ปัจจัยทำนายพฤติกรรมในการรักษาโรคของผู้ใหญ่ตอนกลางที่เป็นโรคความดันโลหิตสูงในจังหวัดบินดิน เวียดนาม

Factors predicting therapeutic behaviors of middle-aged adults with hypertension in Binh Dinh Province, Vietnam

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บทคัดย่อ

ความไม่สม่ำเสมอในการปฏิบัติตามแผนการรักษาโรคของผู้ที่เป็นโรคความดันโลหิตสูง ส่งผลให้ไม่สามารถควบคุมความดันโลหิตได้และเสี่ยงต่ออันตรายในชีวิตและความพิการ การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมในการรักษาโรคของผู้ใหญ่ตอนกลางชาวเวียดนามที่เป็นโรคความดันโลหิตสูง และศึกษาปัจจัยที่มีอิทธิพลต่อพฤติกรรมในการรักษาโรค ได้แก่ การรับรู้ประโยชน์ การรับรู้อุปสรรค การรับรู้สมรรถนะแห่งตน และการรับรู้การสนับสนุนจากพยาบาล กรอบแนวคิดการวิจัยพัฒนามาจากแบบจำลองการส่งเสริมสุขภาพของเพนเดอร์ กลุ่มตัวอย่างคือ ผู้ป่วยโรคความดันโลหิตสูง 82 คน ที่ได้จากการสุ่มอย่างง่าย จากผู้ป่วยโรคความดันโลหิตสูงปฐมภูมิที่มารับบริการที่แผนกผู้ป่วยนอก โรงพยาบาลบินดิน ในช่วงระยะเวลา 3 เดือน เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามให้กลุ่มตัวอย่างตอบด้วยตนเอง วิเคราะห์ข้อมูลโดยใช้สถิติพรรณนา และการวิเคราะห์ถดถอยพหุคูณแบบปกติ ผลวิจัยพบว่า กลุ่มตัวอย่างมีพฤติกรรมในการรักษาโรค การรับรู้ประโยชน์ และการรับรู้สมรรถนะแห่งตน ในระดับสูง รับรู้อุปสรรคและการสนับสนุนจากพยาบาลในระดับปานกลาง ปัจจัยที่มีอิทธิพลต่อพฤติกรรมในการรักษาโรคได้แก่ การรับรู้สมรรถนะแห่งตน (β = .48, p < .001), การรับรู้อุปสรรค (β = -.29, p < .01), และการรับรู้ประโยชน์ (β = .19, p < .05) โดยทั้งสามปัจจัยร่วมกันทำนายความแปรปรวนของเวลาที่เริ่มให้ลูกดูดนมครั้งแรก ร้อยละ 60 (F[4,77] = 29.16, p < .001) ผลการวิจัยเสนอแนะว่า พยาบาลควรมุ่งเพิ่มการรับรู้ประโยชน์และการรับรู้สมรรถนะแห่งตน และลดการรับรู้อุปสรรคของผู้ป่วย เพื่อให้ผู้ป่วยโรคความดันโลหิตสูงมีพฤติกรรมในการรักษาโรคที่ดี

คำสำคัญ: พฤติกรรมในการรักษาโรค ปัจจัย ผู้ใหญ่ตอนกลาง ความดันโลหิตสูง เวียดนาม

Abstract

Inadequate adherent behaviors to therapeutic treatment cause failure of control hypertension and increase death and disability in hypertensive patients. Based on the Health Promotion model, this cross-sectional design aimed to investigate therapeutic behaviors of Vietnamese middle-aged adults with hypertension, and examine influences of participants' perceived benefits, perceived barriers, perceived

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self-efficacy, and perceived nurse support to the therapeutic behaviors. Eighty two participants were randomly recruited. They were diagnosed as having primary hypertension and have visited the out-patient clinic of the Cardiovascular Department at Binh Dinh General Hospital during the past three months. Self-report questionnaires were utilized for data collection. Descriptive analysis and standard multiple regression were used for research hypothesis testing. Results showed high levels of therapeutic behaviors, perceived benefits, and perceived self-efficacy. Moderate levels of perceived barriers and perceived nurse support were also found. Regression analysis disclosed predicting power of perceived self-efficacy ($\beta = .48$, $p < .001$), perceived barriers ($\beta = -.29$, $p < .01$), and perceived benefits ($\beta = .19$, $p < .05$), which could explain up to 60% of variances in the therapeutic behaviors ($R^2 = .60$, $F[4,77] = 29.16$, $p < .001$). The findings of the study suggest that interventions should focus on enhancing the patients' perceived self-efficacy and perceived benefits, and minimizing the perceived barriers in order to enhance the therapeutic behaviors of adults patients with hypertension.

