

Effects of Four Noble Truths Practice on Hypertension Control

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ABSTRACT

Objective: To examine the effects of Four Noble Truths practice in controlling blood pressure with three-group comparison, involving a Mobile Web group, Guidebook group and usual care group in patients with stage 1 hypertension.

Methods: This randomized controlled trial was conducted in one university hospital setting. 145 participants were recruited into the study by randomized selection and were randomly assigning to the three groups. Of these, 45 participated as Mobile Web users, 50 as Guidebook users and 50 in the control group. The Mobile Web and Guidebook were developed using the guidance of the Four Noble Truths and received a phone call every two weeks for three times while control received a usual care. Then, the outcomes were measured including blood pressure and satisfaction at two-month after recruitment. The average blood pressure and satisfaction were compared by comparative descriptive statistic. Finally, analysis of covariance (ANCOVA) was used to analyze the covariate that may influence the outcomes with the post hoc analysis by Bonferroni.

Results: Participants who received Mobile Web or Guidebook had reduced their blood pressure more than those receiving usual care, with statistical significance ($P < 0.05$). It was found that blood pressures could be lowered to a maximum level of 15.09 ± 9.62 mmHg within 8 weeks of treatment. Participants who attended participated in Mobile Web or Guidebook were satisfied with healthcare services more than those receiving usual care, with statistical significance ($P < 0.05$).

Conclusion: The program could be applied to control high blood pressure in patients with stage 1 hypertension. The outstanding of this program could support overall difference in healthcare of each patient with fast efficacy.

Keywords: Blood pressure control; four noble truths; mobile web (Siriraj Med J 2020; 72: 492-501)

INTRODUCTION

One billion of the current world population suffers from high blood pressure,¹ and half of this population has uncontrolled hypertension.² Thailand has also found the same trend among people aged 18 years and older who are likely to have high blood pressure with 53.2% reporting uncontrolled

hypertension.³ Untreated hypertension is notorious for increasing the risk of mortality and is often described as a silent killer. Prehypertension and stage 1 hypertension are also associated with a high risk of atherosclerotic disease by 30% and organ damage by 50% in patients with uncontrolled hypertension within 8-10 years after onset.⁴

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Received 18 May 2020 Revised 23 June 2020 Accepted 24 June 2020

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<http://dx.doi.org/10.33192/Smj.2020.67>

In its general practice guidelines in 2012, the Thai Hypertension Society focused on behavioral change along with treatment to control blood pressure, but the outcome was not optimal. The numbers of people with uncontrolled hypertension continued to rise nationwide. Over the past decade, previous studies have suggested that uncontrolled hypertension is influenced by three main components including personal factors, health care provider factors, and health service system factors. Interventions for alleviating uncontrolled hypertension by development of these three factors have continued to the present.⁵

In recent studies, efforts have been made to control both blood pressure and behavioral modification in patients with hypertension. In the last 20 years, self-management and self-management support have been addressed in terms of raising awareness about creating self-care, systems and environments. Self-management intervention consisted of health education, self-regulation and support group in order to improve the outcomes of care.⁶ Moreover, nowadays, there were an increasing number of self-management intervention using the mobile application.⁷ However, those interventions were implemented without considering the social determinants of health in Thai patients with hypertension, so patients remained unable to control blood pressure.

Several interventions used Buddhism as a guidance to develop the intervention in order to control blood pressure level such as meditation. Meditation interventions were effectively reducing blood pressure level when compared with control.⁸⁻⁹ All uncontrolled hypertension is based on the patient's own behavior¹⁰ and the intervention should focus on the seeking for the truth of problem and develop an intervention related to the cause of problem using of the Four Noble truths guidance. Therefore, interventions aimed at changing the behaviors of patients to reduce blood pressure with the guidance of the Four Noble truths include the following: 1) Dukkha - the truth of suffering; 2) Samudaya - the truth of the cause of suffering; 3) Nirodha - the truth of the end of suffering; and 4) Magga - the truth of the path that frees us from suffering.¹¹ Effective methods are important and require the inclusion of modern communication technology that is suitable for long-distance patients and large groups of the population.

