



Self-management Among Patients with Hypertension in Bangladesh

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Abstract

This descriptive study aimed to identify the level of self-management and its relating factors among patients with hypertension at the Medical College Hospital Rangpur, Bangladesh. One hundred and ten subjects were recruited. The research tool was a questionnaire developed by the researcher which consisted of three parts: demographic data assessment form; health-related data assessment form and hypertension self-management behaviors questionnaire. Using Cronbach's alpha the reliability of the hypertension self-management behaviors of instrument was .91. Frequencies, percentages, means and standard deviations were employed for data analysis. The results revealed that overall self-management among patients with hypertension was at a moderate level ($M = 2.55$, $SD = 0.47$). For five sub-dimensions of self-management, the means of self-integration, self-regulation, interaction, self-monitoring, and adherence, were also at the moderate level. Middle aged and young adults had significantly higher self-management scores than older adults ($t = 4.54$, $p < .05$). Females had higher scores than males ($t = 2.66$, $p < .05$). Uneducated subjects had lower self-management scores than those who had been educated ($F = 5.89$, $p < .001$). Subjects who lived in urban areas had higher self-management scores than those who lived in rural areas ($F = 3.24$, $p < .001$). In addition, the time since diagnosis was found to be significant. Subjects who had longer times since diagnosis (>6 years)

had higher self-management scores than those with shorter time (≤ 6 years) ($t = -2.44$, $p < .01$).

This study offers evidence that among patients with hypertension, there is room for further improving their self-management practices, particularly in patients who are elderly, male, and newly diagnosed or with less years from diagnosis. It is recommended that an educational program should be developed to enhance self-management among this group of patients.

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Hypertension has become an important health problem. The incidence and prevalence of hypertension continue to increase around the world (Bosworth et al. 2007; Chen, Litvak, Howe, Parvez, & Ahsan, 2006; Chockalingam, 2008; Tu, Chen, & Lipscombe, 2008). Currently, 1.5 billion people are affected with high blood pressure globally (Chockalingam). The number of adults with high blood pressure will increase from 333 million to 413 million by 2025 (U.S. Public Health Service, 2007). Approximately 65 million Americans are affected by hypertension (Ong, Cheung, Man, Lau, & Lam, 2007). Hypertension was one of the ten leading reported causes of death and approximately 4% deaths were due to hypertensive complications in Bangladesh (Saha, Sana, & Shaha, 2006). Around 15 million adults in Bangladesh have been suffering from high blood pressure (Khandaker, 2008).

There are several effects as a result of hypertension. High blood pressure is a disease of cardiovascular system and is a major modifiable risk factor for coronary heart disease, congestive heart failure, stroke, renal failure, renal dysfunction and eye problems (Black & Hawks, 2005; Chockalingam, 2008; Ong, et al., 2007). Hypertension is linked with 70% of strokes and 60.5% of kidney diseases and increases the risk of vascular dementia. Therefore, once hypertension has been identified, the patients should be monitored for their blood pressure at regular

intervals, in order to know the blood pressure is in control or not and to take necessary action (Black & Hawks, 2005; Smeltzer & Bare, 2004).

Even though prevention and control of hypertension has been reported as an important public health issue, finding a strategy for controlling high blood pressure has been worldwide problem (Chen et al., 2006). Several surveys from many countries around the world pointed out that public awareness about blood pressure levels was poor (Chockalingam, 2008). Although multiple treatments are available for hypertensive control, it was reported that even in the developed countries, such as the United States of America, only one third of patients with hypertension had their blood pressure well controlled (Bosworth et al., 2007). It has been well recognized that one of several factors is the patient's lack of knowledge related to self-management in terms of adherence to pharmacological treatments (such as antihypertensive drug use), and modification of lifestyles (such as, diet control, exercise). Poor control of blood pressure is the greatest cause of increasing morbidity and mortality of people with hypertension (Black & Hawks, 2005; Bosworth et al., 2007).

Self-management is a dimension of wellness and it emphasizes the fulfilling of basic needs that maintain life in a secure and normal way (Hengwattana, 2001). Dietary modification, lifestyle change, regular use of antihypertensive medication and regular blood pressure check-ups are the important aspects of self-management. (K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease, 2002). Regular use of antihypertensive medication can help to improve symptoms and slow the progress of the complications of hypertension. Self-management is needed as patients try to make themselves healthy by exercising, losing weight or changing their eating

habits so that they can control blood pressure effectively. Lack of self-management ability among the patients with hypertension is a significant cause of higher rates of disability and death, especially from stroke, renal failure, or heart failure.

There are some personal factors and health-related factors that affect the level of patients' self-management of hypertension. These are age, gender, income, education, comorbidity, location of residence and time since diagnosis of hypertension.

In summary, hypertension is the most common cardiovascular problem. Its prevention and control are therefore important public health issues. To reduce the rate of prevalence and mortality among hypertensive patients there is a need to promote self-management abilities. Self-management is a significant challenge to patients with hypertension. Patients with hypertension are expected to be able to monitor themselves and make changes in their lifestyle. Few studies have examined self-management in hypertensive clients. The identification of gaps in hypertensive patients' level of self-management can guide nursing interventions for this group. In addition, the development of self-management programs plays a key role in controlling the unwanted complications of hypertension. Therefore, the researcher is interested in studying self management in persons with hypertension in Bangladesh.

Objective of the Study

1. To identify the level of self-management among patients with hypertension in Bangladesh.

2. To examine factors relating to self-management among patients with hypertension in Bangladesh.

Research Question of the Study

1. What is the level of self-management among patients with hypertension in Bangladesh?
2. What factors may relate to self-management among patients with hypertension?

Conceptual Framework of the Study

Successful strategies for hypertensive management will ultimately depend upon the patient's self-management, or the ability and willingness of the patient to change and maintain certain behaviors. In this study, the researcher's conceptualization of hypertensive self-management is based on the work of Lin, Anderson, Chang, Hagerty, and Loveland-Cherry (2008) and the related literature about hypertension treatment and care. Lin et al. (2008) defined self-management as "an active, flexible process in which patients develop strategies for achieving desired goals by regulating their own actions, collaborating with health care providers and significant others, and performing preventive and therapeutic health-related activities" (p. 371).

The term 'self-management' also refers to the activities people undertake to create order, discipline and control in their lives (Kralik, Koch, Price, & Howard, 2004). The outcome of the self-management process is individual behaviors intended

to maintain or improve health and prevent exacerbation (Deaton, 2000). Five components of self-management include: self-integration; self-regulation; interaction with health professional and significant others; self monitoring; and adherence to a recommended regimen.

Self-integration refers to a patient's ability to integrate hypertensive care into their daily lives through activities such as proper diet, exercise, and weight control. Self-regulation reflects the patient's self-regulation about their behaviors through self-monitoring of body signs and symptoms. This involves identifying life situations and causes related to changes in blood pressure and taking action based on these observations. Interaction with health professionals and significant others is based on the concept that good blood pressure control care involves collaboration with health care providers and significant others. Self-monitoring is concerned with the monitoring of blood pressure for detecting blood pressure levels in order to adjust self-care activities and adherence to recommended regimens. In turn, this is related to the patient's adherence to prescribed antihypertensive medication and visits to clinics.

Some personal factors and health-related factors may help explain the level of self-management among patients with hypertension. These include age, gender, income, education, comorbidity, location of residence and time since the diagnosis of hypertension. These factors were explored in this study.

Definition of Terms

Self-management in this study refers to the frequency of behaviors necessary to be executed by patients with hypertension. Self-management includes five

dimensions: self-integration; self-regulation; interaction with health professionals and significant others; self-monitoring and adherence to recommended regimens. Items were scored on a 4-point scale ranging from 1 (never) to 4 (always). The scores were divided into three levels: low, moderate, and high. The higher score indicated the higher level of self-management reflecting more frequent behaviors.

Factors related to self-management refer to demographic factors and health-related factors.

Demographic factors included age, gender, marital status, educational level, income, and location of residence.

Health-related factors included the instrumental activities of daily living, time since diagnosis and comorbidity.

Significance of the Study

This information should be valuable to patients and health care providers to gain a better understanding about the self-management levels of hypertensive patients. It should also help nurses to develop self-management programs for hypertensive patients.

CHAPTER 2

LITERATURE REVIEW

This chapter discusses the relevant literature reviewed, and is been presented as follows:

1. Hypertension
2. Self-management in patients with hypertension
3. Factors related to self-management
4. Hypertensive care in the Bangladesh health care system

Hypertension

Definition of hypertension

Blood pressure is the pressure or force of blood within the arteries' wall, when passing or circulating of blood throughout the body. Average blood pressure is 90/60-120/80 mmHg. It is primarily produced by the contraction of the heart muscle. The first number, 90-120, is called the systolic blood pressure. It represents the pressure that the blood exerts on the walls of the arteries while the heart is contracting. The second number, 60-80, is called the diastolic blood pressure. It refers to the pressure that the blood exerts on the walls of the arteries when the heart is resting and filling with blood (Hengwattana, 2001).

Persistent elevation of blood pressure is called hypertension. Hypertension is often an asymptomatic disorder characterized by persistent elevation of the systolic blood pressure at a level of 140 mmHg or higher and diastolic blood pressure

at a level of 90 mmHg or higher (Black & Hawks, 2005; Smeltzer & Bare, 2004). When persistent, progressive increases in peripheral resistance continue, blood pressure remains elevated (Black & Hawks; Smeltzer & Bare).

