

THE EFFECTIVENESS OF EMPOWERMENT PROGRAM ON MODIFYING DIETARY BEHAVIOR AMONG PREHYPERTENSIVE ELDERLY IN NAKHON PATHOM PROVINCE, THAILAND

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ABSTRACT

The study was quasi-experimental research (Two-group pretest-posttest design) aimed at evaluating the effectiveness of an empowerment program on changing dietary behaviors among elderly individuals at risk of hypertension in Nakhon Pathom Province, Thailand. The sample consisted of 60 elderly men and women aged 55 and above with blood pressure in the at-risk range of 130-139/85-89 mmHg, divided into a control group of 30 which are 22 of females and 8 males and an experimental group of 30 which are 21 females and 9 males. The empowerment program duration is 8 weeks using Gibson empowerment model having 4 processes which are Fostering Control, Building Competence, Enhancing Connection and Sustaining Empowerment. The data were analyzed using descriptive statistics, frequency distribution, percentage, mean, and standard deviation, along with paired t-tests and t-tests for independent samples to test differences between means within and between the groups. The results showed in term of average scores for dietary behavior and average systolic blood pressure. According to average scores for dietary behavior, after participating in the program, the experimental and control groups had significantly different average scores for dietary behavior at the .05 level. In average systolic blood pressure, after participating in the program, the experimental and control groups had significantly different average systolic blood pressure at the .05 level, while the difference in average diastolic blood pressure between the experimental and control groups was not statistically significant at the .05 level.

Keywords: hypertension, elderly, empowerment program, blood pressure, dietary behavior

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1. INTRODUCTION

Hypertension refers to a condition where the body has blood pressure levels in the arteries higher than 140/90 mmHg. It is a common chronic disease, particularly among the elderly people, and a public health issue worldwide, including in Thailand, with a continuously increasing trend [1]. Statistics from the United States show that between 1999-2000 and 2009-2010, the prevalence of hypertension among the elderly increased from 17.70% to 21.20%. It is projected that in the next 10 years, the number of elderly individuals with hypertension will rise to 35-41% [2]. In Thailand, the 2014 survey of the elderly population reported that among those aged 66-69 years, 47.2% of men and 49.5% of women had hypertension. Among those aged 70-79 years, 52.6% of men and 60.1% of women had hypertension. Among those aged 80 years and older, 58.7% of men and 68.9% of women had hypertension. The mortality rate due to hypertension among the elderly per 100,000 population was 12.05, 13.07, and 13.13 in 2016, 2017, and 2018, respectively [3]. It is evident that the mortality rate among the elderly due to hypertension increases annually, and the likelihood of developing hypertension also rises with age due to the progressive deterioration of blood vessels. Hypertension can cause abnormalities in various organ systems in the body. Individuals with chronic hypertension who cannot maintain normal blood pressure levels consistently often experience complications in vital organs such as the heart, blood vessels, eyes, kidneys, and brain, which are extremely dangerous [4].

The mechanism of hypertension involves an increase in cardiac output, which is the volume of blood pumped by the heart per minute. Factors affecting cardiac output include the increased blood volume and increased contraction of the heart muscle [5]. The onset of hypertension in the elderly differs from adults due to physiological changes, such as the stiffening of arteries caused by lipid deposits or the thickening of arterial walls. These physiological changes lead to increased rigidity, decreased elasticity, and increased tension of the smooth muscle, often associated with the accumulation of connective tissue and lipids in the arterial walls, making

them stiffer [6]. Additionally, the arterial walls exhibit a reduced response to the sympathetic and parasympathetic nervous systems, resulting in decreased ability to contract and relax and a loss of recoil ability. When blood pressure from the heart is applied, there is increased peripheral resistance, causing the heart to work harder to pump blood throughout the body [7].

The factors contributing to these changes include unhealthy lifestyle behaviors such as excessive sodium intake, high cholesterol and fat consumption, alcohol consumption, smoking, overweight, and stress. These factors lead to an increase in cardiac output, which in turn causes hypertension. Hypertension may also result from chronic diseases or other conditions that increase the workload on the heart, such as severe anemia, diabetes, and hyperlipidemia [8].

