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# Factors Related to Health Behaviors in Persons with Hypertension, Myanmar

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## Abstract

**Background:** The aim of this study was to describe the relationships between personal and environmental factors and health behaviors in persons with hypertension. **Methods**: This was a cross-sectional study carried out using a convenient sample of individuals with hypertension from three community health centers in Yangon, Myanmar. Data were collected using a standardized interviewer- administered questionnaire consisting of six sections: demographic characteristics, Self-efficacy to manage Hypertension Scale, Health Behavior Questionnaire, Barriers to Health Promoting Activities Scale, Hypertension Knowledge Questionnaire, and Social Support Questionnaire. The data were analyzed using descriptive statistics, Chi-square, and Pearson's correlation coefficient. **Results:** Participants had a high level of perceived self–efficacy (42.13 ± 7.58), a low level of perceived barriers (35.32 ± 19.63), a poor social support (49.64 ± 8.51), a good level of hypertension knowledge (10.63 ± 1.90) and a moderate level of health behaviors (70.59 ± 12.39). Health behaviors had significant relationship with income, social support, hypertension knowledge and perceived barriers (r = -0.28, $p$ = 0.004; r = 0.23, $p$ = 0.019; r = 0.27, $p$ = 0.006; r = -0.21, $p$ = 0.034), respectively. **Conclusions:** These findings suggest that health behaviors in persons with hypertension can be improved using hypertension knowledge, social support, and decrease in perceived barriers.

*Keywords: health behaviors, hypertension, Myanmar*

## Introduction

Hypertension is a major health problem globally. In 2015, 1.13 billion people worldwide (> 18 years of age) had high blood pressure and it is predicted to increase to around 1.56 billion in 2025.[1] It causes 7.5 million deaths in people around the world.[2] Therefore, the Seventh Report of the Joint National Committee (JNC 7) recommended that combined use of medication and health behavior modification or as an adjuvant therapy is the gold standard of treatment. Health behaviors modification not only reduces blood pressure approximately 2-20 mmHg but also improves efficacy of antihypertensive medications.[3] Health behaviors in persons with hypertension comprise of dietary approach to stop hypertension or DASH consumption[4] including salt intake reduction, physical activities at least 30 to 40 minutes per day, weight management,[5] moderation of alcohol consumption,[3] smoking cessation,[6] stop betel quid chewing,[7] and stress management.[8,9]

Myanmar, one of the countries in the South-East Asia region had prevalence rate of hypertension equals 22% in 2014[10] and 30% in 2016.[11] It was elevated in both rural and urban areas[10,11] resulting in mortality rate of 26.26 per 100,000 population.[12] In addition, it was in the top ten leading causes of death in Myanmar.[12] Previous studies found that persons with hypertension had lower physical activities in urban areas than rural areas, ate high salty diet, such as salted fish paste (ngapi in local language) because it was affordable and easy for Burmese cooking in their houses.[10,11] Moreover, they had less than 5 servings of fruit and vegetable intake per day,[13] alcohol consumption,[14] smoking behaviors,[10,13] overweight,[14,15] and stressful situation.[15] Therefore, almost 7 in 10 persons with hypertension had uncontrolled blood pressure though they took anti-hypertensive medication regularly.[13] While a number of studies[10,11,13-15] had identified risk factors and health behaviors in individuals with hypertension, it is still necessary to identify factors relating to health behaviors in order to develop nursing intervention program for blood pressure control.

Hypertension control is not only individual level but also a community level because health behaviors results from ethnic/racial, demographic, social, cultural, geographical, and environmental dimensions.[16,17] In addition, health behavior is the result of interacting between personal and environmental factors.[18] Personal factors can be

both physical and cognitive factors including personal characteristics, knowledge, perceived self-efficacy and perceived barriers. Social support as environmental factor is necessary for adopting a behavior and increasing perceived self-efficacy, therefore, it needs to be considered in behavior change.[18] In order to understand health behaviors using social cognitive theory, evidence-based studies have identified that personal factors such as personal characteristics (e.g. age, gender, education, occupation, income), hypertension knowledge, perceived self-efficacy, perceived barriers, and environmental factor such as social support were significantly related to health behaviors in persons with hypertension.[19,20] Thus, the aim of this study was to describe the relationships between personal and environmental factors and health behaviors in persons with hypertension.

## Methods

**Study Design.** This was a descriptive cross-sectional survey of individuals with hypertension, carried out between December 2017 and February 2018 in Yangon, Myanmar. The study was carried out in three community health centers in Thaketa Township, Yangon, Myanmar. The health centers offer primary health care services to an estimated 220,347 population in the Township.