In order to diagnose hypertension, a person has to take a rest for at least 5 minutes, and check the blood pressure separately by at least 2 minutes using proper cuff instruments and methods. The diagnosing of high blood pressure is based on the average of two or more readings taken at each of two or more visits after an initial screening (Potter & Perry, 1999). Table 1 shows the recommendations for blood pressure measurement (Potter & Perry, 1999; Kaplan, 2002).

Table 1

Recommendation for Blood Pressure Measurement

Technique for blood pressure measurement	
Posture	<ul style="list-style-type: none"> - Determine best site for BP assessment. - Have client assume sitting or lying position. Be sure room is warm, quite, and relaxing circumstances (Potter & Perry, 1999). - Encourage client to avoid exercise and smoking for 30 minutes before assessment of BP. - For routine follow-up, a patient should sit quietly for 5 minutes with arm bared and supported at the level of the heart and the back resting against a chair (Kaplan, 2002). - Explain to client that BP is to be assessed.

Table 1 (*Continued*)

Technique for blood pressure measurement	
	<ul style="list-style-type: none"> - Exposure of upper arm fully by removing constricting clothing. - Palpate brachial artery. Position cuff 2.5 cm above site of brachial pulsation. Center bladder of cuff above artery.
Equipment cuff size	- The bladder should encircle at least 80% of the circumference and cover two thirds of the length of the arm (Kaplan, 2002).
Menometer	<ul style="list-style-type: none"> - Use mercury, recently calibrated aneroid, or validated electronic devise. - Place stethoscope earpieces in ears and be sure sounds are clear (When use a mercury equipment).
Technique	- Number of reading on each occasion; take at least two reading separately by as much time.

Note From Kaplan's clinical hypertension (p. 35), by N. M. Kaplan, 2002,

Philadelphia: Lippincott Williams & Wilkins.

Types and causes of hypertension

Hypertension can be categorized into two types (Black & Hawks, 2005; Dunphy & Winland-Brown, 2001; Smeltzer & Bare, 2004).

Primary hypertension. Primary hypertension is known as essential or idiopathic hypertension. More than 95 percent of patients have primary hypertension, with no identifiable cause. Primary hypertension results from the interplay of multiple genetic and environmental factors, including lifestyle influences.

Secondary hypertension. It was found that less than 5 percent of patients have secondary hypertension. The cause of elevated blood pressure can be identified, such as narrowing of the renal arteries, renal parenchymal disease, certain medications, pregnancy, and coarctation of the aorta.

Classification of high blood pressure for adults and elder

High blood pressure for adult and elder patients can be classified into 3 categories based on the level of systolic or diastolic blood pressure (Smeltzer & Bare, 2004), as shown in Table 2. The classifications in the table below shows the people who are not taking antihypertensive (blood pressure-lowering) drugs and are not acutely ill. When a person's systolic and diastolic pressures fall into different categories, the higher category is used to classify the blood pressure status.

Table 2

Classification of High Blood Pressure for Adults and Elders

Category of Hypertension	Systolic (mm Hg)	Diastolic (mm Hg)
Stage 1	140-159	90-99
Stage 2	160-179	100-109
Stage 3	≥ 180	≥ 110
Hypertensive crisis	>210	>120

Although the precise cause for most cases of hypertension cannot be identified, it is understood that hypertension is a multifactorial condition. There are several major non-modifiable risk factors, such as family history, age, gender and ethnicity. Mortality statistics indicate that the death rates for adult black women are highest, and modifiable risk factors, including stress, obesity, sodium consumption

and substance abuse contribute to the development of hypertension (Black & Hawks, 2005; Smeltzer & Bare, 2004).

Pathophysiology

The precise cause for most cases of hypertension has not been identified. However, it is understood that hypertension is a multifactorial condition. Hypertension is the result of an increased sympathetic nervous system activity related to dysfunction of the autonomic nervous system. This leads to an increased renal absorption of sodium chloride, and water related to a genetic variation in the pathways by which the kidneys handle sodium (Esler, 2000). Increased activity of the renin-angiotensin-aldosterone system also results in expansion of extracellular fluid volume and increased systemic vascular resistance (Manrique, Lastra, Gardner & Sowers, 2009). Structural and functional changes in the heart and blood vessels contribute to increases in blood pressure with the age.

Clinical manifestations

Hypertension is sometimes called “the silent killer” because people who have it are often symptom-free. In the early stages of development of hypertension, no clinical manifestations are noted by clients or practitioners. Prolonged blood pressure damages blood vessels in the target organ such as the heart, kidneys, brain, and eyes. High blood pressure is a major risk factor for heart disease, congestive heart failure, stroke, impaired vision, and kidney disease (Smeltzer & Bare, 2004). Clinical manifestations will become apparent, and clients will eventually complain about persistent headaches, fatigue, dizziness, palpitations, flushing, blurred or double vision, or epistaxis (Black & Hawks, 2005; Smeltzer & Bare).

Black and Hawks (2005) described the signs and symptoms in hypertensive patients as follows:

Headache.

Most people have experienced headaches from time to time. However, headache is one of the effects of hypertension and does signal the need to get it checked. There is a specific kind of headache and neck-ache when blood pressure is higher than normal.

Nosebleeds

Having nosebleeds with no apparent reason can be an indication that a person's blood pressure has gone higher for one reason or another. Nosebleeds that occur without any regularity are difficult to stop and it is the time to get the blood pressure checked. A nosebleed is a usually side effect of high blood pressure.

Blurred vision

Blurred vision can also be a sign of high blood pressure. If a person's vision becomes blurred, it should be checked out very quickly.

Dizziness

Dizziness is one of the common complaints of people whose blood pressure is high. Even low blood pressure can be accompanied by dizziness. If dizziness is experienced it is wise, to get a checkup by a health-care provider.

Palpitations

There are many different types of palpitations. Palpitations can be happening due to heart problems, nervousness, and/or people worrying about themselves which

only make patients more nervous and so the palpitations get worst. High blood pressure is one of the reasons for experiencing palpitations.

Tinnitus

ringing in the ear, which is also known as tinnitus, is seen as one of the symptoms of hypertension..

Hypertensive management

Hypertension is a chronic condition and leads to serious complications if the person cannot control the blood pressure. Hypertensive management consists of 2 main parts, pharmacological therapy and lifestyle modifications.

Pharmacological therapies. Treating high blood pressure can help prevent serious, even life threatening complications. The major types of medication used to control high blood pressure include diuretics drugs, combined alpha and beta blocker, beta-blockers, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, calcium antagonists, and vasodilators. Details of their actions and side effects (Smeltzer & Bare, 2004) are shown in Table 3.

Table 3

Medication for Patients with Hypertension and its Major Action and Side Effects

Medications	Major Action	Side Effects
Diuretics: Furosemide (lasix)	Volume depletion Blocks reabsorption of sodium chloride and water in kidney	Thirst, nausea, vomiting, skin rash, postural hypotension. Drowsiness, lethargy, headache-decrease dosage.

Table 3 (Continued)

Medications	Major Action	Side Effects
Combined Alpha and Beta Blocker: Labetalol hydrochloride	Blocks alpha-and beta-adrenergic receptors; causes peripheral dilation and decreases peripheral vascular resistance.	Orthostatic hypotension, tachycardia.
Beta-blockers: Propranolol	Block the sympathetic nervous system, especially the sympathetic to the heart, producing a slower heart rate and lowered blood pressure.	Insomnia, lassitude, weakness, and fatigue. Nausea, vomiting, and epigastric distress. Check heart rate before giving.
Angiotensin-converting Enzyme Inhibitors: Captopril (Capoten)	Inhibit conversion of angiotensin I to angiotensin II lower total peripheral resistance.	Gerontologic considerations: Requires reduced dosages and loop of diuretics with renal dysfunction.
Angiotensin II Receptor blockers : Losartan (Cozaar)	Block the effects of angiotensin II at the receptor. Reduced peripheral resistance	Monitor for hypokalemia
Calcium Antagonists: Nondihydropyridines diltiazem hydrochloride	Inhibits calcium ion influx Reduces cardiac afterload	Do not discontinue suddenly. Observe for hypotension. Report irregular heartbeat, dizziness, and edema

Table 3 (*Continued*)

Medications	Major Action	Side Effects
Vasodilators: Hydrolyzing hydrochloride	Decreases peripheral resistance but concurrently elevates cardiac output acts directly on smooth muscle of blood vessels	Headache, tachycardia, flushing, and dyspnea.

Lifestyle modifications

Lifestyle modification is also adjunct therapy for all clients with hypertension who are receiving pharmacologic therapy. Continued healthy lifestyle practices can reduce the number and dosage of antihypertensive medications (Black & Hawks, 2005). There was evidence that the blood pressure of persons who are able to modify their lifestyles were lower and could reduce other major cardiovascular risk factors. Those who modified their lifestyle could reduce the likelihood of heart attack, stroke, and diabetes (Kaplan, 2002). Nurses can help patients modify their lifestyle by informing them that there are several modifiable factors that have been shown to contribute to hypertension. These include: obesity; lack of regular aerobic exercise; daily alcohol intake exceeding 1 oz of ethanol on a regular basis; excessive sodium intake; and a stressful life style. In addition nurses can assist the client to identify how he/she can make appropriate changes in lifestyle to modify the above factors.

Lifestyle modification for hypertensive patients includes weight reduction, dietary management, alcohol restriction, stopping smoking, exercise, stress management, and regular medication adherence.

