Effectiveness of the Self-Care Support Program for People with Acute Coronary Syndrome: A Quasi-experimental Study

Nuntakonrant Chaichana, Apinya Siripitayakunkit, Sumolchat Duangbubpha*

Abstract: Acute coronary syndrome is a chronic illness that influences physical and psychological health and well-being and requires continuous treatment and effective self-care. This two-group quasi-experimental study investigated the effectiveness of the Self-Care Support Program for People with Acute Coronary Syndrome. Sixty participants were purposively recruited from medical wards of a university-affiliated hospital in Bangkok, Thailand. A Self-Care Support Program based on Orem's self-care theory was integrated with a motivational interviewing approach. The experimental group (n = 30) received the 4-week intervention program with the usual care, while the comparison group (n = 30) received only usual care. Instruments for data collection included a Demographic and Health Data Form, the Self-Care Behavior for Acute Coronary Syndrome Questionnaire, the Veterans Specific Activity Questionnaire, and the Rehospitalization Record Form. Data analysis was performed using descriptive statistics, Chi-square test, Fisher's exact test, and two-way repeated measures analysis of variance.

Results revealed that the experimental group had significantly improved self-care behavior and functional ability immediately and four weeks after program completion (week 8), compared to the comparison group. There was no difference in rehospitalization between the two groups. Nurses with advanced skills in motivational training can use this program to promote effective self-care practices, improve functional ability, and reduce rehospitalization. Further study using randomized controlled trials and other settings is needed before it can be widely used.

Keywords: Acute coronary syndrome, Functional ability, Motivational interviewing, Rehospitalization, Self-care behavior, Self-care support program

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Introduction

Acute coronary syndrome (ACS) is a major cause of mortality among the global population,[1] including the Thai population. In Thailand, the mortality rate of ACS rose from 23.4 per 100,000 in 2012 to 33.54 per 100,000 in 2021,[2] and the number of hospitalized patients with ACS was equal to 450 per day on average.[3] ACS treatment in the acute phase currently focuses on pharmacological treatment and reperfusion intervention as quickly as possible. Modern medical treatments have benefits for patients' recovery, but the risk of recurrent cardiovascular events

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or death is high in the first year following an ACS event.[4-5]

Even with the ACS guideline recommendation to improve patient outcomes and secondary prevention to reduce cardiovascular mortality and rehospitalization, encouraging people with ACS (PW-ACS) to return to normal life with a good quality of life. But with the shorter hospital stays for ACS, post-discharge care is often suboptimal due to ineffective communication between healthcare providers and PW-ACS,[4-6] time constraints between patients and a physician or a nurse,[7] lack of trained skills to facilitate behavioral changes,[6] failure to identify barriers and facilitators for addressing self-care,[6] undetermined patients' readiness to changes,[6] and lack of follow-up by health professionals.[8] This often leads to rehospitalization within the first 30 days after discharge due to relapses or complications, such as chest pain, panting, fatigue, heart failure, and pulmonary edema,[9] which increases the cost of medical care.[10] Therefore, this study intended to develop and test the effectiveness of a self-care support program by tailoring the program to incorporate the needs of the individual, such as their readiness to change, barriers, and facilitators to perform self-care, in addition to providing knowledge, skill training, and motivation, which usually found in previous studies. The program is intended to be implemented before PW-ACS discharge from the hospital and has follow-up for four weeks.

Conceptual Framework and Literature Review

This study used Orem's self-care theory by integrating the motivation interview (MI) approach and the literature review on secondary prevention of ACS care to develop an intervention program, namely the Self-Care Support (SCS) Program for PW-ACS. According to Orem et al., "Self-care refers to activities that an individual initiates and performs to maintain life, health, and well-being.[11(p43)] Self-care is a series of complex deliberate actions in which individuals contemplate and make the decision to take action leading to achieving a specific goal and its outcomes. Self-care requires learning and the use of knowledge combined with individual abilities to perform a continuity of self-care actions. One of individual abilities is motivation to perform and engage in self-care.[12] It is noted that how to keep motivation for doing self-care is not described in self-care theory; therefore, the MI principles would be utilized in the SCS program. MI is considered a patient-centered approach. The principles of MI are development discrepancy, avoiding argumentation, rolling with resistance, expressing empathy, and supporting self-efficacy.[13] Studies on the effects of MI in people with heart disease have shown that MI is more effective in enabling patients to undergo behavioral modification compared to a traditional means of dissemination of health education.[14-15]

Literature reviews in Thailand demonstrated the effectiveness of a self-care program for PW-ACS on improved knowledge of self-care[16-19] incorporated with enhanced self-care behavior,[16-19] skill training in ACS symptom management and physical activity,[16-17] and continuous provision of care using telephone calls.[20] Only one educational program was conducted by pharmacists using the MI technique to promote medication adherence in PW-ACS.[21] The outcomes of the self-care programs were assessed regarding functional ability,[17-18] and self-care behavior.[19-20] However, a few studies measured rehospitalization after post-discharge care[17,21] that reflected the proper arrangement of transitional care and continuing follow-up during the first several days to the first week post-hospital discharge.[22] Also, evidence showed that early follow-up after an ACS event should be 4-6 weeks. It is a good opportunity to reinforce continuing

secondary prevention and discuss activities that return to normal life, such as a return to work, increasing physical activities, sexual behavior, and adjusting goal achievement.[23]

Self-care of PW-ACS who tend to have pathological complications and recurrent cardiac events takes time and effort. Evidence showed that PW-ACS are less likely to adjust and maintain their self-care behavior, such as a healthy diet, smoking cessation, and regular physical activity.[6] Furthermore, PW-ACS reported they feared physical activities or fear of dying while exercising.[24] Therefore, PW-ACS requires support from nurses in deciding and doing self-care practices and maintaining self-care behavior after hospital discharge. The SCS Program, based on Orem's self-care theory and the MI approach, was developed and tested to support PW-ACS in this study.

