Since eggs are high in cholesterol, limit egg yolk intake to no more than four per week; two egg whites have the same protein content as 1 oz of meat.

∫   Fat content changes serving amount for fats and oils. For example, 1 Tbsp of regular salad dressing equals one serving; 1 Tbsp of a low-fat dressing equals one-half serving; 1 Tbsp of a fat-free dressing equals zero servings

Abbreviations: oz = ounce;   Tbsp = tablespoon;   tsp = teaspoon.

The DASH eating plan also recommends the persons with hypertension to consume sodium/salt at no more than 2,300 milligrams or 6 grams or 1 teaspoon of table salt per day. However, 1,500 milligrams or 4 grams or two thirds of a teaspoon of table salt is mostly recommended (National Heart, Lung, and Blood Institute, 2011). Since some of the food items in the DASH eating plan table are familiar in western countries and are not familiar in Indonesia, the eating plan will be adjusted to Indonesian food items by using the Indonesian food exchange list. In this food exchange list, there is detailed information about the kinds of foods in every food group (Poliklinik Gizi RSUD Kota Yogyakarta, 1992)

It is recommended to follow the eating plan gradually, since it is not easy to change dietary habits immediately. The following are some tips for gradual change according to the National Heart, Lung, and Blood Institute (2011):

1. Add a serving of vegetables at lunch one day and dinner the next, and add fruit at one meal or as a snack.

2. If you don't eat fruit now or have juice only at breakfast, add a serving to your meals or have it as a snack.

3. Gradually increase your use of fat-free and low-fat milk products to three servings a day. For example, drink milk with lunch or dinner, instead of soda or sugar-sweetened tea.

4. Read the Nutrition Facts label on margarines and salad dressings to choose those lowest in saturated fat and trans fat.

5. Limit lean meats to 6 ounces a day—3 ounces a meal, which is about the size of a deck of cards. If you usually eat large portions of meats, cut them back over a couple of days—by half or a third at each meal.

6. Include two or more vegetarian-style, or meatless meals each week.

7. Increase servings of vegetables, brown rice, whole wheat pasta, and cooked dry beans. Try casseroles and stir-fry dishes, which have less meat and more vegetables, grains, and dry beans.

8. For snacks and desserts, use fruits or other foods low in saturated fat, *trans* fat, cholesterol, sodium, sugar, and calories—for example, unsalted rice cakes; unsalted nuts or seeds, raisins; graham crackers; fat-free, low-fat, or frozen yogurt; popcorn with no salt or butter added; or raw vegetables.

9. Choose grain foods for most grain servings to get added nutrients, such as minerals and fiber. For example, choose whole wheat bread or whole grain cereals.

10. If you have trouble digesting milk and milk products, try taking lactase enzyme pills (available at drugstores and groceries) with the milk products. Or, buy lactose-free milk, which has the lactase enzyme already added to it.

11. If you are allergic to nuts, use seeds or legumes (cooked dried beans or peas).

12. Use fresh, frozen, or low-sodium canned vegetables and fruits.

Since this recommendation fits with the western dietary behavior, only several recommendations were taken into account to make it suitable with Indonesian behaviors.

In addition, it is recommended to combine DASH with regular physical activity in order to help people achieve their ideal body weight. It is very beneficial to lower blood pressure (National Heart, Lung, and Blood Institute, 2011). Similarly, the results of a study in Shanghai showed a significant result in lowering blood pressure, body weight, total cholesterol in the blood, and increasing quality of life when the DASH eating plan is combined with physical activity (Xue et al., 2008).

Indonesian dietary behaviors

Indonesia is one of the Southeast Asian countries. It has 13,670 islands spread throughout the country along the equator south, east, and west of Malaysia. One of the largest Indonesian islands is Sumatra where several ethnic groups such as Melayunese, Minangkabau, and Acehnese live. Typically Indonesian people eat three meals and different kinds of snacks every day. Mostly, families eat together for midday meals (Embassy of Indonesia, 2005). Because of the different ethnic groups in Indonesia there is a diversity of foods. Many foods are influenced by Chinese, Hindu, European, Dutch East Indies, and Middle Eastern backgrounds (Food in Every Country, 2011).

Rice is the main Indonesian staple food, while the rich flavor of cuisine is well known around the world (Cunningham, 2011). There is a study about the nutrient intake pattern among Minangkabau (one of Sumatra ethnic groups) which identified that these people had a poor quality of dietary fat pattern and is related to the increasing levels of cardiovascular disease (Djuwita, Purwantyastuti, & Kamso, 2003). For example, coconut milk known as *santan* is usually used for many kinds of dishes. The Minangkabau use it to cook and stew fish, meat, and even vegetables

(Embassy of Indonesia, 2005). This is also typical in Aceh where most of the daily dishes use coconut milk as one of the main ingredients. Moreover, many kinds of menus use oil to fry and stir-fry several kinds of foods, including snackswhich is applied even more when people have a special occasion or party. It is because in the Indonesian traditional view, special food is served and eaten by the guests (Cunningham).

Factors influencing dietary behaviors in persons with hypertension

Dietary behavior is about food selection and eating patterns that are influenced by psychosocial, behavioral, and environmental elements. To implement the effective dietary behavior modification, it is important to understand the factors that influence how people behave toward diet (Sacova et al., 2001). There are several factors that influence the dietary behaviors in hypertension patients. Several studies have identified age, gender, knowledge, socioeconomics, social support, and culture as the influencing factors of dietary behaviors.

Age

In a study among Korean Americans, the researcher found that age as a personal factor contributes to several poor behaviors that contribute to the development of hypertension in an individual including poor dietary behavior. It can increase the practice of the good behavior, especially for those who have a longer duration of hypertension. It is because they have more opportunity to learn those behaviors and the benefits (Lee et al, 2010). However, due to aging process, people change their way of diet. Because several reasons, such as a change in ability and

health status. The decline of saliva flow, loss of teeth, inadequate dental and gingival care, and loss of appetite can influence the nutritional intake of an individaul (Payette & Shatenstein, 2008). Similarly, Wen, Parchman, & Shepherd (2004) stated that an older age can be a factor that contributes to the self-management of dietary behavior due to the increasing of barriers.

Gender

Gender is an influencing factor of dietary behaviors in persons with hypertension. In several studies, female genders correlated with a higher level of changed dietary behavior. This is shown in a study among Korean Americans where females adopted better dietary behaviors than males (Lee et al, 2010). Differently, several studies showed that males appear to have better dietary behaviors than females such as consuming dinner more frequently (Freedman, 2010).

In addition, there is difference in the kind of food selection between males and females in daily life. A study in England looked at what effect gender had on food selections. This study showed that females ate more fruits and vegetables and males ate more breakfast cereals (Glynn, Emmet, Rogers, & ALSPAC study team, 2005). However, since females usually receive greater support from friends and peers rather than males, changing dietary behavior is easier to accomplish (Gruber, 2008). However, dietary management is a priority for women, even though it may still be difficult for them to do it since they usually have the role and responsibility to prepare meals for family members every day. That is why there are many women obese (Sacova et al., 2001). Therefore, to achieve homogeneity in the present study, only women will be included as the sample population.

Knowledge

Knowledge is also an important factor that has contribution to dietary behavior. The knowledge as the influencing factor of dietary behavior refers to the individuals' understanding about types of food that should and should not be eaten at the appropriate time and the proper portions (Sacova et al., 2001).

Sufficient knowledge is one of the sources of self-management of dietary behavior, where it can bring the intended desire to action (Xue et al., 2008). Knowledge is one of the factors that affects the quality of dietary intake as well as healthy food purchasing behavior (Gittelsohn et al.; Havas et al.; Krebs-Smith et al.; Moser et al.; Turrell et al. as cited in Beydoun and Wang, 2008). In addition, knowledge about food selection practice and food estimation tasks was found to be a higher predictor of dietary self-care compared to demographic variables (Sacova et al., 2001). Moreover, a result of a cross sectional study showed that a lack of knowledge regarding nutrition and management of hypertension resulted in a high proportion of patients with uncontrolled hypertension and non-compliance with medication (Nkosi & Wright, 2010).

However, some studies found a significant effect of knowledge on self behavior, while other studies found it not to be significant. For example, a study of a sample of hypertensive African Americans showed that hypertension knowledge is a significant predictor of hypertension behavior, while the Korean American sample showed that hypertension knowledge has no statistical significant effect on hypertension self behavior (Lee et al, 2010).

Due to the variation of results about the influence of knowledge towards dietary behavior, the prior knowledge of the samples in the present study was

not measured and compared. Instead, the program provided an educational session to improve the participants' knowledge about dietary behaviors for persons with hypertension.

Socioeconomic status

Socioeconomic status has also been associated with dietary behavior. There is a meta-analysis of 11 studies in seven European countries that has found that there is a positive association between the socioeconomic status of people with hypertension and fruit and vegetable consumption (Beydoun et al., 2008). It means that there are several food items that require high financial support to be fulfilled, because most of the cheap food is high in calories, fat, and salt and low in fiber.

In a study about the dietary behavior of type 2 DM, one researcher found that this disease causes financial problems since it requires medical checks, medication, and treatment to deal with the complications (Albarran, Ballesteros, Morales & Ortega, 2006). This situation can be applied to hypertension patients as well, since hypertension also requires medical checks, medication, and treatment. Thus, if it is added with the need to buy several food items that are appropriate for good health, this can cause an increasing need for more money.

Social support

Social support was found as one of mediating variables that influence dietary behaviors (Sacova et al., 2001). It is linked to several health-related behaviors. In a review of 29 articles, the researcher found a positive relationship between social support and chronic illnesses. Dietary behavior management is considered as one of

the most vulnerable behavior affected by social influences. Some articles explained the mechanism of social influence in supporting self-management, while others explained how the social environment influences self-management by providing social support (Gallant, 2003).

The social support for changing dietary behavior can come from the family or larger social groups. The person with a chronic illness who has a supporting spouse will have a better food selection and eating plan compared to those who do not get support from their spouse (Sacova et al., 2001). Similarly, the sample of a study about the psychosocial influence of dietary behavior stated that it is easier for men to alter the dietary behavior if their wives are responsible for preparing their daily meals (Ponzo et al., 2006). In a different setting, a study of college students showed that friends and peer support gave positive encouragement for eating healthfully, gave support for diet, and exercise related to weight loss (Gruber, 2008). Even in the lower income population, the amount of social support has been found to predict success with dietary change. This study indicated that friends, family, and positive support-are helpful for those who are willing to change their dietary behaviors. However, it was found only in the female sample, while for the male sample the biggest predictor was motivation (Kelsey et al., 1996).

From the above information is one reason why this present study was held in a community where the members of the group are neighbors. Therefore, it was expected that they will provide support among themselves during the process to improve their dietary behaviors.

Culture

There are two possibilities of cultural influence on dietary behaviors. It can be either a supporting factor or a barrier. In a study of southwestern New Mexican Hispanics, Mexican culture challenges them in dietary behavior in terms of the traditional Hispanic diet and the importance of support from family and others (McCloskey, & Flenniken, 2010). Conversely, the Mediterranean culinary culture is very good for preventing and managing hypertension since people living in this area use olive oil as the main source of fat instead of animal meat. The Mediterranean people believe that animal meat is ancient or old culture and not good for health. It is not only olive oil, but they also consume a high amount of fish, fruit, raw and cooked vegetables. Besides avoiding hypertension, this culinary culture is also good for preventing hypercholesterolemia, diabetes, obesity, and other cardiovascular diseases (Perez-Lopez, Chedraui, Haya & Cuadros, 2009).

In a study of Italian subjects, the culture challenge for dietary behavior is the difficulty to eat a different meal when eating together at the table and the lack of knowledge about how to modify the traditional Italian food recipes. Moreover, the study showed that it is easier for men to follow the recommended diet when their wife is responsible for preparing the daily meal (Ponzo et al., 2006). In a study of five countries in Asia; Bangladesh, India, Indonesia, Thailand and Vietnam, it was found that the culture influenced the social factors that are related with being overweight. It is known that being overweight can increase the risk of morbidity from a number of chronic diseases including hypertension (Razzaque et al., 2009). However, since the culture of the community where this present study will take place is homogenous the culture will be not compared between an intervention and a control group.

Group-based dietary self-management program on dietary behaviors of female community dwellers with hypertension

There are many studies of self-management programs that have shown their effectiveness to produce the desired outcomes. However, they varied in terms of content, strategies, duration, and outcome measurements. Nine published studies were reviewed to obtain information about group-based self management programs. Five of the nine studies were randomized controlled trials (RCT) (Bosworth et al., 2009; Fanaian et al., 2010; Kendall et al., 2007; Swerisson et al., 2006; Xue et al., 2008) and the other four were quasi experimental studies (Hall et al., 2009; Saelens et al, 2000; Scheurs et al., 2003; Siu et al., 2005).

Setting

The intervention of the studies was conducted in various settings and locations; a community setting such as a community center, churches, and a senior citizen club, (Scheurs et al., 2003; Swerisson et al., 2006), cardiac patient club (Xue et al., 2008), hospital-based outpatients (Hall et al., 2009; Kendall et al., 2007), general practices (Fanaian et al., 2010), primary care clinics (Bosworth et al., 2009), specialist clinics (Siu et al., 2005), and a large urban university (Saelens et al, 2000).

Content of the program

This part presents the content of the self-management programs that was extracted from the literature review. Each study has different contents applied in the programs.

The standardized chronic disease self-management program (CDSMP) was given in a study with a Chinese population, in Victoria and Queensland, Australia. The contents consisted of diet, exercise, medications, fitness, emotional management, problem-solving skills, and communication with health professionals, which are the keys to a better quality of life in persons with chronic illness (Siu et al., 2005; Swerisson et al., 2006; Kendall et al., 2007).

Almost similarly, the contents of the program of self-management for people with hypertension are physical activity, the DASH diet, low salt intake, at least a moderate alcohol intake, stopping smoking, and medication management (Bosworth et al., 2009; Xue et al., 2008). In addition, the study by Bosworth et al. also focused on home blood pressure monitoring. The contents of the program in the Netherlands were maintaining physical condition, recognizing symptoms, taking action, coping with negative emotions, and giving and seeking social support from partners, neighbors, and colleagues (Scheurs et al., 2003). Moreover, a self-management program for diabetes mellitus patients has a different content in the intervention. In a study about DM, the self-management content is managing an anxious temperament, elf-management behavior, and quality of life (Hall et al., 2009).

Several studies focused on one behavior as an outcome. In a study about the use of self-management strategies, the content of the program focused on promoting physical activity (Saelens et al., 2000). Self-management knowledge and skills were also applied in a program about health improvement and prevention study. The content of the program covered individual lifestyle that consists of diet, physical activity; and group lifestyle that consists of educational and physical activity practice based on self-management strategies (Fanaian et al., 2010).

In conclusion, each study has a different content in their self-management program. Mostly, the contents included physical activity, diet, no alcohol, and stopping smoking. Some studies added medications, fitness, emotional management, problem-solving skills, and communication with health professionals. Only a few studies were designed specifically on dietary behaviors for person with hypertension.

Strategies of the program

The strategy of an intervention is an important issue to be discussed, because it can determine how researchers run the program from the beginning to the end. The information that is contained in this part can be useful for those who need to know what strategies can be used in further researches.

One of the strategies that was used in a program of health improvement and prevention study is self-management knowledge and skills. This program offered sessions for individual and lifestyle education for a group. The self-management strategy was applied in the group session, which consists of goal setting, self-monitoring, developing practical skills, and problem solving to promote positive dietary and physical activity changes and weight loss. The total session counted for six sessions during a nine month period (Fanaian et al., 2010).

In a study that was conducted in a cardiac patient club in Shanghai, the participants attended a group treatment session. The participants were divided into six small groups with 10-12 patients per group. There were four sessions where the participants needed to attend. In the first session, each group was given an educational talk, in accordance with a self-management manual for hypertension, an

introduction to goal setting, and the exercise of using a digital blood pressure meter. Moreover, at the end of the session they were given booklets about hypertension, lifestyle changes, compliance to medication, a diary to record their daily blood pressure, and an action plan (a set of goal sheets which the patient set out and recorded their success with weekly goals).

The second session was conducted one week after the first one. The meeting was opened by giving feedback from practicing the goal of the previous week. After that, the participants received an explanation about physical activity, the DASH diet, salt, alcohol, and smoking. Further, they were invited to participate in a patient led exercise session, followed by an explanation about calculating body mass index (BMI). At the end of the session, the participants set new goals for the following week. The third session was done one week after the second session. The contents were about managing the medication and food energy calculations. The last session was conducted two weeks after the third one. The content was about the feedback from the previous goals and encouraging participants to maintain change (Xue et al., 2008).

In a study about Chonic Disease Self-management Program (CDSMP) that was conducted in the Chinese population in Victoria and Queensland, Australia, the procedure of the program covered six weeks. The program was led by a trained professional leader and a trained lay leader. They acted as the role models in the sessions. During the sessions, participants were encouraged to share their experiences and master self-management behaviors. The session was for 2.5 hours once a week. They learned how to set goals that they believed in and felt confident that they could complete. After that, the progress of fulfilling the goals was monitored by peers in a

weekly timeframe. Te goals were used further for reviewing, sharing, and group problem solving (Siu et al., 2005; Swerisson et al., 2006; Kendall et al., 2007).

