Original Article

An Action Research to Develop a Model of Promoting Knowledge and Behavioral Adjustment of Hypertensive Patients

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Abstract

OBJECTIVES: This research aimed to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients.

MATERIALS AND METHODS: This action research was based on the concept of Kemmis and Mc Taggart (1988). The sample of 34 people consisted of 24 hypertensive patients and 10 community health volunteers. The research instruments were divided into the following two parts: 1) a general information questionnaire for older adults; 2) a qualitative data collection instrument consisting of semi-structured interviews, focus group discussions, and observations. The study was conducted between 30 November 2021-10 March 2022. Quantitative data were statistically analyzed by using frequency, percentage, mean and standard deviation. Qualitative data analysis used thematic analysis.

RESULTS: A model of promoting knowledge and behavior adjustment was developed for hypertensive patients through community participation. Both cycles found that there were 4 development activities: 1) educating knowledge to hypertensive patients; 2) education about behavior modification; 3) providing models to transfer knowledge; 4) exchanging knowledge and using learning materials. Knowledge increased considerably, averaging from 14.87 ± 5.21 to 17.37 ± 4.65 (t = -2.882, p = 0.010, 95%CI -4.368 to -0.685). Hypertension complications prevention behavior of hypertensive patients was a high score, with diet control of 87.50 %, exercise at 91.70%. After the second round, hypertension patients were satisfied to develop a model of promoting knowledge and behavioral adjustment, at an higher number and percentage after developing a model from 18 (75.00%) to 21 (87.50%). After developing a model, and having completed the second round, community health volunteers classified the satisfaction of hypertension patients. This showed an increased satisfaction to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients from 8 (80.00%) to 10 (100%).

CONCLUSION: Nurses and healthcare workers should focus on educating and promoting the participation of patients and community health volunteers in encouraging hypertension patients to engage in self-care.

Keywords: action research, knowledge, behavior, hypertension.

Hypertension is one of the world's most serious noncommunicable diseases. It increases the risks of cerebrovascular (stroke), cardiovascular (heart), kidney and other diseases. Therefore, it is a major cause of premature death worldwide and has an socioeconomic effect. Hypertension has been diagnosed in 1.28 billion adults aged 30-79 worldwide[1] and is responsible for an estimated 7.5 million deaths[2]. There are 13.8 million cases of hypertension in Thailand[3], with over 50,000 deaths a year[4].

Blood pressure control is thus the most effective way to reduce the rate of hypertension complications and death.

Promoting knowledge is important in hypertensive patients to apply for behavioral modification. Most recent research studies have been experimental, focusing on the effectiveness of programs to control blood pressure in hypertensive patients. Moreover, promoting knowledge is an important intervention integrated into the program of self-management, self-efficacy, self-regulation, self-care, empowerment, health promotion, and health literacy developed by the researcher to encourage hypertensive patients to control their blood pressure. The research results revealed that these programs could control blood pressure in hypertensive patients. However, applying action research to control blood pressure in hypertensive patients has been limited in Thailand.

The cooperative concept is used in action research to solve problems. Therefore, participants will have the opportunity to find their problem, organize the activities, implement the activities, observe, and reflect on the results with the researcher many times until they get the best results. Action research is defined by Kemmis and McTaggart[5] as four major activities: planning, action, observation, and reflection. The goal of action research is to promote knowledge and behavioral adjustment in hypertensive patients to control their blood pressure and complications of hypertension by engaging people in the community. Therefore, it is possible to solve problems that are in line with the needs of a group of people or communities in a sustainable way, which corresponds with previous action research findings that the use of action research in solving behavioral health problems can solve the problems in question.[6]

In Dong Tio, Muang, Nakhon Phanom Province, there is no clear model contributing to the development of hypertensive knowledge management among older adult patients. According to the situation analysis of data from Ban Dong Tio Health Promoting Hospital in 2017-2020, there were 0.34, 0.80, 0.97, and 2.40% (8, 19, 13, and 57 patients with hypertension, respectively), which was the year in which people in the community were at greatest risk for hypertension. According to a survey of the Dong Tio communities, it was found that Village No. 6 had 24 hypertensive patients, representing 4.85% of the total population. It is clear that the number of hypertension patients is on an upward trend. Therefore, the researchers are interested in studying the development of a model of promoting knowledge and behavioral adjustment of hypertensive patients in Dong Tio to suit the local context and further enhance the quality of life of these patients.

