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ORIGINAL ARTICLE

Effectiveness of a health literacy enhancement program for caregivers of dependent older persons in a community of the Northern Part, Thailand

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ABSTRACT

Caregivers play an important role in helping dependent older persons in their daily activities. Caregivers with advanced health literacy are able to apply their healthcare practices skillfully and search for quality information that will supplement their caregiving skills and improve older persons' quality of life. Many previous researches have shown that caregivers of the elderly do not have enough health literacy, which directly affects the quality of the care they provide. This research aims to assess the effectiveness of a health literacy enhancement program for caregivers of dependent older persons. A quasi-experimental study design was used with an intervention group (n = 22) and a control group (n = 22). The total sample size was 44. The intervention group received the health literacy enhancement program for 12 weeks, during which the researcher conducted workshops and a weekly three-hour training session covering important topics. The results showed that the mean score of the health literacy and caregiving behavior for dependent older persons of the intervention group was higher than the control group after the program, and that the difference was statistically significant ($p<.001$). The better scores were the result of the program's active learning activities in which the learners participated and learned to share their knowledge among group members. In summary, the findings suggest a health literacy enhancement program should be used to promote health literacy and change caregiving behavior for dependent older persons in a community.

Keywords: health literacy, caregivers, dependent older persons, Thailand

INTRODUCTION

The number of the elderly population in Thailand has increased considerably in recent years. The figures from 2015 to 2019 indicate annual increases of 15.9%, 16.5%, 16.7%, 18.0%, and 19.7%, respectively.[1] Moreover, Thailand has been ranked as the second most aged society in Southeast Asia, after Singapore.[2] This rapid increase suggests that Thailand needs to make contingency plans to handle the demands of an aging society that is growing rapidly. Since older persons are considered to be at high risk of diseases because of deteriorating health, they require special care from their younger family members.

Because of the limitations elderly people experience as a result of physical and mental deterioration, they need assistance from their family members in terms of health care and the performance of daily activities. However, caring for both normal and ill elderly persons is complicated and requires comprehensive healthcare knowledge and understanding of elderly behavior.[3] A considerable number of caregivers of older persons have made efforts to seek healthcare knowledge and information to enhance the provision of healthcare among older persons in their families. The healthcare information-seeking behavior of each caregiver in our study varied significantly in terms of education, economic circumstances, and social status. The information obtained by some caregivers of older persons resulted in healthcare applications that had a negative impact on older persons' health and quality of life. Wilson[4] defined information behavior as the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking and information use. Barsevick and Johnson[5] said that health information-seeking behavior was human behavior aimed at obtaining knowledge about a specific event or situation. Such information on how to cope with health problems or situations encountered by the elderly could be beneficial or dangerous to health. As mentioned earlier, caregivers must possess sufficient health literacy in order to provide caregiving to the elderly correctly, appropriately, and efficiently.[6]

However, the biggest obstacle to appropriate caregiving is encountered in seeking, understanding, assessing, and using information to improve health outcomes.[7] These components of health-related knowledge are important in guiding a healthcare system, health treatment, and solutions to health problems.[8] Enhancing the health literacy of caregivers is a method proposed to manage such problems and reduce the caregiver's burden, which is an unavoidable problem that could negatively impact the physical and mental health of the elderly, particularly in relation to financial problems, family conflicts, and loneliness.[9] According to a study conducted by Jukkrit et al.[10], most caregivers need the following health information on elderly care: management of diseases and illnesses of the elderly, health promotion, disease prevention, alternative medicine and complementary therapy (such as food, herbs, or other products for treating illnesses and promoting health), and health service units, 68.84% of caregivers immediately applied information to elderly without carefully researching or confirming such information from various sources. The problems and obstacles caregivers encountered in health information seeking was that 56.94% of them did not have the sufficient literacy to find reliable sources; 32.29% of them failed to understand or interpret information correctly; and 10.76% of them did not have access to information sources. This lack of health literacy of

caregivers highlights concerns about health care provision for the elderly. Therefore, it is very necessary to promote health literacy for caregivers by offering them effective health literacy-enhancement programs.