There was also a study that compared the outcome for groups who received different interventions. The first group received a tailored behavior self-management intervention two times a month, the second group received a home blood pressure monitoring intervention three times a week, and the third group received a combined intervention of the first and second group. The first group focused on adherence, dietary patterns, weight loss, reduced sodium intake, physical activity, smoking cessation, and a moderation of alcohol intake. The monitoring was delivered by a single nurse during bi-monthly telephone calls. The second group recorded their blood pressure three times a week in a log. Meanwhile, the third group did both interventions (Bosworth et al, 2009).

A study by Scheurs et al. (2003) conducted a 5 week program that contained 5 sessions. Each session covered two hours. The program provided several steps: the introduction to self-management tasks; sharing beliefs, emotions, experiences, and barriers; action plans; and goal attainment. The intervention was for groups which consisted of 6-8 participants. The sessions were conducted two times a week.

From the results above, we can see that there are various strategies used to run self-management programs. Mostly, the programs were separated into several group sessions over a period of time. The programs offered several activities such as educational sessions, reflection of experiences, goal setting, and monitoring. Therefore, in this present study, the strategies of a group-based self-management program are sharing and a reflection of individual current dietary behaviors, a group

education session, individual comparisons of behavior and a reflection on obstacles, individual goal setting and an action plan, and a follow up.

Duration of intervention

Each self-management program has a different duration of time in completing all of the steps. Some may take months, some may take years.

Several studies that used the standardized Chronic Disease Self-Management Program (CDSMP) spent six weeks for this intervention (Siu et al., 2005; et al., 2006; Kendall et al., 2007). However, each study had a different timeframe of follow up. Siu et al. followed up at one week following the intervention On the other hand, Swerisson et al. conducted the follow up at the sixth month after the program. Meanwhile, Kendall et al. did the follow up four times in a 12-month period; at 3, 6, 9, and 12 months. Similar with Swerisson, et al., Hall et al. (2009) followed up at the sixth month after the treatment.

A study about health improvement and prevention study which used self-management knowledge and skills did the follow up 9 months after the beginning of the program. During the 9 months, there were 6 group sessions done (Fanaian et al., 2010). Meanwhile, in a randomized trial of self-management program, the intervention was conducted for 5 weeks and contained 4 group treatment sessions. The follow up was held on 1 month and 4 months after ending the treatment (Xue et al., 2008). Similar in duration of following up on the intervention, a study by Scheurs et al., (2003) also took 5 weeks.

A randomized control trial about self-management intervention took 24 months. The evaluation of blood pressure was held every 6 months over a 24 month

period. There were four groups that attended the program. Each group received a different intervention and duration time of the intervention. The tailored behavior self-management group accept the intervention two times a month, the home blood pressure monitoring group did the monitoring of their blood pressure three times a week, and the combined group did both of the interventions that first and second group did (Bosworth et al., 2009). A similar duration of intervention was outlined in a study by Saelens et al. (2000) which also completed the assessment after 24 months. The follow up was held twice; 1 year and 2 years after ending the intervention.

To sum up, the duration of self-management programs that were reviewed ranged for 5 weeks to 24 months. Therefore, due to the limited time, the present study conducted the self-management group-based program within 4 weeks.

Measurements

From the articles that are reviewed, some of studies have diet as the behavioral outcome. There are several measurements that were used in various studies. The instrument for diet as a behavioral outcome that was used in a study in Sweden is food habits. The limit of a satisfactory blood lipid level was set for the study as the indicator of the program. In the intervention, the participants were given simple advice about distributing food consumption throughout the day, reducing their intake of energy-rich food, choosing light dairy products and low-fat cheeses, choosing a cooking oil high in mono- and/or poly-unsaturated fat (olive or rape oil), eating fish more often, eating chicken rather than pork and beef, choosing bread and cereals rich in fibers, cutting off visible fat, choosing low-calorie delicatessen products, eating more fruit, vegetables and root vegetables and distinguishing between

weekdays and special occasions. Then, the follow up was held to assess whether the satisfactory effect on blood lipid levels was achieved or not (Drevernhorn et al., 2007).

In a study about HIPS program for preventing vascular disease, the diet behavior was measured by using a daily living diary. However, the authors did not mention clearly how to use the tool or the validity and reliability of the tool (Fanaian et al., 2010). Meanwhile, diet behavior was measured using the validated Food Frequency Questionnaire (FFQ). In this study, the participants were asked about their diet in the last three months, and then it was compared in two follow ups. The first follow up was 1 month after ending the treatment, and the second follow up was 4 months after ending the treatment (Xue et al., 2008).

The Food Frequency Questionnaire (FFQ) is commonly used for assessing diet and health in large epidemiologic studies. In the application, this instrument asks participants to report the size and portion of food consumption in a particular period (Fred Hutchinson Cancer Research Center, 2011). There is one study which assessed the validity and reliability of FFQ for hypertension. It shows that it has good reliability (Kappa coefficients ranged from 0.79-0.98) and validity (correlation coefficients varying from 0.19 (general sample)-0.31 (female sub-sample)) (Ferreira-Sae et al., 2009).

In summary, from the studies that were reviewed, there are several measurements used for assessing the diet in self-management programs. They are food habits, a daily living diary, and the validated Food Frequency Questionnaire (FFQ). However, the researcher has developed a new tool of dietary behaviors based on the literature review because the existing measurements required the participants to

complete them every day. The DASH eating plan was used as the reference in making the tool. The tool measured the dietary behaviors before and after the program was conducted.

Summary

To sum up, the literature review part of this study provides information related to the concept of hypertension, self-management, dietary behaviors, factors influencing dietary behaviors, and group-based self-management programs. There are two kinds of treatment for hypertension, namely pharmacological and non-pharmacological treatment. One of the non-pharmacological treatments for hypertension is dietary behaviors, where some changes of dietary behaviors are required to be applied in order to stabilize blood pressure and to avoid complications.

According to several resources, dietary behaviors that are required for hypertension consist of consuming whole grain products, consuming protein sources, increasing the consumption of vegetables and fruits, consuming calcium sources, reducing fats and oils, reducing salt and sodium, and limiting sweets and added sugar. Moreover, several factors were found influencing dietary behaviors.

From the evidence, it was proven that self-management concept and group processes were effective to help people to change their behaviors. Thus, it is frequently used as the conceptual framework to guide the implementation of a program related to behaviors, including dietary behavior. However, in Indonesia this concept was not well-known and has not been applied yet. Therefore, it was important to conduct a study to examine the effect of a self-management group-based program for female community dwellers with hypertension in Indonesia.

CHAPTER 3

METHODOLOGY

This chapter presents the details of the methodology used in this present study. It consists of research design, population and sample, instrumentation, data collection procedures, ethical consideration, and data analysis of the research study.

Research design

This study was a quasi-experimental study using a two-group pre-post-test design. The experimental group and the control group were recruited from five villages in the same area. The objective of this study was to examine the effects of a group-based dietary self-management program on dietary behaviors. Therefore, the dietary behaviors of the samples were examined before and after the researcher conducted the intervention, and then the score was compared to examine whether there was a significant change or not. The research design is as follows:

	Pre-test			Post-test
Experimental group	O_1	———	X ——→	O_2
Control group	O_1			O_2
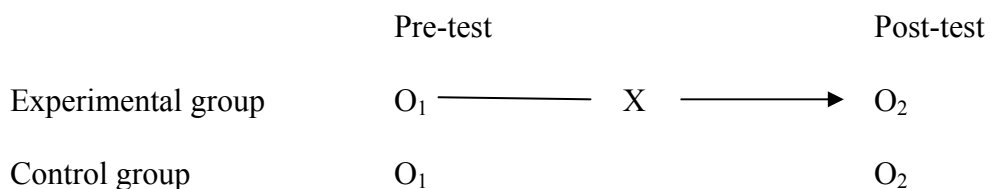
O_1 refers to the baseline data (pre-test score) of the dietary behaviors of female community dwellers with hypertension

X refers to the group-based dietary self-management program for female community dwellers with hypertension

O_2 refers to the data of dietary behaviors of female community dwellers with hypertension after the intervention (post-test score).

Setting

This study was conducted in five villages located in Darussalam sub-district, Aceh Besar District of Aceh Province, namely Lamduro, Lampuuk, Lamtimpeung, Tanjung Selamat, and Tanjung Deah. This district was purposively selected under the consideration that this program was planned to be sustainable by appointing the villages as the community field for the community practicum for university students. Therefore, the location should not be too far from the university where the researcher works. The location of the village would be reachable by colleagues, students and the researcher as well.

This sub-district consists of 29 villages that belong to 1 primary care unit (PCU). It is an area of 7,766 hectare. The population of this sub-district is 20,652. Its west border is Banda Aceh which is the capital of the province of Nanggroe Aceh Darussalam (Pemerintah Daerah Kabupaten Aceh Besar, 2007).

To make the study homogenous, the studied villages had the same characteristics in terms of distance to the PCU and other health services and are located next to each other.

Population and sample

Target population

The target population for this study was female community dwellers with hypertension who were living in the selected villages in Aceh Province, Indonesia.

Sample and sample size

Gender does make a difference to dietary behaviors because women tend to be ones who are responsible for preparing and cooking food for family members. Thus, to achieve the homogeneity in this present study, only women were included as the sample.

The estimation of the sample size for this study was based on a power analysis by using the effect size (*d*) of the previous study that has the closest similarity to the present study. After reviewing several studies, the researcher used the effect size of a study by Park et al. (2010). In this study, the sample population received the integration intervention between health education, individual counseling, and tailored exercises where the samples were assigned into five smaller groups. This study was chosen for several reasons. First, the population was adults and elders with hypertension; second, the researcher used the self-management concept in the program; thirdly, the program was delivered for individual and group sessions; and lastly, the outcome included dietary behaviors.

The effect size was calculated by using the effect of the program on self-management behaviors and yielded a moderate to high effect with *d* = 0.65.

According to Polit and Beck (2008), to achieve $\alpha = 0.05$, p = 0.80, and $d = 0.65$, at least 44 samples were required for each group; the experimental and control group.

Inclusion criteria

The inclusion criteria to select the samples of this study were as follows; (1) adult and older, (2) women, (3) diagnosed with hypertension by a physician or nurses, (4) no paralysis, (5) no cognitive impairment, (6) able to communicate with the researcher, (7) able to read and write, and (8) willing and agree to participate in the study from the beginning to the end of the study. Initially, 89 samples that met the criteria were recruited, where 45 samples were in the experimental group and 44 samples were in the control group. One sample from the experimental group withdrew from the study because she refused to be followed up in the last meeting. Therefore, at the end of this study, the total numbers of samples were 88 samples.

Sampling procedure

The sampling procedure of this study was done in several steps. It was started by selecting the settings of the study. *First*, the setting was chosen by selecting the most appropriate sub-district as explained earlier. The selected one was Darussalam sub-district. Five villages within this sub-district were the population of this study. To make it homogenous, the villages had the same characteristics in terms of distance to the primary care unit and other health services and were located near to one another.

Second, the researcher performed simple random sampling to select five villages by drawing a label of a village's name, so all villages had the same opportunity to be selected. The third step involved obtaining the data about the number of hypertension dwellers who met the inclusion criteria in each village by asking for help from the village health volunteers. To reach the estimated sample size, this study was conducted in 5 villages. In each village there were experimental and control groups. In the fourth step, the samples were invited by the village health volunteers (lay persons) to attend the group-based dietary self-management program. Those who attended the program were considered as the experimental group, while the rest were the control group. The place and time of the program had been scheduled prior to the invitation.

For the experimental group, they were involved in the group-based dietary self-management program in the following week after the invitation and were followed up at the fourth week after the program (post-test). For the control group, they were informed that the researcher would repeat the data collection (post-test) and give the handbook of dietary behaviors for hypertension at the fourth week after the post-test. Figure 2 shows the plot of the sampling procedure that started from selecting the appropriate sub-district as the setting until assigning the experimental group and the control group.

```
┌─────────────────────────────────────────────────────────────┐
│           Selecting the appropriate sub-district            │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Selecting the villages which are the same distance to PCU   │
│               and located next to each other                │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│        Random sampling by drawing labels of village names    │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Getting the number of community dwellers with hypertension  │
│                      in each village                        │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Inviting the community dwellers with hypertension to attend  │
│                         the program                         │
└─────────────────────────────────────────────────────────────┘
              ↓                               ↓
┌──────────────────────────┐      ┌──────────────────────────┐
│  Do not attend the program│      │     Attend the program   │
└──────────────────────────┘      └──────────────────────────┘
              ↓                               ↓
┌──────────────────────────┐      ┌──────────────────────────┐
│   Control group (n= 44)  │      │ Experimental group (n= 44)│
└──────────────────────────┘      └──────────────────────────┘
                              ↓
              ┌──────────────────────────────────┐
              │     Pre-test at the first week    │
              │       Post-test at the fourth     │
              └──────────────────────────────────┘
```

Figure 2. *The Sampling Procedure*

Instrumentation

    Two sets of instruments were used in this study; (1) group-based dietary self-management program instruments, and (2) data collection instruments. The detailed description of each set is presented as follows:

Group-Based Dietary Self-Management Program Instrument

    This set consists of the group-based dietary self-management program instrument and goal setting form. The group-based dietary self-management was

developed by the researcher by using the self-management method that was developed by Kanfer and Gaelick-Buys (1991) as presented in the conceptual framework in chapter 1 (Figure 1). The objective of this study was to examine the effect of a group-based program on the self-management dietary behaviors of female community dwellers with hypertension. This is a quasi-experimental study using a two-group pre-post-test design and took 4 weeks.

The group-based dietary self-management was only given to the experimental group. There were 5 subgroups that received this program. To ensure that all experimental groups received the same treatment, the researcher was the only one who ran this program. Therefore, the meeting time for each group was different based on the arrangement of each group. The interventions that were implemented were; (1) sharing of and reflecting on individual current dietary behaviors, (2) an education session by the researcher about hypertension and dietary behaviors, (3) individual comparison of behavior and reflection of obstacles, (4) individual weekly goal setting, and (5) follow up. In addition, the samples were also given a handbook of dietary behaviors for hypertension and goal setting form by the researcher.

The Goal Setting Form. This form was developed by the researcher. It was used by the samples to record their weekly goals and achievements. The form consists of planned goals and actions, the planned frequency, its actual implementation and achievement. The way to use this form was explained by the researcher in order to guide the samples in completing it by themselves. It was completed by the samples every week without any intervention from the researcher.

Data Collection Instruments

The data collection instruments used for this study were the Demographic Data Questionnaire (DDQ) and the Dietary Behavior for Hypertension Questionnaire (DBHQ). The explanation of each instrument is as follow:

The Demographic Data Questionnaire (DDQ). The instrument was developed by the researcher, which consists of two parts, namely; 1) general data: name, age, marital status, religion, ethnicity, educational level, occupation, experience of having received an educational program about dietary behavior for hypertension, responsibility of preparing food at home, health insurance, and current smoking status, and 2) health-related information; duration of having hypertension, current blood pressure (measured by the research assistants), current medication, and co-morbid diseases.

The dietary behavior for hypertension questionnaire (DBHQ). This instrument was developed by the researcher based on a literature review. The questions in this questionnaire covers seven domains; 1) consuming whole grain products, 2) consuming protein sources, 3) increasing the consumption of vegetables and fruits, 4) consuming calcium sources, 5) reducing fats and oils, 6) reducing salt and sodium, and 7) limiting sweets and added sugar. The format of this questionnaire is a 4-point rating scale (1 = never, 2 = sometimes, 3 = often, 4 = routinely). This questionnaire consists of 32 statements with 19 positive statements and 13 negative statements (7, 10, 11, 20, 21, 23, 25, 26, 27, 28, 29, 31, and 32). A higher score means better dietary behaviors, meanwhile the score of negative statements were reserved.

Translation of the instruments

The instruments were developed by the researcher in English. Since the study was conducted in Indonesia and all samples were Indonesian people, the instruments needed to be translated to Indonesian language. After being validated by three experts, the instruments were translated by back translation process to make sure the content of the original instrument and the translated one is equivalent (Brislin, 1970).

The first bilingual translator translated the instruments from the English version into the Indonesian version. The second bilingual translator translated back the instrument from the Indonesian version into the English version without seeing the original version. The last bilingual translator clarified and identified the discrepancies in several items between the two versions. Several discrepancies were found between the two English versions, namely "boil, roast, or poach", and "internal organs or innards". Finally, the instruments were revised by following the suggestions from the translators.

