

# The Effect of an Integrated Savings and Community Based Health Education Program among Older Adults with Hypertension: A Quasi-Experimental Controlled Study, Bangkok Province, Thailand

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## Abstract

**Introduction:** Hypertension remains as the fifth leading cause of death in both females and males in Thailand. Complications of this disease are risk factors to both cerebrovascular and coronary artery diseases. Simultaneously, there is an increase in the proportion of older adults leading to an increase in high blood pressure cases including high incidence rate of hypertension and high burden of older adults' health care cost while their income decline with lower rate of savings.

**Objective:** To examine the effectiveness of savings and health education model (SHE model) program, which is an integration of savings and community based health education for older adults with hypertension in Sai Mai and Klong Sam Wa districts, Bangkok, Thailand.

**Methodology:** Mixed methods using survey, quasi-experimental and qualitative techniques were employed. We examined KAP on hypertension in a random sample of 242 people suffering from hypertension by using the survey techniques including exploring the effectiveness of savings and health education model (SHE model) program in a random sample of 59 participants using quasi-experimental techniques from 2 communities. Focus group discussion was conducted with 27 participants to explore in-depth information related to care, prevention, and the effectiveness of SHE model program.

**Results:** Survey data found most participants had good basic knowledge regarding hypertensive care and prevention. 65.3% and 49.6% of respondents had positive attitudes and practice toward hypertension care and prevention. Data compiled from quasi-experimental study found that knowledge on hypertension had a significant difference on pre intervention. Negative attitude towards care and control had a positive correlation with practice. SBP-negative attitudes and practices were inversely related to DBP. However with knowledge, attitude, and practices, there were recorded improvements in all groups after intervention compared to the control group. Blood pressure improvements were noted post intervention. Community savings funds and effects of blood pressure control on material impact recorded from quasi-experimental study.

**Conclusion:** Improved hypertension health education effects had the most significant impact in controlling the disease in the community.

**Keywords:** Knowledge; Attitude and practice; Hypertension; Survey; Quasi-experimental; Savings

## Abbreviations

KAP: Knowledge Attitude and Practice; QOL: Quality of Life; BMA: Bangkok Metropolitan Administration; USD: United States Dollar

## Introduction

According to the World Health Organization reported in 2013, high blood pressure is one of the most important causes of premature death worldwide killing nearly 9.4 million people every year globally, and the problem is growing [1]. Two-thirds of which are within developing countries including adults of the south-east Asian region such as Thailand, where one in three older adults have high blood pressure

condition [2]. In Thailand, by the year 2014, Bureau of Policy and Strategy, Ministry of Public Health, Thailand (year 2010 and 2014) have reported hypertension and cerebrovascular diseases as the second leading cause of death both in males and females (death rates per 100,000 population) [3]. During 2012-2013, hypertension has increased steadily in every part of country compared with the last 10 years when hypertension prevalence rates per 100,000 populations among Thais went up from 259 to 1,349 implicating that the prevalence rate of hypertension has increase by 5 times (5.21%) [4].

In addition, hypertension causes damage to the human body for years before symptoms develop. Without any control, the patient may wind up with a disability, a poor quality of life (QOL) or even a fatal heart attack [5]. Successfully with lifestyle changes and treatment, the patient can control their high blood pressure including reducing their risk of life-threatening complications [6]. Likewise, increasing in the proportion of older adults cause an increase in the number of incidents

of high blood pressure. Moreover, the adults are not only experiencing hypertension but also financial issues, decrease in their income and lower savings rate.

The effective method to reduce hypertension is to provide health education programs that can motivate and empower a person to take responsibility for their own health [7]. Additionally, health education is the essence of community based health practice [8]. This method is to help prevent the effects of human's health hazards on both individual and community levels including to enhance understanding of the impact that hypertension disease has through individual's learning, which can improve the health of the population especially among patients with hypertension. However, before health education is conducted and provided, the researcher should understand knowledge, attitudes, and practice of hypertension. Also, knowledge, attitudes, and practices of hypertension in a hypertensive population such as in Bangkok province of Thailand still need to be studied. Consistent with the report of health checkup survey of Thai population 4th 2007-2008, Health Information System Development office, Thailand reviewed the situation of hypertension among state II patients with hypertension in 2013 and found that a higher percentage of patients with hypertension received treatment but uncontrolled symptoms simultaneous with controlled symptoms located in the Bangkok area as detailed in Table 1

