

Original article

Effect of a family member support program on exercise behavior among family members with hypertensive patients

Warangkana Sonjai^a, Yupa Jewpattanakul^b, *Rukchanok Koshakri^b

^aProgram in Community Nurse Practitioner, Faculty of Nursing, Mahidol University, Bangkok, Thailand

^bDepartment of Public Health Nursing, Faculty of Nursing, Mahidol University, Bangkok, Thailand

Background: Hypertension is a silent danger causing the increases of treatment costs and expenses at the family, community and national levels. Changing the habit of exercise of family members and promoting of family participation can help reduce mortality rates from hypertension. Therefore, support for exercise in families with hypertensive patients is a challenging issue that should be promoted.

Objectives: To compare the mean scores for exercise behaviors among family members between the control and experimental groups after the family member support for exercise program.

Methods: This quasi-experimental study with pretest-posttest design was developed by using Caplan's Social Support Concept as the conceptual framework. Ninety-four family members were voluntarily recruited and randomly allocated to two groups: family member support program group (n = 47), and control group (n = 47). The program was administered one or twice a day for eight weeks. The intervention group was given assessment support, information support, instrument support and emotional support. Exercise behaviors of family members was measured before and after program.

Results: After the experiment, the mean posttest scores of exercise behavior of family members of hypertensive patients in the experimental group were significantly higher than those of the control group ($P < 0.05$). The family members in the experimental group exercised more than before the program, while the family members in the control group had the same exercising behaviors as before.

Conclusion: The program was able to change the exercise behavior of family members. The program might efficiently help family members have good health, help families perform activities together and create happiness in families.

Keywords: Family members support program, exercise, family members, hypertensive patients.

The behavior of family members often affects the behavior of patients with hypertension. The government is trying to encourage exercise through the participatory process from all sectors, starting with allowing family members to support exercise for hypertensive patients. Promoting family member participation in exercise helps to reducing risk behaviors of patients with hypertension as well as reducing mortality rates from hypertension. Therefore, family member support program on exercise behavior among

family members with hypertensive patients is a challenging issue that should be accelerated. The most previous studies emphasize exercise in patients with hypertension and empowering family members with others chronic diseases to exercise. While the research for supporting family member of hypertensive patients in exercise remains low. In addition, hypertension incidence rates continue to escalate. Without care, 1.56 billion of the world's population is expected to have hypertension by 2025.⁽¹⁾ In Thailand, the trends for hypertensive patient numbers (systolic blood pressure >140 mercury millimeters and/or diastolic blood pressure >90 mercury millimeters) rose clearly as evident from increases in the rate of hypertension per 100,000 people over the past five years from 3,936,171 people in 2013 to 5,597,671 people in 2017).⁽²⁾ Hypertension is a silent danger causing

*Correspondence to: Yupa Jewpattanakul, Department of Public Health Nursing, Faculty of Nursing, Mahidol University, Nakhon Pathom 73170, Thailand.

E-mail: yupa.jew@mahidol.ac.th

Received: July 30, 2019

Revised: August 15, 2019

Accepted: September 20, 2019

hypertensive patients to bare four times the risk for stroke and twice the risk for myocardial infarction,⁽³⁾ disability, paresis, paralysis, lower quality of life and hypertension is a cause of death (63.0%).⁽⁴⁾ Furthermore, hypertension increases treatment costs and expenses at the family, community and national levels.⁽⁵⁾

Most of the hypertensive patients and family members who come to receive services at Public Health Center 21, Wat That Thong, Bangkok, did not exercise. According to the findings among 1,575 patients with hypertension and family members, 969 of the subjects had never exercised (61.5%) and only 606 of the subjects (38.5%) had exercise behavior. Only 9.72 percent (153 subjects) of hypertensive patients and family members exercised while some of the hypertensive patients and family members rarely exercised (28.8% or 453 patients).⁽⁶⁾ The non-exercise people in charge is a major problem at Public Health Center 21 Wat That Thong and requires an urgent solution. If not corrected, severe hypertension and increased complications are the potential consequences. Making changes in the exercise behaviors of family members with hypertension patient should be an important strategy to help drive family members to participate in thinking, decision-making, monitoring, and solving problems in families who work together and exercise with hypertensive patients.

Therefore, the researcher's interest is in studying the effects of the family members support for exercise program on the exercise behaviors of family members of hypertensive patients by using Caplan's Social Support Concept (1974)⁽⁷⁾ as the conceptual framework with support for family members in four areas consisting of assessment support, news and information support, instrument support and emotional support. The researchers expect to create changes in exercise behaviors among family members that help family members have good health, help families perform activities together and create better bonds and happiness in families.