Validity and reliability of the instruments

Validity

Three experts were approached to validate the content of the instruments, both the program and the data collection instruments. Two of three experts were from the Faculty of Nursing, Prince of Songkla University, Thailand and the other expert was from the Faculty of Nursing, Chiang Mai University, Thailand. The instruments consisted of the program guideline, the teaching plan, the data

collection instrument (Dietary Behavior for Hypertension Questionnaire), and the handbook of dietary behaviors. All these instruments had been modified and revised based on the suggestions and comments from the experts.

Reliability

The researcher examined the internal consistency reliability of the DBHQ by calculating Cronbach's alpha coefficient. This instrument was tested with 20 persons who met the same inclusion criteria of this study. The result showed that the coefficient of DBHQ was 0.74, which is considered reliable for newly developed instruments (Polit & Beck, 2008). Seven of the twenty persons were also involved in the pilot study to check the feasibility of the program.

Pilot study

A pilot study was conducted to examine the feasibility of the planned intervention procedure. Seven persons involved in the reliability test were invited to form a group to receive the planned intervention.

The result of the pilot study showed that in general, the planned group-based dietary self-management program was feasible to be applied to the targeted samples. Actually, in the planned intervention, there were separate meetings of group forming (week 1) and the intervention (week 2). However, the researcher found that it was very difficult to organize the people again for another meeting after the first meeting due to their busy lives. Therefore, the group forming and the intervention were done at the same time. Thus, the duration of the implementation of the present study was reduced from 5 weeks to 4 weeks. Initially there was a food demonstration

in the second meeting, however, the researcher found that no one brought the required food to the meeting. The samples said that they were embrassed to bring food from home because it was leftover food from lunch and they felt it was impolite. Therefore, in the present study, the food demonstration was not implemented.

Procedure

The procedure of the intervention and data collection was conducted in five villages in Aceh Province, Indonesia. The time of the data collection was from January to February 2012. The following description explains the steps in detail:

Preparation phase

This phase consists of: (1) obtaining the official approval from the Faculty of Nursing, Prince of Songkla University, (2) obtaining official permission for data collection from the Director of Darussalam Sub-District in Aceh Province, Indonesia, (3) preparing all instruments and materials including informed consent, (4) testing the instrument validity and reliability, (5) recruiting and training 4 RAs (Research Assistants), and (6) approaching the health volunteers from five targeted villages to ascertain their willingness to help the researcher in getting the data and recruiting the samples.

In this study, RAs were responsible for pre-test and post-test data collection. It was done to avoid the experimenter bias that possibly occurs if the researcher collects the data by herself (McBurney & White, 2009). There were four RAs recruited for this study. They were fresh nursing student graduates who have passed the community nursing course and internship program. Before collecting the

data, they received a detailed explanation from the researcher about the objectives of the study, protocol, and the instruments.

Implementation phase

The implementation phase was started by selecting a sub-district, villages, and samples. For both groups, the pre-test was conducted in the first week, while the post-test was in the fourth week. In the implementation phase, it was not only the researcher who played an active role, but also the group leaders. In the previous studies about group sessions, it was shown that the engagement of the group leaders helped the group members to become more active and not reluctant to take part during the group sessions because the group leader was someone they have known before and was the part of their community. The description of the program is as follows:

Week 1. All samples who came to the program were asked to sign informed consent or to declare it verbally. Then, they were asked to fill in the data collection instruments (pre-test). After completing the data instruments, the intervention of the program was started. The interventions in this meeting were; (1) sharing of and reflecting on individual current dietary behaviors, (2) an education session led by the researcher about hypertension and dietary behaviors, (3) an individual comparison of behavior and a reflection on obstacles, and (4) individual weekly goal setting.

Before starting the intervention, group members were asked to select one leader among themselves. This leader encouraged each member to actively participate in all steps during the group session that was facilitated by the researcher.

The researcher informed the leader and all members that they were free to disclose/share their thoughts and should give feedback to each other.

After selecting the leader, group members were encouraged to reflect on their current dietary behaviors. The researcher asked all group members about what they have done in regard to diet. Then, the group leader wrote all the answers (diet behaviors) in a flipchart table. Then, every group member got some stickers distributed to them by the group leader. These stickers were patched individually in the columns to indicate their individual current dietary behaviors. Lastly, the group leader made a conclusion based on the number of the patched stickers.

After the sharing of and reflecting on the current behaviors, the researcher provided an educational session for all members of the group. The method of the educational session was a game and discussion. The first part was about hypertension, while the second one was about dietary behaviors. In this part, the group leader helped the researcher to prepare the media and the group leader was also taught by the researcher about her role in this part. First, the samples were encouraged to match the questions about hypertension with the answer choices that were provided in the answer bank. The group leader helped the group members to find the right answers and patch it under each question in the flip chart. Then, a body map was also used to make it easier to indicate which body parts can be damaged by hypertension. The group leader wrote all answers from the group members in a prepared flipchart that had a blank body map. Next, the artificial food models or the real foods were provided by the researcher to increase the understanding of the group, especially about the serving size of each food group. In this activity, it is not only the researcher who played the role but also the group leader and all group members had opportunity

to ask questions, give opinions, and give feedback. In order to make the group members remember the information given, the researcher distributed a handbook. This session took 30 minutes.

After the educational session, group members were encouraged to compare their current behaviors with the desired behaviors that had been taught in the educational session. The group leader wrote their answers and helped them to identify the behaviors and distributed the stickers to be patched individually on the flipchart based on the group members' answers. This was followed by reflecting on the obstacles of performing the desired behaviors and took 20 minutes. After that, the researcher assisted every group member to identify their goal for one week. Then, the researcher informed them how to use the goal setting form for the next following weeks. The goal setting form was used independently by themselves without any intervention from the researcher. Group members were informed that the goals should be relevant to their confidence in being able to reach them. Moreover, changing dietary behavior should be done gradually (National Heart, Lung, and Blood Institute, 2011). The goals and actions should be clear and measurable. This step took about 30 minutes overall.

Week 2, Week 3, and Week 4. From week 2 until week 4, the samples monitored their dietary behaviors by continuing and completing the goal setting form by themselves for a total of three weeks. It was done weekly without any intervention from the researcher. The goals could be maintained, modified, and added to by themselves. Moreover, the group members could call their group leaders during this period if they met any difficulties and problems about completing the goal setting form. Group leaders also provided motivation to all group members in improving

their goals and actions. If the leaders could not solve the problem faced by the group members, she called the researcher to help them.

Week 4. For this last meeting, the researcher discussed with the samples about their progress in performing the desired behaviors that they have been set during the previous weeks. They were assisted to reflect and evaluate their achievement by using the goal setting form. Moreover, the researcher reinforced and encouraged them to continue what they have been doing during the program. Lastly, the samples were asked to fill in the data collection instrument from the researcher.

By considering the ethical issues, the researcher informed the samples from the control group that that they would get the handbook of dietary behaviors for hypertension after finishing the next measurement in the next 4 weeks (after post-test). Figure 3 presents the details of the data collection procedure and the implementation of the program from the pre-test time in the first week to the post-test time in the fourth week.

| Control group (n= 44) | ← | Sampling procedure (p.52) | → | Experimental group (n= 44) |

Approached individually
1. Informed consent
2. Pre-test: DDQ, and DBHQ.

Approached individually
1. Informed consent
2. Pre-test: DDQ, and DBHQ.

Week 1: First group meeting
1. Introduction between the researcher and group members.
2. Group forming consisted of 8-12 persons
3. Selecting the group leader.
4. Sharing of and reflecting on individual current dietary behaviors by open-ended questions and patching stickers.
5. Education session given by the researcher about hypertension and dietary behaviors through discussion and games.
6. Individual comparison of behavior and reflection of obstacles by open-ended questions and patching stickers.
7. Individual weekly goal setting and action plan. The goal should be specific for dietary behaviors, clear and measurable. Record in the goal setting form.

Week 2, 3, and 4
The samples continue and complete the goal setting form by themselves. It is done every week without any intervention from the researcher. Group leader and group mates help the members when they meet any difficulties/problems.

Week 4
Second group meeting
1. Post-test: DBHQ
2. Provide the handbook of (dietary+noun) for hypertension

Week 4: Second group meeting
1. Follow up by using goal setting form completed by the samples, discussion, and giving reinforcement and recommendation for the future.
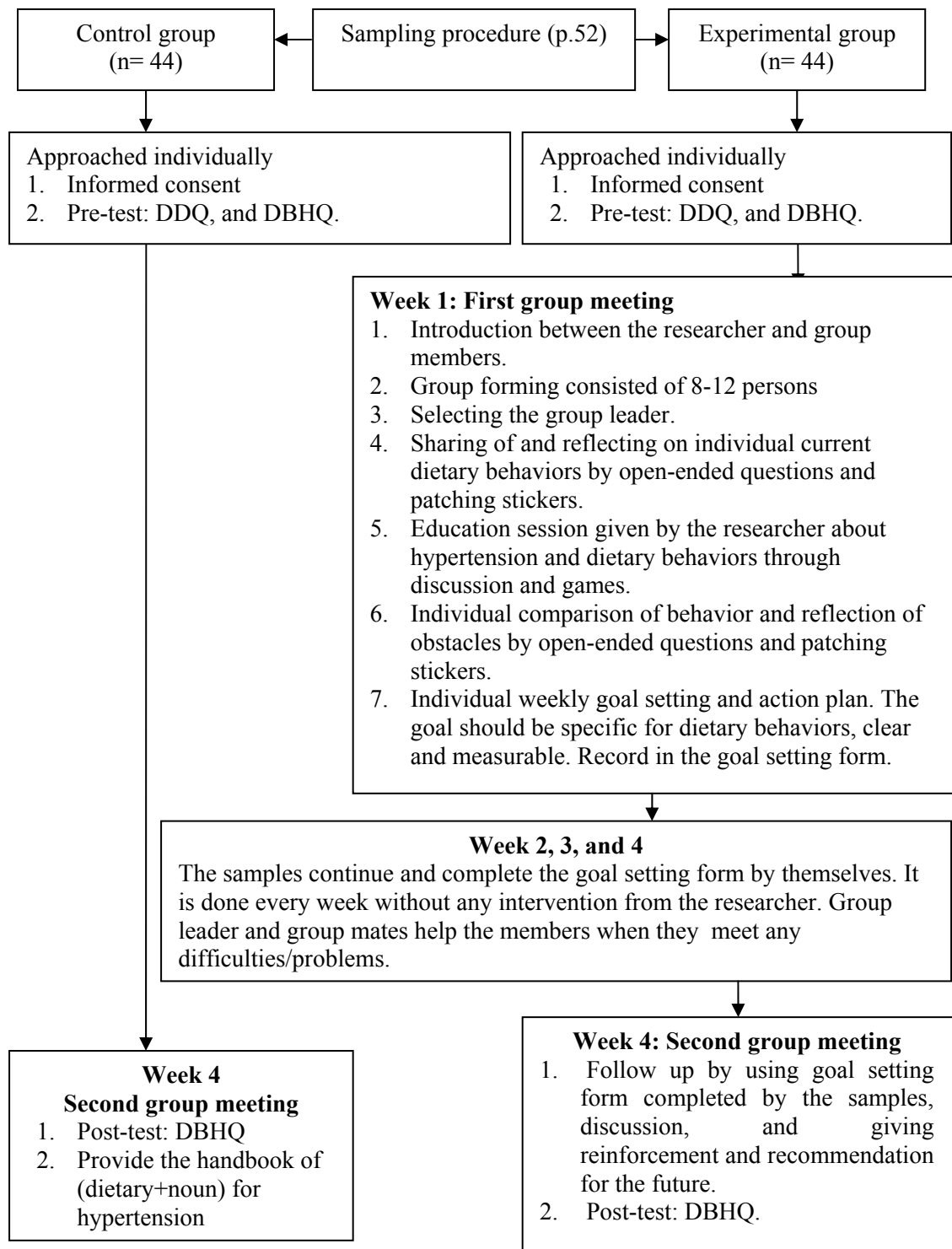2. Post-test: DBHQ.

Figure 3. *Data Collection and Implementation of the Study*

Ethical consideration

The samples of this study were approached with help from village health volunteers. Village health volunteers asked and invited the samples who met the inclusion criteria to attend the scheduled program offered by the researcher. The samples who attended the program were considered as the experimental group, while the rest were the control group. The samples were informed about their right to withdraw at any time without negative consequences. The researcher explained the purpose of the study and other important things related to the program. The samples who agreed provided written or verbal informed consent. Then, the research assistants assisted them to complete the data collection instruments. The researcher maintained anonymity of the samples by using codes and all information was kept confidential. In addition, for those who were in the control group, the researcher distributed the handbook of dietary behaviors for hypertension after the study was completed.

Data analysis

Two kinds of statistics were used in this study, namely descriptive statistics and inferential statistics. Descriptive statistics were used to analyze and describe the demographic and health-related characteristics of the samples. Frequencies, percentages, mean, range, and standard deviation were used. To test the equivalence of the proportion of demographic and health-related characteristics between the experimental group and control group, Chi-square, Fisher's exact test, Continuity correction, and independent *t*-test were used.

Inferential statistics were used to test the hypotheses to compare the dietary behaviors within and between groups. The assumptions of normality and homogeneity of variance for continuous variables were checked prior to hypothesis testing. It was found that the total mean scores of dietary behaviors of both groups met the assumptions. Therefore, independent t-test statistic was used for between-group comparison and paired t-test for within-group comparison. The level of significance was set at $p < .05$. Since there was a significant difference of the pre-test scores between two groups, one-way ANCOVA was used to control the possible contribution of the pre-test scores that may influence the results of the study (post-test scores). The pre-test score was treated as a covariate, while the post-test score was the dependent variable.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents and discusses the findings of the present study. It is presented in three parts, namely; Part I: the demographic characteristics and health-related characteristics of the samples, Part II: The dietary behaviors of female community dwellers with hypertension in Indonesia, and Part III: The effects of a group-based dietary self-management program on dietary behaviors.

Results

Part I: Demographic characteristics and health-related characteristics of the samples

Table 4 shows that the average age in the experimental group was 55.8 years (SD = 11.59) and that of the control group was 54.3 years (SD =13.16). All samples in this study were female, Muslim and non-smokers. From the total 88 samples, only one sample was single, the rest were married or widowed. Similarly, all samples were Acehnese, except one. The majority of the samples in both groups did not have experience in attending programs about diet for hypertension. Of all the demographic characteristics, there were no differences between the two groups.

Table 4

Demographic Characteristics of the Experimental Group and the Control Group
(N=88)

Characteristics	Experimental Group (n = 44)		Control Group (n = 44)		Statistic test value	*p*
	n	%	n	%		
Age (year)	M= 55.84 SD=11.59		M=54.30 SD=13.16		$.585^a$	.560
	(Min-Max= 37-90)		(Min-Max = 25-87)			
Marital status					1.931^b	.381
Single	1	2.3	0	0		
Married	22	50.0	27	61.4		
Widow	21	47.7	17	38.6		
Ethnicity					1.011^c	1.000
Acehnese	44	100	43	97.7		
Other	0	0	1	2.3		
Education					$.983^b$	.612
None	10	22.7	13	29.5		
School	33	75.0	29	65.9		
College/University	1	2.3	2	4.5		
Occupation					$.250^d$	.617
Homemaker/retired	35	79.5	32	72.7		
Staff/others	9	20.5	12	27.3		
Experience in attending the program about diet for hypertension					1.048^c	.616
Yes	3	6.8	1	2.3		
No	41	93.2	43	97.7		

Table 4 (continued)

Characteristics	Experimental Group (n = 44)		Control Group (n = 44)		Statistic test value	p
	n	%	n	%		
Cooking food at home					.000[b]	1.000
Self	35	79.5	36	81.8		
Family	9	20.5	8	18.2		
Health insurance					.321[a]	.571
Yes	38	86.4	35	79.5		
No	6	13.6	9	20.5		

[a] = Independent *t*-test, [b] = Pearson Chi-Square test, [c] = Fisher's Exact test,

[d] = Continuity Correction

Table 5 shows the health-related characteristics of the experimental and control groups. The samples in both groups suffered from hypertension ranging in duration from 0-5 years (70.5%). About one-third were in the pre-hypertension stage. In both groups, most of the samples were not on current medication and did not have any co-morbid diseases. Of all the health-related characteristics, there was no statistical difference between the two groups.