[9]. Consequently, the researcher used simple random sampling technique for selecting two areas of where to conduct the study. As a result of the simple random sampling technique of both survey and intervention study, Sai Mai and Klong Sam Wa districts were chosen. The purpose of this study aims to assess knowledge, attitudes, and practices of hypertension among patients with hypertension and assess the effectiveness of Savings Health Education (SHE model) program, which is an integration of savings and community based health education for older adult with hypertension in Bangkok, Thailand. Researchers divided the study into two phases. With the end of survey, the Savings and Health Education Model (SHE model program) were launch at the two areas of study. The major components of SHE model consisting of savings, community based health education, group health education and counseling as intervention focus on hypertension disease were implemented on the first group. While, the second group of intervention is the group received specific community based health education intervention. The program of implementation within this group focused only on community based health education focus on hypertension disease without savings program. The third group, which had neither savings nor community based health education, is the control group. The intervention was implemented through 6 months.

Total	Religion					
	North	Central	East	South	Bangkok	Total
	n=1,554	n=1,708	n=1,154	n=1,500	n=776	N=6,692
No diagnosis	48.3	51.6	58.1	51.2	36.9	50.3
Diagnosis but no treatment	7.6	5.6	10.1	14.4	8.7	8.7
Treatment but uncontrolled	20.4	21.9	15.1	17.7	26.4	20.7
Treatment and controlled	23.7	21.0	16.7	16.6	28.1	20.9
Diagnosis but no treatment	7.6	5.6	10.1	14.4	8.7	8.7

**Table 1:** Percentage of patients who diagnosed with hypertension, received treatment and the result of treatment divided by region.

Expectedly, the results of this study can enhance understanding of the knowledge, attitudes, and practices of hypertension among patients with hypertension and gain more understanding of the effectiveness of Savings Health Education (SHE model) program, which is an integration of savings and community based health education for older adult with hypertension. Moreover, the evidence derived from this study can help the researcher and healthcare personnel develop a comprehensive plan to control of high blood pressure by using the appropriate health care services and health education programs available to patients. Until recently, reports have suggested that hypertension knowledge is related to blood pressure control and also health education can motivate and empower a person to take responsibility for their own health [10]. As noted above, health education is the essence of community based health practice and the method to prevent the ill effect of human's health hazards on both the individual and the community [11].

## Methods

### The study population and sample

This research is divided into two parts; survey and intervention parts. The part of survey study-population consisted only of people who were diagnosed with hypertension. A simple random sample of 242 participants was selected from Sai Mai and Klong Sam Wa district, Bangkok city, Thailand. The study in Sai Mai district was conducted at Bhumibol Adulyadej hospital, which is the government hospital with a size of 694 beds and the largest-sized hospital in Sai Mai district. Since the hospitals at Klong Sam Wa District did not have the large capacity similar to Bhumibol Adulyadej hospital at Sai Mai district, the study was therefore conducted at the Health Center. The study was conducted during September to December 2013. All subjects signed informed consent forms. The study was reviewed and approved by the Institutional Review Board of the College of Public Health Sciences, Chulalongkorn University, Thailand and the Institutional Review Board of Bhumipol Adulyadej hospital on October 31, 2013.

At the end of survey, the part of intervention was launched - SHE model program was used for examine the effectiveness of SHE model

program over a period of six months with the quasi-experimental study method. The study population consisted only of people who were diagnosed with hypertension aged 50-60 years old. Stratified sampling had selected samples of 37 subjects (in the two intervention groups) from Sai Mai district, Bangkok. 22 subjects from control group were selected from Klong Sam Wa district, Bangkok. The sample size of 59 working older adults was the total subjects to participate in this study, who met the sample criteria during the six months period of data collection. The study was conducted during January to June 2014. Mixed methods using both quantitative and qualitative techniques were employed in this intervention study.

