Factors Predicting Women's Adherence to Hypertensive Treatment

Saovaros Meekusol, Wantana Maneesriwongul, Pisamai Orathai, Kanaungnit Pongthavornkamol, Phyllis Williams Sharps*

Abstract: Hypertension is a major risk factor for cardiovascular disease leading to global mortality among women. Poor adherence to hypertensive treatment is one of the most important problems in controlling blood pressure. However, limited research in this area has been undertaken in Thailand. Thus, this descriptive correlational study aimed to investigate predictability of selected factors on adherence to hypertensive treatment among women with hypertension. A sample of 326 women with hypertension were recruited from hypertension clinics in six public health centers in Bangkok Metropolitan using multi-stage sampling. A set of self-administered questionnaires was used to collect data: background characteristics, Hypertension Knowledge Scale, Thai-version of the Center for Epidemiologic Studies Depression Scale, Patient-Provider Communication Scale, Hypertension Social Support Scale, and Adherence to Hypertensive Treatment Scale. Data were analyzed using descriptive statistics and hierarchical regression analysis.

Results revealed that hypertension knowledge, patient-provider communication, and hypertension social support were significant predictors and could explain 18.3% of the variance in adherence to hypertensive treatment. Such adherence is a collective outcome which may be predicted by multiple factors, such as self-efficacy, perceived benefit, and perceived barriers, so these factors should be included in future study among women with more heterogeneous background characteristics. Our findings suggest that the nurses should develop strategies by using digital health strategies providing healthcare support via mobile technologies such as smartphones. This could provide more convenient patient-provider communication, hypertension knowledge and social support to enhance adherence to hypertensive treatment.

Pacific Rim Int J Nurs Res 2021; 25(1) 131-142

Keywords: Adherence, Hypertension, Hypertensive treatment, Social Support, Women, Thailand

Received 20 May 2020; Revised 26 July 2020; Accepted 15 August 2020

Saovaros Meekusol, *RN, PhD Candidate, Faculty of Nursing and Ramathibodi School of Nursing, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. E-mail: saovaros.meekusol@gmail.com*
Correspondence to: Wantana Maneesriwongul, *RN, DNSc., Associate Professor, Ramathibodi School of Nursing, Faculty of Medicine, Mahidol University, Bangkok, Thailand. E-mail: wantana.lim@mahidol.ac.th*
Pisamai Orathai, *RN, PhD, Associate Professor, Ramathibodi School of Nursing, Faculty of Medicine RamathibodiHospital, Mahidol University, Bangkok, Thailand. E-mail: pisamai.ora@mahidol.ac.th*
Kanaungnit Pongthavornkamol, *RN, PhD, Associate Professor, Faculty of Nursing, Mahidol, University, Bangkok, Thailand. E-mail: kanaungnit.pon@mahidol.ac.th*
Phyllis Williams Sharps, *RN, PhD, FAAN, Professor, Johns Hopkins University School of Nursing Baltimore, MD, USA. E-mail: psharps1@jhu.edu*

Introduction

Hypertension is an important public health challenge, causing premature death and accounting for 7.5 million or 12.8% of the total deaths worldwide, despite being a significant preventable risk factor.[1] Approximately 58% of hemorrhagic stroke, 50% of ischemic stroke, and 55% of ischemic heart disease have been attributed to hypertension.[2] Globally, including in Thailand, the prevalence of hypertension is almost identical in men and women, but the trend is rising

when women have reached menopausal age.[3] Controlling blood pressure (BP) is harder with ageing, particularly in women with exclusive forms of hypertension related to menopause, oral contraceptive use, or pregnancy.[4] The prevalence of hypertension in Thailand was highest in Bangkok and the metropolitan areas.[5]

According to the American Heart Association, more women than men with hypertension develop adverse pathophysiologic conditions such as left ventricular hypertrophy, diastolic dysfunction, heart failure, increased arterial stiffness, diabetes, and chronic kidney disease.[6] The Women's Health Initiative (WHI) also identified hypertension as a significant independent risk factor for sudden cardiac deaths in postmenopausal women.[7] Women's health risk profile is different compared to men. This is due to women experiencing longer life expectancy, exposure to specific influences of the environment, different forms of nutrition, abdominal obesity, lifestyle, or stress, post-menopausal, oral contraceptives, and pregnancy-related hypertension.[8] In spite of sex differences in adverse effect profiles, guidelines for antihypertensive therapy recommend similar approaches in women and men. Consequently, women experience more antihypertensive medication side-effects than men[9-10] and they may be less likely than men to have a choice of treatment. A higher percentage of nonadherence to antihypertensive medications has been documented in females.[11,12] Women generally give priority to care for their family over themselves, pay less attention to the needs of their own health, and maybe not be motivated to carry out their adherence to treatment in chronic conditions.[13]

Adherence to treatment, the extent to which a person's behavior - taking medication, following a diet, and/or executing lifestyle changes - corresponds with agreed recommendations from health care providers, is key for successful BP control.[14] The inference of survey data for the Thai population size in 2019 reported that, out of an estimated 13.2 million Thai adults with hypertension, merely 3.9 million (29.5%) have their BP under control.[15] Effective treatment of hypertension requires both pharmacologic and non-pharmacologic treatments, utilizing collaborative efforts between the health providers and patient.[14] Adherence to hypertensive treatment is the process by which patients follow the agreed treatment regimens with their physician to improve BP control and prevent target organ damage.[16]

Understanding adherence to treatment and identifying factors contributing to this is beneficial in eliminating barriers and developing interventions to promote adherence to treatment.[14] In Thailand, a few studies reported factors related to adherence to hypertensive treatment in general population.[17-18] However, there has been limited research exploring adherence to hypertensive treatment beyond the medication adherence dimension, and no study determining factors influencing adherence to hypertensive treatment in Thai women, especially in Bangkok where the prevalence is highest. As urban women are prone to unhealthy diets and sedentary lifestyle, they face more difficulties in behavioral modifications.[19] Therefore, it is important to investigate factors predicting adherence to hypertensive treatment beyond a scope of medication adherence among Thai women with hypertension in Bangkok. This will help guide further interventions to improve adherence to antihypertensive treatment more specifically.

