

The effectiveness of health education and lifestyle program in improving the blood pressure in hypertensive patients



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ABSTRACT

Risk factors for hypertension are becoming increasingly prevalent. Currently, there is no standardized community-based program for hypertension widely implemented in the Philippines. Health Education and Lifestyle Program for Hypertension is a ten-week health education program that aims to improve the blood pressure in hypertensive patients. This community-based intervention discusses five key health strategies like hypertension awareness, medication regimen, dietary regimen, healthy lifestyles, and stress management. This quasi-experimental study includes 128 hypertensive patients (64 in control and 64 in intervention groups). It utilized IBM SPSS 5.0 to statistically compute for mean, standard deviation, t-test independent samples and t-test paired sample. The study findings revealed that the post-systolic and diastolic blood pressure of the intervention group were 124.67 and 82.00 mmHg, respectively. Paired t-test yielded a significant difference in pre- and post-systolic ($t=5.28$, $p<.001$) and pre- and post-diastolic ($t=3.59$, $p=0.003$) BP of the intervention group before and after the Health Education and Lifestyle Program. Lastly, t-test for independent samples revealed a statistically significant difference ($t=2.32$, $p=0.028$) in the post-diastolic blood pressure readings of control and intervention groups after the implementation of the program. The study implied that program for hypertension was effective in improving blood pressure in hypertensive patients. Thus, compliance with the medication regimen, dietary regimen, healthy lifestyles, and stress reduction strategies can help control blood pressure among hypertensive patients. A health education program that provides emphasis on patient's health and lifestyle behavior teaching is a successful intervention in reducing the blood pressure in hypertensive individuals.

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1. Introduction

A wide-reaching predominance of hypertension surpasses 1.3 billion worldwide (Bloch, 2016).

Chiefly, systolic hypertension is an increasing health issue in Asian populations (Appel et al., 2001). In the United States, hypertension is suffered by adult individuals between 20% and 25% of its population. According to Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (Chobanian et al., 2003), hypertension is systolic blood pressure greater than 140 mm Hg and diastolic pressure greater than 90 mm Hg throughout a persistent period. The confirmation of an increased in blood pressure is

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grounded on the average of two or more blood pressure measurements assessed (Chobanian et al., 2003). Furthermore, the higher the systolic or diastolic pressure, the greater the probability of developing diseases and death from hypertension (Park et al., 2015). Hypertension escalates the probability of developing atherosclerosis, myocardial infarction, heart failure, renal failure, cerebrovascular accident, aneurysm, and retinopathy. Hypertension or also known as the silent killer is a major contributor to death (Hinkle and Cheever, 2018; Robare et al., 2010). Specifically, untreated hypertension sets as a predictor of augmented deaths subsequent intracerebral hemorrhage (Hevesi et al., 2018).

Lifestyle disorders like hypertension, diabetes mellitus, and cancer have become the top causes of death (Hinkle and Cheever, 2018; Gutierrez et al., 2018). Unhealthy diet, sedentary lifestyle, advanced age, physical inactivity, obesity, cigarette smoking, heavy alcohol consumption, and stress are known risk factors that aggravate lifestyle diseases (Hinkle and Cheever, 2018; Ignatavicius and Workman, 2002). In addition, risk factors for hypertension is becoming increasingly prevalent (Tran et al., 2016).

In line with this, there is no standardized health education program for hypertension widely implemented in the country. This prompted the researchers to develop the study that tackled important key health strategies in controlling and managing hypertension. Thus, this community-based intervention program focuses on the following key health strategies, namely: Disease awareness, medication regimen, dietary regimen, healthy lifestyle and stress management.

1.1. Conceptual framework

The researchers utilized two theoretical models (Neuman's System model and Pender's Health belief model) in the development of a conceptual framework of this paper. This Health Education and Lifestyle Program for hypertension was adapted from Betty Neuman's Health Care System Model because it uses primary prevention of care which is necessary to maintain health stability among hypertensive patients. This study used patient education and health teaching to promote cardiovascular health and control hypertension. On the other hand, blood pressure control among hypertensive patients is adapted from Nola Pender's Health Belief Model which states the importance of adherence to health-promoting behaviors and likelihood or commitment of taking the recommended health actions among hypertensive patients (Anderson and McFarlane, 2011).

