THE EFFECTS OF INTEGRATED LAUGHTER MILD PHYSICAL ACTIVITY AND DIETARYSELF-CONTROL ON BLOOD PRESSURE AND SERUM LIPID PROFILE AMONG WOMEN WITH HYPERTENSION IN SUBURB COMMUNITY PATHUM THANI THAILAND

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Abstract- Non-pharmacological treatment has been shown to control blood pressure in patients when evaluated in primary health care setting. The objective of this study was to access the effects of integrated laughter, mild physical activity and dietary self-control (ILMPAD Program) on blood pressure among women with hypertension in suburb community, Pathum Thani province, Thailand**.** Forty-nine and women with hypertension, age range 60 through 80 years, diagnosed to be hypertension with physician's treatment at least for 1 year, and patients who had no serious chronic illness were selected. All participants were randomly assigned into two groups by matching age and sex, one group was selected to participate the ILMPAD program and the intervention group was instructed on how follow the ILMPAD program for 12 weeks at Bueng Kham Phroi Primary Healthcare Center. A 12 week of ILMPAD program consisted of a 10 minute health education and a 40 minute exercise training. Individual for dietary record for 10 minutes was checked. ILMPAD program was repeated every month at clinic under physician's appointment for 3 times. The control group received only the usual care from health promoting hospital. The outcome was changing in blood pressure (BP) from baseline to a 12 week after ILMPAD program, compared between groups. T-test demonstrated Of 41 participants were randomly allocated to ILMPAD program (n=20) and control groups (n=21).Compared with baseline, there was no significant difference of blood pressure between the two groups ($p>0.05$). Serum lipids (cholesterol, LDL, HDL) were significant difference before and after the intervention ($p<0.05$). However, there was showed no significant difference of serum lipids between the two groups ($p>0.05$).ILMPAD program would be effective in lowering blood pressure with longer intervention and it is further needed to evaluate on this program.

Keywords- ILMPAD Program, Blood pressure, Women, Hypertension, Thailand.

I. INTRODUCTION

The recommendation to begin lifestyle therapy, such as having a healthful diet which included reducing salt and sodium, being physically active, smoking cessation and limited alcohol consuming could reduce the risk of developing other complications due to high blood pressure [1]. Thus, there is considerable interest in treating hypertensive patients with lifestyle therapy by combination with anti-hypertensive drugs. Various studies stated that efficacy with mind-body intervention can control of blood pressure [2]. Furthermore, Eastern exercise such as Tai Chi, Qi Gong and other names of Chinese exercise also yoga, is used as an alternative modality for lowering blood pressure [3-5]. Furthermore, mirthful laughter can contribute to lower CVD risk and fewer CVD risk MI reoccurrence. In addition, based on Bandura's self-efficacy theory, how self-efficacy motivates participation in physical activity that provides evidence for further use of these measures in other contexts [6]. Therefore, the author combined set of exercise by using laughter technique [7] and Chinese exercise namely "Jinkangkong" which is popular in Nonthaburi[8], giving short talk about blood pressure and individual checklist for dietary intake. According to pilot study, the results showed laughter plus Jinkangkong exercise is effective in lower systolic blood pressure after an 8 week among old patients with mild hypertension. However, the effects of integrated laughter and mild physical activity, plus with dietary self-control (ILMPAD program) is still unknown, we hypothesized that the program would be show significant improvement in blood pressure control and serum lipid (cholesterol, triglyceride; TG, low-density lipoprotein; LDL and high-density lipoprotein; HDL). Therefore, the objective of the present study was to evaluate the effects of integrated laughter, mild physical activity and dietary self-control program (ILMPAD program) on blood pressure and serum lipid profile among hypertensive patients in community, Pathum Thani, Thailand.

