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Effect of experiential activities planning program on health literacy and 3E2S health behaviors among village health volunteers

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ABSTRACT

This research was conducted as a quasi-experimental, two-group pre-test/post-test study designed to examine the effect of experiential activity planning (EAP) health literacy promotion program on the health literacy and 3E2S health behaviors. The survey was completed by 60 village health volunteers. The sample group was divided into an experimental group and a control group, with 30 volunteers in each group. The experimental group undertook the EAP health literacy promotion program while the control group undertook a conventional health literacy promotion program. The data were collected using pre and post experiment questionnaire and analyzed using descriptive statistical analysis. The results showed that the experimental group's average scores for health literacy and 3E2S health behaviors knowledge after the completion of the EAP health literacy promotion program were higher than before the commencement of the program. Moreover, the post-program scores for the experimental group were also higher than those of the control group. According to the results, it is recommended that the EAP health literacy promotion program provides positive effect on the health literacy and 3E2S health behaviors of the village health volunteers.

Keywords: self-efficacy; learning plan; health literacy promotion program; 6-necessary skills for health literacy

1. INTRODUCTION

Non-communicable diseases (NCDs) are highly significant health issue for international communities, including Thailand. NCDs not only affect the population resources, but also burden the economics of the country. According to Ministry of Public Health, the most important cause of NCDs is unhealthy behaviors, such as consumption of unhealthy food, inadequate exercise, accumulation of emotional stress, as well as smoking cigarette and drinking alcohol (Hfocus News, 2018). The Ministry of Public Health has aimed to promote appropriate health behaviors among the public by prescribing the appropriate health behaviors into the 12th National Health Development Plan (The Constitution of the Kingdom of Thailand, 2017). Such appropriate health behaviors are called 3E2S health behaviors, which refer to "eating, exercise, emotion, stop smoking, and stop drinking". "Eating" means the consumption of food following the five major food groups, limiting the intake of sweets, fats, and salt, and increasing the intake of fruits and vegetables during meals. "Exercise" means regular physical activity to promote physical health. "Emotion" means limiting and managing stress as well as maintaining a positive emotional outlook. "Stop smoking"

means not smoking cigarettes or using tobacco products. "Stop drinking" means maintaining alcohol consumption at healthy levels (Department of Health Service Support, 2017).

To persuade the population to adopt 3E2S health behaviors, the population must first become health literate. World Health Organization (WHO) proposes that health literacy is World Health Organization a group of skills which are needed to achieve in order to perform healthy behaviors (World Health Organization, 1998). The positive effects of health literacy on health behavior performance have been confirmed by many pieces of research. An obesity study among 400 undergraduate students living in Bangkok showed that health literacy has a positive effect on preventive behaviors related to obesity (Chobthamasakul, 2019). Another study examined the relationship between health literacy and 3E2S behaviors among 147 senior citizens and showed that health literacy constructively affected 3E2S behaviors (Singhasem et al., 2019). A study among 171 American children suffering from obesity claimed that individual health literacy level could indicate BMI (Sharif and Blank, 2010). Another obesity study, conducted among 157 Australian immigrants, found that the level of an individual's health literacy could be used to accurately forecast their health-related behaviors such as eating habits, BMI, smoking, alcohol consumption, exercise, and annual physical examinations (Ho et al., 2018).

To promote health literacy in Thai community, Thai Ministry of Public Health initiated a social mechanism called "village health volunteers", who are selected by their respective villages or communities to work at the primary healthcare level. They have to take health literacy promotion programs according to the standard curriculum approved and overseen by Thai Ministry of Public Health (Department of Health Service Support, 2014). Village health volunteers are expected to be reliable primary health care providers. More importantly, they must be health-related change agents, since they can reach the family unit (Kaeodumkoeng, 2018). However, the survey results conducted by health education division, Ministry of Public Health indicated that only 19.43% of village health volunteers possessed a "very good" level of health literacy and knowledge of 3E2S health behaviors (Health Education Division, 2018). The results of this survey have been used to explain the results of a former survey, which revealed that the average level of health literacy and knowledge of 3E2S health behaviors among Thai population was lower than 50% (National Reform Steering Assembly, 2016). Furthermore, the results of the 2018 survey also asserted that the conventional health literacy promotion program undertaken by village health volunteers is likely to be inefficient.

