

# Effects of nursing intervention based on a positive motivational model on cardiac function, self-management and quality of life in elderly patients with coronary heart disease

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**Abstract. – OBJECTIVE:** The aim of this study was to analyze the effects of nursing intervention based on a positive motivational model on cardiac function, self-management, and life quality in elderly patients with coronary heart disease (CHD).

**PATIENTS AND METHODS:** A total of 112 elderly CHD patients were picked as the subjects of this research from August 2021 to August 2022. All patients were randomized to the observation group and regular group by a two-color sampling method, with 56 cases in each group. Subjects in the regular group and observation group received traditional interventions and additional positive motivational model nursing interventions, respectively. The cardiac function [left ventricular ejection fraction (LVEF), left ventricular end-systolic diameter (LVESD), left ventricular end-diastolic diameter (LVEDD)], sports endurance, self-management ability, psychological status [depression self-assessment scale (SDS), anxiety self-assessment scale (SAS)], and life quality before and after the intervention were compared between two groups. The readiness for discharge scores and satisfaction with nursing care were compared between the two groups after the intervention.

**RESULTS:** After the intervention, the LVEF levels of the patients in both groups were elevated, and the LVESD and LVEDD levels were sharply decreased ( $p < 0.05$ ). The improvement in cardiac function indexes was more evident in the observation group than in the regular group ( $p < 0.001$ ). The readiness for discharge score of patients was markedly higher in the observation group than in the regular group ( $p < 0.01$ ). After the intervention, the self-management score and sports endurance score of patients in both groups were evidently elevated ( $p < 0.05$ ), which were much higher in the observation group than in the control ( $p < 0.001$ ). The nursing satisfaction of patients in the observation group was 92.86%, much higher than 73.21% in the regular group ( $p < 0.05$ ). The observation group had

much lower SDS and SAS scores than the regular group after the intervention ( $p < 0.001$ ). After the intervention, the observation group had a much higher life quality score than the regular group ( $p < 0.001$ ).

**CONCLUSIONS:** The nursing intervention model based on the positive motivation model could significantly improve the cardiac function, discharge readiness, sports endurance, and self-management behavior of elderly patients with CHD, thereby improving their quality of life and achieving higher patient satisfaction.

## Key Words:

Positive Motivational Model, Nursing Intervention, Elderly Coronary Heart Disease, Cardiac Function, Self-Management, Quality of Life.

## Introduction

The full name of coronary heart disease (CHD) is coronary Atherosclerosis heart disease, which is induced by stenosis or the obstruction of the vascular lumen and myocardial ischemia, hypoxia, or necrosis due to atherosclerosis of the coronary artery<sup>1,2</sup>. At present, the incidence rate of CHD is high in China, especially in the context of advancing aging, the health of the elderly population has been greatly threatened. After the occurrence of CHD, patients may experience symptoms of precordial pain. If not treated in time, the condition will continue to progress, which will lead to arrhythmia, heart failure, and even cardiogenic shock, greatly affecting the life safety of patients<sup>3,4</sup>. An unhealthy lifestyle is the main pathogenic factor for CHD. Under the influence of diseases, the varying degrees of anxiety and depression in elderly people hinder the progress of treatment or

nursing work, leading to increased blood pressure and heart rate, which is very detrimental to disease control. Therefore, not only medication treatment is needed, but also nursing interventions are needed to help patients change unhealthy lifestyles and achieve the goal of improving prognosis<sup>5</sup>.

Nursing intervention based on positive motivation mode refers to conveying positive attitudes and beliefs to patients through positive guidance in speech and behavior, helping patients to establish confidence in overcoming diseases, promoting disease recovery, and reducing the occurrence of complications<sup>6,7</sup>. Scholars<sup>8</sup> have found that nursing interventions based on a positive incentive model can improve the rehabilitation compliance of patients in the intervention operating room, alleviate negative emotions, change patients' coping styles with diseases, and improve patients' nursing satisfaction. However, there is currently no research confirming the clinical value of applying positive motivation mode in patients with CHD.

In this study, elderly patients with CHD were picked as the subjects of this research from August 2021 to August 2022, with the aim to analyze the effects of nursing intervention based on a positive motivational model on cardiac function, self-management and quality of life in elderly patients with CHD.