The treatment of hypertension in the elderly involves a combination of non-pharmacological and pharmacological approaches. The goal of treatment is to reduce damage to vital organs such as the kidneys, heart, and brain, thereby preventing life-threatening complications. Non-pharmacological treatment emphasizes appropriate lifestyle modifications to reduce the risk of cardiovascular disease without incurring additional costs. The Thai Hypertension Society [9] has proposed several behavior modifications for controlling and preventing hypertension. These include weight loss in overweight individuals, adopting a healthy diet, regulating salt and sodium intake in food, regular exercise, eliminating or reducing alcohol consumption, and quitting smoking.

Elderly individuals with hypertension require lifelong treatment, necessitating knowledge and understanding of how to manage their blood pressure. Chronic hypertension in the elderly can lead to physical and psychological losses, as well as diminished social roles, work roles, and self-esteem, as they may feel burdensome to others. This can result in a sense of powerlessness [10]. This powerlessness affects their ability to perceive their roles appropriately, make decisions, and feel in control of their healthcare, often leading to feelings of isolation, fatigue, and inability to manage their health. Therefore, it is essential to empower this group of elderly individuals in self-care, including lifestyle and dietary behavior changes.

Self-control is a process that enables individuals to adjust their internal drives or desires, expressing them in a socially acceptable manner. This capability is gradually developed through learning and accumulated experiences. Individuals with low self-control or an inability to control themselves lack the ability to evaluate and choose behaviors rationally, often acting on whims without considering the consequences. They frequently lack problem-solving skills, make poor decisions, do not plan for future goals, and cannot control or restrain their emotional expressions when faced with conflicts or problems [11].

Self-control is a skill that allows individuals to mitigate or eliminate intrusive thoughts, feelings, or internal drives, enabling them to perform tasks according to their abilities and adjust their behaviors appropriately in their desired direction. Therefore, individuals with good self-control possess a protective mechanism against potential risks.

Empowerment, as conceptualized by Gibson [12], is a significant method in health management. It encourages patients to discover and accept the reality of their illness, think critically about their situations, make appropriate decisions independently, and maintain effective practices. This process leads to behavioral changes and assists patients in controlling factors that affect their health and lives, enabling them to harness their potential to maintain and develop their health.

Literature reviews indicate that both domestic and international research has implemented empowerment programs to control undesirable behaviors. These programs are designed as therapeutic interventions to help patients recognize their ability to manage and control health-affecting situations. For instance, a study by Patcharapant Chaisang, Panjaphorn Yakasem, and Saowalak Subaporn [13] examined the effectiveness of an empowerment program on the dietary behaviors of overweight elderly individuals in the community. The results demonstrated that the program significantly improved the dietary behaviors of the elderly.

Based on the researcher's study of the basic information and dietary behaviors of the elderly in Nakhon Pathom province, it was found that the prevalence of hypertension among the elderly is as high as 56.00%. Additionally, 14.00% of these elderly individuals have high blood lipid levels. The study revealed that the elderly frequently consumes fatty meats, fried and stir-fried foods, foods containing coconut milk, and occasionally sweet snacks, with consumption rates of 43.00% and 46.00%, respectively. Moreover, the elderly often adds seasonings such as fish sauce and sugar to their food without tasting it first, and use MSG (Monosodium glutamate) or seasoning powder in their dishes [14].

A survey studied by Supanee Prukha and Waratchaya Sukprasert [15] found that over 80% of elderly individuals regularly consume seasonings like fish sauce, soy sauce, salt, fermented fish sauce, and MSG. These eating habits, which include high-sodium foods, high-fat foods, and very sweet foods and sweet drinks, are associated with hypertension [16]. Given the relationship between hypertension and the dietary behaviors of the elderly, as well as findings from Wannadee Suttisak's study [14], which highlighted the significant impact of information perception on the dietary behaviors of the elderly in Nakhon Pathom, the researcher interests in developing an empowerment program aimed at modifying the dietary behaviors of elderly individuals at risk of hypertension.

In this research, the researcher plans to engage with the community to organize activities that include various

educational initiatives. The goal is to equip elderly individuals at risk of hypertension with nutritional knowledge and proper dietary practices. This empowerment program aims to encourage dietary behavior changes to prevent complications arising from hypertension.

2. METHOD

This research is a quasi-experimental design with two groups, using a pretest-posttest control group design. It was approved by the Human Research Ethics Committee of Christian University on May 24, 2021, approval number 23/2563.

2.1. The sample group used in this study

The sample group consists of elderly individuals aged 55 and above, both male and female, who have undergone health risk screenings. They have blood pressure within the at-risk range of 130-139/85-89 mmHg. These individuals are from Ban Mai Subdistrict and Rai Khing Subdistrict, Sam Phran District, Nakhon Pathom Province, Thailand.