**Participants.** Participants were persons diagnosed with hypertension for at least six months with or without comorbidity or any complications, and were registered in cardiovascular clinics of the three community health centers in the Thaketa Township, Yangon, Myanmar. Other inclusion criteria include: the participants should be ≥18 years old (without cognitive impairment if age 60 years old and above), able to read and write in Myanmar language and willingness to participate in the study. The minimum sample size required for this study was calculated using the G*Power program. Assuming a bivariate correlation with power of 0.8, absolute sampling error of 0.05 and a medium effect size of 0.28 based on a previous study by Lee and colleagues.[20] The minimum sample size was estimated to be 97. Considering an attrition rate of 10%,[21] therefore, this study planned to recruit a total of 108 participants.

**Procedures.** The researcher asked permission from Township Medical Officer (TMO) and Township Health Nurse (THN) after receiving ethical approval letters from the Institutional Review Board, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand (ID 11-60-74) and Ethic and Research Committee of University of Nursing (Yangon), in Myanmar. The researcher coordinated with Township Health Nurse and community authorized persons to select the sample and make appointment with potential participants in order to collect the data in their home. All potential participants were approached and if they refused to participate and did not meet inclusive criteria, another subject was selected. The researcher explained information sheet and received informed consent form. It took 30-45 mins for each participant to complete the interview.

**Demographic Questionnaire.** It was developed by the researcher comprising age, gender, marital status, religion, education, occupation, individual's income per month, duration of hypertension, medication, comorbidities, and betel chewing habit.

**Six-item Cognitive Impairment Test.** It was developed by Katzman and colleagues in 1983[22] was used to screen cognitive deficit of the potential participants aged 60 years and older. It has 6 questions and an inverse scoring method was used. The score ranges from 0 to 28 and the interpretation of score was; "0-7"= normal, "8-9" = mildly cognitive impairment, and "10-28" = significantly cognitive impairment. The participants were allowed to answer within 2 minutes. In this study, the potential participants were interviewed in Myanmar language and those who got 0-7 score were recruited.

**Self-efficacy to manage Hypertension Scale.** It was developed by Warren- Findlow and colleagues in 2012.[23] The Cronbach's alpha coefficient of original instrument was 0.81. It includes 5 items and the responses are ranged from 1 (not confident at all) to 10 (totally confident). The possible score was 5-50. A mean score was calculated and classified into three levels by using Bloom's criteria; poor (5-19), moderate (20-34), and (35-50) high. The original English version was translated to Myanmar version. Then, contents validity tested by three expert nurses equal to 1 and Cronbach's Alpha coefficient was 0.90 and 0.78 in the main study.

**Health Behavior Questionnaire.** Health behaviors of persons with hypertension was measured by Health Behavior Questionnaire which was adopted from Health Promoting Behavior Questionnaire of Nepal and his colleagues in 2015.[24] The content validity of the original instrument was .70 and the Cronbach's alpha coefficient was 0.95. It consists of 26 items with four-point Likert-scale ranged from "1" = never to "4" = routinely. The possible score ranged from 26-104. A higher score near to the highest score was determined as greater health behaviors performance and classified as (26-52) low health behaviors, (53-78) moderate health behaviors, and (79-104) high health behaviors.[24] The questionnaire was translated from English into Myanmar version. Contents validity tested by three expert nurses equal to 0.98, Cronbach's Alpha coefficient was 0.79 and 0.80 in the main study.

**Barriers to Health Promoting Activities Scale (BHPAS).** Perceived barriers was measured by BHPAS.[25] The validity and reliability with internal

consistency reliability was 0.82, and test-retest reliability was 0.75.[25] It includes 18 items with four-point Likert-scale from "1"= never to "4" = routinely. The possible score ranged from 18-72. Higher score indicates the greater perceived barriers and classified as: (18-35) low perceived barriers, (36-54) moderate perceived barriers, and (55-72) high perceived barriers.[25] The questionnaire was translated into Myanmar version and was validated by three expert nurses. The scale level CVI was 0.96 and Cronbach's Alpha coefficient was 0.81 and 0.82 in the main study.

**Social Support Questionnaire.** Social support was measured by Social Support Questionnaire.[26] The original version was developed to examine the factors related to care seeking behaviors regarding hypertension in Myanmar. It includes 5 questions for each sources (media, family members, friends and peers, community leaders and religious leaders and health care persons). It comprises of 25 items with four-point Likert-scale from "1"= never to "3" = always. The possible score ranges from 25-75. Higher score indicates greater social support. The interpretation of score was: (<50) poor social support, and (≥50) good social support.[26] Contents validity tested by three expert nurses equal to 1 and Cronbach's Alpha coefficient was 0.88 and 0.89 in the main study.

