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# ORIGINAL

## EFFECT OF INTEGRATED HOLISTIC NURSING MODEL ON THE SUCCESS RATE, COMPLICATIONS AND COOPERATION OF ATHLETHIC PATIENTS UNDERGOING CARDIAC SURGERY

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## ABSTRACT

**Objective:** A cohort study was carried out to research the effects of integrated holistic nursing model on the success rate, complications and cooperation of athletic patients undergoing cardiac surgery. **Methods:** During June 2019 to August 2021, 80 athletic patients who went through cardiac surgery were enrolled in our hospital as the research objects. A random number table method was used to divide the athletic patients into a control and a research group, each with 40 cases. The control group adopted the traditional medical work mode, and research group adopted the holistic nursing model of integrated medical and nursing care. The nursing satisfaction, the degree of cooperation between doctors and nurses, the success rate of operation, the incidence of complications, the improvement of cardiac function, sleep quality and life quality were compared. **Results**: In terms nursing satisfaction, the study group was very pleased in 26 players , satisfactory in 16 players and general in 8 players , with a satisfaction rate of 100.00%; In the control group, 15 players were very pleased, 10 players were pleased, 7 players were general, 8 players were displeased, and the satisfaction rate was 80.00%; The nursing satisfaction of the study group was higher (P<0.05). Compared with the degree of cooperation between doctors and nurses, the scores of factor 1, factor 2 and factor 3 in the study group were noticeably higher (P<0.05). Regarding the success rate of operation and the incidence of complications, the success rate of operation in the study group was higher, and the incidence of complications in the study group was

lower (P<0.05). With regard to the success rate of operation and the incidence of complications, the success rate of operation in the study group was higher, and the incidence of complications in the study group was lower (P<0.05). In terms of the improvement of cardiac function indexes, there exhibited no noticeable difference (P>0.05); Six months after operation, the level of left ventricular ejection fraction (LVEF) in the study group was noticeably higher than that in the control group, while the left ventricular end-diastolic diameter (LVEDD) and plasma N-terminal pro-brain natriuretic peptide (NT-proBNP) levels in the study group were noticeably lower (P<0.05). Compared with the sleep quality scores, there exhibited no noticeable difference (P>0.05); Six months after operation, the scores of sleep quality, falling asleep time, sleep efficiency, sleep disorder and daytime dysfunction in the study group were lower (P<0.05). There exhibited no noticeable difference in preoperative life quality scores (P>0.05); Six months after operation, the scores of physiological functions, body pain, overall health, vitality, social function, emotional function and mental health in the study group were noticeably higher (P<0.05). Conclusion: The integrated holistic nursing model can enhance the success rate of cardiac surgery, reduce the incidence of complications, further promote the cardiac function and sleep quality, strengthen the life quality of athletic patients , and help athletic patients return to family and society as soon as possible. The integrated holistic nursing model of health care also promotes harmonious relationships between doctors and nurses and cooperative behavior between them.

**KEY WORDS:** Holistic nursing model of integrated medical and nursing care; Cardiac surgery; Success rate of operation; Complications; Degree of cooperation between doctors and nurses

## INTRODUCTION

In recent years, with the improvement of my country's medical level, there are more and more medical institutions capable of performing cardiac surgery, and the number of cardiac surgeries is also increasing (Nader, 2022). According to the White Paper on Chinese Cardiac surgery and Cardiopulmonary Bypass data in 2019, a total of 253867 cardiovascular surgeries were performed in 724 hospitals surveyed in 2019. Cardiopulmonary bypass (cardiopulmonary bypass is the transfer of athletic patients' blood from cardiopulmonary bypass to extracorporeal circulation (Kriz, Flores, Villarreal, Bronicki, & Loomba, 2019). The normal physiological functions of the heart and lungs of the athletic patients, containing blood circulation, oxygenation and ventilation, were temporarily replaced by cardiopulmonary bypass machines. The total number of operations was 175557 (69.1%), compared with 2018 statistics, cardiac surgery increased by 13253 cases (5.5%) (Jawad, Nozdrzykowski, Borger, & Saeed, 2022). However, the in-hospital mortality rate for cardiac surgery remains between 1

and 4 percent, negatively impacting hospitals, athletic patients, and their families (Scherrer et al., 2022). Some studies have pointed out that if targeted nursing interventions can be given to cardiac surgery athletic patients, the prognosis of the athletic patients can be effectively improved (Peng, Li, & Lin, 2022). However, in the traditional nursing model, the cooperation between doctors and nurses is that doctors guide nurses to work, nurses execute medication orders, and there is a lack of comprehensive communication between doctors and nurses, resulting in poor nursing effects.