Aim and Hypotheses

This study aimed to examine the effectiveness of the SCS Program for PW-ACS. The hypotheses were 1) the mean scores of self-care behavior and functional ability of the experimental group would be higher than those of the comparison group at week 4 (immediately after the program ended) and week 8 from baseline (four weeks after completion of the program), and 2) the proportion of rehospitalization in the comparison group after hospital discharge within 28 days would be higher than that of the experimental group.

Methods

Design: This study used a non-equivalent quasi-experimental design with a before-and-after research design and repeated measures. The comparison group was completed before starting the experimental group. This paper followed the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) as a guideline.

Sampling and Setting: This study was conducted at the coronary care unit (CCU) and medical inpatient wards of a university-affiliated hospital in Bangkok, Thailand. Inclusion criteria for the participants were diagnosed with ACS, at least 18 years old, and those older than 60 years needed cognitive screening with the Mini-Cog[25] with passing scores of 3 to 5. Additionally, participants had to have stable vital signs and cardiac conditions, were able to communicate in Thai, and were able to be reached by telephone. Exclusion criteria included having severe complications with the cardiovascular system or other systems, having a plan for coronary artery bypass graft (CABG), and being unwilling to participate in the study.

The sample size was determined based on the power table for analysis of variance (ANOVA) utilizing a significance level of 0.05 and a test power of 0.80. Due to the lack of similar studies in Thailand, the effect size was calculated based on the mean scores of self-care in a study investigating the effects of motivational interviewing on self-care behavior of patients with chronic heart failure.[26] Thus, a medium effect size of 0.25 for sample size calculation for an ANOVA test with repeated measures was used, within-between interaction in the G*power analysis version 3.1.9.4 software (for two groups, with three times for measurement). The required sample size was 28 participants per group. It is important to note that a sample size of at least 30 per group would be sufficient because the ANOVA test relies on the assumption that sample means are normal distribution.[27] Thus, the total number of participants was 60, with 30 per group. All 60 participants remained during the study, with 30 participants in each group included for analysis **(Figure 1)**.