Knowledge, Attitudes and Practices (KAP) Survey on hypertension were examined in a random sample of 242 people who suffered from hypertension from two communities. Knowledge, attitudes, and practices of hypertension questionnaires were self-administered at the first time, subsequently, the Savings and Health Education Model (SHE model) program was employed by the research team for Group I. The major components of SHE model consists of 12 modules program composing of the introduction of the program, saving strategies (the participants in group 1 can borrow money but cannot borrow any amount higher than his/her deposit and for not longer than one month, if a subject's borrowing exceeded one month, the fire rate is 5.5 per cent per month until payback all of capita), group health education, exercise and individual counseling (one time at the 4th week) on Saturday or Sunday after health education activity led by community leader (at least two persons). The teaching duration of each module is 40 minutes at the community sport ground. After receiving health education, the participants needed to fill out quiz, takes time about 40 minutes. If the trainees do not pass the quiz, the trainer was provided individual counseling/advising for the trainee, who failed the course. The duration of the counseling is 30 minute per module. Furthermore, participants had attended exercise activities (3 times per week on Friday, Saturday, and Sunday), the duration of each exercise activity is 45 minutes or not less than 30 minutes while, venue of exercise is the community sport ground.

For the specific savings program-participants had deposited one baht per day or 30 Baht per month. The government had also complimented the deposit with one Bath per day or 30 Baht per month per participant and the Bangkok Metropolitan had also supported this deposited with one Baht per day or 30 Baht per month for each participant. Therefore, each member got a total of 90 Baht per month. If a member is admitted to hospital, he/she will receive 300 Baht/visit (max two times per year). In case of death, after cremation, the relative of the member will receive the amount of 8,000 Baht. This program is operating in the Sai Mai community under the name of "Community savings fund", however, a member cannot borrow money from this fund for his/her health expenses. Therefore, the researcher had negotiated with the Community saving fund's Committee for possible change of some regulations in order for a member of this fund to borrow the deposit money from the Community savings fund for health expenditure. Changing will be done with the compliance of the Community savings fund Committee.

Group 2 is the group with specific community based health education intervention. The program of implementation within this group is only community based health education without savings program. Upon the first visit, the researcher was introduced to the SHE model program, group health education, exercise and individual counseling (one time at the 4th week) on Saturday or Sunday after health education led by community leader (at least two persons). The

teaching duration of each module is 40 minutes. The duration of exercise is 45 minutes or not less than 30 minutes while the venue of teaching and exercise was at the community sport ground. After receiving the health education, the participants needed to fill out quiz, taking about 40 minutes. If the trainees do not pass the quiz, the trainer would provide individual counseling/advising for the trainee, who failed the course. The counseling duration is 30 minute per module. Participants should attend the exercise activity (3 times per week on Friday, Saturday, and Sunday), and are educated 2 days (11 modules) on Saturday and Sunday led by leader of the community (at least two persons).

The education class is repeated one every month on Saturday and Sunday, especially the 10 modules (without introduction and savings modules), led by the leader of the community (at least two persons) for both groups of intervention. Community leaders were chosen from health volunteers, who are trained about hypertension disease or chronic disease.

The KAP's tools were composed of socio-demographics, family illness, smoking and alcohol consumption, hypertension knowledge, attitudes and practices. Each part of KAP's questionnaires consisted of 15 items. Knowledge questions had 4 multiple-choice answers. Cut point score used to categorize as "good knowledge" was  $\geq 11$ . Scores that fell below 10 were considered as "fair knowledge". Attitude and practice question parts contained the statements measured on a 5 point Likert scale. The cut point score used to categorize general attitudes and practices scored as "High" was  $>80$  percent of regular correct attitudes and practices, "Moderate" was 60-79 percent, and "low" considered  $<59$  percent.

## Procedures

Before employing survey and intervention, a team was established in order to support and collect data. The researcher informed and trained the team on the objectives of the study and regarding both quantitative questionnaires and in-depth interview, which contained 14 key pieces of information. At the same period, cooperation with the hospital and health center committee was developed. The final step included activities and plans of collecting information for the evaluation of knowledge, attitudes and practices of patients with hypertension and SHE model program in both Sai Mai and Klong Sam Wa districts with the inclusion of the in-depth interview method.

