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Original Article

Application of diversified nursing in percutaneous transluminal coronary intervention and its effect on negative emotions

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Abstract: Objective: To explore the application of diversified nursing in percutaneous transluminal coronary intervention (PCI) and its effect on negative emotions. Methods: A total of 110 patients who underwent PCI were selected as subjects and divided into observation group (n = 55) and control group (n = 55) according to the random number table method. Patients in control group received routine nursing, and patients in observation group took a diversified nursing based on routine nursing. Psychological status, quality of life, health function, self-care ability and satisfaction of patients in the two groups were compared. Results: Compared with pre-nursing, the self-rating anxiety scale (SAS) and self-rating depression scale (SDS) scores in the 2 groups were significantly lower after nursing ($P < 0.001$), and the scores in observation group were significantly lower than those in control group ($P < 0.01$). Compared with pre-nursing, the World Health Organization quality of life (WHOQOL) scores in the 2 groups were significantly increased after nursing ($P < 0.001$), and the scores in observation group were significantly higher than those in control group ($P < 0.01$). Compared with pre-nursing, the scores of sleep, social psychology, housekeeping, physical function and communication were significantly lower in the 2 groups after nursing ($P < 0.001$), and the scores in observation group were significantly lower than those in control group ($P < 0.01$). Compared with pre-nursing, the self-care responsibility, self-concept, health knowledge level and self-care skill scores in the 2 groups were significantly higher after nursing ($P < 0.001$). The satisfaction in the observation group was significantly higher than that in the control group ($P < 0.05$). Conclusion: Diversified nursing for patients undergoing PCI can significantly alleviate their negative emotions and improve their health functions, quality of life, self-care ability, and satisfaction with nursing. Therefore, it is worthy of clinical application.

Keywords: Percutaneous transluminal coronary intervention, diversified nursing, emotions, quality of life, health function

Introduction

Clinical studies have shown that coronary atherosclerotic heart disease has become a common cardiovascular disease. The main pathogenesis is the occurrence of atherosclerosis in the coronary arteries, which makes the blood vessels narrow and even be blocked and finally induces a series of clinical manifestations such as myocardial ischemia and hypoxia, seriously affecting the quality of life of patients and their families [1-3]. Nowadays, with the rapid development of medical technology, percutaneous transluminal coronary intervention (PCI) has become a practical and effective method for the treatment of coronary atherosclerotic heart disease. Although PCI has the characteristics of less trauma and better effect, it is still an invasive treatment, and its potential risks cannot be underestimated. Some study has found that about 65.8%-79.4% of patients do not understand the treatment process and effect of PCI, and then there is a high degree of tension, anxiety, which is not conducive to postoperative recovery [4]. In addition, the gradual improvement of the nursing effect and treatment quality requirements of patients at this stage makes the difficulty of clinical nursing work significantly increase [5].

In the past, patients undergoing PCI were more likely to be treated with routine nursing. How-

ever, this nursing model has a wide range of audiences and is universal. It is often implemented according to doctor's advice and lacks effective communication between nurses and patients, so some patients do not receive targeted care and will still have psychological problems such as anxiety, irritability and depression during the postoperative treatment, resulting in poor overall efficacy. At present, with the continuous transformation of medical model, the concept of clinical nursing work has also changed from "disease-centered" to "patient-centered". In addition, patient's awareness and nursing needs are gradually improving, which has prompted the role and function of nurses to gradually diversify, and the accompanying nursing work has been given a variety of content [6, 7]. There are clinical reports that diversified nursing combines different cultural backgrounds, living conditions, disease status, and nursing needs, so that patients can receive comprehensive and overall care in a strange environment and maintain their psychological and physiological balance to the greatest extent [8]. Some scholars have found that, on the one hand, diversified nursing can help maintain the relationship between doctors and nurses and patients, reduce the incidence of iatrogenic shocks; on the other hand, it helps to maintain a good medical environment and civilized etiquette [9]. Foreign research results suggest that diversified nursing mode can play an active role in elderly patients with chronic cardiovascular disease, which is conducive to patients with negative emotions such as anxiety and irritability [10]. At this stage, there are few applications of diversified nursing in patients who have undergone PCI. This study aimed to explore the application of diversified nursing in patients who had undergone PCI and its impact on patients' psychological status, quality of life, and health function.