Materials and methods

This quasi-experimental study aimed at studying the effects of a family member support for exercise program on the exercising behaviors who are hypertensive patients living in communities in Bangkok. The project was certified by the Institutional Review Board (IRB), Faculty of Nursing, Mahidol University,

IRB NS2018/73.0312 and received permission from the Director, Public Health Service Center 21, Wat That Thong.

The subjects were selected based on the set criteria was family members who have hypertensive patients in their family, living in the same household for more than 1 year, can communicate in Thai and have a mobile phone or computer that can install LINE application

The sample size was calculated by G*Power software⁽⁹⁾ using $\alpha = 0.05$ for a one-tailed hypothesis test by retrieved effect size and power from the quasi-experiment; The effect of the arm swing exercise with family participation program on exercise behavior in elderly with essential hypertension.⁽¹⁰⁾ From calculation, found optimized samples per group is 47. Therefore, we conducted an experiment of total 94 samples, 47 samples for each control group and experimental group. The study was conducted from February to April 2019.

The research instrumentation includes: **Set 1** - Data Collection Instruments The instrument consisted of the following two parts: Part 1 - The demographic data questionnaire for family members with a total of 16 questions. Part 2 - The questionnaire on exercise behaviors of family members had ten questions on a four-level rating scale ranging from regular, frequent, occasional and never. The questionnaire had a scoring range of 10 - 40 points. Higher scores for hypertensive patients and family members meant family members exercised more. The instrument has Cronbach's Alpha Coefficient at 0.95. **Set 2** -The family members support for exercise program which applied Caplan's social support concept (1974)⁽⁷⁾ in the following four areas: assessment support, informational support, instrumental support and emotional support. Each area had the following activities: Assessment Support: In this activity, the researchers provided feedback data concerning exercise behaviors of family members as a group in order for family members to assess exercise behaviors. In formation Support: In this activity, the researchers provided knowledge on hypertension for family members as a group in addition to knowledge on family exercises distributed handbooks with knowledge on hypertension and exercise, In addition, the researcher explained the use of the LINE application to send messages on hypertension and exercise information and researcher sent exercise videos to family members. Instrument Support: The researchers followed-up on family members by

telephone to prepare equipment, time, places or exercise dress for hypertensive patients and on the use of participation techniques in family exercises. Emotional Support: Following up on family members, getting ready to encourage family members and encouraging family members to listen. Emotional support also involves paying attention to the exercise behavior of hypertensive patients by inviting hypertensive patients to exercise in order to ensure that family members of hypertensive patients receive sufficient emotional support. Thus, family members require a mind that is ready to exercise and recognize the importance of exercising along with tracking family members and encouraging exercise behavior among family members. Moreover, the program has various manual tools consisting of the handbook about hypertension and exercise behavior and exercise videos.

The experimental group received the family members support for exercise program while the control group received routine care only. The process for experimental group had performed as follows: day 1 of week 1, the subjects completed the demographic data questionnaire and the questionnaire on the exercise behaviors. Then, the family members support for exercise program continued from day 2 of week 1 to week 8. At the end of program, the researchers collected exercise behaviors of family members by using the same questionnaire.

Statistical analysis

The demographic data of the family members were analyzed by using frequency distribution,

percentage, mean and standard deviation (SD). The differences in the group demographic data of the experimental and control groups were compared by using the Chi-square testing, and unpaired Student *t* - test statistics.

The differences in mean scores for the exercise behaviors of family members were compared between the control and experimental groups after the family members support for exercise program were analyzed by using unpaired Student *t* - test statistics. Preliminary agreements were checked before the data analysis. $P < 0.05$ was considered as significant difference.

Results

Demographic data of family members

Most family members of hypertensive patients in the experimental group were women (70.2%), aged over 30 years, married (57.4%) with a mean height of 159.7 centimeters and a mean weight of 63.1 kilograms. They graduated lower than junior high school (21.3%), worked as hired workers (34.0%), and did not have chronic diseases (66.0%). Monthly family income was sufficient without savings (53.2%). Nearly all of the subjects received news on healthy exercises (97.9%) and spent free time watching television (46.8%). Almost subjects had been caring for the hypertensive patients within a range of 1 - 10 years (74.5%) with primary duties in the family consisting of housework (57.4%) and caring for hypertensive patients, which mostly involved taking patients to see doctors (74.4%).

Table 1. Differences in mean scores for the exercise behaviors of family members were compared between the experimental groups and control groups before and after the family members support for exercise program.