## Materials and Methods

### Clinical Materials

A total of 112 elderly CHD patients admitted for treatment from August 2021 to August 2022 were picked as research subjects. All patients were randomized to the observation group

and regular group, using a random number table, with 56 cases in each group. The observation group consisted of 31 male patients and 25 female patients, ranging between 60 years to 86 years, with a mean of  $(73.00 \pm 17.00)$  years. The body mass index (BMI) ranged from 19 to 29 kg/m<sup>2</sup>, with a mean of  $(24.00 \pm 12.50)$  kg/m<sup>2</sup>. The course of the disease was 0.5 to 8 years, with a mean of  $(4.25 \pm 0.50)$  years. The regular group consisted of 20 male patients and 36 female patients, ranging between 61 years to 87 years, with a mean of  $(74.00 \pm 17.50)$  years. The BMI ranged from 20 to 30 kg/m<sup>2</sup>, with a mean of  $(25.00 \pm 13.00)$  kg/m<sup>2</sup>. The course of the disease was 1 to 7 years, with a mean of  $(4.00 \pm 1.00)$  years. There existed no statistically significant difference in clinical data between the two groups ( $p > 0.05$ ). The process of general information selection is shown in Figure 1.

Inclusion criteria: all patients met the WHO<sup>9</sup> diagnostic criteria for CHD; the patients were diagnosed through coronary artery CT or coronary angiography examination. According to the New York Heart Association (NYHA) cardiac function grading standards, the patients' cardiac function was classified as Grade II to III; the patients' self-care ability was normal; patients could express their wishes normally and actively participated in nursing work; both the patient and their family members were aware of the study and voluntarily signed the informed consent form. This study was approved by the hospital Ethics Committee. Exclusion criteria: patients with disorders of consciousness; patients with severe arrhythmia; patients with important organ damage; patients with poor compliance; patients with malignant tumors;

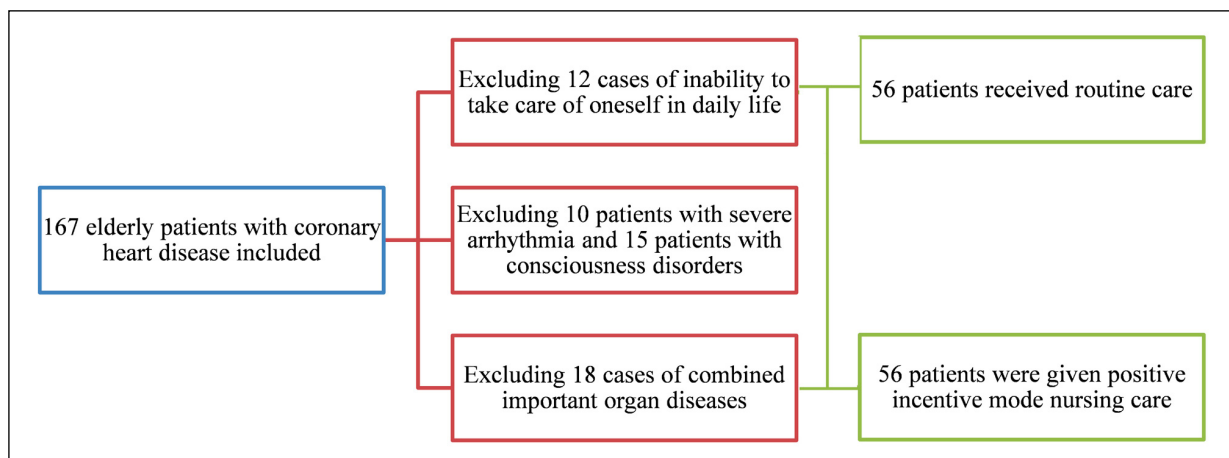


Figure 1. The process of general information selection.

patients with hearing impairment; patients with intellectual disabilities; patients with incomplete clinical data; patients who were lost to follow-up.

### **Methods**

Patients in the regular group received traditional nursing interventions. When nursing, it is necessary to actively explain the knowledge of CHD to the patient, especially the precautions during treatment, how to take medication and so on. It is necessary to pay attention to the patients' psychological changes and physical recovery status, make an executable dietary plan, provide sufficient nutritional support and help them recover physical health.

The patients in the observation group underwent positive incentive nursing interventions based on traditional nursing. The specific measures are as follows: (1) Communicate with patients and develop personalized care plans. Due to the older age of the patients, it is necessary to patiently communicate with them in nursing, and have a thorough understanding of the patients' condition, communication skills, personality traits, etc. Attention should also be paid to communicating with the patients' family members, summarizing potential treatment and nursing issues, and developing a nursing plan that is tailored to the patient's individual condition and needs. Based on this, it is necessary to supervise the implementation of each nursing process to improve nursing effectiveness. (2) Based on patient characteristics, positive language support should be given. Understand the characteristics of the patients' own illness, identify their doubts, and provide psychological counseling. Introduce the recent progress of the disease and successful treatment cases to patients, enabling them to establish a belief in recovery and actively face the disease. Continuously encourage and support patients in communication, especially in daily nursing cooperation work, and give them as much affirmation as possible, mainly focusing on "great, can you take medication on time?" "great progress has been achieved recently" or "is the recovery going well?" to further help patients restore nursing confidence so that they can feel trusted and valued. It is important to use positive language at the right time, with suitable benefits, and create an atmosphere where "rare things are precious" to avoid excessive praise that can make patients feel repulsed. The appropriate language environment and use of appropriate words can also make patients feel the sincerity of the nurs-

