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Effects of Continuous Precision Nursing Model on Knowledge, Attitudes, and Practices (KAP) Behavior and Cardiac Function in Patients after Percutaneous Coronary Angiography and Stent Implantation

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Abstract: *Objective:* To explore the impact of a continuous precision nursing model on patients' Knowledge, Attitudes, and Practices (KAP) and cardiac function during the nursing process of patients undergoing percutaneous coronary angiography and stent implantation. *Methods:* Ninety patients who underwent percutaneous coronary angiography and stent implantation in our hospital from April 2022 to April 2023 were selected and randomly divided into the control group (45 cases), in which routine nursing support was carried out during the treatment process, and the observation group (45 cases), in which continuous precision nursing model was carried out during the treatment process. Comparisons were made between the two groups of patients on their KAP, cardiac function, and quality of life during recovery. *Results:* There was no difference in the left ventricular ejection fraction (LVEF), cardiac output (CO), and cardiac index (CI) levels before intervention. After the intervention, the levels of cardiac function in the observation group were higher than those of the control group ($P < 0.05$). There was no difference in the Exercise of Self-Care Agency (ESCA) self-care ability scale scores before the intervention. After the intervention, the observation group had higher ESCA scores than the control group ($P < 0.05$). *Conclusion:* Implementation of a continuous precision nursing model in the care of patients undergoing percutaneous coronary angiography and stent implantation improved the patient's cardiac function, and KAP, and promoted recovery.

Keywords: Continuous precision nursing model; Percutaneous coronary angiography; Stent implantation; Knowledge, attitudes, and practices (KAP); Cardiac function

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1. Introduction

Percutaneous coronary angiography and stent implantation are common interventional treatments in cardiology. They maintain a very high implementation rate in the treatment of heart diseases. With the continuous

improvement of surgical methods in the clinical treatment of coronary heart disease (CHD) and other heart diseases, the treatment efficiency of such diseases has greatly improved. This procedure is less invasive and has faster postoperative recovery. However, based on clinical feedback, it was observed that some patients lack a comprehensive understanding of the symptom characteristics and subsequent treatment during the recovery process. Their irrational behavior and other factors will affect the recovery of cardiac function and reduce the patient's quality of life during the recovery period [1,2]. Therefore, during the care of these patients, it is necessary to provide continuous and effective nursing support during the postoperative recovery period to help patients improve their knowledge, compliance, and cardiac function. This study explored the role of this nursing model in improving cardiac function and the knowledge, attitude, and practices (KAP) of patients undergoing percutaneous coronary angiography and stent implantation.

2. Materials and methods

2.1. General information

From April 2022 to April 2023, 90 patients who underwent percutaneous coronary angiography and stent implantation in our hospital were selected and randomly divided into the control group (45 cases), in which routine nursing support was carried out during the treatment process, and the observation group (45 cases), in which continuous precision nursing model) was carried out during the treatment process. Comparisons were made between the two groups of patients on their KAP, cardiac function, and quality of life during recovery. This study complied with the requirements of the Declaration of Helsinki.

Inclusion criteria: (1) Patients who meet the diagnostic criteria for CHD according to the Guidelines for the Diagnosis and Treatment of Coronary Heart Disease (2nd Edition) [3] (2) patients without other cardiovascular diseases (3) patients who can communicate normally (4) patients over 60 years old (5) patients with no history of surgery in the past six months. Exclusion criteria: (1) Patients with impaired liver and kidney function (2) patients with coagulation disorders (3) patients who do not follow the doctor's instructions in taking medication (4) patients with incomplete clinical data.

2.2. Methods

2.2.1. Control group

During the postoperative recovery process, the nursing staff in the control group provided all aspects of support according to the routine nursing model, accurately assessed the changes in various patient indicators, and provided routine nursing services.