Health literacy requires the acquisition of intelligent social skills that guide the motivation and ability of individuals to access, understand, and use information to continuously promote and maintain good health.[11] Health literacy is divided into three levels: the functional, interactive, and critical levels, and consists of six skills: information access, knowledge and understanding, self-management, communication, media literacy, and decision-making.[11] Health literacy leads to good health behaviors and health outcomes because individuals who have sufficient or higher levels of health literacy will be more able to seek beneficial information to prevent diseases than caregivers with less health literacy.[12, 13,14] Greater health literacy thus, will reduce rates of illness and hospital admission as well as health expenses. This indicates that low levels of health literacy among caregivers will result in poor health conditions among the elderly persons they look after. As a result, these elderly charges are more likely to get sick and will accordingly need to spend a lot of money on medical treatment. The community's health service centers and government, as the parties in charge, have to bear a significant part of this financial burden.[15] In the light of the above, the researcher aims to assess the effectiveness of a health literacy enhancement program for caregivers of dependent older persons by pursuing a conceptual model of health literacy. This conceptual model emphasizes the skill and potential development that enable individuals to have good health management and reduce health risks.[11] The author also aimed to ensure participants uplifted their health literacy to an interactive level. The gains from this study can be used to promote health literacy for caregivers of dependent older persons.

METHODS

This quasi-experimental research evaluated the outcomes of a health literacy enhancement program for caregivers of dependent older persons. The study design aimed to investigate the health literacy score of the intervention group against the control group after participating in the program. The intervention group was given the health literacy enhancement program for 12 weeks, whereas the control group did not participate in the program.

Population and sample

The population was caregivers of dependent elderly homebound persons (ADL 5-11) and bedridden older persons (ADL 0-4) in the Choeng Doi sub-district, Doi Saket district, Chiang Mai province, Thailand. Power analysis was used to determine the sample size. The power of the test was set at .80, with a .05 level of significance and a .50 effect size.[16] The sample size was 44 people. The sample was drawn by random lottery from lists of caregivers in different villages in the Choeng Doi sub-district. These randomly selected caregivers were divided into an intervention group and a control group, with 22 persons in each group. The sample criteria were those who provided caregiving to dependent older persons in their families without pay, had provided such caregiving to older persons for not less than one year, lived in the same house with the older persons, could communicate, read, and write in Thai and, finally, were willing to participate in the study. A simple random sampling technique was used to select the samples.

Research instruments

1. The research instruments consisted of:

1) The health literacy enhancement program for caregivers of older persons developed by the researcher. This program was applied from the Nutbeam conceptual model of health literacy. Emphasis was placed on activities organized for the development of six skills, namely knowledge and understanding skill, information access skill, self-management skill, communication skill, media literacy skill, and decision-making skill. Activities in the program comprised workshops, participatory learning, knowledge sharing in sub-groups, demonstration and experimentation, and operational trials. The program was submitted to three experts to check content validity, and then improved according to their suggestions. The following suggestions were applied to the program:

1.1) Ensure that processes and activities can be equally perceived and understood by everyone, since the participants are from different backgrounds.

1.2) Ensure that the topics and main ideas are focused, and sum up the important points immediately after discussions to ensure everyone is on the same page.

1.3) Avoid asking for personal information and details.

1.4) Try to keep things on time and don't be late.

1.5) During the demonstration process or workshops, it is important to ensure everyone receives equal practices.

1.6) Compliment participants when they have completed or achieved something.

2) The Handbook on Basic Care for Dependent Older Persons covers a range of topics that include the nature of change among older persons, the mental health of older persons, the roles families and communities play in caring for dependent older persons, food and nutrition, exercise, the use of medication, frequent health problems in dependent older persons, and initial treatments. The handbook was also submitted to three experts to check content validity.

2. The instrument used to collect data is divided into three parts as follows:

Part 1: Demographic data relating to the participants, such as gender, age, relationship, occupation, education etc.

Part 2: A health literacy test containing 38 questions that the researcher developed by literature review. The test is divided into two sections as follows:

Section 1: Test of knowledge and understanding of health and disease prevention (12 multiple-choice questions with four choices, 1 point for the correct answer and 0 for the wrong answer).