Mean scores for exercise behaviors	Experimental group (n = 47)		Control group (n = 47)		P - value
	Mean	SD	Mean	SD	
Before intervention program	14.3	6.9	16.9	6.7	0.065
After intervention program	28.4	7.3	19.7	7.1	0.000

Exercise behaviors of family members

The mean score for exercise behavior for the family members receiving the program was higher than the mean score of the members in families with hypertension patients who did not receive the program ($P < 0.05$). Regarding the differences in mean exercise behavior score, the experimental group had a higher mean score for exercise behavior $M = (28.4 \pm 7.3)$ than the family members with hypertension patients in the control group $M = (19.7 \pm 7.1)$ by 8.7 scores.

Discussion

According to the findings, the mean score for exercise behavior was higher for the group receiving the family member support on exercise program for families with hypertensive patients than the group that did not receive the same program. The increased exercise behavior of the experimental the family members can be explained based on the hypotheses and the concept of social support concept as follows: The feedback provided about exercise for family members caused the family members of hypertensive patients who had received the family member support program on exercise behavior among family members with hypertensive patients had more exercise behavior than the group that did not receive the program, possibly because the feedback information about exercise for family members resulted in the family members reviewing their own previous exercise behavior. Thus, they looked back on obstacles that prevented them from exercising. Furthermore, providing feedback helped family members compare personal exercise behaviors with the exercise behaviors of other family members, which might have allowed the family members to view their weak points in exercising. Hence, the family members were motivated toward behavior modification with more exercise, which was visible in the group receiving the program who exercised three days/week more than the group who did not receive the program (49.0%). This finding corresponded with the social support concept of Caplan G.⁽⁷⁾ who stated that the fact that people feel they have received feedback results in self-evaluation and comparison of personal behavior with the behavior of other people. As a result, people apply the information received from the feedback of others to solve personal behaviors, causing that person to have more positive behavioral changes.^(7, 8) This corresponded with a study conducted by Posri N,

et al.⁽¹¹⁾ who studied the effects of a health promotion program using applied local quarterstaff martial arts exercises with social support and found the exercise program using 14 positions of local quarterstaff martial arts exercises with social support to have feedback data from family members and community volunteers showing the experimental group who received the program to have a higher mean quarterstaff exercise behavior score than the group that did not receive the program. This was because older adults received feedback data and support from their family members and volunteers in the community, which encouraged older adults to exercise with others more frequently. Furthermore, the findings from this study correspond with the findings of Songwattanayut P, *et al.*⁽¹²⁾ who studied the effects of a program with participation from family members and village health volunteers on health promotion behaviors and blood pressure among groups at risk for hypertension in Phetchaburi Province, Thailand, and found the experimental group who received the program with participation from family members and village health volunteers providing feedback data and exchanging knowledge on Pa Boon Mee staff dances to have caused mean exercise behavior scores to be higher than the control group that did not receive the program. Concurrent research findings supported providing feedback data for family members of patients with hypertension. There by resulting in better exercise skill development.

Another reason contributing to the discussion of the findings was education on hypertension and exercise for family members of patients with hypertension. This may have caused family members of patients with hypertension to have greater understanding of exercise, resulting in continual exercise. Furthermore, education by having family members watch videos on exercise helped family members have more accurate picture of how to exercise then enabled family members to exercise more easily. Therefore, education by transferring knowledge to family members directly and indirectly via videos may help family members to have sufficient channels and information for overcoming exercise barriers while pushing family members to exercise more. This was evident from family members in the group which received the program. Most family members never exercised (72.3%) and rates of exercise for more than three days in a week increased by 68.1%. The findings correspond with Caplan's Social Support Theory⁽⁷⁾, which states that useful news and information for

persons without knowledge who were confronting problems helped these persons to receive more knowledge, enabling persons who encountered problems to use knowledge to solve problems appropriately. Provision of support, recommendations, advice or news and information pushed for individuals to have practices to achieve desired goals.^(7, 8) This corresponded with the findings of Soichue M, *et al.*⁽¹³⁾ who studied the effects of an arm-swinging exercise program by applying social support among older adult club members and found the experimental group to have more arm-swinging behaviors after the program than the control group, who did not receive the program with statistical significance. Knowledge is obviously a major base enabling the control group receive the program to swing arms more than the older adults who did not receive the program. The findings from this study also correspond with the findings of Vloothuis J, *et al.*⁽¹⁴⁾ who studied the effects of family support in exercise among stroke patients by teaching rehabilitation exercise knowledge to family members and sending videos of exercises via applications on tablets computers/telephones and having family members act as coaches for stroke patients during exercises. The aforementioned study found the group which received program help stroke patients do more rehabilitation exercise than the other group. Knowledge from the researcher and videos were likely to be a major support for family members to care for stroke patients to exercise more. Therefore, providing knowledge for family members of hypertensive patients can help family members of hypertensive patients to have more knowledge, causing family members to exchange exercise knowledge with hypertensive patients and seek methods for solving lack of exercise in the family, leading to more exercises in their daily life.

