Original Article *นิพนธ์ต้นฉบับ*

Perceptions and Health Behaviors of Hypertensive Patients at the Phichit Hospital's 12 Primary Care Units

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Abstract The prospective empirical research was conducted to assess perceptions of hypertension and health behaviors in a group of hypertensive patients, and to test the associations among these variables. A total of 496 patients seeking treatment at 12 primary care units within the healthcare network of the Phichit Hospital were asked to complete an anonymous pencil and paper survey between March and May 2008. Surveys contained items measuring demographic variables, perceptions of hypertension, and health behaviors. Results indicate a significant number of participants with low perceptions of health behavioral modifications to control hypertension 36.6 percent, severity of hypertension 31.6 percent, and risk factors associated with blood pressure elevation 23.2 percent. Participants needed most improvement with their diets 40.0 percent, their ability to cope with stress 23.2 percent, and their social relationships 18.0 percent. Results of linear regression indicated significant positive associations between perceived severity of hypertension and compliance with medication ($p < 0.01$), between social relationships and coping with stress ($p < 0.01$), and between social relationships and seeking medical attention ($p < 0.01$). Present findings provide useful evidence that may be used in the development of appropriate intervention programs to help manage hypertension in similar patient populations.

Key words: **hypertension, perceptions, health behaviors, primary care unit**

Introduction

Hypertension is a chronic disease characterized by a systolic and diastolic blood pressure equal to or greater than 140 mmHg and 90 mmHg, respectively[1]. It is associated with many risk factors, including age and BMI[2], and has been linked to cerebrovascular accidents, heart failure, and renal failure[3]. In addition, it has been found to significantly increase the risks of all-cause mortality by 41 percent[4]. Hypertension is indeed a burden to the medical community, and as its global prevalence continues to rise, it quickly becomes a critical issue in need of immediate attention.

According to a 2000 census, twenty-six percent

of the world's adults, or approximately one billion individuals, are afflicted with hypertension, with this amount expecting to rise to twenty-nine percent by 2025[5]. It can be found in both economically-developed and developing countries, such as Denmark and Thailand, respectively[6]. Although hypertension may generally be more prevalent among developed countries, the higher populations of developing countries results in an overall higher number of affected individuals[5]. Furthermore, developing countries have been characterized by limited healthcare resources[7], which in turn, may prevent this disease from being effectively managed. Limited resources combined with greater number of afflicted individuals may prove to be a substantial public health challenge to third world nations.

In Thailand, prevalence of hypertension was found to be highest among adults over 35 years of age, with eleven percent of this population, or approximately 2.4 million individuals, afflicted[8]. Nationwide management of this disease is conducted at the district and sub-district level by non-profit, government hospitals and the primary care units (PCUs) that are within their healthcare networks. Each PCU is a medical facility equipped with medical personnel, supplies, and sufficient medication to provide patients with primary care. These hospitals and their respective PCUs are responsible for the public screening of hypertension, for the identification and registration of hypertensive individuals, and for their short and long-term treatment. The collaborative efforts between each non-profit hospital and its PCUs within the many districts of each of the 76 provinces of Thailand make nationwide management of hypertension possible.

In the Phichit province of Thailand, approximately 13 percent of all adults over 35 years of age, including the elderly, are hypertensive and currently seeking treatment[9]. Healthcare is provided for this population and is managed at the district level primarily by 8 non-profit, government hospitals within 11 districts of the Phichit province. In two of theses districts, specifically the Mueang and Sak Lek districts, medical treatment is provided and managed by the Phichit Hospital and twelve PCUs that are within its healthcare network. Hypertensive patients, who are otherwise unable to acquire treatment at private hospitals or clinics, seek treatment directly at the Phichit Hospital or at one of the twelve PCUs where they are registered. Management of hypertension, therefore, becomes a collaborative effort between the Phichit Hospital and its twelve PCUs as they individually provide treatment for their patient populations.

Treatment strategies for the hypertensive population seeking treatment at PCUs in the Mueang and Sak Lek districts have so far included the following: 1) Offering counseling sessions to those diagnosed with the disease, 2) Prescribing anti-hypertensive medications, 3) Providing follow-up care in the form of home visits, and 4) Promoting physical activity, appropriate diets, and stress release[10]. However, according to a 2007 provincial census, only 44.5 percent and 60.9 percent of hypertensive patients seeking treatment at PCUs in the Mueang and Sak Lek districts, respectively, are able to control their own blood pressure[9]. The staggering figures suggests that other factors, aside from health behaviors, may be hampering disease management. The elucidation of these factors and the possible increase in ability to manage this disease in this population warrants increased efforts to assess hypertensive patient characteristics.