**Hypertension Knowledge Questionnaire.** Hypertension knowledge was measured by Hypertension Knowledge Questionnaire.[27] It includes 13 items of knowledge about the complications of hypertension and behavior modification. Each item was scored as "Yes", "No", and "Don't know". A score of "1" was given for correct answer and "0" was given for incorrect and don't know answer. The score ranged from 0-13. The Cronbach's alpha coefficient was 0.85. The high score means good level of knowledge and interpreted as; (< 7) poor knowledge, and (≥7) good knowledge.[27] Contents validity tested by three expert nurses equal to 1 and Cronbach's Alpha coefficient was 0.7 and 0.72 in the main study.

**Ethical Considerations**. The study had been approved by ethical review committee for human research, Faculty of Medicine Ramathibodi hospital, Mahidol University, Thailand, and Ethic and Research Committee of University of Nursing (Yangon), Myanmar. The researcher explained the objectives, expected risk and benefits of the study and the informed consent form was obtained from each participant before data collection. Participants can withdraw from the study any time without any impact on care. All data was kept confidential and presented in terms of overall outcomes.

**Data Analysis**. Data were analyzed using SPSS 21.0 (Statistical Package of Social Sciences) software program. The data were checked for completeness, and outliers. Descriptive statistics such as frequency, percentage, mean (M), median, and standard deviation (SD) were used to describe demographic characteristics, independent variables (age, gender, income, occupation, education, hypertension knowledge, perceived self-efficacy, perceived barriers and perceived social support) and the dependent variable (health behaviors). Pearson's correlation coefficient was used for age, income, perceived self-efficacy, perceived barriers, social support, hypertension knowledge, and health behaviors. Chi-square test was used to examine the relationships between two categorical variables such as gender, occupation, education, and health behaviors. Significance of each test was determined at $p < 0.05$.

## Results

After data were cleaned by checking for completeness, and outliers, 104 participants completed the survey. The age of participants >60 years ranged from 21 to 80 years with average age of 53.27 years, (SD = 10.99). Among them, 67 (64.4%) participants were between 41-60 years, 76 (73.1%) participants were females, 84 (80.8%) participants were Buddhist, 65 (62.5%) participants were married, 39 (37.5%) participants had middle school education and 39 (37.5%) participants did their own businesses or housewives. Average individual monthly income was 61 USD. Moreover, 50% were taking calcium channel blockers, 60.6% suffered comorbidities and 37.50% of participants had habit of betel quit chewing. Average duration of hypertension was 6.71 years (SD=4.50) (Table 1).

Also, the participants had a high level of perceived self–efficacy (42.13 ± 7.58), a low level of perceived barriers (35.32 ± 19.63), a poor social support (49.64 ± 8.51), a good level of hypertension knowledge (10.63±1.90) and a moderate level of health behaviors (70.59 ± 12.39) as in Table 2. Health behaviors had significant relationship with income, social support, hypertension knowledge and perceived barriers (r = -0.28, $p = 0.004$; r = 0.23, $p = 0.019$; r = 0.27, $p = 0.006$; r = -0.21, $p = 0.034$), respectively (Table 3). However, age, gender, education, occupation, and perceived self-efficacy were not correlated with health behaviors (Table 3 and 4).

## Discussion

Age had no relationship with health behaviors. It could be explained that health behaviors in all ages of persons with hypertension had moderate level and need to be improved. The finding was consistent with previous studies in Myanmar.[26,28] In contrast, there was a negative relationship between age and health behaviors in elderly Korean women with hypertension[19] and positive relationship between age and health behaviors in adult Korea-American with hypertension.[20]

Gender had no relationship with health behaviors. Although no significant relationship was found, female (28.95%) had a better health behavior than male (14.29%). It might be partially due to alcohol drinking and smoking were prohibited in female according to Myanmar culture, and Buddhist religion.[11] Despite of this fact, the finding indicated that overall health behaviors in both male and female had low and moderate level and need to be improved. It was consistent with some previous studies in elderly persons with hypertension in Thailand[29] and China.[30] However, many previous studies in Myanmar, and Korea found a relationship between gender and heath behaviors in adult persons with hypertension.[20,28]

