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Factors related to self-management behavior among hypertensive patients in Hue city, Vietnam

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ABSTRACT

***Introduction/aim**: Hypertension, commonly referred to as high blood pressure, is a leading cause of morbidity and mortality globally. This study aimed to investigate the self-management behavior and related factors among hypertensive patients at Hue University of Medicine and Pharmacy Hospital and find out some factors related to the self-management behavior of hypertensive patients at Hue University of Medicine and Pharmacy Hospital.* ***Methods**: In this research, we conducted a cross-sectional descriptive study involving a sample of 223 patients who had been diagnosed with hypertension for at least one year. These patients were receiving outpatient treatment at Hue University of Medicine and Pharmacy Hospital between June 2021 and May 2022. The patients were surveyed using a demographic data questionnaire, the hypertension fact knowledge questionnaire, and the hypertension self-management behavior questionnaire which was referenced from a previous study.* ***Results**: The study found that 96.4% of the patients had high level self-management behaviors. Additionally, the study identified a significant relationship between gender, occupation, economic status, living conditions, knowledge about hypertension, and self-management behaviors of hypertensive patients ($p < 0.05$).* ***Conclusion**: The study findings revealed that the levels of self-management for hypertension were consistently high across all components. Moreover, sociodemographic characteristics such as gender, occupation, economic status, living conditions were found to be associated with self-management. Additionally, knowledge emerged as a significant factor positively influencing the self-management behavior of hypertensive patients. These results highlight the importance of considering sociodemographic factors and knowledge enhancement in promoting effective self-management among individuals with hypertension.*

***Keywords**: Hypertension; hypertensive patients; self-management; behaviors*

INTRODUCTION

Hypertension, commonly referred to as high blood pressure (HBP), is a leading cause of morbidity and mortality globally. According to the World Health Organization (WHO), it is estimated that approximately 1.28 billion adults between the ages of 30 and 79 worldwide suffer from hypertension, with the majority (two-thirds) of cases occurring in low- and middle-income countries [1]. It is worth noting that in Vietnam, the prevalence of high blood

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pressure in adults witnessed a significant increase of 25-fold during the period from 1960 to 2008, reaching 25.1% [2]. This is an alarming rate as hypertension is associated with significant morbidity and mortality, including conditions such as myocardial infarction, stroke, and death. Annually in Vietnam, hypertension contributes to 91,000 fatalities (20.8% of total deaths) and accounts for a disability-adjusted life year loss of 7.2%, primarily attributed to the rising incidence of cerebrovascular accidents and cardiovascular diseases [3]. In Hue City, Vietnam, the results of blood pressure screening among adults through the May Measurement Month (MMM) 2019 program by the International Society of Hypertension revealed that out of 6,156 individuals aged 18 and above, a staggering 1,747 (23.9%) were found to have hypertension, of which 33.9% were unaware of their condition. Among those diagnosed with hypertension, 974 individuals were receiving treatment, but a significant 43.7% had uncontrolled blood pressure. When applying the American Heart Association/ American College of Cardiology (AHA/ ACC) 2017 diagnostic criteria to diagnose hypertension, the number increased to 2,613 individuals (42.4%) diagnosed with hypertension [4]. To reduce the incidence of hypertension and improve its management, the 2020 International Society of Hypertension Global Hypertension Practice Guidelines recommended several self-management activities including adherence to medication use, weight management, dietary modifications, alcohol and tobacco cessation, and regular physical exercise [5]. Multiple studies have shown that patient engagement in self-management practices, which encompass dietary modifications, regular physical exercise, stress management, and other lifestyle changes incorporated into their daily lives, can help control blood pressure [6, 7, 8] it is of considerable importance to develop a web-based self-management program that assist patients to tailor their lifestyle and empower them manage their disease.Our primary aims were to evaluate the effects of a web-based self-management program for improving blood pressure and blood lipids control in patients with primary hypertension. Our secondary aims were to evaluate the effects of the web-based self-management program on enhancing patients' lifestyle, medication adherence and self-efficacy. This randomized controlled trial used permuted block randomization design and randomly divided the 222 patients into the intervention group (n = 111). By actively participating in self-care, individuals with hypertension can have a significant impact on their blood pressure control and overall health outcomes [8] mobile health (mHealth. The ultimate success in controlling blood pressure relies heavily on the patient's ability to self-manage their condition. This includes their willingness and capability to adopt and sustain consistent behaviors that effectively regulate their blood pressure [9].