Table 5

Health-Related Characteristics of the Experimental Group and the Control Group
(N=88)

Characteristics	Experimental Group (n = 44)		Control Group (n = 44)		Statistic test value	*p*
	n	%	n	%		
Duration of having hypertension					.722[a]	.697
0 -5 years	31	70.5	31	70.5		
6-10 years	8	18.2	10	22.7		
≥ 10 years	5	11.4	3	6.8		
Current blood pressure					.956[a]	.620
Pre-hypertension	16	36.4	17	38.6		
Stage 1	15	34.1	11	25.0		
Stage 2	13	29.5	16	36.4		
Current medication					.000[a]	1.00
No	32	72.7	32	72.7		
Yes	12	27.3	12	27.3		
Having co-morbid disease					1.805[b]	.179
No	41	93.2	37	84.1		
Yes	3	6.8	7	15.9		

[a] = Pearson chi-square test, [b] = Continuity Correction

Part II: The dietary behaviors of female community dwellers with hypertension in Indonesia

Table 6 shows the description of the dietary behaviors and dietary behaviors domains of community dwellers with hypertension in Indonesia at the baseline measurement. It covers the mean and standard deviation of each domain for the total sample (N = 88), experiment group (n = 44), and control group (n = 44). Overall, the highest mean was in the domain of consuming grain products (total sample; M = 3.33,

SD = .55), while the lowest one was in the domain of consuming calcium source (total sample; M = 1.84, SD = 0.43). It shows that overall, the samples had good behaviors in regard to consuming grain products and poor behavior in consuming calcium products. Grain products are easily consumed by Indonesian people since they have three regular meals per day consuming rice. In regards to the poor behaviors of consuming a calcium source, it is because in Indonesia the calcium products such as milk and soybean milk are not familiar foods to be consumed. Moreover, the other source of calcium from vegetables was only sometimes consumed. Overall, the mean of most of the sub-domains in the control group was higher than that of the total sample and the experimental group.

Table 6

The dietary behaviors score of female community dwellers with hypertension at baseline

Dietary behavior	Total (N = 88)		Experimental group (n= 44)		Control group (n= 44)	
	M	SD	M	SD	M	SD
Consuming grain products	3.33	.55	3.28	.63	3.37	.46
Reducing salt and sodium	3.31	.43	3.26	.19	3.36	.47
Limiting sweets and added sugar	2.58	.46	2.35	.37	2.80	.43
Reducing fats and oils	2.52	.37	2.49	.36	2.56	.37
Increasing the consumption of vegetables and fruit	2.47	.43	2.38	.39	2.56	.44
Consuming protein sources	2.33	.38	2.35	.38	2.32	.38
Consuming calcium sources	1.84	.43	1.79	.46	1.89	.39
Total	2.58	.19	2.51	.19	2.65	.16

Part III: The effects of group-based dietary self-management program on dietary behaviors

Within-subjects effect

In order to determine the within-subject effect of the group-based dietary self-management program on dietary behaviors, the analysis was done to compare the means of the pre- and post-test scores of each group. A paired *t*-test was used after checking that the normality and homogeneity assumption was met.

Hypothesis 1: The dietary behaviors of female community dwellers with hypertension after attending the group-based dietary self-management program are better than before attending the group-based dietary self-management program. Table 7 shows that for the experimental group, the total mean score was statistically higher than before attending the program (*t*= -11.315, *df* =43, p < 0.05). In contrast, this difference was not found in the control group where the pre- and post-test total mean score was not significantly different (*t* =1.245, *df* =43, p > 0.05).

Table 7

Comparing the Difference of Pre-test and Post-test of Dietary Behaviors Score Using Paired t-test (n=44)

	Pre-test		Post-test		*t*	*p*
	Mean	SD	Mean	SD		
Experimental group (n = 44)	2.51	.194	2.95	.170	-11.315	.000
Control group (n = 44)	2.65	.168	2.61	.170	1.245	.220

p < 0.05.

Between-subject effect

In order to determine the between-subjects effect of the group-based dietary self-management program on dietary behaviors, the analysis was done to compare the total mean scores of the pre- and post-test scores between the experimental and control groups. Concerning the total mean scores, an independent *t*-test was used after checking that the normality and homogeneity assumptions were met.

Hypothesis 2: The dietary behaviors of female community dwellers with hypertension who attended the group-based dietary self-management program are better than those who did not attend the group-based dietary self-management program. Table 8 shows that the pre-test total mean score of the control group was significantly higher than that of the experimental group (t = -3.595, df =86, $p < 0.05$). At the post-test, the experimental group had a significantly higher total mean score than that of the control group (t = 9.231, df =86, $p < 0.05$). However, this finding must be interpreted with caution due to the difference between the groups at the pre-test.

Table 8

Comparing the Difference of Pre-test and Post-test of Dietary Behaviors Score Using Independent t-test (n=44)

Dietary Behaviors	Experimental group (n= 44)		Control group (n= 44)		t	p
	Mean	SD	Mean	SD		
Means of Pre-test	2.51	.194	2.65	.168	-3.595	.001
Means of Post-test	2.95	.170	2.61	.170	9.329	.000

$p < 0.05$.

In order to take into account the effect of the pre-test score acting as a confounder, it was treated as a "covariate" in the subsequent analysis using ANCOVA. The underlying assumption of homogeneity of variance [$F_{(1,86)} = 0.04$, $p= 0.83$], normal distribution, linear relationship, and the equality of slopes for the one-way ANCOVA were met. Table 9 shows that after controlling the pre-test score, the between group effect was still significant [$F_{(1,85)} = 83.17$, $p < .05$, $\eta^2 =.49$]. In other words, the group-based dietary self-management program had a significant contribution to the change of dietary behaviors of the experimental group as compared to that of the control group.

Table 9

Comparing the Control and Experimental Group's Post-Test Score after Controlling for Pre-Test Score Using ANCOVA (N= 88)

Source of variance	Sum of Squares	*df*	Mean of Square	F	*P*	η^2
Group	2.417	1	2.417	83.716	.000	.496
Means of total pre-test score	.041	1	.041	1.416	.237	.016
Error	2.454	85	.029			
Total	686.948	88				

df = (1,85)

In this study, the goal achievement was not measured since it was part of the program instrument. The purpose of the distribution of the goal setting form was to help the samples in the experimental group in monitoring their behaviors gradually every week. Instead of being recorded, it is the content that was discussed together by the researcher and the samples in the follow up meeting (second meeting).

The samples reported varied achievements for each week. Most of them reported that they consumed the recommended serving size of rice and had consumed vegetables and fruit. On the contrary, they also reported that it was difficult to consume milk/soybean milk regularly because they do not like it and need more time to make it familiar in their daily life routine. Therefore, the result of this goal achievement is not presented in the statistical data.

Discussion

The purpose of this study was to examine the effect of the group-based dietary self-management program on dietary behavior in female community dwellers with hypertension in Indonesia. This discussion part consists of the following areas: (1) Demographic and health-related characteristics of the sample population, and (2) hypothesis testing of the effects of the group-based dietary self-management program on dietary behavior in female community dwellers with hypertension.

Demographic and health-related characteristics of the samples

The average ages of both groups in this study were more than 50 years old. Hypertension is considered as a common problem in adults living in the community. It is also known as the most common chronic condition affecting about 26% of the adult population worldwide (Iyer, et al., 2010). All of the sample were female, Muslim and non-smokers. Only female samples were intentionally included in this study because the previous studies showed that females can adopt better dietary behaviors than males (Lee et al, 2010) and usually get better support from friends and

peers to do so (Gruber, 2008). Indonesia is one of the countries that has a majority of Muslims and has the highest population of Muslims among the Southeast Asian countries (88.1 % of the total population). According to the Basis Health Research of Indonesia (RISKESDAS), it was found that female smokers were significantly fewer in numbers than male smokers in the adult age range (5.2%) (Badan Penelitian dan Pengembangan Kesehatan Departemen Kesehatan RI, 2008). Moreover, from the Islamic view, smoking is discouraged (Yong, Hamann, Fong, Borland, & Omar, 2009). Smoking is considered as one of the risk factors of hypertension and a leading risk for cardiovascular events (Huerta, Tormo, Gavrila, & Navarro, 2010). Therefore, it can be said that the samples of the present study were representative of the female population of Indonesia.

In both the experimental and control groups, most of the samples had been suffering from hypertension ranging from 0-5 years (70.5% in each group). They were homogenous in terms of their duration of having hypertension. Most of them have had hypertension for about one year. This period is called newly diagnosed of hypertension where the sample reported that they had known that they had this disease for six months or longer (Neutel & Campbell, 2007). Lifestyle interventions involving diet have been shown to be effective in lowering blood pressure in people with hypertension over a 6 month period (Fanaian et al., 2010). One-third of them were in the pre-hypertension stage where the systolic blood pressure (SBP) is between 120 to 139 mmHg or diastolic blood pressure (DBP) is between 80 to 89 mmHg (National Heart Lung Blood, 2011). This stage is not considered as a disease, yet it is known to be an increased risk for the progression to hypertension. These people should be treated by lifestyle modification (Sun et al., 2008). It means that the

samples of this study were suitable to be included in this study in order to change their dietary behaviors.

Both medication and lifestyle changes are important in treating people with hypertension (Neutel et al., 2007). However, in this study only a few of the samples took medication (27.3% in each group). Similarly, in a study with Chinese in Northern China, it was found that the treatment rate was very low (Sun et al.). However, as explained earlier, since most of the samples in the present study were in the pre-hypertension stage, lifestyle modifications might be the right treatment for them. People with pre-hypertension are not recommended for pharmacological therapies, but should be advised to follow a healthy lifestyle to decrease the potential risk of progression to hypertension (Al-Zaharani, 2009).

To sum up, the demographic and health-related characteristics between the experimental and the control group in this study were not statistically different. Age, ethnicity, and non-smoking habits were quite similar among all of them. Most of them were newly diagnosed with hypertension and were at the pre-hypertension stage; therefore it is suitable for them to be included in the present study which purposed to encourage better dietary behaviors. Even though only a small number of the sample population took medication, it was acceptable because pre-hypertensive persons are recommended to change their behaviors rather than to take medication.

Hypothesis testing of the effects of group-based dietary self-management program on dietary behavior in female community dwellers with hypertension

The finding of the hypothesis testing is discussed to describe the effectiveness of the implementation of the group-based dietary self-management program by confirming the result whether it supports the hypothesis statements or not. As presented earlier, the result of this study confirmed both hypotheses.

Hypothesis 1 states that the dietary behaviors of female community dwellers with hypertension after attending the group-based dietary self-management program are better than before attending the group-based dietary self-management program. The result indicated that the experimental group had better dietary behaviors after the implementation of the program (Table 3). Meanwhile, hypothesis 2 states that the dietary behaviors of female community dwellers with hypertension who attended the group-based dietary self-management program are better than those who did not attend the group-based dietary self-management program. The result indicated that the experimental group had better dietary behaviors compared to the control group after the implementation of the program (Table 4).

These findings were consistent with some of previous studies about group-based self-management program (Bosworth et al., 2009; Fanaian et al., 2010; Hall et al., 2009; Kendall et al., 2007; Saelens et al, 2000; Scheurs et al., 2003; Siu et al., 2005; Swerisson et al., 2006; Xue et al., 2008). Although each study is different in terms of its strategies, duration, and content, a group-based dietary self-management program has shown its effectiveness in changing dietary behaviors. There are several reasons that explain the positive outcomes of the present study. The reasons underpinning the findings include the application of the self-management process, the application of the group process, the motivation of the samples, and the interaction between the researcher and the samples.

Application of self-management process. The self-management process for people with chronic diseases is now widely considered as one of necessary parts of treatment (Dongbo et al., 2003). The self-management process has shown its effectiveness in changing health behaviors (Bodenheimer et al., 2002; Fan & Sidani, 2009). The application of the self-management process in this study was developed based on the self-management process according to Kanfer and Gaelick-Buys. Self-management consists of three systematic stages namely self monitoring, self evaluation, and self reinforcement that are done by the individuals themselves (Kanfer et al., 1991). In the present study, this was done by following several steps as explained in detail in the previous part (chapter 3).

Self monitoring was done by encouraging all group members to share and reflect on their current dietary behaviors. The group members were asked about what they have done in regard to diet and identify which behaviors that they had done individually by patching the stickers. *Self-evaluation* was done by giving an educational session and asking the samples to compare their current behaviors with the desired one. The educational session was about hypertension and dietary behaviors for hypertension. The educational session was done to increase the knowledge of the samples about hypertension and the right dietary behaviors that should be adapted for people with hypertension. The educational session was an effective way to increase an understanding and lifestyle change (Drevenhorn et al., 2001 as cited in Connel, Wolfe, & McKevitt, 2008). In addition, a handbook of dietary behaviors for hypertension was distributed as the guideline after the educational session was completed. The handbook provides simple language and pictures to help the samples to easily follow and understand the content. Written

guidelines have been found as an effective way to improve patients' knowledge (Melchior, Carter, Helsey, Ernest, & Friesner, 2010).

Self-reinforcement was done by setting the weekly goals and action plans. Setting the goals and action plan was also shown effective in changing the dietary behaviors of the samples. People who set explicit goals are more likely to focus their efforts on goal directed activities (Brown, Bartholomew, & Naik, 2007). During the implementation of the program, the researcher informed them how to use the weekly goal-setting form. The goal setting form helped them to ensure that they did what they had planned before. If they have problem in filling it in, they will ask their group leader or group mates.

Application of group process. Group format has been proven as a cohesive and productive environment for the collaboration on the common goals (Hajek et al., 2010). In the present study, all samples had the same ultimate goal which was to have better dietary behaviors in order to manage their hypertension disease. This study incorporated the group process in enhancing self-management. The members of the groups knew each other since they lived in the same neighborhood. During the program, the majority of the samples were active in taking part in each session, they were not reluctant to share their experiences and to give feedback in front of other group members. There was also no conflict in selecting the leader for the program. All group members gave solutions to other group members who had difficulty in managing their diet. Group cohesiveness is important to help reach effective treatment since it can predict the successfulness of the session and group participation (Marshal & Burton, 2010). Groups are more effective when the

members get to know each other, share information about experiences, give feedback, and see each other similarly (Wilkens & London, 2006).

Health care providers are one element that is also important in the group process. The motivated health care providers have been proven to provide benefit for the groups. The health providers' role is to motivate the group, provide guidance for groups, and help the group members to reflect on what they had learnt (Wilkens, et al., 2006). It can be concluded that the group process in the present study created a positive environment so that the members had better dietary behaviors after the study was completed as shown by the higher dietary behaviors score at the post-test.

Motivation of the samples. In the present study, the community dwellers in each village who suffered from hypertension were invited to attend the group-based dietary self-management program. The samples of the experimental group were those who were willing to attend the program offered, while the rest were included in the control group. The result showed that after attending the program, the experimental group had better dietary behaviors than that of the control group. The patient self-selected to be the sample of the study may have been more motivated than others (Dongbo, et al., 2003). By using this sampling procedure it was possible to have selection bias because in the community setting it is difficult to do random assignment. Nursing research mostly takes place in a real-life setting, where it is difficult to provide treatment randomly to some people but not to others (Polit & Beck, 2008).

Since the experimental group and the control group were from the same villages, the issue of diffusion between the groups should be taken into

consideration as well (Cook & Campbell, 1979). Although the samples in the experimental group had been informed earlier not to give any information about the content of the program, it was possible that they did it unintentionally. However, based on the statistical result, it was shown that there were no statistical differences between the pre- and the post-test score of the dietary behaviors score in the control group. In addition, maturation threat is an important issue that may occur in this study and many other nursing studies. The increasing score of dietary behavior may be due to the samples' self-learning. However, the employment of the two groups and the pre- and post-test design helps to decrease this threat (Polit & Beck, 2008).

Interaction between the researcher and the samples. The good interaction between the researcher as the facilitator with the samples may also have contributed to the positive change of the study outcome. In relation to the self-management process, it has been suggested that to reach the ultimate achievement, engagement and support from the health care providers should be built up (Coster & Norman, 2008). In the implementation of group-based dietary self-management in the present study, the researcher played a significant role as the facilitator for the samples when they shared and reflected on their current dietary behaviors, and set the weekly goals and action plans. Besides, the researcher also provided an education session for the groups. In the previous study, it was found that education delivered by a professional was often showed to have higher benefits for the patients (Coster et al., 2008).

During the program, the researcher built two-way communication with the samples. The researcher also used the local language that was more familiar for the samples. The samples were not reluctant to voice their opinions and questions by

using the local language. They had been informed earlier that they had the right to ask and give any comments during the program. Fortunately, most of the samples showed their interest by asking and giving many comments during the sessions. This is congruent with the study in the United States, Canada, and the United Kingdom where the self-management program was successful when the communication between the health care providers and the samples was better (Dongbo, et al., 2003).

However, the interaction and communication between the researcher and the samples can also be a threat, which is called experimenter bias, where the researcher's expectation may influence samples' responses toward the outcomes (Cook & Campbell, 1979). To avoid this, the researcher tried to strictly follow the program guideline that had been prepared earlier and did not build any emotional relationships with the samples during the program.

In conclusion, it can be seen that group-based dietary self-management effectively improved the dietary behaviors of the targeted samples. The results indicated that this program is feasible and suitable to be implemented in the community setting. It can be done by health providers who are responsible for the community. All of the samples in the experimental group reported their satisfaction towards the lesson learnt during the program, and they also felt good about their own bodies during the 4 weeks following the dietary behavior guidance. Therefore, the implementation of a group-based dietary self-management program for community dwellers with hypertension is recommended.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Conclusion

The purpose of the study was to examine the effects of a group-based dietary self-management program on dietary behaviors of female community dwellers with hypertension in Indonesia. The design of the study is a quasi-experimental study using two-group, pre-post-test design. The study was conducted in Darussalam sub-district, Aceh Besar District of Aceh Province. Eighty eight samples with hypertension who met the inclusion criteria were recruited for the study. The samples were divided into two groups; the experimental group and control group. The samples in the experimental group received group-based dietary self-management for four weeks, while the control group only received the handbook of dietary management for hypertension after the post-test was done.