ing staff. (3) Patients can communicate regularly and emphasize the importance of family companionship. Regularly encourage communication between patients and provide them with positive teaching materials. Communication between patients is prone to resonance, and they can also urge each other, learn from each other, and supervise each other, significantly improving the quality of care. The patients' family should provide more care and companionship to the patient and provide favorable support and encouragement from the family's perspective. By feeling the love of their family, patients can further enhance their confidence in healing and improve nursing compliance. (4) Guide patients to exercise correctly to improve physical function. After providing positive language encouragement to the patients, they can be guided to engage in aerobic exercise based on their recovery situation, commonly including slow walking, square dancing, and stair climbing training. Such training needs to be determined based on the patients' own situation. The training plan needs to follow the principle of gradual progress, and excessive training must not be allowed to prevent increasing the patients' physical burden, further improving their physical function, and enhancing their physique.

### **Outcome Measures**

(1) Cardiac function: the cardiac function of patients before and after intervention was detected using cardiac color ultrasound technology. The indexes included left ventricular Ejection fraction (LVEF), left ventricular end-systolic diameter (LVESD), and left ventricular end-diastolic diameter (LVEDD). The statistical data was calculated.

(2) Discharge Readiness: based on the Chinese version of the Discharge Readiness Measurement Form<sup>10</sup>, a total of 12 items were evaluated, including personal status (3 items), adaptability (5 items), and expected support (4 items). The assigned value is 0-10 points, with the highest score indicating that the patients are better prepared for discharge.

(3) Sports endurance and self-management: this indicator was evaluated using a 6-minute walking test. A seat was placed at both ends of a 30-meter-long flat road surface to guide the patient to walk back and forth in a straight line for 6 minutes. The maximum walking distance was measured. The longer the measured distance was, the better the athletic endurance was. Self-management ability was evaluated using the CHD Self-Management Behavior Scale (CSMS)<sup>11</sup>,

which included three dimensions: daily life management (12 items in total), disease management (8 items in total), and emotional cognition management (7 items in total). The higher the score obtained, the higher the patient's self-management ability could be determined.

(4) Satisfaction was evaluated using the Newcastle Nursing Satisfaction Scale (NSNS)<sup>12</sup>, which included 19 items (nurse work ability, health education guidance, nursing service attitude, communication effectiveness), with a score range of 19-95 points. Those who scored above 77 were considered very satisfied, 58-76 were considered satisfied, 39-57 were considered basically satisfied, and scores below 38 were considered dissatisfied. Satisfaction = cases of (very satisfied + satisfied + generally satisfied)/total number of cases  $\times$  100%.

(5) The psychological state was evaluated using the Self Rating Depression Scale (SDS) and the Self Rating Anxiety Scale (SAS). Each scale had 20 items and a 4-level rating. To convert it to a percentage system the total score must be multiplied by 1.25. A higher score indicated a worse psychological state.

(6) The quality of life was evaluated following the fourth version of the Quality-of-Life Rating Scale<sup>13</sup>. The scale included social function, psychological function, physiological function and physical function. A higher score indicated higher life quality.

### Statistical Analysis

The experimental data was analyzed using SPSS 20.0 software (IBM Corp., Armonk, NY, USA). The measurement data were represented by ( $\pm$ s), and were compared using *t*-test for inter-group comparison. The enumeration data were shown as % and compared using the  $\chi^2$  test. The statistically significant results were those with  $p < 0.05$ .

## Results

### Cardiac Function Indicators

There existed no significant difference in heart function index between two groups before intervention ( $p > 0.05$ ). The LVEF levels of the patients in both groups were elevated and the LVESD and LVEDD levels were sharply decreased after the intervention ( $p < 0.05$ ). The improvement of cardiac function indexes was more obvious in the observation group than in the regular group ( $p < 0.001$ , Table I and Figure 2).

### Self-Management Score and Sports Endurance

Before the intervention, the self-management scores and sports endurance scores of the two groups were similar ( $p > 0.05$ ). After the intervention, the observation group had a much higher self-management score and sports endurance score than the regular group ( $p < 0.001$ , Table II and Figure 3).

### Comparison of Patient Readiness Scores for Discharge

The patients in the observation group had much better individual status, adaptability and expected support than those in the conventional group in terms of discharge readiness scores ( $p < 0.01$ , Table III and Figure 4).