1.2. Objectives

The study was taken to determine the effectiveness of the enhanced Health Education and Lifestyle Program in improving the blood pressure of hypertensive patients. Specifically, it aimed to: (A)

assess the pre-intervention mean scores of control and intervention groups before the implementation of Health Education and Lifestyle Program in the systolic and diastolic blood pressures; (B) identify any significant difference in the pre-systolic and pre-diastolic blood pressure readings of control and intervention groups before the implementation of Health Education and Lifestyle Program; (C) evaluate the post-intervention mean scores of control and intervention groups after the implementation of Health Education and Lifestyle Program in the systolic and diastolic blood pressures; (D) determine the significant difference in the post-systolic and post-diastolic blood pressure readings of control and intervention groups after the implementation of Health Education and Lifestyle Program; lastly, (E) determine the significant difference in the pre- and post-systolic and diastolic blood pressure readings of control and intervention groups before and after the implementation of Health Education and Lifestyle Program.

2. Methods

2.1. Study design

The researchers utilized two-group quasi-experimental design. In the study, only the intervention group received the ten-week Health Education and Lifestyle Program whereas the control group did not participate in the said intervention program. This study aimed to establish if the use of intervention can help improve blood pressure readings among hypertensive patients. Likewise, it also determined if there is a significant improvement in the pre- and post-intervention mean scores before and after the implementation of the Health Education and Lifestyle Program.

2.2. Setting and sample

The population of interest in the study included all hypertensive patients in Plaridel, Bulacan, Philippines. A total of one hundred twenty-eight (128) hypertensive patient respondents participated in the study. From the 128 respondents, sixty-four were randomly assigned to control group whereas the remaining sixty-four (64) were randomly assigned to intervention group.

Moreover, the researchers utilized purposive sampling in selecting the respondents of the study using inclusion and exclusion criteria. Inclusion criteria included hypertensive patients with any of the following: (A) primary hypertension, (B) newly-diagnosed, (C) pre-hypertensive patients; and (D) older adult (60 years old and above)

However, exclusion criteria included respondents with any of the following: (A) secondary hypertension, (B) hypertensive crisis, urgency and emergency, and (C) other pre-existing medical conditions (disease comorbidity).

2.3. Ethical consideration

The certificate of ethical research clearance of this research study was obtained from the College of Health Sciences Ethical Committee from Mindanao State University with a reference number or clearance code of 18-2017. Research ethics was primarily observed and maintained throughout the duration of conducting the study. Thus, respondent rights and protection were taken into consideration during the conduct of the study. Anonymity and confidentiality of the participants were likewise observed by designating a code number (and not their real names) for each hypertensive patient who have participated in the study. In this study, the following bioethical principles were also observed including justice, autonomy, fidelity, beneficence, maleficence.

2.4. Measurement

The program is a ten-week Health Education and Lifestyle Program that aimed to promote hypertensive management, prevention, and control. This intervention program contains 5 key health strategies, namely, disease awareness, medication regimen, dietary regimen, healthy lifestyle and stress management. Disease awareness strategy is one of the key health strategies that aimed to promote cardiovascular health necessary to prevent, control and manage hypertension. This community-based health education strategy involves patient education about the definition, risk factors, signs and symptoms, diagnosis, classification, prevention, and medical management of hypertension. Second, medication regimen strategy is a key health strategy that determined the significance of compliance to the prescribed antihypertensive medication(s). Third, the dietary regimen strategy as a health education strategy that involves the introduction of dietary modification strategy, by adhering to the prescribed therapeutic diets for hypertension. Furthermore, this provided health education about low salt diet, low fat and a low cholesterol diet, high dietary fiber, and a dietary approach and strategy for Hypertension (DASH) diet. Likewise, it included weekly meal planning, an optimum nutritious diet, and a non-nutritious diet. Fourth, Healthy lifestyle strategy is a health education strategy that involves the introduction of a smoking cessation program, avoiding alcohol intake, avoidance of sedentary lifestyle, weight reduction, maintenance of physical activity and development of a regular exercise program. Fifth, a stress management strategy involves the introduction of different coping skills,

relaxation techniques and stress management necessary to prevent hypertension.

