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ORIGINAL RESEARCH

Observation on the Application Effect of Stressor Perception and Response Meticulous Nursing in the Perioperative Period of Acute Myocardial Infarction

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ABSTRACT

Objective • To investigate the clinical value of stressor perception-based meticulous nursing measures during the perioperative period of percutaneous coronary intervention (PCI) in patients with acute myocardial infarction (AMI).

Methods and Design • A prospective randomized trial was conducted involving 104 AMI patients undergoing PCI from March 2021 to March 2022. Patients were divided into an "intervention group" and a "routine group" based on consultation numbers, with equal cases in each group. PCI procedures were performed by the same group of doctors in both groups and that basic treatment measures were similar.

Intervention and Comparison • The intervention group received meticulous nursing measures based on stressor perception during the perioperative period, while the routine group received standard care.

Outcome measures • The study compared treatment effects, perioperative sleep quality, negative emotion scores, and perioperative complication rates between the two groups.

Results Overview • The patients in the intervention group and the conventional group were statistically similar in terms of operative time, X-ray fluoroscopy time, contrast agent dosage, catheter lab nurse preparation time, catheter lab-balloon dilation time, portal-ball time, and PCI success rate ($P > .05$). In the post-PCI assessment of negative emotions in both groups, the total scores of depression, anxiety, extroverted irritability, and negative emotion scores in the intervention group were higher than those in the routine group ($P < .05$). In the post-PCI assessment of sleep quality in both groups, subjective sleep quality score, sleep delay score, and total PSQI score in the intervention group were lower than those in the routine group ($P < .05$). The rate of surgical complications was 7.69% in the intervention group and 15.38% in the routine group, and the differences between the two groups were not statistically significant ($P > .05$).

Conclusion • While meticulous nursing measures based on stressor perception did not notably enhance the effectiveness of PCI, they did significantly improve patients' negative emotions and sleep quality. (*Altern Ther Health Med.* 2024;30(1):63-67).

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INTRODUCTION

Acute myocardial infarction (AMI) has a high morbidity and mortality rate.[1,2] Percutaneous Coronary Intervention (PCI) is a minimally invasive and effective treatment method for AMI.[3-5] While PCI is effective, postoperative regression is complex and requires clinical interventions to enhance patient prognosis.[6,7] Stressor is a general term for factors that cause the body to respond adaptively to various internal and external stimuli.[8] Stressors include various types of work, living and physical environments, as well as changes in psychological and physical status.[9] Severe stressors can impede disease regression and negatively affect patient outcomes. Patients with cardiovascular diseases, including AMI, are particularly susceptible to stressors due to their medical conditions.[10,11] AMI patients suffer from pain and psychological stress, which seriously affects their quality of life. In addition, they feel unfamiliar with their surroundings when admitted to the hospital for surgery, thus may experience negative emotions such as anxiety, irritability, and disappointment, which in turn generate more stressors. The adverse reactions triggered by the stressors can directly affect the quality of perioperative treatment, thus forming a vicious

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Table 1. Comparison of Baseline Data of Two Groups

Group	n	Age (years)	BMI (kg/m²)	Gender (%)		Smoking (%)	Drinking (%)	Hypertension (%)	Diabetes (%)	Hyperlipidemia (%)
				Male	Female					
Intervention group	52	64.0±7.0	24.09±1.85	33(63.46)	19(36.54)	24(46.15)	26(50)	29(55.77)	16(30.77)	34(65.38)
Routine group	52	62.9±7.4	24.34±2.01	28(53.85)	24(46.15)	16(30.77)	20(38.46)	33(63.46)	21(40.38)	28(53.85)
t/χ^2		0.779	-0.660	0.991		2.600	1.403	0.639	1.049	1.438
P value		0.438	.511	.319		.107	.236	.424	.306	.230