Researchers have emphasized the important role of patients in self-managing their hypertension. Therefore, Patient empowerment and active participation in their own care, along with regular monitoring, adherence to medication regimens, lifestyle modifications, and ongoing communication with healthcare providers, play crucial roles in achieving and maintaining optimal blood pressure control. Identifying the factors that hinder patients from engaging in self-management of hypertension is a significant concern, as it can lead to the development of intervention programs aimed at improving

self-management behaviors. Although some studies have assessed the level of self-management behaviors among patients with hypertension, both domestically and internationally, there is still limited data on self-management behaviors and related factors specifically in Hue City, particularly at Hue University of Medicine and Pharmacy Hospital. Therefore, this study aimed to investigate the self-management behaviors of patients with hypertension undergoing treatment at Hue University of Medicine and Pharmacy Hospital, with two objectives:

1. To examine the level of self-management behaviors among patients with hypertension undergoing treatment at Hue University of Medicine and Pharmacy Hospital.

2. To determine the factors related to self-management behaviors among patients with hypertension undergoing treatment at Hue University of Medicine and Pharmacy Hospital.

METHODOLOGY

Study population: Outpatients with hypertension undergoing treatment at Hue University of Medicine and Pharmacy Hospital.

Inclusion Criteria: Hypertensive patients aged 18 years and above. Patients diagnosed with hypertension for one year or longer. Willingness to participate in the study.

Exclusion Criteria: Patients diagnosed with secondary hypertension (due to renal, endocrine, or genetic causes). Pregnant or breastfeeding women. Patients who were seriously ill and unable to respond to interviews during the data collection period.

Research design:

The study employed a cross-sectional design to assess the self-management behaviors of patients with hypertension at Hue University of Medicine and Pharmacy Hospital from June 2021 to May 2022

Sample size:

The single population proportion formula was used to determine the appropriate sample size for this study:

$$n = Z^2_{1-\alpha/2}\frac{p(1-p)}{d^2}$$

Where:

+ n: minimum sample size

+ Z = 1.96 (for a 95% confidence level)

+ d = 0.05 (desired absolute precision)

+ p = 0.176 (proportion of patients with hypertension achieving self-management behaviors, based on the study by My et al., 2020 [10]).

Plugging in these values into the formula, we can calculate the minimum sample size is 223 participants.

Data collection Instruments:

The data collection tool for this study consists of three parts:

Part 1: General information of patients

General information about patients includes 7 items related to the demographic characteristics of the participants: age, gender, marital status, educational level, employment status, economic status, and living conditions.

Part 2: Hypertension Knowledge Questionnaire

In this study, the patients' knowledge about hypertension will be assessed using

the Hypertension Knowledge Questionnaire developed by Saleem et al., (2012) in Pakistan [11]. It (2020).The questionnaires exhibited a reliability coefficient of 0.73 [10]. items.

Part 3: Hypertension self-management behaviors

Hypertension self-management behaviors was evaluated using the Hypertension Self-Management Behavior Scale developed by Akhter (2010) in Bangladesh [9] which has also been applied in various other countries such as Indonesia [12] to avoid the complications required the ability to self-management behavior such as lifestyle changes including blood pressure control, diet modification and physical activity. This research aimed to determine the factors related to self-management behavior (SMB, Nigeria [13], and Vietnam [10, 14] . The scale has been translated into Vietnamese and tested for reliability with a Cronbach alpha value of 0.95 [10].