Weight reduction

Weight reduction is important for patients whose body mass index is ≥ 25 . Weight reduction helps in reducing blood pressure. Weight reduction also enhances the effectiveness of antihypertensive medications (Black & Hawks, 2005; Kaplan, 2002). The incidence of hypertension increased threefold at a body mass index (BMI) of 26 as compared to a BMI of 21. The maintenance of significant weight loss is difficult for obese patients. Weight loss lowers blood pressure through multiple effects including an improvement in insulin sensitivity. This may result in: a decrease in visceral fat; a decrease in sympathetic nervous system activity; an increase in plasma leptin levels; and reversal of endothelial dysfunction revealed by nitric oxide-induced vasodilatation (Kaplan). Weight reduction can be done by balancing the diet, reducing salt intake, and taking regular exercise.

Dietary management

Dietary adjustments can reduce the severity of hypertension and in some cases, reduces the need for medication. The persons with hypertension should eat a diet low in salt, calories, cholesterol, and saturated fat. Persons with hypertension should eat more fruits, vegetables, grains and beans as compared to fats. In addition, they need to replace the beef in their diet with alternatives like fish or chicken. It is also suggested that grilled or boiled food rather than fried are recommended.

The Dietary Approaches to Stop Hypertension (DASH) demonstrated that modification in diet can aid in controlling blood pressure. The DASH recommended healthy eating patterns in order to control hypertension (Chen, Litvak, Howe, Parvez, & Ahsan, 2006). As showed in Table 4.

Table 4

The DASH Diet Plan

Food Group	Recommended Serving	Serving Sizes (Example)
Grain product: whole grain breads and cereals	7-8 serving per day	1 slice whole wheat bread
Fruits & Vegetables	8 - 10 serving per day	1/2 cup fruit or vegetable
Dairy products: low fat (<1% M.F) milk products and low fat cheeses	2-3 servings per day	8 oz milk
Meat & alternatives lean meat/fish/ poultry	2-3 servings per day	3 oz cooked meat
Nuts, seeds and dry beans	4-5 servings per week	1/3 cup nuts

Sodium restriction

An estimate shows 40% of people with hypertension are sodium sensitive (Black & Hawks, 2005). A moderate restriction of sodium intake can lower the blood pressure at some cases of stage one hypertension. If sodium intake is lowered, the amount of medication needed may be decreased. Sodium is a hidden ingredient in many processed food. In general, the average adult daily intake of salt is 5 to 15

grams, but the therapeutic effects of sodium reduction on blood pressure do not occur until salt intake is reduced to 6 grams /day or lower (Black & Hawks).

Dietary fat modification

Modification of dietary intake of fat by decreasing the fraction of saturated fat and increasing of polyunsaturated fat leads to decreases in the levels of blood pressure and cholesterol significantly. Because dyslipidemia is a major risk factor in the development of coronary artery disease, diet therapy aims at reducing the lipids in the total dietary regimen (Black & Hawks, 2005).

Potassium supplementation

The high ratio of sodium to potassium in the modern diet was found to be responsible for the development of hypertension. Many studies examined the effect of potassium on blood pressure and most of them identified a salutary effect (Ducher, Fauvel, & Cerutti, 2006). Potassium restriction causes a deficit in cellular potassium that triggers cells to gain sodium in order to maintain their tonicity and volume. The deficits of potassium, sodium, and chloride in the body imposed in those early studies contracted both the intracellular and extracellular compartments, thereby rendering a decrease in blood pressure (Adroque & Madias, 2007).

Alcohol restriction

The consumption of more than 1 ounce of alcohol per day is associated with a higher prevalence of hypertension and poor adherence to antihypertensive therapy (Black & Hawks, 2005). In addition to the mechanisms involved, unresolved issues about the alcohol-blood pressure relationship include whether there is a threshold dosage of alcohol for association with hypertension, the alcohol-associated

hypertension and the roles of interactions with gender, ethnicity, other lifestyle traits, drinking patterns, and choice of beverage (Klatsky & Gunderson, 2008).

Smoking cessation

Stopping smoking in hypertensive patients could provide a reduction of mortality risks similar to a permanent reduction of 40 mmHg in blood pressure, over and above any antihypertensive medications. The use of a “blood pressure equivalence of smoking” can link the two separate risk factors and may lead to a paradigm shift in overcoming an existing clinical challenge (Wen, Tsai, Chan, Tsai, Cheng & Chiang, 2008). Smoking cessation is strongly recommended in order to reduce the risk for cardiovascular disease (Black & Hawks, 2005).

Exercise

A lifestyle of physical activity can reduce the risk of developing hypertension. A regular program of aerobic exercise attains a moderate level of physical fitness in cardiovascular conditioning and can aid the obese hypertensive clients in weight reduction and also minimize the risk of cardiovascular disease. Aerobic exercise is an exercise that involves or improves the oxygen consumption of the body. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process (Donatelle, 2005). Aerobic exercise is helpful for patients and should be performed at a moderate level of intensity for extended time periods. A regular exercise activity can lower the blood pressure in hypertensive clients. Exercise can heighten the client's sense of well being, reduces emotional tension and raises the level of high-density lipoproteins (HDL), enables lipids like cholesterol and triglycerides to be transported within the water based blood stream and decreases the

risk of cardio-vascular morbidity and mortality (Black & Hawks, 2005). The recommended exercises for patients with hypertension involves walking, jogging or cycling of moderate intensity ranging from 4-52 weeks in length and each session typically lasted 30-60 minutes (Baster & Baster-Brooks, 2005). Walking, swimming, cycling and practicing yoga are also recommended.

Stress management

A variety of relaxation therapies, including meditation, yoga, music, rest and psychotherapy can reduce blood pressure. Relaxation can be highly beneficial if practiced routinely in one's everyday life. Techniques involving relaxation are widely used by people to reduce anxiety and cope with stress-related problems. Relaxation procedures are active and educational forms of therapy that can decrease the occurrence of tension and anxiety disorders (Schneider, Staggers, Alexander, Sheppard, Rainforth, Kondwani, et al., 1995).

Regular adherence to medication

Hypertension is a chronic illness that needs a person to adhere to the medication and treatment. Persons with hypertension should take medication as prescribed and should make regular visit to the physician for appointments for monitoring their blood pressure.

Self-Management in Patients with Hypertension

The self-management perspective is receiving increased attention in the chronic illness literature. Several self-management programs have been developed to support patients with chronic illness such as diabetes, hypertension, heart disease and

systemic lupus erythomatus. Self-management programs appeared to improve clinically significant parameters in patients with diabetes and hypertension (Lin, 2006). Self management programs aim to: 1) help the client to acquire more effective interpersonal, cognitive, and emotional behaviors; 2) to alter the client's perceptions and evaluative attitudes of problematic situations; and 3) to either change a stress-inducing or hostile environment or learn to cope with it by accepting that it is inevitable (Kanfer & Gaelick-Buys, 1991).

Definition of self-management

To define the term self-management is difficult, as this term is used widely and interchangeably with self-care (Deaton, 2000). However, self-care is a broader term. According to Riegel and Carlson (2002) self-management is one component of self-care which involves a process of maintaining health through positive health practices, and managing illness and disease.

Self-management refers to the individual behaviors intended to maintain or improve health and prevent exacerbation (Deaton, 2000). Clinicians often defined self-management as a patient's compliance or adherence to the treatment regimen. Regarding self-management, patients are also responsible for monitoring and responding to change in their health status and daily life, maintain their general health and avoid risk factors for other illnesses, such as by eating a healthy diet and participating in regular exercise (Deaton). The key feature of self-management of chronic illness is that people participate effectively in managing their own health care on an ongoing basis (Gallagher, Donoghue, Chenoweth, & Stein-Parbury, 2008).

According to Mc Donald and Gibson (2006), self-management refers to the individual's ability to manage the symptoms, treatment, physical and psychological consequences and life style changes inherent in living with a chronic condition.

DeMonaco and Hippel (2007) defined self-management as a person's behavior in: 1) engaging in activities that protect and promote health; 2) monitoring and managing symptoms and signs of illness; 3) managing the impacts of illness on function, emotions, and interpersonal relationships; and 4) adhering to treatment regimens.

Lin (2006) defined chronic disease self-management as a systematic disease intervention that involves self-monitoring and participation in decision making, or both.

According to self-regulatory theory the term self-management is an active, reactive process of setting a goal, choosing strategies, observing oneself, making judgments based on observation, and reacting appropriately in the light of one's strategy (Bartholomew, Parcel, Kok, & Gottliels, 2006).

In conclusion, self-management is the ability or willingness of patients to change and maintain certain behaviors aiming to protect and promote health.

Self management in persons with hypertension

Hypertension is a chronic illness that requires a person to manage their own health care on an on-going basis. In this study, self-management behaviors in persons with hypertension are based on the work of Lin, et al. (2008) with diabetes patients. According to Lin et al., self-management for diabetes patients consisted of 5 components. These included: self- integration; self-regulation; interaction with

professionals and significant others; self-monitoring; and adherence to a recommended regimen.

Self-integration refers to a patient's ability to integrate health care into their daily lives through activities such as proper diet, exercise, and weight control. Patients with hypertension should be able to: 1) manage food portions and choices when eating out; 2) eat more fruits, vegetable, grain and beans; 3) decrease the fraction of saturated fat; 4) consider effects on blood pressure when making food choices; 5) avoid drinking alcohol (less than 1 ounce per day); 6) take salt at about 6 grams/day or lower in food; 7) reduce weight effectively; 8) manage food choices to control blood pressure; 9) exercise to control blood pressure and weight by walking, jogging or cycling lasting 30-60 minute per session; 10) merge hypertension into daily life successfully; 11) adjust hypertension routines to fit new situations; 12) stop smoking; and 13) control stress by listening to music, taking rest, and talking with family members.