Education via the LINE application is another reason causing exercising behaviors among family members of hypertensive patients who received the family support program on exercise behaviors to be higher than the group that did not receive the program, possibly because family members received interesting knowledge via popular online media, causing family members to have easier, faster and more convenient access to knowledge to read at home. This helped family members to have more knowledge and hence be more able to solve exercise problems and adjust exercise behaviors more effectively. This was evident from the fact that family members who received the

program had higher rates of regular exercise behaviors than the group which did not receive the program (25.6%). The findings were consistent with Caplan's Social Support Theory⁽⁷⁾ which states that a person who feels that the person received news or information support from others such as recommendations, warnings, consultation and news can lead to solutions for problems.^(7, 8) This concurred with Olarikkachat's studying⁽¹⁵⁾ that the subjects received the behavior adjustment program by creating LINE application groups to provide data, knowledge and facilitate information exchanges between the subjects and the researcher. According to the findings of the aforementioned study, the subjects who received the program were found to have higher scores for exercise behaviors than the subjects who did not receive the program with statistical significance. Knowledge sent via the LINE application help enable the subjects to correct behaviors and make changes to exercise more. These media helped the subjects to solve problems and use knowledge to create better guidelines for personal behavior adjustment, causing health behaviors to be better than before receiving knowledge via the LINE application. Therefore, the fact that family members of hypertensive patients received knowledge about family exercises via the LINE application may be a major factor causing family members to have convenience in receiving news and information completely and be able to read at any place and time. This built more knowledge and enabled review of knowledge to be used as guidelines for solving problems and overcoming exercise barriers, causing family members to adjust exercise behaviors more.

Another reason causing family members of hypertensive patients in the group who received the family member support program to have more exercising behaviors than the group which did not receive the program may be because of telephone follow-ups. Follow up by telephone may have reminded family members to review knowledge. In this study, the researcher reminded family members by telephone to prepare exercise equipment, time, places and dress along with using exercise participation techniques and reminders to exercise. This concurred with Caplan's Social Support Theory⁽⁷⁾ which stated having a person to follow-up, advise, recommend or emphasize beneficial news and information will help persons with problems listen, have more understanding of news and information and cause the person to have problem-

solving behaviors and be able to adjust behaviors in a direction desired by the data provider.^(7,8) The findings corresponded with the findings of Pungdee T, *et al.*⁽¹⁶⁾ who studied the effectiveness of the exercise behavior promotion program for patients with Type 2 diabetes mellitus who came to use services at Pathumthani Hospital. The exercise program by follow-up telephone calls caused the mean exercise behavior scores to be higher than the group which did not receive the program. Follow-up telephone calls for diabetic patients can be seen to have motivated reminders and reviews of knowledge to benefit personal exercising behavior changes, causing diabetic patients to exercise more. The final issue causing family members of hypertensive patients to have better exercising behaviors than the group which did not receive the program was possibly psychological support. Psychological support for family members caused family members to have good morale with people paying attention to family members and standing beside family members when confronting exercise problems, enabling family members to recover quickly and solve problems effectively. Having a secure mind toward exercising barriers help motivating family members to solve problem appropriately while reducing stress and anxiety in exercise, providing support for family members to listen to, pay attention to and remind hypertensive patients to exercise while creating confidence to push for exercise. Therefore, family members exercised more than the group which did not receive psychological support. This was evident from increasing exercise frequency of a family members who received program (68.1%) while family members who did not receive the program had only a slight increase in frequent and regular exercise (19.1%). The aforementioned findings were in agreement with Caplan's Social Support Theory⁽⁷⁾, which states that a person's emotional expressions to another person encountering stress or problems to adjust behaviors to be more positive by expressing love, respect, concern, satisfaction, reminders and concern such as behaviors in expressing attention when listening and praising showed understanding while sharing activities.^(7, 8) The findings were consistent with Saelai M, *et al.*⁽¹⁷⁾ When their subjects received encouragement and had people to provide consultation, vent feelings and perceived concern to do more exercise than. This was in line with a study conducted by Muenya S.⁽¹⁸⁾ who provided a family psychological support program for older adults to have family

members encourage and motivate older adults to exercise. After the program, exercise behavior scores of older adults who received the program were found to be higher than those of the control group, who did not receive the program, with statistical significance. Therefore, psychological support from family members helped older adults to perceive love, concern and attention from other persons, causing family members to accept and have self-esteem, resulting in motivation and confidence to adjust and continually increase exercise behaviors.