The researchers utilized OMRON automatic digital wrist blood pressure cuff-meter sphygmomanometer to determine the systolic and diastolic blood pressure of the hypertensive patients before and after the implementation of Health Education and Lifestyle Program. The blood pressure cuff was placed in the left upper arm of all hypertensive patients and taken while in a sitting position. The researchers have chosen blood pressure as an objective bio-physiological parameter as the primary means of evaluating the efficacy of health education sessions.

2.5. Data collection procedure

Blood pressure readings (systolic and diastolic BP) as outcome measures of the study were taken at two-point at the baseline (pre-intervention score) and immediately after the 10-week intervention program (post-intervention score). In here, 64 hypertensive patients remained recruited in the control group and another 64 in the intervention group using simple random sampling. Those recruited in the intervention group participated in the Health Education and Lifestyle Program while encouraged to take their usual medical management for hypertension. On the other hand, those in the control group did not attend the said intervention program but were also advised to adhere to their usual anti-hypertensive treatment. Data collection happened in the months of May to October 2017.

2.6. Data analysis

The researchers utilized the IBM SPSS 5.0 software package to statistically compute for independent t-test (*t*) and paired t-test (*t*).

3. Results

3.1. The pre-intervention means scores of the control and intervention groups before the implementation of health education and lifestyle program

Table 1 shows the pre-systolic and pre-diastolic blood pressure readings of the hypertensive patients before the implementation of Health Education and Lifestyle Program. For pre-intervention means scores, the pre-systolic blood pressure of the control group (\bar{x} =143.33 mmHg; SD±21.60) is a little higher as compared those in the intervention group (\bar{x} =140.00 mmHg; SD±14.64).

Table 1: The pre-intervention means scores of the control and intervention groups before the implementation of health education and lifestyle program for hypertension

Arterial Blood Pressure	Control Group			Intervention Group		
	Mean	SD	Interpretation	Mean	SD	Interpretation
Pre-Systolic blood pressure	143.33	21.60	Mild hypertension	140.00	14.64	Mild hypertension
Pre-Diastolic blood pressure	92.67	12.23	Mild hypertension	90.00	8.45	Mild hypertension

SD- standard deviation

Likewise, the pre-diastolic blood pressure of the control group (\bar{x} =92.67 mmHg; SD±12.23) is comparably a little higher than those in the intervention group (\bar{x} =90.00 mmHg; SD± 8.45). The result provides a baseline data of the outcome measures of control and intervention groups before the implementation of an intervention program.

3.2. The test of significant difference in the pre-intervention mean scores in the systolic and diastolic blood pressure readings of control and intervention groups

Table 2 discusses the test of significant difference on pre-intervention mean scores of control and intervention groups before the implementation of Health Education and Lifestyle Program. Independent t-test revealed no statistically significant difference ($t=0.95, p=0.625$) in the pre-systolic blood pressure readings of control and intervention groups before the implementation of the Health Education and Lifestyle Program. Likewise, t-test for independent samples also showed no differences ($t=0.70, p=0.493$) in the pre-diastolic blood pressure readings of control and intervention groups before the implementation of the program for hypertension.

3.3. The post-intervention means scores of control and intervention groups after the implementation of health education and lifestyle program

Table 3 illustrates the post-systolic and post-diastolic blood pressure readings of hypertensive

patients after the implementation of Health Education and Lifestyle Program. For the post-intervention means scores, the post-systolic blood pressure of the intervention group (\bar{x} =124.67 mmHg; SD±9.90) is lower than those in the control group (\bar{x} =136.67 mmHg; SD±21.27). Likewise, the post-diastolic blood pressure of the intervention group (\bar{x} =82.00 mmHg; SD±7.75) is comparably lower than those in the control group (\bar{x} =90.67 mmHg; SD±12.23). This result of the study is primarily attributed to the provision of an intervention program (health education and lifestyle program for hypertension) to those hypertensive patients designated in the intervention group.