Section 2: Assessment of health information access skills (21 questions, 5 rating scales ranging from 1 point for "never practice" to 5 points for "always practice").

Part 3: Assessment of caregiving behavior for dependent older persons that the researcher developed from a literature review. This step assesses the processing capacity (thinking potential and memory), general knowledge (general health-related knowledge), and specific health knowledge (15 questions, each with a rating scale of 1 to 5; 1 point for an extremely small extent and 5 points for an extremely large extent). The interpretation of mean scores was 1.00 – 1.50 = an extremely small extent, 1.51-2.50 = a small extent, 2.51-3.50 = a moderate extent, 3.51-4.50 = a large extent, and 4.51-5.00 = an extremely large extent.[17]

Validation of research instrument quality

All of the research instruments were submitted to three experts to check content validity. The test of health literacy and the assessment of caregiving behavior for

dependent older persons were calculated to establish the content validity index (CVI); the results were 0.88 and 0.91, respectively. Instrument reliability was measured by a preliminary test on caregivers of older persons (who have the same characteristics) with a sample size of 30 persons. The KR-20 value of Part 1 of the test of health literacy was 0.73. The Cronbach's alpha coefficient of part 2 of the test of health literacy and the assessment of caregiving behavior for dependent older persons was 0.80 and 0.83, respectively.