In the context of the transformation of the medical model, the nursing model has also undergone profound changes. At present, various nursing models have been used in clinical practice. Holistic nursing is a kind of treatment mode that takes the patient as the center, expands the professional connotation of nursing, strengthens basic nursing, and focuses on nursing responsibility system to achieve the overall improvement of nursing quality (Ruetzler et al., 2022). "Bio-psychological-social medicine" changes the medical model from dominant-subordinate to bio-psychological-social, and the traditional dominant-subordinate relationship no longer serves the clinical needs of athletic patients (Hernández-Leiva & Hernández-Huertas, 2022). Under the background of the adjustment of medical relationship, integrating health care is an advanced mode of medical and nursing work that has been widely implemented in a variety of clinical departments with notable results. Throughout the world, physician-nurse collaborations, or NPCs, are used as a way to integrate health care (Bevilacqua et al., 2022; Schranz et al., 2022). The concept of medical and nursing integration has continuously evolved and evolved since it was introduced (Grant, Gregory, & Ouanes, 2022). At first, some researchers believed that health care cooperation is essentially a kind of interdisciplinary communication, and its core is that both doctors and nurses must take part in the whole process of patient assessment, decision-making, clinical goal-setting and problem-solving. And share responsibility (Adhami et al., 2022; Zeitler & Iribarne, 2022). In the 1990s, Henneman et al. put forward four necessary conditions for health care cooperation, namely, ability, confidence, commitment, mutual respect and trust (Tomita-Kobayashi et al., 2022). In 2003, the American Nursing Association (ANA) clearly defined health care cooperation as a reliable cooperation process based on trust between doctors and nurses, in which both doctors and nurses recognize and accept their own scope of responsibility, jointly protect their interests and strive to achieve common goals (Gomes et al., 2019; Sakamoto et al., 2022).

At present, though some elements of the integrated holistic nursing model are common to the views of various scholars, there are still some differences, when it comes to the exact concept (Shi et al., 2022; Siontis et al., 2022). Yet, the nursing quality of all clinical departments has noticeably improved under the guidance of the holistic nursing model of integrated medical and nursing care. Some scholars (Altun et al., 2022) applied the

holistic nursing model of integrated health care to the outpatient clinic of thyroid surgery, built up a cooperative group composed of specialists and responsible nurses, and divided them into groups according to the professional title and age of medical staff to ensure that athletic patients connect seamlessly in each diagnosis and treatment process, the study found that the integrated medical and nursing model can successfully reduce the waiting time of outpatients and enhance the service experience of medical staff (Habibi Khorasani et al., 2022).In the past, the success rate of athletic patients undergoing cardiac surgery depends on the medical level of the hospital and the professionalism of doctors, but some studies have pointed out that if we can give athletic patients targeted nursing intervention and strengthen the degree of cooperation between doctors and nurses, it can reduce the risk of postoperative complications and promote the smooth progress of the operation. As of yet, there are few studies examining how integrating holistic nursing into cardiac surgery can benefit patients. Against this background, it is important to conduct further studies to demonstrate the intervention value of integrated holistic nursing models. It can lay a theoretical foundation for its clinical application. Therefore, the purpose of this study is to explore the influence of integrated holistic nursing mode on the success rate, complications and cooperation of cardiac surgery athletic patients, and to compare the significance of conventional nursing and integrated holistic nursing mode to patients.

## 1 Athletic PATIENTS AND METHODS

### 1.1 General information

During June 2019 to August 2021, 80 athletic patients who went through cardiac surgery in our hospital were enrolled. Random number tables were used to divide athletic patients into control and research groups. The control group adopted the traditional medical work mode, and research group adopted the holistic nursing model of integrated medical and nursing care. Each group had 40 cases. In the control group, the age ranged from 26 to 74 years old, with an average of (45.95±4.11) years old, containing 23 men and 17 women; Body mass index (BMI) 17.55-28.65kg/m2, mean (24.77 ±3.40) kg/m2; Disease types: 12 cases of heart valve disease, 8 cases of cardiac macrovascular disease, 6 cases of cardiac tumor, 7 cases of pericardial effusion, and 7 cases of others; Education level: 19 cases in primary and junior high school, 13 cases in senior high school and technical secondary school, 8 cases in junior college or above. The age in the study group was 25 to 76 years old, with an average of (45.85±4.30) years old; There were 21 men and 19 women; BMI was 17.48-28.62kg/m2, with an average of (24.71±3.35)kg/m2; Disease types: 15 cases of heart valve disease, 5 cases of cardiac macrovascular disease, 5 cases of cardiac tumor, 7 cases of pericardial effusion, and 8 cases of other cases; Educational level: 17 cases

of primary school and junior high school, 14 cases of high school and technical secondary school, and 9 cases of college and above. There exhibited no noticeable difference in the general data (P>0.05), which was comparable. Informed consent forms were signed by all patients in this study, which was approved by our hospital's medical ethics committee.

Inclusion criteria: athletic patients older than 18 years old; patients with relevant surgical indications and requiring surgical treatment; patients with clear consciousness.

