The Effectiveness of Basic Life Support Training Program for Knowledge and Skills of Primary School Teachers: A Quasi-experimental Study

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Abstract: Cardiac arrest outside of hospitals is a leading cause of hospitalization and mortality. Schools are ideal settings to teach individuals basic life support, and teachers should be involved in basic life support training. This two-group quasi-experimental with pre-posttest study aimed to examine the effectiveness of the Basic Life Support Training Program, designed by nurses, for knowledge and skills for basic life support of primary school teachers. The participants comprised 60 primary school teachers purposively selected from two primary schools in central Thailand. They were divided into experimental (n = 30) and control (n = 30) groups. Data were collected using the Demographic and Health Data Form, Basic Life Support Knowledge Questionnaire, and Basic Life Support Skills Questionnaire and analyzed with descriptive statistics and independent and paired t-tests.

From the results, immediately after the program, the mean scores of basic life support knowledge and skills of the program participants were significantly higher than those in the control group. After the program, the experimental group's mean score of basic life support knowledge and skills was higher than before. The Basic Life Support Training Program effectively improves knowledge and skills for providing basic life support to primary school teachers. School nurses can be trained to use this program to improve basic life support skills among primary school teachers. However, long-term follow-up is needed to determine the sustainability of both knowledge and skills by measuring actual practice skills in basic life support.

Keywords: Basic life support, Knowledge, Primary school teachers, Skills

Received 11 September 2023; Revised 27 November 2023; Accepted 30 December 2023

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Introduction

Cardiac arrest outside of hospitals is a predominant problem for public health globally, affecting over 3.8 million cases yearly.[1] Each year, more than 54,000 Thai people die from sudden cardiac arrest, or on average, approximately six people die every 1 hour.[2] Cardiac arrest causes the heart's output and oxygen flow to all of the body's critical organs to stop. Cardiac arrest for more than four minutes can cause permanent brain death.[3] Therefore, receiving medical attention and transferring the injured person to a doctor or hospital promptly and properly will increase the chance of survival and returning to normal function.

Effective and quick basic life support (BLS) is crucial for surviving cardiac arrest. The American

https://doi.org/10.60099/prijnr.2024.265841

Heart Association (AHA)[4] proposed BLS should consist of airway support, support for breathing, how to do cardiopulmonary resuscitation (CPR), and using automatic external defibrillators (AED). CPR, along with using an AED, within 3-5 minutes after the person loses consciousness. This training can help analyze heart arrhythmias and deliver electrical shocks to the heart to treat these irregular heartbeats and get the heart back to beating in the correct rhythm. To prevent lasting brain damage, CPR is most successful when performed as soon as a patient collapses.[5] The lack of oxygenated blood when the heart stops might result in permanent brain damage.[3] Although medical professionals can perform CPR, recent research showed that immediate CPR performed by bystanders on time is crucial for surviving cardiac arrests outside of the hospital.[6]

Schools are ideal places to teach individuals to perform BLS.[7] Training of BLS in primary schools enables an opportunity to access nearly all future populations from an early age[8] and nurses are ideal people to provide BLS training in schools.[9,10] Among healthcare providers, nurses play an important role in mediating between health and education by strategically intervening to provide BLS education.[11] While a large amount of research has focused on enhancing the knowledge and skills in BLS among primary school students,[12,13,14] less priority is placed on primary school teachers who can help to raise awareness of BLS in their school community.[15] It is thus crucial to involve teachers in BLS education, imparting the knowledge they require and ensuring that they can perform BLS appropriately so they may serve as role models. Currently, BLS is incorporated in the Thai education curriculum for students.[16] Unfortunately, there is no standardized BLS training for school teachers. Only a small proportion of school teachers have received BLS training, and those trained did not receive any recent training to refresh their BLS capability.[17] Most school teachers have inadequate knowledge of BLS and feel incapable of giving BLS,[18] and express the need to be trained in CPR.[12,18] Therefore, training primary school teachers on how to perform effective BLS is necessary.