2.2. The sample group selection

The sample size was determined using the sample size calculation formula for comparing the means of two independent populations, as proposed by Arun Jirawatkul [17], with a significance level of .05 and a test power of 90%. The variance used is the pooled variance from the study by Pensri Supimon [18]. From the calculation, the required sample size for each group is 30.13 participants. Thus, the total sample size is 60 participants, with 30 in the experimental group and 30 in the control group.

The selection of the experimental and control areas was done through simple random sampling by drawing lots. The experimental group was assigned to Ban Mai Subdistrict, and the control group was assigned to Rai Khing Subdistrict. Villages within these subdistricts were then selected using cluster random sampling, resulting in one village for the experimental group and one village for the control group.

2.3. Research tool

The tools used in this research consist of two parts which are tools for data collection and tools for the experiment.

2.3.1 Tools for Data Collection

The tools used for data collection are divided into two parts: 1) demographic characteristics data, and 2) an interview on dietary behaviors affecting hypertension based on the DASH concept [21]. The DASH (Dietary Approaches to Stop Hypertension) concept is a dietary plan

designed to prevent and manage high blood pressure (hypertension). The DASH diet emphasizes the consumption of foods that are low in sodium, rich in nutrients like potassium, magnesium, and calcium, and overall beneficial for heart health. The interview guide was reviewed for content validity by three experts and tested for reliability using Cronbach's Alpha Coefficient, resulting in a reliability score of .79, which meets the acceptable criteria.

2.3.2 Tools for The Experiment

The tool used in the experiment is a program designed to empower elderly individuals to change their dietary behaviors. This program includes a total of 8 activities following Gibson's empowerment process [12], which consists of four stages: 1) Discovering the real situation, 2) Critical reflection, 3) Decision-making and action, and 4) Sustaining effective practice. These four main steps can emphasize building participants understanding and enabling them to make their own decisions.

2.4 Experiment

The experimental procedure for the empowerment program will be conducted over 8 consecutive weeks, with each session lasting 90-120 minutes. The duration of each activity may vary depending on the abilities and perceptions of the elderly participants. The activity details are divided into 2 groups which are experimental group and control group.

2.4.1 Experimental Group

In the preparation phase, the researcher outlined the objectives of the research and seek collaboration for data collection. They established rapport with elderly individuals at risk of hypertension, providing training and clarifying the roles of research assistants regarding the tools used for data collection in this study.

Week 1, the researcher assessed the sample group with a pre-test using interviews and blood pressure measurements. They conducted Activity 1, "Building Rapport," to familiarize participants with the researchers and stress the importance of group participation.

Week 2, Activity 2 focused on "Healthy Eating Behaviors," aiming to educate participants on their roles after modifying dietary behaviors according to DASH guidelines.

Week 3's Activity 3, "Understanding Hypertension: Silent Killer," helped participants review their knowledge and understand the impacts of hypertension on themselves, their families, society, and the nation.

Week 4's Activity 4, "Risk Behaviors Leading to Hypertension," involved participants sharing and learning about triggers for hypertension, including management techniques for their own dietary behaviors.

Week 5's Activity 5, "Good Mood, Good Health," facilitated an exchange of learning about the benefits of emotional control and the drawbacks of inadequate emotional management, with a focus on selecting appropriate emotional expressions.

Week 6's Activity 6, "Every Problem Has a Solution," allowed participants to exchange experiences and reflect on problem-solving methods, finding suitable solutions for themselves.

Week 7's Activity 7, "Relaxation for the Elderly," enabled participants to share successful and unsuccessful experiences, reflecting until they could choose appropriate expressions in various situations and practice self-stress relief methods suitable for themselves.

Week 8's Activity 8, "Promise Not to Forget," encouraged elderly participants to describe behaviors controlling high blood pressure through dietary adjustments, exchanging skills and methods for controlling high blood pressure diets with others. Researchers then conducted a post-test evaluation and measured blood pressure levels

2.4.2 Control Group

In the preparation phase, the researcher clarified the objectives of the study and requested cooperation in data collection. They initiated rapport-building with a group of elderly individuals at risk of hypertension.

Week 1: The researcher conducted a pre-test using interviews on dietary behaviors influencing hypertension and measured blood pressure levels.