## Statistical analysis

Descriptive statistics were used to describe means, frequencies, percentages, and standard deviations of socio-demographic characteristics and knowledge, attitudes and practices of hypertension. The Chi-square, ANOVA (F-test), Scheffe' test and Kruskal Wallis test were used to analyze p value of each group as compared with the association of independence variables with p value 0.05 considered as significant. All statistical analyses were conducted using SPSS version 16.

Qualitative data analyses aiming to discover and understand the holistic picture of hypertension was conducted in order to describe the phenomenon and its meaning. The methods consisted of using in-depth interviews, analysis of content of documents and artifacts, focus group discussions, and participant observations. The detail of each step of analyses is as followed;

Coding and classifying data aims to highlight the important message and the features of the findings.

Transcribing the interviews involves notes of the interviews and the tape recorder.

Using interviews and the observations recorded for describing the participants' feelings can help researchers reduce bias.

Latent level of analysis was employed with the responses as well in addition to what the subjects inferred or implied.

## Results

In surveyed data, two hundred forty two participants, 58.3 per cent were females whose ages ranged from 33 to 90 years old (mean=62.37, SD=8.89). Majority, 48.3 percent, had graduated at the primary level while three-fourth of the patients, or 57.9 percent, were still working. The average income per month was 377 USD. Nearly one-third or 23.6 percent of the patients were smokers and consumed alcohol. All patients had hypertension, and among these 2.9 percent did not receive any treatment for hypertension. The duration of high blood pressure is since patient had the onset symptom of the hypertension until 40 years (mean=6.68 yrs). Similar to family illness, nearly half of the subjects or 45.9 per cent had hypertension. Characteristics of the hypertension patients who completed examinations are presented in the Table 2.

	N=242 (%)
<b>Age group (Years)</b>	
<b>Aged range from 33 to 90 years</b>	
33-39	0.8%
40-49	4.5%
50-59	28.9%
60-69	45.9%
70-79	16.9%
80-89	2.5 %
90 and older	0.4%
Mean (SD)	(8.89)
Female	58.3%
Married	52.9%
<b>Education</b>	
Non-education	5.8%
Primary level	48.3%
Secondary level	31.7%
Bachelor degree	11.6%
Higher Bachelor degree	2.5%
<b>Income</b>	
<b>100%</b>	
Lower income	20 USD
Higher income	3,300 USD
(Mean)	377 USD
Smoking	23.6%

consumed alcohol	23.6%
Hypertension's Disease	100%
Treatment	97.1%
Un-treatment	2.9%
Hypertension duration Mean (SD)	(6.68)
DM	28.9%
Treatment	99.6%
Un-treatment	0.4%
High-Cholesterol	36.4%
Treatment	99.6 %
Un-treatment	0.4%
Osteosclerosis	22.7%
Treatment	16.7%
Un-treatment	83.3%

**Table 2:** Characteristics of 242 patients with hypertension from survey. SD: Standard Deviation.

Referring to hypertension knowledge, most of the participants, 88.8 percent, had good basic knowledge regarding hypertensive care and prevention as presented in the Table 3. In terms of the attitudes toward hypertension care and prevention, nearly two-third or 65.3 percent of the participants had neutral attitudes as shown in the Table 3. Table 3 also showed 49.6 per cent or approximately half of patients reported low practice care and prevention behaviors of hypertension.

KAP of Patients N=242		Male	Female	Total
Knowledge	Good	81(33.48%)	116(47.94%)	197(81.4%)
	Fair	20(8.27%)	25(10.33%)	45(18.6%)
Attitude	High	29(11.99%)	28(11.57%)	57(23.6%)
	Moderate	63(26.04%)	95(39.27%)	158(65.3%)
	Low	9(3.72%)	18(7.44%)	27(11.2%)
Practice	High	4(1.66%)	6(2.48%)	10(4.1%)
	Moderate	53(21.9%)	59(24.38%)	112(46.3%)
	Low	44(18.19%)	76(31.41%)	120(49.6%)

**Table 3:** Hypertension patients' knowledge, attitude, and practices from survey.

In addition, the relationships among hypertension' knowledge and the participants' sex, education, attitudes, practices, smoking and alcohol consumptions, and family illness are highlighted in the resulting output table are presented in the Table 4.

