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**The Impact of Personalized Nursing Care on Anxiety, Depression, Angina
Related Life Quality, and Physiological Conditions in Older Adults with
Coronary Heart Disease**

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**A thesis submitted in partial fulfillment of the requirements for the degree
of Master of Public Health**

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Department of Social & Behavioral Sciences**

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Abstract

Objective: To study the impact of medical-personalized nursing care on anxiety, depression, BMI, blood pressure, blood lipid and quality of life in elderly patients with coronary heart disease.

Methods: In this study, 160 older adults with coronary heart disease had been enrolled and randomized using the random range method. The control group included 80 older adults who received a conventional nursing intervention, and the experiment group included 80 older adults who were treated with a focused and personalized nursing intervention. The two groups of older adults had been compared and evaluated for Self-rating Anxiety Scale (SAS) mark, the Self-rating Depression Scale (SDS) mark, Seattle Angina Questionnaire (SAQ) score, Body Mass Index (BMI), blood pressure, and blood lipids levels.

Results: After the intervention, the extents of anxiety (as indicated by SAS mark) and depression (as indicated by SDS mark) of the experiment group were statistically less than those of the control group (SAS: Effect Size: 0.557, $P < 0.05$; SDS: Effect Size: 0.800, $P < 0.05$). Compared to the control group, reduced level of angina and increased angina-related life quality (as reflected by SAQ score) were observed in the experiment group after intervention (Effect Size: -0.203, $P < 0.05$). The levels of BMI, blood pressure, and blood lipids in the experimental group after the intervention were lower than those in the control group (Effect Size: 0.231, $P < 0.05$), indicating that patients in the personalized nursing group have better related physiological outcomes.

Conclusion: Older adults with coronary heart disease receiving a targeted nursing intervention have benefits in these aspects: reduced anxiety and depression, increased angina-related life quality, and improved physiological outcomes.

Keywords: Social and Behavioral Sciences, Elderly, Coronary Heart Disease, Targeted Nursing, Personalized Medication, Psychology, Mental Health, Quality of Life, Physiological Outcomes

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1 Introduction

Coronary heart disease (CHD) is one of the principal cardiovascular diseases that cause a significant number of deaths and threaten human public health. Epidemiological studies have shown that the incidence of coronary heart disease in China is increasing with the current prevalence rate close to 2% (Linden, 1999), forming a serious threat to older adults. The scientific manifestations are angina pectoris, myocardial ischemia and infarction, heart failure, and sudden death; amongst them the aged angina is the most frequent, which severely influences the daily life quality of these patients (Batty, 2002). The current main methods for treating CHD include drugs, coronary artery bypass surgery, and Percutaneous Coronary Intervention (PCI) (Bogaev & Meyers, 2015). With the continuous efforts of medical scientists and engineers, the level of medical operations and the relevant equipment for coronary interventions continue to be improved.

Psychological problems are very frequently related to CHD and greatly affect the life quality of these patients. Depression and anxiety are two most common psychological disorders among CHD patients. Depressive mood disorder is clinically manifested as loss of interest, negative self-evaluation, lack of energy, mental retardation, decreased body activity, and even repeated suicides (Lee, 2015). Anxiety mood disorder is a persistent or intermittent fear and worry about things that have not happened (Linden, 1999). Depression and anxiety issues not solely critically affect the quality of life of CHD patients, moreover, they are high-risk elements for patients' physical health. Mental disorders and CHD impact each other negatively and form a vicious cycle, which significantly affects the prognosis and recovery of the CHD. The mutual interaction between physical and mental disorders and its influence on the progression of diseases have gradually become research hotspots.

In recent years, many studies have been carried out to investigate the psychological issues of people with cardiovascular diseases. Depression and anxiety disorders have a very high prevalence in patients after CHD stent implantation. Studies in China have reported that, within 1 year after PCI treatment, 30% to 40% of patients will develop depressive symptoms, and about 60% of patients will have anxiety symptoms (Sipötz et al., 2013), while related reports suggest that in the USA 35%-58% of patients will experience psychological disorders after coronary stent surgery (Olsen et al., 2018). Mental disorders seriously affect the prognosis of heart diseases. Depression and anxiety disorders are considered to be independent risk factors for CHD and one of the predictors of Major Adverse Cardiovascular Events (MACE) (de Heer et al., 2020). Depression and anxiety can lead to increased sympathetic nerve excitability and cause corresponding pathophysiological changes, such as decreased vascular endothelial function, increased secretion of catecholamines, increased levels of inflammatory factors, abnormal blood lipid metabolism, procoagulant substances, and angiotensin II release (Bogaev & Meyers, 2015). These changes can promote or aggravate angina pectoris, myocardial infarction, arrhythmia, and heart failure, resulting in an obvious growth in the probability of MACE, and seriously affect the treatment and rehabilitation of the disease (Bogaev & Meyers, 2015). At the same time, psychological factors can also directly affect health-related behaviors, and these behaviors can affect the occurrence and prognosis of CHD (Bogaev & Meyers, 2015). Therefore, the mental disorders such as anxiety and depression and the occurrence, development, and

prognosis of CHD are mutually related and interactive.