Exclusion criteria: those who were younger than 18 years old; those who were pregnant or breastfeeding; those who were hospitalized for less than 1 day, who were discharged automatically and whose clinical data were unknown; those who underwent emergency and rescue operations; Patients; athletic patients receiving hemodialysis; patients with psychiatric disorders; athletic patients with a history of cardiac surgery.

### 1.2 Treatment methods

The control group adopted the traditional medical work mode, the athletic patients received routine nursing before operation, and the diagnosis, treatment and nursing of athletic patients during hospitalization were intervened by doctors and nurses respectively. Intraoperative nursing: Familiar with the use of various surgical instruments, strictly carry out aseptic treatment, assist physicians in surgery, and do a good job in skin disinfection and intravenous infusion of patients. During the operation, the nurse observes the patient's vital signs, skin reactions and mental status, and cooperates with the doctor to ensure the smooth operation of the operation; timely and correctly provide the doctor with the instruments, and strengthen the management of the surgical instruments to prevent the instruments from being missed into the athletic patient's body. Routine work flow of nurses: evaluation of patients after admission; nursing care of athletic patients according to doctor's orders; discharge education; Telephone follow-up was conducted 3 months and 6 months after the patient was discharged to understand the basic situation of the patient and give relevant guidance. Doctor's routine work flow: After the patient is admitted to the hospital, he will conduct a physical examination; formulate a diagnosis and treatment plan; once a day, morning ward rounds; after the patient's condition is stable, he will perform cardiac rehabilitation; and provide discharge guidance.

In accordance with the holistic nursing model of integrated medical and nursing care, the following specific measures were taken:

1) The work flow of the holistic nursing model of integrated medical and nursing care is as follows: after admission, the specialist of the integrated

medical and nursing team and the responsible nurse will comprehensively evaluate the general situation and medical records, draw the athletic patients' existing and potential physical, psychological and social problems that need to be solved, and make nursing diagnosis and medical diagnosis. The medical and nursing integration group jointly worked out the patient nursing plan and holistic nursing plan through case discussion, joint ward rounds and cardiac surgery case filling, and adjusted in time according to the condition; through telephone follow-up and outpatient follow-up, athletic patients were followed up, evaluated and fed back, and continuous rehabilitation intervention was given.

2) A medical and nursing integration team was set up, and each group was composed of 1 cardiac surgeon, 1 rehabilitation doctor, 1 specialist nurse and 1 responsible nurse. The medical and nursing integration team is responsible for all the athletic patients during the whole hospitalization period, nd the members of each group are relatively fixed at each stage, formulate the post responsibilities of each member, and make a clear division of labor. Responsible nurses not only carry out disease education, but also participate in the rehabilitation evaluation of patients. Intraoperative nursing: Familiar with the use of various surgical instruments, strictly carry out aseptic treatment, assist physicians in surgery, and do a good job in skin disinfection and intravenous infusion of athletic patients. During the operation, the nurse observes the patient's vital signs, skin reactions and mental status, and cooperates with the doctor to ensure the smooth operation of the operation; timely and correctly provide the doctor with the instruments, and strengthen the management of the surgical instruments to prevent the instruments from being missed into the patient's body. In the operating room, nurses assist anesthesiologists to complete the anesthesia steps, the anesthesia methods are the establishment of fast-track anesthesia, combined with short-acting anesthetics and low-dose drugs for anesthesia induction and continuous anesthesia maintenance. After the athletic patients' muscles were relaxed and the depth of anesthesia was satisfied, endotracheal intubation was performed. In the process of anesthesia, itinerant nurses strengthened the observation of patients' vital signs and made related records. Nurses prepare micropumps or metering infusion devices in advance to assist the operators to accurately control the amount of fluid input during the operation in order to reduce the amount of fluid during the operation as much as possible. Maintain proper temperature and humidity during the operation, and pay attention to the warmth of the athletic patients during the operation. the liquid or plasma is preheated at the appropriate temperature and then injected into the body. At the same time, the itinerant nurse prepares warm water so that the wound can be washed with warm water as much as possible, and the temperature of the limbs should be closely observed to avoid frostbite due to the decrease in temperature. After the operation, the patient was moved to the intensive care unit, and his blood pressure, body temperature, respiration and other signs

were closely monitored. If the pacemaker and perceptual function were impaired, the attending physician should be informed immediately to deal with it so as to avoid abnormal pacing function and adjust pacing parameters on time. If the pacing signal is unstable, it is often caused by motor displacement, poor fixation, partial rupture or rupture of insulating layer. If there is pacing signal but no ECG signal, endocardial edema is caused by motor stimulation, which increases the pacing threshold; if there is fixed frequency pacing, but there is no on-demand function, it is mostly caused by poor perception of the pacemaker, the nursing staff should immediately inform the attending physician to do the relevant work. For incision nursing, athletic patients were given antibiotics for 3 to 7 days to avoid infection, and 0.5kg sandbags were applied to the incision for 4 to 6 hours. The sandbags should be firmly placed to ensure uniform pressure and avoid slippage. Closely observe the skin temperature and color of the athletic patients, and observe whether the incision has hematoma, bleeding and bleeding. Change dressing for the patient under aseptic condition, once a day, to ensure that the dressing is clean and dry. If dampness, blood stains and shedding occur, the dressing should be changed immediately; 24 hours after operation, athletic patients should be informed to avoid severe coughing and sneezing as far as possible. If necessary, gently press the incision with your hands, and if necessary, give cough medicine to avoid bleeding and electrical dislocation caused by vibration.

