Am J Transl Res 2021;13(4):2752-2762
www.ajtr.org /ISSN:1943-8141/AJTR0127497

Original Article

Orem's self-care to treat acute coronary syndrome after PCI helps improve rehabilitation efficacy and quality of life

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Received December 2, 2020; Accepted January 7, 2021; Epub April 15, 2021; Published April 30, 2021

Abstract: Objective: This study was designed to probe into the influence of Orem's self-care model on the rehabilitation efficacy, disease cognition, self-care abilities and quality of life of acute coronary syndrome (ACS) patients after PCI. Methods: A total of 148 ACS patients who underwent PCI in our hospital from October 2018 to October 2019 were recruited as the study cohort. Based on the nursing method each patient received, they were divided into two groups. Among the patients in the study cohort, 78 treated using Orem's self-care were placed into the research group (RG), and 70 treated using conventional nursing were placed in the control group (CG). Their postoperative complications, rehabilitation efficacy, disease cognition, negative emotions, self-care abilities, and quality of life were compared. Results: After the nursing intervention, in the RG, the postoperative complications, the time of D-to-B, the getting out of bed times and the hospitalization stays were significantly shorter than they were in the CG, and the disease cognition and self-care abilities scores were significantly higher. In addition, compared with the CG, the patients' SAS and SDS scores in the RG were dramatically lower and the quality of life scores and the nursing satisfaction were markedly higher. Conclusion: Orem's self-care for ACS after PCI helps to reduce postoperative complications and improves patients' negative emotions and their rehabilitation efficacy, disease cognition, self-care abilities, quality of life, and nursing satisfaction.

Keywords: Acute coronary syndrome, PCI, Orem's self-care, rehabilitation efficacy, quality of life

Introduction

Acute coronary syndrome (ACS) is a frequent cardiovascular disease clinically, with high mortality and disability rates [1, 2]. It occurs frequently in middle-aged and elderly people, and its causes are complex. The main causes are social aging, accelerated pace of work and life, changes in eating habits, and social factors [3]. The main clinical manifestations are chest pain, chest tightness, etc., which cause arrhythmia, heart failure, and sudden death and seriously affect patients' lives and health [4]. The main basis of its pathological changes is the unstable change of coronary atherosclerotic plaques, which easily causes ruptures or the erosion of vulnerable plaques, which then activates the coagulation system of the body, leading to thrombosis, the blocking of blood vessels, and causing clinical syndromes caused by a decrease or even a complete interruption of blood flow [5-7]. ACS can be divided into the following three categories in light of the ECG manifestations at the onset: ST-segment elevation myocardial infarction, non-ST-segment elevation myocardial infarction, and unstable angina pectoris [8]. At the moment, the main treatment methods are drug and reperfusion therapies [9]. In the process of continuous research on ACS patients, new treatment methods are also being developed. The fastest and most effective treatment measures are revascularization, including intravenous thrombolysis, percutaneous coronary intervention (PCI), and coronary artery bypass grafting (CABG). Among these measures, PCI is generally considered to be the best choice for ACS treatment because of its remarkable efficacy, its low level of trauma, and its high cure rate, thereby improving people's quality of life [10, 11]. However, PCI operations

are complicated and cause patients great physical damage. Patients are prone to a variety of serious complications, which cannot completely eliminate the potential pathogenic factors causing atherosclerosis, so many of them still have problems such as poor emotional states, quality of life, and social adaptability after the operation [12]. Therefore, it's quite remarkable to probe into a safe and effective nursing intervention for the prognosis of patients undergoing PCI.

Orem's self-care theory was put forward by the American nursing scientist Orem in 1971. She believes that individuals are able to be responsible for their own health [13, 14]. When an individual can't meet his own self-care needs, there will be defects. At this time, the nursing staff should choose an appropriate compensation system from the complete compensation system, partial compensation and supporting education systems based on the patients' self-care abilities [15]. It is more lasting and effective for the nurses to improve the patients' self-care abilities through health education and skill training than to directly meet their needs [16]. Self-care theory aims to constantly awaken the patients' self-awareness, encourage them to take part in their own nursing plans and medical activities, and give full play to their self-care abilities, so as to enhance their quality of life and prognoses [17]. Saeedifar et al. [18] found that Orem's self-care model intervention for rheumatoid arthritis patients can effectively relieve pain. With the improvement in medical knowledge and the constant renewal of nursing concepts, the application of Orem's self-care concept is gradually increasing [19].

There are few published studies on Orem's self-care for ACS after PCI. Hence, we implemented Orem's self-care intervention for ACS patients after PCI, so as to explore the influence of this nursing model on rehabilitation efficacy, disease cognition, self-care abilities, and quality of life.

Materials and methods

General data

A total of 148 ACS patients who underwent PCI in the Sichuan Mianyang 404 Hospital from October 2018 to October 2019 were recruited as the study cohort. They were divided into two groups according to the nursing method each underwent. 78 patients treated using Orem's self-care method were included in the research group (RG), and 70 treated using conventional nursing were placed in the control group (CG). In the RG, there were 42 males and 36 females, ranging in age from 50-70 years old and (62.73±3.02) years old on average. In the CG, there were 38 males and 32 females, ranging in age from 51-69 years old and (63.67±3.15) years old on average.