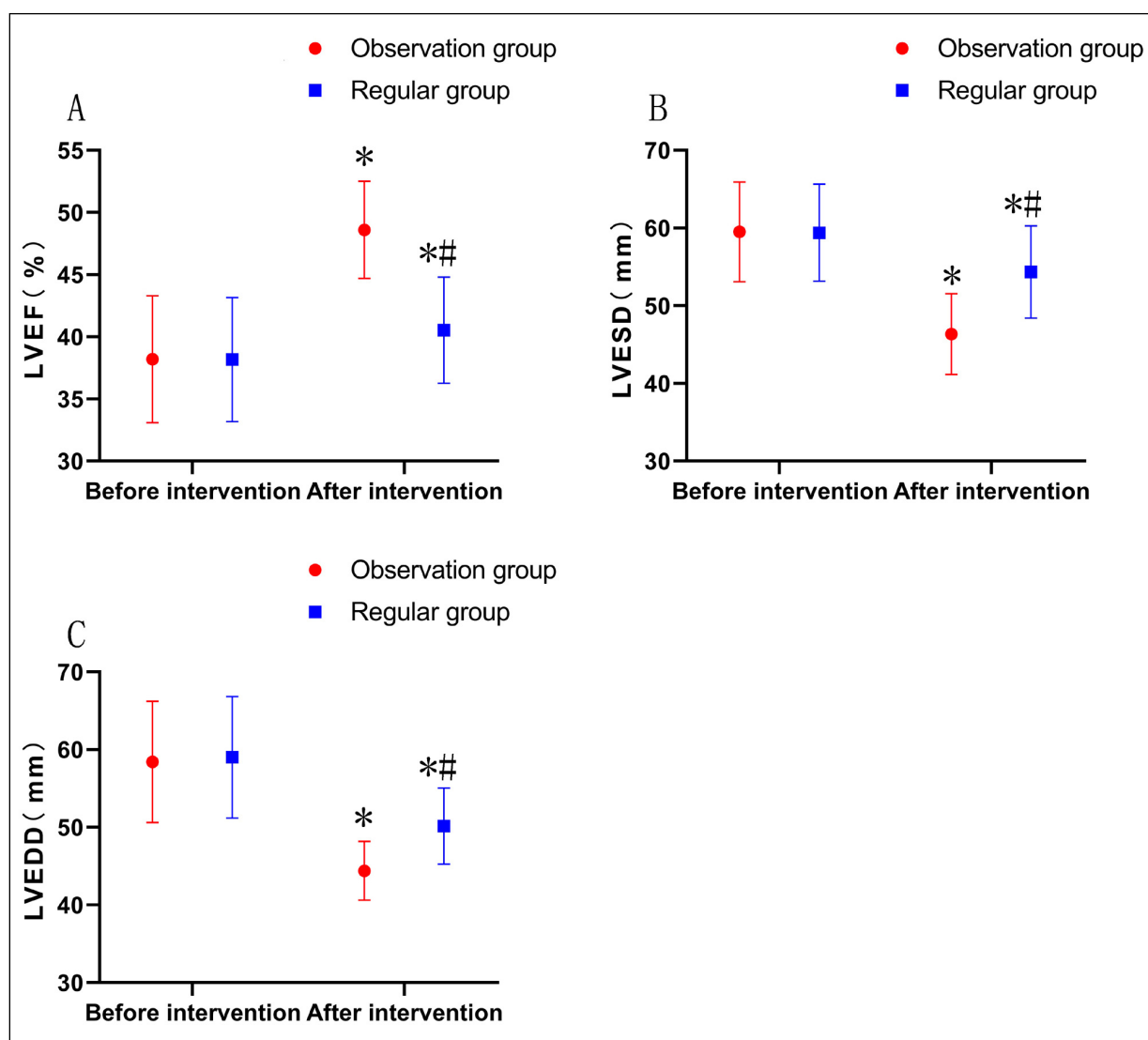
### Comparison of Psychological Status

The SDS and SAS scores were similar between the two groups before the intervention ( $p > 0.05$ ). After the intervention, the SDS and SAS scores of the two groups of patients were both sharply decreased ( $p < 0.05$ ), which were much lower in the observation group than in the regular group ( $p < 0.001$ , Table IV and Figure 5).

Table I. Cardiac function indicators ( $\bar{x} \pm s$ ).

Groups	LVEF (%)		LVESD (mm)		LVEDD (mm)	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
The observation group (n = 56)	38.20 $\pm$ 5.10	48.60 $\pm$ 3.91*	59.50 $\pm$ 6.41	46.34 $\pm$ 5.20*	58.41 $\pm$ 7.80	44.40 $\pm$ 3.80*
The regular group (n = 56)	38.17 $\pm$ 4.99	40.53 $\pm$ 4.28*	59.39 $\pm$ 6.25	54.35 $\pm$ 5.92*	59.00 $\pm$ 7.82	50.15 $\pm$ 4.90*
<i>t</i>	0.031	10.417	0.001	7.607	0.400	6.939
<i>p</i>	0.975	< 0.001	0.999	< 0.001	0.690	< 0.001

\* $p < 0.05$  compared with the same group before the intervention.