As an effective way to help mental disorder in patients, targeted nursing can guide patients to express their concerns and problems and establish a harmonious medical staff-patient relationship through effectively personalized and affectionate communication with patients. A large number of studies have confirmed that in USA targeted nursing is applied to the psychological care of various patients with diabetic retinopathy, or malignant tumors, or cerebral infarction, and pregnant women who have given birth, and has achieved beneficial results (Woods, 2006). Therefore it is theoretically likely that the targeted nursing will bring benefits to soothe the mental stress in CHD patients and help the recovery from the heart diseases. Unfortunately, the targeted nursing research in patients with CHD is relatively insufficient. These together prompt us to study the application of targeted care to CHD patients.

Aiming at providing a potential practical reference for the development, application, and promotion of targeted nursing in the future, this study applied targeted care to CHD patients who were hospitalized in the cardiovascular department of a Chinese tertiary first-class hospital. We communicated with patients on the basis of empathy, analyzed the actual problems faced by each patient to identify personalized health guidance and individual nursing measures, in order to guide patients to actively face the disease, and thereby in the hope to improve the prognosis. In this study, for exploring the roles of targeted nursing intervention in anxiety, depression, life quality, and physiological conditions of older adults with coronary heart disease, 160 older adults with CHD were randomly assigned to two groups and studied respectively. The experiment group received our personalized targeted nursing interventions, while the control group received traditional nursing interventions (Jepma et al., 2020). The Self-rating Anxiety Scale (SAS) mark, the Self-rating Depression Scale (SDS) mark, Seattle Angina Questionnaire (SAQ) score, Body Mass Index (BMI), blood pressure, blood lipids and other different laboratory tests of the patients were acquired and evaluated in two groups before and after the interventions, to observe the effect of targeted nursing interventions.

2 Method

2.1 Clinical data

From January 2019 to December 2020, 160 older adults with coronary heart disease had been chosen from the cardiology branch of our hospital, all of whom have been identified through coronary angiography or coronary CT angiography, aged ≥ 60 years old, and volunteered to be part of this study.

2.1 Inclusion criteria and exclusion criteria

2.1.1 Inclusion criteria

① Meet the diagnostic criteria for coronary heart disease established by the World Health Organization/International Society of Cardiology in October 1997;

② Positive after coronary angiography or coronary CT angiography;

③ Age ≥ 60 years old;

④ The research protocol was examined by the ethics committee of the research center;

⑤ Patients and family members voluntarily join the study after signing the informed consent form.

2.1.2 Exclusion criteria

- ① Accompanied by other serious physical diseases, such as damage to the heart, kidney, brain and other organs, and unable to read and write;
- ② Those who cannot communicate with others normally;
- ③ Patients who have had anxiety and depression in the past and are taking antidepressant, anxiety or sedative drugs;
- ④ Had participated in related psychological intervention studies in the past 3 months;
- ⑤ The clinical data is incomplete, and/or the follow-up cannot be completed.

2.1.3 Rejection criteria (reject if one of them is met)

- ① During the research process, the patient actively requested to withdraw from the research due to other reasons;
- ② Transfer to other departments for treatment due to changes in their own condition;
- ③ Those whose condition deteriorates and cannot continue to participate in the research;
- ④ Those who have serious psychological problems and require intervention and treatment by a psychologist.

2.2 Calculation of sample size

When the number of cases of the two groups of patients in the difference test is equal, the estimation formula of comparing the mean of two independent samples is adopted: $N_1=N_2=2 \times [(U\alpha+U\beta)\sigma/\delta]^2$. According to the preliminary experiment, the two sample contents in the formula are respectively N_1 and N_2 .

The results are calculated, and the standard deviations of the anxiety (SAS) and depression (SDS) scores are respectively acquired, and the mean values are respectively substituted into the formula, $\sigma=5.47$, $\delta=4.41$, $\mu_{0.05/2}=1.96$, $\mu_{0.01}=1.282$, N is the maximum sample size, considering the 20% loss of follow-up, the final sample size is: $(64+64)/(1-20\%) \approx 160$ cases, 80 cases in each group.

2.3 Random grouping method

First, the 80 patients are numbered in the order of entry into the group. In Excel 2016, we entered the "number" in the "A1" cell, and the number is 1-160 in sequence, enter the "random number" in the "B1" cell, and select the formula for generating random numbers: RANDBETWEEN (1,160) generates 160 random numbers and fixes the random numbers; enter "group" in the "C1" cell, where odd numbers are the intervention group and even numbers are the control group.