3) The first evaluation of inpatients was performed by responsible nurses and cardiac surgeons. The responsible nurse and specialist will receive the patient within 10 minutes in accordance with the patient's condition, push the mobile nursing cart to the patient's bedside, and complete the admission evaluation, consultation and physical examination within 2 hours, and the completion of special circumstances will be delayed to this shift. The responsible nurse completed the first nursing evaluation according to the items in the nursing evaluation form by means of inquiry, nursing physical examination, vital sign measurement and so on. After the first evaluation of the inpatients, the responsible nurses and specialists jointly determine the nursing diagnosis and medical diagnosis of the athletic patients, and formulate the corresponding nursing plans and diagnosis and treatment measures respectively.

4) The establishment of cardiac surgery cases is divided into three parts, and the cardiac surgeon is responsible for filling in the patient registration form; the rehabilitation doctor is responsible for evaluating the rehabilitation of patients after cardiac surgery; the responsible nurse is responsible for filling in three parts: nutrition risk screening form, mini nutrition assessment questionnaire and mental state assessment form; specialist nurses are responsible for collecting and sorting cases and urge team members to complete them in time as required to ensure the integrity of the

cases. After the completion of the cardiac rehabilitation cases, the individual cardiac rehabilitation plan is formulated by the rehabilitation doctor, and the specialized nurse communicates with the patient. The responsible nurse is responsible for guiding and supervising the exercise acceptance of the patients, and feedback to the rehabilitation doctor in time. Dynamically adjust the cardiac rehabilitation program.

5) The health care integration team set up a WeChat group, which was maintained and managed by two specialist nurses. After the patient is admitted to the hospital, the specialist nurse will join the patient and his family to inform the patient of the service purpose of the WeChat group, and push a message every week as follows: week 1: basic knowledge of cardiac surgery. Week 2: medication guidance. Week 3: life care and diet guidance. Week 4: rehabilitation training and reexamination on time. Send all the content in 1 month, send it in a cycle next month, and strengthen it repeatedly. At the same time, the latest knowledge related to heart surgery, doctor visit time, activity arrangement and so on were uploaded to WeChat, and questions raised by athletic patients and their families were answered in time.

6) During the next six months following the patient's hospital discharge, the specialist nurses phoned him once a month. Through telephone follow-up to understand the basic situation of athletic patients, containing medication, diet, rehabilitation exercise, intake and intake, self-management of daily life, etc., to answer the confusion encountered by patients in the implementation of cardiac rehabilitation activities outside the hospital in a timely manner. It is emphasized that effective self-management and timely and accurate disease observation can effectively delay the progress of the disease and strengthen the confidence of healthy behavior. Each follow-up was about 10-15 minutes, and the follow-up times and follow-up time were adjusted at any time according to the rehabilitation of each patient. Two specialist nurses contacted by telephone 3 days in advance before the reexamination of the patients in the two groups to ensure timely reexamination.

### 1.3 Observation index

#### 1.3.1 Nursing satisfaction degree

After consulting the literature and experts' discussion, a survey scale of patient nursing satisfaction was designed. In this scale, athletic patients were asked about how satisfied they were with follow-up management, health education, medical and nursing services, and appointment registration. The evaluation results are divided into four dimensions: very pleased, pleased, general and displeased. Nursing satisfaction rate = very satisfaction rate + satisfaction rate + general rate. The nursing satisfaction of the patients was evaluated 6 months after discharge.

### 1.3.2 Degree of cooperation between doctors and nurses

The degree of cooperation between doctors and nurses: based on the scale of cooperation, this scale includes 27 evaluation items, each of which is evaluated by Likter5 score method, which is divided into three factors, in which factor 1 (12 items) is the joint participation of doctors and nurses in treatment and care, factor 2 (8 items) is the sharing of health care information, and factor 3 (7 items) is mutual cooperation and care between doctors and nurses. A higher score indicates a greater degree of cooperation between doctors and nurses. A 6-month follow-up assessment determined the level of cooperation.