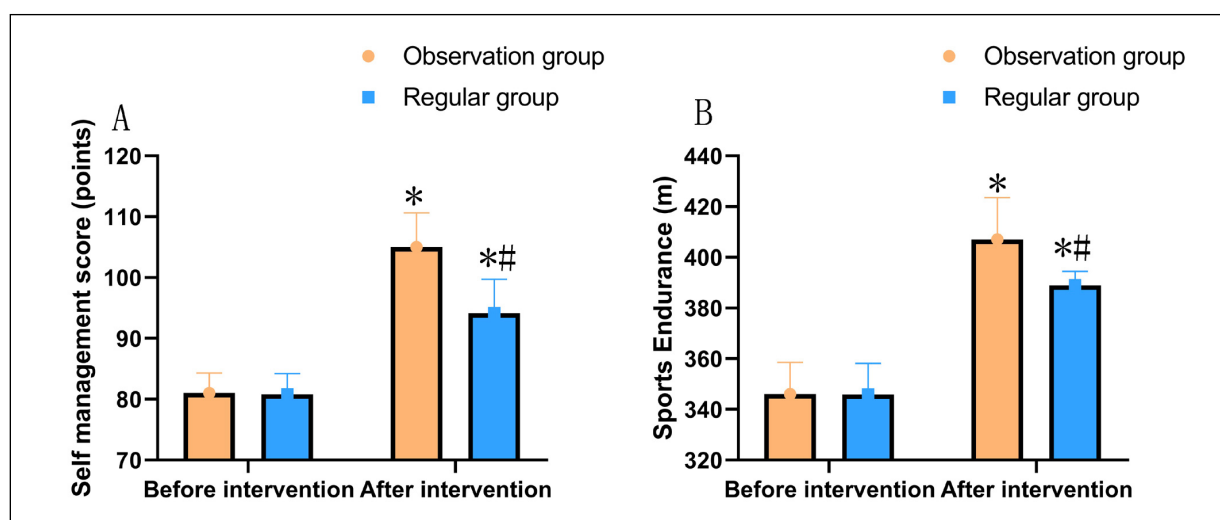


**Figure 2.** Comparison of cardiac function indicators. **A**, Comparison of LVEF levels; **B**, Comparison of LVESD levels; **C**, Comparison of LVEDD levels. \* $p < 0.05$  compared with the same group before treatment, # $p < 0.05$  compared with the observation group.

**Table II.** Self-management score and sports endurance ( $\bar{x} \pm s$ ).

Groups	Self-management score (score)		Sports endurance (m)	
	Before intervention	After intervention	Before intervention	After intervention
The observation group (n = 56)	81.00 ± 3.32	105.00 ± 5.63*	346.00 ± 12.50	407.00 ± 16.50*
The regular group (n = 56)	80.83 ± 3.40	94.15 ± 5.57*	345.85 ± 12.30	388.92 ± 14.25*
<i>t</i>	0.268	10.252	0.064	6.206
<i>p</i>	0.789	< 0.001	0.949	< 0.001

\* $p < 0.05$  compared with the same group before the intervention.



**Figure 3.** Comparison of self-management scores and sports endurance between two groups. **A**, Comparison of self-management scores between two groups; **(B)** Comparison of sports endurance levels between two groups. \* $p < 0.05$  compared with the same group before treatment, # $p < 0.05$  compared with the observation group.

**Table III.** Comparison of patient readiness scores for discharge ( $\bar{x} \pm s$ ).

Groups	Cases	Individual status	Adaptability	Expected support	Total score
The observation group	56	27.00 ± 3.72	46.90 ± 3.22	38.20 ± 2.61	112.10 ± 9.55
The regular group	56	25.15 ± 2.34	44.62 ± 3.68	27.11 ± 2.72	96.88 ± 8.74
<i>t</i>		3.150	3.489	22.015	8.798
<i>p</i>		0.002	0.001	< 0.001	< 0.001

### Comparison of Satisfaction

The satisfaction rate of patients in the observation group was 92.86%, which was higher than 73.21% in the conventional group ( $p < 0.05$ , Table V).