The probability associated with the chi square statistic of education, attitude, and family illness is less than 0.05 indicating that there is a strong relationship between participants' knowledge of hypertension and their education, attitudes, and family illness. Despite this, there is no significant difference between the participants' knowledge of hypertension and their practice of hypertension, and smoking and alcohol consumption.

Level of Hypertension' knowledge	P value						
	Sex	Education	Attitude	Practice	Smoking consumed	Alcohol consumed	Family Illness
N=242	0.683	0.050	0.000	0.073	0.185	0.709	0.028

**Table 4:** P<0.05 of each group as compared with the level of hypertension' s high blood pressure patients and their sex, education, attitude, practice, smoking and alcohol consumption, and family illness. Chi-Square test.

### Intervention result

The intervention result data are presented in six parts consisting of:

**The association of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before implementation between three groups Sai Mai and Klong Sam Wa district, Bangkok, Thailand:** The quasi-experimental study reported, before adoption of this program, that the proportion of patients among both experimental groups and control group are statistically significant at p=0.027 implying that basic knowledge on hypertension among three groups is not different despite health promotion and education by Bangkok Metropolitan Administration especially, with the control group.

In terms of attitudes towards care and control of hypertension, we found the people, who have high level of attitude before intervention, have shown negative association p=0.108 as reported in Table 5. Generally, this study found that, with patients who had low levels of attitudes towards care and control before intervention was due to low levels of knowledge on hypertension. Low levels of knowledge on hypertension do not encourage patients to take action to deal with hypertension.

Variable	(I) Group-(J) Group	Scheffe Test			F-test	p-value
		Mean difference (J-I)	SD	p-value		
Knowledge on hypertension	Gr1-Gr2	-1.739	0.819	0.115	3.870	0.027
	Gr1-Gr3	0.361	0.780	0.899		
	Gr2-Gr3	2.101	0.792	0.036		
Attitudes of hypertension	Gr1-Gr2	0.400	2.305	0.985	2.318	0.108
	Gr1-Gr3	4.244	2.195	0.164		
	Gr2-Gr3	3.843	2.227	0.234		
Practices of hypertension	Gr1-Gr2	0.055	2.743	1.000	1.638	0.203
	Gr1-Gr3	4.090	2.611	0.301		
	Gr2-Gr3	4.035	2.650	0.321		
Systolic blood pressure	Gr1 -Gr2	4.120	4.342	0.640	1.823	0.171
	Gr1 -Gr3	-3.885	4.135	0.645		
	Gr2 -Gr3	-8.005	4.196	0.171		
Diastolic blood pressure	Gr1 -Gr2	-1.594	4.184	0.930	4.369	0.017
	Gr1 -Gr3	-10.816	3.984	0.031		
	Gr2 -Gr3	-9.222	4.043	0.083		

**Table 5:** The association of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure before implementation between three groups. Scheffe statistic test.

Similarly, the respondents' level of practice prior to the SHE program before implementation presented a negative association p=0.203 as presented in the Table 5. Here again, low levels of knowledge on hypertension seem to be the reason for low levels of practices.

The negative attitudes and practice before launch of the SHE model program were consistent with pre systolic blood pressure values. The

association of systolic blood pressure at pre-intervention among three groups by Scheffe test was not significant p=0.171 as shown in the Table 5.

Negative attitudes and practices correlated with generally higher systolic blood pressures. However, the report found diastolic blood pressures did not correlate with negative attitudes and practices.



Results from our quasi-experimental study suggested that health education; appropriate practices for hypertension, together with a healthy lifestyle were serious concerns in the reduction of hypertension among patients. Key issues that require additional focus include interventions from health experts in advising patients with hypertension and appropriate health education targeting the practices of hypertension, promoting salt and stress reduction, and encouraging appropriate exercise at community level in order to control and prevent hypertension complications and to help establish a healthier lifestyle among patients.

The second part focused on exploration of correlation between hypertension' knowledge, attitudes, and practices and blood pressures after implementation among three groups. It also addressed the factors positively affecting their knowledge, attitudes and practices in both communities of study.