3.4. The test of significant difference in the post-intervention mean scores in the systolic and diastolic blood pressure readings of control and intervention groups

Table 4 depicts the test of significant difference in post-intervention mean scores of control and intervention groups after the implementation of Health Education and Lifestyle Program. Independent t-test showed no differences ($t=1.98, p=0.058$) in the post-systolic blood pressure readings of control and intervention groups after the program. In contrast, t-test for independent samples revealed a statistically significant difference ($t=2.32, p=0.028$) in the post-diastolic blood pressure readings of control and intervention groups after the implementation of Health Education and Lifestyle Program.

Table 2: The test of significant difference in the pre-intervention mean scores in the systolic and diastolic blood pressure readings of control and intervention groups

Group	Mean	Mean Difference	Degree of Freedom	t- value	p-value	Decision
Pre-Systolic BP Control	143.33	3.33	28	0.95	.625*	Accept Ho
Pre- Systolic BP Intervention	140.00					
Pre -Diastolic BP Control	92.67	2.67	28	0.70	.493*	Accept Ho
Pre- Diastolic BP Intervention	90.00					

*p-value is significant if $p < .05$

Table 3: The post- intervention means scores of control and intervention groups after the implementation of health education and lifestyle program for hypertension

Arterial Blood Pressure	Control Group			Intervention Group		
	Mean	SD	Interpretation	Mean	SD	Interpretation
Post-Systolic blood pressure	136.67	21.27	Pre-hypertension	124.67	9.90	Pre-hypertension
Post- Diastolic blood pressure	90.67	12.23	Mild hypertension	82.00	7.75	Pre-hypertension

SD- standard deviation

Table 4: The test of significant difference in the post-intervention mean scores in the systolic and diastolic blood pressure readings of control and intervention groups

Group	Mean	Mean Difference	Degree of Freedom	t- value	p-value	Decision
Post-Systolic BP Control	136.67	12.00	28	1.98	.058*	Accept Ho
Post- Systolic BP Experimental	124.67					
Post -Diastolic BP Control	90.67	8.67	28	2.32	.028*	Reject Ho
Post- Diastolic BP Intervention	82.00					

* p-value is significant if $p < .05$

3.5. The test of significant difference in the pre- and post-intervention mean scores of control and intervention groups before and after the implementation of health education and lifestyle program

Table 5 discusses the test of significant difference in pre- and post-intervention mean scores of control and intervention groups before and after the implementation of Health Education and Lifestyle Program. T-test for paired samples revealed a significant difference ($t=2.32$, $p=0.036$) in the

systolic blood pressure of control group before and after the program. On the other hand, no significant differences ($t=0.64$, $p=0.531$) was noted in the diastolic blood pressure of the control group before and after the intervention program. Lastly, study findings revealed, using a Paired t -test that there are statistically significant differences in the systolic ($t=5.28$, $p<.001$) and diastolic ($t=3.60$, $p=0.003$) blood pressure readings of the intervention group before and after the implementation of Health Education and Lifestyle Program.

Table 5: The test of significant difference in the pre- and post- intervention mean scores of control and intervention groups before and after the implementation of health education and lifestyle program for hypertension

Group	Mean	Mean Difference	Degree of Freedom	t- value	p-value	Decision
Pre-Systolic BP Control	143.33					
Post- Systolic BP Control	136.67	6.67	14	2.32	0.036*	Reject Ho
Pre-Diastolic BP Control	92.67					
Post- Diastolic BP Control	90.67	2.00	14	0.64	0.531*	Accept Ho
Pre-Systolic BP Intervention	140.00					
Post- Systolic BP Intervention	124.67	15.33	14	5.28	0.000*	Reject Ho
Pre-Diastolic BP Intervention	90.00					
Post- Diastolic BP Intervention	82.00	8.00	14	3.60	0.003*	Reject Ho

*p-value is significant if $p < .05$

4. Discussion

The study finding that “The pre-systolic and pre-diastolic blood pressure readings are higher in the control group than in the intervention group before the implementation of Health Education and Lifestyle Program for hypertension” is congruent with the studies in Portugal and Brazil. According to a study, the majority of the hypertensive patient in Portugal (49%) have systolic blood pressure over 140.00 mmHg and a diastolic blood pressure beyond 90.00 mmHg (Pinto and José, 2012). Most of the respondents have a predominance of blood pressure above 140.00/90.00 mmHg. Thus, the mean systolic and diastolic blood pressures of the hypertensive patient in Brazil is 151.00 mmHg and 91.00 mmHg, respectively (Jesus et al., 2008).