Inclusion and exclusion criteria

Inclusion criteria: (1) Patients who met the diagnostic criteria of ACS formulated by WHO [20]. (2) Patients in whom PCI was successfully performed for the first time and whose Killip grade was I-II. (3) Patients with complete clinical data.

This research was approved by the Hospital Ethics Committee of Sichuan Mianyang 404.

The patients and their families were informed in advance of the study, and they signed the informed consent forms.

Exclusion criteria: (1) Patients with severe complications such as pulmonary edema, severe arrhythmia, or cardiogenic shock. (2) Patients also suffering from end-stage diseases such as malignancies. (3) Patients also suffering from severe organic diseases such as heart, liver, or kidney disease. (4) Patients with cognition, language, or hearing dysfunction. (5) Patients also suffering from mental illness or patients with family history of mental illness.

Nursing methods

All the patients underwent a PCI operation. The patients in the CG underwent conventional nursing, preoperative preparation, and postoperative nursing according to the doctor's advice, including vital sign monitoring, medication, and discharge guidance. In addition to this conventional nursing, guided by Orem's self-care model, the nursing of the RG evaluated the patients' therapeutic self-care needs and ability in different treatment stages, formulated nursing plans, and implemented nursing using a complete compensation system, a partial compensation system, or a supporting education system. The specific methods were as follows:

(1) An Orem's self-care team was established: it includes specialist doctors and nurses. All members of the team received unified training and had to pass the examination before they could be selected. Their self-care abilities were assessed by the team leader, and the corresponding nursing plans were formulated.

(2) Complete compensation system: nursing with a complete compensation system was applied during the postoperative braking. Specifically, the nursing staff observed the illness narrowly, connected the ECG monitors, and paid close attention to the heart rhythm and blood pressure changes, as well as chest tightness, chest pain, palpitation, shortness of breath, and other symptoms. In addition, they also guarded against vagus nerve reflex when pulling out the arterial sheath, observed the local situation of the puncture point, and focused on whether there was hematoma or bleeding and the pulsation of the dorsal artery of the puncture side. According to the doctor's advice, anti-platelet, infection prevention, and myocardial nutrition were given promptly and accurately. The general self-care needs of the patients were satisfied, such as personal safety, hygiene, excretion, and nutrition needs. After the operations, the patients were supine, and their limbs on the puncture side put in slings. The various needs of the patients were evaluated, such as assisting them to eat, changing their body position to make them comfortable, massaging the sacrococcygeal region, increasing their comfort levels, and reducing their low back pain. Inducing methods were taken to promote urination at first, and then the urine can be guided when it is ineffective.

(3) Partial compensation system: it was applied after limb braking is released after the operation. Based on patients' heart function, they were encouraged to move from bed to bed gradually. With the assistance of nurses or family members, they fulfilled their daily general and therapeutic self-care needs.

(4) Educational support system: it is health education, which provides targeted health education at different treatment stages, and constantly provides information and emotional support to the patients and their families. The patients underwent nursing using the educational support system before their operations, mainly to strengthen their preoperative education and training guidance. Preoperative education: the patients and their families lack an understanding of PCI and have different degrees of anxiety before the operation. The nurses helped them get familiar with the environment as soon as possible, gained their trust and cooperation, and established a harmonious nurse-patient relationship. They also introduced ACS and PCI, explained the need for the operation, described the general process of the operation, the possible discomfort and complications, and the countermeasures after the operation, in order to gain the patients' understanding and recognition, helped prepare them psychologically for the operation, and they also contacted and communicated with the patients when necessary, and introduced the experience of relieving the psychological tension to eliminate their tension and worry, so as to better cooperate with the operation. One day before the operation, we began to train them how to bend their knees on the healthy side of the lower limbs, lift their buttocks and move their limbs horizontally at bed level with the focus on the palm, elbows and back, so as to relieve the discomfort caused by the local long-term simultaneous compression. Meanwhile, we trained them to defecate in a lying position, had them practice lifting their buttocks and placing the bedpan using the above methods, and instructed their family members how to massage and lift their limbs and sacrococcygeal parts to relieve the discomfort caused by the posture restriction. The self-care training was targeted to the patients' ages and education levels, so as to achieve better results. Then, we often visited the ward to care for and comfort the patients, so that they can promptly learn the outcome of the operation. We learned about the discomfort and needs of the patients, relieved their tension, continued to emphasize the importance of the supine position and limb immobilization for them and their families during the period of body position restriction, and guided them to observe the rules and prevent complications. When getting out of bed and squatting after limb immobilization is released, they moved slowly and paid attention to their wounds.

Outcome measures

(1) The incidences of the patients' postoperative complications in the two groups were recorded.

(2) The postoperative rehabilitation processes in the two groups were compared, including time of door to balloon (D-to-B) and getting out of bed and discharging.

(3) The cognition levels in both groups of patients were compared: the patients' mastery of disease-related knowledge was tested using the questionnaire of disease cognition level developed using the American Guidelines for Percutaneous Coronary Intervention [21] compiled by the American Heart Association (AHA), the American Heart College, and the Society of Cardioangiography, and the Interventional Therapy (SCAL) in 2005.

(4) The self-care abilities of the patients in both groups before and after the nursing intervention were evaluated using the Exercise of Self-Care Agency Scale (ESCA) [22]. The scale includes four dimensions: self-care skills and responsibility, self-concept and health knowledge level, with a total of 43 items and a total possible score of 172. The higher the score , the stronger the patient's self-care abilities.