Materials and methods

General information

A total of 110 patients who underwent PCI in Quanzhou First Hospital Affiliated to Fujian Medical University from August 2017 to January 2019 were included in the study. All participating patients were divided into 2 groups according to the random number table: the observation group (n = 55) and the control group (n = 55). Inclusion criteria: i. those over 18 years of age; ii. those who had no contraindications for PCI; iii. those with hemodynamic stability; iv. those with complete clinical data; v. those without cognitive dysfunction; vi. those who could communicate effectively. Exclusion criteria: i. those who withdrew from the study; ii. those with poor compliance; iii. those with severe chronic physical disease; iv. those with malignant tumor; v. those whose important organs such as heart, brain, liver, kidney were accompanied by severe diseases. The study was approved by the Medical Ethics Committee of Quanzhou First Hospital Affiliated to Fujian Medical University, and both participants and their families signed the informed consent.

Methods

Both groups of patients were first given routine nursing, including telling them about the main purpose, operation methods and precautions of PCI according to the doctor's advice. At the same time, patients were advised to avoid ingestion of food and water 8 hours before surgery and use anticoagulation and anti-platelet aggregation drugs 1 day before surgery. Patients were also guided to urinate and defecate after surgery. During the period, we paid attention to the changes in vital signs of patients, told patients to stay in bed for 24 hours after surgery and drink more water to speed up the excretion of contrast agents.

Patients in observation group were given a diversified nursing based on the control group. The specific measures were as follows: i. Health education guidance. Before diversified nursing, the nursing staff should first define patient's understanding of the relevant knowledge, and then develop a targeted health education instruction manual. The main content could be related to the treatment of emergency cardiac events, prevention and control of disease risk factors, correct guidance for later rehabilitation exercises and others. At the same time, patients were organized to participate in knowledge lectures, watch related videos, train bedside behaviors, etc. once per week. ii. Rehabilitation exercise guidance. When the condition of patient was stable 24 hours after surgery, patients were instructed to perform passive exercise such as turning over and sitting. Three days later, targeted rehabilitation exercise was carried out according to patient's self-conscious fatigue and exercise intensity evaluation re-

sults. The specific exercise included jogging, aerobics, Tai Chi and others. The initial exercise time was 4 times per week, 1 hour each time. After 4 weeks of training, patient's amount of exercise was evaluated again, and the exercise load was gradually increased to achieve cardiac function capacity. After patients were discharged from the hospital, they were asked to complete quantitative rehabilitation exercise on a regular basis and conduct regular reexamination monthly. iii. Mental health guidance. Nursing staff developed targeted psychological nursing measures according to psychological anxiety, depression and condition of patients, including PCI treatment methods, curative effect and prognosis, to reduce the psychological burden of patients, and told patients successful cases to improve patients' confidence in treatment. At the same time, the nursing staff also communicated with the patient frequently and comfort the patient. During the period, patients could use relaxation therapy such as deep breathing and listening to music to relieve their negative emotions to the greatest extent. iv. Behavior monitoring according to the doctor's advice. Relevant nursing staff should record the patient's daily diet, rehabilitation exercise and medication in detail and make timely assessment, correction and encouragement.

Observation index and clinical efficacy evaluation

Self-rating anxiety scale (SAS) [11] and self-rating depression scale (SDS) [12] were used to evaluate the changes of psychological status of the 2 groups before and after nursing. The higher the score, the more severe the anxiety and depression state of the patient became. The quality of life of the 2 groups of patients before and after the treatment was evaluated by World Health Organization quality of life (WHOQOL) [13]. The scale involved physiological field, psychological field, social relationship field, and environmental field. The full score was 35 points, and the higher the score, the better the quality of life. The degree of health function of the 2 groups of patients before and after 2 months of care was evaluated using the sickness impact profile (SIP) [14]. The full score was 100 points, and the scale was mainly related to sleep, social psychology, housekeeping, physical function and communication. The higher the scores, the more severe the loss of health became. Self-care ability of the 2 groups of patients before and after 2 months of care was evaluated by the exercise of self-care agency scale (ESCA), which involved self-care responsibility, self-concept, health knowledge level and self-care skills. The full score was 172 points, and the higher the scores, the stronger the patient's self-care ability. Nursing satisfaction: The self-made satisfaction rating scale was used to evaluate the satisfaction of the nursing effect. The scale included evaluations of nursing staff, nursing measures, psychological care, and the entire nursing process. The total score was 100 points, of which more than 85 was satisfied, 70-84 was acceptable, less than 70 was dissatisfied. Satisfaction = (Satisfied + Acceptable) * number of patients/total number of patients * 100%.