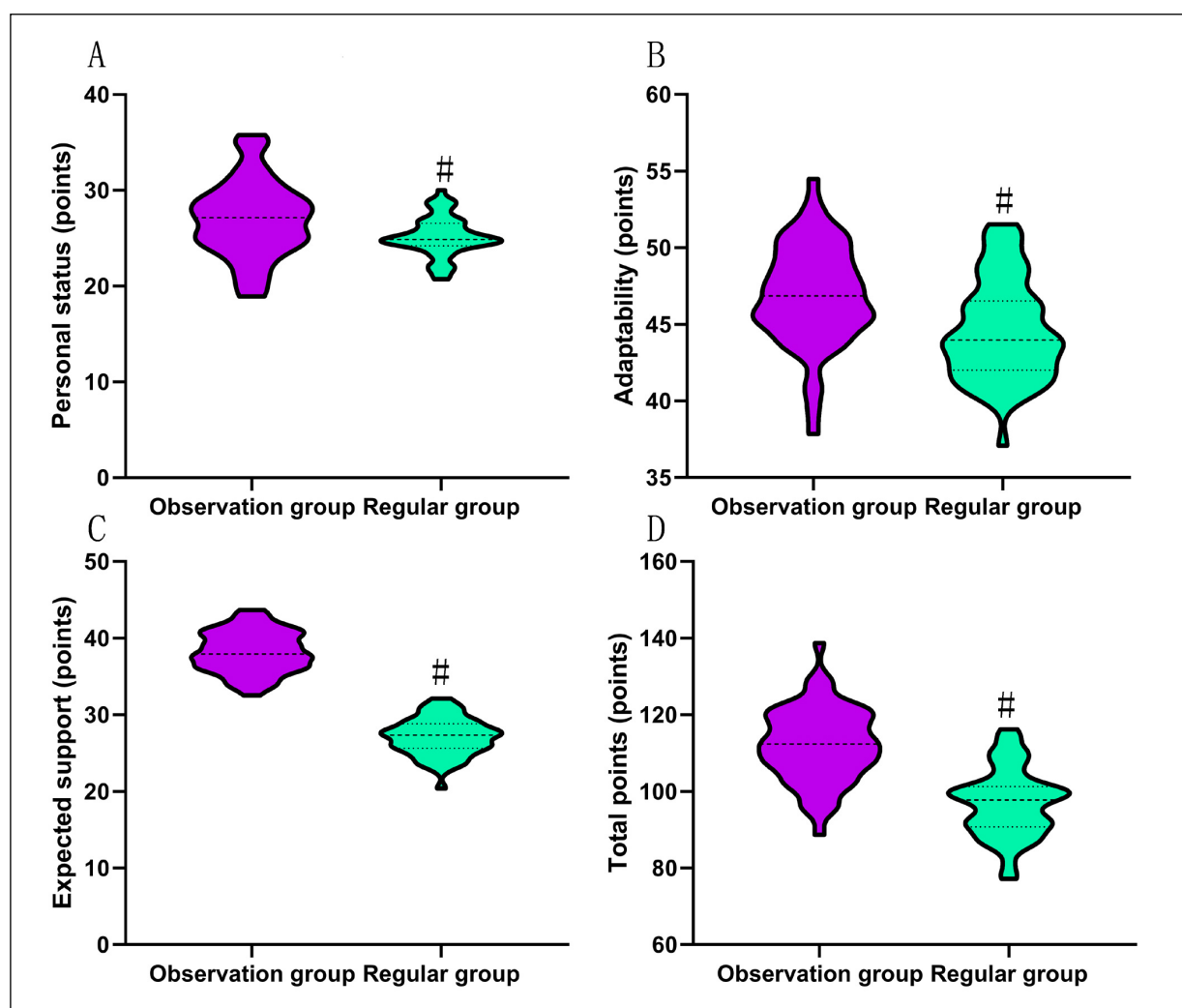
### Comparison of Quality of Life

There existed no significant difference in life quality scores between the two groups before intervention ( $p > 0.05$ ). After the intervention, the life quality scores of the two groups were largely elevated ( $p < 0.05$ ). The life quality scores were much higher in the observation group than in the regular group after intervention ( $p < 0.001$ , Table VI).

## Discussion

Coronary heart disease (CHD) is a common cardiovascular disease with a high inci-

dence rate. CHD mainly refers to heart disease caused by coronary atherosclerosis, which leads to the narrowing or blocking of the vascular lumen, leading to myocardial ischemia, hypoxia or necrosis. CHD is a chronic disease with a relatively long treatment cycle, and the affected population is mainly concentrated in the middle-aged and elderly population. Currently, CHD is becoming prevalent in younger individuals as well<sup>14</sup>. During the treatment process, patients should actively participate in their disease self-management. The effectiveness of disease rehabilitation in the later stage is closely related to whether patients can receive effective nursing interventions and actively participate in self-management of the disease. Therefore, for elderly CHD patients, while providing prevention of complications and disease control, more attention should be paid to patient self-management, psychological status, quality of life, etc.