2.2.2. Observation group

During the postoperative recovery period, the observation group carried out a continuous precision nursing model based on the nursing care of the control group. A nursing team was established with the head nurse of the Department of Cardiology serving as the leader and five other personnel with more than 3 years of nursing experience were selected as members. Every week, the team focused on publicizing and implementing the characteristics of the continuous precision nursing model and emphasized the details that required attention during the implementation process. Continuing care files were established for patients who met the conditions for discharge. All aspects of the patient's information, including the patient's recovery status when discharged, follow-up treatment plans, and the patient's awareness of their illness, etc. were recorded. The patient's living environment, daily eating habits, and life patterns were also taken into consideration. Precision nursing support was provided to patients at least twice a week, covering multiple dimensions such as the patient's daily diet,

medication, and psychological state. The continuous precision nursing intervention included several aspects. (1) An online and offline follow-up platform was established and weekly telephone interviews were conducted to understand the patient's recovery status and behavior during recovery. An online nursing communication channel using WeChat was established to maintain good nurse-patient communication to accurately assess patient needs, and guide patients to improve or complete their treatment. (2) Most patients lack a comprehensive understanding of the characteristics of their symptoms and the available treatment options. The WeChat platform can be utilized to accurately explain to patients the symptom characteristics and treatment methods using photos for easy understanding, and inform patients of the details they need to pay attention to during subsequent recovery. Patients were also encouraged to follow the hospital's WeChat public account. Nursing staff also regularly updated knowledge about the disease and related conditions during recovery to enhance patient awareness. (3) Exercise was actively carried out to promote recovery. Exercise methods should be formulated based on the patient's specific condition, such as walking or Tai Chi, and patients should be encouraged to exercise daily for more than 30 minutes. (4) A diet plan was formulated during recovery based on the patient's dietary preferences and eating habits. Recommended foods are mainly low-fat and low-sugar, along with the increased intake of fresh vegetables and fruits to improve the patient's physical condition and enhance immunity. Patients with smoking and drinking habits were advised to stop during the recovery period. (5) A daily health management record sheet was developed for each patient, which involved all aspects of the patient's daily life. Patients were required to check the boxes based on their completion status daily and provide timely feedback to the hospital nursing staff through WeChat. With this, the patient's family members were guided on how to participate in continuous precision care, and follow-up care measures were formulated.

2.3. Observation indicators

The cardiac function levels between the two groups of patients were compared. Statistics and comparisons were made on the improvement of left ventricular ejection fraction (LVEF), cardiac output (CO), and cardiac index (CI) between the two groups during the recovery process. According to the exercise of self-care agency (ESCA) scale, the self-care responsibility, health knowledge mastery, and nursing skills of the two groups of cases were evaluated before and after the intervention.

2.4. Statistical methods

Statistical analysis was carried out using the SPSS 20.0 software. The ESCA score, quality of life score, and other measurement data were expressed as mean ± standard deviation. The data were compared and analyzed using the *t*-test and chi-squared (χ^2) test. Count data were expressed as %. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Comparison of basic information between the two groups

As shown in **Table 1**, the statistics and comparisons of sex ratio, age, and other indicators between the two groups showed no significant difference ($P > 0.05$).

Table 1. Comparison of general information between the two groups [mean ± standard deviation / *n* (%)]

Group	Cases, *n*	Gender		Age (year)	Duration of disease (years)
		Male	Female		
Observation group	45	24 (53.33)	21 (46.67)	61.52 ± 1.78	3.15 ± 1.25
Control group	45	25 (55.56)	20 (44.44)	6 1.72 ± 1.86	3.14 ± 1.35
t/χ^2		0.725		0.558	0.725
P		0.625		0.305	0.515

3.2. Comparison of cardiac function levels between the two groups

As shown in **Table 2**, there was no significant difference in the cardiac function levels of both groups before intervention ($P > 0.05$). After the intervention, the cardiac function levels of the observation group were higher than those of the control group ($P < 0.05$).

