

A Study of Evidence-based Care Combined with Anticipatory Care in Patients Undergoing Cardiovascular Interventions

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Abstract: *Objective:* To investigate the application value of evidence-based nursing combined with anticipatory nursing in patients undergoing cardiovascular intervention. *Methods:* 68 patients who received percutaneous coronary intervention therapy in the Department of Cardiology of a hospital between May 2024 and April 2025 were selected, and were divided into the control group and the observation group according to the nursing needs, each with 34 cases. The control group was given routine clinical care, and the observation group added evidence-based care combined with anticipatory care on this basis, comparing the pain (VAS), quality of life, incidence of adverse events, and indicators of nursing satisfaction between the two groups under different nursing programs. *Results:* The VAS score of patients in the observation group (4.85 ± 0.63) was lower than that of the control group (6.12 ± 0.56); the somatic function (17.67 ± 3.49), mental health (17.24 ± 5.41), and social function (20.08 ± 2.40) of the observation group were higher than those of the control group (15.48 ± 3.57), (14.55 ± 3.29), (17.08 ± 2.40), (14.55 ± 3.29), and (17.08 ± 2.40). 3.29 points, (17.89 ± 1.43) points, ($P < 0.05$). The complication rate of heart failure, arrhythmia, hypotension and coronary artery occlusion in patients of the observation group was 2.94%, which was significantly lower than that of 23.53% in the control group, and the difference was statistically significant ($P < 0.05$). The nursing satisfaction of patients in the observation group (97.06%) was significantly higher than that of the control group (73.53%), and the difference was statistically significant ($P < 0.05$). *Conclusion:* The implementation of evidence-based nursing combined with anticipatory nursing for cardiovascular interventional therapy patients can effectively improve their pain status, reduce the risk of complications such as heart failure, arrhythmia, hypotension, coronary artery occlusion, and thus further improve their quality of life, which has high clinical application value.

Keywords: Cardiovascular disease; Evidence-based care; Anticipatory care; Interventional therapy; Rehabilitation

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1. Introduction

Cardiovascular diseases, with their high morbidity and mortality rates, continue to threaten global human

health, and cardiovascular interventional techniques, such as coronary intervention (PCI), have become a key means of saving patients' lives and improving their prognosis due to their minimally invasive and highly effective advantages ^[1]. However, the high risk of complications such as heart failure, arrhythmia, hypotension, and coronary artery occlusion accompanying the procedure itself and in the perioperative period poses a serious challenge to nursing care. Traditional care models tend to focus on responding to problems that have already occurred, with limitations in proactively preventing complications and optimizing patient experience and long-term prognosis. In this context, Evidence-Based Nursing (EBN) emphasizes the integration of the best current scientific evidence, nurses' professional skills, and patients' values and wishes to provide a scientific cornerstone for clinical decision-making ^[2]; while Predictive Nursing (PN) focuses on early identification and accurate prognosis of patients' condition evolution and potential risks. Predictive Nursing (PN), on the other hand, focuses on the early identification and precise prediction of the evolution of the patient's condition and potential risks, and the proactive implementation of interventions to prevent adverse outcomes. The in-depth combination of the two, in essence, is to move forward the active intervention under the guidance of scientific evidence, to form a strong synergy of "evidence-based foresight", which can not only significantly enhance the scientific and targeted nursing measures, but also effectively break the limitations of passive response, and realize the transition from "treating the disease" to "preventing the disease." It can also effectively break the limitations of passive response and realize the upgrade of nursing care from "treating the disease" to "preventing the disease" ^[3]. This study aims to explore the application value of evidence-based care combined with the anticipatory care model in cardiovascular interventional therapy patients through clinical trials, hoping to provide a new evidence-based practice path for optimizing the cardiovascular interventional nursing program, reducing the incidence of related complications and accelerating the recovery process of patients.