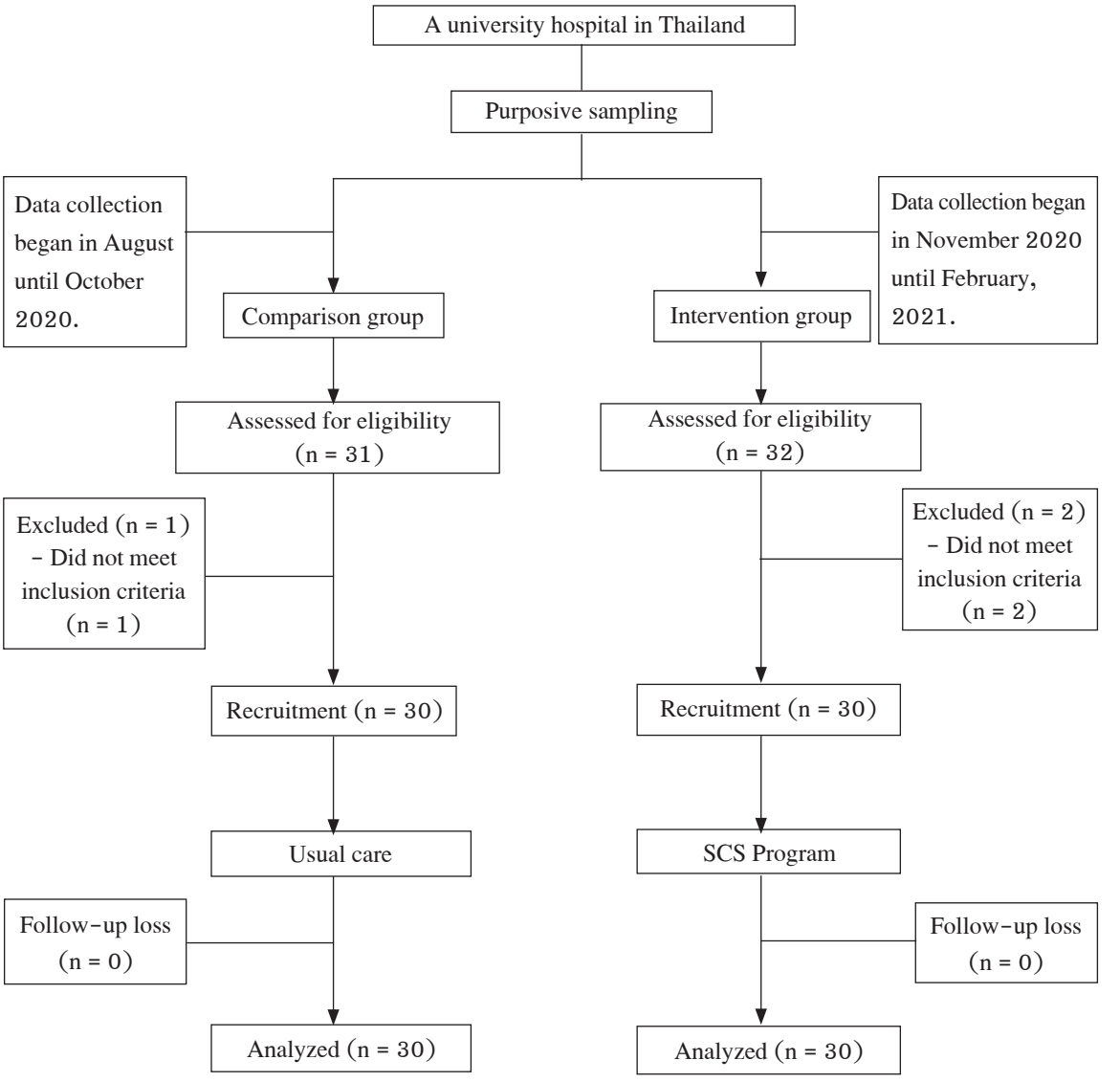

Figure 1. Flow chart of the participants throughout the study

Ethical Considerations: Study approval was granted by the Institutional Review Board (IRB) on Research Involving Human Subjects, Faculty of Medicine Ramathibodi Hospital, Mahidol University, with code no. MURA2020/1083. All participants were informed about the research objectives and procedures, including data collection procedures, risks and benefits, and their rights to confidentially participate or refuse to take part in this study or withdraw from the study at any time if they wished without any effects on the treatment and care they would receive from the hospital. They were asked to sign an informed consent form before the study. Participants' information was kept confidential, and the data were presented anonymously and used only for research purposes.

Instruments: The research instruments consisted of three parts: 1) the screening instrument, 2) the data collection instruments, and 3) the intervention program. A panel of three experts validated all instruments to ensure content validity, including a nursing instructor specializing in cardiac care and MI, an advanced practice nurse (APN) specializing in utilizing MI, and an APN in the cardiac care division. All instruments except the demographic and health data form were used with permission from the developers.

The Mini-Cog, the screening instrument, was developed by Borson et al.[25] and subsequently translated into Thai by Trongsakul et al. to assess the cognitive ability of older adults. The test was divided into two parts. The first part asked the test-takers to repeat three words and draw the face of a clock to tell the time at 11:10. The score for each of the three words was 1 point, and the score of the drawing was 2 points, making the possible total scores range from 0 to 5 points. The scores of 0 to 2 points indicated possible cognitive impairment, while those of 3 to 5 points meant no cognitive impairment. The Mini-Cog was administered to PW-ACS over 60 years old, and it found that five older PW-ACS did not pass the test, so they were excluded from this study.

The data collection instruments were:

The Demographic and Health Data Form was developed by the primary investigator (PI) to gather details on 1) patients' characteristics, including gender, age, marital status, religion, educational background, and occupation; 2) health data comprised of cigarette smoking status, comorbidities, ACS types, treatments and medical procedures received, current medication intake, date of hospital admission, and date of hospital discharge.

The Self-Care Behavior for Acute Coronary Syndrome Questionnaire was developed by Lasutham et al.[29] to assess the self-care behavior of monks with cardiovascular diseases. It was modified for language appropriateness with permission from the developers, as the instrument was originally developed for monks. There are 22 items which can be divided into seven performance areas: food consumption (8 items), physical activity/exercise (2 items), control and reduction of risk factors of ACS (2 items), medication intake (2 items), stress management (3 items), symptom evaluation (4 items), and keeping the doctor's appointment (1 item). Of these, 14 were positive, and eight were negative; reversed scores are used for data analysis. For instance, an item used to measure self-care behavior in physical activity is "*How often in a week do you do physical activity or are physically active activity for at least 30 minutes, such as doing chores, gardening, cutting grass?*" Each item is rated on a 4-point scale from 0 for not doing such self-care behavior in a week to 3 for having such self-care behavior 7 days in a week. The possible total scores range from 0 to 66 points, with higher scores indicating high self-care behaviors. The instrument's content validity index (CVI) was equal to 1, and Cronbach's alpha coefficient was 0.77 in the pilot study among ten PW-ACS and 0.81 in the main study.