Statistical analysis

SPSS 22.0 software (Asia Analytics Formerly SPSS, China) was used for statistical analysis. The measurement data obeying normal distribution by the D test were expressed as mean ± standard deviation ($\bar{x}$ ± sd). Paired t-test was used to compare before and after nursing in the group, and independent sample t-test was used to compare between the two groups, denoted by t. The enumeration data were expressed as number of patients/percentage (n, %) and were compared by χ^2 test, denoted by χ^2. $P < 0.05$ was considered statistically significant.

Results

Comparison of clinical data

There were no significant differences in the main clinical baseline data, such as gender, age, average disease duration, comorbidities, and disease classification, between the 2 groups ($P > 0.05$), and the comparative analysis between groups of the study could continue. See **Table 1**.

Comparison of psychological status before and after nursing

There were no significant differences in the psychological status between the 2 groups before nursing ($P > 0.05$). Compared with pre-nursing, the SAS and SDS scores of the 2 groups were significantly lower after nursing ($P < 0.001$), and the scores in the observation group were

Table 1. Comparison of clinical data

	Observation group (n = 55)	Control group (n = 55)	t/χ^2	P
Gender (n)			0.146	0.702
Male	28	30		
Female	27	25		
Age (year)	49.4 ± 2.5	49.7 ± 2.8	0.593	0.555
Average BMI (kg/m^2)	20.11 ± 3.14	20.36 ± 2.88	0.435	0.664
Average disease duration (years)	2.12 ± 0.22	2.11 ± 0.24	0.228	0.820
Comorbidities			0.412	0.938
Hypertension	4	5		
Diabetes	6	5		
Hyperlipidemia	5	7		
Others	8	9		
Disease classification			0.338	0.953
Angina pectoris	10	11		
Acute myocardial infarction	20	22		
Old myocardial infarction	15	13		
Others	10	9		

Note: BMI: body mass index.

Table 2. Comparison of psychological status before and after nursing ($\overline{x}$ ± sd)

Group	Time	SAS	SDS
Observation group (n = 55)	Before nursing	52.66 ± 8.03	52.75 ± 8.25
	After nursing	31.12 ± 7.08$^{**,\#\#\#}$	34.19 ± 7.14$^{**,\#\#\#}$
Control group (n = 55)	Before nursing	52.69 ± 8.11	52.74 ± 8.33
	After nursing	41.49 ± 7.24$^{\#\#\#}$	45.87 ± 8.30$^{\#\#\#}$

Note: In comparison with control group, $^{**}P < 0.01$; in comparison with before nursing within group, $^{\#\#\#}P < 0.001$. SAS: self-rating anxiety scale; SDS: self-rating depression scale.

significantly lower than those in the control group (P < 0.01). See **Table 2**.

Comparison of quality of life before and after nursing

There was no significant difference in the quality of life between the 2 groups before nursing (P > 0.05). Compared with pre-nursing, the WHOQOL scores of the 2 groups were significantly higher after nursing (P < 0.001), and the scores in the observation group were significantly higher than those in the control group (P < 0.01). See **Table 3** and **Figure 1**.

Comparison of health function levels before and after nursing

There was no significant difference in the degree of health function between the 2 groups before nursing (P > 0.05). Compared with pre-nursing, the scores of sleep, social psychology, housekeeping, physical function and communication were significantly lower in the two groups after nursing (P < 0.001), and the scores in the observation group were significantly lower than those in the control group (P < 0.01). See **Table 4**.