Conceptual Framework and Review of Literature

Thailand's National Institute for Emergency Medicine (NIEM)[19] introduced basic CPR principles for training people's skills to assist in cardiac arrest emergencies. The recommended BLS is performed in six steps. First, the rescuer should check the safety of the environment before going to help, such as safety from repeated accidents, electric shock, or other possible risks. Second, the rescuer should wake up and call the injured person with a loud voice, pat both shoulders if they are conscious and can breathe independently, and have the injured person lie on their side. Third, the rescuer should ask people nearby to call the 1669 hotline for help and bring an AED device. Fourth, if the injured person is unconscious and not breathing, the rescuer should perform CPR by having them lie on their back, placing one hand centered on the chest and the other on top. Chest compressions should be performed with a depth of at least 5 centimeters at a rate of 100-120 times per minute, with the chest fully rising. Fifth, the rescuer should give breaths if the injured person is not breathing. Lastly, the rescuer should apply conductive AED pads, one under the right collarbone and another on the side of the left nipple, and follow the instructions of the AED device. If the AED device does not deliver a shock, the rescuer should continue with chest compressions or press the shock button and perform chest compressions immediately after the shock until the rescue team arrives.

The Basic Life Support Training Program (BLSTP) in this study was guided by Bloom's taxonomy,[20]

which posits that when people learn, understand, and have a good attitude, they can put their newly acquired knowledge into practice to act correctly and skillfully. Three different learning domains probably impact people who actively engage in learning. Firstly, the cognitive domain involves acquiring new knowledge and developing intelligence and skills.[20] BLS knowledge can be enhanced through lectures and education sessions on BLS principles and how to use AED, as well as video multimedia of how to perform BLS procedures and memorize these techniques.[21,22] Secondly, the affective domain deals with internalizing values, appreciation, motivation, and attitudes by helping learners comprehend their values and how they have formed.[20] Learners usually engage in group activities where the earners will learn how to prioritize work, practice cooperation, and create a balance between their ideals and the team's values. In BLS training, the affective domain can be facilitated through group discussion, where learners can reflect on the benefits of BLS, appropriate timing, problems that may arise, and solutions.[21] Lastly, the psychomotor domain is concerned with particular physical abilities to physically carry out tasks and perform certain skills,[20] which can involve skill training and demonstrating CPR maneuvers and AED use.[21]

Bloom's taxonomy has been employed in many studies to design and structure educational goals and learning outcomes for BLS programs and was effective in improving BLS skills of various populations, such as students[21,23,24] and new registered nurses.[22] However, there is scarce literature on BLS training for teachers. There was one previous study on training BLS for primary and secondary teachers, but no educational framework guided it. The teachers still had inadequate knowledge and ineffective skills to perform the BLS sequences even after training.[25] This necessitates the development of a training program in BLS among primary school teachers guided by Bloom's taxonomy that provides structured training activities and enhanced higher-order thinking through cognitive, affective, and psychomotor domains.

Study Aim and Hypotheses

This study sought to investigate the BLSTP's effect on primary school teachers' knowledge and skills. It was hypothesized that the teachers who received the program would have higher knowledge and skills of BLS than those who did not before the program.

Methods

Design: We used a two-group quasi-experimental with pre-posttest design and followed the checklist of Transparent Reporting of Evaluations with Non-randomised Designs.

Sampling and Settings: We determined the sample size using an independent t-test utilizing G*Power, setting .80 for power, .05 for significance, and 0.7 for effect size.[26] This resulted in 26 participants. After adding 15% to account for any attrition,[26] the sample size was 30 per group, totaling 60 participants. Participants were primary school teachers purposively selected from two schools in a province of central Thailand based on the inclusion criteria of 20-59 years and could communicate in Thai. Discontinuation criteria included inability to participate throughout the program. We perform cluster randomization to assign the participants in School A to an experimental group and those in School B to a control group. In School A, 41 teachers were assessed for eligibility, but two did not meet the criteria, and nine could not participate. In School B, 42 teachers were evaluated for eligibility, but four did not meet the criteria, and eight could not participate. All 60 participants remained during the study, with 30 participants in each group included for analysis (**Figure 1**).