**The correlation between hypertension' knowledge, attitudes, and practices and blood pressures after implementation, among the three groups at Sai Mai and Klong Sam Wa district, Bangkok, Thailand:** Since intervention was completed; the evaluation process between two

experimental groups and the control group was conducted to measure the effectiveness of the intervention (SHE model). Key indicator performances of the effectiveness of this program are primary outcomes and secondary outcomes. The primary outcome was improved hypertension' knowledge, attitude, and practice after intervention. The secondary outcome was blood pressure control, measured in both experimental and control groups before and after intervention.

The findings can explain that the association of knowledge on hypertension, after we adopted this program, was statistically significant  $p=0.001$ , meaning basic knowledge on hypertension among three groups was not different.

Regarding attitudes towards care and control of hypertension, the quasi-experimental study reported that the correlation of attitudes among three groups after intervention showed positive association  $p=0.001$  as data in the Table 6. Here we found health education reinforced positive attitudes to hypertension and encourage patients to take action in reducing hypertension.

Variable	(I) Group-(J) Group	Scheffe Test			F-test	p-value
		Mean difference (J-I)	SD	p-value		
Knowledge on hypertension	Gr1-Gr2	0.000	0.482	1.000	110.14	<0.001
	Gr1-Gr3	5.863	0.459	<0.001		
	Gr2-Gr3	5.863	0.466	<0.001		
Attitudes of hypertension	Gr1-Gr2	-0.096	3.032	0.999	11.796	<0.001
	Gr1-Gr3	12.009	2.887	<0.001		
	Gr2-Gr3	12.106	2.930	<0.001		
Practices of hypertension	Gr1-Gr2	-1.350	3.626	0.933	9.960	<0.001
	Gr1-Gr3	12.543	3.452	<0.003		
	Gr2-Gr3	13.893	3.503	<0.001		
Systolic blood pressure	Gr1-Gr2	1.406	4.953	0.961	23.278	<0.001
	Gr1-Gr3	-26.952	4.716	<0.001		
	Gr2-Gr3	-28.359	4.786	<0.001		
Diastolic blood pressure	Gr1-Gr2	8.529	3.301	0.043	25.735	<0.001
	Gr1-Gr3	-13.935	3.143	<0.001		
	Gr2-Gr3	-22.465	3.190	<0.001		

**Table 6:** Mean Different of hypertension' knowledge, attitude, and practice including systolic and diastolic blood pressure after implementation between three groups. Scheffe statistic test.

The respondents' level of practice prior to the SHE model program after implementation presented the positive association  $p=0.001$  as given in the Table 6. Patients with low or negative attitudes towards hypertension had poor perception and low levels of practice, compared with those who had positive or better attitudes and consequent higher levels of practice in dealing with the problem.

Blood pressure control was stronger with those who had positive attitudes and practices than those who had negative attitudes and practices. The association of systolic and diastolic blood pressure post intervention among the three groups by Scheffe test was significant  $p=0.001$  as presented in the Table 7 for understanding the proportion in the level of blood pressure control achievement after intervention.

Variable	Group	N	Achievement (%)	Mean Rank	p-value*
BP post intervention	Group I	19	11(57.9%)	32.58	0.001
	Group II	18	16(88.9%)	41.72	
	Group III	22	2(9.1%)	18.18	
Total		59			

**Table 7:** Compare the percentage of achievement of blood pressure post intervention between three groups. Kruskal Wallis statistic test.

The findings are affected by many factors such as ensuring the necessary hypertension knowledge, adequacy of health education programs, adequacy of motivating the participants, intensity and consistency of the counseling program, stress reduction, hypertensive medication, emergency care, smoking and alcohol consumption program including community co-operations and close links with our research team. Specifically, adequacy of health education programs was the main contributory factors in blood pressure reduction; the program consists of definition, risks, complications and symptoms of hypertension, correct and regular medication intake, correct method of blood pressure measuring, adequate cooking techniques (less salt), weight reduction, stress control, basic principles of emergency care for saving life and awareness of danger smoking and alcohol consumption. It is interesting to note that the dietary and exercise modules are very affective under the SHE program. Therefore, high level of knowledge, positive attitudes and practices were possible in both communities at Sai Mai district compared with control group at Kong Sam Wa district, Bangkok, Thailand.