Comparison of self-care ability before and after nursing

There was no significant difference in the self-care ability between the 2 groups before nursing (P > 0.05). Compared with pre-nursing, the self-care responsibility, self-concept, health knowledge level and self-care skill scores of the 2 groups were significantly higher after nursing (P < 0.001), and the scores in the observation group were significantly higher than those in the control group (P < 0.01). See **Table 5**.

Comparison of satisfaction

The satisfaction of the observation group was significantly higher than that of the control group, and the difference was statistically significant (P < 0.05). See **Table 6**.

Discussion

At this stage, PCI is one of the effective methods for the treatment of coronary atherosclerotic heart disease. It mainly uses cardiac catheter technology to effectively clear the occluded blood vessels to relieve myocardial blood perfusion. Although PCI has the advantages of less trauma and quick recovery after surgery, the patient has high tension and anxiety during the perioperative period due to the lack of understanding of the treatment process or treatment effect, which is not conducive to postoperative recovery. Clinical study has found

Table 3. Comparison of quality of life before and after nursing ($\bar{x}$ ± sd)

Group	Time	WHOQOL
Observation group (n = 55)	Before nursing	16.67 ± 4.11
	After nursing	30.12 ± 2.17**,###
Control group (n = 55)	Before nursing	16.64 ± 4.33
	After nursing	21.68 ± 3.01###

Note: In comparison with control group, **P < 0.01; in comparison with before nursing within group, ###P < 0.001. WHOQOL: World Health Organization quality of life.

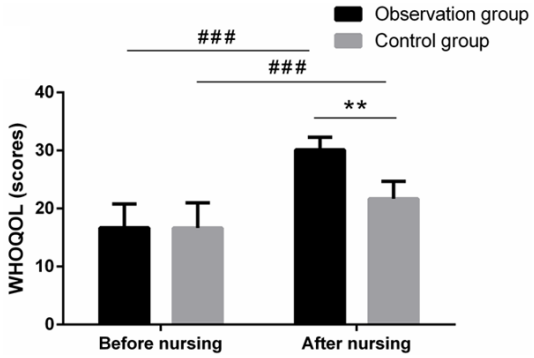

Figure 1. Comparison of quality of life before and after nursing. In comparison with control group, **P < 0.01; in comparison with before nursing within group, ###P < 0.001. WHOQOL: World Health Organization quality of life.

that approximately 23.33% to 88.64% of patients experience anxiety and depression before surgery, and the proportion of irritability and anxiety before PCI is as high as 74.1% [15]. A study has confirmed that the sympathetic nervous system of patients before PCI is in an excited state, which can cause the body to release excessive amounts of catecholamines, further promote coronary spasm and aggravate the symptoms of myocardial ischemia, resulting in poor prognosis and significantly lowered quality of life [16].

At present, with the improvement of the concept of nursing and continuous requirements for quality of care, the diversified nursing model has provided patients with targeted, holistic and comprehensive nursing services on the basis of traditional nursing, and exerted nursing functions to the utmost extent to improve the patient's mental state and quality of life. A clinical report that divided stroke patients into diversified nursing group and routine nursing group during treatment showed that the negative emotions of 85.47% of patients in the diversified nursing group were significantly relieved, and the motor function and quality of life of 88.79% of patients in the diversified nursing group were significantly improved as compared to routine nursing group [17]. The results of this study showed that the SAS and SDS scores of the 2 groups after nursing were significantly lower than those before the nursing, and the scores in the observation group were significantly lower than those in the control group. At the same time, the WHOQOL scores of the 2 groups after nursing were significantly higher than those before the nursing, and the scores in the observation group were significantly higher than those in the control group. It showed that the use of diversified nursing could significantly alleviate the psychological state of anxiety and depression in patients who had undergone PCI, and it was conducive to the improvement of patients' quality of life. Diversified nursing was based on the individual patient's condition, which encouraged the patient to be active and highly compliant in the whole treatment stage. The good behavioral mode generated by subjective initiative could obtain effective feedback through the sympathetic nervous system and keep the patient in a positive attitude, maximizing the prognosis.