(5) The anxiety and depression before and after the nursing intervention were assessed using the Self-rating Anxiety Scale (SAS) and the Self-rating Depression Scale (SDS) [23]. The total possible score on the SAS scale is 100 points: 50-70 indicates mild anxiety, 71-90 indicates moderate anxiety, > 90 indicates severe anxiety. The higher the score, the more serious the anxiety. The total possible score of the SDS scale is 100 points: 50-70 indicates mild depression, 71-90 indicates moderate depression, > 90 indicates severe depression. The higher the score, the more severe the depression.

(6) Quality of life score: the quality of life of the patients in both groups after the nursing intervention was analyzed using the SF-36 quality of life scale [24]. The patients' quality of life was evaluated using the SF-36 scale developed by the American Medical Research Institute. It includes eight items: general health, physiologic function, role-physical, body pain, vitality, social function, emotional role, and mental health. Each item is worth 0-100 points, and the higher the score, the better the quality of life is.

(7) The nursing was graded using the Nursing Satisfaction Questionnaire made by our hospital, with a total of 20 questions. The patients graded the nurses in terms of the nursing content, with 5 points for each question. A total score < 70 indicated dissatisfied, 70-89 indicated satisfied, and ≥ 90 indicated very satisfied. Satisfaction = (very satisfied + satisfied)/total cases × 100%.

Statistical methods

SPSS 24.0 (IBM Corp, Armonk, NY, USA) was employed for the statistical analysis, and the figures were drawn using GraphPad Prism 7. The count data were expressed as [n (%)] and compared using chi-square tests. When the theoretical frequency in a chi-square test was less than 5, a continuity correction Chi-square test was employed. The measurement data were expressed as the mean ± standard deviation (x ± sd). Independent-sample T tests were used for the intra-group comparisons and were assessed using independent-samples t tests, and the intra-group comparisons were made using paired t tests. A difference was statistically significant when $P < 0.05$.

Results

General data

There were no significant difference in terms of the general clinical baseline data such as gender, age, body mass index (BMI), disease type, Killip grade, marriage status, place of residence, education, history of smoking, hypertension, or diabetes between the two groups ($P > 0.05$) (**Table 1**).

Comparison of the incidences of complications in both groups

After the nursing intervention, the incidence of complications was 12.81% in the RG, which was significantly lower than it was in the CG (54.29%) ($P < 0.05$) (**Table 2**).

Comparison of the postoperative rehabilitation processes in the two groups of patients

After the nursing intervention, the D-to-B times, the getting out of bed times, and the hospital stays of the patients in the RG were significant-

Table 1. Comparison of the general data between the two groups [n (%)] ($\bar{x} \pm sd$)

Classification	Research group (n=78)	Control group (n=70)	t/χ^2 value	*P* value
Gender			0.002	0.957
Male	42 (53.85)	38 (54.29)		
Female	36 (46.15)	32 (45.71)		
Age (years)	62.73±3.02	63.37±3.15	1.261	0.209
BMI (kg/m^2)	24.15±2.62	23.82±2.58	0.770	0.442
Disease type			1.616	0.445
UA	45 (57.69)	40 (57.14)		
STEMI	23 (29.49)	25 (35.72)		
NSTEMI	10 (12.82)	5 (7.14)		
Killip grade			0.086	0.768
I	42 (53.85)	36 (51.43)		
II	36 (46.15)	34 (48.57)		
Marriage			0.803	0.370
Married	60 (76.92)	58 (82.86)		
Unmarried	18 (23.08)	12 (17.14)		
Place of residence			0.975	0.323
Cities	36 (46.15)	38 (54.29)		
Countryside	42 (53.85)	32 (45.71)		
Education background			0.516	0.472
≥ high school	30 (38.46)	31 (44.29)		
< high school	48 (61.54)	39 (55.71)		
History of smoking			0.621	0.430
Yes	27 (34.62)	20 (28.57)		
No	51 (65.38)	50 (71.43)		
History of hypertension			0.061	0.804
Yes	52 (66.67)	48 (68.57)		
No	26 (33.33)	22 (31.43)		
History of diabetes			0.211	0.645
Yes	25 (32.05)	20 (28.57)		
No	53 (67.95)	50 (71.43)		

ly shorter than they were in the CG ($P < 0.05$) (**Table 3**).

Comparison of the disease cognition levels between the two groups of patients

After the nursing intervention, the disease cognition scores in the RG were dramatically higher than the corresponding scores in the CG ($P < 0.05$) (**Figure 1**).

Comparison of the ESCA scores in both groups

Before the nursing intervention, there was no significant difference between the self-care skill scores and the responsibility, self-concept, and health knowledge levels and the total self-care ability scores in both groups. After that, the scores of the four dimensions and total self-care ability scores of both groups were markedly higher than they were before the intervention, and the scores in the RG were significantly higher than the scores in the CG (**Figure 2**).

Comparison of the SAS and SDS scores in the two groups of patients

Before the nursing intervention, there was no significant difference in the SAS and SDS scores in the two groups ($P > 0.05$). After that, the two scores decreased markedly, and the scores in the RG were dramatically lower than the scores in the CG ($P < 0.05$) (**Figure 3**).