Materials and Methods

This study was an action research project aimed at developing a model of promoting knowledge and behavioral adjustment for hypertensive patients. The research was carried out between November 30, 2021, and March 10, 2022, in the service area of Dong Tio, Muang, Nakhon Phanom Province, Thailand with a literature review and conceptual framework for the study based on Kemmis and McTaggart's action research concepts. This research consisted of the following four main research areas: planning, action, observation, and reflection.

Phase 1: *Study of the situation/problems*

Study population

The population were 179 samples selected by random sampling. The sample selected hypertension patients in Village No. 6 who had lived there during the period of November 30, 2021 to December 20, 2021. The participants were 24 key informants selected by purposive sampling. Community health volunteers support the development of a model for promoting knowledge and behavioral adjustment of hypertensive patients in terms of sharing information, arranging meetings and are involved in 2 phases of the research as participants.

Measurement

1. A general information questionnaire was developed by the researcher, and consisted of gender, age, educational level, occupation, income, diseases and comorbidities.
2. A knowledge of hypertension questionnaire, created by Sukwong et al.[7], consisted of 20 items, structured as a yes-or-no question. Correct answers were given 1 point, and incorrect answers were given 0 points. A high score indicated that hypertension patients had a higher level of knowledge about hypertension. The questionnaire was tested for reliability by applying Kuder-Richardson (KR-20), which was 0.74.
3. A questionnaire on hypertension complications prevention behavior was created by Sukwong et al.[7], consisted of 20 items. A three-likert scale was used, composed of "always practice" (2 points), "sometime practice" (1 point), and "never practice" (0 points). A high score indicated that hypertension patients had a higher level of hypertension complication prevention behavior. The questionnaire was tested for reliability by applying Cronbach's alpha coefficient, which was 0.78.
    1) Satisfaction questions were created by the researcher applying a questionnaire form on hypertension complication prevention behavior. A two-likert scale was used, composed of "satisfaction" (1 points), and "never satisfaction" (0 points).
    2) Semi-structured questions were used for the focus group discussion to find problems and common solutions between community health volunteers and HT patients. For example, what are the problems of hypertension patients who cannot control their level of blood pressure? How to solve the problem of hypertension in the community?

Data Analysis

Quantitative data analysis used descriptive statistics consisting of frequency, percentage, mean
and standard deviation. On the other hand, qualitative data analysis used the thematic analysis.

Phase 2: *Development of the Model of Promoting Knowledge and Behavioral Adjustment for Hypertensive*

Study population

Purposive sampling was conducted based on the inclusion criteria. The sample size was 34 people, including 24 hypertension

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patients and 10 community health volunteers who attended the training voluntarily to develop a model of knowledge and behavioral adjustment for hypertensive patients. The participants were 24 participants, a sufficient number for qualitative interviews to achieve data saturation and reach informational redundancy.[8] Inclusion criteria included hypertensive patients without comorbidity diseases and community health volunteers who had been working for at least 1 year, living in Dong Tio, Muang, Nakhon Phanom Province. They must be able to communicate fluently in the Thai language, and be willing to participate in the research. Exclusion criteria included hypertension patients and community health volunteers who needed to withdraw from the study due to issues arising such as illness, death, or for personal reasons.