2. Information and methods

2.1. General information

Sixty-eight patients who underwent percutaneous coronary intervention in the Department of Cardiology of a hospital between May 2024 and April 2025 were selected, and were divided into a control group and an observation group of 34 cases each according to nursing needs. In the control group, there were 19 males and 15 females with an age range of 16–75 years old and a mean of (64.26 ± 3.27) years old; in the observation group, there were 21 males and 13 females with an age range of 15–75 years old and a mean age of (65.39 ± 3.75) years old. The study was approved by the Ethics Committee and the general information of the patients was not statistically significant ($p > 0.05$).

Inclusion criteria: (1) diagnosed with coronary artery disease by coronary angiography, receiving percutaneous coronary intervention for the first time, and the vital signs were stable 24 hours after the procedure without acute complications; (2) 15 years old \leq age \leq 75 years old; (3) conscious, with basic language comprehension, able to cooperate with the nursing measures and evaluation of the effect; (4) voluntarily signing the informed consent for the study, and committing to completing the full follow-up.

Exclusion criteria: (1) the presence of end-stage hepatic or renal insufficiency, malignant tumors, and immune system disorders; (2) those who have been diagnosed with Alzheimer's disease, schizophrenia, major depression, and other disorders that affect adherence to care; (3) those who have received prior coronary artery bypass grafting (CABG) or secondary PCI; and (4) women who are pregnant or lactating.

1.2 Methodology

The control group implements conventional nursing interventions and gives basic medical support and health management.

- (1) Basic nursing care: Postoperative dynamic monitoring of patients' vital signs, including heart rate, blood pressure, respiration, body temperature, and other core indicators. At the same time, an individualized nutritional intervention program is implemented, dietary structure is adjusted according to the disease state, and oral hygiene and skin care are strengthened to maintain basic physiological homeostasis.
- (2) Health education: Teaching patients and caregivers the pathological mechanisms of cardiovascular disease, treatment principles and self-management strategies through structured educational pathways, and distributing standardized health manuals to strengthen patients' and family members' practical skills such as symptom recognition, emergency treatment and rehabilitation training, so as to enhance health decision-making ability.
- (3) Psychological support: Adoption of emotional scales to assess psychological status and implementation of cognitive behavioral interventions to alleviate treatment-related anxiety. At the same time, a cooperative psychological support system for family members is established to enhance the effectiveness of family members' emotional support through communication skills training and to improve the level of patients' psychological adaptation.
- (4) Drug management: Strictly follow the doctor's instructions to implement the drug administration program, monitor drug efficacy and adverse drug reactions, and adjust the drug regimen when necessary. At the same time, we carry out pharmacy education programs to analyze the mechanism of drug action, medication standardization and risk warning indicators, so as to ensure the safety and compliance of medication.
- (5) Discharge guidance: Individualized discharge plan is formulated, and detailed discharge guidance is given to patients before discharge, including drug use plan, lifestyle intervention suggestions, follow-up pathway and emergency response process. At the same time, we strengthen the family care ability through scenario simulation training to realize the seamless integration of in-hospital and family care.

The observation group carried out evidence-based care combined with anticipatory care based on the control group, which included:

- (1) Evidence-based nursing: An individualized nursing program is developed based on patients' postoperative vital signs status. Dynamic optimization of drug selection, nutrition and metabolism support in nursing management, and assessment of patients' physiological and psychological status through the construction of a quantitative assessment system of physiological parameters + psychological scales, and implementation of precise nursing interventions to ensure the safety and effectiveness of nursing care.
- (2) Anticipatory nursing: Identify high-risk factors through risk prediction models and establish preventive interventions. At the same time, we utilize digital health media to carry out stratified education, empowering patients with early warning and self-palliative abilities.
- (3) Interdisciplinary teamwork: Establishing an integrated care model (ICM) through close collaboration of a multidisciplinary team, realizing multidimensional data sharing among physicians, pharmacists, and rehabilitators with the electronic medical record as the pivot, and formulating interprofessional intervention plans through a case conference system to ensure continuity of care throughout the cycle.

- (4) Post-discharge follow-up: Regularly follow up patients by phone or WeChat group and provide continuous care guidance, forming a closed-loop management system of “monitoring-feedback-optimization” to ensure patients’ long-term health.