Comparison of the quality of life between both groups of patients

The quality of life scores in general health, physiologic function, role-physical, physical pain, vitality, social function, emotional role, and mental health in the RG were significantly higher than the scores in the CG ($P < 0.05$) (**Figure 4**).

Comparison of the nursing satisfaction between both groups of patients after the nursing intervention

After the nursing intervention, the satisfaction rate in the RG was 96.15%, which was markedly higher than of the rate in the CG (82.86%) ($P < 0.05$) (**Table 4**).

Discussion

ACS is an acute and critical disease in patients with cardiovascular diseases [25]. With an acute onset, a serious illness, and rapid development, it can lead to sudden death and has a high mortality [26]. PCI is the main method of improving the prognosis and reducing the mor-

Table 2. Comparison of the incidences of complications in the two groups [n (%)]

Group	Bleeding at puncture site	Hypotension	Arrhythmia	Deep venous thrombosis of lower extremities	Urinary retention	Total incidence rate
Research group (n=78)	2 (2.56)	2 (2.56)	3 (3.85)	1 (1.28)	2 (2.56)	10 (12.81)
Control group (n=70)	8 (11.43)	7 (10.00)	8 (11.43)	5 (7.14)	10 (14.29)	38 (54.29)
χ^2	-	-	-	-	-	28.950
P	-	-	-	-	-	< 0.001

Table 3. Comparison of the postoperative rehabilitation process between the two groups ($\bar{x} \pm sd$)

Group	D-to-B time/min	Time to get out of bed/d	Hospitalization time/d
Research group (n=78)	80.21±10.49	3.54±1.05	8.06±1.12
Control group (n=70)	95.26±11.55	6.77±1.21	11.13±1.71
t	8.307	17.390	13.040
P	< 0.001	< 0.001	< 0.001

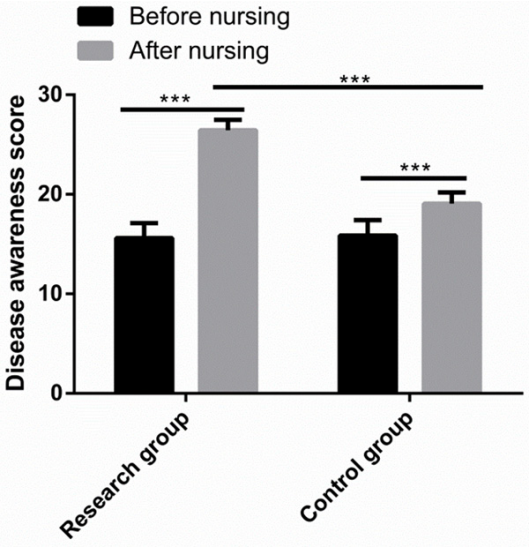

Figure 1. Comparison of the disease cognition in the two groups. After the nursing intervention, the patients in the RG scored dramatically higher than the patients in the CG. Note: ***P < 0.001.

tality. PCI surgery often causes stress reactions in patients, especially among the middle-aged and elderly people with poor tolerance, and the incidence of complications is high. Most patients do not fully understand the high-risk factors of the disease after their operations, and the elderly have low self-management abilities, so the disease is difficult to control effectively [27]. Scientific and reasonable nursing intervention measures are of great significance in reducing the incidence of complications after PCI, promoting postoperative rehabilitation and improving patients' awareness of diseases [28]. WHO points out that society, family and individual play vital roles in deciding to meet their health needs, and self-care is becoming a developmental trend [29]. With the continuous development and changes in the medical model, the modern nursing concept based on the biological-psychological-social model gradually replaces the traditional nursing concept centered on disease, and emphasizes the integrity of human physiology, psychology, and society and the role of humans in maintaining their own health [30]. Orem's self-care theory aims at maintaining and promoting patients' self-care to the maximum extent. In this theory, the medical staff not only pays attention to the nursing of patients, but also helps them cultivate and improve their self-care abilities and actively take part in the treatment and management of diseases [31].

Wong *et al.* [32] pointed out that nursing intervention and out-of-hospital follow-up for ACS after PCI can effectively control a patient's condition and reduce the readmission rate. Khademian *et al.* [33] found that training self-care based on Orem's theory could improve the quality of life and the self-efficacy of hypertensive patients. This research found that the postoperative complications in the RG were significantly lower than they were in the CG, indicating that Orem's self-care intervention can reduce the occurrence of postoperative complications. Xu *et al.* [34] found that a self-care program for elderly hip fracture patients based on Orem's model can improve the patients' quality of life and reduce their perioperative complications, which is similar to our research results. While Welker *et al.* [35] discovered that effective nursing intervention for ACS after PCI can effectively promote the rehabilitation efficacy of patients and reduce their