Group	n	Infarct site(%)			Number of implanted stents (pieces)	NYHAgrade(%)	
		Anterior wall of the heart	Lower wall of heart	Lateral wall of heart		I grade	II grade
Intervention group	52	22(42.31)	18(34.62)	12(23.08)	1.32±0.51	12(23.08)	40(76.92)
Routine group	52	25(48.08)	19(36.54)	8(15.38)	1.18±0.40	6(11.54)	46(88.46)
t/χ^2		1.019			1.558	2.419	
P value		.601			.122	.120	

circle.[12,13] However, standard nursing practices during the perioperative period of PCI for AMI do not currently focus on addressing stressors. Care measures based on the perception of stressors can help improve patients' fear of the disease and improve compliance with treatment.[14] Therefore, this study considered that interventions for stressors in AMI patients undergoing PCI are expected to improve patients' perioperative quality of life. This study aims to explore the clinical value of meticulous nursing care for stressor perception during the perioperative period of PCI in AMI patients. This study involves comparing conventional nursing interventions in one group and meticulous nursing measures based on stressor perception in another group. The aim is to assess the differences in nursing outcomes and evaluate the potential benefits of stressor-focused nursing care.

PATIENTS AND METHODS

Study Design and Population

A prospective randomized trial of 104 patients with AMI to be treated with PCI admitted to our hospital from March 2021 to March 2022 was selected. They were divided into the intervention group and the routine group according to whether the order of the consultation number was odd or even, with 52 cases in each group.

There was no statistically significant difference between the intervention group and the conventional group of AMI patients in all aspects of the underlying data, and the two groups were well balanced ($P > .05$). See Table 1. This study was approved by the ethical committee of our hospital.

Inclusion and Exclusion Criteria

Inclusion criteria: (1) the diagnostic criteria of AMI patients refer to the diagnostic criteria of AMI in the eighth edition of *Internal Medicine*, the People's Health Publishing House.[15] The clinical manifestations of angina pectoris are pressure-like pain in the precordial region and retrosternal area, accompanied by profuse sweating, a sense of imminent death and suffocation, the inability to relieve symptoms with nitroglycerin tablets. The typical manifestations such as pathological Q waves, ST-segment elevation, or pathological ST-segment depression can be found on electrocardiography, and increased CK-MB and cTnI can be found on myocardial enzymatic indexes;(2) the infarcted criminal vessel is confirmed by coronary angiography; (3) the patient's age range is 45-75 years; (4) the cardiac function (NYHA) classification is ≤ grade II;[16] (5) the time interval between the patient's onset and admission does not exceed 24 h; (6) the study protocol should conform to medical ethics regulations and obtain informed consent from the patient's family.

Exclusion criteria: (1) patients comorbid with malignancy; (2) previous history of pacemaker implantation, valvular heart disease, and myocarditis; (3) history of cerebrovascular disease within the last 3 months; (4) psychiatric disease, Alzheimer's disease, etc.; (5) comorbid with other major systemic diseases, etc.

PCI Treatment Measures

The right radial artery was punctured, a 5F shared Tig contrast catheter was placed, and coronary angiography was performed. The non-offender and offender vascular sides were found, and the offender vascular side was treated with PCI according to the angiographic results.

To prevent the formation of emboli, intraoperatively, heparin (produced by Beijing Tobixi Pharmaceutical Co., Ltd., specification 2 ml: 12500 u, State Drug Administration H20043741) was given at a dose of 100 u/kg, with an additional 1000 u every hour. The radial artery sheath was removed and hemostasis was performed immediately after the procedure.

Nursing Interventions

Routine group: The intervention in this group focused on the treatment of the patients, combined with the prescriptions issued by the physicians, and provided the patients with routine medication guidance and health education.

The intervention group used meticulous care measures for nursing based on perception of stressors in the perioperative period. The specific measures were as follows.

(1) reduce stressors related to the environment and to the change of role. Specifically included: a) Take the initiative to introduce the ward environment to the patients so they can adapt to the new environment as soon as possible. b) The identification of patients, take the initiative to coordinate the relationship of patients in the same ward, so that patients in the conditions of mutual acceptance and mutual respect to fight against disease. c) To introduce doctors and nurses and ward-related medical and nursing characteristics to the patients to establish a communication channel between the patient and the medical staff.