In this study, an intervention was developed to control blood pressure in people with stage 1 hypertension with a combination of the principles of Buddhism and modern technology such as mobile health technology. Mobile health or mHealth technology enables platform flexibility and improves patients' mHealth application performance, which is suitable for patients in terms of

schedule and treatment planning. The popularity of mHealth studies in hypertension and other chronic diseases such as improving self-management,¹² and medication adherence¹³ is demonstrated in the improvements in health status made possible by the mHealth application, which is an effective intervention to improve the blood pressure controlling.

The Four Noble Truths are a rational way to understand the realities of suffering and finding a way out of suffering. This will solve the problem of failure to modify behavior that causes uncontrolled hypertension by combining with Mobile Web, which is easy to access, inexpensive, affordable to many people and features a process for effectively reducing the blood pressure of patients. The objective of this study was to determine the effects of practicing the Four Noble Truths in controlling blood pressure. The hypothesis postulated that patients with hypertension in both groups (Mobile Web and Guidebook groups) who attended the Four-Noble Truths Practice on Hypertension Control program would have lower blood pressure and more health service satisfaction than those who received the usual care program only.

MATERIALS AND METHODS

This study was a randomized control trial (RCT) with a three-group pre-test and post-test design. The study was conducted at a university hospital in Thailand. The study protocol was reviewed and approved by the Research Ethical Committee of the Faculty of Medicine Siriraj Hospital, Mahidol University (Si 296/2018). The study participants were male or female patients diagnosed with stage 1 hypertension by a physician and recorded in medical folders by using the international classification of disease codes-9 (ICD-9)* (systolic blood pressure: SBP = 140-159 mmHg or diastolic blood pressure: DBP = 90-99 mmHg),¹⁴ aged 18 years and over with regular doctor's appointments in the out-patient department of the university hospital where the study was conducted.

The sample size was calculated by performing power analysis with the G*Power program.¹⁵ The differences in the mean scores were compared among the three groups with repeated measure analysis (pre-intervention, first month, and post intervention) with ANCOVA. Thus, the sample size calculation set alpha at 0.05 and assigned power of test at 0.80. According to Cohen's guideline, the medium effect size for ANCOVA was set at 0.25. This study obtained 158 patients (53 subjects per group) and added 10% (16 subjects) to prevent attrition from the sample group, thereby bringing the number of participants in this study to a total of 174 (58 subjects/group).¹⁶

The inclusion criteria for the participants was as follows: 1) diagnosis with uncontrolled stage 1 hypertension and treatment with antihypertensive drugs for at least six months and 2) SBP ranging between 140-159 mmHg. The exclusion criteria consisted of: 1) 1) diagnosed with diseases in the critical stage in the past 3 months; 2) history of diagnosis with psychiatric problems such as depression and schizophrenia; 3) Pregnancy. The participants who met the criteria were selected for enrollment in the study by the minimizer technique version 1.0¹⁷ for improving external validity as follows: 1) Minimization of covariates related to blood pressure level for controlling confounding factors. The covariates should not exceed three variables. In this study, one covariate, gender, was included; 2) Random assignment into the following three groups: usual care (Usual Care Group), learning by interactive program (Mobile Web Group) and learning by Guidebook (Guidebook Group).

The intervention packages were categorized into the following three types: 1) The guidebook contained parts of self-directed records (i.e. self-evaluation related blood pressure level, self-perception related cause of hypertension, setting up targeted blood pressure level, finding a way to lower blood pressure, and recording activities); 2) The Mobile Web contained mobile phone information including an animation to present how to control blood pressure. The information for the guidebook and Mobile Web were developed based on the Four Noble Truths which aimed to support hypertension control by understanding the truth of suffering (*dukkha*), the truth of the cause of suffering (*samudaya*), the truth of the end of suffering (*nirhodha*) and the truth of the path that frees us from suffering (*magga*). Therefore, the interventions included self-evaluation related to blood pressure levels, self-perception related to the causes of hypertension, setting up targeted blood pressure levels, finding ways to lower blood pressure and recording activities. The information was implemented into the program following the recommendations of the JNC 8; 3) Usual care received general care from the nurses at the hypertension clinics, including recording blood pressure and weight in addition to following-up with physicians.

SBP and DBP blood pressure were measured by the average value of two separate measures by using a mercury sphygmomanometer¹⁸ after minutes of relaxation. The measurements were taken on the left arms of the participants. All clothing was removed from the arm and the center of the bladder was placed over the brachial artery. The measurement was taken by a trained nurse.