II. MATERIALS AND METHODS

2.1 Participants and recruitment

Bueng Kham Phroi primary healthcare center, located in Lamlukka district, PathumThaniwas purposively selected from 12 centers which are under supervised by Lamlukka community hospital, PathumThani Provincial hospital and Ministry of Public health, respectively. Each of primary healthcare centers can provide healthcare services up to 200 outpatients a day [9].

Participants by matching age were randomly assigned into two groups. The sample size was calculated

based on a previous study [10]. The sample size required in each group in the current study was 17 cases per group with 80% power at the 5% significant level. To compensate for a 20 % dropout rate and added those might have any complications in later, too ill, and/or individual reasons. Finally, overall sample size was 41 cases.

The inclusion criteria was women**,** age range 60 through 80 years, diagnosed of hypertension at least for 1 year, taking hypertensive medication, regular attendances once a moth at hypertension clinic were selected. However, patients who had severe complications or other chronic diseases such as diabetes, renal failure and disability included those could not speak/read Thai language, did not agree to participate were excluded. After participants signed consent, physical fitness test for Thais elderly from Health Education Division, Ministry of Public Health was screened the readiness of body- balance, body-flexibility and agility to ensure that participants fit enough to perform an exercise by themselves. Moreover, stress assessment, the online version from department of Mental health, Ministry of Public Health, was used to evaluate participant's opinions and feelings during a prior of 2 weeks.

The recruitment began in January 2015 and completed in May 2015. From 202 chronic out-patients, 99 participants did not meet inclusion criteria. Of 103 participants were eligible to screen and 62 patients were excluded, respectively. Therefore, forty-one of participants who enrolled at baseline were randomly allocated to intervention (n=20) and control groups (n=21). Finally, totally of participants in the intervention and control group were 20 and 21 with completed ILMPAD program through a12 week of the study that are given in fig 1.

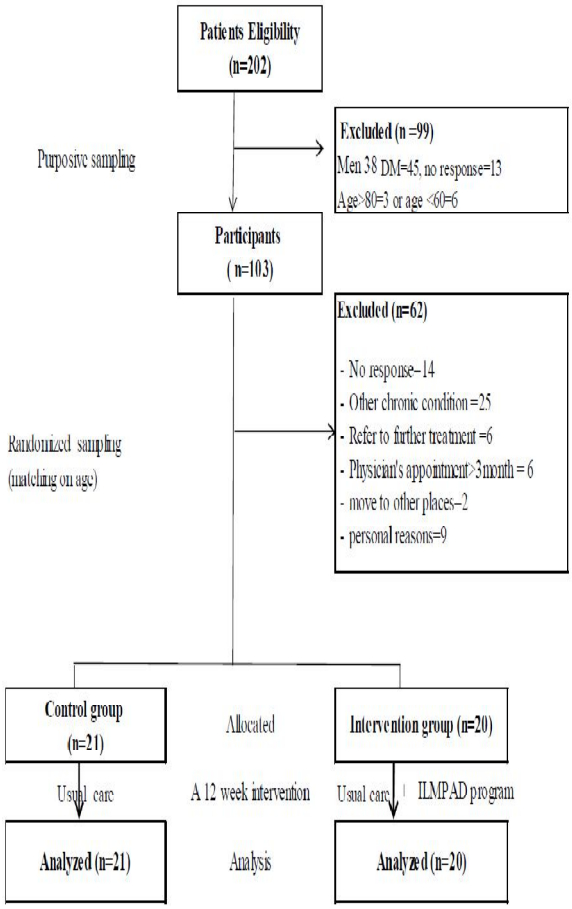


Fig. 1 Study population of hypertensive patients

Table 1 Session of ILMPAD Program

week	Activities
0	Health education (10 min) Laughter with Jinkangkong Exercise (40 min) 20 items dietary intake checklist(20 min)
4	Health education (10 min) Laughter with Jinkangkong Exercise (40 min) 20 items dietary intake checklist(20 min)
6	Home visit I To remind participants follow program
8	Health education (10 min) Laughter with Jinkangkong Exercise (40 min) 20 items dietary intake checklist(20 min)
10	Home visit II To foster participants follow program
12	Health education (10 min) Laughter with Jinkangkong Exercise (40 min) 20 items dietary intake checklist(20 min)