Another point of concern reported in the third part of study was the influence of savings program to control blood pressure among patient with hypertension stage II.

**The influence of savings program to control blood pressure among patient with hypertension stage II:** The savings program survey results did not increase the potential of decrease blood pressure. Only health education programs influenced control of blood pressure and increased knowledge, attitude, and practice on hypertension. Results from focus group discussions found all subjects among group I lived not far from Bhumibol Adulyadej hospital. In addition, the community and family center under Bhumibol Adulyadej hospital was located close to the Sai Mai community. Therefore, the patient had no difficulty in accessing health services.

However, this study found that most of them 18(94.7%) stated that with membership of community savings funds' they can borrow the money from the fund for medical expense or cost of transportation when they go for follow up at hospital or when faced with a financial crisis. In addition, all of them were satisfied with the membership of community saving fund, if it changed the rules regarding return of benefits. The community saving fund should return the benefits to the members when the members are still alive in the form of money. Furthermore, they can increase the cost of health investment in their life as indicated from the focus group discussion.

In the absence of qualitative study, real result will be limited. Result of qualitative study towards quantitative study can best be concluded as a cycle of study. All results of qualitative were in place in part four.

**Results of in-depth interview and focus group discussion:** Using the in-depth interview and focus group discussion methodologies, we sought more information about blood pressure control. Results of in-depth interview and focus group discussion found that blood pressure control among patients diagnosed with stage II of hypertension had different influences on knowledge, attitudes, and practices. Specifically, respondents who were successful in controlling their blood pressure after intervention had high attitudes and were very concerned as to the practice. This finding support the idea that perceived positive outcomes of diet control, regular exercise, and stress reduction will control hypertension. Additionally, all subjects among both experimental groups had a high level of knowledge about hypertension after intervention according to their continuous training with ongoing monthly consultation. After questionnaire checking was complete, if

some subjects do not understand a topic, the research team had provided advice and consultation to the respondents. However, it is less clear whether this had any impact in savings program. Our findings suggest that significant improvement in hypertension knowledge and attitudes results in less intention in appropriate practices. Participants, who are not fully practiced in reducing high blood pressure, may face complications with their hypertension.

**Impact of integrated savings and community based health education or SHE program:** In both groups of experimental respondents, after intervention, the score on knowledge, attitudes, and practices regarding hypertension care and control were higher than pre-intervention scores. Furthermore, systolic blood pressure and diastolic blood pressure of the both experimental group respondents after intervention were lower than prior to implementing SHE model. From the findings of the present study, it can be concluded that it is possible to change older adults' attitude and behavior including increasing awareness on the way to control their severe hypertension while they are not facing with hypertension complications. All of them were satisfied with this program. One respondent (a woman) from experimental group II even stopped taking anti-hyperlipidemia drugs after the fourth month of joining activities with our study.

The challenge was in finding appropriate methods to motivate patient to be interested in developing skills, knowledge and attitudes in solving their hypertension problem. Inadequate knowledge is the root of this health problem. Community leaders and health practitioners in the part have had little training on hypertension. Hence, the SHE model program was implemented in the communities. Currently local leaders now get trained and receive current information on hypertension. It is recommended to increase the capacity of local leaders on hypertension control. Medical practitioners from a variety of disciplines should be aware of the crucial role they play in health education.

**Sustainability of integrated savings and community based health education or SHE program:** Most of people perceived positive outcomes from the SHE model program for hypertension control. After our team left the communities, the community exercise programs continued and were given an Owners Wisdom for Aging People Award on individual and silver award form Sport Excellence on community level in health promotion from Bangkok Metropolitan Administration (BMA), Bangkok, Thailand.