The Veterans Specific Activity Questionnaire [VSAQ] was developed by Gawecki et al.[30] to indirectly assess functional ability, which elicits data regarding activities of daily living, household chores, exercise, and activity in metabolic equivalent of task (MET) which reflects oxygen expenditure (VO2 max) during exercise. The VSAQ consisted of physical activity lists in progressive order. The MET values associated with each activity are in accordance with the American College of Sports Medicine Compendium of Physical Activities. The VSAQ had a positive relationship with the VO2

max of heart disease patients at a moderate level ($r = 0.66$, $p = 0.001$).[31] The scale was translated into Thai and has 13 items.[32] The first item has the lowest MET, equal to 1 (eating, dressing, sitting), and continues to increase to the final item, with 13 METs (racing, jumping over, rowing, and canoeing). The scores range from 1 to 13 points, with higher scores indicating a higher level of functional ability. When using the scale, the researcher assessed the PW-ACS functional ability beginning with item 1, continuing until the PW-ACS could not do the functional ability in the following item. If the patients were able to have functional ability specified in any of the items, they were considered to have the MET equal to the MET of that item. The researchers explained item 12 to ensure clarity, stating, "*jogging agilely and continuously on a flat surface at the speed of 12 kilometers per hour.*" The PI made further comparisons to ease the patients' understanding by comparing the activity "*to running from the first lamp post to the second lamp post within one minute.*" The VSAQ Thai version was translated and back-translated by two bilingual experts and tested for the Kuder-Richardson (KR-20) reliability, which was equal to 0.85.[32] In this study, the scale was submitted to a panel of three experts to ensure content validity and language appropriateness, and its CVI was 0.90. KR-20 reliability was 0.79 in the main study.

The Rehospitalization Record Form was employed to record a return to the hospital for another admission within 28 days after discharge.[33] In this study, the PI reported the rehospitalization only from cardiac causes. The research assistant (RA) followed this up via telephone calls and confirmed rehospitalization with the study hospital system.

The Self-Care Support Program (SCS Program) and Implementation

The PI developed the SCS program based on Orem's self-care nursing theory[11] that integrates the MI approach[13] and literature. The SCS program aimed to raise awareness/motivation, provide practical knowledge and support to continue self-care behavior, improve functional ability, and reduce rehospitalization for PW-ACS. It is a 4-week program with six sessions; two sessions are hospital-based (60-105 minutes), and four sessions are home-based (40-80 minutes). The experimental group received the SCS program from PI plus usual care. The program consists of three phases: (i) raising awareness of oneself and creating a sense of need for self-care, (ii) stimulating key messages for changes and self-care practices, and (iii) continuing to offer care, support, and encourage self-care. Three experts validated the SCS program as aforementioned. It was assessed for content validity regarding content, activities provided, duration, and arrangement. The SCS program was adjusted following the experts' opinions. The details of content, activities provided, duration, arrangement, and program implementation are shown in **Appendix, Table A1**.

Usual Care: PW-ACS tend to be hospitalized for two to three days. They are generally prepared for discharge to home about one day before the discharge date. Nurses individually disseminate knowledge about ACS, self-care practice, and medication intake to the PW-ACS based on nurses' experiences.

Data Collection: Data were collected after IRB approval from September 2020 to February 2021. Before collection, the PI was trained and practiced the MI technique. The PI trained one RA, a professional nurse with a master's degree in nursing science. The RA was trained for data collection procedures but was blinded regarding the participants' group status. Data

were initially collected with the comparison group, and a booklet that covered ACS knowledge, risk factors, treatment, and post-ACS rehabilitation was given after completion. Personal and health data were obtained as baseline data. Self-care behavior and functional ability were collected at three time points: within hospital admission, immediately after the program ended (week 4), and 4 weeks after the program ended (week 8). Rehospitalization was collected immediately after the program ended (week 4).

Data Analysis: The data were analyzed using a statistical software program. Descriptive statistics describe the demographic data. To compare the difference between the two groups at baseline, the Chi-square test and Fisher's exact test were used for the categorical data, while an independent t-test was employed for continuous data. Two-way repeated measures ANOVA was performed. All statistical assumptions of two-way repeated measures ANOVA were tested using Kolmogorov-Smirnov and Levene's test. The results found that the data had normal distribution and homogeneity of variance. Mauchly's test of Sphericity yielded a p-value of < 0.001, indicating a violation of sphericity.[34] Therefore, Greenhouse-Geiser Epsilon was used to report the statistical values. The Bonferroni post hoc test assessed the mean difference between the two groups.

Results

Participant characteristics

There were 60 participants, with 30 in each group. The personal characteristics of both groups were compared, and there were no statistically significant differences ($p > 0.05$). A comparison of health data of PW-ACS in both groups before the implementation of the SCS program revealed that the clinical characteristics between the participants of both groups were not different ($p > 0.05$), as shown in **Table 1**.

Table 1. Personal and clinical characteristics of participants in experimental and comparison groups (N = 60)

Characteristics	Experimental group (n = 30)		Comparison group (n = 30)		Statistic values	p-value
	n	%	n	%		
Gender					0.08[a]	0.774
Male	22	73.30	21	70.00		
Female	8	26.70	9	30.00		
Age (years)					-1.57[b]	0.876
Mean ± SD	63.30 ± 13.46		62.80 ± 11.12			
(Min-Max)	(33-93)		(36-80)			
< 60 years	11	36.70	11	36.70		
≥ 60 years	19	63.30	19	63.30		
Education					0.07[a]	0.793
No formal education/ Elementary school	18	63.30	17	56.60		
Bachelor and Higher	12	36.70	13	43.30		
ACS types					0.08[a]	0.774
NSTEMI*	22	73.30	21	70.00		
STEMI**	8	36.70	9	30.00		
Treatments					0.22[a]	0.640
Percutaneous cardiac intervention (PCI)	28	93.30	27	90.00		
Fibrinolytic agent	2	6.70	3	10.00		

Table 1. Personal and clinical characteristics of participants in experimental and comparison groups (N = 60) (Cont.)