The result of the study regarding “The pre-systolic and pre-diastolic blood pressure of the control group is not significantly different in the blood pressure readings of the intervention group” is similar to previous study in Belgium. A study discussed that there is no significant difference in the systolic and diastolic blood pressure of the control and experimental groups in their systolic and diastolic blood pressure before the 4-week of combination antihypertensive therapy and ambulatory BP monitoring intervention among patients with uncontrolled arterial hypertension in Belgium (Mengden et al., 2006).

The study finding that “The post-systolic and post-diastolic blood pressure readings are lower in the intervention group than those in the control group after the implementation of Health Education and Lifestyle Program” is supported by studies in South Korea, United Kingdom, and Germany. Healthy Aging and Exercise Program (HAEP) program caused a significant improvement in the post-systolic blood

pressure (mean difference= -12.30; $p=0.001$) among older adults with hypertension in South Korea (Park et al., 2011). In addition, it was reported that the 11-week randomized trial for adherence therapy dramatically dropped systolic and diastolic blood pressure readings by -23.11 mmHg (95% CI: -25.85, -20.36) and -15.18 mmHg (95% CI: -17.55, -12.80) among hypertensive patients in the United Kingdom (Alhalaiqa et al., 2012). Likewise, the Treatment of Mild Hypertension Study (TOMHS) is a lifestyle intervention group showed a significant reduction of 10.6 mmHg/8.1 mmHg in their systolic and diastolic blood pressure readings, respectively (Elmer et al., 1995). Another study stated that lifestyle intervention demonstrated significant blood pressure reductions for systolic BP/diastolic BP of 11.10 mmHg/5.10 mmHg, respectively (Appel et al., 2003). Likewise, a study stated that the education program for hypertension in Germany caused a significant improvement in the blood pressure among hypertensive patients as evidenced by a decreased from systolic BP 153.00 mmHg (SD±16.00)/diastolic BP 89.00 mmHg (SD±10.00) before the program to systolic BP 146.00 mmHg (SD±12.00)/diastolic BP 85.00 mmHg (SD±8.00) six months after the said program (Friedrich et al., 2000). Lastly, the intensive nurse-managed care program for hypertension in Germany revealed that the drop in systolic blood pressure was suggestively superior in the experimental group (-7.60±11.70 mmHg; $p=0.036$) than in the control group (-3.30±11.70 mmHg; $p=0.036$) after the said intervention program booklet (Ulm et al., 2010).

Furthermore, the research finding that “There is no statistically significant difference in the post-systolic blood pressure readings of the control and intervention groups after the implementation of Health Education and Lifestyle Program for

Hypertension” is contrary to the previous studies in France, South Korea and United States. The 8-week of sustained follow-up randomized controlled trial of comprehensive lifestyle modification revealed that the control group had a substantial drop in systolic blood pressure (7.97 mmHg) (Appel et al., 2003). Based from the 8-weeks European society of hypertension program in France, it revealed a statistically significant difference ($p=0.005$) in the systolic blood pressure of control and experimental groups (Asmar et al., 2007). As reported in another study in their Healthy Aging and Happy Aging (HAHA) program for hypertensive patients living in South Korea (Park et al., 2015). This program exhibited a statistically significant improvement in the systolic blood pressure with a mean difference of -12.30 ($p=0.001$). A study in South Carolina stated that the faith-based intervention program about physical activity and nutrition showed no statistically significant difference in the systolic blood pressure ($d=0.15$, $F=3.19$, $p=0.083$) readings in both control and experimental groups. Thus, the study revealed that the program showed no significant improvement in the blood pressure reading after 15 months of intervention (Wilcox et al., 2013).

