Application of Structured Health Education and Combined 5A Nursing Model in Self-control of Vulnerable Chronic Diseases: Take Coronary Heart Disease as an Example

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Abstract: *Objective:* To explore the intervention effect of the Structured Health Education course and 5A nursing model for self-control of elderly patients with coronary heart disease. *Methods:* Using the random sampling method, 124 elderly CAD patients admitted to the First Affiliated Hospital of Bengbu Medical University were randomly divided into an experimental group and a control group. The control group line routine health education, experimental group take structured health education combined with 5A nursing before and after the intervention using a coronary heart disease assessment questionnaire, coronary heart disease self-control scale evaluation of two groups of intervention, compare two groups before and after intervention blood pressure, blood sugar, body mass index, lipid index level and complications within 8 months after discharge. *Results:* After the course intervention, the disease cognition and self-behavior of the experimental group were higher than that of the control group, and the differences were statistically significant (all $P < 0.1$). *Conclusion:* This course is suitable for elderly patients with coronary heart disease. The 5A model improves the cognitive and management ability of elderly patients to a certain extent, which is worthy of clinical application.

Keywords: Old age; Coronary heart disease; Self-control; Structured health education; 5A nursing

1. Introduction

Coronary heart disease (CHD) ranks first in the causes of death in many developed countries due to its high morbidity and mortality rate, causing death and disability [1,2]. Its prevalence is positively correlated with age, and the number of elderly patients with coronary heart disease is gradually increasing in China [3]. Due to the poor acceptance of health knowledge and poor memory, traditional health education cannot be accepted by all elderly patients [4]. Therefore, it is necessary to intervene and manage self-control problems such as poor treatment compliance, poor self-control and no attention to disease prognosis. Structured education comes from learning network theory [5]. That is, through reasonable planning and phased courses, patients can be more

aware of their health needs and more actively participate in the health education mode of disease management so as to achieve the goal of improving the health education system and improving health status. Different from traditional health education, this mode by the specialist nurse to patients with self-control defects lack professional single health education, including condition monitoring, restriction of alcohol and tobacco, medication management, sports planning, diet guidance, emotional regulation, such as plate, according to the education situation and patients with health management plan [6]. The 5A nursing model is established on the basis of evidence-based medicine, and the management methods can effectively change the behaviour mode of patients [7,8]. First proposed by the International Cancer Society, the nursing 5A model includes evaluating patients' beliefs, behaviour, psychology and motivation (Ask and Access), providing advice to reduce the risk of illness and improve health (Advice), assisting patients with risk assessment based on their physical and mental conditions and practice ability (Asisst), provide the implementation plan and determine the follow-up (Arrange) protocol [9,10]. It can make medical workers accurately grasp the dynamic situation of patients' health, and ensure the continuity and feasibility of nursing intervention by adjusting nursing measures. So far, many medical institutions at home and abroad have widely applied the 5A model to health examinations [11], sub-health diseases [12], and blood system disorders [13]. In this study, Structured Health Education combined with the 5A nursing model was applied to the intervention of elderly CHD patients, which achieved very satisfactory intervention results in improving the self-control ability of elderly CHD patients. The results are reported as follows.

2. Data and methods

2.1. General information

From 2023 to 2024, 124 elderly patients were admitted to the First Affiliated Hospital of Bengbu Medical University. The patients were numbered in a random number table and evenly divided into two groups: the experimental group and the control group. There are 35 males in the experimental group, 27 female cases; age (67.73 ± 4.47) years old, minimum of 64 years old, maximum of 75 years old; education level: 32 cases of junior high school and below, 20 cases of high school and technical secondary school, 10 cases of college degree or above. On the other hand, there are 43 men in the control group and 19 women; age (67.32 ± 2.65) years old, minimum of 62 years old, maximum of 72 years old; education level: 31 cases of junior high school and below, 18 cases in high school and technical secondary school, 13 cases of junior college degree or above. There was no significant difference in gender, age, body mass index and education between the two groups ($P > 0.05$). This study complied with the requirements of the Declaration of Helsinki and was fully explained to the patient and signed the informed consent form with the patient.

2.1.1. Inclusion criteria

    (1) First diagnosis of coronary heart disease;
    (2) Age between 60 to 80 years old, no other diseases complications
    (3) Without systematic health education on coronary heart disease;
    (4) Normal cognitive level and voluntary participants;
    (5) Patients undergoing coronary angiography;
    (6) Patients undergoing coronary artery bypass grafting and coronary artery stent implantation.

2.1.2. Exclusion criteria

    (1) With severe hepatic and renal dysfunction;
    (2) Had to withdraw from the trial due to special reasons;

(3) Age under 60 and 80 years old;

(4) Without family members;

(5) Patients with mental disorders.