Conceptual Framework and Literature Review

The PRECEDE-PROCEED Model (PPM) was originally developed by Green and Krueter,[20] and was proposed for assessing health needs to design, implement, and evaluate a health program. The PRECEDE is the initial steps of the program-planning framework, which provides the structure for planning that cover needs assessment and identification of health problems/factors associated with the problems, followed by the PROCEED which allows the structure for implementing and evaluating a health program. The framework of this study was based on the PRECEDE model which suggests the assessment of health needs/problems and identification of the causes by considering the multiple determinants of health and environment-related behaviors.

The PRECEDE model presumes the existence of personal factors (predisposing factors) and external factors (enabling and reinforcing factors) imposing on health-related behaviors. These factors are regarded as potential determinants of health problems which finally affect people's quality of life.

Predisposing factors are any characteristics of a person that motivate behavior including an individual's knowledge, beliefs, values, and attitudes. In this study, hypertension knowledge, depressive symptoms, duration of hypertension, and number of comorbidities were considered as predisposing factors. Secondly, enabling factors are those characteristics of the environment that facilitate action and any skill or resource required to attain specific behavior, including new skills required to enable behavior change. Patient-provider communication was selected as enabling factor in this study. Lastly, reinforcing factors are rewards or punishments following or anticipated because of a behavior, they serve to strengthen the motivation for a behavior such as social support, peer support, etc. In this study, hypertension social support was included as a reinforcing factor.

Previous studies reported that hypertension knowledge,[18,21,22] duration of hypertension,[23,24] number of comorbidities,[25,26] depressive symptoms,[27,28] patient-provider communication[29,30] and hypertension social support[21,30,31] have significant relationship with adherence to hypertensive treatment. Thus, we included all these variables in the model to predict adherence to hypertensive treatment. We explored the predisposing, enabling and reinforcing factors, and established the hypothesis that relationships exist between the individual and environmental factors that predispose, enable and reinforce adherence to hypertensive treatment (taking medication, diet and weight control exercise and daily activity, risk factor avoidance, continuing follow-up visit, stress management, and participation in formulating a treatment plan).

Study Aim: To examine the predictability power of hypertension knowledge, duration of hypertension, number of comorbidities, depressive symptoms, patient-provider communication and hypertension social support on hypertensive treatment among women with hypertension.

Methods

Design: A descriptive correlational design was used in this study.

Sample and Settings: Multi-stage sampling was conducted to recruit women with hypertension who received treatment at Bangkok Metropolitan Administration public health centers (PHCs) between March-September 2016. This Administration operates 68 PHCs which are distributed in six geographical clusters. Each cluster has 10-13 PHCs. We randomly selected one centre from each cluster, a total of six PHCs. Then, a convenience sample of women with hypertension was recruited at these six centres. Inclusion criteria were diagnosed with essential hypertension for at least 6-months; aged 35-65 years, as this range covered three stages of menopause, peri-menopause, menopause and post-menopause; taking at least one antihypertensive drug; and able to understand and communicate in Thai. The power ($1 - \beta$) and significance level (α) were determined at .95 and .001, respectively. The effect size was 0.15 (f^2 from previous studies).[22, 31] To achieve multivariate normality assumptions, 20% was added to the calculated sample size. Finally, the sample size of this study was 326.

Ethical Considerations: This study was approved by the Institutional Review Board Faculty of Nursing, Mahidol University with COA No. IRB-NS 2015/315.3010, and the Institutional Review Board Bangkok Metropolitan Administration approval ID no. 071/58. Potential participants were informed about the study purpose, data collection processes, and their right to withdraw from the study at any time without repercussions. Written informed consents were obtained from all participants, and throughout the study, the anonymity and confidentiality of the data collection, and their privacy were protected.

Instruments: A set of six questionnaires was used (described below). All instruments, except the first, were used with permissions from the original authors. Content validity was examined by seven experts in women's health, medicine, hypertension management, pharmacy, health promotion and community health nursing.

The *Background Characteristics Form* was developed by the primary investigator (PI) and included demographic information (age, marital status, educational level, occupation, average monthly income and types of health care schemes), and illness information (duration of hypertension, number of comorbidities, family history of hypertension blood pressure, and BMI).

The *Adherence to Hypertensive Treatment Scale* (AHTS) was modified by the PI from the Hypertensive Adherence to Therapeutic Regimens Scale (HATRS) (17 items), developed by Pinprapapan et al.,[32] and the Hypertensive Adherence Scale (6 items) developed by Limcharoen et al.[33] Three items from the literature were added. Therefore, the AHTS used in this study has 26 items and 7 subscales: taking medication (2 items), diet and weight control (7 items), exercise and daily activity (3 items), risk factor avoidance (4 items), stress management (2 items), participation in formulating a treatment plan (5 items), and continuing follow-up visits (3 items). Item examples include: "You have taken an antihypertensive medication in terms of the number of pills, doses and time as prescribed" and "You have exercised (walking, swimming, cycling, aerobic exercise or Tai Chi) 30 minutes at least three times a week." Item responses are given on a visual analog scale from 0 (never) to 10 (always). The sum score ranges from 0 to 260. A higher score means a higher level of adherence to hypertensive treatment. The overall scores of AHTS are classified into 3 levels: good (score ≥208), moderate (score 156-207), and poor (score <156). In this study, the scale content validity index (S-CVI) of the AHTS was 0.99 with an adequate Cronbach's alpha reliability coefficient (α = .79).