(2) reduce stressors related to the behavior of medical staff. Workers should respect the rights and dignity of

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Table 2. Comparison of PCI Process and Effect Indexes between the Two Groups

Group	n	Operative time (min)	X-ray time (min)	Contrast agent dosage (mL)	Catheter lab nurse preparation time (min)	Catheter Lab - Balloon Dilation Time (min)	Portal-ball time (min)	PCI success rate (%)
Intervention group	52	31.77±6.80	10.68±2.44	78.91±9.83	42.09±6.11	53.48±5.12	72.47±5.59	50(96.15)
Routine group	52	33.05±7.18	11.24±2.51	80.50±10.41	41.67±5.84	51.66±6.40	71.80±6.24	48(92.31)
t/χ^2		-0.933	-1.154	-0.801	0.358	1.601	0.577	0.707
P value		.353	.251	.425	.721	.112	.565	.400

patients and pay attention to their own words and actions. Nursing staff need to lower their voices and reduce their movements to avoid disturbing patients' rest during nighttime ward rounds. When first contacting a patient, they should take the initiative to introduce themselves to the patient and ask if they need help. In their daily work, medical staff need to make haste slowly before performing various tests and treatments.

(3) reduce stressors related to miscommunication of information. Introduce the condition, the purpose of the examination, the treatment plan and the time schedule of the whole treatment cycle to the patients. The medical staff should introduce the examination and treatment measures used to the patient, try not to use technical terms, and use common words that the patient can understand more easily.

(4) reduce the psychological stressors. Specific methods are: a) de-escalation and exorcism: the doctor should be concerned, compassionate, and quietly listen to the patient's pain. b) Cognitive therapy: explain successful treatment cases and change the patient's negative perception of the disease. c) Supportive psychotherapy: Help the patient recognize the problem and inform him/her that the medical staff will help him/her overcome the disease together. d) Psychomusic therapy: Rely on the auditory organs to feel the music, comprehend the various effects produced by the music, and achieve self-adjustment.

Observation Index and Evaluation Method

Treatment Outcomes: The treatment outcomes (operative time, X-ray fluoroscopy time, contrast agent dosage, catheter lab nurse preparation time, catheter lab-balloon dilation time, portal-ball time, and PCI success rate) were compared between the two groups.

Perioperative Sleep Quality and Negative Mood Assessment: The perioperative sleep quality evaluation was investigated by the Pittsburgh Sleep Quality Index Scale (PSQI), which mainly involved 24 questionnaire entries and 7 survey dimensions, with a higher total PSQI score indicates a poorer patient sleep quality.[17] The Self-Rating Scale evaluated negative mood scores *for Agitation, Depression, and Anxiety* introduced by Yuan Yonggui et al. This questionnaire consists of 18 questionnaire entries involving four dimensions of depression, anxiety, introverted agitation, and extroverted agitation, with higher scores indicate weaker negative mood in patients.[18]

These were assessed on postoperative day 2 and day 5 for both groups.

Statistical Analysis

The data were processed with Statistical Product and Service Solutions (SPSS) 21.0 (IBM, Armonk, NY, USA). Mean (± standard deviation) is used for normally distributed data, and count data are described as numbers (percentages). The independent sample *t* test was used for normally distributed data, and χ^2 test was used for count data. The significance level ($P < .05$) was used to determine statistical differences.