For the samples of the experimental group, the baseline data was collected before implementing the program. Every sample was asked to sign a written informed consent form or to give verbal consent to ascertain their willingness to be the sample in this study. They were then asked to fill out the demographic and health-related questionnaire followed by the Dietary Behaviors for Hypertension Questionnaire (DBHQ). The Dietary Behaviors for Hypertension Questionnaire (DBHQ) has been validated by three experts and tested for its reliability using Cronbach's alpha coefficient with 20 samples prior to the data collection. The Cronbach's alpha coefficient of this instrument was 0.74.

The demographic and health-related characteristics were presented in terms of frequency, percentage, mean, and standard deviation. To check the equivalent of the demographic and health-related characteristics between the two groups, the Chi-square and continuity correction tests were used. A paired t-test was used to measure the significance of the differences of dietary behaviors within the groups. An Independent t-test and one-way ANCOVA were used to measure the significance of the difference of dietary behaviors between the experimental and control groups.

The study findings revealed three main results. *First*, the demographic and health-related characteristics between the experimental and control groups were not significantly different ($p > 0.05$). *Second,* the total mean score of dietary behaviors of the experimental group was statistically higher after attending the program ($p < 0.05$). *Lastly*, at the end of the study, the samples of the experimental group had significantly better dietary behaviors than that of the control group ($p < 0.05$). The experimental group received a group-based dietary self-management program that offered sharing of and reflecting on individual current dietary behaviors, an educational session for the groups, individuals' comparison of behaviors, a reflection of obstacles, and goal setting and action plan. According to the findings, it is evident this program is effective in improving the dietary behaviors of female community dwellers with hypertension.

Strengths and Limitations

Similar to most studies, this study has its strengths and limitations. The strengths included the study design, group-based program, and the duration of the

program. First, this study used a quasi-experimental design that makes it possible to be implemented in the real setting including the community setting. Moreover, the study was driven by theory (theory-based by using self-management and group concepts) which has a strong foundation to be applied. Second, the group-based program can make this program efficient in terms of time and cost, because health providers can treat more than one person at the same time. Third, the short duration of the program which was only 4 weeks showed a significant positive result to the study outcome. It means that this program does not require a long time to show significant effects of the dietary behaviors of the people in a community. Thus, it is suitable and recommended to be applied in real practice.

The limitations of this study included the sampling procedure, the issue of diffusion and maturation, female-only samples, and the non-blind technique of data collection. The sampling procedure of this study was not random in that the samples who were willing to attend the program were included into the experimental group, while the rest were included into the control group. This sampling procedure made it possible to have selection bias. Moreover, although the post-test score of the experimental group was significantly higher than that of the control group, the issue of diffusion between the groups still possibly occurred in this study. This is due to both the experimental and control groups were from the same villages which made it possible for them to share their knowledge unintentionally. As many nursing research studies, maturation also possibly occurred in this study due to the samples' self-learning. Another issue was the generalizability of the study since all samples were female community dwellers. It means that there is a possibility that the program may not have the same effects on male samples. Hence, the effects of the study on the male

community dwellers should be examined in the future. The data collection of this study was done by research assistants. There was no blind technique applied, so that the research assistants knew which samples were in the experimental group and which samples were in the control group. It may also lead to the bias of this study.

Implications and Recommendations

The positive findings of this group-based dietary self-management program leads to several recommendations for nursing practice and nursing research.

Nursing practice. This program is recommended for community nurses to implement it. The findings revealed that the dietary behaviors can be improved by applying the concept of self-management where patients are allowed to monitor their behaviors, evaluate their behaviors to the standards, and reinforce themselves by setting the goals and action plan. Nurses can implement the program guidelines of this study as the protocol in applying the group-based dietary self-management process, and conduct each step by considering their role as the facilitator, providing supportive material such as a handbook, and covering all content of dietary behavior for hypertension during the program.

Nursing research. Further research should be conducted to test the feasibility and effectiveness of this program in different settings such as hospitals, clinics, and communities in different areas or regions and with a different gender (male). Since the outcomes of this study were measured in short-term periods (4 weeks), the effects of long periods also need to be investigated. It will be better if a true experiment (Randomized Controlled Trial/ RCT) can be conducted instead of a quasi-experimental study to make it more rigorous and to avoid possible threats.

Furthermore, the health outcomes of this program such as blood pressure levels and

BMI also need to be studied.

REFERENCES

Albarran, N.B., Ballesteros, M.N., Morales, G.G., & Ortega, M.I. (2006). Dietary behavior and type 2 diabetes care, *Patient Education and Counseling, 61,* 191-199.

Al-Zaharani, M. S. (2009). Prehypertension and undiagnosed hypertension in a sampe of dental school female patients. *International Journal of Dental Hygiene, 9,* 74-78.

American Heart Association (2011). *Cigarette smoking and cardiovascular diseases.* Retrieved on May 14, 2011 from http://www.americanheart.org/presenter.jhtml?identifier=4545

Badan Penelitian dan Pengembangan Kesehatan Departemen Kesehatan RI. (2008). *Riset Kesehatan Dasar 2007.* Retrieved on April 4th from http://www.k4health.org/system/files/laporanNasional%20Riskesdas%202007.pdf

Bastiaens, H., Sunaert, P., Wens, J., Sabbe, B., Jenkins, L., Nobels, F., et al. (2009). Supporting diabetes self-management in primary care: Pilot-study of a group-based programme focusing on diet and exercise. *Primary Care Diabetes, 3,* 103-109.

Beydoun, M.A., & Wang, Y. (2008). Do nutrition knowledge and beliefs modify the association of socio-economic factors and diet quality among US adults? *Preventive Medicine, 46*, 145–153.

Bodenheimer, T., Lorig, K., Holma, H., & Grumbach, K. (2002). Patients self-management of chronic disease in primary care. *The Journal of the American Medical Association, 288*, 2469-2475.

Bosworth, H.B., Olsen, M.K., Grubber, J.M., Neary, A.M., Orr, M.M., Powers, B.J, et al. (2009). Two Self-management Interventions to Improve Hypertension Control: A Randomized Trial. *Annals of Internal Medicine, 151* (10): 687-695.

Brookes, L. (2005). The definition and consequences of hypertension are evolving: new definition/classification of hypertension proposed by American Society of Hypertension. *Medscape Cardiology, 9*(1).

Brown, C., Godsey, C., Foody, J., & Lambert. (2010). All About Blood Pressure Medication. Retrieved on May 13, 2011 from http://www.bettermedicine.com/article/all-about-blood-pressure-medication

Brown, V. A., Bartholomew, L. K., & Naik, A. D. (2007). Management of chronic hypertension in older men: An exploration of patient goal setting. *Patient Education and Counseling, 60,* 93-99.

Chang, L., McAlister, A.L., Taylor, W.C., & Chan, W. (2003). Behavioral change for blood pressure control among urban and rural adults in Taiwan. *Health Promotion International, 18* (3), 219-228.

Chobanian, A.V., Bakris, G.L., Black, H.r., Cushman, W.C., Green, L.A., Izzo, J.L., et al. (2003). Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. *American Heart Association, 42,* 1206-1252.

91

Chockalingam, A., Campbell, N.R., Fodor, J.G. (2006). Worldwide epidemic of hypertension. *The Canadian Journal of Cardiology, 22*(7), 553-555.

Committee on Public Health Priorities to Reduce and Control Hypertension. (2010). *A population-based policy and systems change approach to prevent and control hypertension*, Washington, DC: The National Academies Press.

Connell, P., Wolfe, C., McKevltt, C. (2008). Preventing stroke: A narrative review of community interventions for improving hypertension control in black adults. *Health and Social Care in the Community, 16*(2), 165–187.

Cook, T. (2001). Group treatment of female urinary incontinence. *Physiotherapy, 87*(5), 226-234.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for filed setting.* Boston, MA: Houghton Mifflin Company.

Coster, S. & Norman, I. (2008). Cochrane reviews of educational and self-management interventions to guide nursing practice: A review. *International Journal of Nursing Studies, 46*, 508-528.

Creer, T.L. (2000). Self-management of chronic illness. In M. Boekaerts, P.R. Pintrich, & M. Zeidner. *Handbook of Self-Regulation.* (pp. 601-629). San Diego: Academic Press.

Cunningham, C.E. (2011). *Countries and their cultures: Indonesia.* Retrieved on June 22, 2011 from http://www.everyculture.com/Ge-It/Indonesia.html

Djuwita, R., Purwantyastuti, & Kamso, S. (2003). Nutrient intake pattern of a Minangkabau ethnic group. *Makara Kesehatan, 7*(1), 7-11.

Dongbo, F., Hua, F., McGowan, P., Yi-e, S., Lizhen, Z., Huiqin, Y., et al. (2003). Implementation and quantitative evaluation of chronic disease self-management programme in Shanghai, China: Randomized controlled trial. *Bulletin of World Health Organization, 81,* 174-182.

Drevenhorn, E., Kjellgre, K. I., & Bengston, A. (2005). Outcomes following a program for lifestyle changes with people with hypertension. *Journal of Nursing& Healthcare of Chronic Illness, 16*, 144–151.

Embassy of Indonesia. (2005). *Republic of Indonesia.* Culture Grams World Edition.

Embrey, N. (2006). A concept analysis of self-management in long-term condition. *British Journal of Neuroscience Nursing, 2* (10), 507-513.

Fan, L. & Sidani, S. (2009). Effectiveness of diabetes self-management education intervention elements: A meta-analysis. *Canadian Journal of Diabetes, 33*(1), 18-26.

Fanaian, M., Laws, R.A., Passey, M., McKenzie, S., Wan, Q., Davies, G.P., et al. (2010). Health improvement and prevention study (HIPS)-evaluation of an intervention to prevent vascular disease in general practice. *Bio Medical Central Family Practice, 11* (57): 2-10.

Ferreira-Sae, M.C, Gallani, M.C, Nadruz, W., Rodrigues, R.C.M , Franchini, K.G., Cabral, P. C., et al. (2009). Reliability and validity of a semi-quantitative FFQ for sodium intake in low-income and low-literacy Brazilian hypertensive subjects. *Public Health Nutrition: 12*(11): 2168–2173.

Food in every country. (2011). *Indonesia.* Retrieved on June 21, 2011 from
http://www.foodbycountry.com/Germany-to-Japan/Indonesia.html

Freedman, M.R. (2010). Gender, Residence and Ethnicity Affect Freshman BMI and
Dietary Habits. *American Journal of Health Behavior, 34*(5), 513-524.

Gallant. M.P. (2003). The influence of social support on chronic illness self-
management: a review and directions for research. *Health Education
Behavior, 30*(2), 170-195.

Glynn, L., Emmet, P., Rogers, I., & ALSPAC study team. (2005). Food and nutrient
intakes of a population sample of 7-year-old children in the south-west of
England in 1999/2000 – what difference does gender make*? Journal of
Human Nutrition & Diatetics, 18*, 7-19.

Gruber, K.J. (2008). Social Support for Exercose and dietary habits among college
students. *Adolescence, 43* (171), 557-575.

Hajek, P., Humphrey, K., & McRobbie, H. (2010). Using group support to
complement a task-based weight management programme in multi-ethnic
localities of high deprivation. *Patient Education and Counseling, 80,* 135-137.

Hall, P.A., Rodin, G.M., Vallis, T.M. & Perkin, B.A. (2009). The consequences of
anxious temperament for disease detection, self-management behavior, and
quality of life in Type 2 diabetes mellitus. *Journal of Psychosomatic
Research, 67*, 297–305.

Healthy Life Journal. (2010*). Beware of Attack hypertension.* Retrieved on July 16,
2010 from http://www.toxicinfo.org/disease/beware-of-attack-
hypertension.html

Heller, M. (2001). *The DASH diet eating plan.* Retrieved on May 14th, 2011 from
http://dashdiet.org/

Huerta, J.M., Tormo, M.J., Gavrila, D., & Navarro, C. (2010). Cardiovascular risk
estimated after 13 years of follow-up in a low-incidence Mediterranean region
with high-prevalence of cardiovascular risk factors. *BMC Public Health, 10*:1-
10*.

Iyer, A. S., Ahmed, M.I., Filippatos, G.S., Ekundayo, O. J., Aban, I. B., Love, T. E.,
et al. (2010). Uncontrolled hypertension and increased risk for incident heart

failure in older adults with hypertension: findings from a propensity-matched prospective population study. *Journal of the American Society of Hypertension 4* (1), 22-31.

Kanfer, F.H.& Gaelick-Buys, L. (1991). Self-management methods. In F.H. Kanfer & A.P. Goldstein (Eds). *Helping people change: A textbook of methods* (4th ed. pp. 305-359)*.* New York*:* Pergamon Press.

Karlsen, B., Idsoe, T., Dirdal, I., Hanestad, B.R., & Bru, E. (2004). Effects of a group-based counseling programme on diabetes-related stress, coping, psychological well-being and metabolic control in adults with type 1 or type 2 diabetes. *Patient Education and Counseling,53,* 299-308.

Kelsey, K.S., Kirkley, B.G., DeVellis, R.F., Earp, J.A., Ammerman, A.S., Keyserling, T.C., et al. (1996). Social support as a predictor of dietary change in a low-income population. *Health Education Research, 11*(3), 383-395.

Kendall, E., Catalano, T., Kuipers, P., Posner, N., Buys, N., & Charker, J. (2007). Recovery following stroke: The role of self-management education. *Social Science and Medicine, 64*: 735-746.

Lee, J., E., Han, H.R., Song, H., Kim, J., Kim, K.B., Ryu, J.P., et al. (2010). Correlates of self-care behaviors for managing hypertension among Korean Americans: A questionnaire survey. *International Journal of Nursing Studies, 47*, 411–417.

Lofvenmark, C., Karlsson, M.R., Edner, M., Billing, E., & Mattiasson, A.C. (2010). A group-based multi-professional education programme for family members of patients with chronic heart failure: Effects on knowledge and patients' health care utilization. *Patient Education and Counseling, xxx,* xxx-xxx.

Lorig, K. R., & Holman, H. R. (2003). Self-management education: History, definition, outcomes, and mechanism. *Annals Behavioral Medicine, 26*(1), 1-7.

Marshall, W. L., &Burton, D.L. (2010). The importance of group process in offender treatment. *Aggression and Violent Behavior, 15*, 141-149.

Matlock, M.S., Bosworth, H.B., Giger, J.N., Strickland, O.L., Harrison, R.V., Coverson, D, et al. (2009). Strategis for implementing and sustaining

therapeutic lifestyle changes as part of hypertension management in African American. *Postgraduate Medicine, 121* (3): 147-159.

Mayoclinic staff. (2011). *High blood pressure dangers: Hypertension's effects on your body.* Retrieved on May 13th, 2011 from http://www.mayoclinic.com/health/high-blood-pressure/HI00062

McBurney, D. H., & White, T. L. (2009) *Research Methods* (8th ed.). Belmont, Chicago: Wadsworth Cengange Learning.

McCloskey, J., & Flenniken, D. (2010). Overcoming cultural barriers to diabetes control: a qualitative study of Southwestern New Mexico Hispanics. Journal of Cultural Diversity, 17(3), 110-115.

Melchior, L., Carter, B., Helsley, A., Ernest, J. C., & Friesner, D. (2010). The diabetes disease state management exemplar. *Nursing Econimics, 28*(1), 7-17.

Moore, T.J., Alsabeeh, N., Apovian, C.M., Murphy, M., Coffman, G.A., Cullum-Dugan, D., et.al. (2008). Weight, blood pressure, and dietary benefits after 12 months of a web-based nutrition education program (dash for health): longitudinal observational study. *Journal of Medical Internet Research, 10(4), e52.*

National Heart, Lung, and Blood Institute. (2011). Your Guide to lowering your blood pressure with DASH. *National Institutes of Health,* 1-56.

Neutel, C. I., & Campbell, N. R. C. (2007). Antihypertensive medication use by by recently diagnosed hypertensive Canadians. *Canadian Journal of Cardiology, 23,*561-565.

Nilsson, B.B., Westheim, A., & Risberg, M.A. (2008). Long-term effects of a group-based high-intensity aerobic interval-training program in patients with chronic heart failure. *The American Journal of Cardiology, 102*, 1220 –1224.

Nkosi, N.G., & Wright, S.C.D. (2010). Knowledge related to nutrition and hypertension management practices of adults in Ga-Rankuwa day clinics. *Curationis, 33* (2), 33-40.

Pang, M.Y., Harris, J.E., & Eng, J. (2006). A Community-based upper-extremity group exercise program improves motor function and performance of functional activities in chronic stroke: a randomized controlled trial. *American*

Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation, 87, 1-9.

Pareles, L., Lockyer, J., & Fidler, H. (2002). Permanent small groups: Group dynamics, learning, and change. *The Journal of Continuing Education in the Heatlh Professions, 22,* 205-213.