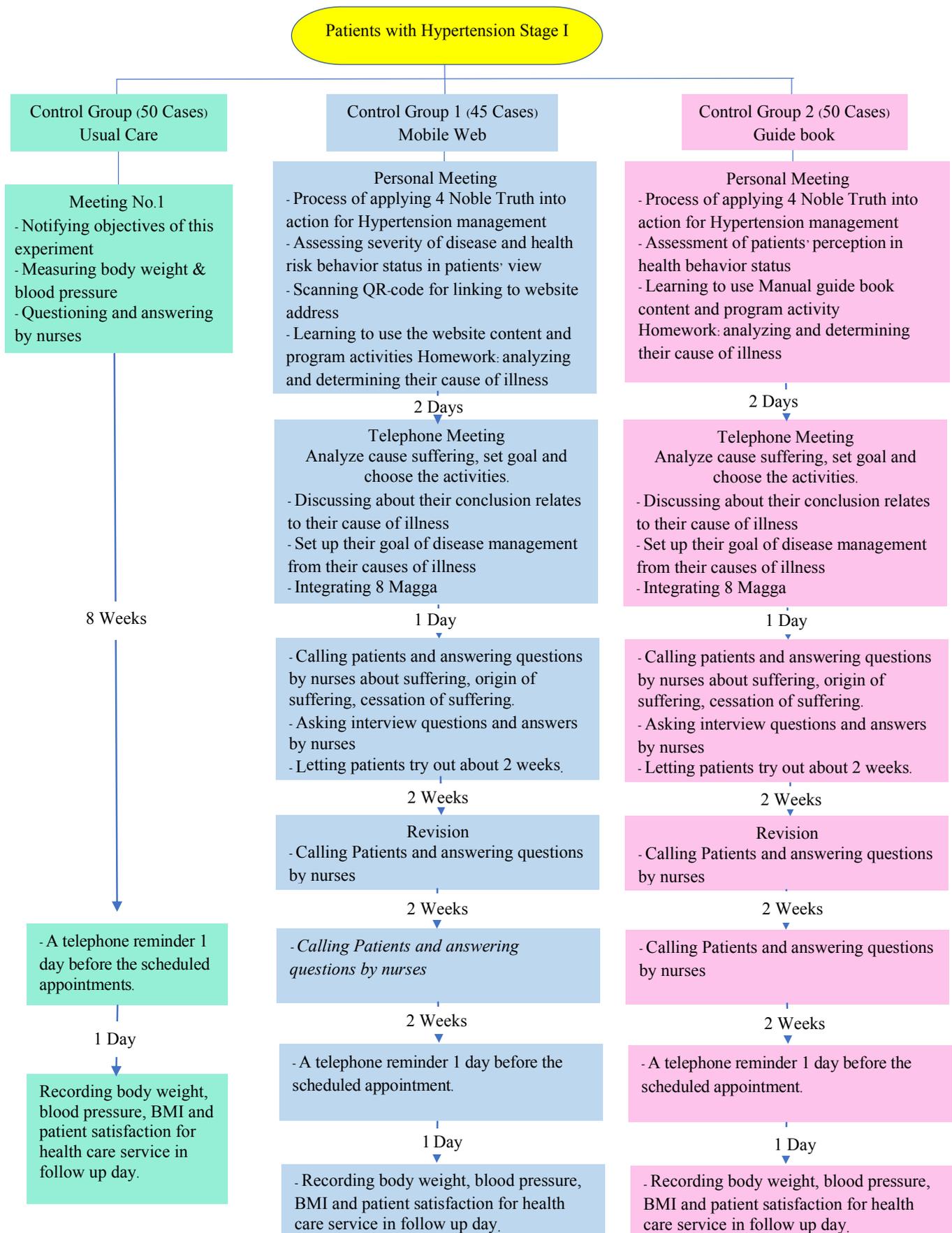
Next, health service evaluation was used to measure patients' satisfaction regarding health service delivery. The instrument was developed by Sindhu, et al. (2004) with a questionnaire containing 20 items on patient perception of health services received from healthcare providers. The overall satisfaction rate was 0-100. In terms of interpretation of the overall items and the overall satisfaction scores, higher scores indicated higher health service satisfaction. The internal consistency (Cronbach's alpha) was 0.89.¹⁹

The research assistants were trained in following protocol, approaching patients, giving questions and answers every two weeks by phone with the same questions and controlling times for accurate treatment between researcher and research assistants. In the intervention group, the participants met the researcher at the first appointment and received usual care with instructions on how to use the Guidebook or Mobile Web. Every two weeks for three sessions after recruitment, the intervention group received phone calls for empowerment, advice and answers to patients' questions. Finally, in the two-month follow-up phase, the participants had data collected on clinical characteristics, SBP and patients' service satisfaction. On the other hand, the control group received usual care detailing hypertension information and measuring the outcome at the end of the study at two months. The flow chart of the data collection process is presented in Fig 1.