Weeks 2-7: The researcher allowed the control group to receive information and activities related to dietary behaviors according to the standard public health service procedures.

Week 8: The researcher conducted a post-test, using interviews on dietary behaviors influencing hypertension and measuring blood pressure levels.

2.5 The Statistics used for data analysis

Statistics used for data analysis include descriptive statistics such as frequency distribution, percentages, mean, and standard deviation, paired t-test for comparing means within groups and independent samples t-test for comparing means between two groups. The statistically significant level was .05.

3. RESULTS

General information revealed that in both the experimental and control groups, the majority are females, comprising 73.33% and 70.00% respectively. In terms of age range, most participants in both groups are aged between 65 and 74 years, accounting for 40.00% and 46.67% respectively. Regarding marital status, it is found that the majority in both the experimental and control

groups are single, divorced, or separated, totaling 50.00% and 46.67% respectively. In terms of occupation, the majority in both groups are farmers, constituting 40.00% and 43.33% respectively. Concerning average monthly income, the majority in both groups earn between 90\$ to 180\$, making up 46.67% and 40.00% respectively. When comparing the differences in general characteristics between the two sample groups, which may be relevant to the research outcomes using the Chi-square statistic, it is found that there is no significant difference between the experimental and control groups.

In terms of dietary behavior, the average score (\bar{x}) of each group is used to analyze the data. In the change of dietary behavior, the study found that after receiving the program, the experimental group had a higher average score in dietary behavior aligned with the DASH guidelines compared to before receiving the program, and significantly higher than the control group at a statistical significance level of .05, as shown in Table 1.

Table 1. Compare the difference in average scores of dietary behaviors before and after receiving the program to enhance dietary behavior change among elderly individuals at risk of hypertension, between the experimental and control groups.

Dietary behaviors according to the DASH guidelines	<i>n</i>	\bar{x}	<i>SD.</i>	<i>t</i>	P-Value
Before experiment	30				
Experimental group		11.30	4.58	.145	.884
Control group		11.47	4.47		
After experiment	30				
Experimental group		14.67	4.47	2.39	.020
Control group		11.97	4.29		

In terms of blood pressure, the study found that after the intervention, the experimental group had significantly lower systolic blood pressure compared to before receiving the program and lower than the control group at a statistically significant level of .05. Similarly, the diastolic blood pressure was lower than before receiving the program, but it was not statistically significantly lower than the control group at the .05 level, as shown in Tables 2 and 3.

Table 2. Compare the difference in mean systolic blood pressure before and after receiving the empowerment program for dietary behavior change among elderly individuals at risk of hypertension, between the experimental and control groups.

Systolic Blood Pressure	<i>n</i>	\bar{x}	<i>SD.</i>	<i>t</i>	p-Value
Before experiment	30				
Experimental group		134.62	2.62	.882	.362
Control group		132.87	1.53		
After experiment	30				
Experimental group		129.41	2.31	-.286	.005
Control group		133.23	9.41		

Table 3. Compare the difference in mean diastolic blood pressure before and after receiving the empowerment program for dietary behavior change among elderly individuals at risk of hypertension, between the experimental and control groups.

Diastolic Blood Pressure	<i>n</i>	\bar{x}	<i>SD.</i>	<i>t</i>	p-Value
Before experiment	30				
Experimental group		86.67	.62	-1.76	.088
Control group		86.87	.54		
After experiment	30				
Experimental group		79.64	3.53	-9.37	.356
Control group		80.89	7.21		

4. DISCUSSION

The study on dietary behavior change according to the DASH guidelines to reduce the risk of hypertension found that after the intervention program, the experimental group had significantly higher average scores compared to before the program and compared to the control group at a statistical significance level of .05. This aligns with the hypothesis that the developed program effectively helps elderly individuals improve their dietary behaviors, thereby reducing the risk of hypertension. The empowerment program for behavior change consists of four steps: 1) Discovering reality, where the elderly individuals accept the reality of events and situations and accurately understand information; 2) Critical reflection, involving thorough examination of events and situations to make informed decisions and manage problems appropriately, as well as developing skills to understand situations; 3) Taking charge, allowing the elderly individuals to decide on suitable ways to engage in activities, control factors involved, face others, exchange information, and use it to make decisions; and 4) Holding on to effective practices, making a commitment to effective practices as a binding commitment to action.