Self-regulation reflects patient's self-regulation of their behaviors through self-monitoring of body signs and symptoms (that is identifying life situations and causes related to the changes in blood pressure and taking action based on these observations). Self-regulation behaviors include: 1) understanding reasons for the changes in blood pressure levels; 2) recognizing the signs and symptoms of high and low blood pressure; 3) acting in response to symptoms; 4) attending to symptoms of high and low blood pressure; 5) treating low blood pressure reactions; 6) making decisions based on experience; 7) attending to situations that may affect blood

pressure levels; and 8) comparing differences between current and target blood pressure levels.

Interaction with health professional and significant others is based on the concept that good health care involves collaboration with health care providers and significant others. Behaviors that reflect interaction with health professionals and significant others are as follows: 1) comfortably discussing degrees of flexibility in treatment plans with health care providers; 2) comfortably suggesting treatment plan changes to health care providers; 3) comfortably asking health care providers questions; 4) collaborating with health care providers to identify the reasons for poor blood pressure control; 5) comfortably discussing out-of-range blood pressure tests with health care providers; 6) comfortably asking health care providers about hypertensive care resources; 7) asking others for help with high blood pressure; 8) asking others for help in controlling blood pressure; and 9) comfortably asking others for high blood pressure management techniques.

Self-monitoring is concerned with the monitoring of blood pressure for detecting blood pressure levels in order to adjust self-care activities. Self-monitoring behavior includes: 1) checking blood pressure when feeling sick; 2) checking blood pressure when experiencing low blood pressure symptoms; and 3) checking blood pressure to help make hypertension self-care decisions.

Adherence to recommended regimens refers to patient's adherence to prescribed hypertensive medication and clinic visits. This dimension also involves taking the prescribed amount of medication, taking medication the prescribed number of times, and seeing health care provider every 1-3 months.

Factors Related to Self-Management in Patients with Hypertension

Many factors influence the self-management of hypertension. They are:

Age.

Age is one factor which affects self-management. Lee et al. (2010) found that older patients with hypertension had better self-care behaviors. However, in old age, the cognitive ability may decline and this may affect their self management behaviors (Sinclair, Girling & Bayer, 2000) and their ability to make daily decisions (Dickson, Tkacs & Riegel, 2007)

Gender.

It was found that female patients have better self-care/self-management behaviors than male patients. Chung et al. (2006) found that women have more knowledge about disease than men, they therefore may be better able to adapt meals to the sodium-restricted diet because they are responsible for preparing meals. In addition, Yount, Agree, and Rebellon (2004) found that women report visiting providers and using medication more often than men.

Income.

Income has an effect on self-management. Low income patients are not able to buy healthy food and medication regularly, so they cannot undertake self-management of hypertension.

Education.

Education is regarded as an essential prerequisite to the self-management of a chronic disease (Kolbe, 2002). Weijman, Ros, Rutten, Schaufeli, Schabracq and

Winnubst (2004) found that the level of education was related to the frequency of self-management.

Comorbidity.

Hypertension is a disease which has links with some comorbid conditions such as diabetes mellitus, stroke, chronic kidney disease, and coronary heart disease. Comorbidity is one patient-specific factor that affects hypertension control (Naik, Kallen, Walder, Street, 2008). These comorbid conditions affect self-management in hypertension. Stroke patients have decreased cognitive capacity because of neurological deterioration and they may develop dementia, so patients may not be able to do normal work (Kim & Kang, 2007). It was found that cardiovascular comorbidities reduce self-management in hypertension (Polijicanin, Ajdukovic, Sekerija, Pibernik-Okanovic, Metelko, Mavrinac, 2010).

Location of residency.

Urban people's self-management is higher than rural people's because in urban areas there are many private and government health care organizations, many doctors and many departments of medicine available. On the other hand, in rural areas the health care organizations are far from people's residences. There are very few health care providers and few drug stores and this influences self-management.

Time since diagnosed.

Time since diagnosis or the duration since being diagnosed with hypertension has effects on self-management. Some patients whose attacks were over a long time manage better than new patients as they have already experienced the risk factors of hypertension. They know the signs and symptoms and have used antihypertensive

medication. Lee et al. (2010) found a positive relationship between years of hypertension and self-care behavior. They stated that those with a longer duration of hypertension might have had more learning opportunities available to them.

Hypertensive Care in Bangladesh Health Care System

Bangladesh is a highly densely populated country. Bangladesh is a developing country and the rate of population increase is very high. The death rate is very high from different communicable disease. Maternal and infant mortality is also high. Hypertension was one of the 10 leading reported causes of death and approximately 4% deaths were due to hypertensive complications in Bangladesh (Saha, Sana, & Shaha, 2006).

Health care providers are very few in relation to the population. Community health services are very limited. Nurses work to follow-up the doctor's activities for admitted patients. There are insufficient self-management education programs provided by nurses in hospitals and the community. Doctors provided written discharge certificates that include instructions about health education.

The approaches that have been recommended for the prevention of hypertension in Bangladesh (Reza, 2002) include primary prevention and secondary prevention, as shown in Table 5.

Table 5

Prevention of Hypertension in Bangladesh

Level of prevention	Activities
Primary prevention	
Population strategy	<p>Modifying nutrition-dietary changes</p> <p>Reducing weight</p> <p>Having regular exercise</p> <p>Promoting behavioral changes</p> <p>Providing health education</p> <p>Taking one's own blood pressure and keeping a log book of his readings</p>
High risk strategies	<p>Detecting high risk subjects by the optimum use of clinical methods</p> <p>Tracking of blood pressure from childhood in those who have family history of hypertension and ideally a blood pressure of 120/80 mmHg</p> <p>Providing health education directed to patient, families and the community</p>
Secondary prevention	<p>Screening should be linked to follow-up and treatment</p> <p>Obtaining blood pressure below 140/90 mmHg and ideally a blood pressure of 120/80 mmHg</p> <p>Providing health education directed to patients, families and the community</p>

Most of the hypertensive people in Bangladesh are middle-level income groups (Mohan, Campbell, & Chockalingam, 2005). Not all people with hypertension in Bangladesh are able to buy medicine regularly. In general, when the patients were hospitalized they obtained some medications. They usually bought this from a shop selling medicines because there is no full supply of medications for the patients. After being discharged patients may not receive any medication from the hospital. In Bangladesh, there is no government rule for giving medication after discharge.

Summary

Hypertension is an important modified risk factor for cardiovascular disease. The management of hypertension includes pharmacological treatment and lifestyle modification. Hypertension is a chronic illness that requires a person to manage their own healthcare on an on-going basis. Self-management for hypertensive patients consists of 5 components including: self-integration; self-regulation; interaction with professionals and significant others; self-monitoring; and adherence to recommended regimens. Several factors are related to effective self management including, age, educational level, gender, comorbidity, time since being diagnosed, and income. Understanding self-management and the factors related to self-management is important for the development of interventions.

CHAPTER 3

RESEARCH METHODOLOGY

This descriptive study was aimed at examining the level of self-management among patients with hypertension in Bangladesh and to explore factors relating to self-management. In this chapter, the research design, settings, population and sample are described.

Setting

The setting of this study was Rangpur Medical College Hospital (RpMCH), Bangladesh. It is located in the northern part of Bangladesh. RpMCH is one of the tertiary level government hospitals. Although it is an 800-bedded hospital; a total of 1000 patients stay regularly each day. The hospital has one coronary care ward, two male-medicine wards, one female-medicine ward, and a male-female out-patient department. This hospital provides services for more than 100 adult patients with medical problems per day. Nurses measure blood pressure and provide some health education to patients with hypertension.

Population and Sample

The target population of this study was hypertensive patients who were admitted in-patient wards, and attended out-patient departments. A total of 150 patients were admitted in the in-patient ward in each month. The samples were

patients who were admitted to the in-patient wards, and attended out-patient departments who met the following inclusion criteria:

1. Being diagnosed with hypertension for at least 6 months
2. Age of 20 years or older
3. Good consciousness
4. Able to communicate in the Bengali language

Sample size estimation

The number of subjects has been estimated by using the following formula based on (Yamane, 1967):

$$n = \frac{N}{1 + (N)(e)^2}$$

N = hypertension patients (150) in Rangpur Medical College Hospital

E = error estimation (this study uses 0.05)

n = 110

Instrumentation

Instrument

The instrument was developed by the researcher and was composed of 3 parts. They were the: 1) Demographic Data Assessment Form; 2) Health-Related Data Assessment Form; and 3) Hypertension Self-Management Behavior Questionnaire which was modified from an existing tool (Lin et al., 2008).

Part 1: Demographic Data Assessment Form

The first part of the questionnaire was used to collect the demographic information about the subjects covering age; sex; marital status; religion; educational level; occupation; economic status/monthly income; location of residency; number of family members; time since being diagnosed; and types of payment for treatment.

Part 2: Health-related Data Assessment Form

The Health-related Data Assessment Form was used to collect clinical relevant characteristics including: body weight; smoking history; drinking status; systolic blood pressure and diastolic blood pressure using mercury sphygmomanometers; and time since diagnosis.