### 1.3.3 Success rate of operation and incidence of complications

The success rate of operation and the incidence of complications were computed. The criteria for the success of the operation: the symptoms disappeared in a short time after operation, the physiological indexes returned to normal, and the disease did not relapse within 6 months after operation. Statistics of patients within 6 months after the occurrence of various complications, and compare the incidence of complications, the common complications are wound bleeding, infection, abnormal pulmonary function, kidney injury, endocarditis, arrhythmia and so on.

### 1.3.4 Cardiac function index

Echocardiography was performed before and 6 months after operation, and LVEF and LVEDD were recorded; Fasting elbow venous blood 3ml was collected before and 6 months after operation, and the plasma NT-proBNP concentration was measured by enzyme-linked immunosorbent assay (Elisa).

### 1.3.5 Sleep quality

Pittsburgh Sleep quality Index (PSQI) is a sleep evaluation scale compiled by Dr. Buysse, a psychiatrist at the University of Pittsburgh in 1989, with a Cronbach's α coefficient of 0.845. In addition to evaluating sleep quality in patients with sleep disorders, this scale can also be used in general population. There are 19 self-evaluation items on the scale and 5 non-scored items, of which 19 are self-evaluation items. The 18 items are divided into 7 parts, and each item is scored according to the 0-3 scale, with a total score of 0-21. Sleep quality deteriorates as the score rises. The measured items need to be completed within 5-10 minutes. Prior to and six months after surgery, sleep quality was assessed in patients.

### 1.3.6 Life quality scale

SF-36 life quality questionnaire was adopted to measure the life quality of

patients, which is a universal scale developed by Boston Institute of Health on the basis of medical outcome study. A good amount of reliability and validity can be found in it. The SF- 36 scale consists of 10 items and 36 items, which are assigned into 8 dimensions, containing physiological function, physical pain, overall health, vitality, social function, emotional function and mental health. The first four dimensions are physical health content, and the last four dimensions are mental health content. Patients with a higher score have better life quality. The life quality of the patients was evaluated before and 6 months after operation.

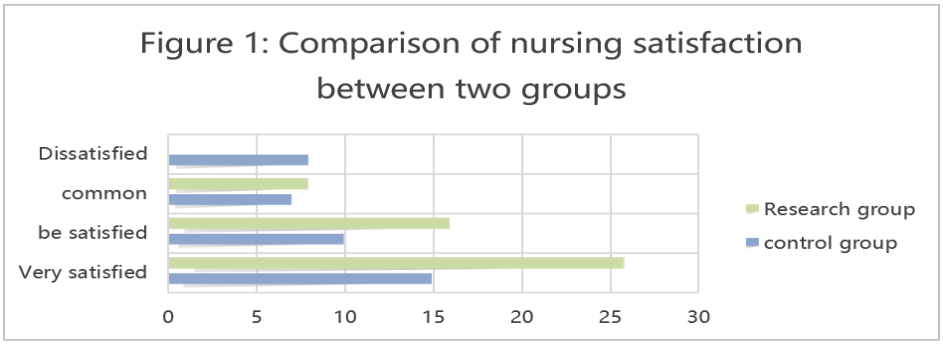
### 1.4 Statistical analysis

The test data are processed by SPSS21.0 statistical software. An analysis of variance homogeneity and normal distribution is performed before analyzing the measurement data statistically. The measurement data that meet the requirements of normal distribution or approximate normal distribution are presented as ($\bar{x}$±s), independent sample t-test was adopted for comparison. Taking n (%) as an example to represent the counting data, χ2 test was adopted. When P<0.05, the difference exhibited statistically noticeable.

## 2 RESULTS

### 2.1 Comparison of nursing satisfaction

In terms of nursing satisfaction, the study group was very pleased in 26 players , satisfactory in 16 players and general in 8 players , with a satisfaction rate of 100.00%; In the control group, 15 players were very pleased, 10 players were pleased, 7 players were general, 8 players were displeased, and the satisfaction rate was 80.00%; In comparison between groups, the nursing satisfaction of the research group was higher (P<0.05). All data results are shown in Figure 1.




### 2.2 Comparison of degree of cooperation

Regarding the degree of cooperation between doctors and nurses, the

scores of factor 1, factor 2 and factor 3 in the study group were noticeably higher (P<0.05). All the data results are shown in Table 1.

**Table 1** comparison of the degree of cooperation [ $\bar{x}$ ±s，points]

| Group | N | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|
| C Group | 40 | 52.04±2.44 | 33.19±2.45 | 28.19±2.56 |
| R Group | 40 | 56.61±2.53 | 35.19±2.66 | 32.59±2.41 |
| *t* | | 8.223 | 3.497 | 7.914 |
| *P* | | ＜0.01 | ＜0.01 | ＜0.01 |

## 2.3 Comparison of success rate and complication rate of operation

With regard to the success rate of operation and the incidence of complications, the success rate of operation in the study group was higher, and the incidence of complications in the study group was lower (P<0.05). All the data results are shown in figure 2.