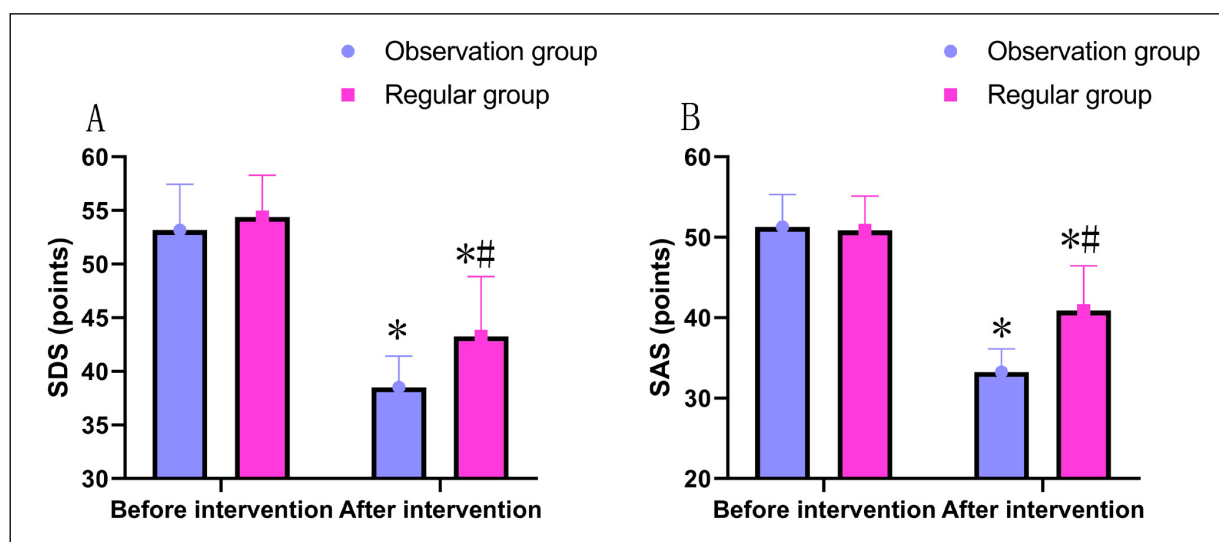


**Figure 4.** Comparison of discharge readiness scores. **A**, Comparison of individual status scores; **B** Comparison of adaptability scores; **C** Comparison of expected support scores; **D** Comparison of total scores. # $p < 0.05$  compared with the observation group.

**Table IV.** Comparison of psychological status ( $\bar{x} \pm s$ ).

Groups	SDS (score)		SAS (score)	
	Before intervention	After intervention	Before intervention	After intervention
The observation group (n = 56)	53.17 $\pm$ 4.26	38.52 $\pm$ 2.88*	51.30 $\pm$ 4.01	33.25 $\pm$ 2.85*
The regular group (n = 56)	54.40 $\pm$ 3.89	43.26 $\pm$ 3.15*	50.85 $\pm$ 4.26	40.88 $\pm$ 3.15*
<i>t</i>	1.596	8.311	0.576	13.441
<i>p</i>	0.114	< 0.001	0.566	< 0.001

\* $p < 0.05$  compared with the same group before the intervention.



**Figure 5.** Comparison of psychological state scores. **A**, Comparison of SDS scores; **(B)** Comparison of SAS score. \* $p < 0.05$  compared with the same group before treatment, # $p < 0.05$  compared with the observation group.

The application focus of traditional nursing methods is to educate patients on disease knowledge and alleviate negative emotions. However, due to the failure to organize and summarize the problems that arise in nursing, there are loopholes in nursing work that do not allow to achieve the expected nursing effect. In addition, conflicts with patients are also prone to arise during this process, and the relationship between nurses and patients is also prone to “stalemate”, which affects the subsequent development of nursing services<sup>15,16</sup>. A nursing intervention that uses positive motivation models is a new type of nursing method. In practical nursing work, nursing staff can actively think about how to communicate and exchange emotions with patients and family members. Different incentive methods, such as verbal and behavioral incentives, are applied to stimulate patients’ motivation to participate autonomously, improve their confidence, further alleviate negative emotions, and improve their quality of life<sup>17,18</sup>. According to relevant data<sup>19</sup>, the positive incentive nursing mod-

el can improve the nursing satisfaction rate, knowledge awareness rate of myocardial infarction, and treatment compliance of patients undergoing percutaneous coronary intervention, and improve the symptoms and adverse emotions of angina pectoris in patients. The results of our study revealed that the observation group had much better improvement in cardiac function indicators and much higher self-management and exercise endurance scores than the regular group. From this, it could be seen that a positive incentive model for nursing intervention could improve patients’ heart function, and could also help patients learn self-management through corresponding incentives, thereby enhancing their confidence in their own abilities. The relevant reason might be that the nursing intervention using positive incentives was a humanized and personalized nursing plan. Through this nursing method, patients could solve their tension and fear problems, strengthen their cardiac blood supply function, and improve their heart function and coronary heart disease cure rate.