Park, Y.H., Song, M., Cho, B., Lim, J., Song, W. & Kim, S. (2010). The effects of an integrated health education and exercise program in community-dwelling older adults with hypertension: A randomized controlled trial. *Patient Education and Counseling, xxx, xxx-xxx.*

Payette, H., & Shatenstein, B. (2008). Determinants of healthy eating in community-dwelling elderly people. *Canadian Journal of Public Health, 96* (supplement 3), S27-S31.

Pemerintah Daerah Kabupaten Aceh Besar. (2007). *Kecamatan.* Retrieved on June 24th, 2011 from www.acehbesarkab.go.id

Perez-Lopez, F.R., Chedraui, P., Haya, J., & Cuadros, J.L. (2009). Effects of the Mediterranean diet on longevity and age-related morbid conditions. *Maturitas, 64,* 67-79.

Pettman, T.L., Buckley, J.D., Misan, G.M.H., Coates, A.M., & Howe, P.R.C. (2009). Health benefits of a 4-month group-based diet and lifestyle modification program for individuals with metabolic syndrome. *Obesity Research & Clinical Practice, 3,* 221-235.

Poliklinik Gizi RSUD Kota Yogyakarta (1992). *Food exchange list.* Direktorat Rumah Sakit Khusus dan Swasta Departemen kesehatan RI.

Polit, D. F., & Beck, C. T. (2008). *Nursing Research: Generating and assesing evidence for nursing practice (*8th ed.). Philadelphia; Lippincot Williams & Wilkins.

Ponzo, M.G., Gucciardi, E., Weiland, M., Masi, R., Lee, R., & Grace, S.L. (2006). Gender, ethnocultural, and psychosocial barriers to diabetes self-management in Italian women and men with type 2 diabetes. *Behavioral Medicine, 31,* 153-160.

Razzaque, A., Nahar, L., Minh, H.V., Ng, N., Juvekar, S., Ashraf, A., et al. (2009). Social factors and overweight: evidence from nine Asian INDEPTH Network sites. *Global Health Action,* 54-59.

Ryan, P., & Sawin, K.J. (2009). The Individual and Family Self-Management Theory: Background and perspectives on context, process, and outcomes. *Nursing outlook, 57,* 217-225.

Sacova, M., & Miller, C. (2001). Food Selection and Eating Patterns: Themes Found among People with Type 2 Diabetes Mellitus. *Journal of Nutrition Education, 33* (4), 224-233.

Saelens, B.E., Gehrman, C.A., Sallis, J.F., Calfas, K.J., Sarkin, J.A. & Caparosa, S. (2000). Use of self-management strategies in a 2-year cognitive-behavioral intervention to promote physical activity. *Behavior Therapy, 31*: 365-379.

Savica, V. Bellinghieri, G., & Kopple, J.D. (2010). The effect of nutrition on blood pressure. *Annual Review of Nutrition, 30,* 365-401.

Scheurs, K.M.G., Colland, V.T., Kuijer,R.G., Ridder, D.T.D. & Elderen, T. (2003). Development, content, and process evaluation of a short self-management intervention in patients withchronic diseases requiring self-care behaviours. *Patient Education and Counseling, 55:*133-141.

Siu, A.M.H., Chan, C.C.H., Poon, P.K.K, Chui, D.Y.Y.& Chan, S.C.C. (2007). Evaluation of the chronic disease self-management program in a Chinese population, *Patient Education and Counseling. 65*: 42–50.

Sol, B.G.M., Bijl, J.J., Banga, J.D., & Visseren, F.L.J. (2005). Vascular risk management through nurse-led self-management program, *Journal of Vascular Nursing, 23*(1): 20-24.

Sood, N., Reinhart, K.M., & Baker, W.L. (2007). Combination therapy for the management of hypertension: A review of the evidence. *American Journal of Health-System Pharmacy, 67*: 885-892.

Sun, Z., Zheng, L., Xu, C., Li, J., Zhang, X., Liu, S., et al. (2008). Prevalenece of prehypertension, hypertension, and associated risk factors in Mongolian and Han Chinese population in Northeast China. *International Journal of Cardiology, 128,* 250-254.

Swerisson, H., Belfrage, J., Weeks, A., Jordan, L., Walker, C., Furler, J., et al. (2006). A randomised control trial of a self-management program for people with a chronic illness from Vietnamese, Chinese, Italian and Greek backgrounds. *Patient Education and Counseling 64*: 360–368.

Varekamp, I., Heutink, A., Landman, S., Koning, C.E.M., Vries, G., & Dijk, F.J.H. (2009). Facilitating empowerment in employees with chronic disease: qualitative analysis of the process of change. *Journal of Occupational Rehabilitation, 19*, 398–40.

Wang, C. & Abbot, L.J. (2001). Development of a community based diabetes and hypertension preventive program. *Public Health Nursing 15*(6): 406-414.

Warsi, A., Wang, P.S., LaValley, M.P., Avorn, J., & Solomon, D.H. (2004). Self-management education program in chronic disease. *American Medical Association, 164*: 1641-1649.

Wen, L.K., Parchman, M.L., & Shepherd, M.D. (2004). Family support and diet barriers among older Hispanic adults with type 2 diabetes. *Clinical Research and Methods, 36*(6), 423-430.

Wilkens, R. & London, M. (2006). Relationship between climate, process, and performance in continuous quality improvement group. *Journal of Vacational Behavior, 69,* 510-523.

Xue, F., Yao, W., & Lewin, R.J. (2008). A randomised trial of a 5 week, manual based, self-management programme for hypertension delivered in a cardiac patient club in Shanghai. *BMC Cardiovascular Disorder, 8* (10): 1-11.

Yong, H. H., Hamann, S. L., Borland, R., Fong, G. T., & Omar, M. (2009). Adult smokers' perception of the role of religion and religious leadership on smoking and association with quitting: A comparison between Thai Buddhists and Malaysian Muslims. *Social Science & Medicine, 9,* 1025-1031.

Zhang, A. Y., Tsui, A. S., & Wang, D. X. (2011). Leadership and group creativity in Chinese organizations: The role of group process. *The Leadership Quarterly, xxx,* xxx-xxx.

APPENDICES

APPENDIX A

Informed Consent

RESEARCH INFORMATION SHEET

My name is Arfiza Ridwan. I am a lecturer at School of Nursing, Faculty of Medicine, Syiah Kuala University, Indonesia who is doing my Master Degree of Nursing at Faculty of Nursing, Prince of Songkla University, Thailand. I am conducting a research study entitled "Effects of Group-based dietary self-management Program on Dietary Behaviors of Community Dwellers with Hypertension in Indonesia". This is conducted to fulfill the requirement of my study in Thailand.

This study and its procedures have been approved by the Institutional Review Board (IRB) of Prince of Songkla University, Thailand and also have been granted permission by the head of Sub-District of Darussalam Indonesia. You are asked to participate in this research project. Because you are diagnosed with hypertension, not paralyzed, and able to communicate, you are invited to participate in this study. Your participation will be beneficial to improve self-management dietary behaviors of persons with hypertension like you in the future.

If you decide to participate in this study voluntarily, I will initiate the following procedure:

a. You will be assigned to either intervention group who will receive the group-based dietary self-management program or the control group who will receive a booklet of dietary behavior for hypertension in the end of program.

b. If you are in the intervention group, you will be invited to a meeting that you and other samples will assigned into small groups that consists of 8-9 persons. In the meeting, you and your group mates will be given group-based dietary self-management program on dietary behaviors of hypertension. I will make follow up in the fourth week to assist you in assessing your progress during the program.

c. If you are in the control group, you will be given a booklet of dietary behavior for hypertension to help you to understand the healthy eating behavior for hypertension at the end of program. You can ask me any question about the content of the booklet if you want.

d. Evaluation and forms

1. You will be asked to fill up the forms about your personal and health-related information (demographic data questionnaire). This would take time around 5 minutes.

2. You also will be asked to fill the form of dietary behaviors for hypertension questionnaire to measure your dietary behaviors before and after completion of the program (two times). This questionnaire will take another 10 minutes.

Risks and Comfort

There are no foreseeable risks or harm to you to join this study. There is no payment to participate in this study.

Benefits

The result of this study can be used as a protocol for nurses and other health care professionals to provide group-based dietary self-management program on dietary behaviors for hypertension persons in order to improve better dietary behaviors, thereby it will give benefit for your overall quality of life. The data from this research will be used to write a research paper. It also will provide useful information for future research related to this area.

Confidentiality

All information and your responses in this study will remain confidential. Only the researcher and the research advisors are eligible to access the data. Neither your name

nor identifying personal information will be used in the report of the study. Further, the data on the report will be presented as a group rather than individual.

Participation and Withdrawal from Participation

Your participation in this study is voluntary. Signing the informed consent or agreeing verbally to participate and returning the form given indicate that you understand what is involved and you consent to participate in this study project. In any time of this study, you have right to withdraw from participation. No penalty will be incurred if you decide to withdraw and no any influence to your medical service or medical treatment.

If you have any question, suggestion or cannot participate in this study, you can directly contact the researcher (me) at mobile phone (+6283189356000). Lastly, if you agree to participate in this research study, please kindly sign your name on the consent form or verbally state your agreement to participate in the study.

Thank you for your cooperation

(Arfiza Ridwan)
Researcher

RESEARCH INFORMATION SHEET: GROUP-BASED DIETARY SELF-MANAGEMENT PROGRAM (FOR INTERVENTION GROUP)

If you are in the intervention group of group-based dietary self-management program, I will initiate the following procedures:

1. At the beginning, you will be asked to fill the forms of the demographic data questionnaire and dietary behavior for hypertension questionnaire. It may take time about 15 minutes. You will be also measured your blood pressure. The research assistant will help you to complete these two forms.

2. After completing the questionnaire, you will be asked to assign yourself into groups that consist of 8-12 persons in each group.

3. In the first group meeting, you will receive a set of intervention that consists of:

   a. Sharing and reflection of individual existing dietary behavior

   b. Educational session

   c. Individual comparison of behavior and reflection of obstacles

   d. Individual goal setting

4. You will receive a handbook about dietary behaviors for hypertension to facilitate your learning process. You will also receive a goal setting form that will be used to record your dietary behaviors during three weeks. The way to fill this form will be informed by the researcher.

5. In the second group meeting, you will be assisted to assess your progress during the previous weeks by using the goal setting form. Then you will be asked to fill the dietary behavior for hypertension questionnaire. The research assistant will help you to complete the form.

6. You have right to withdraw from the program without any penalty.

Risk and Comfort

There are no foreseeable risks or harm to you to join this study.

QUANTITATIVE STUDY INFORMED CONSENT FORM

Study Title : Effects of Group-Based Dietary Self-Management Program on Dietary Behaviors of Community Dwellers with Hypertension in Indonesia

Investigator : Arfiza Ridwan

         Master Candidate, Faculty of Nursing, Prince of Songkla University, Thailand

Patient's Name :_____Age:_____

Patient's Consent

I, _____, was informed of the details of the research entitled "Effects of Group-based Dietary Self-Management Program on Dietary Behaviors of Community Dwellers with Hypertension in Indonesia" and was ensured that all of information related to personal information, health history and research result will be kept confidential. If any further problem or issues arise, I can discuss them with the researcher. I have the right to withdraw from the research study at any time without any effect. I am willing to participate in this research study without any threat and force. Hereby, I endorse my signature.

Given by: _____ (Consenter)   Date:_____

Researcher's note

I had given the detailed information of the research entitled "Effects of Group-Based Dietary Self-Management Program on Dietary Behaviors of Community Dwellers with Hypertension in Indonesia." The signature and returning the form indicate that you understand what is involved and that you consent to participate in this study

voluntarily. You have been given an opportunity to ask question and were satisfied with the due answer.

Signature: _____ (Researcher)   Date:_____

APPENDIX B

GROUP-BASED DIETARY SELF-MANAGEMENT PROGRAM GUIDELINE

No	Time	Objective	Activities	Method/ Media	Duration	Action Researcher	Action Samples	Evaluation
1	Week 1 (for all samples)	1. All samples will actively form themselves into groups. 2. All samples will be allocated in groups that consisted of 8-9 persons. 3. Samples will select a group leader.	Group forming	Method: Discussion	30 minutes	1. Explain the samples the objective of group allocation. 1. Introduce the personal data. 2. Encourage the sample to select a group leader.	1. Actively participate in group forming. 2. Arrange the sitting position as the sample feel convenience.	1. All samples actively form themselves into groups. 2. All samples are allocated in groups that consisted of 8-12 persons.
		Sharing and reflection session: 1. All samples will be able to mention their current dietary	1. Sharing and reflection of individual existing dietary behaviors.	Method: Discussion Media: - Flipchart	30 minute	3. Ask the samples with an open-ended question to all participants: - "Can you tell us what have you done related to diet in	A. Group leader: - Distribute the small stickers for group members. - Write all answer from participant in	Sharing and reflection session: 1. Samples select a group leader. 2. All samples are able to mention their

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	**Samples**	
		behaviors and choose only the behaviors that they have done. 2. All samples will participate in patching the sticker to indicate which behaviors they have done currently.		- Marker - Stickers		managing hypertension?" 4. List all answers of the samples in a flipchart. 5. Ask each participant to patch the sticker (distributed by the leader) in the flipchart that indicated their current behaviors, it can be more than one answer. - "Please patch the stickers that have been distributed in the column that indicated the things that you have done. There is no correct or wrong answer, so you are free	the flipchart. - Facilitate all group members to actively participate. - Make a conclusion from the answer of the group members. B. Group members: - Answer the researcher's question by describing his/her current dietary behavior in managing hypertension. - Patch the sticker in the column that indicated their current dietary	current dietary behaviors and choose only the behaviors that they have done. 3. All samples participate in patching the sticker to indicate which behaviors they have done currently.

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	**Samples**	
						to answer it" 6. Ask the participant: - "Do you think what you have done is adequate? Why/why not?" 7. List the answer in the flipchart. 8. Encourage the group leader to conclude the answer of the participant based on the number of stickers that have been patched. 9. Encourage the participants who have done the good behaviors to share her experience and tips to each other.	behaviors".	

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	Samples	
		Educational session: 3. Seven of nine samples will be able to match the questions given with the answers correctly.	2. Educational session	Method: Lecture Discussion Media: Food models (artificial or real food) Handbook Goal setting form	30 minutes	Teaching plan (appendix C)	Teaching plan (appendix C)	Educational session: 4. Seven of nine samples can match the questions given with the answers correctly.
		Individual comparison session: 4. All samples will be able to mention the things they should improve in regard to dietary behaviors. 5. All samples will	3. Individual comparison of behavior and reflection of obstacles	Method: Discussion	20 minutes	1. Assist samples to compare the current dietary behaviors with the desired behavior as discussed in the educational session by asking: - So, after we know what we have done and know what should be done, what dietary	A. Group leader: - Write all answer from participant in the flipchart. - Facilitate all group members to actively share and give feedback during the group session. B. Group members 1. Answer the	Individual comparison session: 5. All samples can mention the things they should improve in regard to dietary behaviors. 6. All samples participate in patching the

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	**Samples**	
		participate in patching the sticker to indicate which behaviors they should improve.				behaviors that you think you need to improve? 2. List all answers of the samples in a flipchart. 3. Ask each participant to patch the sticker (distributed by the leader) in the flipchart that indicated their answer, it can be more than one answer. "Please patch the stickers that have been distributed in the column that indicated the things you want to improve. There is no correct or wrong answer, so you are free to answer it"	researcher question by describing his/her feeling about the discrepancies between what have done to the standard that have been taught. 2. Answer the researcher question about what dietary behaviors that they think that need to be improved.	sticker to indicate which behaviors they should improve.

No	Time	Objective	Activities	Method/ Media	Duration	Action Researcher	Action Samples	Evaluation
						4. Ask the participant: - "Do you think it is adequate? Why/why not?" 5. Add the things if the participants answer are incomplete. 6. List the answer in the flipchart. 7. Encourage the group leader to conclude the answer of the participant based on the number of stickers that have been patched.		
		Individual goal setting session: 6. All samples will be able to mention their weekly goal setting for the next following	4. Individual goal setting	Discussion	30 minutes	1. Explain how to operate the goal setting form in detail by demonstrate an example of goal setting. Then ask the voluntary sample to re-	A. Group leader: Facilitate all group members to actively share and give feedback during the group session. B. Group members: 1. Re-demonstrate an	Individual goal setting session: 7. All samples can mention their weekly goal setting for the next following week.