The present study was a prospective empirical research study that largely utilizes the Health Promotion Model of Pender[11] to investigate perceptions of hypertension and health behaviors in a group of hypertensive patients in the Mueang and Sak Lek districts. It also proposed to determine possible associations between these variables. By assessing the char-

acteristics of the sample population, health officials might be given better insights into the characteristics of the general hypertensive patient population at PCUs within the Phichit Hospital's healthcare network and how they were associated with difficulties in disease management.

Methodology

Sample and Procedures

The sample consisted of 496 hypertensive patients seeking treatment at the twelve PCUs that are within the Phichit Hospital's health care network. Recruitment was conducted on-location and simultaneously across the 12 PCUs between March and May of 2008. It was conducted on days in which hypertensive patients were scheduled for their follow-up visits.

Subjects over 35 years of age were approached and asked to complete an anonymous pencil and paper survey that assessed their perceptions of hypertension, specific health behaviors, and demographic information. For those participants that were either illiterate or were otherwise unable to complete the surveys by themselves, recruitment was conducted in an interview format. Public health officials served as interviewers using the items on the survey as interview questions and subjects were asked to complete each survey verbally. Surveys completed in the interview format contained no identities in order to remain anonymous. Each survey was completed within 15 minutes from the beginning of its administration.

The size and representativeness of the sample population were determined using the statistical technique of average variability[12,13]. Known demographic data of the hypertensive patient population were compared to those of the sample population at each respective PCU. Recruitment ended when the sample population was deemed representative of the actual hypertensive patient population.

Measures

Perceptions of Hypertension

Perceptions of hypertension was measured using the Perceptions of Hypertension Scale (Cronbach alpha = 0.82), a modified version of the questionnaire Chamnansua and Krirkgulthorn[14] used in their study. This questionnaire consisted of 19-items that were score on a 3-point scale ranged from 1 = Disagree to 3 – = Agree. It could be further divided into three subscales: The SEVERE subscale (Cronbach alpha coefficient 0.82), the RISK subscale (Cronbach alpha coefficient 0.72), and the CONTROL subscale (Cronbach alpha coefficient 0.76), which consists of 7, 7, and 5-items, respectively. The SEVERE subscale measured perceived severity of hypertension, while the RISK subscale measured perceived risk factors associated with blood pressure elevation. Possible scores on these two scales ranged from 7 to 21. The CONTROL subscale measured perceived health behavioral modifications that could help control hypertension. Possible scores on this scale ranged from 8 to 24. Continuous scale scores were obtained by reverse-scoring (i.e., 1=3, 3=1, etc.) all negatively-stated items and then summing the scores of all items.

Health Behaviors

Health behaviors of hypertensive patients were assessed using the Hypertensive Patient Health Behaviors Questionnaire (Cronbach 0.74), a modified version of the questionnaire Chamnansua and Krirkgulthorn[12] was used in their study. This questionnaire consisted of 26-items rated on a 4-point Likert-type scale ranging from 1 – Never to 4 – Always. It could be divided into six subscales: The SEEKMED subscale (Cronbach 0.77), the COMPLY subscale (Cronbach 0.76), the PHYSICAL subscale

(Cronbach 0.74), the DIET subscale (Cronbach 0.87), the SOCIAL subscale (Cronbach 0.75), and the COPING subscale (Cronbach 0.72), which consisted of 3, 7, 4, 4, 4, and 4-items, respectively. The SEEKMED subscale measured how often respondents sought medical attention, whether for regular check-ups or for any particular illnesses. Possible scores on this scale ranged from 3 to 12. The COMPLY subscale measured how they complied with medication. Possible scores on this scale ranged from 7 to 28. The PHYSICAL subscale measures the level of physical activity in which respondents were currently engaged. The DIET subscale measured the degree to which respondents had diets appropriate for their hypertensive conditions. The SOCIAL subscale measured the degree to which respondents had positive social relationships with their family and peers. The COPING subscale assessed how well respondents cope with stress. Possible scores on these five scales ranged from 4 to 16. Continuous scale scores were obtained by reverse-scoring (i.e., 1-4, 2-3, etc.) on all negatively-stated items and then summing the scores of all items.