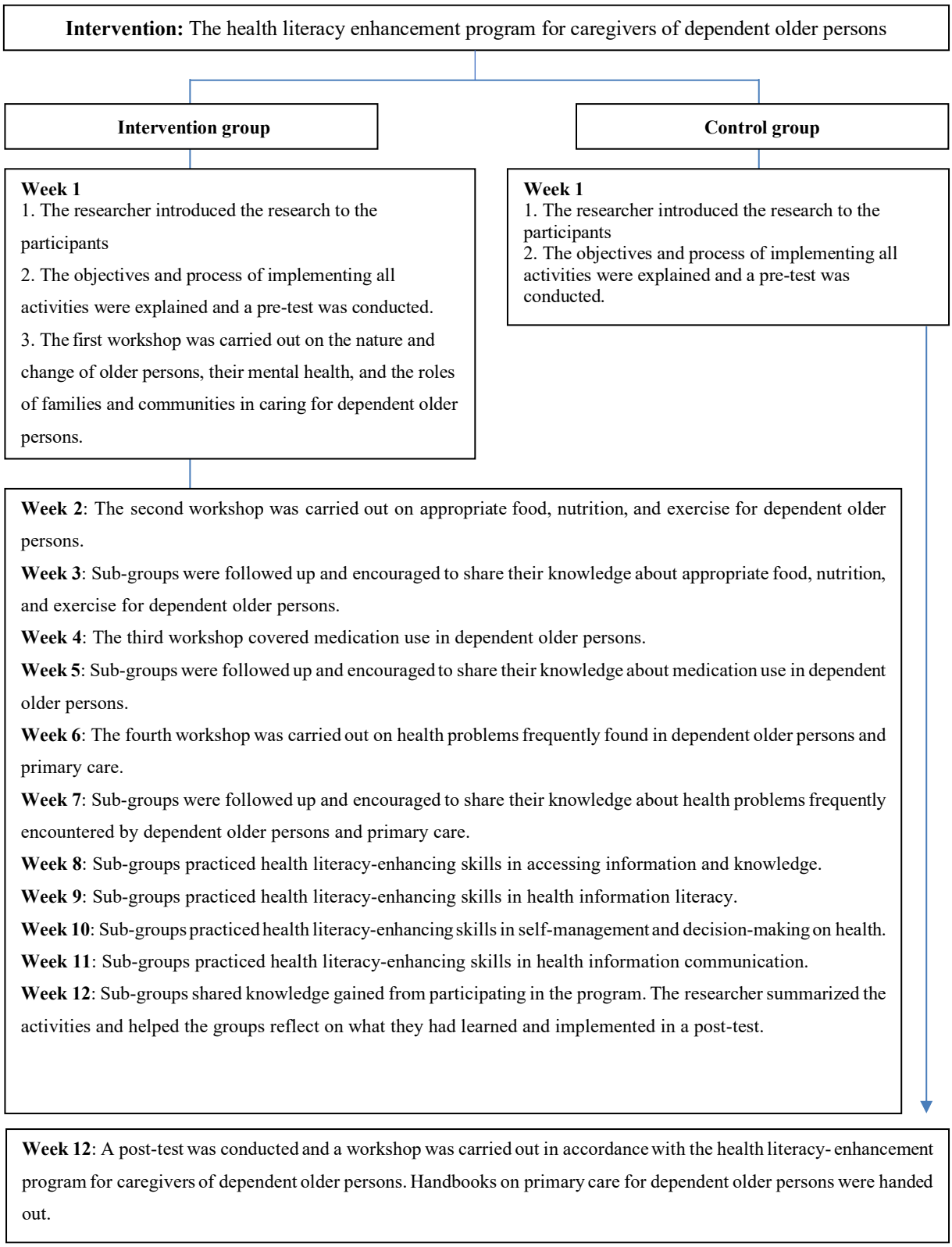
Ethics

This study was conducted in accordance with the code of human research ethics. Deciding to participate in the study was entirely in the hands of the participants. Data on the participants were kept confidential, and the study was approved by The Ethical Review Committee for Human Research, Faculty of Public Health, Chiang Mai University (ET016/2561).

Data collection

This research was conducted from November 1, 2018, to January 31, 2019. The experiment with the intervention and control groups took about 12 weeks, as depicted below:

Experimental procedures flow diagram



Data analysis

Demographic data were analyzed using descriptive statistics, i.e., frequency, percentage, mean, and standard deviation. The means of health literacy and caregiving behavior for dependent older persons between the intervention group and the control group, before and after they participated in the program, were compared using paired t-test statistics. The means of health literacy and caregiving behavior for dependent older persons between the intervention group and the comparison group were compared using independent t-test statistics. A p-value < 0.05 was considered statistically significant.

RESULTS

1. Demographic characteristics of caregivers of dependent older persons

The mean age of caregivers was 46.8 years, and 81.82% were females. There was no significant difference in demographic characteristics between the intervention and control groups, as shown in Table 1.

Table 1. Demographic characteristics of the caregivers in the control group and intervention group

General information	Control group n(%)	Intervention group n(%)	Total n(%)	P-value
Gender				
Male	4 (18.2)	4 (18.2)	8 (18.2)	.814[a]
Female	18 (81.8)	18 (81.8)	36 (81.8)	
Age (Year)				
21-30	2 (9.1)	1 (4.6)	3 (6.8)	.115[a]
31-40	5 (22.7)	6 (27.3)	11 (25.0)	
41-50	11 (50.0)	10 (45.5)	21 (47.7)	
51-60	3 (13.6)	3 (13.6)	6 (13.6)	
>60	1 (4.6)	2 (9.1)	3 (6.8)	
Mean (SD)	47.2 (4.5)	46.3 (5.6)	46.8 (4.7)	
Relationship with older persons				
Child (son or daughter)	12 (54.6)	11 (50.0)	23 (52.2)	.261[b]
Spouse	7 (31.8)	9 (40.9)	16 (36.4)	
Relatives	3 (13.6)	2 (9.1)	5 (11.4)	
Education level				
Primary	2 (9.1)	2 (9.1)	4 (9.09)	
High school	4 (18.2)	4 (18.2)	8 (18.18)	.122[b]
Senior high school/ vocational	9 (40.9)	10 (45.5)	19(43.18)	
Diploma /higher education	4 (18.2)	4 (18.2)	8 (18.18)	
Bachelor's degree or higher	3 (13.6)	2 (9.1)	5 (11.36)	
Occupation				