## 2.4 Comparison of cardiac function indexes

There exhibited no noticeable difference in cardiac function indexes before operation (P>0.05); Six months after operation, the LVEF level of the study group was noticeably higher, and the levels of LVEDD and NT-proBNP were noticeably lower (P<0.05). See Table 2 for details.

**Table 2** comparison of cardiac function indexes [ $\bar{x}$ ±s]

| Group | N | LVEF（%） | | LVEDD（mm） | | NT-proBNP（pg/ml） | |
|---|---|---|---|---|---|---|---|
| | | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation |
| C Group | 40 | 45.52±4.38 | 49.73±4.20a | 58.11±7.19 | 47.66±7.40a | 282.23±23.80 | 158.84±18.20a |
| R Group | 40 | 45.66±4.41 | 60.39±4.27a | 58.36±7.24 | 40.45±7.02a | 283.39±23.95 | 126.66±16.27a |
| *t* | | 0.142 | 11.257 | 0.155 | 4.471 | 0.217 | 8.337 |
| *P* | | ＞0.05 | ＜0.05 | ＞0.05 | ＜0.05 | ＞0.05 | ＜0.05 |

Note: a is P<0.05 compared with the same group before operation.

## 2.5 Comparison of sleep quality score

There exhibited no noticeable difference in sleep quality scores before operation, and there exhibited no noticeable difference (P > 0.05); Six months after operation, the scores of sleep quality, sleeping time, sleep efficiency, sleep disorder and daytime dysfunction in the study group were noticeably lower (P<0.05). All data results are shown in Table 3 and Table 3 continuation Table.

**Table 3** comparison of sleep quality scores [ $\bar{x}$ ±s，points]

| Group | N | Sleep quality | | Time to fall asleep | | Bedtime | |
|---|---|---|---|---|---|---|---|
| | | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation |
| C Group | 40 | 2.91±0.55 | 2.58±0.52a | 2.86±0.40 | 2.58±0.33a | 2.89±0.41 | 2.51±0.36a |
| R Group | 40 | 2.93±0.49 | 1.24±0.22a | 2.89±0.44 | 1.29±0.32a | 2.90±0.43 | 1.53±0.35a |
| *t* | | 0.172 | 15.009 | 0.319 | 17.748 | 0.106 | 12.344 |
| *P* | | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 |

**Table 3** continuation of table

| Group | N | Sleep efficiency | | Sleep disorder | | Daytime dysfunction | |
|---|---|---|---|---|---|---|---|
| | | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation |
| C Group | 40 | 2.79±0.30 | 2.49±0.24a | 2.85±0.36 | 2.41±0.33a | 2.59±0.68 | 2.06±0.63a |
| R Group | 40 | 2.81±0.33 | 1.29±0.12a | 2.87±0.37 | 1.95±0.22a | 2.61±0.70 | 1.83±0.23a |
| *t* | | 0.284 | 28.284 | 0.245 | 7.335 | 0.130 | 2.168 |
| *P* | | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | 0.897 | ＜0.01 |

Note: a is P<0.05 compared with the same group before operation.

## 2.6 Comparison of life quality scores

There exhibited no noticeable difference in preoperative life quality scores (P>0.05); Six months after operation, the scores of physiological function, physical pain, overall health, vitality, social function, emotional function and mental health in the study group were noticeably higher (P<0.05). All the data results are shown in Table 4 and Table 4.

**Table 4** comparison of life quality scores [ $\bar{x}$ ±s，points]

| Group | N | physiological function | | Physiological function | | Somatic pain | | Overall health | |
|---|---|---|---|---|---|---|---|---|---|
| | | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation |
| C Group | 40 | 15.85±3.10 | 24.95±3.55a | 20.14±3.25 | 30.91±3.66a | 18.86±2.29 | 27.19±2.15a | 50.14±1.66 | 65.13±1.53a |
| R Group | 40 | 15.77±3.15 | 36.19±2.44a | 20.20±3.30 | 39.91±3.53a | 18.95±2.33 | 32.95±4.91a | 50.20±1.80 | 78.92±4.63a |
| *t* | | 0.114 | 16.502 | 0.082 | 11.194 | 0.174 | 6.796 | 0.155 | 17.885 |
| *P* | | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 |

**Table 4** continuation of table

| Group | N | Vitality | | Social function | | Emotional function | | Mental health | |
|---|---|---|---|---|---|---|---|---|---|
| | | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation | Before operation | 6 months after operation |
| C Group | 40 | 20.44±3.20 | 31.91±4.33a | 26.68±3.05 | 35.96±3.15a | 14.47±2.39 | 23.95±3.31a | 20.11±1.89 | 25.96±1.94a |
| R Group | 40 | 20.69±3.25 | 42.91±3.44a | 27.01±3.09 | 48.18±2.34a | 14.50±2.46 | 31.95±2.21a | 20.23±1.95 | 31.91±3.53a |
| *t* | | 0.347 | 12.580 | 0.481 | 19.695 | 0.055 | 12.712 | 0.279 | 9.342 |
| *P* | | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 | ＞0.05 | ＜0.01 |

Note: a is P<0.05 compared with the same group before operation.