Conclusion

Intervention program helps family members more confident to change their exercise behavior. Therefore, this intervention program has been proved to be effective tool to be used in family members of hypertensive patients who have less physical activity. The findings from this study provide baseline data for enhancing exercise skills among family members with hypertensive patients. Moreover, the findings could help develop guidelines for nurses in organizing health promotion activities for family members and other patients who suffered chronic diseases in communities.

Acknowledgements

The researchers would like to thank all the participants as well as the Department of Health, Bangkok Metropolitan Administration for providing scholarships and time to conduct the study.

Conflict of interest

The authors, hereby, declare no conflicts of interest.

References

1. World Health Organization. Global status report on non-communicable diseases. WHO staff in Geneva and Lyon 2014;1-302.
2. Strategy and Planning Division, Department of Disease Control, Ministry of Public Health. Statistical 2018. Bangkok: Strategy and Planning Division Ministry of Public Health; 2018.
3. World Health Organization. Noncommunicable diseases Progress Monitor 2017. Geneva: World Health Organization 2017;1-234.
4. Institute of Medical Research, Technology Assessment Diabetes situation/ hypertension and complications in Thailand. [Internet]. 2013[cited 2018 Oct 19] Available from: <http://thaincd.com/document/>

- file/download/paper-manual/Annual-report-2015.pdf.
5. Bureau of Non-communicable Diseases. Annual Report 2017. Bangkok: Bureau of Non-communicable Diseases; 2017.
 6. Public Health Center 21, Wat That Thong. Home visiting report 2018. Bangkok: Community Health Centers; 2018.0714/21/2561. Public Health Center 21, Wat That Thong.
 7. Caplan G. Support systems and community mental health: lectures on concept development. California: Behavioral Publications; 2000.
 8. Cohen L, Underwood LG, Gottlieb BH. Social support measurement and intervention: a guide for health and social scientists. 2nd. New York: Oxford Univ; 2013.
 9. Chohen J. Statistical power analysis for the behavioral sciences. 2nd ed. New York: Lawrence Erlbaum Associates; 1988.
 10. Jewpattanakul Y, Ruantongdee U, Tabkaew T. The effect of the arm swing exercise with family participation program on exercise behavior in elderly with essential hypertension. *J Nurs Sci* 2012;30:46-57.
 11. Posri N, Kittichottipanich B. The effect of health promotion program on applied folk art plong stick exercise and social support toward quality of life of elderly. *J Nurs Health Care* 2018;2:49-57.
 12. Songwatthanayuth P, Watthanakorn K, Klinhom K, Ratanapat P. Effects of family and village health volunteer participation program on health promoting behavior, and blood pressure in pre-hypertension adults. *Veridian E-J Sci Technol Silapakorn Univ* 2017; 3: 1-14.
 13. Soichue M, Benjakul S, Kengganpanich M, Kengganpanich T. Effects of the arm swing exercise program applying self-efficacy theory and social support of the young elderly in Bangkok metropolitan. *J Boromarajonani College Nurs* 2017;33:73-83.
 14. Vloothuis J, de Bruin J, Mulder M, Nijland R, Kwakkel G, van Wegen E. Description of the CARE4STROKE programme: a caregiver-mediated exercises intervention with e-health support for stroke patients. *Physiother Res Int* 2018;23:e1719.
 15. Olarikchat T, Jittanoon P, Silkeaw T. Effects of the behavior adjustment promotion program on health behaviors and blood cholesterol levels among hotel employees with hyperlipidemia. *J Nurs Songklanagarind Univ* 2016;36:99-116.
 16. Phungdee T, Sirisopon N, Kainakha P, Nititham A, Chaleoykitti S. The effectiveness of exercise behaviors promotion program of diabetes mellitus type 2 patients. *JR Thai Army Nurs* 2017;18:291-8.
 17. Saelai M, Nicharajana LO, Piaseu N. Effects of program promoting aerobic hula hoop exercise and nutritional education with social support on body mass index, waistline, and blood lipid in persons at risk of metabolic syndrome. *J Phrapokkiao College Nurs* 2018;29:54-67.
 18. Muenya S. Effectiveness of Family supports on exercise behaviors of elderly. *J Nurs Burapha Univ* 2017;1;74-81.