Part 3: Hypertension Self-Management Behavior Questionnaire

The Hypertension Self-Management Behavior Questionnaire (HSMBQ) was modified by the researcher from the Diabetes Self-Management Instrument, developed by Lin et al. (2008). The HSMBQ consisted of 40 items addressing different aspects of self-management for the illness. These included: self-integration (13 items); self-regulation (9.items); interaction with health professionals and significant others (9 items); self-monitoring (4 items); and adherence to recommended regimen (5 items). The subjects were asked to rate each item to indicate the frequency which they performed the self-management practices. Items were scored on a 4-point scale ranging from 1 (never) to 4 (always). The self-management scores were divided into three levels: low, moderate and high.

The scores of 1.00-2.00 means low level of self-management, scores of 2.01-3.00 means moderate level of self-management, and scores 3.01-4.00, means high level of self-management.

Validity and reliability of the instruments

Validity of the instrument

The content validity of the instruments was validated by a panel of three experts who were nurse lecturers working with Faculty of Nursing, and who had expertise in developing such instruments.

Reliability of the instrument

The internal consistency and reliability of the questionnaire in part 3, and the self-management behavior for hypertensive patients, were assessed by using Cronbach's alpha .70. A pilot study was conducted with 20 hypertensive patients in the RpmCH. The pilot study showed an internal consistency of .91 and the whole study reliability was .95.

Translation of the instrument

The instrument was translated in three steps by bilingual experts into the Bengali version based on a back translation procedure (Sperder & Devellis, 1994). First, the original English version was translated into the national Bengali language by a Bangladeshi bilingual translator. Second, the Bengali version was back translated into English by another Bangladeshi bilingual translator. Finally, the two English versions were compared by another Bangladeshi bilingual translator to check the appropriate meaning and ensure the equivalence of the two versions.

Ethical Consideration

The study was approved by the Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University and the RpMCH hospital authority. Written informed consent was obtained from the participants before the data collection. The participants were reassured that they could refuse to participate in the study and could withdraw at any time. The participants were free to ask any questions about the study. The confidentiality of the collected data was maintained throughout the study.

Data Collection Procedures

The data collection procedure consists of two phases: preparation phase and implementation phase.

Preparation phase

After getting written permission from the Faculty of Nursing, Prince of Songkla University, the researcher asked for permission to collect data from the Director of Rangpur Medical College Hospital. After obtaining permission from the Director,, the researcher met the head nurse (nursing superintendent) of the Nursing Department, she was then introduced to the head nurse of in-patient and out-patient departments and asked for permission to collect data and explained the study objective and pretests.

Implementation phase:

1. The researcher contacted the subjects, introduced herself and gave out and explained the information concerning the study. After receiving the explanations, the subjects were asked to sign an informed consent form. Verbal consent was also

accepted. However, the participants were informed that they were free to withdraw at any time without any penalty.

2. The researcher explained the questionnaires to ensure that they had understood the questions. The researcher allowed time for the subjects to answer all the questions; the researcher clarified the questions, if necessary. The questions were completed in about 30 minutes. The researcher then checked whether the questionnaires were complete, and asked the subjects to complete them as necessary.

3. The researcher coded the questionnaires to assure the anonymity of the subjects. Finally, the researcher scored the responses, and compiled them for data analysis.

Data Analysis

Descriptive statistics were used for presenting the demographic data and health-related data and self-management strategies, These consisted of frequencies, percentages, means, and standard deviations. Inferential statistics such as the independent t-test and ANOVA were used for testing factors relating to self-management.

CHAPTER 4

RESULTS AND DISCUSSION

This descriptive study aimed to identify the level of self-management among patients with hypertension in Bangladesh. The results and discussions of this study are presented as follows:

1. Demographic characteristics of the subjects
2. Health-related characteristics of the subjects
3. Self-management behaviors of the subjects
4. Factors relating to self-management behaviors

Results

Demographic Characteristics of the Subjects

For this study 110 hypertensive patients from the tertiary level hospital in Bangladesh were recruited. The mean age of the subjects was 56.22 years (SD = 14.30; range (20-87)). A total of 78 were men (70.9 %), and 32 women, 39 (35.5 %) had a high school or higher education. The majority of them were Muslims (91.8%). There were farmers (31.8%) who were working in agricultural. The majority of the subjects earned less than 5,000 Taka a month (80.9%) and lived in rural areas (71.8%). More than half of the subjects (56.3%) had 5-8 family members who were living together. Other patients' demographic characteristics are presented in Table 6.

Table 6

Frequency and Percentage of Demographic Characteristics (N = 110)

Variable	n	%
Age	M = 56.22 years; SD = 14.30, Min = 20 years, Max = 87 years	
20-46 years	30	27.3
47-59 years	32	29.1
60-87 years	48	43.6
Gender		
Male	78	70.9
Female	32	29.1
Marital status		
Single	2	1.8
Married	104	94.5
Widowed	4	3.6
Religion		
Islam	101	91.8
Hindu	9	8.2
Educational level		
No formal education	37	33.6
Primary	14	12.7
High school	39	35.5
College	13	11.8
University	7	6.4

Table 6 (Continued)

Variable	n	%
Occupation		
Service (government and private sectors)	26	23.6
Business	10	9.1
Agriculture	35	31.8
Retirement	8	7.3
Unemployment	1	0.9
House wife	30	27.3
Family's relationship		
Fair	109	99.1
Not good	1	0.9
Monthly average income		
Taka \leq 5000	89	80.9
Taka $>$ 5000	21	19.1
Residential area		
Urban	31	28.1
Rural	79	71.8
Number of family members		
1-4 persons	31	28.2
5-8 persons	62	56.3
9-15 persons	17	15.50

Health-Related Characteristics

Table 7 presented the health related characteristics. The mean systolic blood pressure was 160.55 mmHg and mean diastolic blood pressure was 96.55 mmHg. Subjects' weight ranged from 40 kg to 80 kg, with a mean weight of 56.06 kg and a SD of 8.69 kg. Body weights of most patients were in the range of 45-50 kg (40.9%). Most of the patients' had known their diagnosis for ≤ 6 years (67.3%). These patients had a history of smoking, but 50 % had stopped at the time. The most common co-morbidity was coronary artery disease, which found in nearly half of them (47.3%), followed by diabetes mellitus (13.6%), stroke (8.2%) and chronic kidney disease (3.6%).

Table 7

Frequency and Percentage of Health-Related Data (N = 110)

Variables	n	%
Blood Pressure MSBP = 160.55, SD =28.78, Min = 90, Max = 260.		
MDBP =96.55, SD = 17.90, Min = 60, Max = 150.		
Normotensive	27	24.5
Stage 1	26	23.6
Stage 2	33	30
Stage 3	10	9.1
Hypertensive crisis	14	12.7
Body weight M= 56.06, SD = 8.69, Min = 40, Max = 80		
40-50 kg	45	40.9
51-60kg	40	36.3
>60kg	25	22.8

Table 7 (Continued)

Variables	n	%
Time since diagnosis		
≤6 years	74	67.3
>6 years	36	32.6
Smoking history		
Never	48	43.6
Yes but quit now	55	50.0
Continue to smoke	7	6.4
Drinking habits		
Never	109	99.1
Everyday	1	.9
Comorbidity		
No comorbidity	40	36.4
Diabetes mellitus	15	13.6
Chronic kidney disease	4	3.6
Stroke	9	8.2
Coronary artery disease	52	47.3
(10 subjects had 2 comorbidity)		

Self-Management Behaviors

The self-management behaviors of the subjects are summarized in Table 8. The mean total score of hypertensive patients' perception of self-management

behaviors was 2.55 (SD = 0.47, ranging from 1.40 to 3.80). The mean and standard deviations of five categories of self-management for the total sample were as follows: self-integration with health professional and significant others (M = 2.3, SD = 0.55); self-regulation (M = 2.75, SD = 0.57); interaction with health professionals and significant others (M = 2.37, SD = 0.50); self-monitoring (M = 2.99, SD = 0.67), and adherence to recommended regimen (M = 2.79, SD = 0.59). Based on the categorized levels of self-management (see above), the results showed that the total self-management behaviors and each dimension of self-management behaviors were at a moderate level.

Table 8

Minimum, Maximum, Mean, Standard Deviation, and Level of Self-Management

(N = 110)

Variable	Min	Max	M	SD	Level
Total	1.40	3.80	2.55	0.47	Moderate
Self-integration	1.00	3.46	2.30	0.55	Moderate
Self-regulation	1.11	4.00	2.75	0.57	Moderate
Interaction with health professionals and significant others	1.33	4.00	2.37	0.50	Moderate
Self-monitoring	1.75	4.00	2.99	0.67	Moderate
Adherence to recommended regimens	1.00	4.00	2.79	0.59	Moderate

Table 9 shows the top five self-management behaviors which most subjects always or never practiced. The top five self-management behaviors which most subjects always practiced were: discussing treatment with doctors and nurses (40%); recognizing signs and symptoms of high blood pressure (35.5%); recognizing the changes of blood pressure (34.5%); considering portions of food when eating outside the home (34.5%); and thinking about the level of blood pressure when making food choice (34.5%). The top five self-management behaviors which most of subjects never practiced were: drinking alcohol (99.1%); reducing the amount of food per meal (87.3); exercising (77%); smoking (69.1); and controlling stress (38.2%).