Statistical Methods

The SPSS version 14.0 software[13] was used to analyze data in the present study. Descriptive statistics were computed to present demographic data, including age, gender, BMI, education, occupation, and monthly income. Independent samples t-tests were used to compare mean scores between subgroups of different genders. One-Way Analysis of Variance (ANOVA) with post-hoc tests using the Scheffe correction was used to compare mean scores between subgroups of different BMI, level of education, occupation, and monthly income. Linear regression was used to assess the associations among perceptions of hypertension and health behaviors.

Categorization of subscale scores were determined using mean-values and standard deviations. For each subscale, scores that were equal to or greater than the sum of the mean score and the standard deviation were categorized as "high." Scores equal to or less than the difference between the mean score and the standard deviation were categorized as "low." Any score between the sum of and the difference between the mean score and the standard deviation was categorized as "normal".

Table 1 Participant characteristics (n=496 patients)

Characteristics	Value (%)
Age*, $\bar{X}$ (SD)	61.83 (11.24)
Gender	
Male	31
Female	69
BMI	
Underweight	4.6
Normal	46.2
Overweight	36.0
Obese	13.2
Level of Education	
No education	15.4
Elementary school-level	77.0
Junior high school-level	5.2
High school-level	1.4
College-level	1.0
Present Occupation	
Unemployed	38.8
Farmer	30.6
Manual laborer	17.6
Private business owner	10.8
Government official	1.2
Retired with pension	1.0
Monthly Income (baht)	
No income	24.2
<5,000	46.2
5,001-10,000	16.2
10,001-15,000	3.4
15,001-20,000	2.0
>20,000	8.0

**Mean (Standard Deviation)*
BMI - Body Mass Index

Results

The sample population consisted of 496 hypertensive patients between 35 and 93 years of age ($\bar{x}$ 61.83, SD 11.242), and was predominantly female (69%). In terms of education, the majority (92.4%) of the participants had elementary school-level education or lower. Over a third of the participants (38.8%) were unemployed, and the majority (70.4%) had a monthly income of less than 5,000 baht. Furthermore, over a third (49.2%) of the participants was either overweight or obese. Demographic characteristics of the sample are shown in Table 1.

Approximately 36.6 percent of the participants scored low on the CONTROL subscale, while 31.6 percent and 23.2 percent of the sample scored low on the SEVERE and RISK subscales, respectively. With regards to health behaviors, the majority (40.0%) of participants scored low on the DIET subscale. Furthermore, approximately 23.2 percent and 18.0 percent of participants scored low on the COPING and SOCIAL subscales, respectively. The number of participants who scored low on the remaining variables was trivial (Table 2).

Results of linear regression indicated significant positive associations between SEVERE and COMPLY (β 0.237, $p < 0.01$) scores. Furthermore, significant positive associations were found between SOCIAL and COPING (β 0.393, $p < 0.01$) scores, and SOCIAL and SEEKMED (β 0.323, $p < 0.01$, Table 3) scores. No significant associations were found among the remaining perception and health behavior variables. No significant associations were found between health be-

Table 2 Perceptions of Hypertension and Health Behavior Scores of Participants

Scale	Score Mean (SD)	Score Levels Number of Participants (%)		
Perceptions of Hypertension		**Need Improvement**	**Average**	**Good**
SEVERE	11.80 (3.845)	31.6	53.6	14.8
RISK	12.68 (3.390)	23.2	57.4	19.4
CONTROL	9.89 (2.609)	36.6	45.4	18.0
Health Behaviors		**Need Improvement**	**Average**	**Good**
SEEKMED	9.85 (2.443)	0	22.0	78.0
COMPLY	10.80 (3.257)	1.6	83.6	14.8
PHYSICAL	9.53 (2.940)	0.4	83.4	16.2
DIET	8.48 (3.867)	40.0	30.6	29.4
COPING	11.20 (3.113)	23.2	62.0	14.8
SOCIAL	12.65 (2.913)	18.0	60.2	21.8