## Conclusion

By living a healthy lifestyle, we can help keep our blood pressure in a healthy range and lower our risk for heart disease and stroke as mention in the previous chapters. Although hypertension is preventable, it is important to know that it requires adequate knowledge and skills by patients and sufferers. Understanding the definition of high blood pressure, the DASH diet for hypertensive people, the need for proper and regular exercise, stress reduction, emergency care, medication, and limiting smoking and alcohol consumption, all these measures will assist an effective hypertension control. As the World Health Organization has advocated health education, consciously instructed people have access to opportunities for learning to improve health literacy, developing appropriate life skills, and improving knowledge of disease management among individuals and the community. This is consistent with our study. Our three main conclusions concern the following:

First, blood pressure control among patients with stage II of hypertension was positively affected by the significant increase in the knowledge, attitude, and practice of hypertension when compared with the control group. Second, the rationale for focusing on savings program may not significantly decrease blood pressure among patients with stage II of hypertension when compared with experimental group I. Nevertheless, the savings program was satisfied by the older adults from the result of in-depth interview and focus group discussion, despite some concerns on the financial nature. Thirdly, most importantly, the SHE model program seems to be effective for control of high blood pressure by providing health education at a community based level. It offers a positive educational outcome in enhancing the knowledge, attitude, and practice in hypertensive patients. Recommendation for health policy

Researcher needed to determine the consequences for health policy maker who is the main person in the formulation of health policy but lack reliable and comparable data for the efficiency of the community savings funds and positive health outcome. The community is recommended to take advantage of community savings funds and the funds should return the benefits to members while member are still alive. The members can eventually use these benefits to continue investment in their health during the time of economic crisis, or when an emergency happens in their life in order to enhancing access to health care among those with disease or chronic disease.

Promotion of a community savings fund among elderly should be expanded to include savings in other age groups such as working-age groups; or pre-retirement groups. However, if the health policy maker wanted to seriously invest in health, a universal savings plan should be introduced. If this is not possible, then at least a plan for patients suffering from chronic disease should be introduced.

The SHE model creates a greater commitment and supports the changing of behavior in hypertension care and control for all respondents. Community based health education activities might include disseminating accurate information and dispelling myths about definition, risks, complications and symptoms of hypertension. Furthermore, community based activities might control the regular medication intake, correct method of blood pressure measuring, adequate cooking techniques (less salt), weight reduction, stress control, basic principles of emergency care for saving lives, and awareness of consequences of smoking and heavy alcohol consumption. There is an important need for health policy maker to plan the intervention details carefully as an effective and long lasting hypertension control program will not be successful without proper education, encouragement and motivation of hypertensive patients in

order to reduce their unhealthy lifestyle, making their healthy measures become a habit. Furthermore their family members have to be more actively involved in the intervention program for active support. The organization of social mobilization events and community participation will raise hypertension awareness and promote healthy lifestyle habits in the future.

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## References

1. WHO (2013) High Blood Pressure Global and Regional Overview. World Health Day 2013.
2. Hypertension Statistics World-wide (2005) *The Lancet Journal*, Frost and Sullivan statistics.
3. Bureau of policy and strategy (2014) Public Health Statistics AD 2014. The office of the permanent secretary for public health, Ministry of Public Health, Thailand.
4. Bureau of policy and strategy (2013) Public Health Statistics AD 2013. The office of the permanent secretary for public health, Ministry of Public Health, Thailand.
5. Henry B, William E (2007) Hypertension A Companion to Braunwald's Heart Disease (2nd Edn), Philadelphia, Canada.
6. Stephen PF, Winkleby MA, Flora JA, Haskell WL, Taylor CB (1990) Effect of Long-term Community Health Education on Blood Pressure and Hypertension Control: The Stanford Five-City Project. *Am J Epidemiol* 132: 629-646.
7. Karen G, Barbara KR, Viswanath K (2008) Health Behavior and Health Education Theory, Research and Practice. John Wiley and Sons.
8. The report of health checkup survey of Thai population 4th 2007-2008 (2009) Health Information System Development Office, Thailand, p: 58.
9. Bandura A (1977) Social Learning Theory. General Learning Press, New York, USA.
10. Marianne C, Forsyth EA (1992) Changes in knowledge, attitudes and behavior of women participating in a community outreach education program on breast cancer screening. *Paper patient education and counseling Journal* 19: 241-250.
11. Iso H, Shimamoto T, Yokota K, Sankai T, Jacobs D Jr, et al. (1996) Community-Based Education Classes for Hypertension Control: A 1.5-Year Randomized Controlled Trial. *American Heart Association* 4: 968.