Statistical analysis

The comparison of the demographic data among the three groups used the Kruskal Wallis Test. Then the post hoc analysis employed Dunn's test to perform pairwise comparison of variables. In this case, the expected value was < 5 more than 20%, and chi-square or Fisher's exact testing was used. The average pre- and post- SBP of each intervention were compared by using the Wilcoxon Signed Ranks Test. Then the comparison of each part of satisfaction on healthcare services was compared by Kruskal Wallis Test and followed by pairwise comparison using Dunn's test. Finally, analysis of covariance (ANCOVA) was used to analyze the covariate potentially influencing blood pressure reduction after the program with dependent variables (SBP and patient satisfaction) After adjusting the covariate, if at least one pair of the dependent variables and covariate had statistically significant differences, post hoc analysis by Bonferroni was performed to identify those pairs. The variance among the three groups was analyzed by Levene's Test in which a 2-sided p value of <0.05 was considered statistically significant.

Fig 1. Flow of Data Collection Process.



RESULTS

One hundred and seventy-four patients with stage 1 hypertension who were eligible based on the inclusion and exclusion criteria were recruited into this study. During data collection, 29 patients withdrew from the study due to the difficulty in getting to the hospital and inconvenience in completing the 2-month study program. Thus, a total of 145 participants remained in the study including 45 Mobile Web users, 50 Guidebook users and 50 participants in the control group.

Demographic characteristics

The mean ages in each group were 57.6 ± 11.75 years for the Mobile Web group, 68.04 ± 8.86 years for the guidebook group and 63.70 ± 13.40 for the control group. Most of the participants were females. The percentage of females in each group was 75.6 in the Mobile Web group, 76 in the guidebook group and 66 in the control group. When comparing the personal characteristics of the experimental Mobile Web, Guidebook, and control groups, it was found that gender and type of hypertension medication showed no statistically significant difference. However, there were statistically significant differences in body mass index (BMI), blood pressure before the program, duration after hypertension diagnosis, educational attainment, healthcare coverage, income, employment and comorbidities (Table 1).

Systolic blood pressure

The comparison of mean SBP following the intervention found that the Mobile Web group had an average decrease at the end of the program (2 months), with a mean difference SBP of 15.09 ± 9.62 mmHg, while the Guidebook group had a mean difference in SBP of 13.02 ± 12.19 mmHg and the control group had a mean difference of 9.18 ± 12.95 mmHg. The comparisons of mean SBP at pre- and post-intervention were statistically and significantly different in all three groups as shown in Table 2.

Comparison of SBP among three groups after adjusting for covariates

Analysis of covariance (ANCOVA) was used to analyze the covariates potentially influencing blood pressure reduction after the program, including age, comorbidities, SBP before the program, duration after hypertension diagnosis, educational attainment, healthcare coverage, income, employment and BMI. After adjusting the covariate, it was found that at least one pair of the mean SBP had a statistically significant difference. The post hoc analysis by the Bonferroni method found that

the mean SBP of the Mobile Web group was lower than the control group, while the Guidebook group was also lower than the control group with statistical significance as shown in Tables 3 and 4.

Satisfaction scores

The satisfaction score with the selected program found the Mobile Web group to have the highest mean satisfaction score of 93.78 ± 4.97 , followed by the control group (93.36 ± 7.26) and the Guidebook group (90.4 ± 5.26).

Comparison of satisfaction scores among the three groups after adjusting for covariates

Analysis of covariance (ANCOVA) was used to analyze the covariate with potential influence over satisfaction scores, including age, comorbidities, SBP before the program, duration after hypertension diagnosis, educational attainment, healthcare coverage, income, employment and BMI. After adjusting the covariate, at least one pair of satisfaction scores was found to have statistically significant differences as shown in Tables 5 and 6.