3 Intervention methods

Both groups of patients received the treatment with conventional medications for coronary heart disease, including 10 mg of atorvastatin per day and 20 mg of traumatized each time 3 times a day.

3.1 Control group

Patients in the control group received standard routine care in the Department of Cardiology, including: condition observation, diet care, health education, medication care, psychological counseling, standard patient instruction on diet, exercise, follow-up visit and other precautions after discharge.

3.2 Personalized Intervention group

Patients in the experimental group received the targeted care intervention for coronary heart disease, including:

① After the patients were hospitalized, the nursing staff made personalized rehabilitation plans step by step based on the differences in their eating habits and activity patterns, and promoted the importance of healthy lifestyles to the patients.

② We drew up a personalized diet and exercise plan according to the patient's physical condition and the recommendations from the nutrition department of the hospital. The basic dietary requirements were: reasonable food intake to ensure protein amount; controlling total calories and especially cholesterol intake; the amount of salt per day does not exceed 5g; eating small meals; and eating enough vegetables, fruits, and other fiber-rich foods. Reasonable exercise methods include fast walking, slow running, and swimming. The amount of exercise should not cause the patients to feel too tired: exercise 3 times a week for the first month, and increase the frequency later if necessary.

③ For those who were not sleeping well, they were given timely sleep promotion care, such as listening to soothing music during sleep, soaking feet in warm water before sleep, etc., to ensure that the patients fall asleep in a relaxed mood and improve the quality of sleep.

④ When the patient was discharged from the hospital, senior nursing staff would provide post-discharge self-care guidance, distribute brochures and video CDs, and determine the time for follow-up visits and record detailed contact information for follow-up.

⑤ Patients would be monitored for 6 months after discharge: follow-up once a week in the 1-2 months, once every two weeks in the 3-4 months, and once every four weeks in the 5-6 months. The follow-up content mainly included the recovery of the condition, diet and health guidance, and positive psychological guidance was given to encourage patients to develop and stay in good living habits.

3.2.1 Preparations before targeted nursing intervention

(1) Conducted literature review by searching domestic and foreign databases; drafted the intervention plan of relevant targeted nursing, according to the actual situation and clinical practice of this research, under the guidance of experts and mentors in related fields; formulated and modified the outline and content of the targeted nursing intervention plan.

(2) Formed an intervention team: For the smooth progress of the research, the project leader invited 1 clinical psychologist, 1 cardiovascular doctor, 4 cardiovascular nurses, 1 deputy chief nurse, and 2 master graduate students to assist in the implementation of the intervention plan. The team members each have clear division of labor, and the specific arrangements are shown in Table 1.

Table 1 Team members and task assignment

Team Members	Task Assignment
Clinical psychologist	Coordinate and guide patients in the process of receiving targeted care
Cardiologist	Screen and enroll patients
Cardiology nurse	Routine nursing for control group and experiment group
Deputy chief nurse	Issuance of questionnaires, data collection, data entry, analysis, and participation in targeted nursing interventions throughout the process
Postgraduate	Help implementing targeted nursing intervention and coordinate

(3) Team personnel training: First, the team members who organized and implemented the intervention learnt the actual cases of targeted nursing in clinical application through the network platform, and obtained valuable experience from the cases, and mastered the five major skills and core concepts of targeted nursing. Then the research team leader - clinical psychologists - and master graduate students organized team members to conduct a 12-hour training on the research purpose, significance and the application methods of targeted nursing, core skills, and precautions.

(4) Targeted nursing skills practice: Two people as a group, one played the intervener, and the other played the intervened person. The member who played the intervened person thought about a minor problem they had encountered in life or work recently and told the intervener. The intervener would intervene according to the four stages of targeted nursing (Table 2). Then two members in the group would conduct role exchanges. This would help team members to understand and master the relevant skills of targeted nursing from different perspectives.

(5) Pre-experiment: Before the targeted nursing intervention, selected 4 CHD patients to implement targeted care according to the intervention plan, and dealt with the problems found in the implementation process in time, then further revised and improved the intervention plan based on this pre-experiment experience.

3.2.2 Time, place, form and method of targeted nursing intervention plan

Location: Chose a quiet and comfortable place, such as a conference room or classroom. If the patient was weak because of illness, he could be communicated at the bedside after obtaining the chief doctor's consent.

Time: Generally, the morning was the patient's intensive treatment and nursing time. Therefore, as far as possible, chose the time period after the end of the treatment in the afternoon or after the dinner for targeted nursing intervention. 2-3 conversations at each stage, and face-to-face communication with the patient each time 30-45 minutes were performed for 4 consecutive weeks. After the patient was discharged from the hospital, the communication was conducted via telephone audio or video call.

Format: This study adopted an "individualized, one-to-one, face-to-face" approach to listen to the "story" of patients.