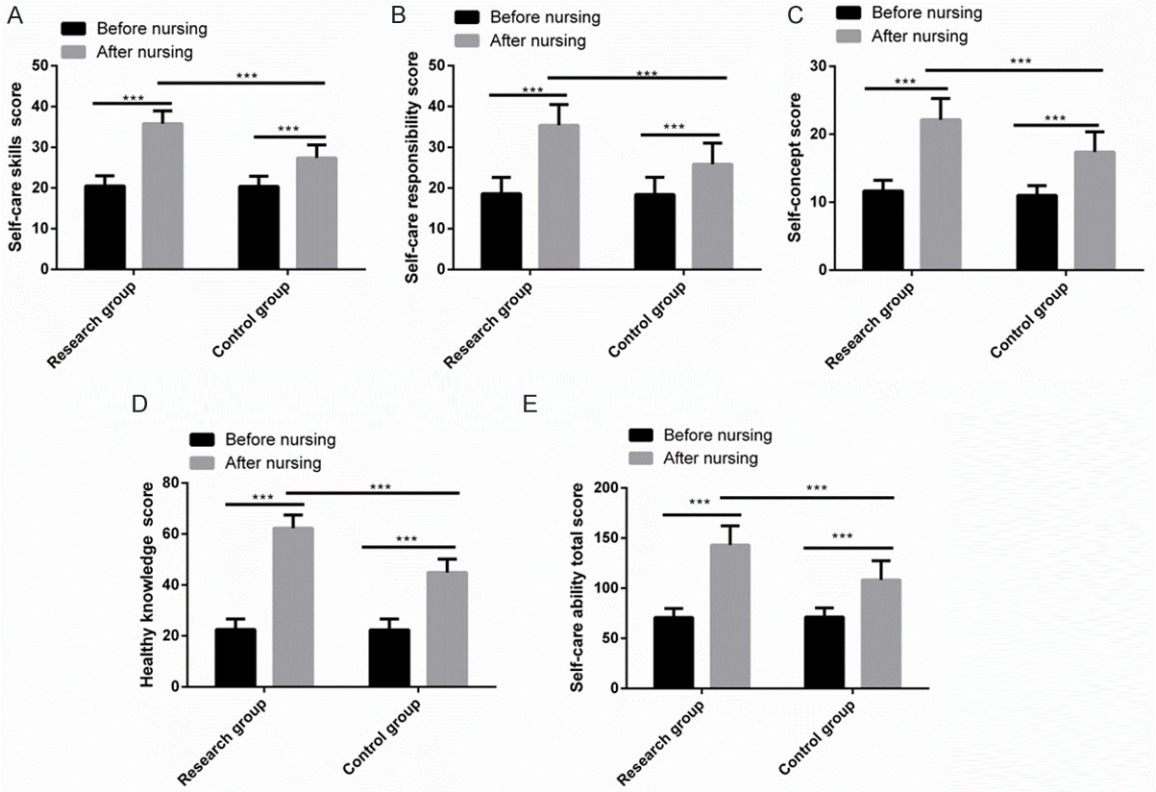

Figure 2. Comparison of the ESCA scores in the two groups. A: Before the nursing intervention, there was no significant difference in self-care skill scores between the two groups, but after the nursing intervention, the scores increased dramatically, and the RG was significantly higher than the CG. B: Before the nursing intervention, there was no significant difference in the self-care responsibility scores between the two groups, but after that, the scores increased markedly, and the RG was significantly higher than the CG. C: Before the nursing intervention, there was no significant difference in the self-concept scores between the two groups, but after that, the scores increased dramatically, and the RG was significantly higher than the CG. D: Before the nursing intervention, there was no significant difference in the health knowledge score levels between the two groups, but after that, the scores increased significantly, and the RG was significantly higher than the CG. E: Before the nursing intervention, there was no significant difference in the total self-care ability scores between the two groups, but after that, the scores increased markedly, and the RG was significantly higher than the CG. Note: ***P < 0.001.

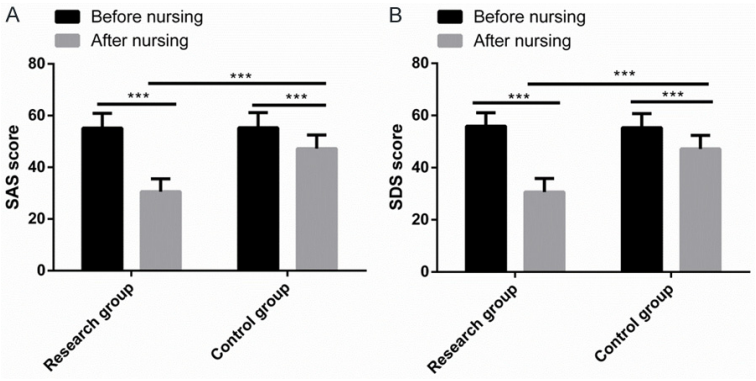

Figure 3. Comparison of the SAS and SDS scores between the two groups of patients. A: After the nursing intervention, the SAS scores of the patients in the two groups decreased markedly; the scores of the patients in the RG were dramatically lower than those in the CG. B: After the nursing intervention, the SDS scores of the patients in the two groups decreased markedly, and the scores of the patients in the RG were dramatically lower than the scores in the CG. Note: ***P < 0.001.

hospital stays. This research showed that the D-to-B times, the getting out of bed times, and hospital stays of the patients in the RG were significantly shorter than they were in the CG, indicating that Orem's self-care can markedly improve patients' postoperative recovery, which is similar to the research results of Welker. This might be related to the role of different compensation systems in Orem's self-care intervention in the patients' different recovery periods. Furthermore, patients in the RG scored significantly higher than the patients in the