The conventional health literacy promotion program is a 2-hour lecture. It provides fundamental information on health literacy and guidance of 3E2S health behaviors. Uses of media are occasionally introduced in this program. The program focuses on enhancing the cognitive skills of the participants. Therefore, the content of the program only consists of the health literacy theory and a description of 3E2S health behaviors. The lecture-based method allows an instructor to fully utilize time to provide knowledge. On the other hand, it diminishes students' participation and generates a less supportive educational atmosphere.

Since the Ministry of Public Health relies on village health volunteers to elevate health literacy, their level of health literacy and knowledge on 3E2S health behaviors need to be sufficient to provide advice to people in their communities. Therefore, it is important to develop a different health literacy promotion program for village health volunteers. The health literacy of an individual can be developed by improving three basic skills including communication and education skill, social organization and advocacy skill, and negotiation and self-management skill (Nutbeam, 2008). Thai Ministry of Public Health adopts Nutbeam's framework and indicates 6 necessary skills for people to become health literate, including 1) access skill, 2) cognitive skill, 3) communication skill, 4) decision-making skill, 5) media literacy skill, and 6) self-management skill (Kaeodumkoeng, 2018). However, most health literacy promotion programs for village health volunteers only focus on cognitive skills, which is inadequate to make them health literate according to the literature reviews. Furthermore, most health literacy promotion programs are lecture-based, which is not sufficient to lead village health volunteers to become confident in providing advice to the public or even to perform appropriate 3E2S health behaviors according to the self-efficacy theory. Bandura (1977) proposed that confidence is a major driving force for an individual to take any action. Further, there are 4 sources of confidence including 1) self-experience, 2) role model (others' experiences), 3) verbal encouragement, and 4) emotional arousal perception.

Experiential activity planning (EAP), a teaching methodology that educators develop according to Bandura's self-efficacy theory, emphasizes learning through experiences. Utilizing EAP does not only enhance students' knowledge on the target topic but also encourage students to perform the desired behaviors accordingly (Chitrachinda and Kanha, 2005). The method, therefore, is suitable for the health literacy promotion program for village health volunteers since the purposes of the program are not only to provide the village health volunteers with credible health information but also to promote their confidence in performing appropriate health behaviors and providing advice to their community on health issues.

The EAP procedure comprises 6 steps. It starts with warm-up activities, such as singing or playing games in order to physically or emotionally prepare students for the topic. The instructors then utilize media or stories to introduce the topic. Such media or stories are required to be able to arouse students to be emotionally committed to the topic, thus motivating them to interact with the topic. In this step the instructors guide the students in a brainstorming session, which aims to define the issues the group concern about the topic. After the students develop the issues together, the instructors allow them to individually find the solution for every issue. This step helps students to relate their own experiences to the topic. Next, the students are divided into small groups and have a discussion within their respective groups to exchange their ideas with each other. Each group is required to present their conclusion to the other group in various forms, such as role-playing, poems, songs, etc. Group discussion and presentation sessions are designed to make students learn from others' experiences and also enhance their creativity, which is an important skill to find the solutions to the issues related to the topic. The last step is debriefing by the instructor, which conclude the main idea, provide credible information, and encourage students to

implement the lessons learned (Chitrachinda and Kanha, 2005).

This research studied the effectiveness of utilizing the EAP method in the health literacy promotion program for village health volunteers. An EAP health literacy promotion program was designed to develop the 6 necessary health literacy skills (access skill, cognitive skill, communication skill, decision-making skill, media literacy skill, and self-management skill). The program focused on basic health literacy and health 3E2S behaviors.

2. MATERIALS AND METHODS

This research was a quasi-experimental study that aimed to measure the effects of an EAP health literacy promotion program on health literacy and 3E2S health behaviors of 60 village health volunteers. It was designed as a two-group pre-test/post-test study and conducted over a period of 8 weeks.

2.1 Sampling

All of the village health volunteers participating in this study was working for Participatory Health Region 4 in Thaklong municipality, located in the Klong Neung area of Klong Luang district, Pathumthani province. The volunteer group was chosen using purposive sampling with the following specified inclusion criteria: 1) the volunteer is aged 18 or older, 2) had been serving as a village health volunteer for no less than 1 month, and 3) had never received health literacy training/instruction before the study, or had previously undergone training more than 1 year before the study.