Table 9

Five Items with Highest Percentage of Always Performed and Highest Percentage of Never Perform Behaviors (N = 110)

Items	n	%
Five highest percentage of always performed behaviors		
Discussing treatment plan with doctors or nurses	44	40.0
Recognizing signs and symptoms of high blood pressure	39	35.5
Recognizing the changes of blood pressure	38	34.5
Considering portions of food when eating outside the home	38	34.5
Thinking the level of blood pressure when making food choice	38	34.5
Five highest percentage of never performed behaviors		
Drinking alcohol	109	99.1
Reducing the amount of food per meal	96	87.3
Exercising	85	77
Smoking	76	69.1
Controlling stress	42	38.2

Factors Relating to Self-Management Behaviors

Demographic and health-related factors were examined to find out whether they were related to or affecting the self-management behaviors of patients with hypertension. Using independent t-test for 2-level independent variables (gender and comorbidity) and one-way analysis of variance (F-test) for 3 or more than 3 levels of the independent variables, the findings are shown in Table 10. For demographic factors, it was found that middle aged and young adults had significantly higher self-management scores than older adults ($t = 4.54, p < .05$); females had higher scores than males ($t = 2.66, p < .05$); subjects with no education had lower self-management scores than those who had been educated ($F = 5.89, p < .001$); and subjects who lived in urban areas had higher self-management scores than those who lived in rural areas ($t = 3.24, p < .001$). The only demographic variable that was not significant was income.

Between the two identified health-related variables, only time since diagnosis was found to be significant. The subjects who had longer times since diagnosis (>6 years) had higher self-management scores than those who had shorter time (≤ 6 years) ($t = -2.44, p < .05$).

Table 10

Comparing Mean Difference of Self-Management According to Demographic Factors and Health Related Factors Using Independent t-Test or ANOVA (N=110)

Factors		n	M	SD	t/F	p-value
Demographics						
Age	Young Adult (20-40 years)	19	2.53	0.43	4.54	.01
	Middle Aged Adult (41-65 years)	66	2.64	0.45		
	Old Adult (> 65 years)	25	2.32	0.47		
Gender	Male	78	2.47	0.44	-2.66	.01
	Female	32	2.73	0.49		
Education	No	14	2.25	0.52	5.89	.00
	Primary and high school	52	2.68	0.47		
	College and University	44	2.48	0.39		
Income	≤5000 Taka	89	2.50	0.45	-1.76	.08
	>5000 Taka	21	2.70	0.50		
Residential area	Urban	31	2.77	0.49	3.24	.00
	Rural	79	2.46	0.42		
Health-related data						
Time since diagnosis	≤6 years	90	2.49	0.44	-2.44	.01
	>6 years	20	2.77	0.50		
Comorbidity	No	40	2.50	0.51	-0.77	.44
	Yes	70	2.57	0.44		

t = t-test; F = ANOVA

Discussion

Demographic data of the subjects

Most of the participants were Muslim (91.8%) and this might be related to the fact that Islam is the main religion in Bangladesh. Unsurprisingly, more than half of the participants had 5-8 family members, reflecting the large families common in the Bangladeshi culture.

The mean age of the subjects was 56.22 years (SD = 14.30; range 20-87 years) and most of the subjects were over 47 years. The results of the study support the idea that the incidence rate of hypertension increases with age and primary hypertension typically occurs between the age of 30 and 50 years (Blacks & Hawks, 2005). The majority of the subjects were male. The gender of the hypertensive patients in this study was consistent with the hypertensive literature that has reported that the overall incidence of hypertension is higher in men than in women until about the age of 55 years, while the risk to men and women are almost equal between the ages of 55 and 74 years. After the age of 74 years, women are at greater risk (Blacks & Hawks). These findings are also in accordance with a previous study (Salman & Al-Rubeaan, 2009) that noted that older and male patients are at greater risk of hypertension.

Half of the subjects had histories of smoking. Rahman and Zaman (2008) also found that a history of using tobacco, either smoking heavily or less, was strongly associated with coronary heart disease and hypertension. A majority of participants were Muslim and their religion asserts that alcohol is harmful to health. About two-thirds (67.3%) of them had known the diagnosis for ≤ 6 years and had developed at least one comorbidity such as coronary artery disease, diabetes, stroke, or chronic

kidney disease. These comorbidities are commonly found in hypertensive patients who have hypertension for few years (Smeltzer & Bare, 2004). In addition, the majority of the subjects had high levels of blood pressure and only 24.5% were in normal stages of hypertension. All subjects had to pay for their medical treatment as there is no policy in Bangladesh to provide medications/drugs for discharged patients. Therefore, all medication was bought from outside the hospitals.

Self-management behaviors

The findings of this study showed that the total mean score and all the dimensions of self management behaviors among the subjects were at the moderate level. These findings can be explained as follows.

One of the major health programs in Bangladesh is an Expanded Program on Immunization (EPI) against six killer diseases including tuberculosis, whooping cough, diphtheria, tetanus, measles, poliomyelitis, and family planning (due to the high population density). For hypertension, doctors are mainly responsible for the management of hypertension while nurses are rarely involved in health education and hypertensive care. When a patient is discharged from the hospital, doctors give a written discharge certificate. 'This contains the patient's address, investigation report, and name of the necessary medication. There are also written instructions about related health education included. According to Xu, Toobert, Savage, Pan, and Whitmer (2008), the communication between the provider and the patient may play the more important role in building patients' knowledge base, belief about treatment and confidence in the management of illness.

Hospitals in Bangladesh have a shortage of nurses (Hadley, Blum, Mujaddid, Parveen, Nuremowla, Haque et al., 2006). The distribution of physician per 10,000 population was 3.0 in 2005, whereas the nurses available per 10,000 population was only 1.4 in 2004 (World Health Organization, 2007). Due to the shortage of health care staff in Bangladesh, doctors and nurses might spend too little time talking with their patients. As a consequence, patients may be unable to have the chance to discuss their health and self-management strategies with their doctors. As a result they do not receive comprehensive hypertensive self-management education.

In addition, thirty seven patients had not received formal education. Most of them were illiterate. They were unable to read or understand the written discharge certificate. Several authors (Jerant, Friederichs-Fitzwater, & Moore, 2005; Mead, Andres, Ramos, Siegel, & Regenstein, 2010; Riegel, Carlson, & Glaser, 2002) have found that lack of provider support and poor physician communication and lack of knowledge were the main barriers to self-care or self-management among patients with heart disease and other chronic diseases. These barriers therefore, may affect their abilities to maintain their self-management of hypertension well.

Furthermore, most of the subjects in this study were poor and lived in rural areas. The majority of them were working in the farm or were housewives. Economic conditions and place of residence may affect their self-management behaviors. They may not be able to afford to pay for medication, healthy food and for the fares to the hospital if it was located far from their home. These subjects may not be able to travel to see doctors regularly. Jerant et al. (2005) found that financial constraints and costs of care were the most common barriers to accessing self-management support

resources. In addition, Gucciardi, Demelo, Offenheim, and Stewart (2008) stated that ongoing follow-up and continued assistance with self-management needs was an important feature of chronic disease management programs. As a consequence, the subjects in this study may not be able to perform self-management on a regular basis.

Self-monitoring dimensions had the highest mean score, compared to other dimensions. Self-monitoring dimension is about testing blood pressure when experiencing symptoms. All subjects had developed hypertension for more than one year and most of them were in an advanced stage of hypertension. Therefore, they may have had symptoms experiences related to high or low blood pressure. As a consequence, they would be able to notice any changes in their health-related hypertension symptoms and seek blood pressure tests.

The top five of self-management behaviors which most subjects always practiced were: discussing treatment with doctors and nurses; recognizing the signs and symptoms of high blood pressure; recognizing the changes in blood pressure; considering portions of food when eating outside the home; and thinking about the level of blood pressure when making food choice. Most of subjects had developed hypertension for more than 1 year and the majority of them were in the advanced stage. They therefore learned about symptoms of hypertension and also learned how to adapt their self-management behaviors to control their blood pressure.

On the other hand, the top five of self-management behaviors which the most of subjects never practiced were drinking alcohol; reducing the amount of food per meal; exercising; smoking; and controlling stress. These findings are not surprising and can be explained. In this study, the majority of the subjects were Muslim.

Drinking alcohol was a religious restriction. The majority of subjects were poor. They might not have enough food to meet body requirements. Most of the people in Bangladesh have poor economic conditions, and people have low quality food. Based on the researcher's observation, most of them are not overweight. They may perceive that it is not necessary to reduce the amount of food per meal.

Most of them were farmers (31.8) and housewives, (27.3). Such people work hard physically. Women do all the household work and males work outside the house. They may feel that working on the farm or in the house was a form of exercise. They thus thought that rest, not exercise, was necessary for them, so most of the people did not exercise. It is hard for the subjects to reduce stress in their daily life. Most of subjects had incomes lower than 5,000 Taka per month. It was found that the anxiety and pressures related to earning a living, and honoring material obligations to members of the extended family living abroad was the main cause of stress for men while isolation, lack of informal support, language barriers and inability to access essential services and to communicate with key professionals (Netto, McCloughan, & Bhatnagar, 2007). Perceived financial stress is strongly connected to smoking and not being able to give it up (Nystedt, 2006). As a consequence, these subjects were not able to reduce stress and quit smoking in their daily lives.

Factors affecting self-management

The results of this study showed that middle aged and young adults had higher self-management behaviors compared to older people. The capacity to understand and communicate is good among young adult and middle age groups but reduced in older groups due to cognitive impairment. Sinclair, Girling, and Bayer (2000) stated that the

cognitive dysfunction in the elderly is associated with changes in self-care behavior and use of both health and social services. The cognitive deficits may make daily decision-making challenging by impairing the perception and interpretation of early symptoms and reasoning and thereby delay early treatment implementation (Dickson, Tkacs, & Riegel, 2007). This finding in this present study is not consistent with some previous studies. Lee et al. (2010) found that older patients with hypertension had better self-care behaviors.