Whereas, the study findings regarding “There is a statistically significant difference in the post-diastolic blood pressure readings of the control and intervention groups after the implementation of Health Education and Lifestyle Program” is supported by a study in Argentina and United States. The randomized controlled trial presented a significant difference in the blood pressure of the experimental group and control group ($p=0.045$) after the education program on blood pressure control (Figar et al., 2006). On the contrary, the 8-week of sustained follow-up randomized controlled trial of comprehensive lifestyle modification revealed that the control group have no significant reduction in their diastolic blood pressure (3.72 mmHg) (Appel et al., 2003). In addition, study in South Carolina stated that the faith-based intervention program about physical activity and nutrition showed no statistically significant difference in the diastolic blood pressure ($d=0.08$, $F=0.90$, $p=0.350$) readings in both control and experimental groups. Thus, the study revealed that the program showed no significant improvement in the blood pressure reading after 15 months of intervention (Wilcox et al., 2013).

Studies in Germany, Argentina and Belgium contradicted the finding of the study regarding “There is a significant difference in the pre- and post-systolic blood pressure readings of the control group before and after the implementation of Health Education and Lifestyle Program for Hypertension”. The 8-week of sustained follow-up randomized controlled trial of comprehensive lifestyle modification revealed that the experimental group achieved a prominent improvement and significant reduction both in systolic (19.03 mmHg) and diastolic blood pressures (11.68 mmHg) (Appel et

al., 2003). Based from the intensive nurse-managed care program for hypertension in Germany, this intervention program booklet revealed no statistically significant difference in the pre- and post-systolic ($p=.332$) blood pressure readings of the control group (Ulm et al., 2010). Moreover, reduction in systolic blood pressure showed no significance in the control group (-2.10 ± 7.10 mmHg; $p=0.036$) with a reduction in systolic BP from 132.40 ± 13.50 mmHg to 128.20 ± 13.00 mmHg. A randomized controlled trial displayed a little reduction of 3 mm Hg (95.0% CI -3 to 8), with a net reduction of 6 (95.0% CI -3 to 14) of the control group after the education program on blood pressure control in Argentina (Figar et al., 2006). Lastly, a study cited no statistically significant difference in the systolic blood pressure of the control group after four weeks of combination antihypertensive therapy and ambulatory BP monitoring intervention among patients with uncontrolled arterial hypertension in Belgium (Mengden et al., 2006). Accordingly, the control group still remained with uncontrolled hypertension even after the intervention program. This is evidenced by a high systolic blood pressure of 155.00 mmHg (SD=10.00; $p=0.005$).

The finding of the study regarding “There is no significant difference in the pre- and post-diastolic blood pressure readings of the control group before and after the implementation of Health Education and Lifestyle Program for Hypertension” is contradicted by the studies in Germany, Argentina and Belgium. Based from the intensive nurse-managed care program for hypertension in Germany, this intervention program booklet revealed that the reduction in diastolic blood pressure showed no significance in the control group with a little reduction from diastolic BP from 78.10 ± 9.90 mmHg to 74.40 ± 8.00 mmHg (Ulm et al., 2010). A randomized controlled trial displayed a little reduction of 3 mm Hg (95.0% CI -3 to 8), with a net reduction of 6 (95.0% CI -3 to 14) of the control group after the education program on blood pressure control in Argentina (Figar et al., 2006). Lastly, a study cited no statistically significant difference in the systolic blood pressure of the control group after four weeks of combination antihypertensive therapy and ambulatory BP monitoring intervention among patients with uncontrolled arterial hypertension in Belgium (Mengden et al., 2006). Accordingly, the control group still remained with uncontrolled hypertension even after the intervention program. This is evidenced by a high diastolic blood pressure of 84.00 mmHg (SD=12.00; $p=0.005$).

