Journal of Clinical and Nursing Research, 2025, Volume 9, Issue 6
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Impact of Problem-oriented Care on Self-efficacy and Compliance Behavior of Patients Undergoing Coronary Intervention Therapy

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Abstract: *Objective*: To explore the effects of problem-oriented nursing on self-efficacy and compliance behavior of patients undergoing coronary intervention. *Methods*: Seventy patients who underwent coronary intervention in a hospital from March 2024 to February 2025 were selected and divided into the control group (n=35) and the observation group (n=35) by using the randomized numeric table method. The control group implemented conventional clinical care, and the observation group was given problem-oriented nursing intervention on the basis of conventional care. The self-efficacy, negative psychological state, medical compliance behavior, and quality of life improvement of patients in the two groups were compared. *Results*: Before nursing intervention, the difference in the scores of patients' role function, symptom management, emotion management, nurse-patient communication and exchange and other dimensions between the control group and the observation group was not statistically significant ($P > 0.05$). After nursing intervention, the scores of all indexes of the two groups were significantly higher, and the difference between the two groups was statistically significant ($P < 0.05$). Before nursing intervention, the difference in the scores of patients' anxiety and depression status between the control group and the observation group was not statistical significance ($P > 0.05$). However, after nursing intervention, the negative psychological state of the two groups improved significantly, and the difference between the groups was statistically significant ($P < 0.05$). The total excellent rate of patients' compliance behavior in the observation group was 97.14%, which was significantly higher than that of the control group, which was 74.29%, with a statistically significant difference ($P < 0.05$). The patients of the observation group had a higher psychological state, social function, physical condition, emotional condition and other dimension scores of patients in the observation group were significantly higher than those of the control group, and the difference was statistically significant ($P < 0.05$). *Conclusion*: The implementation of problem-oriented nursing care for patients undergoing coronary intervention can not only significantly improve their self-efficacy and enhance their compliance behavior, but also positively improve their negative emotions of anxiety and depression, and improve their quality of life.

Keywords: Problem-oriented nursing; Coronary heart disease; Interventional therapy; Self-efficacy; Medical compliance behavior

Online publication: July 8, 2025

1. Introduction

Coronary heart disease is a common clinical cardiovascular disease, if not treated in time, it can lead to angina pectoris, chest tightness and chest pain, heart failure, shortness of breath, and other symptoms, and in serious cases, even endanger the patient's life [1]. Percutaneous Coronary Intervention (PCI) is an important means to improve the prognosis of patients, but the long-term recovery effect is not only dependent on the procedure itself, but also closely related to the patient's self-management ability and medical compliance behavior [2]. However, relevant medical studies have shown that post-PCI patients generally suffer from low self-efficacy, poor medical compliance behavior, anxiety, and depression, resulting in poor quality of life [3]. Therefore, how to enhance patients' self-efficacy and improve their compliance behavior through effective nursing interventions has become an important topic in clinical nursing research. Problem-Based Nursing (PBN) is a patient-centered, problem-solving nursing model, the core of which is to help patients actively participate in health management by systematically assessing their individualized needs and developing targeted = interventions [4]. In recent years, this model has demonstrated significant advantages in the field of chronic disease management, but the effectiveness of its application in post-PCI patients still needs to be further explored. This study aims to explore the effects of problem-oriented nursing on self-efficacy and compliance behavior of PCI patients through clinical trials, with a view to providing more scientific and efficient intervention strategies for clinical nursing practice, and ultimately improving patients' prognosis and quality of life.

2. Data and methods

2.1. General information

Seventy patients who underwent coronary intervention in a hospital from March 2024 to February 2025 are selected and divided into the control group (n=35) and the observation group (n=35) by using the random number table method. Comparison of the general information of patients in the two groups, the difference was not statistically significant, as shown in **Table 1**. All patients are aware of the content and purpose of the study in advance, and voluntarily signed the informed consent for the study, and the study has been approved by the ethics committee of the hospital for implementation.