Notes:
SEVERE - Perceptions of Severity of Hypertension
RISK - Perceptions of Risk Factors Associated with Blood Pressure Elevation
CONTROL - Perceptions of Health Behavioral Modifications to Control Hypertension
SEEKMED - Seeking Medical Attention
COMPLY - Compliance with Medication
PHYSICAL - Physical Activity
DIET - Diet
COPING - Coping with Stress
SOCIAL - Social Relationships

Table 3 Relationships among Perceptions of Hypertension and Health Behaviors

Linear Regression			
IV	**Std. β**	**p**	**DV**
SEVERE	0.057	0.213	SEEKMED
SEVERE	0.237	0.000*	COMPLY
SEVERE	0.087	0.218	PHYSICAL
SEVERE	0.177	0.122	DIET
CONTROL	0.125	0.227	PHYSICAL
CONTROL	0.037	0.751	DIET
RISK	0.010	0.900	DIET
SOCIAL	0.393	0.000*	COPING
SOCIAL	0.323	0.000*	SEEKMED

Notes:
**Significant Associations*
IV = Independent Variable
DV = Dependent Variable
SEVERE - Perceptions of Severity of Hypertension
CONTROL - Perceptions of Health Behavioral Modifications to Control Hypertension
RISK - Perceptions of Risk Factors Associated with Blood Pressure Elevation
SEEKMED - Seeking Medical Attention
PHYSICAL - Physical Activity
COMPLY - Compliance with Medication
DIET - Diet
SOCIAL - Social Relationships
COPING - Coping with Stress

havior and demographic variables.

Discussion

The present study was conducted to assess perceptions of hypertension and health behaviors of hypertensive patients seeking treatment at twelve PCUs within the Phichit Hospital's healthcare network. It was also conducted to determine the associations among these variables. Present findings indicate that there are indeed a significant number of patients whose perceptions of hypertension and health behaviors may possibly lead to difficulty managing this disease. Findings also indicate significant associations.

Present findings indicate a significant number of patients with low perceived severity of hypertension, perceived risk factors associated with blood pressure elevation, and perceived health behavioral modifications that can help them control hypertension. Low perceptions of hypertension, specifically, of disease severity, have been found to be predictive of compliance with medication. A study conducted by Nelson et al.[14], studied blood pressure control in a sample of patients undergoing treatment for hypertension, and found patients with inconsistent "self-reported medication-taking" to have high perceived severity of hypertension. Present findings also support this association as perceived severity of hypertension was found to be positively associated with compliance with medication. Patients with low perceived severity of hypertension were likely to have low compliance with antihypertensive medication, and vice versa. Since compliance with medication is a critical component of disease management, addressing issues of low perceived severity of hypertension may be an effective approach to better manage this disease within this patient population.

Present findings also indicate poor diet among patients, that is, a diet high in sodium, high in fat, low in fruits and vegetables, or any combination of the aforementioned. Sodium and fat-intake increases blood pressure, while fruits and vegetables, in the form of potassium-intake, help manage blood pressure elevation[15]. These findings suggest that those hypertensive patients with poor diets should consider diet modification. According to a study conducted by Sacks et al.[16] on the diets of pre-hypertensive and hypertensive adults, a diet low in sodium and high in fruits and vegetables, a crucial component of the Dietary Approaches to Stop Hypertension (DASH) diet, can substantially lower blood pressure. Based on this finding, efforts to increase the effectiveness of managing hypertension in this patient population should also consider diet modification approaches.

Difficulty coping with stress and poor social re-

lationships was also found to be characteristic of this patient population. Poor social relationships were defined as limited or negative interactions with family members and peers, while difficulty coping with stress was defined as limited or total inability to cope adaptively to stress. According to a study conducted by Strogatz et al.[17] who studied the associations among social support, stress, and blood pressure in a sample of community adults, difficulty coping with stress and poor social relationships have been found to be directly associated with blood pressure elevation. Efforts to manage hypertension may therefore involve addressing issues of coping and social interactions. Possible strategies may involve establishing peer support groups. In exploring social support measurements and interventions, Helgeson and Gottlieb found support groups to compensate for deficiencies in participants' support networks, and expose them to varied social interactions and ways of coping with stress[18]. As such, support groups may well prove to be an effective approach in facilitating hypertension control in this population.