**Table 1.** Demographic characteristics of persons with hypertension

| Characteristics | N (%) |
|---|---|
| **Age** | |
| <41 years | 14 (13.5) |
| 41-60 years | 66 (64.4) |
| >60 years | 23 (22.1) |
| **Gender** | |
| Female | 76 (73.1) |
| Male | 28 (26.9) |
| **Religious** | |
| Buddhist | 84 (80.8) |
| Islam | 19 (18.3) |
| Christian | 1 (1.0) |
| **Marital Status** | |
| Married | 65 (62.5) |
| Divorced/Widowed/Separate | 32 (30.8) |
| Single | 7 (6.7) |
| **Education** | |
| No education | 5 (4.8) |
| Primary school | 26 (25.0) |
| Middle school | 39 (37.5) |
| High school | 27 (26.0) |
| Certificate/ Bachelor degree | 7 (6.7) |
| **Occupation** | |
| Government staff | 8 (7.7) |
| Own-business | 39 (37.5) |
| Employee | 3 (2.9) |
| Agriculturist | 10 (9.6) |
| Housewife | 39 (37.5) |
| Retired | 5 (4.8) |
| **Co-morbidity** | |
| No | 41 (39.4) |
| Yes (can answer more than one) | 63 (60.6) |
| Diabetes | 23 (22.1) |
| Heart disease | 16 (15.4) |
| Hypercholesterolemia | 11 (10.6) |
| Others (arthritis, gout) | 13 (12.5) |
| **Medications (can answer more than one)** | |
| Calcium channel blocker | 52 (50.0) |
| Beta-blocker | 31 (27.9) |
| Hydrochlorothiazide | 2 (1.9) |
| Others (for examples; Alpha blockers, Vasodilators, etc.) | 21 (20.2) |
| **Betel chewing** | |
| No | 65 (62.5) |
| Yes | 39 (37.5) |

**Table 2** Perceived self-efficacy, perceived barriers, social support and health behaviors of participants

| Variables | Possible score | Range | Mean ± SD | Interpretation |
|---|---|---|---|---|
| Perceived self-efficacy | 5-50 | 18-50 | 42.13 ± 7.58 | High |
| Perceived barriers | 18-72 | 18-65 | 35.32 ± 10.63 | Low |
| Social support | 25-75 | 34-71 | 49.64 ± 8.51 | Poor |
| Hypertension knowledge | 0-13 | 4-13 | 10.63 ± 1.90 | Good |
| Health Behaviors | 26-104 | 38-104 | 70.59 ± 12.39 | Moderate |

**Table 3** Pearson's product moment correlation coefficient between health behaviors and related factors

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Age | 1 | -.22* | .19* | -.12 | .16 | -.01 | .13 |
| Income | -.22* | 1 | .09 | .09 | -.12 | .12 | -.28** |
| Perceived self-efficacy | .19* | .09 | 1 | -.09 | -.12 | .44** | .13 |
| Perceived barriers | -.12 | .09 | -.09 | 1 | -.22* | -.08 | -.21* |
| Hypertension knowledge | .16 | -.12 | -.12 | -.22* | 1 | -.11 | .27** |
| Social support | -.01 | .12 | .44** | -.08 | -.11 | 1 | .23* |
| Health behaviors | .13 | -.28** | .13 | -.21* | .27** | .23* | 1 |

**$p < 0.01$, *$p < 0.05$

**Table 4** Relationships between gender, occupation, education and health behaviors in persons with hypertension

| Variables | Health Behaviors N (%) | | *p* |
|---|---|---|---|
| | Low and Moderate (25-78) | High (79-104) | |
| **Gender** | | | 0.13 |
| Male | 24 (85.71) | 4 (14.29) | |
| Female | 54 (71.05) | 22 (28.95) | |
| **Education** | | | 0.09 |
| Low education | 56 (80.00) | 14 (20.00) | |
| High education | 22 (64.71) | 12 (35.29) | |
| **Occupation** | | | 0.65 |
| Employed | 46 (76.67) | 14 (23.33) | |
| Unemployed | 32 (72.73) | 12 (27.27) | |

Education had no relationship with health behaviors which was consistent with a previous study.[28] According to health capital framework, education causes persons to access more knowledge about the effect of unhealthy behaviors and leads to alter these behaviors. Therefore, more educated persons had better health behaviors because they could use a limited set of healthcare resources and could select different kinds of resources compared to less educated persons.[31] On the other hand, a relationship was found between education and health behaviors in Chinese[30] and Thai older adults with hypertension.[29] The reasons for diverse finding might be due to different inputs of persons such as nature and quality of learning, hours in school, different curriculum, and learning at different ages.[32]