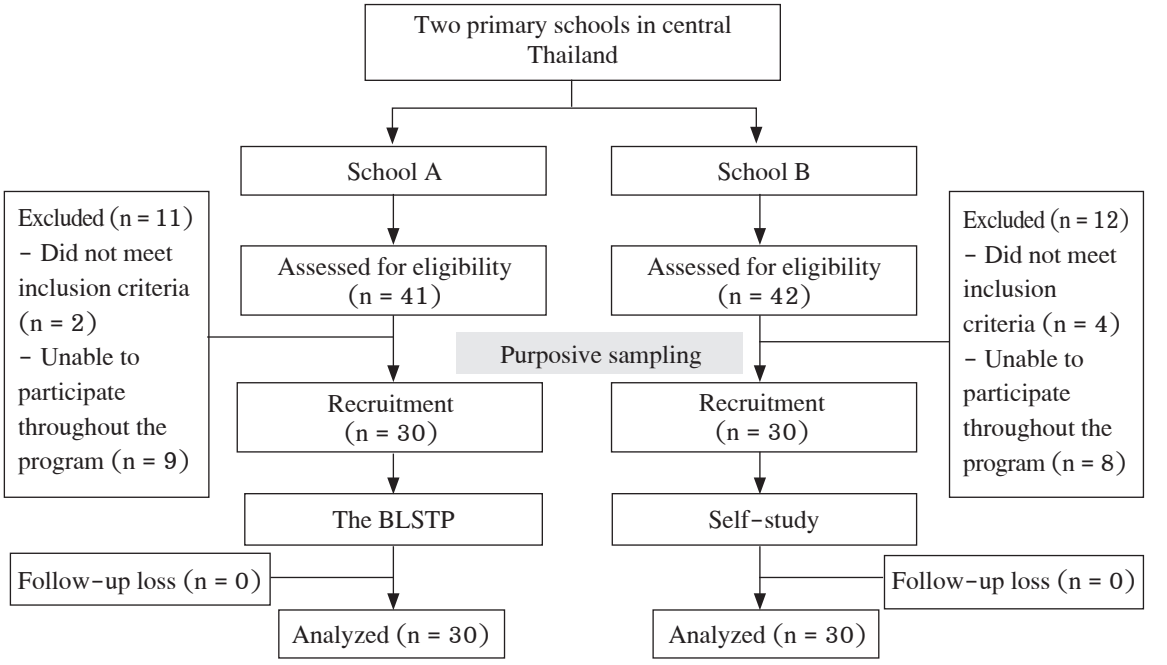

Figure 1. Flow chart of the participants throughout the study

Ethical Considerations: This study's approval was granted by the Ethics Committee for Research in Human Subjects of Boromarajonani College of Nursing, Bangkok (BCNB-2563-03) and permission for data collection was given by the director of the participating school. Participants received a full explanation of the study objectives, participant rights, potential risks, and benefits. After participants agreed to take part, they gave written consent. Prevention measures for COVID-19 transmission were strictly maintained.

Research Instruments: Three research instruments were used for data collection.

A Demographic and Health Data Form was developed by the principal investigator (PI). It has eight items on gender, age, religion, education, experience in BLS, body mass index (BMI), chronic illness, and family history of chronic illness.

The Basic Life Support Knowledge Questionnaire was created by Sriklo et al.[27] It contains 15 multiple-choice items; 1 point is given for each correct answer. An example item is: "What would you do to check if the person is conscious?" The range of total scores is between 0 and 15, with higher scores representing greater BLS knowledge.[27] This questionnaire was examined for content validity by three experts in emergency medicine, yielding an item objective congruence (IOC) index of 0.66-1.00.[27] Kuder-Richardson 20 (KR-20) coefficient was 0.95 in the pilot test with 30 primary school teachers and 0.85 in the actual study.

The Basic Life Support Skills Questionnaire was also created by Sriklo et al.[27] and according to the principles of BLS of the NIEM.[19] It has nine items; 1 point is given for a correct performance of BLS, and 0 points are given for an incorrect or no performance of BLS. An example item is: "Assessment of consciousness." The total score ranges between 0 and 9, with higher scores reflecting better BLS skills.[27] Content validity was investigated by three emergency medicine experts, giving an IOC of 0.66-1.00.[27] A KR-20 coefficient was 0.71 in the pilot test with 30 primary school teachers and 0.75 in the actual study.

The Intervention

The BLSTP was developed based on the principles of BLS of the NIEM[19] with learning activities guided by Bloom's taxonomy[20] to increase knowledge and skills of effective BLS in cognitive, affective, and psychomotor domains. The total time spent on the BLSTP was approximately three hours, led by the PI, and included five sessions: 1) creating motivation to help emergency cases with cardiac arrest/ acute coronary syndrome; 2) CPR; 3) using AED; 4) recovery position; and 5) resuscitation skills. The strategies comprised lectures, video multimedia, skill training in a small group of six participants per group, demonstrations and return demonstrations, and real-time feedback. The BLSTP was reviewed by three emergency medicine experts and revised following expert suggestions. The activities in each session are described in **Appendix Table 1**.