2.2 Procedure

For the intervention group (ILMPAD program) consisted of laughter, mild physical activity and dietary self-control which based on the concept of lifestyle modification which suggested for all patients with hypertension byhaving a healthy food, being physically active, quit smoking and reducing alcohol consumption [1, 11]. Therefore, the major components of ILMPAD program: 1) giving a 10 minute short talk of hypertension knowledge, 2) motivation by a 10 minute checking routine activity as a 3 previous days of week in term of dietary intake (high fiber and fruit), exercise stress with relaxing and 3) 40 minutes group exercise training (laughter plus with Jinkangkong exercise) were done. ILMPAD program was repeated in monthly through 3 months. Furthermore, Participants were encouraged to do activity via program individually by home visiting during month 2nd interval and month interval in order to ensure that those had followed ILMPAD program, which are shown in Table 1.

The usual care for the control group consisted of 1) monthly physician's appointment, 2) routine hypertensive measuring (body weight, body mass index, waist circumferences and blood pressure, 3) individual counseling from doctor, 4) collecting antihypertensive medication from pharmacist and 5) regularly making the next appointment.

Measurement procedures were done in both groups of participants received all routine care at BeungKamPhroi healthcare center. Participants did

not know if they were in the intervention or the control group, the single-blind technique was used and separate for different day of the week appointment at clinic, participants in the intervention group were appointed on the second week of each month while participants in the control group were appointed on the third and fourth week of the month, respectively. Before and after intervention program was done, those had a schedules for physical assessment, measurement of bodyweight (BW), body mass index (BMI) and waist circumferences (WC). Blood pressure was measured in a sitting position at least two different occasions which followed by JNC7 [1].

For serum blood test, all participants were asked to fast from food, beverages, tea, coffee, and smoking for at least 12 hours before drawn blood. Blood of 5 ml was collected at 6.00- 8.00 A.M. to measure serum lipid. Other parameters were done during period of ILMPAD program and monitored by multi-professional health team staff of healthcare center. All medical record was permitted agreement from director of health promoting hospital. prior to participation, the purpose and procedures were fully explained and all participants gave written inform consent after the study was reviewed by the Ethics Review Committee for Research Involving Human Research Subjects, Health Sciences Group from Chulalongkorn University (COA No.178/2557).

2.3 Data analyses

The results obtained were statistically analyzed using SPSS statistical package version16.0. The independent t-test and Chi square used to evaluate statistical differences between the control and ILMPAD groups. The dependent t-test was used to analyze the differences between baseline and at month 3rd. All analysis used a 95% confident interval (CI) and the level of significance for all the statistical tests was set at p-value less than 0.05.

III. RESULTS AND DISCUSSION

3.1. Baseline characteristics

Baseline characteristics of participants are shown in Table 2, for the intervention group, mean age was 67.4±5.0 year, married 65.0 %. Regarding education, 85.0 % had completed elementary school. In regarding to unemployed/ housekeeping, 90.0 %. Those who were non-smoker 100.0 %, non-alcohol drinker 90.0 %. The average of body mass index (BMI) was 25.1±3.4 kg/m^2, waist circumference (WC) was 87.3±8.9 cm, duration of hypertension was 9.4±3.9 year and duration of taking antihypertensive medication was 8.6±3.0 year, respectively. The control group had similar characteristics and there were no significant differences in general demographic characteristics, hypertension related characteristics.