Some scholars have found that postoperative rehabilitation exercise is beneficial to the coronary collateral circulation of the body, and to improve myocardial blood supply, maximize cardiac function and reduce the incidence of postoperative deep vein thrombosis. Especially for patients with coronary atherosclerotic heart disease who are suffering from prolonged illness and different degrees of depression and irritability, postoperative rehabilitation exercise can greatly improve the self-care ability of patients, reduce the incidence of postoperative complications, and improve the health function of the body [18, 19]. The results of this study showed that the scores of health function of the 2 groups after nursing were significantly lower than those before the nursing, and the scores of self-care ability were significantly increased; the difference between the 2 groups was significant and satisfaction of the observation group was significantly higher than that

Table 4. Comparison of health function levels before and after nursing

Group	Time	Sleep	Social psychology	Housekeeping	Physical function	Communication
Observation group (n = 55)	Before nursing	30.15 ± 4.08	28.09 ± 3.15	15.31 ± 2.01	22.58 ± 4.66	12.11 ± 3.79
	After nursing	14.79 ± 2.88$^{**,\#\#\#}$	13.37 ± 3.64$^{**,\#\#\#}$	8.44 ± 1.03$^{**,\#\#\#}$	9.76 ± 1.05$^{**,\#\#\#}$	5.33 ± 0.87$^{**,\#\#\#}$
Control group (n = 55)	Before nursing	30.13 ± 4.06	28.41 ± 3.12	15.35 ± 1.98	22.63 ± 4.54	12.15 ± 4.02
	After nursing	22.17 ± 3.14$^{\#\#\#}$	20.44 ± 4.86$^{\#\#\#}$	10.03 ± 1.15$^{\#\#\#}$	14.11 ± 3.86$^{\#\#\#}$	9.02 ± 0.11$^{\#\#\#}$

Note: In comparison with control group, $^{**}P < 0.01$; in comparison with before nursing within group, $^{\#\#\#}P < 0.001$.

Table 5. Comparison of self-care ability before and after nursing

Group	Time	Self-care responsibility	Self-concept	Health knowledge level	Self-care skills
Observation group (n = 55)	Before nursing	18.15 ± 5.73	17.09 ± 3.77	23.31 ± 5.36	28.03 ± 4.25
	After nursing	34.79 ± 5.30$^{**,\#\#\#}$	36.37 ± 4.12$^{**,\#\#\#}$	48.62 ± 6.52$^{**,\#\#\#}$	41.98 ± 3.82$^{**,\#\#\#}$
Control group (n = 55)	Before nursing	18.17 ± 5.81	17.11 ± 3.69	23.35 ± 5.18	27.99 ± 4.36
	After nursing	25.02 ± 5.18$^{\#\#\#}$	25.44 ± 4.92$^{\#\#\#}$	34.03 ± 7.08$^{\#\#\#}$	33.15 ± 3.44$^{\#\#\#}$

Note: In comparison with control group, $^{**}P < 0.01$; in comparison with before nursing within group, $^{\#\#\#}P < 0.001$.

Table 6. Comparison of satisfaction

Group	Satisfied (n)	Acceptable (n)	Dissatisfied (n)	Satisfaction (n, %)
Observation group (n = 55)	38	12	5	50 (90.91)
Control group (n = 55)	29	13	13	42 (76.36)
χ^2				4.251
P				0.039

of the control group. It showed that diversified nursing for patients underwent PCI could contribute to the improvement of their self-care ability and health function. Diversified nursing through health education, psychological counseling, rehabilitation training and music therapy throughout the treatment stage could improve the patient's mental state and exert different degrees of sedative and pain-reducing effects, thereby maximizing the patient's psychological mood stabilization and improving their enthusiasm and compliance to treatment [20, 21]. However, the number of samples in this study was limited, and the exact mechanism of the impact of diversified nursing on the level of health function still needs to be studied in large-scale and multi-center studies in the future.

In summary, diversified nursing for patients underwent PCI can significantly improve their anxiety, depression and other negative emotions and contribute to the improvement of their self-care ability and health function. Diversified nursing has a good overall effect and high satisfaction, which is worthy of clinical application.

Disclosure of conflict of interest

None.

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