Data Collection: Data were collected in November 2020. Following ethical approval, the PI screened and recruited participants based on the inclusion criteria. The experimental group received the BLSTP in a large school meeting room, while the control group was allowed to self-study BLS from online platforms. For both groups, knowledge of BLS was assessed with the Basic Life Support Knowledge Questionnaire and skills of BLS were measured using the Basic Life Support Skills Questionnaire before and immediately after the program ended. A single-blind technique was performed so the participants did not know which group they were in.

Data Analysis: Demographic and health data analyses were run with descriptive statistics, including numbers and percentages, and compared utilizing the Chi-square test or Fisher's exact test and independent t-test. The BLS scores of knowledge and skills were compared between groups with independent t-tests and between before and after the program using paired t-tests. Before analyses, statistical assumptions for normality were examined using the Komogorov-Smirnov test. The data showed a normal distribution.

Results

In total, 60 participants remained, with 30 in each group. In the experimental group, most participants were women aged 35-47 years, Buddhist, and bachelor's degree graduates. Most had no experience in BLS. About half had average weight. Around two-thirds had no chronic illness, and half of the participants had no history of family illness. In the control group, most participants were women aged 35-47 years, Buddhist, and bachelor's degree graduates. Almost all had no experience in BLS. Nearly half had average weight, no chronic illness, and no history of family illness. The experimental and control groups did not significantly differ regarding their demographic and health characteristics (**Table 1**).

Table 1. Characteristics of participants in the experimental and control groups

Characteristics	Experimental (n = 30)		Control (n = 30)		p-value
	n	%	n	%	
Gender					1.000[b]
Male	2	6.67	3	10.00	
Female	28	93.33	27	90.00	
Age (years)					.919[a]
22-34	8	26.66	9	30.00	
35-47	17	56.68	17	56.67	
48-60	5	16.66	4	13.33	
Religion					1.000[b]
Buddhism	27	96.67	28	96.67	
Islam	3	3.33	2	3.33	

Table 1. Characteristics of participants in the experimental and control groups (Cont.)

Characteristics	Experimental (n = 30)		Control (n = 30)		p-value
	n	%	n	%	
Education level					1.000[b]
Bachelor's degree	28	93.33	27	90.00	
Master's degree	2	6.67	3	10.00	
Experience in basic life support					1.000[b]
Yes	1	3.33	1	3.33	
No	29	96.67	29	96.67	
Body mass index (kg/m^2)					.987[a]
Underweight (< 18.5)	3	10.00	2	6.67	
Average weight (18.5-22.9)	13	43.34	14	46.67	
Overweight (23-24.9)	4	13.33	4	13.33	
Obese (25-29.9)	7	23.33	6	20.00	
Severely obese (> 30)	3	10.00	4	13.33	
Chronic illness					.997[a]
None	10	33.33	12	40.00	
Diabetes	3	10.00	3	10.00	
Hypertension	2	6.67	2	6.67	
Diabetes and hypertension	10	33.33	9	30.00	
Diabetes, hypertension, and dyslipidemia	2	6.67	1	3.33	
Allergy and asthma	2	6.67	2	6.67	
Anemia	1	3.33	1	3.33	
History of family illness					.267[a]
None	15	50.00	14	46.67	
Diabetes	8	26.66	9	30.00	
Hypertension	5	16.67	4	13.33	
Diabetes and hypertension	2	6.67	3	10.00	

[a] = Chi-square test, [b] = Fisher' Exact test

BLS knowledge was compared between groups at baseline and after the program ended using an independent t-test. We found no significant differences between groups at baseline, but the experimental group demonstrated significantly higher knowledge of BLS than the control group at post-test (**Table 2**).

BLS skills between groups before and after the program were compared using an independent t-test. The result revealed no significant differences between groups at baseline. After the program ended, the experimental group had a significantly higher BLS skills mean score when compared to the control group (**Table 2**).

Within groups, we observed a difference in the experimental group's mean scores of BLS knowledge and BLS skills before and after the program ended with statistical significance. The mean scores for BLS knowledge and skills after receiving the program were higher than before. The control group, in contrast, did not demonstrate significant differences (**Table 2**).

Table 2. Mean differences in BLS knowledge and BLS skills between the experimental and control groups and between before and after the program

Variable	Experimental (N = 30)		Control (N = 30)		t-test	
	mean	SD	mean	SD	t	p-value
BLS knowledge						
Before program	7.60	1.632	7.63	1.586	-.080	.936
After program	10.87	3.431	8.20	1.669	3.828	.000
	t=-4.615 (p < .001)		t=-1.292 (p = .207)			
BLS skills						
Before program	5.80	1.243	5.83	1.234	-.104	.917
After program	7.13	1.676	5.93	.8276	3.516	.00
	t=-3.364 (p = .002)		t= -.320 (p = .751)			

Note: Total score ranges from 0 to 15 for BLS knowledge and 0 to 9 for BLS skills.[27]

Discussion

Our findings showed that the BLSTP participants had higher BLS knowledge and skills than participants who did not receive it. After receiving the BLSTP, the participants had higher BLS knowledge and skills than before the program. These findings supported the research hypotheses.