2.3. Observation indicators

- (1) Pain level: The patients’ pain level was assessed using the Pain Visual Analog Scale (VAS) with a total score of 10, with higher scores indicating more severe pain;
- (2) Quality of life: Patients’ somatic functioning, mental health, and social functioning were quantitatively assessed using the Quality of Life Scale (WHOQOL-BREF), with a total score of 25 for each dimension, with higher scores indicating better quality of life for patients;
- (3) Incidence rate of related complications: Observe and record the occurrence of heart failure, arrhythmia, hypotension, coronary artery occlusion and other complications during the treatment of the two groups, incidence rate = number of cases/total number of cases \times 100%;
- (4) Nursing satisfaction: The hospital’s satisfaction questionnaire was used to investigate the nursing staff’s satisfaction with the nursing operation, health education, nurse-patient communication, etc. The patients ticked the boxes of very satisfied, more satisfied or dissatisfied according to their inner real feelings, and the total satisfaction = number of cases (very satisfied + more satisfied)/total number of cases \times 100%.

2.4. Statistical methods

The data were statistically analyzed using SPSS 22.0 software, and the count data were expressed as % and compared with χ^2 test, and the measure data were expressed as mean \pm standard deviation (SD) and compared with t -test, and the difference of $P < 0.05$ was considered statistically significant.

3. Results

3.1. Comparison of VAS scores and quality of life WHOQOL-BREF scores between the two groups of patients

The VAS score of patients in the observation group was lower than that of the control group, and the quality of life scores of somatic function, mental health, and social function were higher than that of the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of VAS scores and quality of life scores between the two groups after nursing intervention (mean \pm SD, points)

Groups	VAS	Quality of life WHOQOL-BREF score		
		Body function	Mental health	Social function
Control group ($n = 34$)	6.12 \pm 0.56	15.48 \pm 3.57	14.55 \pm 3.29	17.89 \pm 1.43
Observation group ($n = 34$)	4.85 \pm 0.63	17.67 \pm 3.49	17.24 \pm 5.41	20.08 \pm 2.40
t	8.7854	2.5578	2.4772	4.5541
p	< 0.001	0.0128	0.0158	< 0.001

3.2. Comparison of the incidence of relevant complications between the two groups

The complication rates of heart failure, arrhythmia, hypotension and coronary artery occlusion in patients of the observation group were significantly lower than those of the control group, and the difference was statistically significant ($P < 0.05$), see **Table 2**.

Table 2. Comparison of the incidence of related complications between the two groups (n , %)

Groups	Heart failure	Arrhythmia	Low blood pressure	Coronary occlusion	Gross
Control group ($n = 34$)	1 (2.94)	3 (8.82)	3 (8.82)	1 (2.94)	8 (23.53)
Observation group ($n = 34$)	0	0	1 (2.94)	0	1 (2.94)
χ^2					4.610
p					0.032

3.3. Comparison of nursing satisfaction between the two groups

The patient care 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 3**.

Table 3. Comparison of nursing care satisfaction between the two groups (n , %)

Groups	Very happy	More satisfied	Unsatisfactory	Job satisfaction
Control group ($n = 34$)	11 (32.35)	14 (41.18)	9 (26.47)	25 (73.53)
Observation group ($n = 34$)	20 (58.82)	13 (38.24)	1 (2.94)	33 (97.06)
χ^2				7.503
p				0.006

4. Discussion

Cardiovascular disease (CVD) is one of the major causes of death worldwide, and its morbidity and mortality rates have remained high, becoming a major global public health problem ^[4]. With the continuous development of medical technology, cardiovascular interventional therapy has become one of the core diagnostic and therapeutic tools for CVD, such as coronary heart disease, by its minimally invasive characteristics and the advantages of rapid postoperative recovery. However, the complexity of this technology, the individual variability of patients, and the high risk of potential complications in the perioperative period have put forward higher requirements for nursing practice. Nursing staff need to balance intraoperative immediate response monitoring with postoperative long-term rehabilitation management in patient care management to optimize patient prognostic outcomes ^[5].