keywords: therapeutic behaviors, factors, middle-aged adult, hypertension, vietnam

Introduction

Hypertension has become a significant global health problem and a risk factor for premature death and disability.[1] The World Health organization reported one in three adults worldwide have high blood pressure[2] which contributes to approximately half of all deaths due to stroke and heart disease.[2] Consequences of the condition are extremely harmful with personal and family disruption, loss of income, as well as health-care expenditure.[3-4] Once hypertension is diagnosed, patients need to modify health behaviors by adhering to prescribed medication and adopting recommended lifestyle changes from their health care providers in order to prevent the disease's progression and improve health status. Adherent behaviors are the term which commonly used in the literature referring medication-taking behaviors and lifestyle modifications to treatment recommendations. Such behaviors are essential for therapeutic success, but were found low in hypertensive populations. Uncontrolled hypertension and related health risks were found increase among those who did not adhere to prescribed medication and lifestyle modifications.[5-6] Vietnam is also included in the above trend and mean systolic and diastolic blood pressures are increasing significantly each year.[7] moreover the proportions of treated and controlled hypertension are unacceptably low,[8] and adherent behaviors are generally inadequate.[6,8-10]

Most clinical practitioners and researchers focused on blood pressure control as their ultimate goal of treatment success by concentrating on health behaviors in terms of adherence to medication regimens,[11-13] and only partly promoting lifestyle modifications.[14-16] However, nurses should consider the behaviors of people living with hypertension through the lens of "health protection-promotion" proposed by Pender,[17] in which wellness and illness are the repertory of behaviors that can exist simultaneously. Health behaviors may be motivated by a desire of health protection by avoiding illness or increasing level of well-being in the presence of illness, especially in middle-aged and older adults.[17]

Patients with hypertension can have a higher level of wellness by integrating the human functions toward maximizing the potential of which the individual is capable. Moving from the old perspective of care just blood pressure control is enough to the new one promoting optimal health is the ultimate goal, in order to prevent hypertensive consequences and promote higher levels of health and well-being. Therefore, the patients should be motivated to engage in healthy behaviors by adhering to treatment therapies. The therapeutic behaviors in this study refer to adherent behaviors for controlling blood pressure and promoting health, which consisted of both medication adherence and lifestyle modifications as health protection including health promotion.

Among cognitive factors affecting patients' therapeutic behaviors, perceived benefits, perceived barriers, perceived self-efficacy, and perceived social support have been found to be significant.[13,18-19] However inconsistent findings indicated a need to further reconsider these factors as predictors.[15-16] Additionally, nurses should know whether professional nurse support is a predicting factor for the therapeutic behaviors. Furthermore, by focusing on avoidance of symptoms rather than promoting optimal health, previous research instruments did not include all significant dimensions of the concepts. For instance, they may include only a medication dimension.[11-13] or lack of blood pressure self-monitoring as part of hypertension behaviors. Noticeably, middle-aged adults have high motivation when responding to health behaviors,[17] but they are often susceptible to potential onset of middle life crises leading to high risk of hypertension[20] and were not a targeted population in most previous studies. Vietnamese adults ages 40-60 were specifically targeted to verify effects of intervention. Constructs of behavior-specific cognitions and affect in the Pender's Model[17] were used to predict the therapeutic behaviors of selected Vietnamese middle-aged adults with primary hypertension.

This study aims to describe the therapeutic behaviors, perceived benefits, perceived barriers, perceived self-efficacy, and perceived nurse support, as well as examine predicting influence between the factors and the therapeutic behaviors of Vietnamese middle-aged adults with primary hypertension.