The sample size calculation was performed based on Takpho et al. (2017), using the G* Power program, with assumed effect size at 0.72 (medium), Cronbach's alpha coefficient 0.05, power 0.80, obtaining a sample of 25 participants per group. Approximately 20% were added, obtaining the final sample of 30 participants per group. In addition, the experimental group was separated from the control group since they lived and worked in different geographical areas of Thaklong municipality (different village, separated by 10 km).

2.2 Materials

2.2.1 Data collection instrument

The questionnaire utilized in this research aimed to measure the level of health literacy and 3E2S health behaviors performance of the sample. It was originally developed under the conceptual framework of health literacy and 3E2S health behaviors promotion outlined by the Thai Ministry of Public Health. It utilized data from relevant literatures and was partly modified from the "ABCDE-health literacy scale of Thai adult", which is currently used by the Thai Health Education Division. Cronbach's alpha coefficient of the questionnaire was over 0.6. The questionnaire consisted of 85 questions divided into 8 parts as follows:

Part 1: General information, consisted of 10 check-list questions

Part 2: 3E2S health behaviors practice, consisted of 11 four-rating scale questions

Part 3: Knowledge on 3E2S health behaviors, consisted of 12 multiple-choice questions

Part 4: 3E2S information and healthcare services access, consisted of 10 questions

Part 5: Communication skills relevant to the improvement of 3E2S health behaviors performance, consisted of 10 questions

Part 6: Decision-making skills relevant to 3E2S health behaviors performance, consisted of 11 questions

Part 7: Media literacy skills relevant to 3E2S health behaviors performance, consisted of 10 questions

Part 8: Self-management skills relevant to 3E2S health behaviors performance, consisted of 11 questions.

Prior to the collection process, the questionnaire was approved for content validity by 3 specialists (the content validity was 0.95) and then the comments from the specialists were applied to the content. Additionally, this questionnaire was tested with 30 village health volunteers who worked outside the Thaklong municipality area and had similar characteristics to the sample in order to prove its reliability. The reliability of this questionnaire was 0.81.

2.2.2 Experimental tool

The EAP health literacy promotion program has been developed to be used as the experimental tool for this research. It aimed to enhance the 6 necessary skills for health literacy and 3E2S health behaviors. The program was decided based on Bandura's self-efficacy theory (Bandura, 1977) and the 3E2S health behaviors guidance of the Thai Ministry of Public Health. The EAP concept (Chitrachinda and Kanha, 2005) was adopted to formulate the structure of the program, which was comprised of 5 learning plans (total of 10 hours, 2 hours per learning plan), as shown in Figure 1.

2.3 Data collection methods

Prior to the commencement of data collection, the researchers trained the research assistants for 2 days on the EAP program and the utilization of the questionnaire. The research was also granted permission by the Human Ethics Research Committee of the Faculty of Nursing, Thammasat University (COA No. 070/2562) as well as Thaklong Municipality. The researchers declared their commitment to protecting the rights of concerned research participants and began the process of data collection. In addition, all collected data was written on the questionnaires by the participants themselves. The data collection process took 8 weeks, as shown in Figure 2.

2.4 Data analysis

Descriptive statistics were utilized to determine frequency distribution (%) and standard deviation, while Chi-square was used to compare the demographic data.

The differences between the pre-test and post-test health literacy scores were compared by using paired sample t-test. The differences between pre-test and post-test 3E2S health behaviors scores were compared by using the Wilcoxon signed ranks test (due to non-normal distribution).

The differences between the pre-test and post-test health literacy scores between the experimental group and control group were compared by using an independence t-test. Comparison of the difference in the pre-test and post-test 3E2S health behaviors scores between the experimental group and control group was done by using Man-Whitney U (due to non-normal distribution).