Measurement

1) A general information questionnaire was developed by the researcher, and consisted of gender, age, educational level, occupation, income, diseases and comorbidities.
2) A knowledge of hypertension questionnaire, created by Sukwong et al.,[7] consisted of 20 items, structured as a yes-or-no question. Correct answers were given 1 point, and incorrect answers were given 0 points. A high score indicated that hypertension patients had a higher level of knowledge about hypertension. The questionnaire was tested for reliability by applying Kuder-Richardson (KR-20), which was 0.74.
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4) Satisfaction questions were created by the researcher applying a questionnaire form on hypertension complication prevention behavior. A 2-likert scale was used, composed of "satisfaction" (1 points), and "never satisfaction" (0 points).
5) Semi-structured questions were used for the focus group discussion to find problems and common solutions between community health volunteers and hypertension patients. For example, how do you promote knowledge and behavioral adjustment of hypertensive patients? How do community health volunteers promote health of hypertension patients in Village No. 6?

Data collection

This part relied on the participation of hypertensive patients and community health volunteers. The study was conducted by using an action research model. One hypertension patient did not participate in the project; 24 people volunteered to participate in the study with 10 community volunteers. The study used four stages of action research with two cycles.

	Round 1 6-week December 31, 2021- February 11, 2022	Round 2 1-month (February 11, 2022 - March 10, 2022)
1. Plan	• After finding that there were 24 hypertension people in the community, plans were made, and consent was obtained for participation in the research. • The findings showed that 10 of the participants were community health volunteers (VHVs), 24 community hypertensive patients participated, and plans were made for two workshops.	• Bringing the findings and recommendations from the round 1 workshops for activity planning to promote knowledge and behavioral adjustment for hypertension patients.
2. Do	• The participants in the training workshops gained knowledge about the causes, symptoms, complications and prevention of complications - gaining knowledge about adjusting the behavior of hypertension patients.	• This involved improving the plan of action in order to achieve its objectives or to increase the efficiency of the action as suggested by round 1 of the model, including the transfer of knowledge and use of learning materials.
3. Observe, Monitor and Evaluate	• It involves observing, monitoring and evaluating the application of knowledge from the training workshops in terms of knowledge and behavior modification.	• This part involved following up on the results, evaluation, and assessment of the findings on knowledge management, procuring model hypertension patients with controlled and uncontrolled hypertension to share experiences and exchange learning with the participants, and exchanging knowledge with the use of learning materials among the hypertension patients together with community health volunteers and registered nurses in the community.
4. Reflect	• Information was returned to the community, and the results of round 1 were reflected in workshops and group activities to improve the model of knowledge and behavioral adjustment for hypertension patients in round 2.	• This section included learning and reflection exchanges on operational difficulties and barriers. • The desired outcome was a model of methods or activities for development as appropriate for the context of the area.

Data Analysis

Quantitative data analysis used descriptive statistics consisting of frequency, percentage, mean and standard deviation. On the other hand, qualitative data analysis used the thematic analysis.

Results

Phase 1: Study of the situation/problems

The survey was conducted, 179 people had chronic diseases such as hypertension (13.40%), hypertension and diabetes mellitus (2.23%). In the 24 hypertension patients, most were found to be hypertension patients aged 35 years and older; 62.50% were females, with primary levels of education (91.66%). The oldest were 60-75 years of age (54.16%), followed by 25-59 years of age (33.33%). Of these, 10 community health volunteers were found to have agricultural occupations (40.00%), monthly income of less than 6,000 baht (70.00%), monthly incomes of 6,001-12,000 baht (30.00%) (Table 1).

Table 1: Personal profiles of participants.