The Hypertension Self-Management Behavior Scale includes 40 items and is divided into 5 domains as follows: self-integration behaviors (13 items), self-regulation behaviors (9 items), self-monitoring behaviors (4 items), interaction with health professionals and significant others (9 items), and adherence to treatment regimen (5 items). The responses are measured on a 4-point Likert scale, with options ranging from "never" corresponding to 1 point, "rarely" corresponding to 2 points, "sometimes" corresponding to 3 points, and "always" corresponding to 4 points. The scores for hypertension self-management behavior are divided into 3 levels: scores from 1.00 to 2.00 indicate low self-management behavior, scores from 2.01 to 3.00 indicate moderate self-management behavior, and scores from 3.01 to 4.00 indicate high self-management behavior.

Data collection:

In the initial stage of participant selection, the researcher collaborated with trained nurses who possessed knowledge of the inclusion and exclusion criteria for the study. Subsequently, the researcher personally introduced herself to the patients and provided a detailed explanation of the study, including its purpose and objectives. The patients were then asked for their willingness to participate in the research. Then they were given the questionnaires and requested to drop them into a designated collection box upon completion.

Data analysis:

The data were analyzed using Statistical Package for the Social Sciences 20.0. Descriptive statistics were used to analyze the characteristics of the patients, including the number and percentage of participants. Factors related to self-care practices were determined using statistical tests such as the Mann-Whitney U test, Kruskal-Wallis test, and Spearman correlation. Results were considered statistically significant when the p-value was less than 0.05 ($p < 0.05$).

Ethical consideration:

This study adhered to ethical guidelines and obtained approval from the Research Ethics Committee of Hue University of Medicine and Pharmacy, with the approval number H2021/259, granted on May 28th, 2021. The participant was provided with information regarding the study's purpose, as well as their right to withdraw without repercussions. Informed consent was obtained from all participants.

RESULTS

Table 1. Socio-demographic characteristics of participants (n = 223)

Characteristics		n	%
Age	< 60	37	16.6
	≥ 60	186	83.4
	Mean ± SD	69.67 ± 11.53 (Min: 25; Max: 95)	
Sex	Male	110	49.3
	Female	113	50.7
Marital status	Single	1	0.4
	Married	179	80.3
	Divorced	1	0.4
	Widowed	42	18.8
Educational status	Unable to read and write	11	4.9
	Primary School	75	33.6
	Secondary School	63	28.3
	High School	45	20.2
	College and above	29	13
Occupation	Unemployed	1	0.4
	Full-time employment	26	11.7
	Part-time employment	32	14.3
	Retirement	140	62.8
	Housewife	11	4.9
	Others	13	5.8
Economic conditions	Poverty	7	3.1
	Moderate	146	65.5
	Fair	68	30.5
	Rich	2	0.9
Living status	Living alone	9	4.0
	Living with family	214	96.0

The results from Table 1 showed that out of the 223 participating patients, females (50.7%) accounted for a higher proportion than males (49.3%) with an average age of 69.67 ± 11.53. The majority of patients had an educational level of high school or below (87%).

Most patients were retired or unemployed (68.2%), with two-thirds of them had a moderate economic status. The majority of patients lived with their families, accounting for 96% of the total.

Table 2. Level of knowledge about hypertension among patients (n = 223)

Number of correct answers about HTN	n	%	Interpreting the level of knowledge
< 8	7	3,1	Poor
8 - 12	39	17,5	Moderate
13 - 15	177	79,4	Good
Total Mean ± SD (min - max)	13.11 ± 1.75 (5 - 15)		**Good**

The research results indicated that the majority of patients had good knowledge about hypertension, accounting for 79.4%. The participants' scores on hypertension knowledge ranged from 5 to 15 with the overall mean score was 13.11 ± 1.75.