Methods

Setting and Design. This study was conducted at the out-patient clinic of the Cardiovascular Department at Binh Dinh General Hospital, a tertiary health center located in middle coastal region of Vietnam. The cross-sectional and predictive design was utilized to test proposed hypotheses. The formula of Tabachnick and Fidell, 2007 was used[21] to calculate the sample size ($N \geq 50 + 8m$ where m is the number of independent variables). Eighty-two Vietnamese adults ages 40-60 having willingness, who have been diagnosed primary hypertension, and visited the clinic in the past three months, were recruited during February and March, 2015. Because of multiple biases may exist from convenience sampling, simple random sampling technique was utilized to recruit participants for this study.

Ethical considerations. Human rights were ensured through strictly following research procedure. The proposal was approved with the IRB approval number 06-01-2558, for ethical issue by

the Institutional Review Board for Graduate Students, Faculty of nursing, Burapha University. All participants were respected for autonomy, beneficence, and confidentiality during data collection procedure. Research purposes and processes were clearly explained prior to data collection. Voluntary involvement was respected with patients' agreement in signing consent forms. They were also informed of the right to withdraw from the study without any prejudice. Confidentiality and anonymity were maintained by using just ID number on related forms and patient's data.

Data collection procedures. After the proposal was approved, data collection procedures were carried out by the researcher as following:

1. Permission letters from the dean of Burapha University were presented to the director of Binh Dinh General Hospital, Binh Dinh province, Vietnam to get entitlement for data collection.

2. Research purposes and method were informed to chief of the Cardiovascular Department, physicians and nurses at the out-patient clinic.

3. Simple random sampling technique was started in the morning of working days by the researcher when most hypertensive patients seek the clinic for treatment follow-up.

4. The researcher explained participants about research purposes, method of collecting data, human protection, and asked for participation. Then they were requested to sign in consent form according to their willingness.

5. The researcher invited the participants into a prepared room for hypertension consulting, explained their responsibility to the self-reports, and then allowed them to fill the questionnaires. It took around 25-30 minutes for a package of answering the questions.

6. Participant was presented with a small gift for thankfulness from the researcher.

7. The data collection procedures from step 3 to 6 were continued until 82 required samples were met.

There were no subjects who either refused participating or submitted incompleted self-report questionnaires.

Research instruments

Six self-report questionnaires were developed by the researcher to meet demands of variable measurement and were used for data collection.

1. The Demographic Background Questionnaire (DBQ) was used to collect participants' age, gender, marital status, education level, occupation, duration of hypertension, duration of hypertensive treatment, current blood pressure, and co-morbidities.

2. The therapeutic behaviors of Vietnamese Middle-aged Adults with Primary Hypertension Questionnaire (TB-VMA-PHQ) was developed based on concepts from the Pender's Health Promotion Model and literature evidences.[13,19,22] This instrument consisted of 32 Likert items with two main dimensions: medication adherence (9 items) and lifestyle modifications (23 items included: healthy diet, weight control, physical exercise, stimulant avoiding, stress management, blood pressure self-monitoring, and treatment follow-up).They all were positive statements, for example, "I have taken the prescribed medications followed the required time". Correspondent levels were ranged from 1to 5 as "Never = 1; almost never = 2; sometimes = 3; often = 4; and

always = 5". Total items score ranged from 32 to 160. The higher scores indicated the higher levels of therapeutic behaviors.

3. The perceived benefits of therapeutic behaviors Questionnaire (PBe-TBQ) was developed based on literatures review,[13,19] which consisted of 11 Likert items and comprised 3 parts: perceived benefits of therapeutic behaviors in controlling blood pressure and preventing hypertensive consequences, perceived benefits of therapeutic behaviors in avoiding financial burden, and perceived benefits of therapeutic behaviors in promoting health. Example of item was "I will protect my life from stroke". Correspondent levels were ranged from 1 to 5 as "Strongly disagree = 1; disagree = 2; neutral = 3; agree = 4; and strongly agree = 5". Total items score ranged from 11 to 55. The higher scores indicated the higher levels of perceived benefits.