Personal data	n (%)
Disease (n = 179)	
Hypertension	24 (13.40)
Hypertension and diabetes mellitus	4 (2.23)
Chronic kidney disease	2 (1.11)
Asthma	1 (0.55)
Other diseases	13 (7.26)
Hypertension patients (n = 24)	
Sex	
Female	15 (62.50)
Male	9 (37.50)
Age	
60-75 years of age	13 (54.16)
25-59 years of age	8 (33.33)
Education: Primary level	22 (91.66)
Community health volunteers (n = 10)	
Occupations	
Agricultural	4 (40.00)
Household	6 (60.00)
Monthly income (baht)	
< 6,000	7 (70.00)
6,001- 12,000	3 (30.00)

Phase 2: Development of the Model of Promoting Knowledge and Behavioral Adjustment for Hypertensive Patients

According to the findings, the activities in which the hypertensive patients and community health volunteers participated involved creating the following four activities: educating, behavior, awareness-raising activities, and exchange of knowledge and use of learning materials.

Activity 1: Educating; after developing the model of promoting knowledge and behavioral adjustment for hypertensive patients, the knowledge of hypertension patients has significantly increased from 15.0 to 17.5. The results showed that the majority responded correctly to the itemized knowledge about hypertension (90.0%). The items most frequently answered incorrectly were that smoking does not affect strokes and that young people are more likely to develop hypertension than older people. Both items had the lowest number of incorrect responses (29.16%). In terms of qualitative data, the participants stated, "I usually get my knowledge from doctors (public health officials)." Some participants said, "I get knowledge from the media." "When I see the doctor, he or she gives me advice."

Activity 2: Behavior; according to the findings, after round 1 activities, the majority of hypertensive patients had more correct and appropriate health care behaviors than before developing the model from 1.20 ± 0.54 to 2.30 ± 0.79 at 100%, indicating that the top three answers to the questions provided by participants were that most of them took antihypertensive medications strictly as prescribed by their doctors and the service recipients asked about public health. The third was that, whenever something upset them, they would find a relaxing activity to relieve stress, such as reading a book, watching television, listening to music, talking to friends, going here and there to meet, socialize to talk, or connect with friends, relatives, or neighbors (11 people). Concerning the qualitative data, the hypertension patients commented, "Doing household chores is already exercise; going to the fields is exercise in and of itself." (P2, 3, 20) "I've never increased or decreased my medications, but I've forgotten to take medications, but not often, and my high blood pressure levels are still good." (P5, 6, 18) "The participants in the project are increasingly adopting correct and appropriate health care habits" (31.44%). The remainder gave incorrect answers, so the research team added activities to round 2. After the activities in round 2, in terms of self-care behavior for hypertension in terms of dietary control, the highest number was "controlled" in 21 people (87.5%). In the same category, the lowest number was "uncontrolled" (3 people, or 12.5%).

Activity 3: Awareness-raising activities; according to the findings, after the group discussion following Round 1, the participants wanted to increase the activities by bringing hypertensive patients with paresis and paralysis to share their experiences. Thus, one person was brought into share experiences. The results showed that the participants shared what was in their hearts and wanted to have a campaign in the community for reducing sweet, fatty, and salty foods, as expressed in the following statements: "I'd like to bring in someone who's been paralyzed to tell us about it." "My neighbor across the way has paresis. "My guess is that he or she did not take his or her medications." (P7, H10) "I know of two people in our neighborhood. I used to visit them. They both took medication, then stopped and didn't monitor themselves." (P9, P23, H5) "After listening to people with paresis, I feel like it's difficult for them, so it makes me feel like I don't want to be that way." "I'll be strict about eating foods and measuring my blood pressure, so it doesn't get too high." (P3, P20, H1). "After listening to the story of a grandmother across the way, I'm going to be strict about my salt intake, and I'm not going to stop the medications I'm taking." (P2, P17, H7).