Characteristics	Experimental group (n = 30)		Comparison group (n = 30)		Statistic values	p-value
	n	%	n	%		
Smoking history					2.45[a]	0.294
No smoking	14	46.70	10	33.30		
Ex-smoking	10	33.30	16	53.30		
Smoking	6	20.00	4	13.30		
Comorbidities***					1.00[a]	0.694
No	2	6.70	2	6.70		
Yes	28	93.30	28	93.30		
Type of comorbidities						
Hypertension	21	70.00	19	63.30	0.30[a]	0.584
Diabetes	13	43.30	13	43.30	1.00[a]	0.603
Dyslipidemia	11	36.70	14	46.70	0.62[a]	0.432
Chronic kidney disease	7	23.3	5	16.7	0.42[a]	0.519
Heart disease	5	16.70	12	40.00	4.02[c]	0.084
Medication****						
Antiplatelet drugs	30	100.00	30	100.00	-	-
Anticoagulants	30	100.00	30	100.00	-	-
Statins	29	93.30	27	90.00	1.07[a]	0.301
Beta-blockers	18	60.00	20	66.70	0.29[a]	0.592
Nitrates	16	53.30	11	36.70	1.68[a]	0.194
Angiotensin-converting enzyme inhibitors	11	36.70	9	30.00	0.30[a]	0.584
Calcium chanel blockers	1	3.30	3	10.00	1.07[a]	0.301
Length of stay						
Mean ± SD	3.80 ± .397		3.67 ± .297		1.99[b]	0.163
(Min-Max)	2-7		1-10			

Note. [a] = Chi-square test, [b] = independent t-test, [C] = Fisher's exact test, *NSTEMI = Non-ST segment elevation myocardial infarction, **STEMI = ST segment elevation myocardial infarction, *** 1 person had more than one comorbidity, **** 1 person received more than one medication.

Before implementing the SCS program, the stages of change were assessed at baseline, and it was found that three (10%) participants were in pre-contemplation, and 27 participants in the experimental group were in the contemplation stage. After the SCS program ended (week 4), PW-ACS changed its stage of change to the action stage. They achieved goals in food selection and continued to change other self-care behaviors, such as increasing physical activity. After week 8, the participants in the experimental group were in the action and maintenance stages. They continued to carry out their self-care behavior and modify the second-goal self-care behaviors, as shown in **Table 2.**

Table 2. Stage of change in self-care behavior before and after participating in the SCS program and the problem of the need to change self-care behavior after discharge from the hospital of PW-ACS in the experimental group (N = 30)

Time	Stage of change in self-care behavior	n	Problem of the need to change self-care behavior	n (%)
Baseline before implementing the SCS program	Pre-contemplation	3		
	Contemplation	27		

Table 2. Stage of change in self-care behavior before and after participating in the SCS program and the problem of the need to change self-care behavior after discharge from the hospital of PW-ACS in the experimental group (N = 30) (Cont.)

Time	Stage of change in self-care behavior	n	Problem of the need to change self-care behavior	n (%)
Before discharge	Pre-contemplation	0	1. Part Food selection, e.g., sweet foods, oily foods	18 (60)
	Contemplation	0		
	Preparation	30	2. Part Risk factors, e.g., cigarette smoking	6 (20)
	Action	0		
	Maintenance	0	3. Part Medication adherence, e.g., nonadherence	4 (13.3)
	Relapse	0		
			4. Part Physical activity, e.g., walking	1 (3.3)
			5. Part Stress and stress management	1 (3.3)
Immediately after the program ended* (week 4)	Pre-contemplation	0	- Achieve goals and continue to change self-care behavior in the original goal, e.g., part food selection and risk factors	30 (100%)
	Contemplation	0		
	Preparation	0		
	Action	30		
	Maintenance	0	- Additional self-care behaviors that need to be changed include:	
	Relapse	0		
			1. Part Physical activity, e.g., walking, riding a bike, walking upstairs, jogging, and exercising;	6 (54.5)
			2. Part Food selection, e.g., sweet foods, oily foods.	5 (45.5)
After the end program (week 8)	Pre-contemplation	0	- Maintenance of self-care behavior in the original goal total of 30 cases	30 (100)
	Contemplation	0		
	Preparation	0	- Achieve original goals and modify the second-goal self-care behaviors	11 (36.7)
	Action**	11		
	Maintenance	30		
	Relapse	0		

Note. *1 person chose to do more than 1 problem of the need to change; ** Initiate and modify the second goal self-care behavior

The mean score of self-care behavior of the participants in the experimental group continued to increase sharply, measured at week 4 and week 8 after completion of the program compared to before the implementation of the program. However, in the comparison group, the mean score also increased slowly (**See Table 3**).