The BLSTP provided content on the principles of BLS guided by Bloom's taxonomy[20] that organized the contents and learning in three domains. First, the affective domain involved activities for creating motivation and awareness of cardiac arrest in various situations and the importance of BLS in saving lives. It also asked the participants to share their experiences related to BLS and cardiac arrest. These strategies enhanced the participants' motivation for BLS[20] by helping them visualize how useful BLS is in real life. This created a foundation of enthusiasm to seek further BLS knowledge. An interest in BLS was an important determinant of laypeople's willingness to learn about BLS.[28] Consistent with the European Resuscitation Council Guidelines,[29] an important step in BLS education for laypeople is to enhance willingness to perform BLS, making the participants willing to learn about it.

The significant increase in BLS knowledge is most likely attributable to the activities in the cognitive domain that focused on increasing BLS knowledge through lectures about BLS principles, CPR procedures, usage of AED, and recovery position. This content was arranged from simpler to more complex concepts based on the proper sequence of BLS procedures.[19] This created a knowledge base, strengthened the participant's cognitive structure and maximized their learning process,[20] making learning easier. Moreover, the contents were organized using various pedagogic and technological means to promote multimodal learning, including lectures and multimedia videos on BLS principles. Congruently, BLS training incorporating video multimedia and brochures helped increase the participants' short-term and long-term memory of BLS and thus improved their knowledge.[22] Evidence from other training programs on BLS also supported using Bloom's taxonomy to structure learning activities to enhance cognitive gain and promote knowledge of BLS.[21-24] However, it is noteworthy that, despite a significant increase in BLS knowledge, the experimental group's mean knowledge score at the post-test was 10.87, which was a fair level of knowledge.[27] It is possible that most of the participants in this study (96.67%) had no experience with BLS. Therefore, they had little to share about such prior experience during the program. In laypeople, having experiences of BLS was a significant predictor of

BLS knowledge.[30] Effective BLS training programs should be designed to promote meaningful learning based on the participants' prior experience.[29]

Regarding the increase in BLS skills, the psychomotor domain focused on the technical skills of executing CPR maneuvers taught through demonstrations, small-group practices with a manikin, and feedback for incorrect maneuvers. The practice of CPR maneuvers in a small group allowed each participant to receive the corrective feedback individually, which could improve their skills in BLS. Congruent with a systematic review of BLS training for laypeople,[31] effective resources for teaching and learning resuscitation skills included practices with manikins and feedback. Feedback enabled the evaluation and monitoring of the participants' CPR performance. Similarly, another CPR training program revealed that corrective feedback improved compression rates and depth.[24] The finding was also aligned with Bloom's taxonomy-based BLS training program employing demonstrations and practice with a mannequin that could significantly increase the skills of Thai nursing students.[21]

Limitations

This study had some limitations. BLS skills were measured using a questionnaire so that performance assessment might be limited. BLS knowledge and skills were measured at pre-test and post-test within three hours, which could be a major threat to the internal validity. Moreover, the construct validity of cause and effect might be distorted because there is no evidence to support the construct validity of the research instruments. There was no assessment to determine the sustainability of the outcome improvements over a longer period. Additionally, the participants were primary school teachers, so the findings may not be generalizable to other groups of teachers. Further studies are warranted to investigate the effects of BLS training on the attitude toward BLS and whether BLS knowledge and skills can be retained for longer periods among teachers of secondary or higher education.

Conclusions and Implications for Nursing Practice

The findings show the effectiveness of the BLSTP in increasing BLS knowledge and skills of primary school teachers. Nursing educators, emergency nurses, and community nurses can be trained to use this program to educate and train the teachers in BLS by focusing on enhancing the affective, cognitive, and psychomotor domains of learning to increase teachers' motivation, knowledge, and skills of BLS.