DISCUSSION

The mobile web and Guidebook groups had lower SBP than the control group after participating in the Practice of Four Noble Truths for Controlling High Blood Pressure program with statistical significance. At the same time, there were differences in diastolic blood pressure in the Mobile Web and Guidebook groups with no statistical significance. Thus, the program was able to have remarkable effects on lowering SBP in both groups. The program introduced the Four Noble Truths of Buddhism combined with the Mobile Web and the Guidebook technology under the management of specialized nurses in high blood pressure.

Both of the experimental groups with Mobile Web and Guidebook users were encouraged to lower their blood pressure accurately, continuously and appropriately according to individual cases. The Four Noble Truths of Buddhism comprise the four truths of suffering and cessation of suffering, which briefly refer to the cessation of suffering from the causes with correct processes. In patients with high blood pressure, the causal effects were from high blood pressure. Hence, the design of this program had to focus on the elimination of those causes in each patient according to the Four Noble Truths, including Dukkha, Samudaya, Nirodha, and Magga²⁰ as described below:

TABLE 1. Demographic of participants.

Characteristic	Mobile web (n=45)	Guide book (n=50)	Control (n=50)	P-value
Age (years)	57.60±11.75	68.04±8.86	63.70±13.40	<0.001¹
Sex				0.455 ²
Male	11 (24.4)	12 (24.0)	17 (34.0)	
Female	34 (75.6)	38 (76.0)	33 (66.0)	
BMI	27.92±6.21	24.58±3.60	26.09±5.02	0.040¹
SBP before participating in the study (mmHg)	144.18±8.26	147.24±7.28	148.40±5.69	0.050¹
Duration after hypertension diagnosis (years)	6.57±5.33	10.12±6.98	13.62±7.81	<0.001¹
Educational attainment				<0.001²
Uneducated or elementary school	6 (13.3)	28 (56.0)	13 (26.0)	
High school or vocational school	9 (20.0)	7 (14.0)	17 (34.0)	
Bachelor degree or higher	30 (66.7)	15 (30.0)	20 (40.0)	
Healthcare coverage				0.002³
UHC	1 (2.2)	2 (4.0)	11 (22.0)	
SSS	4 (8.9)	2 (4.0)	8 (16.0)	
CSMBS	28 (62.2)	39 (78.0)	27 (54.0)	
Self-employed	10 (22.2)	6 (12.0)	3 (6.0)	
Other	2 (4.4)	1 (2.0)	1 (2.0)	
Income	19,328.89±11,565.26 20,000 (0-50000)	12,164±11,807.21 8,000 (0-50,000)	13,840±17,289 5,000 (0-70,000)	0.004¹
Employment				0.004³
Marchant	2 (4.4)	7 (14.0)	3 (6.0)	
Government officer	13 (28.9)	2 (4.0)	4 (8.0)	
Employer	9 (20.0)	4 (8.0)	9 (18.0)	
Unemployed	21 (46.7)	37 (74.0)	34 (68.0)	
Types of hypertension medication				0.595 ³
Never received	0 (0.0)	2 (4.0)	1 (2.0)	
1 type	26 (57.8)	26 (52.0)	23 (46.0)	
2 types	19 (42.2)	22 (44.0)	26 (52.0)	
Comorbidities				0.023²
None	26 (57.8)	15 (30.0)	23 (46.0)	
Have	19 (42.2)	35 (70.0)	27 (54.0)	
Diabetes	9 (20.0)	22 (44.0)	13 (26.0)	
Hyperlipidemia	10 (22.2)	19 (38.0)	17 (34.0)	
AR	1 (2.2)	1 (2.0)	0 (0.0)	
CKD	1 (2.2)	3 (6.0)	5 (10.0)	
Other	3 (6.7)	4 (8.0)	6 (12.0)	

¹Kruskal Wallis Test, ²Chi-square test, ³Fisher's exact test

Results: mean±SD, median (min-max), n (%)

Abbreviations: BMI = Body Mass Index, SBP = Systolic Blood Pressure, UHC = Universal health coverage, SSS = Social Security Scheme, CSMBS = Civil Servant Medical Benefit Scheme, AR = Allergic Rhinitis, CKD = Chronic Kidney Disease

TABLE 2. The average of SBP before and after intervention with the mean difference of SBP.