2.2. Course implementation method

2.2.1. Control group

Adopt routine health education methods; guide the patients on self-blood pressure monitoring, hypertension knowledge, diet and exercise; inform the patient about face-to-face and instruct regular review at discharge.

2.2.2. The experimental group

The Structured Health Education and 5A nursing model intervention were used, and the two groups detected changes in blood pressure, blood glucose, body mass index and blood lipid level by self-control behaviour scale after 8 months. As the intervention method, the Structured Health Education 5A nursing intervention model was constructed and implemented for the experimental group where the experimental group should set the structured health education curriculum and adopt the 5A nursing model based on the control group.

In the Structured Health Education course, a structured health education mode in line with the patient's condition is developed with the cooperation of the department directors, head nurses and specialized nurses. The director of the department is responsible for formulating the outline and participating in the popularization of disease knowledge and medication guidance, the head nurse is responsible for sorting out the opinions of patients and solving the problems arising in the process of education, and the specialist nurse is responsible for the nursing plan and dietary standard; the head nurse, the specialist nurse and professional pharmacists jointly compile the dietary health education manual for coronary heart disease. Its contents mainly include coronary heart disease etiology, pathogenesis treatment measures, daily blood pressure management, diet structure, exercise guidance, and medication norms. On this basis, cardiovascular experts are invited to design the course plan and implementation details and provide guiding suggestions to ensure the rationality and feasibility of the course; set up 5 credit hours, 1 credit hour per week and 25 minutes each in the teaching room of the department. To ensure that each patient could participate in each lecture, screening was carried out according to the exclusion criteria. Select 1 specialized nurse to speak and 2–3 responsible nurses to assist.

On the other hand, 5A nursing was implemented by taking the 5A nursing model as the guideline, combined with the specific demands of patients, and implementing effective intervention policies.

(1) Ask: Develop and distribute questionnaires, including history of hypertension, diabetes, smoking, treatment, and current condition changes.

(2) Assess: Evaluate the questionnaire results, physical and mental health, and daily action ability to master the patients' confidence in the completion of the goal and find the key to the problem.

(3) Advise: Identify the key problems and propose solutions. Strengthen the healthy living environment and, if cognitive and self-control barriers exist, provide targeted guidance on communicating with family members and medical staff.

(4) Assist: Using the measures of the previous stage, combined with the actual information and information of the patient, jointly formulate the expectations and reach the plan by helping to solve the patient's questions through the guidance of their negative emotions, improve the patient's confidence, and establish a harmonious, reliable and solid doctor-patient relationship.

(5) Arrange: Based on the patient's problems, target progress, physical condition, psychological state, etc., reasonably arrange irregular follow-ups and give accurate guidance and advice. The follow-up should be face-to-face or online 15 to 20 minutes after discharge.

2.3. Experimental indicators and evaluation criteria

(1) Cognition of coronary heart disease. The CHD cognitive level was assessed by the CHD knowledge test questionnaire within 1 month before and after the intervention.

(2) Self-control ability of coronary heart disease patients. Including their own blood pressure and blood glucose monitoring, taking medicine according to the doctor's advice, regular exercise, diet control, abnormal treatment, and using the level 5 scoring method: 5 as completely achieve, 4 as often monitor, 3 as sometimes monitor, 2 as rarely monitor, 1 as do not monitor.

(3) Coronary heart disease self-efficacy. Using the general self-efficacy scale (GSES), the Chinese version of the scale jointly developed by Zhang Jianxin and Schwarzer, including 10 items, using grade 4 scoring method, the total score is 10–40. The higher the score, the better the self-efficacy level of the patient.

(4) Complications. Follow-up within 6 months after discharge to record the occurrence of complications in both groups, including blood glucose: blood glucose value < 3.9 mmol/L or > 16.7 mmol/L; consistent with coronary heart disease, disease-induced heart failure; arrhythmia: paroxysmal atrial fibrillation and frequent atrial premature beats. Serious complications caused by acute myocardial infarction include heart rupture and papillary muscle dysfunction.

2.4. Statistical methods

Data were analyzed and processed using the SPSS21.0 statistical software. Measurement data are expressed as mean ± standard deviation (SD), using t-test; count data as rate and χ^2 test as $P < 0.05$ were considered as statistically significant.

3. Results

3.1. Comparison of CHD cognitive level before and after the intervention groups

Before the intervention, the scores were not significant ($P > 0.05$); one month after the intervention was higher than the control group, which was significant ($P < 0.01$). Refer **Table 1**.