Activity 4: Exchange of knowledge and use of learning materials; an activity involved having two registered nurses

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participate in the group on two occasions by having community health volunteers with the hypertensive patients and healthcare workers exchanged knowledge with one another as they participated in educating and caring for hypertensive patients as follows: In gaining knowledge, most of the participants (11 of 34 people, or 32.35%) received knowledge from the health-promoting hospital staff and physicians at Nakhon Phanom Hospital. Two had heard information about hypertension on television (5.88%), and 34 people (100%) received knowledge over their telephones. Most exchanges of learning took place among the VHVs and the hypertensive patients near their homes. As for qualitative data, some of the participants stated, *"When the doctors organized the event today, we learned about self-care."(P1, P5) "I inquired about high blood pressure with a nurse at the Tambon health-promoting hospital." (P3, P24, H1).* Knowledge increased considerably, averaging from 14.87 ± 5.21 to 17.37 ± 4.65 (t = -2.882, p = 0.010, 95%CI -4.368 to -0.685). After the second round, hypertension patients were satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients at an increased number and percentage after developing a Model from 18 (75.00%) to 21 (87.50%). After developing a Model and having completed the second round, community health volunteers classified the satisfaction of hypertension patients as increased satisfaction to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients from 8 (80.00%) to 10 (100%).

Table 2: The numbers of respondents who were hypertensive patients after developing the model in Round 2 were classified according to itemized knowledge about hypertension with Paired t-Test (n = 24).

Items	Before Correct Answers	After Correct Answers	p
Knowledge about the Disease	13.89 ± 6.84	18.11 ± 5.46	
Causes, Mean ± SD	8	12	0.013*
1. If your parents have high blood pressure, there is a chance that you will develop high blood pressure			
2. Young people are more likely to develop hypertension than older people	5	7	
3. High blood cholesterol levels can result in hypertension	15	20	
4. The substances in cigarettes can make smokers susceptible to blood clots (thrombosis)	12	17	
5. People who drink alcoholic beverages are more likely to develop hypertension than non-drinkers	12	18	
6. People who eat salty foods are more likely to develop hypertension	7	21	
7. People who lack physical activity are more likely to develop hypertension	20	22	
8. People with regular stress are more susceptible to hypertension	24	24	
9. People who are very obese are more likely to develop hypertension	22	22	
Symptoms , Mean ± SD	15.00 ± 5.00	17.00±5.29	0.212
10. Most people with hypertension do not have symptoms of the disease	10	11	
11. Headache, numbness, blurred vision can be primary symptoms of hypertension	15	19	
12. People with asymptomatic hypertension can often come to the hospital with severe symptoms such as tired breathing, difficulty breathing and loss of consciousness	20	21	
Complications, Mean ± SD	17.00 ± 0.81	17.00±4.32	0.811
13. People with prolonged hypertension can have cerebral artery stenosis, blockage, or aneurysm	18	21	
14. People with hypertension can have a heart attack	17	11	
15. People who have been suffering from high blood pressure for a long period of time may develop kidney failure	16	19	
16. People with hypertension can develop macular degeneration	17	17	
Practical Knowledge to Prevent Complications , Mean ± SD	14.67 ± 4.16	16.00 ± 3.60	0.024*
17. Controlling intake of foods with high fat content and not eating salty foods will prevent stroke	16	17	
18. Regular exercise can help prevent strokes	19	19	
19. Smoking has no effect on stroke	18	19	
20. Drinking alcoholic beverages can help prevent the development of an aneurysm	10	12	
21. Total , Mean ± SD	14.87 ± 5.21	17.37 ± 4.65)	T= -2.882 p = 0.010* 95%CI -4.368, -0.685

p <*05

NOTE: According to Table 2, most of hypertension patients were found to have answered correctly, according to the itemized knowledge about HT; before using development of a model on knowledge and behavioral adjustment of hypertension patients had the mean scores of 14.87 ± 5.21. After using development of a model on knowledge and behavioral adjustment of hypertension patients had the mean scores of 17.37 ± 4.65 with statistical significance at 0.05 (p = 0.010).

After the second round, hypertension complication prevention behavior of hypertensive patients presented a high score, namely diet control of 87.50 %, exercise at 91.70%, not increasing and decreasing the drug by yourself by 87.50%, and diet and medication control at 91.70% (Table 3).

After developing a Model completed second round, hypertension patients were satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients which increased in number and percentage after developing a Model from 18 (75.00) to 21 (87.50) see Table 4.