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	Samples	
		week. 7. All samples will be able to set the weekly goals and action plan by themselves in the following weeks.				demonstrate another example of goal setting. 2. Assist the samples to set the goals for a week by asking: - What are goals that you want to achieve for this upcoming week? - What are actions that you think are important to be performed to achieve your goals? 3. Inform the sample that they should do goal setting by themselves every week for the three upcoming weeks without any intervention from researcher. If they	example of goal setting by using goal setting form. 2. Mention the goals of dietary behavior that they willing to achieve during the up-coming week. 3. Set a goal for the upcoming week together with the actions and its frequency by using goal setting form. 4. Ask the researcher anything that they do not understand about goal setting.	8. All samples can set the weekly goals and action plan by themselves in the following weeks.

| No | Time | Objective | Activities | Method/ Media | Duration | Action | | Evaluation |
						Researcher	Samples	
						find something they do not understand during that time, they should ask help from the group leader and group mates. 4. Inform the samples that they can call researcher if there is something they cannot answer or solve by themselves. 5. Encourage the sample by motivate them and make them confidence to perform all planned goals.		
3.	Week 2, 3, and 4	1. All samples will be able to set the goal and action plan weekly.	Continue the goal setting and its implementation by the samples.	Media: Goal setting form	Every week during three weeks	1. Answer the question from the samples (if there is any call from the group leader or the samples)	A. Group leader: 1. Make sure that all sample can complete the goal setting form	1. The samples can set the goal and action plan weekly. 2. The group

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	Samples	
		2. The group leaders will be able to provide help and information when the group members meet any difficulties or problem during this period.					2. Help the members when they meet any difficulties or problems related to the goal setting form. 3. Call the researcher if the group members meet a problem that cannot be solved by themselves. B. Group leader and group members: 1. Actively monitor and record their goals in goal setting form. 2. Set the goal every one week and record in the goal setting	leaders can provide help and information when the group members meet any difficulties or problem during this period.

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	**Samples**	
							form.	
							3. Ask help or questions from the group leader and group mate if find some problem or unclear situation.	
							4. Call the researcher if they cannot find the answer or cannot solve any problem.	
4.	Week 4	Follow up session: 1. All samples will be able to reflect their behaviors during three weeks by using the goal setting form.	1. Follow up	Method: Discussion Media: Goal setting form	Depends on the needs of the samples	1. Assist patient to reflect their behaviors during three weeks by using the goal setting form, and ask question: - How do you feel during these three weeks? - Do you have	1. Reflect their behaviors during four weeks by using the goal setting form. 2. Answer the researcher question about their feeling, barriers, and their view about their own achievement. 3. Receive	Follow up session: 1. All samples can reflect their behaviors during three weeks by using the goal setting form. 2. All samples receive

No	Time	Objective	Activities	Method/ Media	Duration	Action		Evaluation
						Researcher	Samples	
		2. All samples will receive reinforcement and recommendation from researcher.				any barriers during implementing the planned action that you set? - How do you view your achievement regarding dietary behavior now? 2. Reinforce their achievements and give recommendation for the future.	reinforcement and recommendation from researcher	reinforcement and recommendation from researcher.

APPENDIX C

TEACHING PLAN FOR EDUCATIONAL SESSION

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	Sample	
1.	Introduction	The samples will be able to mention the objective of educational session.	"After knowing about your current dietary behaviors, now we will play some games in order to gather the information related to the standard of dietary for person with hypertension. It will help you to improve your knowledge about hypertension and help you to justify whether your current dietary behavior fits to the standard or not. You are free to get involved during this session by asking question, giving comments and opinion, sharing experiences, and clarifying unclear information. To make you remember about all information I will provide, in the end of this session I will distribute a handbook about dietary behavior for persons with hypertension. This session	Method: Lecture	1. Explains the importance of education session. 2. Answers the question from the samples	1. Pays attention 2. Provides comment 3. Clarifies the unclear information/ ask further explanation.	The samples can mention the objective of educational session.

| No | Topic | Objectives | Content | Method/ media | Activities | | Evaluation |
					Researcher	Sample	
			will take time about 30 minutes"				
2.	Hypertension overview	8. Seven of nine samples will be able to match the questions given with the answers correctly. 9. Seven of nine samples will be able to identify and note the organs/body parts that can be damaged by hypertension by using body map.	"The rule of the first game is: 1. You must answer six questions in the flipcharts. The questions between groups are the same. The question are: - What is hypertension? - What are the causes of hypertension? - What are the signs and symptoms of hypertension? - What are the complications if hypertension is not treated? - What are the ways to manage hypertension? 2. You can get the answer choices in the answer bank (provided by researcher). 3. Patch the answer below each question. 4. You can work together in your own group. 5. Group leader will lead this session.	Method: Games Media: - Flipcharts - Marker - Paper glue - Body map	1. Explain the rue of each game. 2. Let the participant know how to play the game and let the group leader know her role.	Group leader: - Make sure that all group members take part in the games. - Help the group member if they meet difficulty in the games. - Provide necessary media such as marker and glue. Group members: - Answering all question together in group by	1. Seven of nine samples can match the questions given with the answers correctly. 2. Seven of nine samples can identify and note the organs/body parts that can be damaged by

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	**Sample**	
			The rule of second game is: 1. I will provide a picture of human body called body map, so group members must show and note the organs/body parts that can be damaged by hypertension. 2. You can work together in your own group. 3. Group leader will lead this session. Now, let's start"			using the answer choices provided by the researcher in the answer bank. - Make a note in some body parts that they think can be damaged by hypertension (in body map)	hypertension by using body map.
3.	Dietary behaviors for person with hypertension	1. Seven of nine samples will be able to mention the important nutrients for lowering blood pressure 2. Seven of nine	Detail information about dietary behaviors for person with hypertension, invites sample participation by stimulating them by some question and leading the discussion. a) "Now, let start by sharing about how the diet for hypertension should be? You can share anything you know about it". "Diet for hypertension should high	Method: Discussion Media: - Food models (artificial or real foods)	1. Provides the information related to dietary behaviors of hypertension including recommended serving size and some tips	1. Pays attention 2. Provides feedback 3. Clarifies the unclear information/ ask further explanation.	1. Seven of nine samples can mention the important nutrients for lowering

No	Topic	Objectives	Content	Method/ media	Activities Researcher	Sample	Evaluation
		samples will be able to mention the effect of salt and fat for blood pressure. 3. All samples will able to show the recommended serving size of each food group by choosing the pictures that provided by researcher. 4. Seven of nine samples will be able to mention at list one tips/food group to	in potassium, magnesium, calcium, protein, fiber, and low in fat and salt. Potassium, magnesium, calcium, protein, and fiber can decrease blood pressure. Meanwhile, salt and fat can increase blood pressure." Information about the recommended serving size of each food group and the display the size of it so it will be easier for the sample to understand. b) "Here I display the serving size of each food group that is recommended for the person with hypertension" - Rice: 1 cup/meal time, or bread: 2 slices/meal time. One cup is same with a fist size, so you can measure it by your own hand. - Cooked vegetables: ½ cup/meal time, or raw vegetables: 1 cup/meal time. One cup is same with a fist size, so you can		to change gradually. 2. Answers the question from the samples.		blood pressure 2. Seven of nine samples can mention the effect of salt and fat for blood pressure. 3. All samples can show the recommended serving size of each food group by choosing the

| No | Topic | Objectives | Content | Method/ media | Activities | | Evaluation |
					Researcher	Sample	
		change dietary behaviors gradually.	measure it by your own hand. - 4-5 medium fruits/day, or 1 glass of fruit juice/day. A medium size is same with a tennis ball size. - 1 glass of fat-free milk/day, or 2 medium size tempe, 1 big size tahu, soymilk, or 1 cup of spinach/broccoli/sweet potato/day, or 1 medium tuna/day. - 1 medium piece of fish/poultry/meat /meal time, or 1 egg/day (no more than 4 eggs/week), or 2 cups of green bean porridge/week. - No more than 3 teaspoon of vegetable oil or margarine/day - No more than 5 tablespoon of sugar in a week - No more than 1 teaspoon of salt in a day."				pictures that provided by researcher. 4. Seven of nine samples can mention at list one tips/food group to change dietary behaviors gradually.

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	Sample	

			Providing some tips to change dietary behaviors gradually:
			c) "It is not easy to change dietary behavior, so it will be easy to be done gradually. Moreover, since this diet is high fiber, the immediate change can probably cause bloating and diarrhea. To avoid this problem, there are several ways to change your dietary behavior gradually:
			- Consuming the whole grain products:
			   i. Consume any product of grain in every meals every day
			   ii. Choose whole grain foods for most grain servings/ biggest serving size.
			- Consuming the protein sources
			   i. Make sure you have fish, poultry, or meats in every meal every day.				

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	Sample	
			ii. Increase servings of beans porridge.				
			- Increasing the consumption of vegetables and fruits:				
			i. Add a serving of vegetables at lunch one day and dinner the next day, and add fruit at one meal or as a snack.				
			ii. Use fruit as snack and dessert every day, the amount is about 4-6 medium fruit.				
			iii. Include two or more vegetarian-style each week				
			iv. If you don't eat fruit now or have juice only at breakfast, add a serving to your meals or have it as a snack.				
			v. Avoid the use of coconut oil in cooking the vegetables				

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	Sample	

			- Consuming the calcium sources
			  i. Increase your use of fat-free and low-fat milk products instead of sweet tea or coffee.
			- Reducing fats and oils
			  i. Try stir-frying dishes, which have less meat and more vegetables.
			  ii. Limit egg-yolk no more than 4 times a week
			  iii. Reduce the use of oil in cooking no more than 3 teaspoon a day
			  iv. Remove the skin from poultry before cooking.
			- Reducing salt and sodium
			  i. Reduce the use of salt in coking no more than 1 teaspoon a day
			  ii. Reduce the consumption of salted fish, salt ketchup, and other				

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	**Sample**	

			salted foods.
			 - Limiting the sweets and added sugar.
			   i. Reduce the sugar containing beverages such as syrup, lemonade, soda, etc.
			   ii. Reduce the sweet jelly, hard candy, fruit-flavored gelatin.
			   iii. Reduce the use of sugar in beverages such as tea and coffee."				

4.	Goal setting	1. The samples will be able to demonstrate how to use the goal setting form correctly.	In this part, researcher will inform the sample the importance of goal setting and how to use it. The goal setting form will be displayed in order to make the sample easier to understand the explanation. a) "Now, we already know how is the dietary behavior of person with hypertension should be. So, now I would like to introduce you a goal setting form. This form will help	Method: - Lecture - Demonstration Media: - Goal setting form	1. Explain the importance of goal setting. 2. Explain how to use the goal setting form. 3. Demonstrate how to use the goal setting form by using an example.	1. Pays attention 2. Provides feedback 3. Clarifies the unclear information/ ask further explanation.	1. The samples can demonstrate how to use the goal setting form correctly

No	Topic	Objectives	Content	Method/ media	Activities		Evaluation
					Researcher	Sample	
			you to monitor you dietary behaviors in order to manage your blood pressure. This form is useful and already tested in several studies" b) "Now, I will inform you how to use this form. First, you decide what goals you want to reach for a week. You can give mark for the goals you choose in column (1). The number of goals that you chose depends on your confidence. It is up to you. For the first week, you may start with few goals and it may increase in the next weeks. Second, you mark the action plan to reach the goals that you choose in column (2). The action plan is the ways to reach each goal. You can take all ways or several ways of the goals, it depends on your				

| No | Topic | Objectives | Content | Method/ media | Activities | | Evaluation |
					Researcher	Sample	
			confidence. Third, you decide how often you will perform the action within a week and write it in column (3). Fourth, in the end of each week, you mark which action you have performed and unmark the action you have not performed in column (4). Then, you mark the achievement grade in the column (5). Finally, if you meet any barriers during the process, you can write it in column (6) Is there any question? You can ask everything". Then, researcher demonstrates how to use the form by giving an example and ask one voluntary member to re-demonstrate it.				

HANDBOOK OF DIETARY BEHAVIORS FOR HYPERTENSION

BY:

ARFIZA RIDWAN

STUDENTS OF INTERNATIONAL MASTER NURSING PROGRAM OF PRINCE OF SONGKLA UNIVERSITY THAILAND

- Hypertension is a condition when the upper value of blood pressure is greater than 140 mmHg and the lower value is greater than 90mmHg based on two or more correct measurement of blood pressure.
- The cause of hypertension is imbalance diet (fat, salt, and sweet food), do not perform regular physical activity, stress, family history, kidney disease, smoking, and alcohol.
- The symptoms of hypertension are headache, dizziness, shortness of breath, and blurred vision.
- Hypertension can affect the function of brain, heart, vascular, eye, and kidney.
- If hypertension is not treated, it can cause stroke, kidney disease, heart attack, and heart failure.

- Hypertension can be managed with lifestyle modification, such as diet, weight reduction, physical activity, medication and regular check up, stop alcohol consumption, and quit smoking.

- Diet for hypertension should high in potassium, magnesium, calcium, protein, fiber, and low in fat and salt. Potassium, magnesium, calcium, protein, and fiber can decrease blood pressure. Meanwhile, salt and fat can increase blood pressure. To fulfill this, person with hypertension should consume foods from several food groups.

- Diet to hypertension person should be:
  1. Consuming the whole grain products
  2. Consuming the protein sources
  3. Increasing the consumption of vegetables and fruits
  4. Consuming the calcium sources
  5. Reducing fats and oils
  6. Reducing salt and sodium
  7. Limiting the sweets and added sugar

Serving size of food:

Grain

Rice: 1 cup/meal time   Bread: 2 slices/meal time
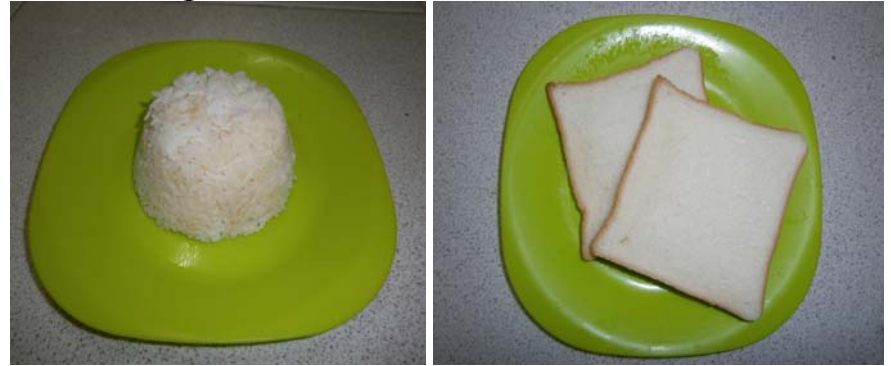
(1 Cup = 1 fist)

Vegetables (cooked or raw)

Cooked: ½ cup/meal time   Raw: 1 cup/meal time

(1 Cup = 1 fist)

Fruits

4-5 medium fruits/day or 1 glass of fruit juice/day
(medium= tennis ball size)

Tennis ball size:

Calcium source

1 glass of fat-free milk/day
2 medium tempe, or 1 big size tahu, soymilk
1 cup of spinach/broccoli/sweet potato/day

Protein

1 palm of fish/poultry/meat /meal time
1 egg/day (no more than 4 eggs/week)
2 fist of green bean porridge/week

1 Palm
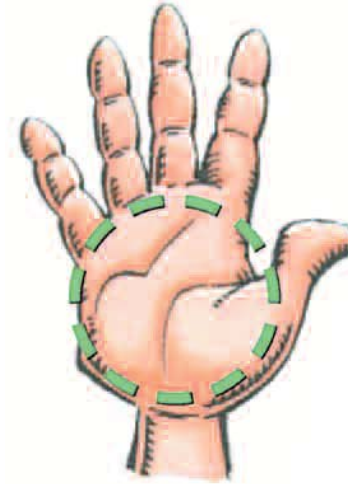
Fats and oil

No more than 3 teaspoon of vegetable oil or margarine/day

Sugar

No more than 5 tablespoon in a week

Salt

No more than 1 teaspoon in a day

It is not easy to change dietary behavior, so it will be easy to be done gradually. There are several tips to change your dietary behavior gradually:

1. Consuming the whole grain products:
   - Consume any product of grain in every meals every day
   - Choose whole grain foods for most grain servings/ biggest serving size.
2. Consuming the protein sources:
   - Make sure you have fish, poultry, or meats in every meal every day.
   - Increase servings of beans porridge 2 cups a week (porridge with no coconut milk)
3. Increasing the consumption of vegetables and fruits:
   - Add a serving of vegetables at lunch one day and dinner the next, and add fruit at one meal or as a snack.

- Use fruit as snack and dessert every day, the amount is about 4-6 medium fruit.
- If you don't eat fruit now or have juice only at breakfast, add a serving to your meals or have it as a snack.
- Avoid the use of coconut oil in cooking the vegetables

4. Consuming the calcium sources:
   - Increase your use of fat-free and low-fat milk products instead of sweet tea or coffee.
   - Increase the consumption spinach, soybean, turnip green, collard, broccoli, cowpeas, sweet potato, tuna, sardines, and trout instead of milk.

5. Reducing fats and oils:
   - Boil, roast, or poach the vegetables and fish/meat/poultry rather than fry it.
   - Try stir-frying dishes, which have less meat and more vegetables.
   - Limit egg-yolk no more than 4 times a week

- Reduce the use of oil in cooking no more than 3 tablespoon a day
- Remove the skin from poultry before cooking.