Table 3. Level of Patients' Hypertension Self-management Behaviors

Contents	Low		Moderate		High		Mean ± SD (min - max)
	n	%	n	%	n	%	
Self-integration behaviors	0	0	15	6.7	208	93.3	3.64 ± 0.36 (2.23 - 4.00)
Self-regulation behaviors	4	1.8	22	9.9	197	88.3	3.62 ± 0.47 (1.67 – 4.00)
Interaction with health professionals and significant others	2	0.9	16	7.2	205	91.9	3.76 ± 0.43 (1.67 – 4.00)
Self-monitoring behaviors	0	0	13	5.8	210	94.2	3.85 ± 0.29 (2.50 - 4.00)
Adherence to treatment regimen	0	0	1	0.4	222	99.6	3.97 ± 0.13 (3.00 – 4.00)
Hypertension Self-management Behaviors	0	0	8	3.6	215	96.4	3.73 ± 0.28 (2.53 – 4.00)

The results of the self-management behaviors of the study participants in our research showed the average total mean score of hypertension patients' self-management behaviors was 3.73 (SD = 0.28), with scores ranging from 1.68 to 3.88. The majority of patients exhibited self-management behaviors in managing hypertension, and the various component areas were at a high level, accounting for over 90% except for the self-adjustment component area was at 88.3%.

Table 4. Factors related to Hypertension Self-management Behaviors

Characteristics		Mean Ranks	Hypertension Self-management Behaviors
Age	< 60	115.27	U = 3320 p = 0.735
	≥ 60	111.35	
Gender	Male	134.68	U = 3720 p = 0.000**
	Female	89.92	
Occupation	Unemployed	159	χ 2 = 15,057 p = 0.010*
	Full-time employment	106.67	
	Part-time employment	104.69	
	Retirement	121,28	
	Housewife	89	
	Others	56.58	
Economic conditions	Poverty	r = -0.176 p = 0.009**	
	Moderate		
	Fair		
	Rich		
Living status	Living alone	66.56	U = 554 p = 0.031*
	Living with family	113.91	
Level of knowledge	Poor	r = 0.362 p = 0,000**	
	Moderate		
	Good		

U: Man Whitney test; χ 2: Kruskal Wallis test ; r: Spearman test

** p <0.05; ** p < 0.01*

The analysis results indicated that there were significant correlation between gender, occupation, economic status, living conditions, knowledge about hypertension, and self-management behaviors in hypertension patients ($p < 0.05$).

DISCUSSION

Socio-demographic characteristics of participants: The research results on the 223 study participants showed that the age group above 60 years old accounts for 83.4%, with an average age of 69.67 ± 11.53. Females had a higher proportion than males, accounting for 50.7%. These findings were consistent with the hypertension patient screening study conducted by Sang et. al,[4] in Hue City, where females were the majority (58.7%). However, when considering age,

the current study showed that the majority of participants were above 60 years old, while the study by Sang et al., (2020) reported an average age of hypertension patients in Hue City as 42.82 ± 17.31. A study by My et.al [8] in Da Nang City also showed that females accounted for 54.1% and the average age of hypertension patients was below 60 years old. In the current research, it was observed that a significant majority of the patients, accounting for 68.2%, were either retired or unemployed. This could be understood as most of the participants were in the elderly age group (above 60 years old), accounting for 82.4%.

Patients' Hypertension knowledge: In this study, the results indicated that the majority of participants surveyed had good knowledge about hypertension, accounting for 79.4%. This result highlighted a relatively high level of awareness about hypertension among the participants in our study. This finding was consistent with some previous studies conducted within the country. A cross-sectional descriptive study conducted on 400 individuals aged 18 and above in Hue City, Vietnam, showed that the proportion of study participants with knowledge about hypertension was 89.7% [15]. The research results of Viet Nam University Of Traditional Medicine & Pharmacy also showed that the proportion of patients with knowledge about hypertension and its treatment regimen was 67.1% [16]. The high level of knowledge observed in our study population from Hue City can likely be attributed to several factors. Easy access to healthcare facilities in a city allows residents to get regular checkups and potentially receive information about hypertension from medical professionals. The availability of educational resources, through community programs, or public health campaigns, can significantly enhance knowledge about health issues like hypertension. However, our results exhibited substantial disparities when compared to several other research studies worldwide. A study conducted in Gondar City, Northwest Ethiopia, revealed that a majority of the participants, specifically 55.3%, exhibited a low level of knowledge about hypertension. Additionally, 17.9% demonstrated a moderate level of knowledge, while only 26.8% had a high level of knowledge regarding hypertension [17]. A study of adults in Jordan found that participants' mean overall hypertension knowledge score was 11.5 ± 3.82 (52.2%), with 85.9% (n = 621) had incomplete knowledge [18]. The disparities in findings could be attributed to various factors, including the timing of the studies, socioeconomic disparities, differences in the measurement tools used to assess knowledge, as well as variances in the study populations across different research investigations. While the participants demonstrated a good knowledge base about hypertension, maintaining and further improving this knowledge is essential. Regular public health campaigns, community involvement, and targeted educational resources can play a crucial role in achieving this goal.