Method: Based on the establishment of a friendly and trusting relationship with the patient, this study adopted guiding questions to initiate a dialogue to encourage the patient to express their own feelings. Through a large number of literature searches and group discussions, four stages of guiding questions had been designed (Table 2). When the researcher asked the patient questions such as "What are your psychological feelings after learning about the illness", and "Please talk about your psychological changes after you fell sick", the intervention process of targeted nursing had begun.

Table 2 Guiding questions in the four stages of narrative nursing

Stages	Leading questions
Attention stage	1. What is your psychological feeling after learning about the illness? Please talk about your psychological changes after your illness. 2. You seem to be in a bad mood. Is there something upset? Can you talk to me specifically? 3. What do you think of this disease? Do you think fate is unfair

	to you?
	4. What is your opinion of the "story" that tells your feelings and experiences?
Comprehension stage	<ol style="list-style-type: none"> 1. If you use a word or state to describe yourself, what do you think it is? (Trouble, grievance, badass, enormous stone...) 2. What does the trouble look like? 3. How did the trouble come from? Which factors will increase or decrease the trouble? 4. How do you see the changes that the heart disease has brought to your life? Why?
Reflection stage	<ol style="list-style-type: none"> 1. From the initial diagnosis to the present, what have you learned from this experience? 2. What is the one thing you are most proud of? 3. How do you think the disease has progressed to the current state? 4. Have you ever encountered a similar problem, and do you remember how it was solved? 5. What potential do you think you have been overlooked?
Response stage	<ol style="list-style-type: none"> 1. In the face of difficulties and troubles, how do you think they can be overcome or avoided? 2. What role do family members play in your diagnosis and treatment process? 3. If you see your changes, will so many people who love you feel proud? 4. Are there "wolf war stars" around you? Compared with them, what advantages and disadvantages do you think you have? 5. What valuable experiences can you share with other patients?

3.2.3 Specific steps of targeted nursing intervention

Attention stage: Actively established a trusting relationship with the patient. With the patient's permission, chose the right time and suitable place to let the patient relax and enter the patient's story. Gained a comprehensive understanding of the personalized information on each patient's psychological history, illness, specialty, hobbies and social support, guided patients to talk about their painful experiences and specific problems that had plagued them, to have a basis for follow-up targeted care. Through active communication with patients, established a good relationship of trust with patients. The key nursing points at this stage were: in communicating with patients, paid attention to observing their expressions and emotions; cooperated with physical movements such as holding hands and stroking their backs to allow patients to open their hearts and tell their stories; made observation records at the same time.

Comprehension stage: Guided the patient's to dissect the problems. For the communication with the patient in this stage, the nurse should patiently listen to the patient's statement, analyzed the social and cultural background of the problem, and asked the patient to understand its deep meaning, as well as the predisposing factors and inhibitory factors, and analyzed the specific problems based on the communication with the patient from the previous stage. Used the anthropomorphic method to name the actual problem encountered by the patient, explored its impact, and guided the patient to get rid of the trouble of the disease. The main points of care at this stage were:

guiding the patient to name the specific issues in the previous stage as anthropomorphic names (such as "grief" and "big stone"); and helping patients see the problem and its impact from different standpoints and perspectives.

Reflective stage: Reviewed and dug into past positive emotional events of the patient. Reflection in action was the process of talking with the patient, while paying attention and understanding, and immediately reflecting, and immediately discovering the difference between the patient's narrative and his own knowledge. The action in reflection was carried out after the first conversation with the patient, to help the patient summarize the relevant content of the narrative and analyze their own understanding deviation, to guide the patient to review and discover similarities that had been neglected in the past experience, and to help patients find a way to solve the problem. The main points of care at this stage were: guiding the patient to eliminate the influence of negative emotions; establishing themselves to look at the problem from multiple angles; asking questions about the patient's past similar life experiences that were neglected; and eventually giving affirmation, analyzing and reflecting for deficiencies, summing up experiences, and helping patients improve themselves.

Response stage: Helped patients reconstruct the story, enhance their confidence, and look forward to the future. Assisted patients in increasing their confidence to overcome problems, and guiding patients to turn "how to deal with pain" into "how to overcome pain when it occurs." Encouraged patients to actively share their past experiences to discover their own potential shining points; helped patients to re-recognize their potential, and to make mental space for new life events. Instant response meant that the nurse would listen to the patient's story and sort out the clues, find and deal with problems in time, and provide information support and emotional feedback immediately. Delayed response meant that the nurse would carefully analyze the story told by the patient, and then provide thoughtful feedbacks later. Nurses were encouraged to consult relevant literature, group discussions, and experts to give a comprehensive response plan. The main points of care at this stage were: guiding the patient to identify the positive previous life experiences, to establish confidence to overcome the current problems; using the stories of others to empathize and ignite the patients; correctly handling and solving problems by referring to literature resources and experts.