After implementing the chosen methods and achieving effectiveness or success, elderly individuals feel confident and empowered. This research aligns with previous studies such as Charunsak Wonglee [19] who studies on the impact of empowerment programs on self-care behaviors among

elderly individuals with hypertension in Klong Hin Pun Sub-district, Wang Nam Yen District, Sa Kaeo Province, Thailand. It found that after the intervention, the experimental group had significantly higher average scores in perceived empowerment towards self-care behaviors compared to before the intervention at a statistical significance level of .05. Similarly, it corroborates with the study by Jarawi Kanitaphilak, Totsaporn Khampholsiri, and Linjong Pothiban [20] on the quality of life among elderly stroke patients undergoing an empowerment program, where the experimental group showed significantly higher empowerment levels compared to the control group at a statistical significance level of .05. This consistency in findings also supports the research conducted by Patcharapant Chaisang, Panjaphorn Yakasem, and Saowalak Subaporn [13] on the effectiveness of an empowerment program on dietary behaviors among overweight elderly individuals in the community, which found that after the intervention, the experimental group had significantly higher scores in perceived empowerment towards dietary behaviors and appropriate dietary behavior averages compared to before the program and compared to the control group at a statistical significance level of .05.

Blood pressure levels: The study found that the experimental group had significantly lower systolic blood pressure compared to before the program and compared to the control group at a statistical significance level of .05. However, for diastolic blood pressure, the experimental group had lower values compared to before the program and compared to the control group, but this difference was not statistically significant at .05. This finding contrasts with the research results of Saowalak Moolsarn [21], where the study found that after participating in a program to change dietary behavior according to the DASH guidelines, together with the theory of self-perception and social support, to reduce the risk of hypertension in the high-risk group, the experimental group had significantly lower systolic blood pressure compared to before receiving the program and lower than the control group at a statistically significant level of .05. As for diastolic blood pressure, the experimental group had lower values compared to before receiving the program and lower than the control group, but this was not statistically significant at .05. The lack of significant difference might be due to physical differences and age-related changes in the elderly, which can cause the arteries to stiffen and lose elasticity, making diastolic blood pressure less responsive to reduction. This discrepancy does not align with the findings of Netnipa Chantrakulchai [22], which found that hypertensive patients who did not receive care according to the empowerment program had significantly lower systolic blood pressure compared to the control group at a statistically significant level of .05, and the average value of diastolic blood pressure found that after the experiment, the experimental group that received the program had an

average value of diastolic blood pressure lower than the control group. This is because blood pressure is largely due to the pressure of blood flow within the arteries, which in the elderly group has factors related to changes in senescence, leading to hardening of the arteries [23], resulting in blood pressure during heart compression, which is one of the causes that does not affect the hypothesis. In addition, it can explain other risk factors outside of consuming food according to the DASH guidelines to help reduce the risk of hypertension. The experimental group may consume caffeine-containing beverages, smoke cigarettes, or consume foods containing sodium chloride, lack of exercise, and stress factors while measuring blood pressure. These factors mentioned are factors that affect blood pressure. In order to potentially yield more significant improvements in both systolic and diastolic blood pressure, the empowerment program could be modified by extended duration and incorporation of physical activity. These can allow for more sustained behavioral changes and potentially more pronounced effects on both systolic and diastolic blood pressure and complement dietary changes and lead to more significant reductions in blood pressure.

In this research, although this study does not include long-term data, continuous use of the empowerment program with long-term follow-up might help the elderly maintain healthy dietary behaviors and control blood pressure sustainably in the future.

5. CONCLUSION

This study demonstrates the significant positive impact of the DASH-guided dietary behavior change program on elderly individuals at risk of hypertension. The findings reveal that participants in the experimental group showed notable improvements in dietary behaviors and a reduction in systolic blood pressure compared to the control group. This aligns with previous research supporting the efficacy of empowerment programs in promoting healthier lifestyles among the elderly.

The results emphasize the importance of structured, supportive interventions in managing hypertension through diet and lifestyle modifications. By empowering individuals to take charge of their health, such programs can lead to meaningful improvements in both behavior and clinical outcomes. It also demonstrates the potential of empowerment programs in improving dietary behaviors and reducing the risk of high blood pressure, which can be applied in other areas with similar problems, particularly among the elderly. Moreover, the results can be adapted, but the program may need to be modified to suit the demographic characteristics and culture of other populations, such as in terms of education, economic status, or food culture. Future research should explore the application of similar interventions to other high-risk

populations and examine the long-term sustainability of these behavioral changes.

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