Table 2 Baseline characteristics (N=41)

Variables	ILMPAD (n20)		Control (n21)		p
	n	(%)	n	(%)	
Education: elementary school	17	(85.0)	16	(76.2)	0.32
Marital status: married	13	(65.0)	13	(61.9)	0.77
Occupation: unemployed	18	(90.0)	16	(76.2)	0.16
Non-smoker	20	(100.0)	20	(95.2)	0.34
Non- drinker	18	(90.0)	19	(90.5)	0.63
HTN in family: no	18	(90.0)	14	(66.7)	0.13
	X	(SD)	X	(SD)	
Age in year	67.4	(5.0)	68.2	(4.2)	0.54
BMI (kg/ m^2)	25.1	(3.4)	23.8	(3.5)	0.27
WC (cm)	88.7	(8.9)	82.6	(8.5)	0.09
Duration of HTN(yr)	9.4	(3.9)	10.1	(2.6)	0.53
Taking Medication(yr)	8.6	(3.0)	9.8	(2.8)	0.17

BMI: body mass index, HTN: hypertension, WC: waist circumference

3.2. Clinical outcome variable

In Table 3, the average of systolic and diastolic BP ±SD were 135.4±13.3, 76.0±12.0 mmHg. The average cholesterol, TG, LDL and HDL ±SD were 220±32.6, 166.2±84.5, 139.4±27.4 and 46.0±5.2 mg/dl, respectively. Similarly, the average of blood pressure and serum lipid in the control were not different significantly.

Table3 Clinical outcome variables (N=41)

	ILMPAD (n20)		Control (n21)		mean diff	p
	X	(SD)	X	(SD)		
SBP	135.4	(13.3)	137.6	(11.0)	-2.27	0.56
DBP	76.0	(12.0)	74.8	(8.7)	1.14	0.73
CHOL	220.6	(32.6)	211.1	(31.6)	9.5	0.35
TG	166.2	(84.5)	140.0	(55.6)	26.2	0.25
LDL	139.4	(27.4)	137.9	(26.0)	1.5	0.86
HDL	46.0	(5.2)	44.8	(9.0)	1.2	0.60

SBP: systolic blood pressure, DBP: diastolic blood pressure, CHOL: cholesterol, TG: Triglyceride, LDL: low density lipoprotein, HDL: high density lipoprotein

3.3 Comparison of outcome variables after a 12 weeks of ILMPAD program

In table 4, changes in blood pressure and serum lipid from baseline through a 12 week of the program. The ILMPAD group showed significantly different in cholesterol, triglyceride and HDL before and after the intervention program. However, there were showed no significant difference on blood pressure both systolic blood pressure and diastolic blood pressure compared with baseline. On the other hand, there were showed no significant difference of blood pressure and LDL before and after intervention in the control group.

Table4 Changes in blood pressure and serum lipid Profile from baseline to a 12 weeks of ILMPAD Intervention (N=41)

Measures	Baseline mean (SD)	3rd month mean (SD)	X diff	P
SBP				
Control	137.6(11.0)	133.6(16.8)	4.1	0.30
ILMPAD	133.3(12.9)	132.0(16.2)	1.4	0.69
DBP				
Control	74.8(8.7)	76.9(10.4)	-2.1	0.43
ILMPAD	74.7(12.3)	72.7(10.7)	2.5	0.41
Cholesterol				
Control	209.9(33.5)	196.0(35.4)	13.9	0.12
ILMPAD	214.9(30.1)	184.0(36.7)	30.9	0.02
TG				
Control	145.7(57.6)	133.2(54.0)	12.5	0.35
ILMPAD	161.9(82.6)	122.5(42.3)	39.4	0.04
LDL				
Control	135.3(26.7)	119.4(34.5)	16.4	0.52
ILMPAD	134.6(26.0)	116.2(31.1)	18.4	0.12
HDL				
Control	45.4(10.0)	50.0(12.3)	-4.6	0.16
ILMPAD	46.3(4.9)	60.3(22.3)	-14.0	0.02

SBP: systolic blood pressure, DBP: diastolic blood pressure, CHOL: cholesterol, TG: Triglyceride, LDL: low density lipoprotein, HDL: high density lipoprotein

3.4 Comparison of outcome variables between the intervention program and the control group

Changes on blood pressure and serum lipid profile after a 12 week of the intervention program between ILMPAD group and the control group were present as shown in Table 5. The ILMPAD group were showed no significant difference of blood pressure and serum lipids profile as same as the control group. However, the changing of blood pressure and each value of serum lipids in the ILMPAD group were showed the better value than the control group.