Evidence-based nursing (EBN) is based on the best current research evidence, integrates nursing expertise with individualized patient needs and wishes, and provides a reliable basis for decision-making in complex clinical situations, which significantly improves the science and efficacy of nursing practice. Xi (2022) ^[6] explored the impact of evidence-based nursing on postoperative complications in patients undergoing cardiovascular interventions through a clinical trial, and found that the implementation of evidence-based nursing in patients undergoing cardiovascular interventions significantly reduced the incidence of postoperative

complications such as bleeding from the puncture site, hematomas, and vagal nerve reflexes, and effectively enhanced the perioperative safety of the patients and the quality of care. Yang *et al.* (2022) ^[7] found that the application of evidence-based nursing in the perioperative management of patients undergoing percutaneous coronary intervention in cardiovascular medicine can effectively reduce patients' anxiety and depression, shorten hospitalization time, and improve patients' knowledge of the disease and adherence to treatment. Anticipatory nursing (AN), on the other hand, focuses on the dynamic assessment and early warning of the trajectory of patients' disease evolution and potential risks, emphasizes proactive intervention instead of reactive response, and has outstanding advantages in identifying high-risk groups and preventive management of complications such as hypotension or bleeding. Li (2020) ^[8] found through clinical practice research that the implementation of anticipatory nursing interventions such as risk assessment, rehydration and expansion, and psychological counseling for elderly patients undergoing cardiovascular interventional therapy can effectively reduce the incidence of postoperative reflex hypotension and mitigate the severity of its episodes. Hao (2024) ^[9] pointed out that for patients prone to postoperative reflex hypotension after cardiovascular interventions, early identification of risk factors, development of individualized prevention programs and dynamic monitoring can significantly reduce hypotensive events and improve the hemodynamic stability of the patient, which can help to shorten the length of hospital stay. However, many current studies are limited to the application of a single nursing model, failing to fully integrate the scientific decision-making core of EBN and the risk prevention and control essence of AN to form a systematic, structured and comprehensive intervention system, which restricts the release of nursing's potential to comprehensively improve the quality, safety and long-term prognosis of cardiovascular interventional patient care.

In this study, through the joint use of evidence-based care and anticipatory care model to implement the nursing management of cardiovascular interventional therapy patients, it was found that the patients in the observation group had lower VAS scores and lower incidence of related complications than those in the control group ($P < 0.05$), while the patients' quality of life scores of physical function, mental health, social function and nursing satisfaction were significantly higher than those in the control group ($P < 0.05$). The reasons were attributed to the significant advantages of the joint nursing program: first, the scientific decision-making core of evidence-based nursing and the risk forward concept of anticipatory nursing were deeply integrated to realize the early warning of high-risk factors, and the two synergistically formed the closed-loop management of "evidence-guided practice, early warning-driven intervention," which reduced the occurrence rate of preventable complications from the source. The two collaborate to form a closed-loop management of "evidence-guided practice and early warning-driven intervention," reducing preventable complications at the source.

Secondly, this joint care model breaks through the limitations of traditional passive response and builds a proactive care pathway of "assessment-prediction-intervention." This dynamically adapted intervention strategy significantly improved patients' pain perception, accelerated functional recovery, and ultimately helped patients achieve simultaneous improvement of physiological indicators and psychological status ^[10].

Third, in the practice of evidence-based care and anticipatory care, evidence-based care ensures the scientific articulation of interventions at all stages of the patient care cycle, and anticipatory care realizes the seamless transition of the nursing focus through continuous risk monitoring, and the structural integration of the two not only reduces the blind spot of nursing care, but also comprehensively improves the patient's somatic function, social role adaptation, and subjective satisfaction through the design of systematic and standardized

processes, and finally the result is a multi-dimensional optimization of healthcare quality, safety and experience.

5. Conclusion

In summary, the clinical effect of evidence-based nursing combined with anticipatory nursing intervention for cardiovascular interventional therapy patients is remarkable, and it has positive clinical value in improving patients' pain, enhancing their quality of life, and reducing the risk of related complications.

Disclosure statement

The authors declare no conflict of interest.

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