Applied Research on the Impact of SOC Model on Health Literacy and Disease Uncertainty among Young and Middle-aged Patients with Coronary Heart Disease

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Abstract: *Objective*: To analyze the impact and mechanism of the SOC model intervention on improving health literacy and reducing disease uncertainty among young and middle-aged patients with coronary heart disease. *Methods*: A hundred young and middle-aged patients with coronary heart disease from our hospital between March and October 2024 were randomly divided into an observation group and a control group, with 50 patients in each group. Both groups received routine nursing intervention, while the observation group also received intervention based on the Stages of Change (SOC) model. The intervention period was 30 days. Changes in self-efficacy, health literacy, and disease uncertainty were compared between the two groups before and after the intervention. *Results*: After the intervention, the self-efficacy scores of both groups increased significantly, and the observation group had higher self-efficacy scores than the control group, with a significant difference ($P < 0.05$). Additionally, the observation group showed significantly higher levels of health literacy than the control group ($P < 0.001$). Furthermore, the observation group had significantly lower scores for disease uncertainty compared to the control group ($P < 0.001$). *Conclusion*: The SOC model, in addition to routine nursing, significantly affects self-efficacy, disease uncertainty, and health literacy among young and middle-aged patients with coronary heart disease. It helps to enhance patients' knowledge of coronary heart disease, improve health literacy levels, and reduce disease uncertainty, making it worthy of clinical promotion and application.

Keywords: SOC model; Young and middle-aged coronary heart disease; Health literacy; Disease uncertainty

1. Introduction

Coronary Heart Disease (CHD) is a common chronic cardiovascular disease that has a significant impact on human health and quality of life, and it has a high incidence and mortality rate [1]. With changes in people's lifestyles, attitudes, and habits, the prevalence of CHD among young and middle-aged people aged 18–45 years old is continuously increasing, and clinical manifestations are mostly myocardial infarction, angina pectoris, etc.

[2]. In the treatment of young and middle-aged patients with CHD, it is necessary to pay high attention to changes in patients' own health literacy, self-efficacy, and levels of uncertainty about the disease. Therefore, it is necessary to strengthen the implementation of health education to help patients develop scientific and healthy behaviors and lifestyle habits, thereby promoting patient health. Based on this, this article explores the value of the SOC model in clinical medical research and application from the perspective of psychological research, and conducts a clinical comparative trial with conventional intervention effects to provide a scientific basis for health education and nursing of young and middle-aged patients with coronary heart disease, and to explore new treatment methods.

2. Subjects and methods

2.1. Subjects

From March to October 2024, a study is conducted on 100 hospitalized young and middle-aged patients with coronary heart disease admitted to the First Department of Cardiology at Wu'an First People's Hospital in Handan City, Hebei Province. In this paper, patients are randomly divided into an observation group and a control group, with 50 patients in each group. The control group consisted of 27 males and 23 females, with an average age of (35.22 ± 10.56) years and an average course of disease of (2.67 ± 0.96) years. The observation group comprised 29 male patients and 21 female patients, with an average age of (35.13 ± 10.12) years and an average disease duration of (2.90 ± 1.03) years. There was no difference between the two groups in general information $(P > 0.05)$, indicating comparability. This study has been reviewed and approved by the ethics committee of Wu'an First People's Hospital in Handan City, Hebei Province.

2.1.1. Inclusion criteria

(1) Hospitalization duration ≥ 3 days.

(2) Clinically diagnosed as coronary heart disease patients, with diagnostic criteria based on American Cardiology Coronary Heart Disease Diagnostic Criteria.

(3) Self-efficacy and health literacy scores < 95.

(4) Patients and their families are informed of the study details and have signed an informed consent form.

2.1.2. Exclusion criteria

(1) Those allergic to coronary heart disease treatment drugs

(2) Those with low mental health levels, psychological cognitive impairments, and mental illnesses.

(3) Those with incomplete information or who withdraw from the study midway.

(4) Those with malignant tumors in the progressive stage.

2.2. Methods

The control group received routine nursing and health education intervention, guiding patients and their families to learn about coronary heart disease-related knowledge through health education, and routinely observing and monitoring patients' clinical manifestations.