Table 1. Comparison of the general information of the two groups

Group	Number of cases (n)	Sex (n)		Age	Disease duration	Co-morbidities(n)		
		Male	Female	($\bar{x} \pm s$, years)	($\bar{x} \pm s$, years)	Hypertension	Hyperlipidemia	Diabetes mellitus
Observation Group	35	20	15	65.65 ± 2.18	5.32 ± 1.03	13	12	10
Control group	35	19	16	66.12 ± 2.23	5.26 ± 1.12	14	10	11
x^2/t value		0.058		0.892	0.233		0.267	
P-value		1.809		0.375	0.816		0.875	

The inclusion criteria of the study are: (1) Those who were clearly diagnosed with coronary artery disease and successfully underwent percutaneous coronary intervention; (2) Those who possessed basic communication and comprehension skills and were able to cooperate with the study; (3) Those who were clearly conscious without serious cognitive disorders or psychiatric disorders; (4) Those who were in a stable condition after the procedure

and had serious complications such as cardiogenic shock and severe heart failure.

However, the exclusion criteria included: (1) Those with other serious diseases such as combined malignant tumors, end-stage liver and kidney failure; (2) Those with language or hearing impairment, unable to communicate effectively; (3) Those with previous history of psychiatric disease or cognitive dysfunction that affects the assessment of the effectiveness of the nursing intervention; and (4) Those with poor adherence, unable to complete the follow-up visit or withdraw from the study halfway.

2.2. Methods

2.2.3. Control group

Routine clinical nursing intervention is given. After the operation, closely monitor the patients' vital signs such as heart rate, blood pressure, oxygen saturation, etc., and keep an eye on the puncture site to see if there are any complications such as blood seepage and hematoma; if so, give symptomatic treatment. During the recovery period, the patients are asked to adjust their dietary structure, focusing on low-salt, low-fat, high-fiber foods, and are asked to quit smoking and alcohol, and actively carry out early exercise training. Before discharge from the hospital, they are given written instructions on coronary heart disease risk factors, postoperative precautions for PCI, and methods of drug administration, and are instructed to undergo regular outpatient review.

2.2.4. Observation group

Based on the control group, the observation group is given problem-oriented care, i.e., individualized and continuous rehabilitation management through problem identification, dynamic intervention, social support closed-loop management. First of all, a special nursing team composed of cardiologists, rehabilitators, and specialized nurses is set up, and after implementing special training on systematic PCI perioperative management guidelines and postoperative medication guidance, psychological adjustment, exercise rehabilitation, and dietary management, a group discussion is held to formulate a problem-oriented nursing program.

(1) The Coronary Heart Disease Self-Management Behavior Scale is used to assess the individualized needs of the patients, identify the key problems of postoperative rehabilitation, and develop a targeted intervention plan.

(2) Assess patients' cognitive level and self-efficacy changes through open-ended questioning, use positive incentives to strengthen their behavioral improvement, increase the frequency of education for low self-efficacy, and extend the intervention to the whole rehabilitation management, such as synchronous health education for family members to guide them to supervise the patients' behaviors. Screen the patients with good rehabilitation results as "peer supporters", and provide "peer supporters" through case sharing. For example, family members are provided with synchronized health education to guide them to monitor the patients' behavior. Patients with good rehabilitation results in the past are screened as "peer supporters", and experience is provided through case sharing to enhance patients' confidence. At the same time, a WeChat group was used to regularly disseminate PCI rehabilitation knowledge, provide medication reminders, conduct online self-efficacy assessments, and respond to patients' questions in real time, thereby enhancing self-efficacy and promoting long-term compliance behavior.

2.3. Observation indicators

(1) Self-efficacy: The chronic disease self-efficacy scale is applied. The self-efficacy scale is used to assess patients' self-efficacy in terms of their role function, symptom management, emotion management, and

nurse-patient communication. The score ranges from 0 to 10 points, with 10 points being completely confident and 0 points being completely unconfident.

(2) Negative psychological state: Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD) are applied to assess the negative psychological state of the patients, with a total score of 30, and the higher the score, the more serious the negative psychological state of the patients.