4. The perceived barriers of therapeutic behaviors Questionnaire (PBa-TBQ) was developed to measure patient's perception of anticipated blocks, hurdles, or personal costs of undertaking the therapeutic behaviors, which based on literature review.[6,9,13,19,23] The instrument consisted of 24 Likert items covering 8 kinds of perceived barriers: medication; diet; weight control; exercise; stimulant avoidance; stress control; blood pressure self-monitoring, and treatment follow-up. Example of items was "I feel it is inconvenient to take all of the medications every time". Correspondent levels were ranged as "Strongly disagree = 1; disagree = 2; neutral = 3; agree = 4; and strongly agree = 5". Total items score ranged from 24 to 120. The higher scores indicated the higher levels of perceived barriers.

5. The perceived self-efficacy of thera peutic behaviors Questionnaire (PSE-TBQ) was a 16-item Likert scale, developed based on operational definition of the concept and literature review[18,24] to measure personal judgment concerning capability to organize and execute a certain level of the behaviors. Participants were asked for their level of confidence in performing behaviors of medication taking, dietary modifications, weight control, physical exercise, stimulant avoidance, stress management, blood pressure self-monitoring, and treatment follow-up. An example of item was "I am confident that I can take all of the prescribed medications". The correspondent responses were ranged from 1 to 5 where "Not confident at all = 1, less confident = 2, neutral = 3, fairly confident = 4, and totally confident = 5". Total items scores ranged from 16 to 80. The higher scores indicated the higher levels of perceived self-efficacy.

6. The perceived nurse support of therapeutic behaviors Questionnaire (PNS-TBQ) was developed by the researcher from modifying the Health Care Climate Questionnaire[25] and based on nurse's role in caring for hypertensive patients, to assess the patient's perception of information and emotional encouragement to motivate the therapeutic behaviors, which were supported by nurses. The PNS-TBQ included 16 Likert items comprising two dimensions: perceived informational support and perceived emotional support. They were positive statements, for example, "Nurses have advised me to reduce stress". Correspondent responses were ranged from 1 to 5 as "Strongly disagree = 1; disagree = 2; neutral = 3; agree = 4; and strongly agree = 5". Total items score ranged from 16 to 80.

The higher scores indicated the higher levels of perceived nurse support.

There was no reverse score of any item in the questionnaires. All the instruments were originally developed in English and were translated into Vietnamese by back translation technique.[26] Three bilingual translators who are experts in healthcare practice as well as English language and Vietnamese mother tongue were recruited for the instrumental translation.

7. *Validity and reliability of the instruments*. The study instruments were evaluated for clarity and relevance of contents by a panel of 5 experts in nursing field of hypertension and health promoting behavior. Results of Content Validity Index (CVI), were .98 for the Therapeutic Behaviors of Vietnamese Middle-aged Adults with Primary Hypertension Questionnaire, .96 for both the Perceived Benefits of Therapeutic Behaviors Questionnaire and the Perceived Nurse Support of Therapeutic Behaviors Questionnaire, .95 for the Perceived Barriers of Therapeutic Behaviors Questionnaire. The Perceived Self-Efficacy of Therapeutic Behaviors Questionnaire had highest content validity with S-CVI equal to 1. Additionally, to ensure the instruments denoted the consistency of the measures obtained an attribute, a pilot study was carried out with 30 patients who had the same characteristics and study setting as the study's participants, but were excluded from the study sample. Reliability statistics of the instruments were acceptable with Cronbach's Alpha of .93 for both the TB-VMA-PHQ and PBe-TBQ, .91 for the PBa-TBQ, and .94 for both the PSE-TBQ and PNS-TBQ.

Results

Total 82 hypertensive patients had an average age of 57.2 years. Females were dominant (53.7%). The majority of them were married (96.3%) and retired (81.7%), (retirement age of 55 years for female and 60 years for male, according to Vietnam Social Insurance Law). As many participants had intermediate/college education (46.3%) as those with undergraduate education (45.1%). Mean time since hypertension was diagnosed was around 5.3 years and time receiving treatment averaged approximately 4.5 years. Average systolic and diastolic blood pressure (SBP & DBP) were 134.70 mmHg and 80.73 mmHg, respectively. Prevalence of controlled blood pressure (BP) was 64.6% (with BP < 140/90 mmHg or < 130/80 mmHg if patient had diabetes or hypertension complications). Noticeably, uncontrolled blood pressure accounted for 35.4% of visits. Totally, 42.7% participants had co-morbidity, in which 11% of cardiovascular diseases and 7.3% of stroke after primary hypertension was diagnosed, 9.8% of diabetes, and 14.6% of other diseases, but dyslipidemia was dominant.