Occupation was not related with health behaviors in this study. The finding was similar to the results of many previous studies.[20,26,28] However, a study revealed that occupation had a relationship with hypertension health behaviors in persons with hypertension.[33] One explanation for different findings might be due to competing scales of occupation such as level of skill, manual or professional occupation, and combined use of education and income in the study.[34]

Income had a negative relationship with health behaviors. The result indicated that the participants with higher income had poor health behaviors. The reason might be due to urbanization, westernized lifestyle, and economic development that increase unhealthy behaviors such as smoking, alcohol consumption, unhealthy food habits, and physical inactivity in Myanmar.[35] In contrast, a study had a positive relationship between income and taking medication behavior in persons with hypertension. It was found that low-income persons were less likely to adhere anti-hypertensive drug in a tertiary hospital in Myanmar because of high cost of medication.[36] Some

studies found that there was no relationship between income and health behaviors.[28,30]

Hypertension knowledge was related to health behaviors. Based on Social Cognitive Theory,[18] knowledge is an understanding of health behaviors and the information necessary to perform behaviors. If the persons had inadequate hypertension knowledge, they would not change to better health behaviors. Therefore, it is a precondition and a crucial factor for behavior change. Similarly, hypertension knowledge was associated with self-care behaviors[37] in persons with hypertension. On the other hand, some studies found that hypertension knowledge was not related to health behaviors of persons with hypertension in Korea[19,20] and Myanmar.[28,36] Therefore, although knowledge is a foundation for behavior change, it needs to combine with perception to adopt new behaviors and sustain the behaviors.[18]

Perceived self-efficacy was not related to health behaviors. Previous study[18] argued that perceived self-efficacy is a core determinant in health behavior and it leads to motivation, overcome the barriers and sustain the behaviors. Moreover, perceived self-efficacy is behavior specific and it might be different from one behavior to another.[38] Therefore, it might be due to the researcher did not identify participants' confidence level for each health behavior in this study. Similarly, there was no relationship between perceived self-efficacy and anti-hypertensive treatment adherence in Yangon region.[36] Previous research[23] found that perceived self-efficacy was related to five health behaviors including taking medication, nutrition, physical activity, smoking cessation, and weight management strategies but not alcohol limitation or cessation. In contrast, a number of previous studies found a relationship between perceived self-efficacy and health behaviors in persons with hyper-tension in China,[30] Bhutan,[24] and Korea.[19,20] According to Social Cognitive Theory[18] and evidence-based studies,[23,36] more researches are warranted to identify the relationship between perceived self-efficacy and each health behavior with more rigorously designed, and larger sample.

There was a negative relationship between perceived barriers and health behaviors. According to Social Cognitive Theory,[18] barriers are factors that can cause obstacles in performing health behaviors and they can be both cognitive and physical factors. If the persons perceive more barriers, they are less likely to engage health behaviors. It was consistent with many previous studies that found a relationship between perceived barriers and anti-hypertensive treatment adherence in Myanmar[36] and in China.[39] Moreover, there was relation-ship between perceived barriers and health behaviors in Bhutanese persons with hypertension,[24] and in African American persons with hypertension.[40] A significant positive relationship was observed between social support and health behaviors. Social support as environmental factor is necessary for adopting a behavior and increasing perceived self-efficacy.[18] Therefore, social support needs to be considered in behavior change. This was consistent with a number of previous studies which found that social support had a relationship with health behaviors.[19,24,26] However, some studies indicated that there was no relationship between social support and self-care behaviors.[20,28]

This study had some limitations. First, convenience sampling method might lead the researchers select participants who may be more willing to participate in the study. As this study was done in one urban area of Myanmar, the findings might not be generalizable to all hypertension population in Myanmar. Second, as the researcher interviewed by using structured questionnaires, some participants could not understand well in some parts of questionnaires, for example, Self-efficacy to manage hypertension scale. Third, the instruments in the present study were too much and it took about 45 mins to administer the study instrument, therefore, the participants might bored and/or be in hurry to answer the questions which might affect the study findings.

## Conclusions

The study recommended to conduct nursing intervention studies guided by Social Cognitive Theory aimed to promote hypertension knowledge, social support, and decreasing perceived barriers in persons with hypertension. In addition, there were 37.5% of betel chewing persons with hypertension and health education program should highlight the effect of betel chewing on hypertension and develop program for stopping betel quid chewing. The future research should be replicated in other geographical areas in order to generalize the findings. A predictive design study to identify the causal relationship of heath behaviors is recommended.

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## Conflict of Interest Statement

None declared.

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