The *Thai version of the Center for Epidemiologic Studies Depression Scale* (CES-D) was translated from the original version by Kuptniratsaikul & Pekuman.[34] The CES-D comprises 20 items assessing perceived mood and level of functioning over the past seven days, for example, "In the past week, I was easily bothered" and "In the past week, my appetite was poor." Responses are given on a 4-point Likert scale ranging from (0) never, (1) sometimes, (2) frequently to (3) always. Possible sum scores range from 0-60. The overall Cronbach's alpha was 0.92, with a sensitivity of 93.3% and specificity of 94.2%. A score of ≥20 identifies individuals at risk for clinical depression. In this study, the Cronbach's alpha reliability coefficient (α) was .77.

The *Interpersonal Processes of Care 29* (IPC-29) instrument measuring patient-provider communication was developed by Stewart, et al.[35] It was translated by the first and second authors into Thai using a forward-backward translation technique to achieve semantic equivalence.[36] The Thai IPC-29 was piloted and two items were found hard to understand in the Thai context, so they were omitted with permission of the instrument developer. The final Thai version comprises 27 items, for example, "How often did doctors/nurses speak too fast?" and "How often did doctors/nurses let you say what you thought was important?" Responses are given on a rating scale from 1 (never) to 5 (always) and sum scores range 27-135. Higher scores indicate better patient-provider communication. In this study, the S-CVI was 0.98 and the Cronbach's alpha reliability coefficient was .84.

The Hypertension Social Support Scale (HSSS) was modified from original scale developed by Pinprapapan.[32] The HSSS has 20 items with four subscales of social support: emotional support (6 items), appraisal support (5 items), information support (4 items) and instrumental support (5 items). Item examples include: "Someone around you has concerns that you are diagnosed with hypertension" and "Someone reminds you to have a medical follow up" Responses are given on a 4-point rating scale ranging from 1 (not true) to 4 (strongly true). Possible sum scores ranged 20-80, and higher scores indicate higher

social support. In this study, the S-CVI was 1.00 and the Cronbach's alpha reliability coefficient was .95.

The *Hypertension Knowledge Scale* (HKS) was modified by the PI with permission from the originators of the Knowledge of Hypertension Scale (KHS),[31] and has 29 items covering five domains. Twenty items were from the KHS and 9 items were generated from a literature review relating to alternative medicine, dietary, side-effects of hypertensive medicine, sleep hours and hypertension follow up. Responses are given as "yes", "no" or "don't know". A score of 1 is given for a correct response, while 0 is given for "no" and "don't know". The KHS comprises five subscales: Risk factors (6 items), Behavior modification (6 items), Medication taking (11 items), Symptoms and complications (3 items), and Follow up visit (3 items). Item examples are: "People who have chronic stress have more chance to have hypertension" and "People who are obese or overweight have more chance to have hypertension." Possible sum scores range 0-29. The higher the score indicates higher knowledge. The S-CVI was 0.99 and the reliability testing in terms of KR-20 was .79

Data Collection: Was undertaken by the PI in a quiet area after the informed consent was obtained. The participants took 45-60 minutes to complete the self-administered questionnaires, with a short break if needed. After completion, they received compensation of 100 Thai baht (around US$3) for their time contribution.

Data Analysis: Analysis of background characteristics, hypertension knowledge, duration of hypertension, number of comorbidities, depressive symptoms, patient-provider communication, hypertension social support, and adherence to hypertensive treatment was performed using descriptive statistics. Pearson's correlation analysis was conducted to examine the relationships between adherence to hypertensive treatment and the hypothesized independents variables (predisposing factors [hypertension knowledge, duration of hypertension, number of comorbidity, depressive symptoms], enabling factor [patient-provider communication], reinforcing factor [hypertension social support]). As the PRECEDE model ascribes the existence of personal and external factors that impose health-related behaviors, this study used the hierarchical regression analysis to determine the best predictors, instead of stepwise regression due to prior research strongly indicating that all of the selected independent variables were correlated and predictive of adherence to hypertensive treatment.[22,23,25,27,29] We entered independent variables into the hierarchical regression model in order as suggested by the PRECEDE model: predisposing, enabling, and reinforcing factors. In accord with the basic assumption of regression, multivariate normality, linearity, and homoscedasticity were tested before running the regression analysis.

Results

The mean age of the 326 participants was 57.32 years, ranging between 37-65 years. Most were married (54.2%), had primary school education (60.7%), monthly household incomes of ≤20,000 baht (about US$641) (68.4%) and used the Thai universal coverage healthcare scheme (73.3%). Most had reached menopause (94.5%), and had a family history of hypertension (61.9%), and co-morbidities (71.5%). The most common co-morbidities were dyslipidemia (65.2%) and diabetes mellitus (45.9%).

The participants' duration of hypertension ranged from 1-20 years with a mean of 6.38 years. Their mean overall score of hypertension knowledge was 23.5, ranging 5-29. The reported score for depressive symptoms ranged 0-26, with a mean of 7.37. The overall score for patient-provider communication ranged 63-125, with a mean of 103.17, and an overall score for hypertension social support 20-80, with a mean of 55.36. The mean percentage of these variables from highest to lowest were: patient-provider communication (good), hypertension knowledge (good), hypertension social support (moderate), and depressive symptoms (low) with only 12 participants (3.7%) had indicative depressive symptoms according to the criteria.