References

1. Brooks SC, Clegg GR, Bray J, Deakin CD, Perkins GD, Ringh M, et al. Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: a scientific statement from the International Liaison Committee on Resuscitation. Circulation. 2022;145(13):e776-e801. doi: 10.1161/CIR.0000000000001013.
2. Queen Sirikit Heart Center of the Northeast. 2022 [cited 2023 Oct 2]. Available from: https://heart.kku.ac.th/index.php?option=com_k2&view=item&id=13:4 (in Thai)
3. Sandroni C, Cronberg T, Sekhon M. Brain injury after cardiac arrest: pathophysiology, treatment, and prognosis. Intensive Care Med. 2021;47(12):1393-414. doi: 10.1007/s00134-021-06548-2.
4. American Heart Association. 2023 [cited 2023 Oct 2]. Available from: https://international.heart.org/our-courses/basic-life-support/
5. Perkins GD, Callaway CW, Haywood K, Neumar RW, Lilja G, Rowland MJ, et al. Brain injury after cardiac arrest. Lancet. 2021;398(10307):1269-78. doi: 10.1016/S0140-6736(21)00953-3.
6. Yan S, Gan Y, Jiang N, Wang R, Chen Y, Luo Z, et al. The global survival rate among adult out-of-hospital cardiac arrest patients who received cardiopulmonary resuscitation: a systematic review and meta-analysis. Crit Care. 2020;24(1):61. doi: 10.1186/s13054-020-2773-2.

7. Böttiger BW, Van Aken H. Kids save lives – Training school children in cardiopulmonary resuscitation worldwide is now endorsed by the World Health Organization (WHO). Resuscitation. 2015;94:A5-7. doi: 10.1016/j.resuscitation.2015.07.005.
8. Tse E, Plakitsi K, Voulgaris S, Alexiou GA. Schoolteachers teach first aid and trauma management to young primary school children: an experimental study with educational intervention. Children. 2023;10(6):1076. doi:10.3390/children10061076.
9. Martínez-Isasi S, García-Suárez M, De La Peña Rodríguez MA, Gómez-Salgado J, Fernández N, Méndez-Martínez C, et al. Basic life support training programme in schools by school nurses: how long and how often to train? Medicine (Baltimore). 2021;100(13):e24819. doi: 10.1097/MD.0000000000024819.
10. Sanati A, Jaberi AA, Bonabi TN. High school basic life support training: is the trainer's experience of cardiopulmonary resuscitation in the actual setting important? a randomized control trial. J Educ Health Promot. 2022;11:165. doi: 10.4103/jehp.jehp_1011_21.
11. Tony ACC, Carbogim FDC, Motta DS, Santos KBD, Dias AA, Paiva ADCPC. Teaching basic life support to schoolchildren: quasi-experimental study. Rev Lat Am Enfermagem. 2020;28:e3340. doi: 10.1590/1518-8345.4078.3340.
12. Suwanpairoj C, Wongsombut T, Maisawat K, Torod N, Jaengkrajan A, Sritharo N, et al. Outcome of basic life support training among primary school students in Southeast Asia. Clin Exp Emerg Med. 2020;7(4):245-9. doi: 10.15441/ceem.19.095.
13. Lienkrua A, Throrungruang A, Huttakee P, Sanee P, Kaewsongk P, Sirinongwa U. The effects of basic life support learning program on knowledge attitude and skill in basic life support in primary school students, Watduangkhae School. Thai J Cardio-Thorac Nurs. 2022;33(1):149-66 (in Thai).
14. Baznik Š, Mohar A. Basic life support training for primary school children. Resuscitation. 2019;142(Suppl 1):e55. doi:10. 1016/j.resuscitation.2019.06.132.
15. Louis CJ, Beaumont-Caminos C, Velilla N, Greif R, Fernández J, Díez DR. The "ABC SAVES LIVES": a schoolteacher-led basic life support program in Navarra, Spain. SAGE Open. 2022;12(3):215824402211244. doi:10.1177/21582440221124478.
16. The Ministry of Education, Thailand. Basic education core curriculum BE 2551 (AD 2008). Bangkok: Ministry of Education;2008.
17. Alahmed YS, Alzeadi HS, Alghumayzi AK, Almarshad LA, Alharbi AS, Alharbi AS. Knowledge and attitudes of first aid and basic life support among public school teachers in Qassim, Saudi Arabia. Cureus. 2023;15(8): e42955. doi:10.7759/cureus.42955.
18. Dursun A, Özsoylu S, Emeklioğlu B, Akyıldız BN. Evaluating the basic life support knowledge among school teachers: a cross-sectional survey in Kayseri, Turkey. Turk J Pediatr. 2018;60(6):702-8. doi: 10.24953/turkjped.2018.06.011.
19. National Institute for Emergency Medicine. 2019 [cited 2023 Oct 2]. Available from: https://www.niems.go.th/1/News/Detail/7214?group=3 (in Thai)
20. Bloom BS, Engelhart MD, Furst EJ, Hill WH, Krathwohl DRA. Taxonomy of educational objectives: the classification of educational goals. Handbook 1: cognitive domain. New York: David McKay;1956.
21. Dhabdhimsri V, Ninwatcharamanee C, Silapatcharanun S, Rungsa J. The effectiveness of basic life support programs by senior nursing students, Boromarajonani College of Nursing, Bangkok. J Health Nurs Res. 2023;39(2):22-33. Available from: https://he01.tci-thaijo.org/index.php/bcnbangkok/article/view/261324 (in Thai)
22. Tantasirin K, Partiprajak S, Piaseu N. Effectiveness of basic life support retraining program on knowledge and chest compression performance in basic life support among new registered nurses. TJN. 2019;68(3):21-9. Available from: https://he02.tci-thaijo.org/index.php/TJN/article/view/233324 (in Thai)
23. Castanha CSC, Tavares LFB, Leone C, Paiva LS, Daboin BEG, Marques NSF, et al. Basic life support education: the impact of lecture-demonstration in undergraduate students of health sciences. J Hum Growth Dev. 2021;31(2):283-90. doi: 10.36311/jhgd.v31.11509.
24. Tobase L, Peres HHC, Gianotto-Oliveira R, Smith N, Polastri TF, Timerman S. The effects of an online basic life support course on undergraduate nursing students' learning. Int J Med Educ. 2017;8:309-13. doi: 10.5116/ijme.5985.cbce.