The result of the study that “There is a significant difference in the pre- and post-systolic and diastolic blood pressure readings of the intervention group before and after the implementation of Health Education and Lifestyle Program for Hypertension” is similar in the studies in Belgium, Germany, Brazil, South Korea, France, United Kingdom, and Australia. Based from the intensive nurse-managed care program for hypertension in Germany, this

intervention program booklet revealed that there was a great reduction in the systolic BP from 78.10 ± 9.90 mmHg to 74.40 ± 8.00 mmHg (Ulm et al., 2010). Likewise, the diastolic blood pressure declined from 80.20 ± 9.70 mmHg to 75.00 ± 7.40 mmHg in the experimental group. As reported in a study of Healthy Aging and the Happy Aging (HAHA) program for hypertensive patients in South Korea displayed a statistically significant difference in the systolic blood pressure with a significant mean difference of -12.30 ($p=0.001$) (Park et al., 2008). Likewise, the 8-week European Society of Hypertension- International Society of Hypertension (ESH-ISH) program in France revealed a statistically significant difference ($p=.005$) in the diastolic blood pressures of the experimental groups with a mean difference of 1.7% (Asmar et al., 2007). The study was also supported with another study which revealed that the systolic blood pressure is reduced by 23.11 mmHg (95.0% CI: 25.86, 20.36) and diastolic blood pressure (SBP) is reduced by 15.18 mmHg (95.0% CI: 17.55, 12.80) in the treatment group among hypertensive patients in United Kingdom (Alhalaiqa et al., 2012). According to a study, the Education Program for Hypertension is effective in promoting a significant difference ($p < 0.001$) in the systolic and diastolic blood pressure of hypertensive patients before and after the intervention program (Friedrich et al., 2000). Furthermore, the randomized controlled trial in Argentina revealed that the systolic BP (156.00 mmHg) and diastolic BP (88.00 mmHg) of the experimental group exhibited a substantial drop of 8.00 mm Hg (95.0% confidence interval) after the education program on blood pressure control (Figar et al., 2006). It states that an exercise training program for hypertension is statistically significant in reducing the systolic blood pressure (-3.80 mmHg) and the diastolic blood pressure (-5.90 mmHg) of the hypertensive patients in Brazil (Jarrete et al., 2014). The 12-week structured community exercise and nutritional program in Australia revealed that systolic and diastolic blood pressure had a statistically significant difference from a standard parameter in the active group at -4.09 mmHg and -2.17 mmHg, respectively. Lastly, the 12-week nutrition program established a reduction in the blood pressure after 3-month follow-up among hypertensive patients in Australia (Canuto et al., 2012).

5. Conclusion and recommendations

The study concludes that the Health Education and Lifestyle Program can cause a significant improvement in the systolic and diastolic blood pressure of the intervention group before and after the implementation of the intervention program. Therefore, this implies that the key health strategies (hypertension awareness, medication regimen, dietary regimen, healthy lifestyles, and stress management) for hypertension is an effective intervention in improving the blood pressure

readings among hypertensive patients. Thus, Health Education and Lifestyle Program is a highly recommended community-based program to be used for promoting hypertension control and optimum blood pressure parameters in hypertensive patients. This health education program is recommended for used by community health nurses, advanced nurse practitioner, clinical nurse specialist and cardiovascular staff nurses who deal with hypertensive patients. Thus, a good hypertensive control among hypertensive patients can lead to low cardiovascular risk, reduced risk of morbidity and mortality, good clinical outcomes, positive health outcomes, and favorable disease prognosis. Further clinical trials and experimental studies must be conducted to assess the success of a community-based program for hypertension. The need to assess other parameters (like cognitive measurement thru pretest and posttest) to determine the efficacy of the health education session is highly encouraged for future researches.

Nurses in various healthcare facilities, such as community health centers, hygiene or wellness centers and clinics, must deliver safe, quality nursing care which was given emphasis in this study. Maintaining patient's health is an ultimate nurses' role. Caring for patients with hypertension requires effective health education about the importance of medication, dietary and lifestyle modification compliance. The role of nurses in promoting health educative role in stressing the essentials of monitoring blood pressure is of paramount importance. Thus, nurses play an essential key role in hypertension care, awareness, promotion, prevention, and control. And such implications reduce unnecessary hospital readmission and occurrence of disabling complications through patient health and lifestyle behavior education. Patient health and lifestyle behavior education is a successful instrument to reduce blood pressure in the hypertensive individuals. The creation of a health education program is significant as it serves as an avenue to provide a good hypertensive control measures and thus, contributes to cardiovascular reduction risk occurrences. Furthermore, this study can be a starting point for future researchers to conduct clinical studies for further community-based program valuation.

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Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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