The participants had a reported score of adherence to hypertensive treatment ranging 79-249, with a mean of 186.90. The mean percentage of each subscale ranged from as follows: taking medication (88.9%), continuing follow-up visit (78.6%), stress management (76.7%), risk factor avoidance (71.7%), participation in formulating a treatment plan (68.5%), exercise and daily activity (68.2%), and diet and weight control dimension (66.0%) (**Table 1**).

The correlation matrix of adherence to hypertensive treatment revealed that hypertension knowledge, patient-provider communication and hypertension social support were positively correlated with adherence to hypertensive treatment. The remaining factors (duration of hypertension, number of comorbidities, and depressive symptoms) were not significantly correlated with adherence to hypertensive treatment (**Table 2**).

Table 1 Descriptive statistics of the study variables (n = 326)

Variables	Possible Range	Actual Range	Mean(SD.)	Mean Percentage	Interpretation
Hypertension knowledge	0 - 29	5 - 29	23.59(3.93)	81.34	Good
Depressive symptoms	0 - 60	0 - 26	7.37(5.25)	12.28	Low
Duration of hypertension (years)	-	1 - 20	6.38(3.82)	-	-
Patient-provider communication	25 -125	63 - 125	103.17(10.80)	82.54	Good
Hypertension social support	20 - 80	20 - 80	55.36(12.68)	69.20	Moderate
Adherence to hypertensive treatment	0 - 260	79 - 249	186.90(26.62)	71.88	Moderate
Taking medication	0-20	2 - 20	17.78(2.79)	88.90	Good
Diet and weight control	0 - 70	18 - 70	46.21(10.35)	66.01	Moderate
Exercise and daily activity	0 - 30	6 - 30	20.45(4.78)	68.17	Moderate
Risk factor avoidance	0 - 40	0 - 40	28.69(7.63)	71.73	Moderate
Stress management	0 - 20	0 - 20	15.33(3.85)	76.65	Moderate
Participation in formulating a treatment plan	0 - 50	5 - 50	34.25(10.35)	68.50	Moderate
Continuing follow-up visit	0 - 30	3 - 30	23.575.52	78.57	Moderate

Table 2 Correlation matrix of the study variables

Variables	1	2	3	4	5	6	7
1. HT_know	1.000						
2. HT_dura	.003	1.000					
3. Cormo	-.073	.121	1.000				
4. Depress	-.204***	-.009	.151***	1.000			
5. PPC	.301***	.008	.038	-.212***	1.000		
6. SS	.411***	-.021	-.073	-.187***	.391***	1.000	
7. Adhere	.302***	-.015	.025	-.072	.314***	.347***	1.000

*p < .05, **p < .01, ***p < .001

HT_know = Hypertension Knowledge, HT_dura = Duration of Hypertension, Comor = Number of Comorbidities, Depress = Depressive Symptoms, PPC= Patient-Provider Communication , SS = Hypertension Social Support, Adhere = Adherence to Hypertensive Treatment

Predictors of Adherence to Hypertensive Treatment

After the assumptions with each type of statistics were met, three steps of hierarchical regression analysis were conducted to examine the effects of three sets of predicting variables on adherence to hypertensive treatment. The six predictive variables could explain 18.3% of the variance in adherence to hypertensive treatment (**Table 3**). In Model 1, the predisposing factors (hypertension knowledge, depressive symptoms, number of comorbidities, and duration of hypertension accounted for 9.4% of the variance in adherence to hypertensive treatment. Among these, hypertension knowledge was the only significant predictor of adherence to hypertensive treatment.

In Model 2, adding the enabling factor (patient-provider communication) after controlling for the predisposing variables could increasingly explain 5.4%. These variables could jointly explain 14.8 % of the variance in adherence to hypertensive treatment. The patient-provider communication significantly predicted adherence to hypertensive treatment, while hypertension knowledge remained the significant predictor of adherence to hypertensive treatment.

In the final model, the reinforcing factor (hypertension social support) after controlling for the predisposing and enabling variables could additionally explain 3.5 %. The predisposing, enabling and reinforcing variables could jointly explain 18.3% of the variance in adherence to hypertensive treatment while hypertension knowledge and patient-provider communication remained significant predictors of adherence to hypertensive treatment (**Table 3**).

Table 3 Result of hierarchical regression analysis for adherence to hypertensive treatment (N = 326)

Variables	b	S.E. (b)	Beta(β)	t	p
Model 1	137.873				
(Constant)	2.060	9.957		13.847	.000
Hypertension knowledge	-.155	.371	.304	5.556	.000
Duration of hypertension	1.777	.373	-.022	-.417	.677
Number of co-morbidities	-.036	1.881	.051	.945	.345
Depressive symptoms		.280	-.007	-.129	.897
R =.307, R^2 =.094, Adjusted R^2= .083, R^2 Change = .094 , Overall $F_{(4,321)}$ = 8.333, p=.000					
Model 2					
(Constant)	84.573	15.258		5.543	.000
Hypertension knowledge	1.610	.374	.238	4.308	.000
Duration of hypertension	-.148	.362	-.021	-.409	.683
Number of co-morbidities	1.067	1.833	.031	.582	.561
Depressive symptoms	.166	.276	.033	.601	.548
Patient-provider communication	.611	.135	.248	4.516	.000
R =.385 , R^2 = .148 , Adjusted R^2=.135, R^2 Change = .054, Overall $F_{(5,320)}$ = 11.148, p=.000					
Model 3					
(Constant)	85.202	14.970		5.692	.000
Hypertension knowledge	1.160	.386	.171	3.002	.003
Duration of hypertension	-.120	.355	-.017	-.338	.735
Number of co-morbidities	1.456	1.802	.042	.808	.420
Depressive symptoms	.214	.271	.042	.788	.431
Patient-provider communication	.457	.139	.186	3.282	.001
Hypertension social support	.451	.123	.215	3.671	.000
R =.428 , R^2 =.183 , Adjusted R^2 = .168, R^2 Change = .035, Overall $F_{(6,319)}$ = 11.899, p=.000					