Patients' Self-management Behaviors: The assessment of individual self-management behaviors unveiled notable adherence to self-management practices across multiple dimensions, encompassing self-integration behavior (93.3%), self-regulation behavior (88.3%), Interaction with health professionals and significant others (91.9%), self-monitoring behavior (94.2%), and Adherence to treatment regimen (99.6%). In the comprehensive evaluation of hypertension self-management behaviors, an overwhelming 96.4% of the

study population exhibited a commendable level of self-management behavior. These findings suggest that a substantial proportion of hypertensive individuals included in our research study demonstrated proficient self-management capabilities, effectively navigating the management of their condition. In comparison to the study conducted by My et al., (2020) [10], our research findings reveal significant disparities in the prevalence of patients with a high level of self-management behaviors. While My et al. reported that only 17.6% of participants demonstrated high self-management behaviors, our study observed a substantially higher proportion of individuals, with 96.4%, classified as having high level of self-management behaviors. These contrasts may be attributed to differences in sample size and the specific study populations examined. Our study encompassed a broader sample of individuals with hypertension, whereas My et al. focused specifically on patients with uncontrolled blood pressure. Similarly, studies conducted in Indonesia, Tanzania, and Ethiopia also reported lower rates of adherence to self-management behaviors, with proportions categorized as good self-management ranging from 44.6% [19], 19.7% [20], to 33.1% [21], respectively. These findings are considerably lower compared to the results of our study. This inconsistency could be explained by variations in sample size, socioeconomic and cultural differences, levels of knowledge regarding hypertension, differences in data collection methods and tools utilized, as well as disparities in research methodologies across these studies. It is crucial to acknowledge that these findings are specific to the study population in Hue City and may not be generalizable to other populations or regions of Vietnam. Additionally, self-reported assessments can be susceptible to bias. Future research should consider including a broader range of participants and utilizing additional methods, such as observational techniques, or structured interviews with healthcare professionals, to provide a more comprehensive picture of self-management behaviors among hypertensive individuals.

Factors related to Hypertension Self-management Behaviors: The primary objective of this study was to ascertain the level of self-management behaviors among hypertensive patients and explore various related factors. In light of this objective, our research findings have revealed statistically significant associations between demographic factors and the level of self-management behaviors in hypertension, including gender ($p = 0.000$), occupation ($p = 0.010$), economic status ($p = 0.009$), and living status ($p = 0.031$). These results align with previous studies that have evaluated the relationship between demographic factors and the level of self-management behaviors in hypertension. The study conducted by AlHadlaq et al., [22] on 187 hypertensive patients in Saudi Arabia revealed a correlation between gender and self-management behaviors in hypertension. A literature review also summarized the factors influencing the practice of self-management behaviors in hypertension, including gender, marital status, and patients' economic status [23]. A study conducted in South Korea showed that the self-management health behavior scores of individuals with hypertension were higher among those with at least a high school education ($F = 3.20$; $p = 0.001$), those who were married ($F = 2.76$; $p = 0.007$), and those living with family members ($t = 3.16$; $p = 0.002$) [24]. Notably, this study found that age was not associated with self-