25. Pichel López M, Martínez-Isasi S, Barcala-Furelos R, Fernández-Méndez F, Vázquez Santamariña D, Sánchez-Santos L, et al. A first step to teaching basic life support in schools: training the teachers. An Pediatr (Engl Ed). 2018;89(5):265-271. Spanish. doi: 10.1016/j.anpedi.2017.11.002.
26. Kang H. Sample size determination and power analysis using the G*Power software. J Educ Eval Health Prof. 2021;18:17. doi: 10.3352/jeehp.2021.18.17.
27. Sriklo M, Yujaiyen M, Sriamonruttanakul. The effects of an education program promoting basic cardiopulmonary life support on knowledge and skills of basic cardiopulmonary life support of middle school students. JBCN Bangkok. 2019;35(1):239-51 (in Thai).
28. Hasegawa Y, Hanaki K. Factors related to young people's willingness to perform basic life support. Yonago Acta Med. 2023;66(1):120-8. doi: 10.33160/yam.2023.02.014.
29. Greif R, Lockey A, Breckwoldt J, Carmona F, Conaghan P, Kuzovlev A, et al. European Resuscitation Council Guidelines 2021: education for resuscitation. Resuscitation. 2021;161:388-407. doi: 10.1016/j.resuscitation.2021.02.016.
30. Mekonnen CK, Muhye AB. Basic life support knowledge and its associated factors among a non-medical population in Gondar Town, Ethiopia. Open Access Emerg Med. 2020;12:323-31. doi: 10.2147/OAEM.S274437.
31. González-Salvado V, Rodríguez-Ruiz E, Abelairas-Gómez C, Ruano-Raviña A, Peña-Gil C, González-Juanatey JR, et al. Training adult laypeople in basic life support: a systematic review. Rev Esp Cardiol (Engl Ed). 2020;73(1):53-68. doi: 10. 1016/j.rec.2018.11.013.

Appendix

Table 1. The BLSTP

Session	Domain	Objective	Activities
1 (25 minutes)	Affective	To create motivation to help emergency cases with cardiac arrest/ acute coronary syndrome	- Lecture and video multimedia about cardiac arrest and its impact and the importance of BLS in saving lives - Discussion on the significance of BLS and ask participants how they think BLS can save lives - Recalling previous experience with cardiac arrest and BLS
2 (70 minutes)	Cognitive and psychomotor	To increase knowledge and understanding of CPR procedures and train skills in correct CPR	- Lecture about BLS principles and CPR procedures (scene size-up, assessment of response, sending for help, opening the airway, breathing, chest compression only) - A demonstration of CPR procedures - Practice of CPR procedures with a manikin in a small group of 6-8 members
3 (30 minutes)	Cognitive and psychomotor	To increase knowledge and understanding of how to use AED and train skills in using AED	- Lecture, video multimedia, and a demonstration about AED, including topics of the components and how to use AED, one-rescuer CPR with AED, and two-rescuer CPR with AED - Practice of using AED in a small group of 6-8 members
4 (25 minutes)	Cognitive and psychomotor	To improve knowledge and skills of the recovery position	- A lecture and a demonstration about recovery position - Practice the recovery position in a small group of 6-8 members and give feedback
5 (25 minutes)	Cognitive and psychomotor	To improve resuscitation knowledge and skills	- A return demonstration of resuscitation - Feedback and suggestions for incorrect practice - Questions and answers - Summarizing BLS and CPR principles