P < .01

Discussion

Hierarchical regression revealed three significant predictive variables of adherence to hypertensive treatment, namely: hypertension knowledge, patient–provider communication and hypertension social support. This modelling can explain 18.3% of the variance for adherence to hypertensive treatment. The only predicting predisposing factor that influenced adherence to hypertensive treatment was hypertension knowledge. This finding is consistent with previous studies.[18,21,22] One possible explanation is that participants who have more knowledge of hypertension as a whole, will have sufficient better understanding of the disease, be able to define their condition and better understand important aspects of the disease such as its asymptomatic nature and the need for long-term treatment. This may lead them to have good adherence to treatment.[37]

It should be emphasized that the other three selected predisposing factors variables (duration of hypertension, number of comorbidities and depressive symptoms) did not influence adherence to hypertensive treatment. We did not find the duration of hypertension to be a significant influence on adherence to hypertensive treatment because all participants had Stage I hypertension with a duration of ≤10 years. They were prescribed with first-line treatment which did not involve multiple daily doses. This finding is in contrast with previous studies,[23, 24] and requires further investigation.

The number of co-morbidities did not influence adherence to hypertensive treatment. Although 71.5% of participants reported co-morbidities such as dyslipidemia and diabetes mellitus, their conditions were not severely complicated and did not require complex treatment. Thus, they may have had less awareness of adherence to treatment. This finding was incongruent with previous studies that reported a significant association between the number of co-morbidities and adherence to hypertensive treatment.[25,26]

We found no significant influence of depressive symptoms on adherence to hypertensive treatment, in contrast to previous research.[27,28] This may be because 96.3% of participants had no indicative depressive symptoms, and only 3.7% had indicative depressive symptoms. All were diagnosed with stage I hypertension and less severe complications. They could access hypertensive treatment at the primary healthcare setting near their residential area. Nearly all participants used the universal health care coverage scheme, so they had less burden from direct costs of healthcare.

As one of the enabling factors, patient–provider communication was a strong and significant predictor influencing adherence to hypertensive treatment. This predictor had a significantly positive association with adherence to hypertensive treatment. After entering patient–provider communication into model 2, the explained variance increased from 9.4% to 14.8%. An explanation for this is that good patient–provider communication enabled patients to gain adequate information, understand their health condition and treatment as well as share decision-making on their treatment plan. They also developed trust in their healthcare providers; therefore, they were more likely to have good adherence to hypertensive treatment.[29] This result was also consistent with previous studies.[29,30]

In this study, hypertension social support was the reinforcing factor found to be the strongest predictor of adherence to hypertensive treatment. A possible reason is that social support is buffers stress, providing material and psychological resources needed to deal with difficult situations during treatment. More than half of participants were married and lived with family members. They had access to emotional, appraisal, instrumental, and informational social support. Besides the support from family, the participants usually attended a hypertension clinic at primary care setting nearby home, become well accustomed with their healthcare providers, and had good patient–provider communication. Thus, they had good information support as they had more chance to receive useful information on self-care management from their healthcare providers, such as taking medications as prescribed, eating a healthy diet, keeping physical

activity, and monitoring blood pressure and body weight.[37] Social support can encourage women with hypertension to develop better adherence to their treatment regimens, and our finding is consistent with prior research.[18, 30, 31]

Despite the above, we also found 75.8% of participants had a poor to moderate level of overall adherence to hypertensive treatment. Taking medication and continuing follow-up visits were the highest reported among the subscales of adherence to treatment maybe because all participants had healthcare coverage, so they could regularly attend a hypertension clinic at primary care setting in their local area, and were familiar with their healthcare providers. Thus, they tended to adhere to their medication and follow-up schedule. However, in the subscales related to health behaviors, the result indicated that they had poorer scores on exercise and daily physical activity as well as diet and weight control. Thus, a possible reason may be participants had urban lifestyle, as all of them lived in Bangkok. The common barriers limiting urbanized women from having adequate exercise were such as lack of time, facilities and/or suitable places for exercise,[19] as Bangkok has heavy traffic and often congested living environments.

Limitations

This cross-sectional study had a convenience sample of women with stage 1 hypertension who regularly attended and received treatment in public health centers in Bangkok, and who had access to universal health coverage. The participants were thus homogenous. The findings cannot be generalized to all urban women with hypertension urban since we did not include samples of those who did not continue treatment or those who had severe complications, received complex treatment or had poorer histories of adherence to hypertensive treatment. These limitations may also lead to a low predictive power of the model. We recommend that this study be replicated in women with more heterogeneous background characteristics. As adherence to hypertensive treatment is a collective outcome predicted by multiple factors, additional variables (such as self-efficacy, perceived benefit, and perceived barriers) should be included in further studies. More specific factors among women with hypertension in Bangkok also need to be scrutinized.