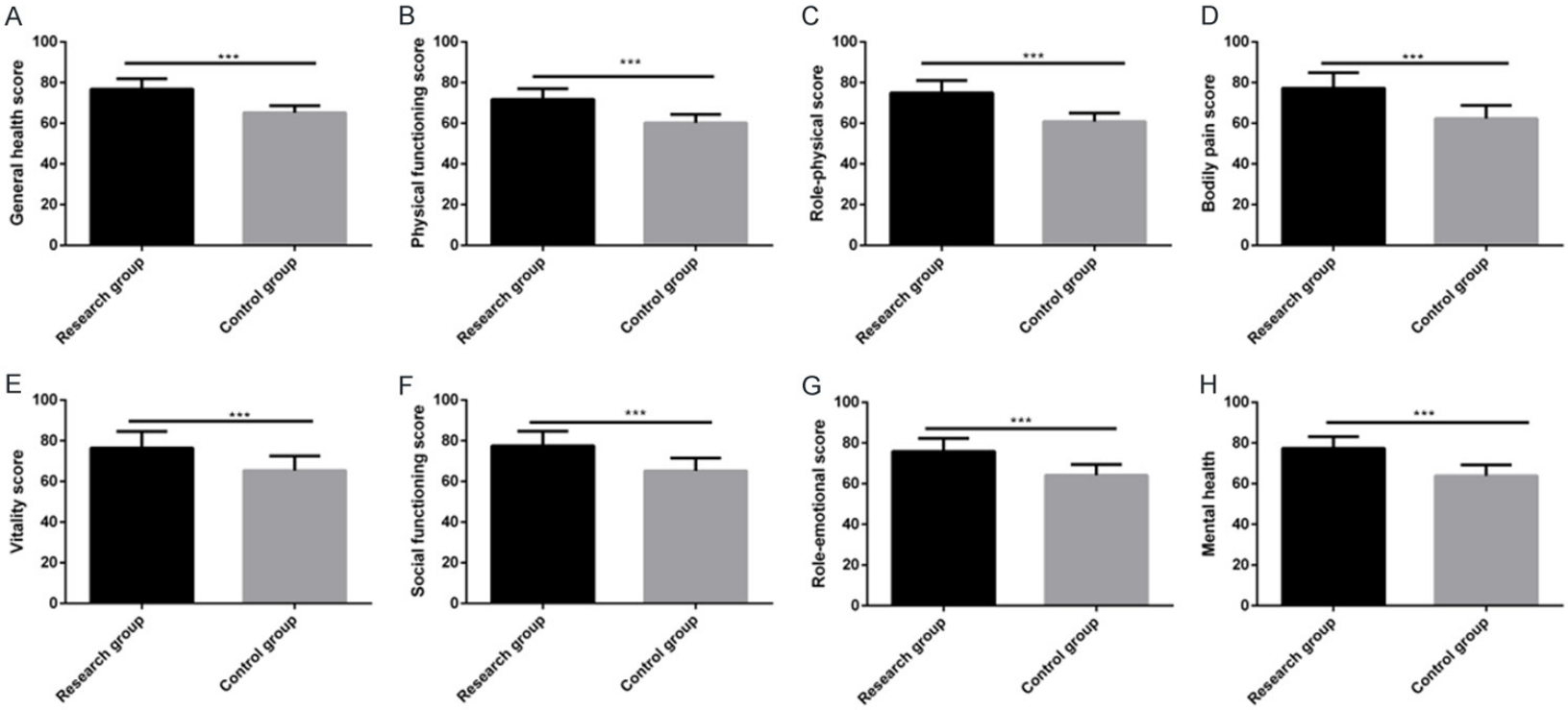

Figure 4. Comparison of quality of life between the two groups of patients. A: The overall health scores of the research group were dramatically higher than the overall health scores in the control group. B: The physiologic function scores in the research group were dramatically higher than of the scores in the control group. C: The physiological function scores in the research group were dramatically higher than the scores in the control group. D: The physical pain scores in the research group were dramatically higher than the corresponding scores in the control group. E: The life vitality scores in the research group were dramatically higher than the corresponding scores in the control group. F: The social function scores in the research group were dramatically higher than the corresponding scores in the control group. G: The emotional function scores in the research group were dramatically higher than the scores in the control group. H: The mental health scores in the research group were dramatically higher than the scores in the control group. Note: ***P < 0.001.

Table 4. Comparison of the nursing satisfaction in both groups after the nursing intervention [n (%)]

Projects	Research group (n=78)	Control group (n=70)	χ^2 value	*P* value
Very satisfied	60 (76.92)	26 (37.14)	-	-
Satisfied	15 (19.23)	32 (45.72)	-	-
Dissatisfied	3 (3.85)	12 (17.14)	-	-
Nursing satisfaction	75 (96.15)	58 (82.86)	7.161	0.007