ประสิทธิผลของโปรแกรมการฝึกอบรมการช่วยชีวิตขั้นพื้นฐานต่อความรู้และทักษะการช่วยชีวิตขั้นพื้นฐานของครูโรงเรียนประถมศึกษา: การวิจัยกึ่งทดลอง

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บทคัดย่อ: ภาวะหัวใจหยุดเต้นนอกโรงพยาบาลเป็นสาเหตุสำคัญของการเข้ารักษาในโรงพยาบาลและการเสียชีวิต โรงเรียนเป็นสถานที่ที่เหมาะสมในการสอนบุคคลเกี่ยวกับการช่วยชีวิตขั้นพื้นฐาน และครูควรมีส่วนร่วมในการฝึกอบรมเกี่ยวกับการช่วยชีวิตขั้นพื้นฐาน การวิจัยแบบกึ่งทดลองแบบสองกลุ่มวัดผลก่อนหลังนี้มีวัตถุประสงค์เพื่อตรวจสอบประสิทธิผลของโปรแกรมการฝึกอบรมการช่วยชีวิตขั้นพื้นฐานที่ออกแบบโดยพยาบาลต่อความรู้และทักษะในการช่วยชีวิตขั้นพื้นฐานของครูโรงเรียนประถมศึกษา ผู้เข้าร่วมวิจัยประกอบด้วยครูโรงเรียนประถมศึกษาจำนวน 60 คน คัดเลือกโดยการสุ่มแบบเฉพาะเจาะจงจากโรงเรียนประถมศึกษา 2 แห่งในภาคกลางของประเทศไทย ได้รับการสุ่มเข้ากลุ่มทดลอง (n = 30) และกลุ่มควบคุม (n = 30) เก็บรวบรวมข้อมูลโดยใช้แบบฟอร์มข้อมูลประชากรและสุขภาพ แบบสอบถามความรู้การช่วยชีวิตขั้นพื้นฐาน และแบบสอบถามทักษะการช่วยชีวิตขั้นพื้นฐาน วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา การทดสอบทีอิสระ และการทดสอบทีแบบคู่

ผลการวิจัยพบว่า หลังสิ้นสุดโปรแกรมทันที คะแนนเฉลี่ยความรู้การช่วยชีวิตขั้นพื้นฐานและทักษะการช่วยชีวิตขั้นพื้นฐานของผู้เข้าร่วมวิจัยที่ได้รับโปรแกรมสูงกว่าผู้ที่ไม่ได้รับโปรแกรมอย่างมีนัยสำคัญ หลังเข้าร่วมโปรแกรม คะแนนเฉลี่ยความรู้การช่วยชีวิตขั้นพื้นฐานและทักษะการช่วยชีวิตขั้นพื้นฐานของกลุ่มทดลองสูงกว่าก่อนเข้าร่วมโปรแกรม โปรแกรมการฝึกอบรมการช่วยชีวิตขั้นพื้นฐานนี้มีประสิทธิภาพในการเพิ่มความรู้และทักษะในการช่วยชีวิตขั้นพื้นฐานของครูโรงเรียนประถมศึกษา พยาบาลในโรงเรียนสามารถเข้ารับการฝึกอบรมให้ใช้โปรแกรมนี้เพื่อส่งเสริมการช่วยชีวิตขั้นพื้นฐานของครูโรงเรียนประถมศึกษา อย่างไรก็ตาม จำเป็นต้องมีการติดตามผลในระยะยาวเพื่อประเมินความยั่งยืนของความรู้และทักษะ พร้อมวัดทักษะการปฏิบัติจริงในการช่วยชีวิตขั้นพื้นฐาน

Pacific Rim Int J Nurs Res 2024; 28(2) 240-251

คำสำคัญ: การช่วยฟื้นคืนชีพขั้นพื้นฐาน ความรู้ ครูโรงเรียนประถมศึกษา ทักษะ

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