(3) Medical compliance behavior: A questionnaire is used to investigate the patients' compliance behaviors, such as taking medication dose, frequency, time, taking medication according to the course of treatment, adhering to a light diet, and exercising. A 4-level scoring method is used for evaluation, with 3 points for completely doing it, 2 points for basically accomplishing it, 1 point for occasionally accomplishing it, and 0 points for not being able to accomplish it.

(4) Quality of life: The hospital's homemade quality of life scale is used to quantitatively score the patients' psychological state, social functioning, physical condition, and emotional condition, with a total score of 100 points, with higher scores indicating a higher level of quality of life.

2.4. Statistical methods

SPSS23.0 software is applied to carry out statistical analysis. Measurement data are expressed as mean ± standard deviation ($\bar{x} \pm s$), and t-test is used for comparison. Count data are expressed as rate (%), and x^2 test is used for comparison, and $P < 0.05$ is taken as the difference is statistically significant.

3. Results

3.1. Comparison of self-efficacy scores between the two groups

Before nursing intervention, the difference between the two groups of patients' scores in the dimensions of role function, symptom management, emotion management, nurse-patient communication and exchange was not significant, and there was no statistical significance ($P > 0.05$). After nursing intervention, the scores of all indicators in the two groups were significantly higher, and the observation group was better than the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of self-efficacy scores of patients in the two groups ($\bar{x} \pm s$, points)

Group	Role function		Symptom management	
	Pre- Intervention	Post- Intervention	Pre- Intervention	Post- Intervention
Control group (n=35)	6.21 ± 1.03	6.82 ± 1.24*	6.21 ± 1.13	6.75 ± 1.49*
Observation group (n=35)	6.19 ± 1.12	7.56 ± 1.65*	6.24 ± 1.20	7.52 ± 1.51*
t	0.078	2.121	0.467	2.147
p	0.938	0.038	0.642	0.035
Group	**Emotion management**		**Nurse-patient communication**	
	Pre- Intervention	Post- Intervention	Pre- Intervention	Post- intervention
Control group (n=35)	6.08 ± 1.04	6.95 ± 1.53*	5.96 ± 1.15	6.68 ± 1.32*
Observation group (n=35)	6.13 ± 1.22	7.76 ± 1.49*	6.01 ± 1.24	7.55 ± 1.49*
t	0.185	2.244	0.175	2.586
p	0.854	0.028	0.862	0.012

3.2. Comparison of negative psychological state scores between the two groups of patients

Before nursing intervention, the difference between the anxiety and depression state scores of the two groups of patients was not statistically significant ($P > 0.05$). After specialized nursing intervention, the negative psychological state of the two groups improved significantly, and the anxiety and depression scores of the observation group were lower than those of the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of negative psychological state scores of patients in two groups ($\bar{x} \pm s$, points)

Group	HAMA				HAMD			
	Pre-intervention	Post-intervention	*t*	*p*	Pre-intervention	Post-intervention	*t*	*p*
Control group (*n*=35)	27.45 ± 1.38	19.52 ± 1.58	22.364	< 0.001	26.02 ± 1.46	20.04 ± 1.19	18.783	< 0.001
Observation group (*n*=35)	27.20 ± 1.12	12.78 ± 1.53	44.992	< 0.001	25.75 ± 1.28	14.33 ± 1.26	37.616	< 0.001
t	0.832	18.130			0.823	19.491		
p	0.408	< 0.001			0.414	< 0.001		

3.3. Comparison of the excellent rate of medical compliance behavior between the two groups

The total excellent rate of patients' medical compliance behavior in the observation group was 97.14%, significantly higher than the 74.29% in the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of the total excellent rate of medical compliance behavior of patients in the two groups [(cases), %]

Group	Excellent	Excellent	Poor	Total good
Control group (*n*=35)	16(45.72)	10(28.57)	9 (25.71)	26 (74.29)
Observation group (*n*=35)	25 (71.42)	9 (25.71)	1 (2.86)	34 (97.14)
x^2				7.467
p				0.006

3.4. Comparison of the quality of life scores of patients in the two groups

The scores of psychological state, social function, somatic condition, emotional condition and other dimensions of patients in the observation group were significantly higher than those of the control group, and the difference was statistically significant ($p < 0.05$), as shown in **Table 5**.