After developing a Model in the completed second round, community health volunteers classified by satisfaction of hypertension patients who showed increased satisfaction to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients from 8 (80.00) to 10 (100.00) see Table 5.

The outcomes of the Model for educating and adjusting the behavior of hypertension patients included: increasing knowledge about HT with statistical significant at .05 (t =2.882, p = 0.010) ; having high percentage of hypertension complication prevention behavior and; hypertension patients were satisfied with the model, see Table 6.

Table 3: Number and percentage of hypertension patients classified by self-care behavior for controlling high blood pressure after the second round (n = 24)

The behavior of hypertensive patients	Frequency n (%)
Diet controlled	
Yes	21 (87.50)
No	3 (12.50)
Exercise	
Yes	22 (91.70)
No	2 (8.30)
Increase and Decrease the drug by yourself	
Yes	3 (12.50)
No	21 (87.50)
Diet and Medication Controlled	
Yes	22 (91.70)
No	2 (8.30)

Table 4: Number and percentage of hypertension patients classified by the satisfaction of hypertension patients comparing before and after developing a Model.

Satisfaction Items	Before (n = 24)	After (n = 24)
You are satisfied in diet controlled	18 (75.00)	21 (87.50)
You are satisfied for the exercise	22 (91.66)	24 (100.00)
You are satisfied to increase and decrease the drug by yourself	19 (79.16)	21 (87.50)
You are satisfied to control diet and medication	22 (91.66)	24 (100.00)
You are satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients	18 (75.00)	21 (87.50)

Table5: Number and percentage of community health volunteers classified by satisfaction of hypertension patients (n=24) comparing before and after developing a Model

Satisfaction Items	Before Frequency (n = 10) n(%)	After Frequency (n = 10) n(%)
You are satisfied in diet controlled	18 (75.00)	21 (87.50)
You are satisfied for the exercise	22 (91.66)	24 (100.00)
You are satisfied to increase and decrease the drug by yourself	19 (79.16)	21 (87.50)
You are satisfied to control diet and medication	22 (91.66)	24 (100.00)
You are satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients	18 (75.00)	21 (87.50)

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Table 6: Model for educating and adjusting the behavior of hypertension patients.

Antecedent	Development Activity Models	Outcomes
• Characteristics of hypertensive patients/ community health volunteers • Prior knowledge of hypertensive patients; mean = 15 points • Correct behavior for hypertension; mean = 1.20±0.54	1. Educating hypertensive patients. 2. Educating about adjusting behavior. 3. Having model examples transfer knowledge. 4. Knowledge exchange and use of learning materials.	1. Knowledge about HT; before using development of a model on knowledge and behavioral adjustment of hypertension patients had the mean scores of 14.87 ± 5.21 to 17.37 ± 4.65 (t = -2.882, p = 0.010, 95%CI -4.368 to -0.685). 2. hypertension complication prevention behavior of hypertensive patients was high score such as diet control of 87.50 %, exercise at 91.70%. 3. After the second round, hypertension patients were satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients which increased in number and percentage after developing a Model from 18 (75.00%) to 21 (87.50%).

Discussion

Phase 1: Study of the situation/problems

People were found to have chronic diseases, with hypertension being the most common among females with primary levels of education. The oldest were 60–75 years old. Most of the community health volunteers were found to have agricultural occupations and a monthly income of less than 6,000 baht. The findings are consistent with the study of World Health Organization [4], that found that the majority of hypertensive patients were females over the age of 60. Borisut[9] studied the situation and direction of the development of community health volunteers in the era of Thailand 4.0 and found that the most common occupation of village health volunteers was agriculture. The knowledge of hypertensive patients was 14.87 ± 5.21. The hypertension complication prevention behavior of hypertensive patients was 81.5-91.7%. Thematic analysis revealed 4 themes including educating, behavior, awareness-raising activities, and exchange of knowledge and use of learning materials. The findings are consistent with the study of Maneepong et al[10], who found that the health literacy of most people is at a moderate level, followed by those who have high and low health literacy. The findings suggest an increase in health-promoting measures and activities to reduce risky behaviors and increase public health literacy. This includes developing the capacity of public health volunteers and staff to build health literacy and increase public health literacy.