Key points:

- (1) First of all, before the start of the intervention, informed the patient that there was no right or wrong answer, and encouraged the patient to express their thoughts;
- (2) Used guiding questions flexibly according to the specific situation and the patient's emotions, and appropriately adjusted the content and number of questions;
- (3) In the actual application of targeted care, the above four steps were not completely independent and could be interspersed and overlapped. It was necessary to correctly understand the needs of patients, guide patients to explore their own potential to solve problems, help patients relieve pain and regain confidence in life.

4 Evaluation tools

4.1 General information and disease-related information survey form of the research object

The general information questionnaire is based on the content and purpose of the

research, and is developed by the group based on the discussion, including: age, gender, age of onset, family income per capita, payment method of medical expenses, time of diagnosis, number of hospital admissions, number of relapses, whether you understand the condition, etc.

4.2 Self-rating Anxiety Scale (SAS)

The subjective anxiety feelings in patients were assessed with this scale. The Cronbach's α coefficient is 0.759. There are 20 items in total. The total mark was multiplying the sum of the marks of 20 items, by 1.25 and taking the integer part of the number to get the final value: (< 50) no anxiety, (50-59) mild anxiety, (60-69) moderate anxiety, (≥ 70) severe anxiety; for higher score, the anxiety is more severe.

4.3 Self-rating Depression Scale (SDS)

The subjective depression feelings of patients were assessed with the scale. The Cronbach's α coefficient is above 0.75. There are 20 items in total, and the total mark was multiplying the sum of the marks of 20 items, by 1.25 and taking the integer part of the number to get the final value: (< 53) no depression, (53-62) mild depression, (63-72) moderate depression, (≥ 72) severe depression; the higher the score, the more severe the depression is.

4.4 Seattle Angina Pectoris Questionnaire (SAQ) score

The quality-of-life evaluation includes physical activity limitation, stable angina pectoris and frequency of attacks, clinical treatment satisfaction and subjective feelings, etc.; the score is positively correlated with life satisfaction.

4.5 Detection of clinical indicators

The testing content mainly includes BMI index, blood pressure, total cholesterol and triglycerides; the blood pressure monitoring instrument uses the German IEM company's MOBIL ambulatory blood pressure monitor; the testing instrument is fixed on the patient's left upper limb from 8:00 to 9:00, and the daytime is 6: 00-22:00 set to automatically inflate once every 15 min, 22:00-6:00 set to automatically inflate once every 30 min; ensure that the number of effective measurements $>90\%$, the detection time $>72h$; the blood lipid index detection adopts Beckman Coulter AU680 automatic biochemical analyzer, blood samples are taken from the patient's early morning to draw 10 ml of fasting venous blood.

5 Data collection

On the first day of admission, the general information questionnaire, SAS, and SDS were used to conduct a baseline survey on them. If the patient is discharged from the hospital, telephone audio or video calls will be used for targeted care. After the intervention (4 weeks later) the patient will be reviewed by the investigator in advance communication with the patient, and use SAS and SDS to evaluate the patient again under the guidance of the investigator during the outpatient review. The patient who did not go to the hospital for the review for other reasons will be interviewed by phone or voice.

6 Statistical methods

SPSS25.0 software was adopted for statistical analysis. Measurement data (such as age of onset, age) are described by mean \pm standard deviation, and count data (such as number of relapses, whether you know the disease, etc.) are described by several cases (percentage). Two groups, the patient's SAS, SDS, scores and total scores before

the targeted nursing intervention and after the intervention (4 weeks later) are tested for normal distribution first. The t test is used for measurement data, and the measurement data is Count \pm standard deviation); count data is expressed by χ^2 test as a percentage (%); $P < 0.05$ is regarded as a statistically significant difference.

7 Quality control

7.1 Quality control of researchers

The members of this research group are objective and all have strong professional knowledge, and the members have strong executive ability, coordination ability and practical ability, and they have uniformly trained targeted nursing related content, mastered the core theories and basic requirements of targeted nursing, and can effectively communicate with patients.

7.2 Intervention process quality control

Targeted care is carried out in a separate room to avoid contamination with patients in the control group to reduce interference; in the process of targeted care intervention, strictly follow the intervention plan, try not to interrupt the patient's complaint, and establish a trust relationship with the patient in a timely manner.

7.3 Quality control at the data collection stage

The researcher is proficient in using each scale and uses a unified and standardized language to guide the patient to fill it out. Issuing all questionnaires and the entry of data are completed by two graduate students in the research group, and then they are checked and revised to ensure the accuracy of the data.

7.4 Quality control in the data analysis stage

All data is checked and entered by two persons, and after logical error detection, the integrity of the data is ensured while avoiding duplication or omission of the data. Invite statistical experts to guide in the process of data analysis and processing.