Conclusion and Implications for Nursing Practice

This study found that significant predictors of adherence to hypertensive treatment among women with hypertension in Bangkok were hypertension knowledge, patient-provider communication and hypertension social support. Each of these predictors represented predisposing, enabling and reinforcing factors based on the PRECEDE Model. The women with hypertension living in Bangkok had higher mean scores percentage of taking medication and continuing follow-up visit than other subscales dealing with behavioral modification such as exercise and daily activity, as well as diet and weight control. Nurses need to ensure that effective strategies to ensure good patient-provider communication are included in practice interventions, as these can help develop trust and provide opportunity for the patients to clarify ambiguities or misunderstanding, gain good hypertension knowledge and better understanding of their health conditions. This will help increase social support for those with hypertension. Our findings suggest that nurses should focus beyond the importance of hypertension knowledge and behavior modification, as patient-provider communication and hypertension social support were also significant predictors of adherence to hypertensive treatment. Nurses need to develop strategies to increase patient-provider communication by using information technology such as mobile health (that is, digital health providing healthcare support via mobile technologies such as smartphones) which could provide more convenient patient-provider communication, hypertension knowledge and social support to enhance adherence to hypertensive treatment.

Acknowledgements

We are grateful to all participants in this study, and Commission of Higher Education for study support.

References

1. World Health Organization. Global Health Observatory (GHO) data: raised blood pressure. Geneva, Switzerland, 2016. [cited 2016 May 31]. Available from https://www.who.int/gho/ncd/risk_ factors/blood_pressure_prevalence_text/en/
2. Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, Marczak L, et al. Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. JAMA. 2017;317(2):165-82. doi:10.1001/jama.2016.19043
3. Wenger NK, Arnold A, Bairey Merz CN, Cooper-DeHoff RM, Ferdinand KC, Fleg JL, et al. Hypertension across a woman's life cycle. J Am Coll Cardiol. 2018;71(16):1797-813. doi: 10.1016/j.jacc.2018.02.033
4. Rödström K, Weman L, Sandin L, Hange D, Björkelund C. Is it possible to investigate menopausal age? A comparative cross-sectional study of five cohorts between 1968 and 2017 from the population study of women in Gothenburg, Sweden. Menopause (New York, NY). 2020;27(4):430-6. doi: 10.1097/GME.0000000000001476
5. Laohasiriwong W, Puttanapong N, Singsalasang A. Prevalence of hypertension in Thailand: Hotspot clustering detected by spatial analysis. Geospat Health [Internet]. 2018May7 [cited 2018Jul.29];13(1). Available from: https://www.geospatialhealth.net/index.php/gh/article/view/608. doi:10.4081/gh.2018.608
6. Writing Group M, Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, et al. Heart disease and stroke statistics-2016 update: A report from the American Heart Association. Circulation. 2016;133(4):e38-e360. doi:10.1161/CIR.0000000000000350
7. Garcia M, Mulvagh SL, Merz CNB, Buring JE, Manson JE. Cardiovascular disease in women: clinical perspectives. Circ Res. 2016;118(8):1273-93. doi:10.1161/CIRCRESAHA. 116.307547
8. Oparil S. SY 11-3 Hypertension in women: more dangerous than in men? J Hypertens. 2016;34:e366. doi: 10.1097/01.hjh.0000500943.95477.bd
9. Muiesan ML, Salvetti M, Rosei CA, Paini A. Gender differences in antihypertensive treatment: myths or legends? High Blood Press Cardiovasc Prev. 2016;23:105-13. doi 10.1007/s40292-016-0148-1
10. Mahmoodi H, Jalalizad Nahand F, Shaghaghi A, Shooshtari S, Jafarabadi MA, Allahverdipour H. Gender based cognitive determinants of medication adherence in older adults with chronic conditions. Patient Preference and Adherence. 2019;13:1733-44. doi: 10.2147/PPA.S219193
11. Abegaz TM, Shehab A, Gebreyohannes EA, Bhagavathula AS, Elnour AA. Nonadherence to antihypertensive drugs: A systematic review and meta-analysis. Medicine. 2017;96(4):e5641-e. doi: 10.1097/MD.0000000000005641
12. Baker-Goering MM, Roy K, Howard DH. Relationship between adherence to antihypertensive medication regimen and out-of-pocket costs among people aged 35 to 64 with employer-sponsored health insurance. Prev Chronic Dis. 2019;16:E32. doi: 10.5888/pcd16.180381
13. Wang X, Robinson KM, Hardin HK. The impact of caregiving on caregivers' medication adherence and appointment keeping. West J Nurs Res. 2015;37(12):1548-62. doi: 10.1177/0193945914533158
14. Abegaz T.M., Shehab A., Gebreyohannes E.A., Bhagavathula A.S., Elnour A. A. nonadherence to antihypertensive drugs a systematic review and meta-analysis. Medicine. 2017;96:e5641. doi: 10.1097/MD.0000000000005641. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
15. World Health Organization. Country Office for Thailand. Hypertension care in Thailand: best practices and challenges, 2019. [cited 2020 March 30]. Available from https://apps.who.int/iris/handle/10665/330488
16. Rivera SL, Martin J, Landry J. Acute and Chronic Hypertension: What clinicians need to know for diagnosis and management. Crit Care Nurs Clin North Am. 2019;31(1):97-108. doi: 10.1016/j.cnc.2018.11.008.
17. Woodham N, Taneepanichskul S, Somrongthong R, Auamkul N. Medication adherence and associated factors among elderly hypertension patients with uncontrolled blood pressure in rural area, Northeast Thailand. Journal of Health Research. 2018;32:449-58. doi 10.1108/JHR-11-2018-085
18. Taengsakha K, Maneesriwongul W, Putawatana P. Factors related to adherence to treatment in essential hypertensive patients with early renal insufficiency. Rama Nurs J [Internet]. 2019. [cited 2019November11];25(1):87-101. Available from: https://med. mahidol.ac.th/ nursing/jns/DocumentLink/D_110813.pdf