Table 2. Comparison of cardiac function levels between the two groups (mean ± standard deviation)

Group	Cases, *n*	LVEF (%)		CO (L/min)		CI (min/m^2)	
		Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Observation group	45	49.73 ± 2.15	55.15 ± 2.25	3.61 ± 0.35	5.21 ± 0.25	2.78 ± 0.41	4.11 ± 0. 21
Control group	45	49.58 ± 2.05	51.35 ± 2.11	3. 68 ± 0.28	4.11 ± 0.25	2.81 ± 0.39	3.18 ± 0.21
t	-	1.168	8.425	1. 253	10.105	1. 145	12.427
P	-	0.478	0.001	0.748	0.001	0.147	0.001

3.3. Comparison of self-management behaviors between the two groups

As shown in **Table 3**, when comparing the self-management behavior scores of the two groups during the recovery period, there was no difference between the two groups before the intervention in terms of self-care responsibility, health knowledge mastery, and nursing skills ($P > 0.05$). After nursing, the observation group's three-dimensional behavioral scores were higher than the control group's ($P < 0.05$).

Table 3. Comparison of self-management behaviors between the two groups (mean ± standard deviation)

Group	Cases, *n*	Self-care responsibility		Health knowledge mastery		Nursing skills	
		Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Observation group	45	28.85 ± 2.25	39 .1 8 ± 2.7 4	22.51 ± 2.05	36 .4 7 ± 2.0 1	14 .4 8 ± 2. 21	23.44 ± 2.1 7
Control group	45	28.85 ± 2.17	31.87 ± 2.51	23.01 ± 2.44	31.67 ± 1.87	15.12 ± 2.44	17.11 ± 2.41
t	-	1.052	13.105	1.152	15.117	1.142	11.425
P	-	0.624	0.001	0.564	0.001	0.564	0.001

4. Discussion

CHD is the most common cardiovascular disease in clinical practice with a high incidence rate among middle-aged and older adults. Atherosclerosis in the coronary arteries, abnormal narrowing of the blood vessel lumen, and occlusion are the main characteristics of CHD patients, which increase the risk of myocardial ischemia and hypoxia. The pathogenesis of CHD is relatively complex and is related to the patient's diet and lifestyle

habits [4,5]. In CHD, coronary blood supply and oxygen supply are insufficient to meet the needs for myocardial metabolism, and coronary blood flow is abnormally reduced, which can result in myocardial ischemia or myocardial necrosis [6,7]. Clinical treatment of CHD is mainly percutaneous coronary angiography and stent implantation. Still, it takes time for patients to recover after surgery and the recovery of the patient's damaged cardiac function is related to their daily behavior and habits [8,9]. Based on routine nursing care, it is necessary to comprehensively evaluate all aspects of the patient's condition to implement targeted support and improve the patient's knowledge, belief, and compliance to ultimately promote patient recovery.

The continuous precision nursing model is a new model of clinical care for patients with chronic diseases. It aims to provide patients with precise nursing support during recovery, correct patients' wrong self-care behaviors, and avoid unwanted consequences. The development of a continuous precision nursing model based on the knowledge and behavior of patients undergoing percutaneous coronary angiography and stent implantation can enhance the specificity of the nursing intervention [10]. All aspects of the patient's behavior and needs should be assessed to provide precise continuing care support online and offline. Care support can be provided from multiple dimensions, including diet, exercise, and cognition, to improve the patient's recovery. In this study, the observation group's self-management behavior score during the recovery process was significantly higher than that of the control group, confirming that the continuous precision nursing model helped patients have a clearer understanding of the problems that need to be addressed during the recovery period. In addition, precise continuous nursing support in various dimensions established an effective foundation for fast recovery of the patient's cardiac function. The cardiac function in the observation group during recovery was higher than in the control group, indicating that the continuous precision nursing model could effectively promote a patient's cardiac function recovery.

5. Conclusion

The continuous precision nursing model improved patients' knowledge, behavior, and cardiac function levels during post-operative care for patients who underwent percutaneous coronary angiography and stent implantation.

Disclosure statement

The author declares no conflict of interest.

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