Table 3. Comparison of outcome variables of patients with ACS at different time points between the experimental (n = 30) and comparison groups (n = 30)

Dependent variables	Experimental group			Comparison group		
	Min-Max	Mean	SD	Min-Max	Mean	SD
Self-care behavior (Possible score 0-66)						
Baseline	26-47	36.53	6.39	17-47	33.00	7.78
4 weeks	41-60	53.97	5.49	33-58	45.63	6.99
8 weeks	46-62	56.30	4.00	34-59	46.35	6.99
Functional ability (Possible score 1-13 METs)						
Baseline	1-3	2.17	0.99	1-3	2.17	0.99
4 weeks	3-8	4.70	1.51	2-8	4.17	1.23
8 weeks	3-11	6.73	1.76	3-8	5.33	1.32

Note. MET = Metabolic Equivalents of Task

Effectiveness of the SCS program

After the PW-ACS received four weeks of the SCS program, a two-way repeated measures ANOVA and η_p^2 for two outcome variables showed a significant difference between both groups (the experimental and comparison groups). It showed significant differences in mean scores of self-care behavior [$F(1,58) = 32.36$, $p < 0.05$, $\eta_p^2 = .358$] and mean scores of functional ability [$F(1,58) = 5.38$, $p < 0.05$, $\eta_p^2 = 0.085$] at baseline, immediately after the program ended (week 4), and after the program ended (week 8) between the experimental group and the comparison group. There was a significant interaction between the time and group on self-care behavior and functional ability (**Table 4**). Bonferroni post hoc analysis was used to assess at each time point between groups. The results demonstrated that the mean scores for self-care behavior in the experimental group were significantly different compared to the comparison group immediately after the program ended (week 4) and after the program ended (week 8). Functional ability was statistically significantly higher in the experimental group only at week 8 than in the comparison group (**Table 5**). All participants in both groups had no rehospitalization event, so there were no differences in rehospitalization after 28 days of discharge (Fisher's exact test, $p = 1.00$) between the experimental and comparison groups.

Table 4. Comparison of mean differences in self-care behavior scores and functional ability between groups over time and the effect size using two-way repeated measures ANOVA (N = 60)

Source	SS	df	MS	F	p-value	Partial Eta Squared
Self-care behavior						
Within-subjects effects						
Time	9,796.04	1.60	6,139.51	193.35[a]	< 0.001	0.822
Time × Group	396.84	1.60	248.72	7.83[a]	< 0.001	0.183
Error	2,938.44	92.54	31.52			
Between-subjects effects						
Group	2,538.76	1	2,538.76	32.36[a]	< 0.001	0.358
Error	4,550.22	58	78.45			
Functional ability						
Within-subjects effects						
MET	912.18	2.42	377.10	348.32[a]	< 0.001	0.857
MET × Group	19.18	2.42	7.93	7.32[a]		0.947
Error	151.89	140.30	1.08			
Between-subjects effects						
Group	14.50	1	14.50	5.38[a]	0.024	0.085
Error	156.41	58	2.63			

Note. [a]Report results using values: Greenhouse-Geisser, SS = sum of square, df = degree of freedom, MS = mean square

Table 5. Post-hoc comparison of outcomes variables on different time points between the experimental (n = 30) and comparison groups (n = 30)

Time/ Outcome variables	Group		Mean difference	SE	p-value	95% CI for difference	
						Lower	Upper
Self-care behavior							
Baseline	Experimental	Comparison	3.533	1.839	0.060	-0.149	7.215
Week 4	Experimental	Comparison	8.333	1.623	< 0.001	5.084	11.582
Week 8	Experimental	Comparison	10.667	1.609	< 0.001	7.445	13.888
Functional Ability							
Baseline	Experimental	Comparison	0	0.254	1.000	-0.509	0.509
Week 4	Experimental	Comparison	0.533	0.356	0.140	-0.180	1.247
Week 8	Experimental	Comparison	1.400	0.402	< 0.001	0.595	2.205

Note. SE = Standard error, CI = Confidence interval, Adjustment for multiple comparisons: Bonferroni

Discussion

The SCS program is effective in improving self-care behaviors and functional ability but not rehospitalization among PW-ACS. This is because the program has several strategies in accordance with the supportive-educative nursing system proposed by Orem et al.[11] The helping methods used in the SCS program include teaching, guiding, coaching, providing, and supporting. The findings might result from the processes of the SCS program, which enabled the participants to understand their situation, then provided ACS knowledge for decision making, goal setting in controlling ACS risk factors, enhanced skills in self-care practices, and guiding self-evaluation of immediate ACS signs and symptoms, as well as the MI approach, which could help stimulate intrinsic motivation for self-care. Training for physical activity and recognizing ACS symptoms before hospital discharge also help enhance self-care practices. Services offered included providing self-care material, continually offering care in telephone calls, asking and discussing problems and obstacles of self-care practices and physical activity, and opening opportunities for self-evaluation of their goals (e.g., weight monitoring and blood pressure results). These activities aided the appropriate strategies for PW-ACS to continuously take responsibility for their self-care behavior. Also, praising and emphasizing the benefits of self-care behavior and maintaining self-care behavior to prevent rehospitalization could help achieve successful individual self-care needs. Consequently, the collective approach from the SCS program assisted PW-ACS in fulfilling their self-care abilities before deciding and taking deliberate self-care actions. The findings support the validity of Orem's self-care theory.[11]