CG, indicating that Orem's self-care intervention effectively improved their disease knowledge and their practice of healthy behavior. Tok Yildiz *et al.* [36] discovered that Orem's nursing intervention for patients with coronary artery diseases can markedly improve their self-care abilities, health knowledge levels, and their overall quality of life, which is similar to our research results. Simultaneously, Kusnanto *et al.* [37] suggested that the application of Orem's self-care model can effectively improve the self-care abilities and quality of life of patients with systemic lupus erythematosus. Mohammadpour *et al.* [38] found that the supportive educational intervention based on Orem's self-care theory can improve the self-care abilities of myocardial infarction patients and have a positive impact on public health achievements. The self-care skills and responsibility, self-concept and health knowledge level scores and the total of self-care abilities scores of the patients in the RG were significantly higher than those in the CG. This indicated that the application of Orem's self-care model can effectively improve the patients' self-care abilities, similar to the research results of Kusnanto and Mohammadpour A *et al*. We also evaluated the adverse psychological emotions of the patients in the two groups, and found that the SAS and SDS scores of the patients in the RG were dramatically lower than those in the CG, which indicated that Orem's self-care model encouraged patients to control the diseases and fundamentally alleviated their anxiety and depression. Finally, we evaluated the patients' quality of life: the quality of life of the patients in the RG was markedly higher than it was in the CG, which indicated that Orem's self-care intervened from the comprehensive aspects of patients, society and diseases, and dramatically improved their quality of life, which was similar to the results of Wong and Khademian *et al*. In addition, we also measured the nursing satisfaction of Orem's self-care intervention model and found that the patient satisfaction in the RG was significantly higher than it was in the CG, which also shows that this model is more easily accepted.

Although this study confirmed that Orem's self-care can bring more benefits to ACS patients after PCI, there is still room for improvement. For example, we can further evaluate the treatment compliance, and can also analyze the risk factors affecting their poor prognoses. In the future, we will gradually conduct supplementary research from the above perspectives.

To sum up, Orem's self-care intervention for ACS for patients undergoing PCI can reduce their postoperative complications, relieve their postoperative negative emotions, and improve their rehabilitation efficacy, disease cognition, self-care abilities, quality of life, and their satisfaction with the nursing.

Disclosure of conflict of interest

None.

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References

[1] Gach O, El HZ and Lancellotti P. Acute coronary syndrome. Rev Med Liege 2018; 73: 243-250.
[2] Makki N, Brennan TM and Girotra S. Acute coronary syndrome. J Intensive Care Med 2015; 30: 186-200.
[3] Al-Hawwas M, Tsitlakidou D, Gupta N, Iliescu C, Cilingiroglu M and Marmagkiolis K. Acute coronary syndrome management in cancer patients. Curr Oncol Rep 2018; 20: 78.
[4] Hedayati T, Yadav N and Khanagavi J. Non-ST-segment acute coronary syndromes. Cardiol Clin 2018; 36: 37-52.
[5] Piironen M, Ukkola O, Huikuri H, Havulinna AS, Koukkunen H, Mustonen J, Ketonen M, Lehto S, Airaksinen J, Antero Kesaniemi Y and Salo-

maa V. Trends in long-term prognosis after acute coronary syndrome. Eur J Prev Cardiol 2017; 24: 274-280.
[6] Crea F and Libby P. Acute coronary syndromes: the way forward from mechanisms to precision treatment. Circulation 2017; 136: 1155-1166.
[7] Bentzon JF, Otsuka F, Virmani R and Falk E. Mechanisms of plaque formation and rupture. Circ Res 2014; 114: 1852-1866.
[8] Smith JN, Negrelli JM, Manek MB, Hawes EM and Viera AJ. Diagnosis and management of acute coronary syndrome: an evidence-based update. J Am Board Fam Med 2015; 28: 283-293.
[9] Switaj TL, Christensen SR and Brewer DM. Acute coronary syndrome: current treatment. Am Fam Physician 2017; 95: 232-240.
[10] Braun M and Kassop D. Acute coronary syndrome: management. FP Essent 2020; 490: 20-28.
[11] Bakhai A, Iniguez A, Ferrieres J, Schmitt C, Sartral M, Belger M and Zeymer U; APTOR trial investigators. Treatment patterns in acute coronary syndrome patients in the United Kingdom undergoing PCI. EuroIntervention 2011; 6: 992-996.
[12] Pirhonen L, Gyllensten H, Fors A and Bolin K. Modelling the cost-effectiveness of person-centred care for patients with acute coronary syndrome. Eur J Health Econ 2020; 21: 1317-1327.
[13] Allison SE. Self-care requirements for activity and rest: an Orem nursing focus. Nurs Sci Q 2007; 20: 68-76.
[14] Younas A. A foundational analysis of dorothea Orem's self-care theory and evaluation of its significance for nursing practice and research. Creat Nurs 2017; 23: 13-23.
[15] Younas A and Quennell S. Usefulness of nursing theory-guided practice: an integrative review. Scand J Caring Sci 2019; 33: 540-555.
[16] Zaidouni A, Ouasmani F, Benbella A, Kasouati J and Bezad R. The effect of nursing consultation based on Orem's theory of self-care and bandura's concept on infertility stress. J Hum Reprod Sci 2019; 12: 247-254.
[17] Hemati Z, Abasi S, Mosaviasl F, Shakerian B and Kiani D. Effect of Orem's self-care model on perceived stress in adolescents with asthma referring the asthma and allergy Clinic, Isfahan, 2014. Int J Community Based Nurs Midwifery 2016; 4: 247-255.
[18] Saeedifar ES, Memarian R, Fatahi S and Ghelichkhani F. Use of the Orem self-care model on pain relief in women with rheumatoid arthritis: a randomized trial. Electron Physician 2018; 10: 6884-6891.
[19] Wong CL, Ip WY, Choi KC and Lam LW. Examining self-care behaviors and their associated factors among adolescent girls with dysmenorrhea: an application of Orem's self-care deficit nursing theory. J Nurs Scholarsh 2015; 47: 219-227.
[20] Kalarus Z, Svendsen JH, Capodanno D, Dan GA, De Maria E, Gorenek B, Jedrzejczyk-Patej E, Mazurek M, Podolecki T, Sticherling C, Tfelt-Hansen J, Traykov V, Lip GYH, Fauchier L, Boriani G, Mansourati J, Blomstrom-Lundqvist C, Mairesse GH, Rubboli A, Deneke T, Dagres N, Steen T, Ahrens I, Kunadian V and Berti S. Cardiac arrhythmias in the emergency settings of acute coronary syndrome and revascularization: an European Heart Rhythm Association (EHRA) consensus document, endorsed by the European Association of Percutaneous Cardiovascular Interventions (EAPCI), and European Acute Cardiovascular Care Association (ACCA). Europace 2019; 21: 1603-1604.
[21] Panchal AR, Berg KM, Hirsch KG, Kudenchuk PJ, Del Rios M, Cabanas JG, Link MS, Kurz MC, Chan PS, Morley PT, Hazinski MF and Donnino MW. 2019 American Heart Association focused update on advanced cardiovascular life support: use of advanced airways, vasopressors, and extracorporeal cardiopulmonary resuscitation during cardiac arrest: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation 2019; 140: e881-e894.
[22] Cho H and Park E. Canonical correlation between self-care agency and health-related self-efficacy with chronic viral hepatitis patients. Osong Public Health Res Perspect 2019; 10: 281-288.
[23] Dunstan DA, Scott N and Todd AK. Screening for anxiety and depression: reassessing the utility of the Zung scales. BMC Psychiatry 2017; 17: 329.
[24] Lins L and Carvalho FM. SF-36 total score as a single measure of health-related quality of life: Scoping review. SAGE Open Med 2016; 4: 2050312116671725.
[25] Kubena P, Spinar J, Dastych M, Lokaj P and Parenica J. Diagnostic and prognostic biomarkers in acute coronary syndrome. Vnitr Lek 2018; 63: 935-944.
[26] Pouralijan Amiri M, Khoshkam M, Salek RM, Madadi R, Faghanzadeh Ganji G and Ramazani A. Metabolomics in early detection and prognosis of acute coronary syndrome. Clin Chim Acta 2019; 495: 43-53.
[27] Haude M, Rupprecht HJ, Schuster S and Uebis R. Acute coronary syndrome with ST-elevation. Herz 2019; 44: 16-21.
[28] Perera D, Crake T and Lee V. Angiography-guided multivessel percutaneous coronary intervention versus ischemia-guided percutaneous