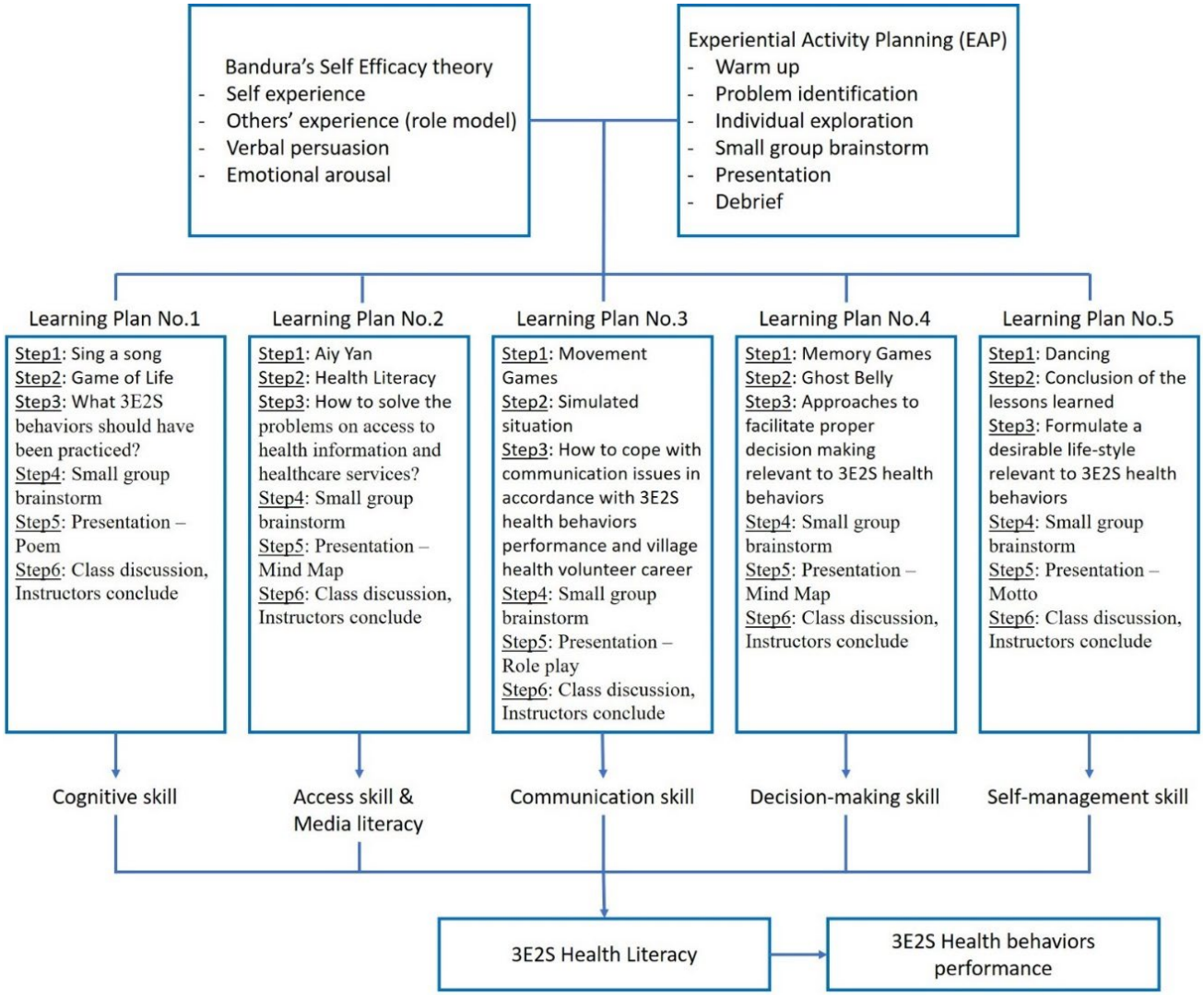

Figure 1. The EAP health literacy promotion program concept

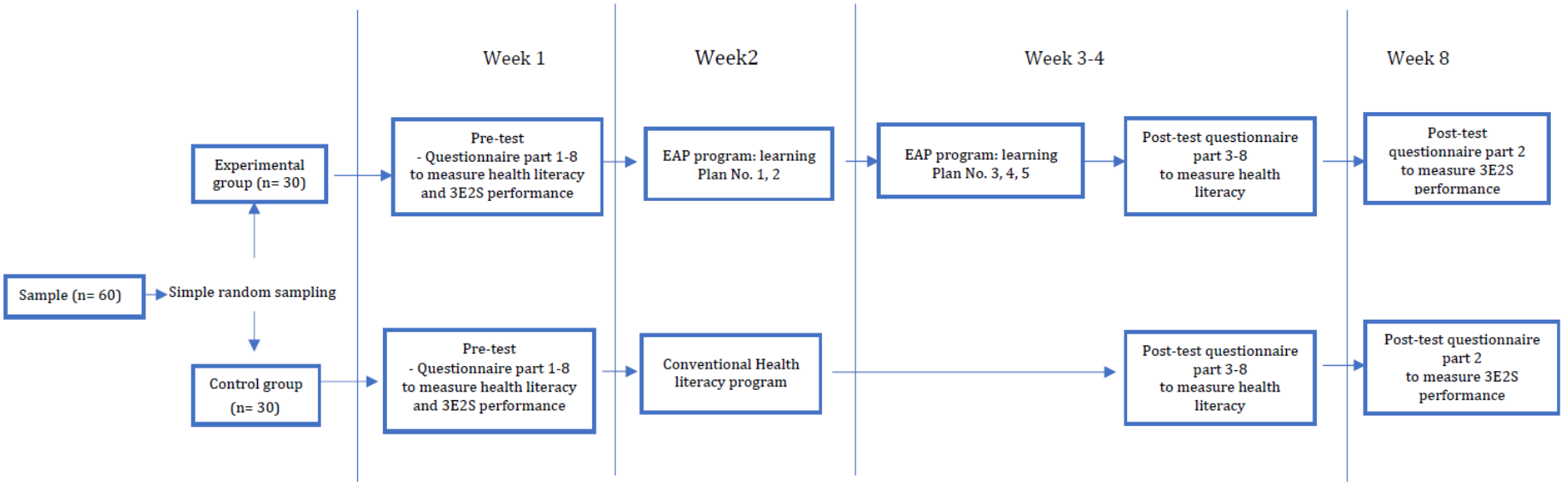

Figure 2. Data collection method

3. RESULTS

The demographic data showed that the majority of participants in the experimental group and control group were female at 90% and 86.7%, respectively, and were 54-60 years of age at 36.7% and 46.7%, respectively. Also, the majority of participants in each group had high school or vocational certificates, specifically 40.0% of those in the experimental group and 43.3% of those in the control group. For the health education aspect, 63.3% of the experimental group and 73.3% of the control group had previously undergone a 3E2S health behaviors promotion program for more than 1 year prior to the study. A comparison of the demographic data, which included gender, age, education, and health education, between the experimental group and the control group showed no significant differences. A comparison of pre-test average score on health literacy and 3E2S health behavior between both groups also carried no significant difference (t=0.28, 0.60, p=0.39, 0.55), as shown in Table 1 and 2

After the experimental group had received the EAP health literacy promotion program, the participants in this group performed higher scores on health literacy and 3E2S health behaviors with statistically significant difference (t=7.12, 4.71, p<0.05), as shown in Table 1.

The scores on health literacy and 3E2S health behaviors of the experimental group were higher than those of the control group with statistically significant differences (t=6.63, 5.10, p<0.05), as shown in Table 2.

4. DISCUSSION

The results of this research indicated that the experimental group achieved a higher average score on health literacy and 3E2S health behaviors after receiving the EAP health literacy promotion program. The average post-program score performed by the experimental group was also the higher of the two with statistically significant differences (p-value <0.05). This confirmed the research assumptions.

The demographic data carried no statistical difference. The results of this research also showed that there was no statistical difference between the pre-program average score for both groups, which meaned the demographic data did not affect the level of health literacy and 3E2S health behaviors. This was confirmed by the research of Tachavijitjaru et al. (2018) which argues that the factors of gender, age, education, career, and marriage were not statistically significantly relevant to the level of health literacy. According to the mentioned research, demographic data did not alter the effect of a health literacy promotion program provided to the sample of this research as well.

Post-program average score on health literacy and 3E2S health behaviors of the experimental group was higher than its pre-program score with statistical significance. This result asserted the positive effect of the EAP health literacy promotion program on the level of health literacy and 3E2S health behaviors. The reason that the EAP health literacy promotion program was effective was that it was designed to promote all 6 skills relevant to health literacy. It also encouraged the participants to perform appropriate 3E2S health behaviors by instilling them with self-confidence and motivation in accordance with Bandura's self-efficacy theory.