## 3 DISCUSSION

Cardiac surgery is complex and injured, perioperative stress and injury will cause the release of pro-inflammatory molecules, and the central nervous system perceives the cascade of inflammation, resulting in a surge of catecholamines, resulting in hemodynamic disorders and myocardial injury; cardiopulmonary bypass can also induce and aggravate the inflammatory response. At the same time, admission to the intensive care unit (ICU) after cardiac surgery has the potential to increase the risk of gastrointestinal ischemia and bacterial translocation. Therefore, it is necessary to strengthen nursing intervention for patients undergoing cardiac surgery (Warkentin, Sheppard, & Whitlock, 2022). At present, the nursing interventions for patients undergoing cardiac surgery at home and abroad mainly include perioperative nursing, collaborative nursing, holistic nursing and so on. China has also carried out some research in this area, but there are still some shortcomings: most of the interventions are during hospitalization, there is less out-of-hospital intervention, most of them only carry out health education for diseases, the form of intervention is single, and there is a lack of overall guidance before and after cardiac surgery. There are only nurses involved and lack of cooperation between doctors and nurses; patients passively receive health education given by medical staff, on the one hand, medical staff do not know the knowledge related to cardiac surgery, on the other hand, patients

lack supervision, and the duration of good self-care behavior established in life is limited (Kato & Imamura, 2022; Neuburger & Pospishil, 2022).

With the development of world economy and medical technology, the disease-centered traditional medical model has been gradually replaced by the "bio-psycho-social" medical model (Dannemiller et al., 2022). At this time, there is an urgent need for hospital management to use the spirit of innovation to explore a new working mode to adapt to the gradual transformation of the health care relationship from the initial dominant-subordinate model to the juxtaposition-complementary model (Gerdisch et al., 2022; van der Heijden, Bidar, & Maesen, 2022). In the past, the working mode was that doctors instructed nurses to work, nurses carried out medication orders, and there was a lack of comprehensive communication between doctors and nurses. In the 1950s, the nursing activities of senior practical nurses were carried out in Britain, the United States and other developed countries, and adopted the work mode of combining doctors and nurses in clinical work, which well improved the quality and efficiency of medical and nursing services. to meet the expectations of each other's roles between doctors and nurses, the integration model of health care has sprung up and has been gradually promoted (Nates et al., 2022). The holistic nursing mode of integrated medical and nursing care is different from the previous work mode in which doctors make medical plans and nurses carry out doctor's orders, which breaks the original parallel lines of doctors and patients and nurses and patients. a new work pattern of the trinity of doctors, nurses and patients has been established (Liu et al., 2022). In 2003, the American Nursing Association (Pascale et al., 2022) defined the health care integration model as a reliable cooperation model between doctors and nurses, in which both of them recognize and accept their own behaviors and responsibilities, safeguard common interests and achieve common goals. Meanwhile, doctors and nurses work closely together, exchange information, and work together cooperatively (Biancari et al., 2022). Medical quality is continuously improved through this process. The study shows that in addition to shortening hospital stays, reducing mortality and complication rates, and improving nurse satisfaction, good doctor-nurse cooperation can reduce the number of days patients spend in the hospital [. At present, the integrated medical and nursing model has been used in peritoneal dialysis, wound treatment, outpatient examination, chronic disease management and other fields], and achieved good results. Combined with the results of this study, compared with the degree of cooperation between doctors and nurses, the scores of factor 1, factor 2 and factor 3 in the study group were noticeably higher ($P<0.05$). Regarding the success rate of operation and the incidence of complications, the success rate of operation in the study group was higher, and the incidence of complications in the study group was lower ($P<0.05$). The analysis shows that most of the rehabilitation time of patients undergoing cardiac surgery is at home, and the rehabilitation after cardiac surgery needs the guidance and

supervision of medical staff. Through the holistic nursing model of integrated medical and nursing care, the rehabilitation guidance during hospitalization and the follow-up supervision after discharge can prommote the execution of cardiac rehabilitation in and out of hospital, and then help to enhance the self-nursing ability and life quality of patients. At the same time, it also increases the degree of cooperation between doctors and nurses, which is conducive to the tacit understanding of medical and nursing cooperation, and protect the health of patients.