Table 3. Comparison of Postoperative Negative Emotion Scores between the Two Groups ($\bar{x} \pm s$, points)

Group	n	Depression	Anxiety	Introverted irritability	Extroverted irritability	Total negative emotion scores
Intervention group	52	8.10±1.84[a]	6.92±1.60[a]	4.42±0.88	4.90±0.91[a]	24.34±5.10*
Routine group	52	7.16±1.40	6.11±1.56	4.21±0.94	4.41±0.95	21.89±5.62
t		2.932	2.614	1.176	2.686	2.328
P value		.004	.010	.242	.008	.022

[a]Compared with the routine group, the difference is statistically significant

Table 4. Comparison of Postoperative Sleep Quality between the Two Groups ($\bar{x} \pm s$, points)

Group	n	Subjective sleep quality	Delayed falling asleep	Prolonged sleep	Sleep efficiency	Sleep disorder	Hypnotic drugs	Day function	Total PSQI Score
Intervention group	52	1.20±0.41[a]	1.18±0.39[a]	1.43±0.47	1.47±0.48	1.38±0.50	0.40±0.11	2.29±0.81	9.35±2.20[a]
Routine group	52	1.42±0.43	1.41±0.45	1.51±0.49	1.55±0.53	1.54±0.56	0.44±0.13	2.41±0.86	10.28±2.45
t		-2.670	-2.785	-0.850	-0.807	-1.537	-1.694	-0.732	-2.037
P value		.009	.006	.398	.422	.127	.093	.466	.044

[a]Compared with the routine group, the difference is statistically significant

RESULTS

Comparison of PCI Process and Effect Indexes

Patients in the intervention and routine groups had statistically similar results for operative time, X-ray fluoroscopy time, contrast agent dosage, catheter lab nurse preparation time, catheter lab-balloon dilation time, portal-ball time, and PCI success rate ($P > .05$); see Table 2.

Comparison of Postoperative Negative Emotion Scores

Patients' negative emotions were assessed after PCI. Depression, anxiety, extroverted irritability scores, and total negative emotion scores in the intervention group were higher than those in the routine group ($P < .05$). The introverted irritability scores of patients in the two groups were not statistically different ($P > .05$); see Table 3.

Comparison of Postoperative Sleep Quality

Sleep quality assessment after PCI showed that the subjective sleep quality score, sleep delay score, and total PSQI score of the intervention group were lower than those of the routine group ($P < .05$). Sleep prolongation score, sleep disorder score, sleep efficiency score, hypnotic medication score, and daytime function score were not statistically different ($P > .05$); see Table 4.

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Table 5. Comparison of Surgical Complications

Group	n	Low blood pressure	Local bleeding	Bradycardia	Arrhythmia	Complication rate (%)
Intervention group	52	2	1	0	1	4(7.69)
Routine group	52	3	2	1	2	8(15.38)
χ^2						1.507
P value						.220

Comparison of Surgical Complications

Surgical complications were counted, with a rate of 7.69% in the intervention group and 15.38% in the routine group. No statistical difference was found between the two groups ($P > .05$); see Table 5.

DISCUSSION

Stressors include changes in the physical environment, the work-life environment, and psychological, spiritual, and physical changes, and patients who perceive stressors strongly are more likely to have a poor prognosis.[19] patients with AMI suffer from the stimulation of disease and treatment and perceive stressors more often.[20,21] This study investigated the impact of appropriate meticulous care on treatment outcomes based on appropriate interventions in AMI patients treated with PCI for stressor perception.

Impact on Treatment Outcomes

The results of this study showed that when patients in the intervention group and the routine group were statistically similar in terms of operative time, X-ray fluoroscopy time, contrast agent dosage, catheter lab nurse preparation time, catheter lab-balloon dilation time, portal-ball time, and PCI success rate, the differences between the two groups were not statistically significant. It is suggested that the application of meticulous care measures based on stressor perception of nursing during the perioperative period of PCI in patients with AMI did not affect the above indicators in the perioperative period and the treatment outcomes with a certain safety.