Table5 Changes in blood pressure and serum lipid after the intervention program between ILMPAD group and the control group (N=41)

	ILMPAD (n20)		Control (n21)		X diff	p
	X	(SD)	X	(SD)		
SBP	132.0	(16.2)	136.4	(15.8)	-4.43	0.38
DBP	72.2	(10.8)	78.6	(11.1)	-6.37	0.07
CHOL	184.0	(36.7)	196.0	(35.4)	-12.1	0.29
TG	122.5	(42.3)	133.2	(54.0)	-10.7	0.48
LDL	116.8	(31.1)	119.0	(34.6)	-3.2	0.76
HDL	60.3	(22.3)	50.0	(12.3)	10.3	0.07

SBP: systolic blood pressure, DBP: diastolic blood pressure, CHOL: cholesterol, TG: Triglyceride, LDL: low density lipoprotein, HDL: high density lipoprotein

CONCLUSIONS

The hypothesis of the study was that ILMPAD program would show significant improvement in blood pressure and serum lipid profile. The result reported no significant improvement of both systolic and diastolic blood pressure ($p>0.05$) in the ILMPAD group compare to the control group following a 12 week of the intervention ILMPAD program which was probably due to the fact that participants in the intervention group might not intend to follow ILMPAD program enough by themselves because of unchanged behavior, individual reasons and social environment [12]. Unfortunately, the social environmental factors emerged during the intervention period such as seasoning of sweet fruit in Thailand (mango, durian, lambutan), holiday for Thais-festival in April which is very important for enjoying time in all Thai families for a cultural-religious celebration including the enjoying party with high energy food intake, sugary-beverage and alcohol consumption which those factors might barrier to follow program [13].

The unsuccessful in improving for controlling blood pressure is not only exercise, but blood pressure also has been discussed in combination with other lifestyle modifications, including control weight, sodium restriction, DASH diet, smoking cessation and moderation of alcohol [1]. However, the result of this study showed the significant change of cholesterol, LDL and HDL in the ILMPAD group compared with the control group. It may be considered that ILMPAD program have beneficial effects on improving cholesterol, LDL and HDL. Other studies indicated that education program led to lowering cholesterol, LDL and regular exercising increased HDL [14, 15]. Furthermore, factors of dietary intake associated with the prevention of chronic disease, particularly among individuals at elevated disease risk [16, 17].These results from the present study showed the ILMPAD program would effective in lowering blood pressure and improve serum lipid among women with hypertension in community. The larger and longer intervention are further needed to evaluate on this program into clinical practice. Limitation of this study is included the lack of the generalization to those patients who are under treatment in other healthcare providers in Thailand. This program may limit application for patients who were more interested in their family members than in following activity, also the study was conducted for 12 weeks which had “Sonkran’s day” or water festival for a long holiday in April. Therefore, timetable should be concerned in further studies**.** During the intervention period, monthly interval for home visiting can directly provide individual promoting succeeded in this program. It therefore indicates a need for specific guidance for giving education and motivation individually. Therefore, home visiting would be added in improving behavior change among women with hypertension.

ACKNOWLEDGMENTS

The author would like to express gratitude to the support and help from Assoc. Prof. Dr. WirojJiamjarasransi, Dr.JitraDusadeemetha, Mr. Bumrung -Mrs. AungsiyaTraimontreeand healthcare

team from BuengKamPhroi healthcare center, PathumThani.The study has been supported by Fund of SuanSunandhaRajabhat University.

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