Table 1. Comparison of health literacy and 3E2S health behaviors average scores for the experimental group between pre and post EAP program

Variable	Pre-experiment (n=30)		Post-experiment (n=30)		statistic	p-value
	Mean	SD	Mean	SD		
Health literacy	149.23	13.59	178.60	10.72	7.12*	0.00***
3E2S health behaviors	26.00	4.25	29.30	3.15	4.71**	0.00***

* t: pair t-test
** Z: Wilcoxon signed ranks test
*** p-value <0.05

Table 2. Comparison of health literacy and 3E2S health behaviors average scores between the experimental group and the control group, pre -and post experiment

Variable	Experiment-Group (n=30)		Control-Group (n=30)		statistic	p-value
	Mean	SD	Mean	SD		
Health literacy						
Pre-Experiment	149.23	13.59	150.33	16.76	0.28*	0.39
Post-Experiment	178.60	10.72	150.73	20.38	6.63*	0.00***
3E2S health behaviors						
Pre-Experiment	26.00	4.25	27.00	3.63	0.60**	0.55
Post-Experiment	29.30	3.15	26.60	3.23	5.10**	0.00***

* t: independent t-test
** Z: Man-Whitney U test
*** p-value <0.05

The program enhanced the health literacy of the participants, which was the result of its design that aimed to promote all 6 necessary skills of health literacy. According to the Thai Ministry of Public Health, there were 6 skills relevant to health literacy, including access skill, cognitive skill, communication skill, decision-making skill, media literacy skill, and self-management skill (Kaeodumkoeng, 2018). Learning plan No.1 of the program aimed to promote the cognitive skills, which refered to the ability to learn basic knowledge. It provided participants with important information that was fundamental to health literacy. Learning plan No.2 proposed to build media literacy and access skill. Access skill refered to the ability to access healthcare services and health information. The ability to access local healthcare services enabled one to serve oneself with proper primary health care as well as the ability to gain

access to health information, which allowed one to receive essential and up-to-date information. Media literacy skill refered to the ability to filter the information received through media. This learning plan established these skills by introducing them to the importance and possible problems. It then discussed appropriate practices. Learning plan No.3 was designed to increase the communication skill which was needed in order to pass on one's issue or advice to others. It introduced the participants to a simulated situation that contained communication issues and showed them how to overcome the problems. Learning plan No.4 intended to promote the decision-making skills, which refered to the ability to make a decision that benefited health behavior performance. This learning plan allowed participants to learn the negative factors that altered reasonable decisions and how to mitigate their effects. Learning plan No.5 introduced the self-management skill, which was the ability to comprehensively utilize the other 5 skills. The participants were required to plan a healthy life-style, which was the first step to effectively manage their situations. All necessary skills of the participants were improved through the 5 learning plans of this EAP health literacy promotion program, and their level of health literacy was elevated as a result.

The program not only enhanced the participants' health literacy but also built self-confidence in them. According to Bandura's self-efficacy theory, self-confidence is required to perform desired behaviors. Self-confidence can be acquired from personal experience, the experience of others, verbal encouragement, and emotional arousal perception (Bandura, 1977). The program encourages participants to perform 3E2S health behaviors by adopting the EAP concept to build self-confidence. Each step of every learning plan in the program was designed according to the EAP method in order to generate sources of self-confidence in accordance with Bandura's theory. The first step of each learning plan aimed to facilitate participants' emotions. The second step was introducing the problems designed to attach participants with the problems emotionally. This would arouse their emotion and motivate them to solve problems. The problem introduced to the participants was modified to be related to their own experiences as well so they could connect themselves to the problems and gained self-confidence through personal experiences. The fourth and fifth steps, which were small group brainstorm and presentation, respectively, allowed participants to learn and gain self-confidence through the experiences of others. Verbal encouragement was provided by the instructors throughout the activities. Furthermore, the program intended to persuade the participants to be the centered on every learning activity under a supportive educational atmosphere which helped to maximize its effectiveness in return.