6. Reducing salt and sodium:
   - Use of salt in coking no more than 1 teaspoon a day.
   - Reduce the consumption of salted fish, salt ketchup, and other salted foods.

7. Limiting the sweet and added sugar:
   - Reduce the sugar containing beverages such as syrup, lemonade, soda, etc.
   - Reduce the sweet jelly, hard candy, fruit-flavored gelatin.
   - Reduce the use of sugar in beverages such as in tea and coffee.

GOAL SETTING FORM

Instruction: This form is used to monitor your goals within a week. You can choose any goals and action plans that you want freely based on your confidence.

- Please fill the square box by mark (√) in the column (1) and (2) which indicates your goals and the action plan.
- Please write how many times you want to perform the action within a week in column (3).
- Fill the square box by mark (√) in column (4) and (5) which indicates the actions you done, and its achievement.
- You may right any kinds of barrier in column (6).

You are free to answer yes or no because there is no correct and wrong answer. Please feel free to ask any unclear statement to the person who gives you this questionnaire.

Date:………………….to…………………………

Goal planned			Implementation and grade		Barriers
Goal **(1)**	**Action** **(2)**	**Frequency (in a week)** **(3)**	**Action done** **(4)**	**Achievement** **(5)**	**(6)**
☐ Consuming the whole grain products	☐ Consume any product of grain in every meal every day. The amount of grain is 3-4 cup cooked rice or 6-8 slices bread. ☐ Choose whole grain foods for most grain servings/ biggest serving size. ☐	☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	

Goal planned			Implementation and grade		Barriers
Goal **(1)**	**Action** **(2)**	**Frequency (in a week)** **(3)**	**Action done** **(4)**	**Achievement** **(5)**	**(6)**
☐ Consuming the protein sources	☐ Eat fish, poultry, or meats about 10 medium pieces every day. ☐ Increase servings of beans porridge 4-5 times a week. ☐		☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	
☐ Increasing the consumption of vegetables and fruits:	☐ Add a serving of vegetables at lunch one day and dinner the next. The amount of vegetable is 2-3 cup cut-up cooked vegetable or 4-5 cup of leafy vegetables per day. ☐ Use fruit as snack and dessert every day, the amount is about 4-6 medium fruit. ☐ If you don't eat fruit now or have juice only at breakfast, add ½ cup to your meals or have it as a snack. ☐ Avoid the use of coconut oil in cooking the vegetables. ☐		☐ ☐ ☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	

Goal planned			Implementation and grade		Barriers
Goal **(1)**	**Action** **(2)**	**Frequency (in a week)** **(3)**	**Action done** **(4)**	**Achievement** **(5)**	**(6)**
☐ Consuming the calcium sources	☐ Increase your use of fat-free and low-fat milk products instead of sweet tea or coffee. ☐ Consume other source of calcium, such as tuna, sardines, dark leafy greens (turnips, spinach, cabbage, and broccoli), dried beans, soybean, and sweet potato. ☐		☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	
☐ Reducing fats and oils	☐ Try stir-frying dishes, which have less meat and more vegetables. ☐ Limit egg-yolk no more than 4 times a week. ☐ Reduce the use of oil in cooking no more than 3 tablespoon a day. ☐ Remove the skin from poultry before cooking. ☐		☐ ☐ ☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	

Goal planned			Implementation and grade		Barriers
Goal (1)	Action (2)	Frequency (in a week) (3)	Action done (4)	Achievement (5)	(6)
☐ Reducing salt and sodium	☐ Reduce the use of salt in cooking no more than 1 teaspoon per day. ☐ Reduce the consumption of salted fish, salt ketchup, and other salted foods. ☐		☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	
☐ Limiting the sweets and added sugar.	☐ Reduce the sugar containing beverages such as syrup, lemonade, soda, etc. ☐ Reduce the sweet jelly, hard candy, fruit-flavored gelatin. ☐ Reduce the use of sugar in beverages such as tea and coffee no more than 5 tablespoon per week. ☐		☐ ☐ ☐ ☐	☐ Completely done ☐ Partially done ☐ Not done at all	

APPENDIX E

DEMOGRAPHIC DATA QUESTIONNAIRE

Instruction: This form aims to obtain information about your current demographic data and health information. Please fill in the blank and mark (√) in the column which indicates your data.

Demographic Data

1. Name   :

2. Age   :

3. Gender   : 1☐ Male   2☐ Female

4. Marital status   : 1☐ Single   2☐ Married   3☐ Widowed

5. Religion   : 1☐ Muslim 2☐ Christian 3☐ Catholic

    4☐ Buddhist 5☐ Hinduism

6. Ethnic   :

7. Educational level : 1☐ Never School   2☐ Elementary school

    3☐ Junior High School   4☐ High School

    5☐ Diploma   6☐ Bachelor

    7☐ Master   8☐ PhD

8. Occupation   :

9. Experience of attending educational program about dietary behavior for hypertension   : 1☐ No   2☐ Yes, please specify………………………...

10. Monthly income   :

11. Responsibility of preparing cook at home :

    1☐ Self   2☐ Family   3☐ Buying

12. Health insurance   : 1☐ No   2☐ Yes, please specify………………………...

13. Current smoking status: 1☐ No   2☐ Yes

Health information

14. Duration of having hypertension :   years

15. Current blood pressure   :   mmHg

16. Current medication   : ☐   Diuretics

☐   Beta blockers

☐   Ace inhibitors

☐   Angiotensin II receptor blockers

☐   Calcium channel blockers

☐   Alpha blockers

☐   Alpha-beta blockers

☐   Nervous system inhibitors

☐   Vasodilators

☐   Others:………………………..

17. Co-morbid disease   : 1.

2.

3.

APPENDIX F

DIETARY BEHAVIORS FOR HYPERTENSION QUESTIONNAIRE

Instruction: This form consists of statements about your dietary behavior in managing hypertension during one last months. Please fill the statements by mark (√) in the column which indicates your usual dietary behaviors. You are free to answer because there is no right or wrong answer. Please feel free to ask any unclear statement to the person who gives you this questionnaire.

Note:

- Never : Never perform it.
- Sometimes : Several times a month (1-2 times/month)
- Often : Repeat the activity for several times, but not as habit (3-4 times/week)
- Routinely : Continuously, regularly, and always perform the activity (5-7 times/week)

No.	Statement	Never (1)	Some times (2)	Often (3)	Routinely (4)
Consuming the grain products					
1	You consume any product of grain three times a day.				
2	You usually eat rice or noodle or bread as your heavy meal				
3	The serving size of the grain is: - 1 fist of rice, or - 1 fist of noodle, or - 2 slices of bread				

No.	Statement	Never (1)	Some times (2)	Often (3)	Routinely (4)
Consuming protein sources					
4	You eat fish/ lean meat/poultry in every meal time				
5	The size of fish/ lean meat/poultry is 1 palm size/meal time				
6	You usually boil, roast, or poach the fish/ lean meat /poultry				
7	You do not remove the skin from poultry before cooking it.				
8	You eat two cups of green bean porridge /week.				
Increasing the consumption of vegetables and fruits					
9	You eat a variety of vegetables in every meals within a day				
10	The serving size of vegetable is the smallest one compare to grains and fish.				
11	You usually cook the vegetables by using coconut milk or oil.				
12	You eat 4-6 medium fruits a day (medium = tennis ball size)				
Consuming the calcium sources					
13	You drink low-free fat milk/ soya bean milk				
14	You eat the unsalted small fish (ikan teri)				
15	You consume 2 medium size of tempe or 1 big size of tahu every day				

No.	Statement	Never (1)	Some times (2)	Often (3)	Routinely (4)
16	You consume 1 cup of spinach/broccoli/sweet potato				
Reducing fats and oils					
17	You limit the use of oils no more than 3 teaspoon a day				
18	You limit the use of margarine no more than 3 teaspoon a day				
19	You limit the use of coconut oil no more than 1 cup of water a day				
20	You eat fried fish or poultry or meat as your daily menu.				
21	Your daily snack is fried banana.				
22	You limit the consumption of egg yolk no more than 4 times in a week				
23	You eat internal organs/innards of cow or poultries				
Reducing salt and sodium					
24	You use the salt in your cooking no more than 1 teaspoon for a day				
25	You eat salted fish as your daily menu				
26	You eat salty ketchup in your daily eating				
27	You eat the salted fruits as snacks				
Limiting the sweets and added sugar					
28	You eat the sweetened fruits				
29	You eat various kinds of sweet foods as daily snack				

No.	Statement	Never (1)	Some times (2)	Often (3)	Routinely (4)
30	Your choose fresh fruit as your snack/dessert rather than sweet foods				
31	You add sugar in foods or beverages more than 5 tablespoon a week.				
32	You drink lemonade or syrup and other kinds of sugar-containing beverages.				

APPENDIX G

EFFECT SIZE CALCULATION FOR SAMPLE SIZE ESTIMATION

A STUDY BY PARK ET AL. (2010)

$$ES = \frac{M2 - M1}{PooledSD}$$

Note:

ES = Effect size

M1 = Mean of dietary behavior post-test score of control group

M2 = Mean of dietary behavior post-test score of experimental group

SD = Standard Deviation

SD1 = Standard Deviation of dietary behavior post-test score in the control group

SD2 = Standard Deviation of dietary behavior post-test score in the experimental group

$$Pooled\ SD = \sqrt{\frac{(SD1)^2 + (SD2)^2}{2}}$$

$$= \sqrt{\frac{(12.5)^2 + (8.5)^2}{2}}$$

$$= \sqrt{\frac{156.25 + 72.25}{2}} \quad = \sqrt{\frac{228.5}{2}} \quad = \sqrt{114.25} \quad = 10.688$$

$$ES = \frac{M2 - M1}{PooledSD} \quad = \frac{60.6 - 67.6}{10.688} \quad = 0.65$$

APPENDIX H

LIST OF EXPERTS

Three experts examined the content of instrumentation used in this study:

1. Asst. Prof. Dr. Ploenpit Thaniwattananon

    Faculty of Nursing, Prince of Songkla University, Thailand

2. Dr. Wandee Kahawong

    Faculty of Nursing, Prince of Songkla University, Thailand

3. Assoc. Prof. Dr. Patcharaporn Aree

    Faculty of Nursing, Chiang Mai University

APPENDIX I

Mean and standard deviation of

Dietary Behavior Questionnaire for Hypertension

Table I1

Mean Score and Standard Deviation of the Dietary Behaviors at Pre-Test (n= 44)

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
Consuming the grain products					
1	You consume any product of grain three times a day.	3.41	1.02	3.41	.84
2	You usually eat rice or noodle or bread as your heavy meal	3.61	.61	3.64	.48
3	The serving size of the grain that you eat is: - 1 fist of rice, or - 1 fist of noodle, or - 2 slices of bread	2.82	.94	3.07	.99
Consuming protein sources					
4	You eat fish/ lean meat/poultry in every meal time	3.34	.83	3.32	.67
5	The size of fish/ lean meat/poultry is 1 palm size/meal time	1.57	.87	1.61	.84
6	You usually boil, roast, or poach the fish/ lean meat /poultry	2.07	.62	2.05	.60
7	You do not remove the skin from poultry before cooking it.	3.18	1.22	2.84	1.25

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
8	You eat two cups of green bean porridge /week.	1.57	.62	1.77	.71
Increasing the consumption of vegetables and fruits					
9	You eat a variety of vegetables in every meals within a day	2.77	1.00	2.82	.92
10	The serving size of vegetable is the smallest one compare to grains and fish.	2.52	.97	2.82	.1.01
11	You usually cook the vegetables by using coconut milk or oil.	2.66	.74	2.66	.74
12	You eat 4-6 medium fruits a day (medium = tennis ball size)	1.55	.66	1.95	.57
Consuming the calcium sources					
13	You drink low-free fat milk/ soya bean milk	1.16	.56	1.07	.25
14	You eat the unsalted small fish (ikan teri)	1.80	.70	1.98	.79
15	You consume 2 medium size of tempe or 1 big size of tahu every day	2.25	.94	2.39	.61
16	You consume 1 cup of spinach/broccoli/sweet potato	1.95	.93	2.11	.75
Reducing fats and oils					
17	You limit the use of oils no more than 3 teaspoon a day	1.77	1.00	1.61	.84
18	You limit the use of margarine no more than 3 teaspoon a day	3.66	.64	3.48	.82

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
19	You limit the use of coconut oil no more than 1 cup of water a day	1.59	.87	2.14	.87
20	You eat fried fish or poultry or meat as your daily menu.	2.18	.78	2.07	.87
21	Your daily snack is fried banana.	2.43	.87	2.70	.63
22	You limit the consumption of egg yolk no more than 4 times in a week	2.25	1.18	2.32	1.03
23	You eat internal organs/innards of cow or poultries	3.52	.66	3.61	.61
Reducing salt and sodium					
24	You use the salt in your cooking no more than 1 teaspoon for a day	2.11	1.26	2.73	.99
25	You eat salted fish as your daily menu	3.45	.66	3.36	.75
26	You eat salty ketchup in your daily eating	3.61	.53	3.52	.62
27	You eat the salted fruits as snacks	3.86	.41	3.82	.39
Limiting the sweets and added sugar					
28	You eat the sweetened fruits	3.75	.48	3.59	.54
29	You eat various kinds of sweet foods as daily snack	2.32	.85	2.75	.81
30	Your choose fresh fruit as your snack/dessert rather than sweet foods	2.16	.64	2.41	.65
31	You add sugar in foods or	1.75	1.03	2.25	1.05

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
	beverages more than 5 tablespoon a week.				
32	You drink lemonade or syrup and other kinds of sugar-containing beverages.	1.77	.88	3.02	.73

Table I 2

Mean Score and Standard Deviation of the Dietary Behaviors at Post-Test (n= 44)

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
Consuming the grain products					
1	You consume any product of grain three times a day.	3.55	1.02	3.55	.79
2	You usually eat rice or noodle or bread as your heavy meal	3.84	.37	3.70	.51
3	The serving size of the grain that you eat is: - 1 fist of rice, or - 1 fist of noodle, or - 2 slices of bread	3.68	.56	3.27	.87
Consuming protein sources					
4	You eat fish/ lean meat/poultry in every meal time	3.50	.55	3.27	.72

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
5	The size of fish/ lean meat/poultry is 1 palm size/meal time	2.45	.90	1.93	.99
6	You usually boil, roast, or poach the fish/ lean meat /poultry	2.73	.54	2.23	.52
7	You do not remove the skin from poultry before cooking it.	3.70	.73	3.07	1.04
8	You eat two cups of green bean porridge /week.	1.84	.74	1.57	.58
Increasing the consumption of vegetables and fruits					
9	You eat a variety of vegetables in every meals within a day	3.05	.57	2.84	.71
10	The serving size of vegetable is the smallest one compare to grains and fish.	3.02	.73	2.73	.75
11	You usually cook the vegetables by using coconut milk or oil.	3.02	.73	2.89	.58
12	You eat 4-6 medium fruits a day (medium = tennis ball size)	2.45	.82	1.86	.66
Consuming the calcium sources					
13	You drink low-free fat milk/ soya bean milk	1.36	.81	1.20	.70
14	You eat the unsalted small fish (ikan teri)	1.70	.66	1.55	.62
15	You consume 2 medium size of tempe or 1 big size of tahu every day	2.84	.77	2.48	.62

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
16	You consume 1 cup of spinach/broccoli/sweet potato	2.16	.80	1.73	.62
Reducing fats and oils					
17	You limit the use of oils no more than 3 teaspoon a day	2.75	.61	1.93	.92
18	You limit the use of margarine no more than 3 teaspoon a day	3.80	.59	1.50	1.00
19	You limit the use of coconut oil no more than 1 cup of water a day	2.41	.94	2.00	.74
20	You eat fried fish or poultry or meat as your daily menu.	2.30	.82	1.98	.76
21	Your daily snack is fried banana.	2.77	.60	2.86	.46
22	You limit the consumption of egg yolk no more than 4 times in a week	2.68	1.07	1.89	.84
23	You eat internal organs/innards of cow or poultries	3.75	.48	3.55	.54
Reducing salt and sodium					
24	You use the salt in your cooking no more than 1 teaspoon for a day	2.93	.90	2.50	1.02
25	You eat salted fish as your daily menu	3.82	.44	3.61	.58
26	You eat salty ketchup in your daily eating	3.86	.34	3.77	.42
27	You eat the salted fruits as snacks	3.95	.21	3.86	.34

No	Statements	Experimental group (n=44)		Control group (n=44)	
		M	SD	M	SD
Limiting the sweets and added sugar					
28	You eat the sweetened fruits	3.98	.15	3.84	.37
29	You eat various kinds of sweet foods as daily snack	2.77	.52	2.98	.58
30	Your choose fresh fruit as your snack/dessert rather than sweet foods	2.23	.52	2.27	.58
31	You add sugar in foods or beverages more than 5 tablespoon a week.	1.75	1.03	2.25	1.05
32	You drink lemonade or syrup and other kinds of sugar-containing beverages.	1.77	.88	3.02	.73

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