8 Ethical principles

(1) This research was examined by the hospital's ethics committee before implementing the study. Explain to CHD patients true and sufficient information on specific measures of targeted care intervention before the start of targeted care intervention, talk about its pros and cons, and allow patients to make their own choices. After obtaining the patient's consent, targeted nursing interventions will be implemented.

(2) Confidentiality principle: the personal information of patients collected during the research is limited to the research, and the information related to the privacy of patients and family members will not be leaked or made public.

(3) The principle of fairness and benefit: the various measures in the study have no potential harm to patients and their families physically and mentally, and can help patients improve their self-care ability and general self-efficacy.

(4) Voluntary principle: before the start of the research, explain the research purpose, significance, the voluntary nature of the research process and participation, confidentiality and harmlessness to the research subjects, and obtain the patient's consent and sign an informed consent form.

(5) The principle of no harm: the researcher shall make a detailed explanation before the study to ensure the patient's informed consent and ensure that the relevant rights of the patient and family members will not be harmed.

9 Results

9.1 Comparison of SAS and SDS marks between the two groups of patients before and after intervention

Before the intervention, two groups showed not statistically significant ($P>0.05$) differences of SAS score and SDS score. Compared to itself before intervention, the SAS and SDS scores after intervention were significantly smaller in each group ($P<0.05$).

As indicated in Table 3, the SAS (Effect Size: 0.557, $P<0.05$) score and SDS (Effect Size:0.800, $P<0.05$) score of the experimental group have been notably smaller than these of the control group after intervention, indicating that the personalized nursing can better reduce the depression and anxiety of CHD patients than the conventional nursing.

Table 3 Comparing depression and anxiety marks between the two groups

Group	Cases	SAS		SDS	
		Before intervention	After intervention	Before intervention	After intervention
Control group	80	51.26±8.72	42.80±6.94 [*]	48.35±8.11	29.70±5.14 [*]
Experiment group	80	51.53±8.78	35.14±4.12 [*] △	48.27±8.07	18.12±3.36 [*] △
<i>t</i>		1.35	2.17	1.44	2.23
<i>P</i>		>0.05	<0.05	>0.05	<0.05

△ By comparing with the control group, $P<0.05$; ^{*}Compared with the pre-intervention, $P<0.05$

9.2 Comparison of SAQ scores between the two groups of patients before and after intervention

Before the intervention, the diversity of SAQ score between the two groups was not statistically obvious ($P>0.05$). Compared to itself before intervention, the SAQ score after intervention was significantly higher in each group ($P<0.05$).

The SAQ score of the experiment group was greatly higher than that of the control group after intervention (Effect Size: -0.203, $P<0.05$) (Table 4), indicating that the personalized nursing is more helpful to grow the quality-of-life of CHD patients than the conventional nursing.

Table 4 Comparison of quality-of-life scores between the two groups

Group	Cases	SAQ	
		Before intervention	After intervention
Control group	80	61.37±9.45	64.72±10.50 [*]
Experiment group	80	63.42±9.47	69.25±11.34 [*] △
<i>t</i>		1.51	2.04

P	>0.05	<0.05
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△By comparing with the control group, P<0.05; ※By comparing with the pre-intervention, P<0.05

9.3 Comparison of the clinical index levels of the two groups of patients before and after the intervention.

Before the intervention, the differences of BMI, blood pressure, and blood lipid levels between the two groups were not statistically significant (P>0.05). By comparing with itself before intervention, the BMI, blood pressure, and blood lipid levels after intervention were significantly smaller in each group (P<0.05).

The BMI, blood pressure (both Diastolic and Systolic pressures), and blood lipid levels (TG and TC) of the experiment group after intervention have been drastically smaller than these of the control group (Effect Size: 0.231, P<0.05) (Table 5), indicating that the personalized nursing is more helpful to reduce the body mass index, recover the blood pressure, and reduce blood lipid level in CHD patients than the conventional nursing.

Table 5 Comparison of clinical index levels between the two groups

Group	n	BMI (kg/m ²)		Diastolic pressure (mmHg)		Systolic pressure (mmHg)		TG (mmol/L)		TC (mmol/L)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	80	24.81±6.14	21.67±5.15※	84.93±11.34	80.35±9.63※	142.67±22.51	137.46±18.79※	1.67±0.53	1.45±0.46※	5.23±1.55	4.74±1.26※
Experiment group	80	24.69±6.03	20.21±4.10※△	85.02±11.57	75.28±8.14※△	142.59±22.60	131.35±15.36※△	1.65±0.52	1.22±0.34※△	5.19±1.51	4.19±1.05※△
P		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

△ Compared with the control group, P<0.05; ※Compared with the pre-intervention, P<0.05

10 Discussion

CHD is one of the most prevalent death-causing diseases. CHD patients are adversely affected in their physical and social functions, and they are prone to varying degrees of pessimism, depression, resistance, anxiety, and other emotion difficulties during the illness. With the continuous development of the medical model of "physiology-psychology-society-psychiatry", researchers have paid more attention to

the psychological problems exhibited by patients with CHD. For these patients, the diagnosis of the disease seriously affects their mental health. Patients are too worried about their condition and prognosis, which can cause the relatively high incidence of anxiety and depression. Studies have shown that early, professional, and timely psychological care, and gradually and orderly providing emotional support to CHD patients, can improve their mental health (Belialov, 2017), and that CHD patients are willing to receive early psychological counseling and mental health screening (Twomey et al., 2003).