The observation group, in addition to implementing routine nursing measures and carrying out health education work, introduced the SOC model. Targeted interventions are carried out based on five different stages: pre-intention, intention, preparation, action, and maintenance. By comprehensively judging the patient's stage

and implementing targeted intervention measures at different stages, patients in the pre-intention stage, who had not yet developed factors for changing behavioral concepts, could be guided to enter the intention stage. In this stage, patients gradually developed ideas for changing behaviors and gradually transitioned to the preparation stage. In this stage, plans for behavioral change are already in place. In the action stage, patients began to change related behaviors, but the duration of behavioral change did not exceed 3 months. Patients in the maintenance stage indicated that they could consistently adhere to behavioral changes for more than 6 months. Under the SOC model intervention, patient performance at different stages is observed and recorded, and appropriate intervention measures are taken for different stages. Specifically, in the pre-intention and intention stages, interventions are conducted three times a week, once every 30 minutes; in the preparation stage, interventions are conducted once a week, once every 20 minutes; in the action and maintenance stages, interventions are conducted twice a week, once every 30 minutes. All patients are intervened from the first day of inclusion in the study for 30 days.

2.3. Observation indicators

(1) Self-efficacy

The Self-efficacy for Managing Chronic Disease (SECD) scale is used to evaluate the level of self-efficacy among young and middle-aged patients with CHD before and after intervention. The SECD scale assesses four dimensions: pain management, fatigue management, symptom control, and health/situation control. It consists of 6 items, rated on a 1–10 scale. Self-efficacy levels are determined as low (≥ 7 points), medium (< 27 points), and high (≥ 27 points). A higher SECD score indicates stronger self-efficacy. The Cronbach's α coefficient of this scale is 0.91, indicating good reliability and validity for assessing self-efficacy in chronic disease patients.

(2) Health literacy

The Health Literacy Measurement Scale (HLMS) is used to evaluate the health literacy levels of young and middle-aged CHD patients before and after intervention. This scale assesses multiple dimensions, including health behaviors, health knowledge, and the ability to access and utilize health information. It contains 24 items covering diagnosis, treatment, prevention, rehabilitation, and other knowledge and skills. The item types are diverse, including rating, true/false, multiple choice, and fill-in-the-blank questions. Scores below 96 indicate low health literacy, while scores of 96 or above indicate high health literacy. The Cronbach's α coefficient ranges from 0.891 to 0.947, demonstrating good reliability and validity.

(3) Uncertainty in illness

The Mishel Uncertainty in Illness Scale (MUIS) is a professional psychometric tool widely used in clinical medicine to assess patients' uncertainty when facing illness. It evaluates multiple dimensions, including diagnosis, treatment, prognosis, and normal changes. The scale consists of 33 items, rated on a 5-point scale, with scores ranging from 32 to 160. Scores of 32–75 indicate low uncertainty, 76–117 indicate medium uncertainty, and 118–160 indicate high uncertainty. The Cronbach's α coefficient is 0.9, indicating excellent reliability and validity.

2.4. Statistical analysis

Statistical data are entered into Excel spreadsheets and analyzed using SPSS 21.0 software. Measurement data are expressed as mean ± standard deviation and compared using the t-test. Count data are expressed as percentages (%)

and compared using the chi-square test. A *P*-value less than 0.05 is considered statistically significant.

3. Results

3.1. Comparison of self-efficacy before and after intervention in both groups

There were no differences in self-efficacy scores for symptoms, emotions, roles, communication with doctors, or total scores between the two groups before intervention ($P > 0.05$). After intervention, the scores for all indicators improved significantly in both groups. However, the observation group had significantly higher scores than the control group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of self-efficacy before and after intervention in both groups ($\bar{x} \pm s$)

Self-efficacy	Control group		Observation group		t	P
	Pre- intervention	Post- intervention	Pre- intervention	Post- intervention		
Symptom	6.33 ± 2.48	6.49 ± 2.02	6.28 ± 2.42	7.27 ± 1.14	-2.272	0.026
Emotion	5.97 ± 2.65	6.55 ± 2.59	6.03 ± 2.58	7.40 ± 1.43	-2.118	0.034
Role	6.04 ± 2.47	6.16 ± 2.25	6.06 ± 2.50	6.94 ± 1.69	-2.025	0.045
Communication with physicians	6.24 ± 2.49	6.73 ± 2.02	6.43 ± 2.54	7.39 ± 1.48	-2.104	0.036
Total score	6.17 ± 2.14	6.52 ± 1.70	6.22 ± 2.18	7.27 ± 1.13	-2.753	0.005

3.2. Comparison of health literacy before and after intervention between the two groups

Before the intervention, there was no difference in health literacy scores between the two groups ($P > 0.05$). However, after the intervention, the level of health literacy in the observation group was significantly higher than that in the control group, with a significant difference ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of health literacy before and after intervention between the two groups($\bar{x} \pm s$)