management behaviors in hypertension, contrary to previous research. Several studies have indicated that age is one of the factors influencing self-management behaviors [22]. The study by Tebelu et al. [21] demonstrated that the proportion of good self-management practices was 3.77 times higher in younger individuals (i.e., patients under 65 years old) compared to older adults (i.e., patients aged 65 and above). These findings emphasize the importance of considering demographic characteristics such as gender, occupation, economic status, and living status when examining self-management behaviors among hypertensive patients. This highlights the significance of personalized care in the management of hypertension, as different patients exhibit varying levels of adherence to self-management behaviors. By recognizing these associations, healthcare professionals can tailor interventions and support systems to address the specific needs of different patient groups, ultimately promoting better self-management outcomes in hypertension. For instance, focused education and support groups can be designed for each gender. Patients with demanding work schedules could benefit from incorporating telehealth consultations or medication reminders through mobile apps to improve adherence. Similarly, for patients living alone, connecting them with community support groups or pairing them with a healthcare buddy could be useful.

Our study also found a significant positive correlation between knowledge of hypertension and the level of self-management behaviors in hypertension patients ($p = 0.000$). This correlation suggests that patients who are knowledgeable about their condition are more likely to engage in self-management practices, leading to better disease control, reduced complications, and improved quality of life. This finding is also supported by previous research indicating that patients with better knowledge are more likely to engage in positive lifestyle practices and self-management behaviors. The study by Ilkafah et al., [19] to avoid the complications required the ability to self-management behavior such as lifestyle changes including blood pressure control, diet modification and physical activity. This research aimed to determine the factors related to self-management behavior (SMB demonstrated a significant relationship between the level of knowledge about hypertension in hypertensive patients and their self-management behaviors, where a higher level of understanding of hypertension was associated with higher levels of self-management behaviors, and vice versa. The study by My et.al., [8] also revealed a significant positive correlation between knowledge of hypertension and self-management behaviors ($r = 0.617$, $p < 0.01$). Alefan et al., [25] also suggested that knowledge of hypertension is considered an independent predictor of adherence to lifestyle recommendations among patients ($p = 0.043$). Patients with high scores in the knowledge section of the survey (95%) tended to have higher adherence compared to patients with low scores (5%). This finding underscores the importance of patient knowledge in promoting effective self-management practices. By providing comprehensive education and information about hypertension, healthcare providers can empower patients to take a proactive role in their self-care, leading to improved outcomes and overall well-being. This may involve educating patients about the causes and consequences of hypertension, the importance of medication adherence, the role of lifestyle modifications such as

diet and exercise, and the significance of regular monitoring and follow-up can be beneficial. However, it is important to note that knowledge alone is not enough to drive behavior change. Other factors such as motivation, social support, and access to resources also play a crucial role. Further research could explore the interaction between knowledge and these factors to gain a more comprehensive understanding of the mechanisms through which knowledge influences self-management behaviors.

CONCLUSION

This study presents compelling evidence of a high level of self-management behaviors among patients with hypertension. The findings indicate that sociodemographic characteristics, including gender, occupation, economic status, and living status, are correlated with the ability to effectively self-manage hypertension and its components. Furthermore, the study highlights the positive association between knowledge and self-management behaviors among hypertensive patients. Recognizing and understanding this correlation is of paramount importance in improving hypertension management and ultimately enhancing the quality of life for individuals affected by this condition. By tailoring interventions and support systems based on sociodemographic factors and promoting patient knowledge, healthcare providers can empower patients to take an active role in managing their hypertension and achieving better health outcomes.

Indeed, this study has certain limitations that should be acknowledged. Firstly, the sample size of 223 hypertensive patients may be considered relatively small, potentially limiting the generalizability of the findings to the broader population of hypertensive patients. It is important to exercise caution when extrapolating the results to a larger population. Additionally, the study focused on a specific geographic area, which further restricts the generalizability of the findings to other regions or populations. Furthermore, the reliance on self-reporting from the patients introduces the possibility of recall bias or social desirability bias. Patients may unintentionally provide inaccurate or exaggerated information about their self-management behaviors, which can impact the validity and reliability of the data collected. Future research endeavors could consider incorporating alternative data collection methods, such as direct observation or objective measurements, to strengthen the accuracy and objectivity of the findings.

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