Phase 2: Development of the Model of Promoting Knowledge and Behavioral Adjustment for Hypertensive

Through community involvement, a model for promoting knowledge and behavior modification for hypertensive patients was developed. Both cycles discovered four development activities:

1. Educating hypertensive patients on knowledge
2. Educating on behavior modification
3. Providing models for knowledge transfer
4. Exchanging knowledge and using learning materials.

Knowledge increased considerably, averaging from 14.87 ± 5.21 to 17.37 ± 4.65 (t = -2.882, p = 0.010, 95%CI -4.368 to -0.685). The mean hypertension behavior increased from 1.20 ± 0.54 to 2.30 ± 0.79. After the second round, hypertension patients were satisfied to develop a model of promoting knowledge and behavioral adjustment of hypertensive patients which increased in number and percentage after developing a Model from 18 (75.00%) to 21 (87.50%). It could be explained by the fact that promoting knowledge, exchanging knowledge, using learning materials, and transferring knowledge are important for hypertension patients to apply their knowledge for appropriate behavioral adjustment to control their blood pressure and prevent complications from hypertension.

The findings are consistent with the study of Sukwong et al[7], who found that after completing the health education program in hypertension patients, the mean score of knowledge and behavior in the post-test was higher than the pre-test with a statistical significance level of 0.05. Moreover, it is consistent with the study of Insrichuen et al.[11], who found that the mean post-test score on the health behaviors of the older adults with HT in the experimental group after participating in the program for developing self-care capacity in older adults with HT was higher than that of the older adults with hypertension in the control group ($p < 0.05$). The same was true in the study of Boonyathee et al12, who found the mean knowledge and self-efficacy scores of the participants improved after participating in the caregiver training program. As a result, self-care behaviors also improved, while blood pressure and cholesterol levels among the older adults decreased.

Furthermore, the findings are consistent with the findings of Thongsuk et al.[13], who investigated the effects of empowerment programs on behavioral health, body mass index, and blood pressure levels in patients with uncontrolled hypertension and discovered that, after joining the empowerment program, patients with uncontrolled hypertension had statistically and significantly higher mean behavioral health scores than patients receiving only routine nursing care and higher than before joining the program.The BMIs of patients with uncontrolled hypertension after joining the program were statistically and significantly lower than before joining the program ($p < 0.001$).

In addition, the finding is consistent with the study of care models, emphasizing the role of healthcare workers in modifying

the lifestyles of hypertension patients[14]. Patients had a decrease in blood pressure, while contraction of the heart decreased by nearly 5 mmHg, and more patients were able to control their blood pressure. The findings support the efficacy of such forms of care and highlight the importance of healthcare workers' roles in increasing efforts to further implement such models in the care of HT patients. The aforementioned actions were consistent with action research to improve geriatric health literacy in Nong Traud, Muang Trang, and Trang Province[15], which discovered that older adults had a statistically significant increase in knowledge after participating in activities ($p < 0.001$) and could use their knowledge to adjust behavior and educate others.

Conclusion

In rural areas, education and behavioral education in patients with hypertension is still important, and this increased the patient's knowledge scores. The action research was to develop a model on knowledge and behavioral adjustment of hypertensive patients by the patients themselves, and the participation of community health volunteers increased and adjusted the behavior of hypertension patients for a better quality of life.

Recommendations

1) Nurses and health care workers who have been working in communities should focus on providing information about the disease since most of the hypertension information patients had been received from healthcare workers in the community.
2) More research should be conducted in the form of programs or quasi-experimental research involving self-management programs for hypertensive patients in the community to have activities aimed at self-management while suffering from hypertension.

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