General information	Control group n(%)	Intervention group n(%)	Total n(%)	P-value
Farmer	4 (18.2)	4 (18.2)	8 (18.2)	
Vendor/general employee	7 (31.8)	7 (31.8)	14 (31.8)	.178[b]
Civil servant/state enterprise officer	5 (22.7)	5 (22.7)	10 (22.7)	
Private company employee	3 (13.6)	2 (9.1)	5 (11.4)	
Unemployed	3 (13.6)	4 (18.2)	7 (15.9)	
Duration of a caregiver's role				
<5 years	5 (22.7)	6 (27.3)	11 (25.0)	
5-10 years	14 (63.7)	13 (59.1)	27 (61.4)	.570[b]
>10 years	3 (13.6)	3 (13.6)	6 (13.6)	
Number of older persons who needed caregiving in their families				
1 person	8 (36.4)	10 (45.5)	16 (36.4)	.271[b]
2 persons	14 (63.6)	12 (54.5)	28 (63.6)	
Health condition of older persons under their caregiving				
Having a medical condition.	22 (100)	22 (100)	44 (100)	.167[b]
Medical Condition of older persons under their care (1 or more can be reported)				
Hypertension	14 (63.6)	16 (72.7)	30 (68.2)	
Diabetes	9 (40.9)	10 (45.4)	19 (43.2)	
Coronary heart disease	5 (22.7)	7 (31.8)	12 (27.2)	.450[b]
Musculoskeletal disorders	7 (31.8)	8 (36.3)	15 (34.1)	
Nervous system disease	3 (13.6)	4 (18.1)	7 (15.9)	

Remark: SD = Standard Deviation, [a] = Fisher's exact test (p value < 0.05), [b] = Chi-square test (p- value < 0.05)

2. Effect of the health literacy enhancement program on the health literacy of caregivers of older persons

The pretest and post-test mean scores of health literacy of the intervention group were 48.37 (SD = 7.66) and 63.12 (SD = 8.72), respectively. It was found that the post-test mean score of health literacy was higher than the pretest mean score, with statistical significance ($p < 0.05$, $t = -12.63$).

The post-test mean scores of health literacy between the intervention group and the control group were 63.12 (SD = 8.72) and 54.71 (SD = 10.16), respectively. It was also found that the mean score of health literacy in the intervention group was higher than that of the control group, with statistical significance ($p < 0.05$, $t = 7.24$), as shown in Table 2.

Table 2. The mean scores of health literacy between the intervention group and the control group, before and after they participated in the program

Health literacy	Pretest Mean (SD)	Post-test Mean (SD)	Paired T-test	P-value
Intervention group	48.37 (7.66)	63.12 (8.72)	-12.63***	<.0010
Control group	49.70 (9.43)	49.61 (10.16)	-10.93	.104

*Remark: ***p value < 0.0001*

3. Effect of the health literacy enhancement program on caregiving behavior for older persons dependent on caregivers

The pretest and post-test mean scores of caregiving behavior for dependent older persons of the intervention group were 47.45 (SD = 14.87) and 61.11 (SD = 16.70), respectively. It was found that the post-test mean score of health literacy was higher than the pretest mean score, with statistical significance ($p < 0.05$, $t = -10.76$).

The post-test mean scores of caregiving behavior for dependent older persons between the intervention group and the control group were 61.11 (SD = 16.70) and 46.62 (SD = 16.55), respectively. It was also found that the mean score of caregiving behavior for dependent older persons in the intervention group was higher than that of members in the control group, with statistical significance ($p < 0.05$, $t = -6.20$), as shown in Table 3.

Table 3. The mean scores of caregiving behavior for dependent older persons of caregivers in the intervention group and the control group, before and after they participated in the program

Caregiving behavior	Pretest Mean (SD)	Post-test Mean (SD)	Paired T-test	P-value
Intervention group	47.45 (14.87)	61.11 (16.70)	-10.76***	<.001.000
Control group	46.88 (17.63)	46.62 (17.55)	1.43	.812

*Remark: ***p value < 0.0001*

DISCUSSION

The study's findings revealed that the health literacy enhancement program developed by the researcher helped increase the health literacy of participants (caregivers of dependent older persons), which in turn contributed to changes in caregiving behavior for dependent older persons. The program was developed in accordance with the active learning conceptual framework of Bonwell and Eison[18] which emphasized a learning-management process that allows learners to practice and use their thinking process. Learners have a chance to practice rather than just listen, which changes their roles from knowledge receivers to knowledge co-creators. Learners use high-level thinking processes (i.e., analysis, synthesis, and evaluation), which enable them to maintain stable, longer learning outcomes than the traditional learning process.[19] Similarly, Nutbeam[20] and Ferguson[21] mentioned that health literacy was complementary skills and competency that could be created or developed in each individual.