The therapeutic behaviors, consisting of adherence to prescribed medications and modifying daily lifestyles, presented as high level. Medication adherence scores were higher than lifestyle modification scores. Perceived benefits of the therapeutic behaviors was scored at a high level, contrasted to moderate levels of perceived barriers. Perceived self-efficacy was also indicated at a high level, while perceived nurse support was indicated at a moderate level. The therapeutic behaviors and the factors are detailed in Table 1.

Table 1 Ranges, Mean, Standard deviation (*SD*), and Item means of the study variables (n= 82)

Variables	Possible score	Actual score	Mean	SD	Item Means	Level
Therapeutic behaviors	32-160	103-155	129.65	12.66	4.05	High
Medication adherence	9-45	28-45	39.11	4.71	4.35	High
Lifestyle modifications	23-115	68-111	90.54	9.68	3.94	High
Healthy diet	8-40	25-40	32.38	3.76	4.05	High
Weigh control	2-10	4-10	7.50	1.13	3.75	High
Exercise	2-10	4-10	8.23	1.46	4.12	High
Stimulant avoidance	3-15	7-15	12.43	2.14	4.14	High
Stress control	3-15	7-15	10.71	1.65	3.57	Moderate
BP self-monitoring	2-10	2-10	6.98	1.68	3.49	Moderate
Treatment follow up	3-15	8-15	12.32	1.60	4.11	High
Perceived benefits	11-55	37-55	46.33	4.20	4.21	High
Perceived barriers	24-120	28-96	64.98	12.53	2.71	Moderate
Perceived self-efficacy	16-80	39-79	61.94	10.68	3.87	High
Perceived nurse support	16-80	33-71	52.40	8.12	3.28	Moderate

Standard multiple regression was run to find significant predictors of the therapeutic behaviors. Assumptions of multiple regression were carefully tested to ensure trustworthiness of the findings. The dependent and independent variables showed normal distribution with no multicollinearity between the factors, linearity, no autocorrelation, no outliers, and homoscedasticity of residuals. The correlations of the study variables were significant with no bivariate correlations were greater than .70.

All the factors were entered simultaneously into regression model. Regression analysis indicated that perceived benefits, perceived barriers, and perceived self-efficacy significantly explained up to 60% of the variances in the therapeutic behaviors (R^2 = .60, $F[4,77]$ = 29.16, p < .001). The best predictor was perceived self-efficacy (β = .48, p < .001), followed by perceived barriers (β = -.29, p < .01) and lowest predicting power were perceived benefits (β = .19, p < .05). Contrary to expectations, perceived nurse support individually was not significant in predicting the therapeutic behaviors. The results of data analysis are interpreted below in Table 2.

Table 2 Summary of multiple regression analysis of factors predicting the therapeutic behaviors (n = 82)

Predictors	*B*	*SE*	β	*t*	t	*p*-value
Perceived self-efficacy	.57	.10	.48	5.59		< .001
Perceived barriers	-.30	.10	-.29	-3.11		.003
Perceived benefits	.56	.25	.19	2.20		.031
Perceived nurse support	-.05	.12	-.03	-.43		.67
Intercept = 90.49***; R^2 = .60, $F[4,77]$ = 29.16***						

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

Discussion

The Pender's Health Promotion Model provided a conceptual framework for this study. Association between the behavior-specific cognition factors affected the outcomes resulting in high therapeutic behaviors of the participants.