The experimental group's average health literacy and 3E2S health behavior scores were higher upon completion of the experiential learning program when compared with those of the control group. This result could be described by the comparison between the EAP health literacy promotion program provided to the experimental group and the conventional health literacy promotion program, which provided to the control group. The EAP program promoted 6 necessary skills of health literacy and built self-confidence among the participants. On the other hand, the conventional program only served cognitive skills and insufficiently generated self-confidence among the participants. In the content aspect, the conventional program provided fundamental knowledge on health literacy and 3E2S health behaviors guidance, which was considered to facilitate cognitive skills. However, the program lacked contents relevant to the other 5 skills, especially communication, decision-making, and self-management. Therefore, the level of its participants' health literacy could not be fully developed. In the area of teaching method, the program was mainly lecture-based, which was not suitable for health literacy education. This is because learning about communication skills, decision-making skills, and self-management skill requires practice. Most importantly, a lecture-based approach was insufficient to create self-confidence according to Bandura's theory. A lecture-based approach might provide verbal encouragement with minimal emotional arousal. However, it was unable to provide experiences to the participants. Participants needed a chance to practice in order to acquire experiences. Overall, it could be seen that the conventional health literacy promotion program was less effective compared to the EAP program. Therefore, the experimental group that undertook the EAP performed with a higher score than the control group that undertook the conventional program.

This research argued that the EAP health literacy promotion program provided a substantial effect on the health literacy and 3E2S health behaviors of village health volunteers. This was because it focused on every necessary skill of health literacy and adopted Bandura's self-efficacy theory to establish self-confidence in the participants. The results of this study supported and were supported by prior research into the effectiveness of using experiential learning programs to promote appropriate health behaviors. One such case was the effectiveness of participatory learning school-based intervention prevention of soil-transmitted helminth infections among primary school students - Nan Province, Thailand, which found that after participating in an experiential learning program, the students' average scores reflecting knowledge, attitude, and behavior related to the prevention of infection were higher than before taking part in the program. The scores were also higher than those of the control group and exhibited a statistical significance (Seangpraw, 2014). Similarly, the results of Takpho et al. (2017) showed that a self-help group that received experiential training demonstrated higher average scores pertaining to mental health self-care behaviors upon completion of the education program as when compared with before completion. Moreover, their scores were also higher when compared with those of the control group. Additionally, Phoomchart (2018) found that preschool-aged children, who received experiential education, had better health behaviors than before they participated in the program. In the same fashion, research undertaken by Prasitsart et al. (2019) found that a program aimed at increasing intrinsic motivation through experiential learning was able to effectively boost stress management skills in nursing students. According to another study by Chanchorn (2017) students demonstrated an increased likelihood to brush their teeth before going to bed increasing from 27.40% to 42.40% after received the experiential oral health promotion. Lastly, research on the effects of a behavioral modification program on the mental health self-care of persons with alcohol dependence again supported the conclusion that learning programs emphasizing personal experience positively affected health outcomes. The experimental group, comprised of individuals with alcohol dependence, possessed higher average scores relative to mental health self-care after the program, when compared with before the program, as well as when compared

to the scores of the control group (Sasung et al., 2018). In light of all the supporting data, the researchers confidently stated that the experiential activities planning program had a direct, positive and measurable effect on the promotion of both health literacy and 3E2S health behaviors among village health volunteers.

5. CONCLUSIONS

The EAP health literacy promotion program could be utilized by nurses or health care practitioners to promote health literacy among health care leaders, village health volunteers, and other segments of the population. Support was needed for the application of active learning techniques in health education, which placed greater emphasis on learner participation and creating experiences through an atmosphere that promoted health literacy and 3E2S health behavior principles, in addition to conventional lecture-based teaching/learning. The authorities should set policy relevant to the promotion of creativity in a health educational manner. A follow-up study should be conducted to monitor the sustainment of the experimental group's health literacy and 3E2S health behaviors in the long term (6 - 12 months).

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REFERENCES

Bandura, A. (1977). *Social learning Theory*, New Jersey: Prentice-Hall, pp. 384-385.