With the change of medical model, the life quality has been paid more and more attention by clinical workers, and it has become an important index to evaluate the therapeutic effect and prognosis of patients undergoing cardiac surgery. The life quality of patients undergoing cardiac surgery is noticeably lower compared to healthy people, especially in terms of physical function and vitality. A meta-analysis of 35 randomized controlled trials showed that the life quality of 463 cardiac surgery patients improved by 28% after exercise rehabilitation. A meta-analysis conducted by foreign scholars in 2014 showed that physical care based on the integration of health care and health care reduced the hospitalization rate of patients undergoing cardiac surgery and improved the related life quality. Combined with the results of this study, the life quality scores were compared 6 months after the operation. The scores of physiological function, physical pain, general health, vitality, social function, emotional function and mental health of the research group were higher ($P<0.05$). Analyzing the reasons, the integrated nursing model of medical and nursing connects doctors, nurses and patients. Through scientific and continuous nursing intervention, containing in-hospital rehabilitation guidance, out-of-hospital follow-up and follow-up, patients are given continuous supervision and management of postoperative rehabilitation after cardiac surgery to improve self-care. ability to enhance the life quality. This study enables patients to participate in their own postoperative rehabilitation, fully understand the risk factors of disease, and abandon the concept of long-term bedridden patients after surgery. Rehabilitation exercise can help to improve patients' exercise tolerance, improve cardiac function and skeletal muscle and myocardial aerobic metabolism, reduce peripheral vascular resistance, and continuous cardiac rehabilitation will benefit patients in the long term. The improvement of patients' life quality is mainly due to the fact that high-quality nursing intervention is more conducive to improving their condition. After the patient's condition is improved, the life quality will naturally improve, allowing them to return to normal life as soon as possible.

Nursing satisfaction, surgical success rate and complications are important indicators to evaluate the satisfaction with medical level and health outcomes of cardiac surgery patients. Cardiac surgery patients are often hospitalized repeatedly due to poor disease control. Recent improvements in diagnosis and treatment have improved the survival rate of cardiac surgery

patients, but the mortality rate has not improved significantly. A multicenter randomized controlled trial of cardiac rehabilitation conducted by HF-ACTION included 2331 patients with LVEF < 35% and New York Heart Association (NYHA) cardiac function grade Ⅱ-IV. The patients were followed up for 30 months. After adjusting the baseline cardiopulmonary exercise duration, LVEF, Beck depression score and other factors, the incidence of all-cause mortality or all-cause hospitalization (main end point) decreased by 11%. Combined with the results of this study, compared with the success rate of operation and the incidence of complications, the success rate of operation in the study group was higher, and the incidence of complications in the study group was lower (P<0.05). It shows that the application of holistic nursing mode of integrated medical and nursing can help to ensure the curative effect of operation and effectively reduce the incidence of complications in patients undergoing cardiac surgery. In this study, a team of cardiac surgeons, rehabilitation doctors, cardiology nurses and responsible nurses was set up before the intervention, through face-to-face teaching, health education, WeChat platform to answer questions and so on. The patients in the study group have noticeably improved their disease-related knowledge and self-care, and through the above measures, the risk of complications has been effectively reduced, so compared with the control group. The success rate of operation in the study group was noticeably enhance. The improvement of the success rate of operation and the decrease of the incidence of complications fully reflect the application value of integrated holistic nursing. This intervention has more advantages than conventional intervention and is more conducive to the protection of athletic patients' health. This study found that the integrated holistic nursing model can improve the cardiac function and sleep quality of patients undergoing cardiac surgery. The results showed that six months after operation, the LVEF level of the athletic patients undergoing cardiac surgery was noticeably higher compared to the control group, while the levels of LVEDD and NT-proBNP were noticeably lower compared to the control group. Six months after operation, the sleep quality, falling asleep time, sleep time, sleep efficiency, sleep disorder and daytime dysfunction scores of PSQI were lower compared to the control group (P<0.05), indicating that the application of holistic nursing mode of integrated medical and nursing care was beneficial to enhance the cardiac function of athletic patients undergoing cardiac surgery, promote their sleep quality, reduce sleep time and sleep disorder, and strengthen athletic patients' sleep efficiency and sleep time. The improvement of the patient's cardiac function shows that the application of the integrated medical and nursing care model can play a positive role in the treatment effect, help to improve the clinical efficacy, and maximize the enhancement of the patient's condition, which also meets the needs of the patient. Sleep disturbance is a common complication of cardiac surgery, and there are many influencing factors, such as psychological factors, disease factors, environmental factors, and family economic

conditions. The study found that after adopting the integrated medical and nursing care model for cardiac surgery patients, cardiac surgery patients can effectively improve the problem of sleep disturbance in the short term, and at the same time relieve the athletic patient's negative emotional problems, which is consistent with the results of this study.

In summary, the holistic nursing model of integrated medical and nursing care can enhance the success rate of cardiac surgery, reduce the incidence of complications, further promote their cardiac function and sleep quality, and strengthen the life quality of athletic patients. Integrating holistic nursing into healthcare can promote doctor-nurse relationships that are harmonious, as well as cooperative behavior between doctors and nurses.

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