19. Chiang L-C, Heitkemper MM, Chiang S-L, Tzeng W-C, Lee M-S, Hung Y-J, et al. Motivational counseling to reduce sedentary behaviors and depressive symptoms and improve health-related quality of life among women with metabolic syndrome. J Cardiovasc Nurs. 2019;34(4):327-35. doi: 10.1097/JCN.0000000000000573
20. Green L, Kreuter M. Health Program Planning: An educational and ecological approach. 4th edition. New York: McGraw-Hill; 2005.
21. Jankowska-Polańska B, Uchmanowicz I, Dudek K, Mazur G. Relationship between patients' knowledge and medication adherence among patients with hypertension. Patient preference and adherence. 2016;10:2437-47. doi: 10.2147/PPA.S117269
22. Shi S, Shen Z, Duan Y, Ding S, Zhong Z. Association between medication literacy and medication adherence among patients with hypertension. Front. Pharmacol. 2019;10(822). doi: 10.3389/fphar.2019.00822
23. Pan J, Wu L, Wang H, Lei T, Hu B, Xue X, et al. Determinants of hypertension treatment adherence among a Chinese population using the therapeutic adherence scale for hypertensive patients. Medicine (Baltimore). 2019;98(27):e16116. doi: 10.3389/fphar. 2019.00822
24. Uchmanowicz B, Chudiak A, Mazur G. The influence of quality of life on the level of adherence to therapeutic recommendations among elderly hypertensive patients. Patient preference and adherence. 2018;12:2593-2603. doi: 10.2147/PPA.S182172
25. Saadat Z, Nikdoust F, Aerab-Sheibani H, Bahremand M, Shobeiri E, Saadat H, et al. Adherence to antihypertensives in patients with comorbid condition. Nephrourol Mon. 2015 Jul; 7(4): e29863. doi: 10.5812/numonthly.29863
26. Zhang Y, Li X, Mao L, Zhang M, Li K, Zheng Y, Cui W, Yin H, He Y, Jing M. Factors affecting medication adherence in community-managed patients with hypertension based on the principal component analysis: evidence from Xinjiang, China. Patient preference and adherence. 2018;12:803-12. doi: 10.2147/PPA.S158662z
27. Berntson J, Stewart KR, Vrany E, Khambaty T, Stewart JC. Depressive symptoms and self-reported adherence to medical recommendations to prevent cardiovascular disease: NHANES 2005-2010. Soc Sci Med. 2015;138:74-81. https://doi.org/10.1016/j.socscimed.2015.05.041
28. Goldstein CM, Gathright EC, Garcia S. Relationship between depression and medication adherence in cardiovascular disease: the perfect challenge for the integrated care team. Patient Preference and Adherence. 2017;11:547-59. doi: 10.2147/PPA.S127277
29. Schoenthaler A, Knafl GJ, Fiscella K, Ogedegbe G. Addressing the social needs of hypertensive patients: The role of patient-provider communication as a predictor of medication adherence. Circ Cardiovasc Qual Outcomes. 2017;10(9):e003659. doi:10.1161/CIRCOUTCOMES.117.003659
30. Namwong A, Panuthai S, Suwanprapisa T, Khampolsiri T. A Casual Model of Adherence to Therapeutic Thai Older Adults with Hypertension. PRIJNR [Internet]. 2015May20 [cited 2020Jul.16];19(2):107-21. Available from:
31. Ofoli JN, Dankyau M, Ja S, Db L. Relationship between family and social support and adherence to treatment among outpatient hypertensives in an urban hospital. NJFP [Internet]. 2017March08[cited 2018 June.20]; 8(1):45-52. Available from:https://www.researchgate.net/publication/314385420
32. Pinprapapan E, Panuthai S, Vannarit T, Srisuphan W. Casual model of adherence to therapeutic regimens among Thais with hypertension. PRIJNR [Internet]. 2013Aug.28 [cited 2020Jul.29];17(3):268-81. Available from: https://he02.tci-thaijo.org/index.php/PRIJNR/article/view/8781
33. Limchareon S, Masingboon K, Kunsonkeit W. Factors related to adherence to treatment among essential hypertensive patients. The J of Faculty of Nursing Burapha Uni. 2007. [cited 2019 November 10];15(1):63-79. Available from: https://digitalcollect.lib. buu. ac.th/ journal/Nursing/15_1/p63-79.pdf (in Thai)
34. Kuptniratsaikul V, Pekuman P. The study of the Center for Epidemiologic Studies-Depression Scale (CES-D) in Thai people. Siriraj Hosp Gaz. 1997;49.
35. Stewart AL, Nápoles-Springer AM, Gregorich SE, Santoyo-Olsson J. Interpersonal processes of care survey: patient-reported measures for diverse groups. Health Serv Res. 2007;42(3 Pt 1):1235-56. doi: 10.1111/j.1475-6773.2006.00637.x
36. Maneesriwongul W, Dixon JK. Instrument translation process: a methods review. J Adv Nurs. 2004;48(2):175-86.
37. Akoko BM, Fon PN, Ngu RC, Ngu KB. Knowledge of hypertension and compliance with therapy among hypertensive patients in the Bamenda Health District of Cameroon: A Cross-sectional Study. Cardiol Ther. 2017;6(1):53-67. doi. 10.1007/s40119-016-0079-x