Previous studies supported our findings. An educational program using face-to-face disseminated knowledge and telephone follow-up improved knowledge and self-care behaviors among people with coronary heart disease.[19] Gomes and Reis demonstrated that an educational program on self-care skills (e.g., medications, ACS symptoms management, activities of daily living, and health status management) among PW-ACS can significantly improve self-care skills in the intervention group compared to the control group.[35] Similarly, a self-care promoting program with an MI approach in Thai people with diabetes mellitus (PW-DM) with complex problems revealed that PW-DM receiving knowledge, skill training, enhancing motivation, and continuing telephone follow-up had improved knowledge, self-care behavior, and clinical outcome (hemoglobin A1C).[36]

It is noted that after discharge, a few PW-ACS had emotional distress with their illness, and they were not able to do a specific action of self-care, such as avoiding sweet desserts after meals or lack of confidence to do physical activity and fear of getting chest pain when having physical activity. Follow-up call activities in the SCS program four times in the first, seventh, 14th, and 28th days could help develop appropriate self-care behavior and improve physical activity. However, follow-up calls alone may not help older PW-ACS to do physical activity themselves; older PW-ACS may need help from family members to support them before performing physical activity confidently. This may be a reason why the mean scores of functional ability had statistically significant differences only at week 8. The result of this study was not congruent with the effects of a transitional care program for people with ACS, which found that the mean scores of functional abilities after the program ended were higher than before entering the program and higher than those who received routine nursing care.[37] The maturation effect possibly needs to be considered due to a long period of post-ACS changing participants' performance in the post-test relative to the pre-test. In addition, functional ability in this study was measured with a self-reported questionnaire; alternative methods to evaluate cardiac functioning, such as a six-minute walk test and ejection fraction (EF) of the left ventricle, would be warranted.[38]

For rehospitalization, no difference was found between either group. It could be explained that the research setting is a university-affiliated hospital. It is fully equipped with medical supplies and health personnel, so most participants in both groups undergo PCI, which relies on the clinical practice guidelines for PW-ACS.[1] In addition, most participants received ACS medicine according to the secondary prevention guidelines.[1,9] The result of the present study was not congruent with the study on early readmission after acute myocardial infarction in a tertiary hospital in the United Kingdom, which found that 4.2% of PW-ACS post-discharge were readmitted with cardiac causes. The timing of readmission was mostly in the first until seven days post-discharge.[39] The favorable outcome in this study may be from the continuity of care of the SCS program, where follow-up calls were made from the first day until the 28th day after hospital discharge.

In summary, the study findings supported Orem's self-care theory, which explains that self-care is a deliberate and goal-oriented action, with motivation leading to perform and sustain self-care behavior to respond to self-care needs sufficiently.[11]

Limitations

There are some limitations of this study. Since the time of data collection between the two groups differed, we could not control the external factors that might influence the outcomes. However, the treatment regimens were based on ACS guidelines, which were the same for both groups. Therefore, the results of this study may be interpreted with caution. In addition, the SCS program was implemented only at a single tertiary hospital; thus, the generalizability of the findings may be limited. Additionally, the follow-up duration of the present study was short, so longer studies with follow-up of 6 months to one year with randomized control in other settings are needed.

Conclusions and Implications for Nursing Practice

The results of this study indicate that the SCS program effectively improved self-care behavior and functional ability and prevented rehospitalization of PW-ACS. Nurses with special training, like APNs, can use this program to provide continuous care with telehealth, such as mobile health applications, among PW-ACS and other chronic illnesses. According to the nature of ACS, most PW-ACS in this study were older adults, so family members should be included in the program to learn to help PW-ACS in secondary prevention. However, further study is needed to test the effectiveness of the SCS program in different settings with rigorous research designs.

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Appendix

Table A1. Summary of the SCS Program

Schedule	Domain	Activities*	Duration
Phase I (within 48 hours after clinical stability)	A—Aware (Raising awareness)	1. Establishing rapport with PW-ACS to create trust	5-10 minutes
		2. Raising awareness of one's health through self-evaluation of the situation before having ACS, identification of current behaviors affecting treatment outcomes, and self-care behavior requiring further modification	25-50 minutes
		3. Identifying the stage of change according to explore patients' intentions to change, stimulate patients to express self-motivation statements (SMSs)	
	C—Create (Creating a sense of need for self-care behavioral modification)	4. Exchanging knowledge on ACS, risk factors, and possible complications using a PowerPoint presentation to increase one's insight and sense of need for self-care behavioral modification	
		5. Summarizing key messages being discussed and made an appointment for the next session	
Phase II (72 hours after hospitalization)	S—Stimulate (Stimulating key messages for change)	1. Reviewing key messages of the first session and offering Q&A	10-15 minutes
		2. Stimulating the patients to talk about their motivation to undergo self-care behavioral modification and facilitate them to identify target self-care behaviors that need to be modified	
	S—Self-care practices	3. Sharing knowledge and experience regarding how people overcome or manage to change their lifestyle and reduce risk factors	
		4. Enhancing and strengthening self-care practice skills regarding monitoring and managing ACS signs and symptoms (e.g., arrhythmia—pulse checking, edema, chest pain, medication adherence, etc.)	10-30 minutes
		5. Motivating and facilitating the patients to develop a self-care plan for target behaviors requiring modification	
		6. Providing the self-care manual for PW-ACS, including an overview of ACS, risk factors, treatment, and self-care at the end of the manual, there was a record form for patients to keep track of their body weight, blood pressure, blood examination results, and appointment date	5 minutes
		7. Summarizing key messages being discussed and making an appointment for the next session	5 minutes

Table A1. Summary of the SCS Program (Cont.)