Results of linear regression indicated positive associations among patients' social relationships, their ability to effectively cope with stress, and their tendency to seek medical attention. Patients with poor social relationships are less likely to be able to effectively cope with stress and less likely to seek medical attention, and vice versa. As stated, social relationships were defined as the number and type (i.e., positive or negative) of social interactions with family members and peers. The association between social relationships and ability to cope with stress has been explored in the past. A study conducted by Fleishman et al.[19] that explored the relationship between coping with stress and social relationships not only found similar positive associations, but also suggested that negative social interactions have a greater impact on the effectiveness of coping than positive social interactions. Furthermore, present findings add to current literature on the determinants of care-seeking behavior. According to a study conducted by Cameron et al.[20] that examined care-seeking behavior in a sample of middle-aged and older adults, determinants of healthcare utilization were well-developed representations of a serious health threat, perceptions of inability to cope with the threat, advice to seek care, and life stress. Results of the present study supplement this finding by contributing poor social relationships as a possible determinant of poor care-seeking behavior. Since tendency to seek medical attention and coping with stress are essential to the management of hypertension, improving patients' social relationships may be an effective approach to managing hypertension in this patient population.

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บทคัดย่อ **การรับรู้และพฤติกรรมของผู้ป่วยความดันโลหิตสูงในศูนย์สุขภาพชุมชนเครือข่ายบริการสุขภาพ โรงพยาบาลพิจิตร 12 แห่ง**

จาตุรงค์ วิเชียรสรรค์, ประภาศิริ เมืองพรวน

กลุ่มงานเวชกรรมสังคม โรงพยาบาลพิจิตร

วารสารวิชาการสาธารณสุข **2553; 19:343-51.**

การวิจัยแบบไปข้างหน้านี้ประเมินการรับรู้เกี่ยวกับโรคความดันโลหิตสูงและพฤติกรรมสุขภาพของผู้ป่วยความดันโลหิตสูง และทดสอบความสัมพันธ์ระหว่างตัวแปรต่าง ๆ ทำการศึกษาในกลุ่มตัวอย่างจำนวน 496 รายที่รับการรักษาในศูนย์สุขภาพชุมชนเครือข่ายบริการสุขภาพ โรงพยาบาลพิจิตรจำนวน 12 แห่ง โดยใช้แบบสัมภาษณ์ที่ประกอบด้วยข้อมูลทั่วไปของผู้ป่วย การรับรู้ภาวะสุขภาพของผู้ป่วยความดันโลหิตสูง และพฤติกรรมส่งเสริมสุขภาพของผู้ป่วยความดันโลหิตสูง การศึกษาพบว่ากลุ่มตัวอย่างมีการรับรู้ระดับต่ำในด้านการปฏิบัติตัวเพื่อควบคุมโรคความดันโลหิตสูงร้อยละ 36.6 ด้านการรับรู้ถึงความรุนแรงของโรคความดันโลหิตสูงร้อยละ 31.6 ด้านการรับรู้ถึงปัจจัยเสี่ยงต่อการเพิ่มขึ้นของความดันโลหิตร้อยละ 23.2 พฤติกรรมสุขภาพของกลุ่มตัวอย่างที่อยู่ในระดับต่ำ ได้แก่ ด้านโภชนาการ ร้อยละ 40.0 การจัดการกับความเครียด ร้อยละ 23.2 และสัมพันธภาพระหว่างบุคคล ร้อยละ 18.0 จากการศึกษาความสัมพันธ์พบว่าการรับรู้ความรุนแรงของโรคความดันโลหิตสูงมีผลต่อการกินยาถูกต้องตามคำแนะนำของแพทย์ ($p < 0.01$) สัมพันธภาพระหว่างบุคคลมีผลต่อการจัดการกับความเครียด ($p < 0.01$) และสัมพันธภาพทางสังคมมีผลต่อการใฝ่หาบุคลากรทางสาธารณสุขเพื่อรับการรักษา ($p < 0.01$) ผลการวิจัยครั้งนี้จะช่วยเป็นข้อมูลพื้นฐานในการพัฒนาโปรแกรมที่เหมาะสมในการดูแลรักษาประชากรผู้ป่วยความดันโลหิตสูงที่มีลักษณะคล้ายคลึงกับกลุ่มตัวอย่างในศูนย์สุขภาพชุมชนต่อไป

คำสำคัญ: **โรคความดันโลหิตสูง, การรับรู้, พฤติกรรมสุขภาพ, ศูนย์สุขภาพชุมชน**