Groups	Before SBP	After SBP	P-value	Mean SBP difference
Mobile web	144.20±8.27	129.09±7.85	<0.001	15.09±9.62
Guide book	147.24±7.29	134.22±10.10	<0.001	13.02±12.19
Control	148.40±5.69	139.22±12.85	<0.001	9.18±12.95

Wilcoxon signed ranks test

Abbreviation: SBP = Systolic Blood Pressure**TABLE 3.** The ANCOVA of mean SBP difference and mean satisfaction difference among groups after adjusting for age, comorbidities, SBP before the program, duration after hypertension diagnosis, educational attainment, healthcare coverage, income, employment and BMI.

Variables	SS	df	MS	F	P-value
SBP^a					
Groups	1464.3549	2	732.1775	6.94	0.001
Age	168.2553	1	168.2553	1.59	0.209
Comorbidities	343.2014	1	343.2014	3.25	0.074
SBP before the program	255.1927	1	255.1927	2.42	0.123
Duration after hypertension diagnosis	228.5107	1	228.5107	2.16	0.144
Educational attainment	30.6850	2	15.3425	0.15	0.865
Healthcare coverage	335.7861	4	83.9465	0.80	0.530
Income	245.8787	1	245.8787	2.33	0.129
Employment	348.2690	3	116.0897	1.10	0.352
BMI	115.8679	1	115.8679	1.10	0.297
Satisfaction^b					
Groups	287.1816	2	143.5908	3.87	0.023
Age	0.4960	1	0.4960	0.01	0.908
Comorbidities	12.2170	1	12.2170	0.33	0.567
SBP before the program	26.5270	1	26.5270	0.71	0.400
Duration after hypertension diagnosis	137.3572	1	137.3572	3.70	0.057
Educational attainment	36.9258	2	18.4629	0.50	0.609
Healthcare coverage	54.9481	4	13.7370	0.37	0.830
Income	14.7046	1	14.7046	0.40	0.530
Employment	46.2282	3	15.4094	0.41	0.743
BMI	0.4826	1	0.4826	0.01	0.909

^aLevene's Test of Equality of Error Variances: F=0.647 P-value=0.966^bLevene's Test of Equality of Error Variances: F=1.098 P-value=0.346**Abbreviations:** SBP = Systolic Blood Pressure, BMI = Body Mass Index

TABLE 4. The mean difference of mean SBP after the program in the mobile-web, the guide-book and the control groups.

Group		Mean Difference	P-value
SBP^a			
Mobile web	Guide book	-3.09	0.711
Mobile web	Control	-9.15	0.001
Guide book	Control	-6.06	0.045
Satisfaction^b			
Mobile web	Guide book	2.92	0.183
Mobile web	Control	-1.02	1.000
Guide book	Control	-3.94	0.023

^aAdjustment for multiple comparisons: Bonferroni^bPost hoc analysis of satisfaction score**TABLE 5.** The ANCOVA of mean satisfaction score among groups after adjusting for age, comorbidities, SBP before the program, duration after hypertension diagnosis, educational attainment, healthcare coverage, income, employment and BMI.

Variables	SS	df	MS	F	P-value
Groups	287.1816	2	143.5908	3.87	0.023
Age	0.4960	1	0.4960	0.01	0.908
Comorbidities	12.2170	1	12.2170	0.33	0.567
SBP before the program	26.5270	1	26.5270	0.71	0.400
Duration after hypertension diagnosis	137.3572	1	137.3572	3.70	0.057
Educational attainment	36.9258	2	18.4629	0.50	0.609
Healthcare coverage	54.9481	4	13.7370	0.37	0.830
Income	14.7046	1	14.7046	0.40	0.530
Employment	46.2282	3	15.4094	0.41	0.743
BMI	0.4826	1	0.4826	0.01	0.909

Levene's Test of Equality of Error Variances: F=1.098 P-value=0.346

TABLE 6. Comparison of overall satisfaction on health services.

Characteristics	Mobile-web group (n=38)	Guide-book group (n=38)	Control group (n=42)	P-value
Overall satisfaction on health services	95.33±6.94	87±11.11	89.80±12.86	0.001³

³Kruskal Wallis test

Dukkha (knowing symptoms) - Patients understood their own symptoms when they had physical examinations by taking measurements for blood pressure, weight and height in addition to receiving immediate information from the staff. Blood pressure measurement could inform the patients that they had asymptomatic stage 1 hypertension.²¹ Thus, they became careless. However, this program would stimulate patients to know and understand, so they had greater awareness and self-care.