Self-efficacy	Control group		Observation group		t	P
	Pre- intervention	Post- intervention	Pre- intervention	Post- intervention		
Information acquisition	35.88 ± 5.99	36.93 ± 3.42	36.64 ± 6.28	40.27 ± 5.28	-7.236	＜ 0.001
Communication and interaction	30.14 ± 4.42	32.47 ± 3.51	30.97 ± 4.35	37.02 ± 4.47	-4.185	＜ 0.001
Health improvement	11.18 ± 3.80	12.68 ± 3.19	10.47 ± 4.03	15.35 ± 5.07	-6.197	＜ 0.001
Financial support	6.98 ± 1.95	7.36 ± 1.56	6.96 ± 2.02	8.14 ± 5.13	-5.014	0.007
Total score	84.19 ± 8.58	88.63 ± 4.80	85.03 ± 8.53	99.82 ± 7.99	-2.640	＜ 0.001

3.3. Comparison of disease uncertainty before and after intervention between the two groups

Before the intervention, there was no difference in disease uncertainty scores between the two groups ($P > 0.05$). However, after the intervention, the total score of the observation group (78.50 ± 8.87) was significantly lower than that of the control group (92.24 ± 9.93), indicating a significant difference ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of disease uncertainty before and after intervention between the two groups ($\bar{x} \pm s$)

Self-efficacy	Control group		Observation group		t	P
	Pre- intervention	Post- intervention	Pre- intervention	Post- intervention		
Complexity	17.24 ± 2.60	17.04 ± 3.46	16.93 ± 2.33	15.39 ± 3.02	2.522	0.010
Ambiguity	41.64 ± 5.21	40.19 ± 6.03	40.26 ± 6.34	78.50 ± 8.94	8.139	< 0.001
Lack of information	21.22 ± 3.29	20.28 ± 3.54	20.97 ± 3.57	17.19 ± 3.60	4.651	< 0.001
Unpredictability	15.08 ± 2.81	14.72 ± 2.58	15.02 ± 2.74	14.18 ± 2.52	1.166	0.245
Total score	95.07 ± 8.66	92.24 ± 9.93	94.76 ± 9.63	78.50 ± 8.87	7.686	< 0.001

4. Discussion

Coronary heart disease (CHD) is a significant threat to human health, caused by cardiovascular and cerebrovascular diseases triggered by coronary artery blood vessels. Narrowing or blockage of blood vessels can lead to CHD, which is often accompanied by inducements such as hyperlipidemia, hyperglycemia, and hypertension [3]. Statistics show that in recent years, the incidence and mortality of CHD in China have been continuously increasing, with an incidence rate of 6.5%. Every year, an average of 1 million people die from CHD, and 5 million people suffer from adverse emotions such as depression and anxiety due to CHD, which harms their mental health and severely reduces their quality of life. Therefore, in the clinical treatment of CHD patients, psychological intervention, targeted health education, and nursing measures should be implemented, which have certain clinical value and practical significance.

The SOC model is widely used in patient behavior change. It is a new intervention method based on the theory of stages of behavior change. It divides patient behavior change into multiple stages and implements behavioral interventions for young and middle-aged CHD patients according to the characteristics of different stages. This approach enhances patients' self-efficacy perception level, improves self-efficacy, and helps young and middle-aged CHD patients build confidence [4]. In recent years, the application of the SOC model has become a hot topic of focus in clinical medicine, aiming to help patients build good behavior habits, enhance behavioral abilities, and change unhealthy habits in life.

The results of this study showed that the self-efficacy score level of the observation group was higher than that of the control group ($P < 0.05$), and the health literacy score of the observation group was also higher than that of the control group ($P < 0.05$). This indicates that applying the SOC model through staged behavioral intervention measures can promote patients to change unhealthy behavior patterns and improve their overall quality of life and health literacy [5]. The disease uncertainty score of the observation group was lower than that of the control group ($P < 0.05$). Disease uncertainty can have various adverse effects on patients' psychological aspects. When patients' disease uncertainty is at a high level, it can easily disturb their psychological adjustment mechanism, leading to a decline in their ability to adapt to disease states. This can cause patients to experience long-term psychological pressure, which may give rise to fear emotions, interfere with their correct cognition of the disease, and exacerbate their negative psychological experiences. Simultaneously, it can weaken patients' willingness and ability to actively acquire disease-related information, resulting in a gradual decrease or even complete lack of healthy behaviors. Ultimately, this leads to a lack of continuity in the disease treatment process [6]. The SOC model has unique advantages when applied to intervention measures targeting young and middle-aged CHD patients. In

the action and maintenance stages, this model encourages patients to maintain healthy behaviors through spiritual motivation and material rewards. Simultaneously, it guides patients to deeply learn about CHD health knowledge through science popularization and education activities, helping them develop good reading habits and thereby enhancing their self-care abilities and health literacy [7].

5. Conclusion

In summary, intervention measures based on the SOC model can change patients' behavioral abilities, enhance their self-efficacy, and have promotional value by strengthening health education and individualized nursing for young and middle-aged patients.

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Disclosure statement

The authors declare no conflict of interest.

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