Chanchorn, W. (2017). A Study of oral health promotion integration in primary school Song district Phrae province. *Journal of Prapokklao Hospital Clinic Mediacal Education Center*, 34(3), 237-246. [in Thai]

Chitrachinda, S., and Kanha, S. (2005). *Children in the Know Collection*. Bangkok: Pimdee Publishing, pp. 14-17. [in Thai]

Chobthamasakul, S. (2019). Relationship between health literacy and obesity prevention behavior of undergraduate students in Bangkok metropolitan region. *Journal of Interdisciplinary Research: Graduate Studies*, 8(1), 116-123. [in Thai]

Department of Health Service Support. (2014). *Regulation of the Ministry of Public Health: Public Health Volunteers 2011 A.D.*, Bangkok: WVO Officer of Printing Mill. [Online URL: http://phc.moph.go.th/www_hss /data_center/dyn_mod/2580.pdf] accessed on January 15, 2019. [in Thai]

Department of Health Service Support. (2017). *Guide to Enchance Healthliteracy from VHV to FHV*, Bangkok: O-VIT (Thailand) Co., Ltd., pp. 39-43. [in Thai]

Health Education Division. (2018). *Village health volunteer's 3E2S Health literacy, Health Literacy and Health Behavior Assessment Report 2018*. [Online URL: www.hed.go.th/linkHed/364] accessed on February 25, 2019. [in Thai]

Hfocus News. (2018). *Thai NCDs mortality rate reach 37 deaths/hr, speed up complication prevent-control measures*. [Online URL: https://www.hfocus.org/content/2018/08/16157] accessed on January 15, 2019. [in Thai]

Ho, T. G., Hosseinzadeh, H., Rahman, B., and Sheikh, M. (2018). Health literacy and health-promoting behaviours among Australian-Singaporean communities living in Sydney metropolitan area. In *Proceedings of Singapore Healthcare*, pp. 125-131. Singapore.

Kaeodumkoeng, K. (2018). *Health Literacy Access, Understand and Application*, Bangkok: Amarin Printing and Publishing Co., Ltd., pp. 3-8. [in Thai]

National Reform Steering Assembly. (2016). *Summary of problems: Health literacy and communication reform.* [Online URL: https://www.parliament.go.th/ewtadmin/ewt/parliament_parcy/ewt_dl_link.php?nid=38939] accessed on January 20, 2018. [in Thai]

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science and Medicine*, 67, 2072-2078.

Phoomchart, A. (2018). Health promotion in preschool age on experiential activities planner (EAP) to good health behavior. *Journal of Department of Health Service Support,* 14(3), 57-67. [in Thai]

Prasitsart, N., Somprasert, C., and Jirarode, A. (2019). The effects of an intrinsic motivation program on the stress management skills of nursing students. *Journal of The Royal Thai Army Nurses,* 20(2), 205-214. [in Thai]

Sasung, C., Somprasert, C., and Vuthiarpa, S. (2018). *The effect of a behavioral modification program on the mental health self-care of persons with alcohol dependence*. Master's thesis, Thammasat University, Bangkok. [in Thai]

Seangpraw, K. (2014). *Effectiveness of participatory learning school-based intervention prevention of soil-transmitted helminth (STH) infections among primary school students Nan Province Thailand*. Doctoral dissertation, Chulalongkorn University, Bangkok. [in Thai]

Sharif, I., and Blank, A. E. (2010). Relationship between child health literacy and body mass index in overweight children. *Patient Education and Counseling*, 79(1), 43-48.

Singhasem, P., Krinara, P., and Tiparat, W. (2019). Correlation between health literacy and health behaviors in older people: a survey research in a community, Trang Province. *Boromarajonani College of Nursing, Uttaradit Journal*, 11(1), 37-51. [in Thai]

Tachavijitjaru, C., Srisupornkornkul, A., and Changtej, S. (2018). Selected factors relate with the health literacy of village health volunteer. *Journal of The Royal Thai Army Nurses*, 19(Suppl.), 320-332. [in Thai]

Takpho, A., Somprasert C., and Imkome E. (2017). The effects of a self-help group program on the mental health self-care of schizophrenic patients' primary caregivers. *Journal of Nursing and Health Care*, 35(3), 109-119. [in Thai]

The Constitution of the Kingdom of Thailand. (2017, April 6) *Thai Government Gazette* (No. 134). [Online URL: http://www.ratchakitcha.soc.go.th/DATA/PDF/2560/A/040/1.PDF] accessed on January 15, 2019.

World Health Organization. (1998). *Health Promotion Glossary*, Geneva: WHO, p. 10. [Online URL: https://apps.who.int/iris/bitstream/handle/10665/64546/WHO_HPR_HEP_98.1.pdf?sequence=1&isAllowed=y] accessed on June 13, 2018.