ปัจจัยทำนายความร่วมมือในการรักษาโรคความดันโลหิตสูงของผู้หญิง

เสาวรส มีกุศล วันทนา มณีศรีวงศ์กูล พิศสมัย อรทัย คนึงนิจ พงศ์ถาวรกมล Phyllis Williams Sharps*

บทคัดย่อ: ความดันโลหิตสูงเป็นปัจจัยเสี่ยงที่สำคัญของโรคหัวใจและหลอดเลือดที่นำไปสู่การเสียชีวิตของผู้หญิงทั่วโลก ความร่วมมือในการรักษาไม่ดีเป็นปัญหาสำคัญในการควบคุมระดับความดันโลหิต แต่ในประเทศไทยมีการศึกษาวิจัยในประเด็นดังกล่าว อยู่อย่างจำกัด ดังนั้นการวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความสามารถในการทำนายของปัจจัยคัดสรรต่อ ความร่วมมือในการรักษาโรคความดันโลหิตสูงของผู้หญิงที่เป็นโรคความดันโลหิตสูง กลุ่มตัวอย่างเป็นผู้หญิงจำนวน 326 คนที่ได้รับการวินิจฉัยว่าเป็นโรคความดันโลหิตสูง ซึ่งได้รับการคัดเลือกจากคลินิคโรคความดันโลหิตสูงในศูนย์บริการสาธารณสุขจำนวน 6 แห่ง ในกรุงเทพมหานคร โดยการสุ่มแบบหลายขั้นตอน เก็บข้อมูลโดยใช้ชุดแบบสอบถามซึ่งประกอบไปด้วย 6 ส่วนตามลำดับดังนี้ 1) ข้อมูลลักษณะภูมิหลังของผู้ป่วย 2) แบบสอบถามความรู้เกี่ยวกับโรคความดันโลหิตสูง 3) แบบคัดกรองภาวะซึมเศร้าฉบับภาษาไทย 4) แบบสอบถามการสื่อสารระหว่างผู้ป่วยกับผู้ให้บริการสุขภาพ 5) แบบสอบถามการสนับสนุนทางสังคมของผู้ป่วยโรคความดันโลหิตสูง และ 6) แบบสอบถามการให้ความร่วมมือในการรักษาโรคความดันโลหิตสูง วิเคราะห์ข้อมูลด้วยสถิติบรรยาย และการวิเคราะห์ถดถอยพหุคูณแบบเชิงชั้น

ผลการศึกษาความรู้เกี่ยวกับโรคความดันโลหิตสูง การสื่อสารระหว่างผู้ป่วยกับผู้ให้บริการสุขภาพและสนับสนุนทางสังคมของผู้ป่วยความดันโลหิตสูง ร่วมกันทำนายความร่วมมือในการรักษาโรคความดันโลหิตสูงอย่างมีนัยสำคัญทางสถิติ และสามารถอธิบายความแปรปรวนของความร่วมมือในการรักษาโรคความดันโลหิตสูง ได้ร้อยละ 18.3 ความร่วมมือในการรักษาโรคความดันโลหิตสูงอาจเกิดจากอีกหลายปัจจัยร่วมด้วย เช่นการรับรู้ความสามารถของตนเอง การรับรู้ประโยชน์และการรับรู้อุปสรรค ดังนั้นในการศึกษาครั้งต่อไปควรศึกษาปัจจัยเหล่านี้ร่วมด้วยและศึกษาในกลุ่มผู้หญิงที่มีคุณลักษณะและภูมิหลังที่แตกต่างกันมากขึ้น ผลการวิจัยเสนอแนะว่า พยาบาลควรพัฒนาระบบบริการโดยใช้เทคโนโลยีสารสนเทศเช่น Mobile Health (บริการสุขภาพแบบดิจิทัลที่ให้การสนับสนุนด้านการดูแลสุขภาพผ่านเทคโนโลยีมือถือเช่นสมาร์ท) ซึ่งจะเพิ่มประสิทธิภาพของการสื่อสารระหว่างผู้ป่วยกับผู้ให้บริการสุขภาพ อันจะช่วยให้ผู้ป่วยได้รับความรู้เกี่ยวกับ**โรคความ**ดันโลหิตสูง และเพิ่มการสนับสนุนทางสังคม เพื่อที่จะสามารถส่งเสริมให้เกิดความร่วมมือในการรักษาโรคความดันโลหิตสูง

Pacific Rim Int J Nurs Res 2021; 25(1) 131-142

คำสำคัญ: ความร่วมมือในการรักษา โรคความดันโลหิตสูง การรักษาโรคความดันโลหิตสูง การสนับสนุนทางสังคม ผู้หญิง ประเทศไทย

เสาวรส มีกุศล *นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการพยาบาล (หลักสูตรนานาชาติร่วมกับมหาวิทยาลัยต่างประเทศ) โครงการร่วมคณะพยาบาลศาสตร์ และโรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล E-mail:saovaros.meekusol@gmail.com*

วันทนา มณีศรีวงศ์กูล*** *รองศาสตราจารย์โรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล, E-mail: wantana.lim@mahidol.ac.th*

พิศสมัย อรทัย *รองศาสตราจารย์ โรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล, E-mail: pisamai.ora@mahidol.ac.th*

คนึงนิจ พงศ์ถาวรกมล *รองศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล E-mail:kanaungnit.pon@mahidol.ac.th*

Phyllis Williams Sharps *Professor, Johns Hopkins University School of Nursing Baltimore, MD, USA. E-mail: psharps1@jhu.edu*