coronary intervention versus medical therapy in the management of significant disease in non-infarct-related arteries in ST-elevation myocardial infarction patients with multivessel coronary disease. Crit Pathw Cardiol 2018; 17: 77-82.

[29] Ose D, Kamradt M, Kiel M, Freund T, Besier W, Mayer M, Krisam J, Wensing M, Salize HJ and Szecsenyi J. Care management intervention to strengthen self-care of multimorbid patients with type 2 diabetes in a german primary care network: a randomized controlled trial. PLoS One 2019; 14: e0214056.

[30] Rudebeck CE. Relationship based care - how general practice developed and why it is undermined within contemporary healthcare systems. Scand J Prim Health Care 2019; 37: 335-344.

[31] Velo Higueras M, Fajardo Galvan D, Cruces Gonzalez M, Sanchez Merino B and Santos Muniz A. International development cooperation from the D. Orem self-care theory. Rev Enferm 2013; 36: 48-51.

[32] Wong N, Chua SJT, Gao F, Sim STR, Matchar D, Wong SLA, Yeo KK, Tan WCJ and Chin CT. The effect of a nurse-led telephone-based care coordination program on the follow-up and control of cardiovascular risk factors in patients with coronary artery disease. Int J Qual Health Care 2016; 28: 758-763.

[33] Khademian Z, Kazemi Ara F and Gholamzadeh S. The effect of self care education based on Orem's nursing theory on quality of life and self-efficacy in patients with hypertension: a quasi-experimental study. Int J Community Based Nurs Midwifery 2020; 8: 140-149.

[34] Xu X, Han J, Li Y, Sun X, Lin P, Chen Y, Gao F, Li Z, Zhang S and Sun W. Effects of Orem's self-care model on the life quality of elderly patients with hip fractures. Pain Res Manag 2020; 2020: 5602683.

[35] Welker J, Auer R, Gencer B, Muller O, Cornuz J, Matter CM, Mach F, Windecker S, Rodondi N and Nanchen D. Hospital revascularisation capability and quality of care after an acute coronary syndrome in Switzerland. Swiss Med Wkly 2016; 146: w14275.

[36] Tok Yildiz F and KaSikCi M. Impact of training based on Orem's theory on self-care agency and quality of life in patients with coronary artery disease. J Nurs Res 2020; 28: e125.

[37] Kusnanto K, Sari N, Harmayetty H, Efendi F and Gunawan J. Self-care model application to improve self-care agency, self-care activities, and quality of life in patients with systemic lupus erythematosus. J Taibah Univ Med Sci 2018; 13: 472-478.

[38] Mohammadpour A, Rahmati Sharghi N, Khosravan S, Alami A and Akhond M. The effect of a supportive educational intervention developed based on the Orem's self-care theory on the self-care abilities of patients with myocardial infarction: a randomised controlled trial. J Clin Nurs 2015; 24: 1686-1692.