Samudaya (knowing causes) - The patients received knowledge, considered, and determined the causes of their own hypertension, particularly the causes by incorrect lifestyles²² that could be solved and prevented on their own. The causes of each patient were different. Patients reviewed those causes with nurses in this program, thereby allowing patients to understand the causes based on their behaviors and the effects to their blood vessels and systems in the body. The program empowered patients to strengthen their well-being as a source of awareness about the importance of healthcare with true beliefs and knowledge based on health science. The patients could make their decisions to change or maintain the behaviors that support controlling hypertension as advised by nurses and other people involved. Ultimately, there was a development of health with clear outcomes.¹⁹

This was the reason why the researcher used the Mobile Web or Guidebook, which were designed to allow patients to understand the pathophysiology of fatty tissues that could narrow blood vessels. The patients could then imagine the changes in their bodies as motivation to solve all causes. The pictures in Guidebook or the animation in Mobile Web described the mechanisms of high blood pressure in the body with deep and clear understanding rather than practice by usual care of simply using words to describe and explain. According to the findings, the general introduction of tablet devices could entail a shift in the way students learnt, because the devices provided interactive, media-rich and exciting new environments.²³ When understanding the self-led causes, patients could come up with the idea that they were able to correct themselves and design or choose a lifestyle that would suit them. For instance, they chose to exercise by cycling or walking fast at home, at work, with friends, and at convenient times to do so. Thus, they were able to adopt these activities into real-life practice.²⁴

Nirodha - Once the patients understood the root causes of their behaviors, they accepted the idea that they were able to fix those problems themselves. They were the ones who set the right goals and chose the right lifestyles. For example, they chose to exercise by cycling or walking fast at home, at work, or with friends. Setting

the right times for themselves could actually be helpful in everyday life. The nurses provided information. There was goal-setting between patients and nurses, which was also a means of empowerment. The study of Anuruang found that participants in the program were healthier and more satisfied with their healthcare services than in the past and better than the control group receiving usual care only with statistical significance ($p < 0.05$).¹⁹ These clear goals led patients to practice continuously until they reached their goals.

Magga (practice) - Implementation could be the key to success. Buddhist concepts tend to focus on practice rather than prayer. The main focuses are on the present time, concentration of mind and conscious actions at all times. It should be important to encourage patients to order and remind themselves constantly. The two experimental groups (100%) were composed of Buddhists who understood these contexts when they were encouraged to do so. In particular, all of the participants were Thai Buddhists and used the principles of Buddhism in their daily lives. Therefore, they could correct their own causes based on the Noble Eightfold Path toward successful achievement of goals.

In terms of overall satisfaction in health care services, it was found that the average satisfaction of the Mobile Web group was statistically and significantly higher than that of the Guidebook group. According to the findings, the patients' satisfaction with Mobile Internet-based Health Services (MIHS) was positively influenced by perceived usefulness and confirmation of MIHS performance expectations.²⁵ When comparing the satisfaction with the health services of the three groups, the Mobile Web group had the highest satisfaction, followed by the Guidebook group and the control group, respectively.

Limitation

There was some limitation in this study. First, the adherence to antihypertensive drugs may influence the blood pressure level of participants however we did not measure the adherence of participants and control for this extraneous variable. Second, there was the statistically significant differences among groups for baseline characteristics (e.g. age, BMI, education) however we used the random assignment to assign participants into three groups so the difference may happen by change. Third, our study lacked of controlling for changes in anti-hypertensive regimens during the study period so the medication adjustment may influence the blood pressure level.

CONCLUSION

The program, “Practice of Four Noble Truths in Controlling High Blood Pressure” could be applied to controlling high blood pressure in patients with stage 1 hypertension in nursing and health care practice at both public and private public health centers, hospitals and others. The outstanding features of this program were able to support the overall differences in the healthcare of each patient with rapid efficacy with a variety of choices such as interventions (Mobile Web or Guidebook) for patients to choose based on their needs. They could select their own activities that fit their reasons, convenience and preferences. The program could potentially develop nursing roles in providing care for patients with hypertension nationwide. In particular, the project team could collaborate with other healthcare providers to improve the health of the entire population. It could be helpful to use the Four Noble Truths in health service delivery as a reasonable and conceptual practice leading to optimal success.

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