Therapeutic behaviors. The participants performed high levels of the therapeutic behaviors. Compared to previous Vietnamese studies in the field of hypertensive health behavior, the current findings were similar to findings of Tran,[27] but higher than health promoting behavior investigated by Ho.[28] The consistency and inconsistency of the results might be because of the different ages of participants and differences in the outcome measurements. Medication adherence was better than following lifestyle changes in this study. This result was congruent with another cross-sectional survey done in North Vietnam[6] and implied the more difficult of adherence to lifestyle modifications than medication adherence. Taking medication generally is a more clear action while acting the lifestyle modification behaviors are broad in scope, unfolding and endless territory, especially in health promoting behaviors.[17]

However, the patients also indicated high level of modifying their daily lifestyles. Dietary recommendations to stop hypertension were strictly followed by their often eating more vegetables, eating less fat, cholesterol and salty foods. Body weight control was somewhat higher than the moderate level in other research.[27] Similarly, doing exercise, stimulant avoidance, and treatment follow-up were presented as high levels. However, stress control in daily life was presented at moderate level by the participants, which is consistent with the results of Ho's study[28] and might be expressed by endocrine changes in the middle age relating to emotional distress.[29] Besides, blood pressure self-monitoring was also not guaranteed, perhaps due to either a lack of beneficial perception of this behavior; or lack of equipment as well as supporting skills for patients using the equipments to self-check their BP.

The presentation of high level of therapeutic behaviors in the current study might be explained from a high motivation and high competency of the specific population as middle-aged adults,[17] resulting in high response of perceived benefits and self-efficacy but moderate response of perceived barriers.

However, the best level of therapeutic behaviors ideally should be at "always" response level to promote optimal health. This means just blood pressure control is not enough, but promoting optimal health is the ultimate goal. Though the study participants revealed high therapeutic behaviors, the proportion of controlled hypertension was still not optimal (just 64.6%). These findings may be inferred from a lacking of maximal therapeutic behaviors of the patients, which decreased the optimal effectiveness of therapeutic treatment. The prevalence of uncontrolled hypertension in the study (35.4%) can also be reflected from the hypertensive patients' treatment history; while most patients have been diagnosed since more than 5 years, the most of them have received treatment for less than 5 years. Some patients did not receive immediate treatment, which might result in increasing hypertension and its complications. The notable prevalence of heart failure and cerebrovascular infarction in the current participants showed treatment failure that might be partly related to inadequate therapeutic behaviors of the patients. Therefore, improving and optimizing the therapeutic behaviors always remains an essential target for hypertension management. Furthermore, highest levels of health and well-being might be accessed if hypertensive patients are completely aware and continue their health behaviors to manage and maintain the controlled blood pressure.

Factors predicting the therapeutic behaviors

Research findings indicated the predictors of the therapeutic behaviors in this study including perceived self-efficacy, perceived barriers, and perceived benefits. Considering these significant factors simultaneously could predict 60% of variances in the therapeutic behaviors.

Perceived self-efficacy. Similar to prior study in Vietnam[27], the current participants presented high level of perceived self-efficacy in taking prescribed medications and changing lifestyles to control hypertension. It is said that most middle-aged adults are at the peak of their influence and authority[30] as well as they have high competency to perform health behaviors.[17] These foundations might explain the high confidence of the middle-aged participants in this study.

The perceived self-efficacy was found as the best predictor in this study, which proved the research hypothesis that perceived self-efficacy could explain the therapeutic behaviors. This effectiveness was confirmed in previous researchs regarding perceived self-efficacy of adults with hypertension.[18,24,28] Self-efficacy is competence in a particular domain which could motivate individuals to engage in health promoting behavior as well as affect perceived barriers to the actions. The higher perceived self-efficacy, the lower the perceived barriers.[17] Thus, high efficacy resulted in high performance of the therapeutic behaviors in the current participants.

Perceived barriers. Perceived barriers to the therapeutic behaviors were just moderate. Panic about medication side-effects was prominent. As other medications, anti-hypertensive drugs can cause side effects for patients leading to the drugs being refused. Additionally, perceived barriers included difficulty to adjust daily caloric intake, eating less favorite foods due to diet restrictions, paying more money to get good food, and eating less salty food were remarkable hurdles in current study, which were also frequently mentioned in numerous previous researches.[9,13,18,31-32] However, perception of barriers

in the current study was not generally high, meaning the middle-aged adults with their high competency could overcome difficulties in lives and engaged in their medication adherence and lifestyle modifications.