Table 5. Comparison of quality of life scores of patients in the two groups ($\bar{x} \pm s$, points)

Group	Psychological status	Social function	Physical condition	Emotional status
Control group (*n*=35)	65.36 ± 3.28	63.56 ± 3.47	69.22 ± 2.98	68.74 ± 3.46
Observation group (*n*=35)	79.41 ± 3.65	80.06 ± 4.25	77.69 ± 3.85	81.13 ± 3.29
t	16.939	17.791	10.292	15.353
p	< 0.001	< 0.001	< 0.001	< 0.001

4. Discussion

Coronary artery disease is a narrowing or occlusion of the lumen of the coronary artery caused by atherosclerosis, which can lead to myocardial infarction, heart failure and other serious events. Although percutaneous coronary intervention (PCI) can rapidly restore patients' blood flow, the risk of post-procedural restenosis and in-stent thrombosis still exists, and patients are under long-term pressure for secondary prevention, so post-procedural care should focus on post-procedural complication monitoring, treatment adherence management, control of cardiovascular risk factors and lifestyle reconstruction [5]. However, traditional nursing care focuses on the implementation of the main medical advice, lacks standardized and individualized education, ignores the differences in patients' cognitive level and cultural background, resulting in patients not being able to actively identify potential health problems, coupled with fragmented intervention models that tend to disassociate health education, psychological support, and behavioral supervision, there is an urgent need to build a new model of nursing care that focuses on the needs of the patient [6].

Problem-Based Care (PBC) is based on the core of "accurate identification-collaborative solution-dynamic feedback", through the structured assessment tool to locate individualized health problems, and then combined with the patient's specific care needs to formulate a targeted intervention program, which is highly effective in the management of chronic disease care. It is highly effective in chronic disease care management [7]. Shao *et al.* demonstrated that PBC-based health education combined with relaxation training significantly improved anxiety/depression scores and quality of life scores of elderly patients with PCI [8]. Wang *et al.* found that a diversified PBC strategy increased patients' self-efficacy by 32.7% [9]. Based on the above research results, this study was conducted to verify the optimization effect of PBC on self-efficacy and compliance behavior of PCI patients, aiming to provide an evidence-based basis for clinical practice.

The results of the study showed that the scores of the observation group in the dimensions of role functioning and symptom management were significantly higher than those of the control group ($P < 0.05$), indicating that PBC solved the problems of patients' medication omission coping and anginal attack management through contextualized nursing care and strengthened their confidence in recovery. The anxiety/depression scores of the observation group were reduced to (12.78 ± 1.53)/(14.33 ± 1.26), which was close to the health threshold, confirming the effect of PBC on patients' self-efficacy and compliance behavior in clinical practice. The anxiety/depression score of the observation group dropped to (12.78 ± 1.53)/(14.33 ± 1.26), which was close to the health threshold, confirming the synergistic mechanism of "psychological care-relaxation training" proposed by Du [10]. The rate of good medical compliance in the observation group reached 97.14%, which was significantly higher than that of the control group that practiced routine clinical care (74.29%), due to the continuous tracking of the safety of medications and reminders of follow-up appointments by the PBC, ($P < 0.05$). In terms of social function and emotional status, the observation group had higher scores in all dimensions, which fully proved the important value of problem-oriented nursing in improving the physiological-psychological-social function of PCI patients.

Overall, the core advantages of the problem-oriented nursing model are obvious, as its timely response to patients' needs and through patients' participation in decision-making can significantly improve patients' behavioral autonomy.

5. Conclusion

In conclusion, problem-based care can significantly improve patients' self-efficacy and compliance by accurately

identifying the individualized health problems of PCI patients and constructing a collaborative intervention pathway, which can provide an efficient and scalable practice paradigm for the continuity of care in coronary intervention.

Disclosure statement

The authors declare no conflict of interest.

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