Those who have a low level of health literacy should use a teaching technique that focuses on learning experience. The results of this research show that after doing the program, the post-test mean score (63.12) of health literacy among participants was higher than the pretest mean score (48.37). This is consistent with a study conducted by Tuanjai and Ganoksri[22], in which a program was developed to change the health behavior of caregivers of patients in families with non-communicable diseases. The study used a conceptual framework of health literacy enhancement in conjunction with the trans-theoretical model of health behavior. The study found that after participating in the program, the sample had a higher level of health literacy that was statistically significant. Furthermore, a study conducted by Cianfrocca et al.[23] suggested that participants are able to seek health-related information and understand the importance of presence, which indicates the usefulness of a training curriculum. The finding was similar to the result obtained from the study of Uemura et al.[24], which showed that an active learning program (emphasizing physical activity, a healthy diet, and nutrition over 24 hours) and learning activities were effective in enhancing comprehensive health literacy among older adults.

Consequently, if the health literacy of caregivers of older persons was developed to a higher level, it would contribute to better caregiving for older persons in general. Bevan and Pecchioni [25] mentioned that family members are important sources of health information. Ill persons with low health literacy are more likely to have symptoms of depression.[26] The research findings indicated that after joining the program, the mean score of health literacy in the intervention group (63.12) was higher than that of the control group (54.71). Better health literacy enhanced caregivers' ability to seek useful information to apply to the caregiving of older persons Therefore, caregivers who have sufficient health literacy have a greater ability to seek beneficial health information than those with lower health literacy. Sufficient health literacy has a positive effect on older person's physical, mental, and social health.[14]

According to the health literacy enhancement program, the caregivers' caregiving behavior was better after participating in the program. This was supported by the higher post-test mean score (61.11) of health literacy compared to the pretest mean score (47.45). We found that the participants had developed themselves in a process similar to the knowledge model of health literacy of Chin et al.[27] Three elements of Chin'smodel were 1) processing capacity (better development of thinking potential and memory), 2)

general knowledge (better development of general health-related knowledge) and 3) specific health knowledge (better development of specific health knowledge for caring for older persons). This led to better caregiving behavior for older persons and greater confidence in caring.[28]

Many studies have indicated that participants who join a health literacy enhancement program improve their health behavior. This study's findings illustrate that after receiving the program, the mean score of caregiving behavior for dependent older persons of the intervention group (61.11) was higher than that of the control group (46.62). This finding supports a study by Suree and Pannee [29] which showed that an intervention group had higher means of post-test scores for health literacy with regard to preventing falls, and balance and muscle strength than the comparison group ($p<0.001$). Furthermore, a study by Kritsapon et al.[17] revealed that after enrolling in the program, the intervention group had a higher mean score of health literacy and self-care behavior relating to hypertension than the comparison group with statistical significance ($p<.05$), and the mean arterial pressure of the intervention group was significantly ($p<.05$) lower after enrolling in the program than the comparison group's. Similar to the study conducted by Rungnapa et al.[28], they found that after receiving the program, the intervention group had significantly higher mean scores of health literacy and hypertensive prevention behavior than the control group. Besides, the study revealed that after doing the program, the intervention group had significantly lower systolic and diastolic blood pressure.

In this study, all workshops and weekly three-hour training sessions were solely performed by the researcher, thus it was difficult for the researcher to efficiently manage and control the training environment. Consequently, the information obtained might not be perfectly represented because of exaggeration and recall bias.

RECOMMENDATIONS

The results obtained from this study could be highly beneficial as basic information for promoting health literacy, especially for caregivers of the elderly, as they play an important role in looking after dependent older persons. However, there are some restrictions in this study as it was conducted only in Doi Saket district, Chiang Mai province, Thailand. In further studies, the area of study could be expanded to cover more health information topics, and the experimental design could include many treatment groups with different levels of interventions. In this regard, the research results will lead to health literacy development at a higher level by continuously applying the program for caregivers of dependent older persons in other regions, to uplift the level of health literacy overall.

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