**Table V.** Comparison of satisfaction [n/%].

Groups	Cases	Very satisfied	Satisfied	Basically satisfied	Dissatisfied	Satisfaction
The observation group	56	30 (53.57)	12 (21.43)	10 (17.86)	4 (7.14)	52 (92.86)
The regular group	56	20 (35.71)	13 (23.21)	8 (14.29)	15 (26.79)	41 (73.21)
$\chi^2$		-	-	-	-	7.670
$p$		-	-	-	-	0.006



Effects of nursing intervention based on a positive motivational model on cardiac function

**Table I.** Comparison of quality of life ( $\bar{x} \pm s$ ).

Groups	Physical function		Social function		Physiological function		Psychological function	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
The observation group (n = 56)	71.51 $\pm$ 2.73	86.01 $\pm$ 5.25*	71.31 $\pm$ 2.53	86.04 $\pm$ 4.07*	71.53 $\pm$ 2.73	86.41 $\pm$ 4.24*	71.71 $\pm$ 4.29	86.42 $\pm$ 5.17*
The regular group (n = 56)	71.14 $\pm$ 2.75	77.59 $\pm$ 5.23*	71.45 $\pm$ 2.63	77.23 $\pm$ 5.50*	71.59 $\pm$ 2.08	77.37 $\pm$ 3.07*	70.85 $\pm$ 3.42	77.35 $\pm$ 5.25*
<i>t</i>	0.715	8.503	0.287	9.636	0.131	12.923	1.173	9.212
<i>p</i>	0.476	< 0.001	0.775	< 0.001	0.896	< 0.001	0.243	< 0.001

\**p* < 0.05 compared with the same group before treatment.

Discharge readiness is a multidimensional concept that estimates and judges the ability of patients and their families to leave the acute care unit and is a perception of whether they are ready to be discharged. It is also an indicator that the patient has basically recovered (intermediate rather than later recovery) and can be safely discharged from the hospital<sup>20</sup>. Discharge readiness is becoming increasingly important in improving the quality of patient hospitalization and reducing the occurrence of adverse events after discharge and has received widespread attention and application in clinical practice. Some studies<sup>21,22</sup> have shown that discharge readiness assessment can help healthcare professionals better assess patients' discharge readiness, thereby improving patient recovery and reducing readmission rates. The present study pointed out that the observation group had much higher scores of discharge readiness and nursing satisfaction than the conventional group. From this, it could be seen that the positive incentive nursing model intervention could largely improve the readiness quality of discharge guidance and nursing satisfaction for elderly CHD patients. Nursing interventions that use positive motivation models help patients understand the importance of self-care ability through behavioral and linguistic incentives, and timely affirms patients' progress, enabling them to maintain confidence in positive changes and spontaneously adhere to rehabilitation exercises. By encouraging behavior and mutual assistance and reference from other patients, we can better implement each aspect of nursing and improve patients' self-care abilities. Family support can provide patients with multi-dimensional support, enhance their desire for life, and actively learn and practice<sup>23</sup>. In addition, the results of this study also found that the psychological state and quality of life of patients in the observation group were much better than those in the control group after the intervention. This exhibited that positive incentive nursing could effectively alleviate negative emotions in patients, and further understand the needs and main problems of patients during hospitalization<sup>24</sup>. At the same time, this nursing model enables the nursing plan to achieve the established goals and incentivizes patients to actively participate in disease management, thereby improving overall satisfaction and improving patients' prognosis and quality of life. The positive motivation nursing model utilizes relevant behaviors to motivate patients during the implementation process<sup>25</sup>. For example, verbal praise can alleviate patients'

concerns and enhance their confidence in combating diseases to a certain extent.

## Conclusions

In general, nursing intervention based on the positive motivation model could significantly improve the cardiac function of elderly patients with CHD, and help improve their discharge readiness, sports endurance, and self-management behavior, thereby improving their quality of life and achieving higher patient satisfaction. The sample size selected in the clinical implementation process was small, and the representativeness of our results needed further verification.

### Ethics Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All procedures were approved by the Ethics Committee of Hulun Buir Zhongmeng Hospital. The acceptance number is HBZH2021015.

### Informed Consent

Informed consent was obtained from all individual participants included in the study. The patients participating in the study all agreed to publish the research results.

### Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Conflict of Interest

The authors declare that they have no competing interests.

### Funding

Not applicable.

### Authors' Contributions

Sa Ren Tuo Ya and Yan Yuan Lei confirmed the authenticity of all the raw data and edited the manuscript. Li Xin Bao and Xiang Shu Cui collected data and processed the data. Sa Ren Tuo Ya and Yan Yuan Lei conducted the statistics. Li Xin Bao and Xiang Shu Cui reviewed and revised the article. All authors read and approved the final manuscript.

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