In the present study it was found that females had higher self-management behaviors ($M = 2.73$, $SD = 0.49$) compared to males ($M = 2.47$, $SD = 0.44$). This might be because most of Bangladesh women are housewives and they maintain all household work, such as cooking, cleaning, and taking care of children and older people. Chung et al. (2006) found that women have more knowledge about disease than men, they therefore may be better able to adapt meals to a sodium restricted diet as they are responsible for preparing meals. In addition, Yount, Agree, and Rebellon (2004) found that women often report they visit providers and use medication more often than men.

Primary to high school respondents, college, and university respondents had higher self-management behavior compared to those with no education. The findings in the current study support those of previous studies. Kolbe (Kolbe, 2002) demonstrated that education is regarded as an essential prerequisite for self-management of a chronic disease. Weijman, Ros, Rutten, Schaufeli, Schabracq, and Winnubst (2004) also found that level of education was related to the frequency of self-management. Urban people's self-management is higher than rural people's. This

is because in urban areas there are many private and government health care organizations, many doctors and many departments of medicine available. On the other hand, for rural people the health care organizations are far from their residences, there are few health care providers and drug stores and these factors influence self-management.

Length of time since diagnosis more than six years was associated with higher self-management compared to those with less than 6 years. Thus longer duration of hypertension was associated with better self-management behavior. The finding of this study is consistent with a previous study. Lee et al. (2010) found a positive relationship between years of hypertension and self-care behavior. They stated that those with longer durations of hypertension might have had more learning opportunities available to them.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This descriptive study aimed to identify the level of self-management among patients with hypertension in Bangladesh. One hundred and ten patients were recruited using a purposive sampling method from a tertiary level hospital in Bangladesh. Data collection and interviews took place from January 2010 to February 2010. The instrument used in this study was developed by the researcher and was based on the Diabetes Self-Management Instrument, developed by Lin et al. (2008). The instrument had three parts: part 1 the demographic characteristics covering patient's personal information; part 2 the health-related characteristics covering patient's health-related information; and part 3 the self-management questionnaire which covered the five dimensions of self-management. The data were analyzed by using a computer program. Following the foregoing results and discussion, the conclusions, recommendations and limitations of this study are presented here.

Summary of the Study Findings

The mean age of the subjects was 56.22 years (SD = 14.30; rang 20-87). Of these 78 were men (70.9 %), and 39 (35.5 %) of all subjects had a high school or higher education. The majority of them were Muslim (91.8%). More than thirty percent were farmers. The majority of the subjects earned less than 5,000 Taka (80.9%) and lived in rural areas (71.8%). More than half of the subjects (56.3%) had 5–8 family members that were living together.

The mean systolic blood pressure was 160.55 mmHg and mean diastolic blood pressure was 96.55 mmHg. Subjects' weight ranged from 40 kg to 80 kg, with a mean of 56.06 kg and an SD of 8.69. The body weight of most patients (40.9%) was 40-50 kg. Most of the patients' had known their diagnosis for ≤ 6 years (67.3%). Most of them had a smoking history, but about (50.0%) patients had stopped. The most common comorbidity was coronary artery disease (47.3%), followed by diabetes mellitus (13.6%), stroke (8.2%) and chronic kidney disease (3.6%).

The mean total score of patients' perception of self-management behaviors was 2.55 (SD = 0.47). Among the five dimensions, the highest mean score was for self-monitoring (M = 2.99, SD = 0.67), followed by adherence to treatment regimen (M = 2.79, SD = 0.59). The lowest score was for self-integration (M = 2.3, SD = 0.55). The total self-management score and each dimension score were all at the moderate level.

The five self-management behaviors in which the most subjects 'always practice' were, in order: 'discussing treatment plan with doctors or nurses' (40%); 'recognizing signs and symptoms of high blood pressure' (35.5%); 'recognizing the changes of blood pressure'; 'considering portions of food when eating outside the home' (34.5%); and 'thinking about the level of blood pressure when making food choice' (34.5%). The five self-management behaviors which most subjects 'never practice,' were, in order: 'drinking alcohol' (99.1%); 'reducing the amount of food per meal' (87.3%); 'exercising' (77%); 'smoking' (69.1); and 'controlling stress' (38.2%).

Middle aged and young adults had significantly higher self-management scores than older adults ($t = 4.54, p < .05$). Females had higher scores than males

($t = 2.66, p < .05$). Uneducated subjects had lower self-management scores than those who had been educated ($F = 5.89, p < .01$). Subjects who lived in urban areas had higher self-management scores than those lived in rural areas ($t = 3.24, p < .001$). In addition, the time since diagnosis was found to be significant. Subjects who had longer times since diagnosis (>6 years) had higher self-management scores than those who had shorter times (≤ 6 years) ($t = -2.44, p < .01$).

Implications and Recommendations

Self-management among patients with hypertension is a comparatively new concept for Bangladesh. For nurses, this is the first study to research this topic.

Nursing practice

The findings of this study indicated that health care providers should be used as an important source of information for promoting self-management among hypertensive patients. As 33.6 % of the subjects were illiterate, written health education is not sufficient, so discussion with patients and caregivers is also necessary with these and elder patients. Male patients' self-management levels were lower; identifying the cause of this is necessary and care should be provided accordingly. Health professionals may need to be focused more on those who are at relatively high risk because of low level of self-management, such as older patients, those with less education, male patients and individuals recently diagnosed with hypertension.

Nursing education

The result of this study could be used in nursing education and preparing future nurses with skills in this subject at an acceptable standard and level.

Nursing research

Further studies are needed to explore this phenomenon using a larger number of sample and various settings. However, in order to gain detailed knowledge, a descriptive study is not sufficient. An experimental study would provide more understanding and information. Furthermore, the instrument used in this study needs further consideration and revision in order to enhance its validity and reliability.

Health policy

According to the findings of this study, a self-management education program should be put in place at each healthcare center and hospital in order to prevent strokes, others comorbidities and death resulting from hypertension.

Limitations

The limitations of this study are that the sample size was very small and only one government hospital was used. This study is a simple descriptive study and convenient sampling was used. Another limitation was that the body mass index was not measured.

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APPENDIXES

Appendix A

Informed Consent Form

Study Title: Self-management among patients with hypertension in Bangladesh.

My name is Nargis Akhter, I am a master's degree student of the Faculty of Nursing, Prince of Songkla University. I am also a senior staff nurse (RN). at Rangpur Medical College Hospital Rangpur Bangladesh. I am conducting a study "self-management among patients with hypertension in Bangladesh." This is to fulfill the requirement of the Master of Nursing Science Program at Prince of Songkla University, Hatyai, Thailand.

All the procedures of this study have been approved by the appropriate authority and the Institutional Review Board of the Prince of Songkla University, Thailand. The study procedures involve no foreseeable risk of harm to you or your organization. A code number is used so that your personal identity was not be disclosed.

The information gathered will be used to write a research report. The findings of this study will be useful for nurses and doctors to understand how patients with hypertension like you take care of yourself so that they can find ways to help patients better than ever before.

All information in connection with this study will remain confidential. The question will be destroyed after completion of the study. Your participation in this study is voluntary. You have the right to participate or not to participate. You also have the right to withdraw at any time.

Lastly, returning the questionnaire indicates that you understand what is involved and your consent to participate in this study. You are free to ask any question about the study or being a subject.

-----	-----	-----
(Name of participant)	(signature of the participant)	Date
-----	-----	-----
(Name of Researcher)	(Signature of Researcher)	Date

If you have any questions related to the questionnaires now or any time during the study, please feel free to ask or discuss with me. Please contact me at the following address

Contact:

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Appendix B

Instruments

Code: -----.

Date and Time: -----

Hospital: -----

Part A: Demographic Data Assessment Form (DDAF):

Please select the best answer (s) that can be one or multiple choices corresponding to your situation and fill “√” in the box () next to the answer you have selected

	CODE
1. Ageyear	
2. Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	
3. Religion <input type="checkbox"/> Buddhist <input type="checkbox"/> Islam <input type="checkbox"/> Hindus <input type="checkbox"/> Christian	
4. Marital status <input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed	

	CODE
<p>5. Level of education</p> <p><input type="checkbox"/> Primary</p> <p><input type="checkbox"/> High school</p> <p><input type="checkbox"/> College</p> <p><input type="checkbox"/> University</p> <p><input type="checkbox"/> No formal education</p> <p><input type="checkbox"/> Other.....</p>	
<p>6. Occupation</p> <p><input type="checkbox"/> Service</p> <p><input type="checkbox"/> Business</p> <p><input type="checkbox"/> Agriculture</p> <p><input type="checkbox"/> Retired</p> <p><input type="checkbox"/> Unemployed</p> <p><input type="checkbox"/> Others</p>	
<p>7. Monthly average income</p> <p><input type="checkbox"/> < Taka 5000</p> <p><input type="checkbox"/> Taka 5001-15000</p> <p><input type="checkbox"/> Taka15001-30000</p> <p><input type="checkbox"/> Taka 30001-50000</p> <p><input type="checkbox"/> > Taka 50000</p>	

	CODE
<p>8. Where you live now?</p> <p><input type="checkbox"/> Urban</p> <p><input type="checkbox"/> Suburban</p> <p><input type="checkbox"/> Rural</p>	
<p>9. Number of family members -----</p>	
<p>10. Getting medicine</p> <p><input type="checkbox"/> All from hospital</p> <p><input type="checkbox"/> All need to buy</p> <p><input type="checkbox"/> Some from hospital and some need to buy</p>	
<p>11. Family's relationship</p> <p><input type="checkbox"/> Good relationship</p> <p><input type="checkbox"/> Fair</p> <p><input type="checkbox"/> Not good</p>	

Health - Related Data Assessment Form

CODE

Blood Pressure.....