Psychological Effects

Patients often experience varying degrees of anxiety and depression after the onset of AMI, and coupled with the fact that PCI is an invasive treatment, it can easily cause disturbances in neurohumoral factors and increase the degree of excitation of the sympathetic nervous system, bringing adverse physiological and psychological effects to patients and affecting the therapeutic effect.[12,22,23] Therefore, giving appropriate psychological nursing interventions is beneficial to improve patients' negative emotions. The traditional perioperative care model focuses on the care of the patient's routine functions without much intervention for the psychosomatic level.[24] The intervention group introduced meticulous care measures for nursing based on the perception of stressors, and it was found that there were more negative emotions in the intervention group than in the routine group after PCI. The introverted irritability scores of patients in both groups were compared between the two groups, with no statistically significant differences. In the intervention group, the responsible nurse grasped the patients' psychology in time and had the patience to listen to their pain and to change the negative perception of the disease by explaining the theoretical framework of the disease and successful cases. All medical and nursing staff do their best to comfort the patients and to help them overcome the disease. In addition, the medical and nursing staff would patiently use normal words to explain the role and precautions of the examination and treatment to relieve patients' anxiety caused by doubts. It can also bring the doctor-patient relationship closer to a certain extent and facilitate the smooth development of treatment.[25-27] The intervention group program focused on improving the smoothness of information communication. The nursing staff actively informed the patients about the treatment plan and even the whole hospitalization cycle arrangement and other related matters in terms of the patients' needs, so that the patients were more familiar with the whole treatment process, which facilitated the psychological construction and preparation and reduced the panic about the unknown of the treatment measures.

Sleep Quality Improvement

The results of this study showed that the subjective sleep quality score, sleep delay score, and total PSQI score of the intervention group were lower than those of the routine group; however, no significant differences were found between groups in sleep disorder score, sleep prolongation score, sleep efficiency score, hypnotic medication score, and daytime function score. It is suggested that the intervention group program can significantly improve the sleep quality of patients, which has some clinical significance. When patients are admitted to the hospital, they are unfamiliar with everything in the hospital and their life rhythm also changes, combined with the stress brought by the disease, they are prone to sleep disorder problems.[28,29] Stressors associated with environmental and role changes were controlled in the intervention group protocol. It helped patients find a sense of belonging and improved their sleep quality after making them adapt to the in-hospital environment more quickly and familiarize themselves with the patients and healthcare workers. In addition, the intervention group also intervened on the stressor of healthcare staff behavior, so that health care staff could respect patients during special periods such as night rounds and strictly restrain their words and actions to avoid disturbing patients' rest and improve their sleep quality.

Surgical Complications

The results of this study showed that there was no statistically significant difference in the rate of surgical complications between the two groups of patients. It is suggested that the application of meticulous care measures based on stressor perception of nursing in the perioperative period of PCI in patients with AMI does not increase the rate of complications with safety and the value of clinical application. Stressor management is a humane working scale to measure surgical care, which can effectively relieve patients'

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physical and mental suffering.[30-32] Prevention and control of stressors has become an important direction in the treatment of cardiovascular diseases, and effective measures for different stressors are beneficial to improve perioperative quality.[33,34]

This study also has shortcomings due to its diverse intervention methods, inconsistent nursing indicators, and insufficient refinement and quantification of nursing measures; therefore, it needs to be continuously explored and improved by our nursing staff. In future research, more observation indicators should be included to analyze the effectiveness of stressor perception nursing from more perspectives, and to observe the application effect of this nursing method in other diseases.

This study compared the treatment outcome, psychological effects, sleep quality improvement, surgical complications between the intervention group and the routine group, and found that the application of meticulous nursing measures based on the perception of stressors in the perioperative period of PCI in patients with AMI had better effects on the psychological status and the sleep quality.

CONCLUSION

In conclusion, the application of meticulous nursing measures based on the perception of stressors in the perioperative period of PCI in patients with AMI has no obvious advantages in improving the effect of PCI, but it can significantly improve the negative emotions and sleep quality of patients.

CONFLICT OF INTEREST

The authors have no potential conflicts of interest to report relevant to this article.

AUTHOR CONTRIBUTIONS

YS and LH designed the study and performed the experiments, NZ and WB collected the data, FG and ML analyzed the data, YS and LH prepared the manuscript. All authors read and approved the final manuscript.

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