3.2. Comparison of self-control ability of CAD before and after intervention

Before the intervention, there was no significant difference in the SDSCA scale ($P > 0.05$); 3 months after the intervention, the diet, exercise, blood glucose monitoring and drug management dimensions in the experimental group were higher than that of the control group, indicating a statistical difference ($P < 0.01$). Refer **Table 2**.

3.3. Self-efficacy evaluation of CAD before and after intervention in both groups

Before the intervention, the difference was not significant ($P > 0.05$); the self-efficacy scores were higher than the control group was significant ($P < 0.01$). Refer **Table 3**.

3.4. Comparison of the occurrence of disease-related complications in the two patient groups

Within 6 months of follow-up, the incidence of blood glucose, heart failure and arrhythmia in the experimental group was lower than that in the control group, but the difference was not significant ($P > 0.05$). Refer **Table 4**.

Table 1. Comparison of the cognitive level between the two groups of CAD patients before and after the intervention (score, mean ± SD)

Group	Cases before intervention	Cases after intervention
Experimental group 62	10.35 ± 2.62	20.18 ± 4.40
Control group 62	10.47 ± 2.86	16.54 ± 4.22
t value	0.312	0.755
P value	5.987	< 0.001

Table 2. Comparison of self-control ability of two groups of CAD patients before and after intervention (score, mean ± SD)

Group number	Diet exercise	Blood glucose monitoring	Drug management
Before			
Experimental Group 62	2.34±0.57	0.84±0.19	3.94±0.96
Control group 62	2.41±0.44	0.89±0.22	4.12±1.15
t value	0.982	1.737	1.214
P value	0.327	0.084	0.226
After			
Experimental group 62	5.74±0.49	3.62±0.75	6.13±0.48
Control group 62	5.15±0.62	2.96±0.68	5.56±0.76
t value	7.540	6.584	6.404
P value	<0.001	<0.001	< 0.001

Table 3. Comparison of self-efficacy of two groups of CHD patients before and after intervention (score, mean ± SD)

Group number	Cases before intervention	Cases after intervention
Experimental group 62	65.74 ± 6.42	91.54 ± 7.37
Control group 62	65.96 ± 6.35	76.37 ± 6.82
t value	0.133	8.275
P value	0.894	< 0.001

Table 4. Comparison of the two groups of CAD patients before and after intervention (score, mean ± SD)

Group number	Hypoglycemia	Heart failure	Arrhythmia
Experimental group 62	3	2	6
Control group 62	6	3	10
P value	0.44	0.621	1.000

4. Discussion

According to the fifth health service survey in China in 2013, the prevalence of coronary heart disease among Chinese mainland 15-year-olds was 12.3% in urban areas, 8.1% in rural areas, and 10.2% in urban and rural areas. The prevalence of CHD in people over 60 years old was 27.8 per thousand [14,15]. Studies have shown that CHD is highly associated with individual behavioural habits and that unhealthy behavioural habits can lead to the occurrence of CHD and acute CHD events [16]. Because elderly patients are prone to diabetes, hypertension, hyperlipidemia and other diseases, the coronary lesions show tissue calcification, complex branches, narrowed lumen, etc., which is more prone to myocardial infarction, leading to poor prognosis of patients [17,18]. In addition, the clinical manifestations of CHD in elderly patients are often atypical combined with the interference of physical function, elderly weakness and decreased tolerance, the rate of clinical omission and misdiagnosis is as high as 65% [19]. However, by artificially constructing the intervention model, patients' cognitive level of the disease can be significantly improved, and their self-control ability and self-efficacy can be enhanced [20]. In the course of conducting structured health education and teaching, according to the disease characteristics of CHD and the demands of the sick population, reasonable, targeted and feasible courses were designed to let the patients have a systematic understanding of the disease pathogenesis, exercise mode, eating habits, medication management, etc. For disease prevention, diet matching, exercise plans, etc., which are difficult to undergo, oral education can be done with minor assistance to the patients through the brochures. At the same time, the 5A care model combines inquiry, assessment, advice, help and follow-up, resulting in obtaining real-time information feedback, a better understanding of patients' deficiencies in disease perception, self-control, guidance and suggestions [21]. The results of this study showed that the cognitive level, self-control ability and self-efficacy score of the experimental group were higher than that of the control group, which was statistically significant ($P < 0.05$). It suggests that structured health education combined with the 5A nursing model has better effects in the treatment of elderly patients with CHD than the traditional nursing methods.

5. Summary

To sum up, the structured health education course combined with 5A nursing for the intervention of elderly patients with coronary heart disease is conducive to improving the disease cognition level, enhancing their self-control ability and self-efficacy, to help patients better control the condition, and the intervention effect is good, which is worthy of clinical application.

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Disclosure statement

The authors declare no conflict of interest.

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