Body weight.....

Time since diagnosis.....

Smoking history

 Never Yes but quit nowyear Continue to smokestick / day

Drinking habit

 Never Monthly Two or four times a month Two or three times a week Four or more times a week Every day.....with amount

Co-morbid

 No comorbidity Diabetes mellitus Chronic kidney disease Stroke Coronary artery disease

Appendix C

Self-Management Instruments

Instruction

This questionnaire is aimed to assess **how often you have performed things** related to hypertension control **in the last months**. There is no right or wrong answer.

Therefore, please answer truly to each statement to indicate your actual behavior by marking X in the column that applies to you using the following 5 options:

1 = Never (I have never performed the behavior)

2 = Rarely (I have rarely performed the behavior)

3 = Sometimes (I have sometimes performed the behavior)

4 = Always (I have always performed the behavior)

N/A = Not applicable (this behavior is not applicable to my life)

Examples:

No.	Hypertension Self-Management Behavior	1	2	3	4	N/A
1.	I have eaten fruits, vegetable, grains, and beans more than when I did not have hypertension				X	

If you mark (X) in column 4, it means you have always eaten fruits, vegetable, grains, and beans more, when compared with before you have been diagnosed of hypertension.

Now, please respond to the following statements according to your real life situation

No.	Hypertension Self-Management Behavior	1	2	3	4	N/A
Self-Integration						
1	I have considered about food portions and choices whenever I have to eat food.					
2	I have eaten fruits, vegetable, grains, and beans more than when I did not have hypertension					
3	I have decreased food that contains high saturated fat (e.g., cheese, coconut oil, cottonseed oil, mutton fat etc.) since being diagnosed.					
4	I have thought of my blood pressure when making food choice					
5	I have tried to stop drinking alcohol					
6	I have reduced the amount of food per meal to reduce my weight					
7	I have chosen less salty food.					
8	I have exercised to reduce my weight (such as walking, jogging (running), and/ or cycling for about 30-60 minutes/session)					
9	I have thought that my hypertension is a part of my life					
10	I have made my routine to fit with things I have to do for my hypertension (such as my work and my hospital/doctor visit)					
11	I have quitted smoking/I have tried to quit smoking					
12	I have tried to control my stress by listening to music, taking rest, talking with my family or my friends					
13	I never use extra salt to season my food since being diagnosed					

No.	Hypertension Self-Management Behavior	1	2	3	4	N/A
Self-regulation						
14	I have recognized why my blood pressure has changed					
15	I have recognized signs and symptoms of high blood pressure					
16	I have managed my hypertensive signs and symptoms properly					
17	I have recognized signs and symptoms of low blood pressure					
18	I have managed my hypotensive signs and symptoms properly					
19	I have made my goal towards my blood pressure control					
20	I have made my action plan to achieve my goal towards my blood pressure control					
21	I have compared my current blood pressure level with the target (desired, controlled) level					
22	I have managed situations that may increase my blood pressure					
Interaction with health professionals and significant others						
23	I have discussed the flexibility of treatment plan with my doctor or nurses regarding my treatment plan.					
24	I have suggested my doctor to change the treatment plan if I may not be able to conform with the plan					
25	I have asked my doctor or nurses when there are things I do not understand					
26	I have helped my doctor or nurses to find why my blood pressure is not well controlled					
27	I have discussed with my doctor or nurses when my blood pressure is too high or too low.					
28	I have asked my doctor or nurses where I can learn more about my hypertension					

No.	Hypertension Self-Management Behavior	1	2	3	4	N/A
29	I have asked others (such as friends, neighbors, other patients) for their help with my high blood pressure					
30	I have asked others (such as friends, neighbors, other patients) for their help in controlling my blood pressure					
31	I have asked others (such as friends, neighbors, other patients) how they have managed or what techniques they have used to control their high blood pressure					
Self-monitoring						
32	I have checked or have visited my doctor to check my blood pressure when I have experienced signs and symptoms of high blood pressure					
33	I have checked or have visited my doctor to check my blood pressure when I have felt sick					
34	I have checked or have visited my doctor to check my blood pressure when I have experienced signs and symptoms of low blood pressure					
35	I have checked my blood pressure on a regular basis to help make my self-management decision					
Adherence to recommended regimen						
36	I have strictly taken my antihypertensive medications					
37	I have taken the right amount of my antihypertensive medications (e.g., my doctor orders me to take 2 tablets, I also take 2 tablets)					
38	I have taken the right time of my antihypertensive medications (e.g., my doctor orders me to take 2 times a day, I also take 2 times a day)					
39	I have visited my doctor as scheduled					
40	I have followed my doctor's or nurses' advise regarding my blood pressure control					

Table 11

Mean, and Standard Deviation, of Self-Management Among Patients with Hypertension (N =110)

No		Mean	SD
Self-Integration			
1	I have considered about food portions and choices whenever I have to eat food.	2.99	1.018
2	I have eaten fruits, vegetable, grains, and beans more than when I did not have hypertension	2.95	1.008
3	I have decreased food that contains high saturated fat (e.g., cheese, coconut oil, cottonseed oil, mutton fat etc.) since being diagnosed.	2.99	1.009
4	I have thought of my blood pressure when making food choice	3.00	1.014
5	I have tried to stop drinking alcohol	1.01	.095
6	I have reduced the amount of food per meal to reduce my weight	1.27	.777
7	I have chosen less salty food.	2.57	.760
8	I have exercised to reduce my weight (such as walking, jogging (running), and/ or cycling for about 30-60 minutes/session)	1.49	.993
9	I have thought that my hypertension is a part of my life	2.85	.921
10	I have made my routine to fit with things I have to do for my hypertension (such as my work and my hospital/doctor visit)	2.58	.817
11	I have quitted smoking/I have tried to quit smoking	1.72	1.182
12	I have tried to control my stress by listening to music, taking rest, talking with my family or my friends	1.98	.948
13	I never use extra salt to season my food since being diagnosed	2.49	.906
Self-regulation			
14	I have recognized why my blood pressure has changed	3.03	.962
15	I have recognized signs and symptoms of high blood pressure	3.27	.619

Table 11 (*Continue*)

No		Mean	SD
16	I have managed my hypertensive signs and symptoms properly	2.79	.692
17	I have recognized signs and symptoms of low blood pressure	2.75	.859
18	I have managed my hypotensive signs and symptoms properly	2.61	.651
19	I have made my goal towards my blood pressure control	2.64	.687
20	I have made my action plan to achieve my goal towards my blood pressure control	2.55	.712
21	I have compared my current blood pressure level with the target (desired, controlled) level	2.49	.739
22	I have managed situations that may increase my blood pressure	2.58	.734
Interaction with health professionals and significant others			
23	I have discussed the flexibility of treatment plan with my doctor or nurses regarding my treatment plan.	3.20	.810
24	I have suggested my doctor to change the treatment plan if I may not be able to conform with the plan	3.04	.716
25	I have asked my doctor or nurses when there are things I do not understand	2.70	.914
26	I have helped my doctor or nurses to find why my blood pressure is not well controlled	2.78	.696
27	I have discussed with my doctor or nurses when my blood pressure is too high or too low	2.99	.723
28	I have asked my doctor or nurses where I can learn more about my hypertension	1.34	.781
29	I have asked others (such as friends, neighbors, other patients) for their help with my high blood pressure	1.75	.627
30	I have asked others (such as friends, neighbors, other patients) for their help in controlling my blood pressure	1.75	.597
31	I have asked others (such as friends, neighbors, other patients) how they have managed or what techniques they have used to control their high blood pressure	1.77	.601

Table 11 (*Continue*)

No		Mean	SD
Self-monitoring			
32	I have checked or have visited my doctor to check my blood pressure when I have experienced signs and symptoms of high blood pressure	3.09	.819
33	I have checked or have visited my doctor to check my blood pressure when I have felt sick	3.23	.712
34	I have checked or have visited my doctor to check my blood pressure when I have experienced signs and symptoms of low blood pressure	2.95	.917
35	I have checked my blood pressure on a regular basis to help make my self-management decision	2.71	.770
Adherence to recommended regimen			
36	I have strictly taken my antihypertensive medications	2.89	.668
37	I have taken the right amount of my antihypertensive medications (e.g., my doctor orders me to take 2 tablets, I also take 2 tablets)	2.95	.696
38	I have taken the right time of my antihypertensive medications (e.g., my doctor orders me to take 2 times a day, I also take 2 times a day)	3.01	.642
39	I have visited my doctor as scheduled	2.56	.698
40	I have followed my doctor's or nurses' advise regarding my blood pressure control	2.56	.711

Appendix D
List of Experts

Three experts examined the content validity of the instruments for self-management among patients with hypertension.

They are:

1. Asst. Prof. Dr. Wongchan petpichetchian Faculty of Nursing PSU.
2. Assoc. Prof. Dr. Wandee Suttharangsee Faculty of Nursing PSU.
3. Md. Nurul Anwar Ph.D. student Faculty of Nursing PSU.

VITAE

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