Following perceived self-efficacy but with an opposite direction in effects to the outcome, perceived barriers was the second factor that could reversely predict therapeutic behaviors. Prior research[13,19] also indicated the significant predictor of perceived barriers to adherence behaviors among hypertensive populations. The lower perceived barriers, the higher the health promoting behaviors. Participants in the current study perceived barriers to adherence to therapeutic treatment were not high, therefore, the variable contributed somewhat less to high level of therapeutic behaviors.

Perceived benefits. Patients perceived benefits of the therapeutic behaviors were at a high level, in which highest scores indicated in preventing heart disease and stroke. The findings might be explained from the high complication prevalence as heart diseases and stroke in the participants (11% and 7.3%, respectively). Once patients experience the consequences of disease, they would be impressed with the benefits of the disease management and would adopt better health behaviors. Another explanation might relate to length of diagnosed hypertension of more than five years which the patients might learn and gain more knowledge from their disease treatment.

Congruent with previous studies in terms of health behavior of hypertensive populations,[18-19] perceived benefits was also a significant factor in the current set of predicting variables of the therapeutic behaviors. With high perceived level of benefits, the patients took seriously their responsibilities to hypertensive management by adhering to medications regimens and modifying lifestyles.

Integrating between the cognitive factors affected the behavioral outcomes in this study. The current participants showed high perceived self-efficacy and perceived benefits but moderate perceived barriers, the outcome therefore revealed a high level of therapeutic behaviors. These findings proved Pender's philosophy[17] that health behaviors can be directly affected by multiple factors including behavioral cognitive factors.

Perceived nurse support. The patients perceived moderate support from nurses in both information and emotional domains. In contrast to prior studies,[6,18] nursing role in this study was assessed independently with the purpose of determining how much effort was taken by nurses to support the patients in their hypertensive management and promoting optimal health. However, these supports might not be adequate. The findings implied nursing role in categories of care for the hypertensive outpatients were either not addressed in some aspects, or nurses support were not as much as their capability.

Contrary to expectation, perceived nurse support was not significant in predicting the therapeutic behaviors. Although the Pearson correlation statistic showed the relationship between this factor and the outcome, the effects of other variables overshadowed nurse support when modeled as a regression equation. This study did not examine support from other health providers such as doctors or pharmacists, which might explain the differences from previous studies such as that of Pinprapapan[18].

According to Ho, Vietnamese patients mostly received medical information supported from physicians.[28] The current participants presented high level of health behaviors though received moderate support from nurses, they might receive the support from physicians. Actually, behavior change involves not only giving and receiving information, but also involves how it is given and the perceived value of such received information. If health care providers all take their capabilities to care for patients, the hypertension control would better. Consequently, disease preventing and optimal health would increase in the population. Although this finding did not support the hypothesis, the study supported a general scenario of nursing roles under the study setting. In the future it may beneficial to develop an orientation of nursing care approaches to hypertension protection and health promotion.

Limitations of the study

Along with providing literature the predicting factors concerning adherence to therapeutic treatment, the research still had limitations. This cross-sectional study was conducted at only one setting, so generalizability of the findings would be limited.

Implications and recommendations

For clinical nursing practice

As hypertension is increasing over time among Vietnamese adults, reaching optimal goal of hypertension control and promoting health to prevent the disease expanding are targets of the national health goals. The findings should be applied in intervention programs with aim to enhance hypertensive middle-aged adults' behaviors through increasing their perceived self-efficacy and perceived benefits, but minimizing perceived barriers. There is a need to further investigate problems related to blood pressure self-monitoring and stress control in this population. Especially, for middle adults who are transitioning to retirement, self-efficacy can be developed or enhanced through an example of intervention in the form of strengthen patient's self-esteem.

For further research

The research findings are beneficial for developing and testing advanced nursing interventions to enhance and reach optimal level of the therapeutic behaviors. Future research should be conducted to understand the reasons and meanings behind patient's behaviors, especially perceived self-efficacy and perceived barriers, for designing the nursing therapeutic interventions in order to achieve the optimal level of therapeutic behaviors. Additionally, longitudinal design is necessary to capture change over time of the therapeutic behaviors in the middle-aged adults with hypertension.

Conclusion

There is high recognition and practice of hypertensive management by middle- aged adults. The current findings showed that health behaviors can be improved through enhancing the set of behavior specific cognition and affect variables as major motivational significance of health-related factors.

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