In our study, the SAS score, SDS score, SAQ score, BMI, blood pressure, and blood lipid levels of the personalized nursing group after intervention have been notably better than these of the control group ($P < 0.05$), suggesting that, compared with conventional nursing intervention, personalized and targeted nursing for aged sufferers with CHD has apparent benefits in enhancing the body conditions and intellectual satisfaction of life. The personalized nursing intervention program implemented in this study, through active psychological counseling, systemic diet, exercise, and sleep intervention, significantly improves patients' awareness of the harmfulness of negative mental states, and guides patients to correct emotional catharsis. During targeted interventions, we were able to further increase the patients' recognition of their diseases, help them master the treatment methods in the acute attack and remission period, and make sure that they use the drugs correctly to obtain the ideal therapeutic effect. We showed implementing psychological nursing interventions is beneficial to remove the anxiety and worry of the patient, to assist the affected person to regulate their mentality, and to increase the conscious cooperation with treatment and nursing care.

Previous studies have indicated that nursing interventions containing efforts to soothe the mental stress of CHD patients might be beneficial to the prognosis (Farquhar et al., 2018). The nursing interventions in their study include: preparing before the operation, giving the patients appropriate psychological interventions, and eliminating the patients' tension, anxiety, and other unhealthy psychological emotions. They showed that these could help to establish patients' confidence in treatment, improve their motivation and compliance of treatment and nursing, and reduce the adverse effects caused by psychological stress. However, in the study these authors could not access these medical benefits very quantitatively, but only at qualitatively level basing on follow-up interview feedbacks from patients. In our study, we carefully designed personalized nursing intervention plans, which were better personalized to meet the individual need of each patient and included more nursing contents. Also, we well quantitatively characterized the differences between the targeted nursing and control groups in three major aspects: the anxiety and depression scores, angina related life quality, and physiological parameter measurement. Therefore, we were able to prove that older adults with coronary heart disease receiving a targeted nursing intervention showed reduced anxiety and depression, increased angina-related life quality, and improved physiological outcomes.

Inspired by our research, we call on the medical staff in the clinical setting to conduct personalized interventions according to the patients' individual conditions after implementing routine nursing interventions, to achieve the purpose of targeted nursing for CHD patients. Differentiated nursing intervention plans shall be planned by analyzing the severity of the patient's situation and the traits of their dietary activities. Targeted nursing is based on the patient's specific condition. The level of understanding

of the patient, the condition of the disease, the living habits, and the personality are different, and the nursing model of the corresponding nursing plan is implemented according to the person. The goals of personalized nursing are to increase self-control ability, relieve patients' unpleasant emotions, enhance treatment confidence, correct diet errors, and develop good living habits, etc., to ultimately improve patients' quality of life and help disease prognosis. To achieve great prognosis outcome and ultimately benefit the patients, target nursing requires the involvement from many stakeholders including the cardiologists and psychologists supervising the personalized nursing plan, nurses implementing the plan in hospital, family members of patients helping conducting the plan at home after the discharge of patients, and most importantly the patients themselves willing to participate.

In summary, our work indicates focused nursing interventions for aged sufferers with CHD can effectively alleviate bad intellectual states, improve the lifestyles and assist in enhancing physiological functions. However, due to the small quantity of study samples, quick follow-up time, and single-center limitations, these conclusions are to be further demonstrated with large-scale medical trials.

References:

- BATTY, G. D. 2002. Physical activity and coronary heart disease in older adults. A systematic review of epidemiological studies. *Eur J Public Health*, 12, 171-6.
- BELIALOV, F. I. 2017. [Depression, anxiety, and stress in patients with coronary heart disease]. *Ter Arkh*, 89, 104-109.
- CARNEY, R. M. & FREEDLAND, K. E. 2017. Depression and coronary heart disease. *Nat Rev Cardiol*, 14, 145-155.
- DE HEER, E. W., PALACIOS, J. E., ADÈR, H. J., VAN MARWIJK, H. W. J., TYLEE, A. & VAN DER FELTZ-CORNELIS, C. M. 2020. Chest pain, depression and anxiety in coronary heart disease: Consequence or cause? A prospective clinical study in primary care. *J Psychosom Res*, 129, 109891.
- DE HERT, M., DETRAUX, J. & VANCAMPFORT, D. 2018. The intriguing relationship between coronary heart disease and mental disorders. *Dialogues Clin Neurosci*, 20, 31-40.
- HVIDTFELDT, U. A., TOLSTRUP, J. S., JAKOBSEN, M. U., HEITMANN, B. L., GRØNBAEK, M., O'REILLY, E., BÄLTER, K., GOLDBOURT, U., HALLMANS, G., KNEKT, P., LIU, S., PEREIRA, M., PIETINEN, P., SPIEGELMAN, D., STEVENS, J., VIRTAMO, J., WILLETT, W. C., RIMM, E. B. & ASCHERIO, A. 2010. Alcohol intake and risk of coronary heart disease in younger, middle-aged, and older adults. *Circulation*, 121, 1589-97.
- JEPMA, P., JORSTAD, H. T., SNATERSE, M., TER RIET, G., KRAGTEN, H., LACHMAN, S., MINNEBOO, M., BOEKHOLDT, S. M., PETERS, R. J. & SCHOLTE OP REIMER, W. 2020. Lifestyle modification in older versus younger patients with coronary artery disease. *Heart*, 106, 1066-1072.
- LLOYD-JONES, D. M., LARSON, M. G., BEISER, A. & LEVY, D. 1999. Lifetime risk of developing coronary heart disease. *Lancet*, 353, 89-92.
- OLSEN, S. J., SCHIRMER, H., WILSGAARD, T., BØNAA, K. H. & HANSSSEN, T. A. 2018. Cardiac rehabilitation and symptoms of anxiety and depression after percutaneous coronary intervention. *Eur J Prev Cardiol*, 25, 1017-1025.
- RICHARDS, S. H., ANDERSON, L., JENKINSON, C. E., WHALLEY, B., REES, K., DAVIES, P., BENNETT, P., LIU, Z., WEST, R., THOMPSON, D. R. & TAYLOR, R. S. 2017. Psychological interventions for coronary heart disease. *Cochrane Database Syst Rev*, 4, Cd002902.
- RICHARDS, S. H., ANDERSON, L., JENKINSON, C. E., WHALLEY, B., REES, K., DAVIES, P., BENNETT, P., LIU, Z., WEST, R., THOMPSON, D. R. & TAYLOR, R. S. 2018. Psychological interventions for coronary heart disease: Cochrane systematic review and meta-analysis. *Eur J Prev Cardiol*, 25, 247-259.
- WIRTZ, P. H. & VON KÄNEL, R. 2017. Psychological Stress, Inflammation, and Coronary Heart Disease. *Curr Cardiol Rep*, 19, 111.
- Twomey, P., Reynolds, T., & Wierzbicki, A. (2003). 2P-0318 concordance evaluation of coronary risk scores — implications for CHD Risk Screening. *Atherosclerosis Supplements*, 4(2), 108. [https://doi.org/10.1016/s1567-5688\(03\)90461-2](https://doi.org/10.1016/s1567-5688(03)90461-2)

- Caunt, H. (1992). Preoperative nursing intervention to relieve stress. *British Journal of Nursing*, 1(4), 171–174. <https://doi.org/10.12968/bjon.1992.1.4.171>
- Lee, K. K. (2015). Major depressive disorder and bipolar mood disorders. *Encyclopedia of Social Work*. <https://doi.org/10.1093/acrefore/9780199975839.013.892>
- Yesilbursa, D., Serdar, A., & Aydinlar, A. (1999). Effect of successful coronary angioplasty and stent implantation on Qt dispersion. *Coronary Artery Disease*, 10(5), 335–338. <https://doi.org/10.1097/00019501-199907000-00010>
- Sipötz, J., Friedrich, O., Höfer, S., Benzer, W., Chatsakos, T., & Gaul, G. (2013). Health related quality of life and mental distress after PCI: Restoring a state of equilibrium. *Health and Quality of Life Outcomes*, 11(1). <https://doi.org/10.1186/1477-7525-11-144>
- Bogaev, R., & Meyers, D. (2015). Medical treatment of heart failure and coronary heart disease. *Coronary Artery Disease*, 533–560. https://doi.org/10.1007/978-1-4471-2828-1_20
- Linden, B. (1999). Coronary heart disease: Screening and management. *Coronary Health Care*, 3(4), 215–219. [https://doi.org/10.1016/s1362-3265\(99\)80048-0](https://doi.org/10.1016/s1362-3265(99)80048-0)
- Farquhar, J. M., Stonerock, G. L., & Blumenthal, J. A. (2018). Treatment of anxiety in patients with coronary heart disease: A systematic review. *Psychosomatics*, 59(4), 318–332. <https://doi.org/10.1016/j.psych.2018.03.008>