Schedule	Domain	Activities*	Duration
Phase III (first, seventh, 14th, and 28th days after hospital discharge)	C—Continue (Continuing to offer care)	1. Following up with each patient using telephone calls to 1) continue to provide moral support and encouragement, 2) facilitate effective problem-solving when needed, 3) evaluate the self-care plan, and 4) facilitate reflective learning through self-reflection 2. Summarize key messages at the end of each telephone follow-up call 3. At the last telephone follow-up call, summarize the patient's journey and experience attending the program together with the researcher's experience, express gratitude to them, and provide additional healthcare resources as needed	10-20 minutes

Note. *The MI approach and its techniques are used during the program activities, including active listening, avoiding argumentation, rolling with resistance, expressing empathy, and supporting self-efficacy.

ประสิทธิผลของโปรแกรมสนับสนุนการดูแลตนเองสำหรับผู้ป่วยกลุ่มอาการโรคหัวใจโคโรนารี : การวิจัยกึ่งทดลอง

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บทคัดย่อ: กลุ่มอาการโรคหลอดเลือดหัวใจโคโรนารีเป็นการเจ็บป่วยเรื้อรังที่มีผลกระทบต่อสุขภาพและความผาสุกทั้งด้านร่างกายและจิตใจ จำเป็นต้องมีการรักษาและการดูแลตนเองอย่างต่อเนื่อง ผู้ที่มีกลุ่มอาการโรคหลอดเลือดหัวใจโคโรนารีจำเป็นต้องได้รับความรู้ พัฒนาความสามารถในการดูแลตนเอง เสริมแรงจูงใจในการปฏิบัติการดูแลตนเองอย่างต่อเนื่องสม่ำเสมอ การวิจัยกึ่งทดลองแบบสองกลุ่มวัดผลก่อนหลังมีวัตถุประสงค์เพื่อศึกษาประสิทธิผลของโปรแกรมสนับสนุนการดูแลตนเองสำหรับผู้ป่วยกลุ่มอาการโรคหัวใจโคโรนารี กลุ่มตัวอย่างจำนวน 60 คน คัดเลือกแบบเฉพาะเจาะจงจากหอผู้ป่วยอายุรกรรม โรงพยาบาลมหาวิทยาลัยแห่งหนึ่งในจังหวัดกรุงเทพมหานคร ประเทศไทย พัฒนาโปรแกรมสนับสนุนการดูแลตนเองตามกรอบทฤษฎีการดูแลตนเองของโอเร็มร่วมกับการเสริมสร้างแรงจูงใจ กลุ่มทดลองจำนวน 30 คน ได้รับโปรแกรมเป็นระยะเวลา 4 สัปดาห์ร่วมกับการดูแลตามปกติ กลุ่มเปรียบเทียบได้รับการดูแลตามปกติเท่านั้น เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลประกอบด้วยแบบบันทึกข้อมูลส่วนบุคคลและข้อมูลสุขภาพ แบบสอบถามพฤติกรรมการดูแลตนเองสำหรับกลุ่มอาการโรคหัวใจโคโรนารี แบบสอบถามความสามารถในการทำกิจกรรม และแบบบันทึกการกลับเข้ารักษาซ้ำในโรงพยาบาล วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา การทดสอบไคสแควร์ (Chi-square) การทดสอบค่าเฉลี่ยของกลุ่มตัวอย่าง 2 กลุ่มที่เป็นอิสระต่อกัน (Independent t-test) การทดสอบฟิชเชอร์ (Fisher's exact test) และการทดสอบความแปรปรวนแบบสองทางเมื่อมีการวัดซ้ำ (Two-way repeated measures ANOVA)

ผลการวิจัย พบว่า กลุ่มทดลองที่ได้รับโปรแกรมมีพฤติกรรมการดูแลตนเอง และความสามารถในการทำกิจกรรมเพิ่มขึ้นเมื่อเปรียบเทียบกับกลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ หลังสิ้นสุดโปรแกรมทันทีและ 4 สัปดาห์หลังสิ้นสุดโปรแกรม (สัปดาห์ที่ 8) การกลับมารักษาซ้ำในโรงพยาบาลในทั้ง 2 กลุ่มไม่แตกต่างกัน พยาบาลควรได้รับการฝึกทักษะการเสริมสร้างแรงจูงใจก่อนนำโปรแกรมไปใช้เพื่อส่งเสริมพฤติกรรมการดูแลตนเอง ความสามารถในการทำหน้าที่ของร่างกายและลดการกลับเข้ารักษาซ้ำในโรงพยาบาล ในอนาคตควรมีการทำวิจัยเชิงทดลองแบบสุ่มที่มีกลุ่มควบคุม และควรทดสอบโปรแกรมในสถานที่บริบทอื่นก่อนนำโปรแกรมไปใช้อย่างแพร่หลาย

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คำสำคัญ: กลุ่มอาการโรคหัวใจโคโรนารี การทำหน้าที่ของร่างกาย การเสริมสร้างแรงจูงใจ การกลับมารักษาซ้ำในโรงพยาบาล พฤติกรรมการดูแลตนเอง โปรแกรมสนับสนุนการดูแลตนเอง

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