

Qualitative Study on Active Exercise Experience in Patients with Coronary Heart Disease after PCI Surgery

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Abstract: ***Objective:** To explore the positive exercise experience of patients with coronary heart disease after PCI surgery. **Methods:** purposive sampling was used to conduct semi-structured interviews with 15 patients with coronary heart disease after PCI in a tertiary hospital in Baise City from March to May 2024. The data was analyzed using the Colaizzi seven step method. **Results:** Three themes were extracted as a result. Knowledge is the foundation of active movement, including the transmission of external advantageous resources and actively absorbing new information; Belief is the driving force behind sports, including stimulating enthusiasm for sports, promoting sports consciousness, and enhancing sports confidence; Behavior is the foundation of exercise, including personalized formulation of exercise prescriptions, improvement of exercise compliance, and positive incentives for exercise experience. **Conclusion:** Patients with coronary heart disease after PCI can form positive emotional experiences during exercise, internalize internal and external advantageous resources into exercise beliefs, and stimulate exercise behavior. Nurses should be guided by the knowledge, belief, and action model to improve patients' mastery of motor knowledge, perceive positive incentives for exercise, and form sustained exercise behavior.*

Keywords: Coronary heart disease, After PCI surgery, Exercise, Qualitative research.

1. Introduction

Coronary heart disease is a heart problem caused by coronary artery stenosis or blockage caused by coronary atherosclerosis, which can lead to acute myocardial ischemia and hypoxia, and is considered to be a cardiovascular disease with high mortality [1]. In China, the mortality rate of coronary heart disease among urban residents is 94.96/100000, while in rural areas it is 71.27/100000. Coronary heart disease has a significant negative impact on the health of patients and poses a serious threat to their lives [2]. It is crucial to adopt efficient diagnostic and treatment methods in order to effectively address this issue. At present, percutaneous coronary intervention (PCI) is an effective treatment method, and although its efficacy is significant, the prognosis of patients still varies [3]. Therefore, a scientifically effective postoperative rehabilitation plan has become crucial. Although traditional rehabilitation methods have some effectiveness, the results and prognosis have not reached ideal levels. Both guidelines and consensus documents recommend exercise rehabilitation as it can improve patients' exercise endurance, promote cardiac function recovery, reduce readmission and mortality rates, and enhance medical efficacy [4,5]. Although cardiac rehabilitation is widely recognized, the frequency and compliance of patients' exercise are still not high. Foreign studies have shown that only 31.0% of patients with coronary heart disease who undergo PCI achieve their expected exercise goals [6], due to a lack of cardiac rehabilitation awareness and fear towards exercise rehabilitation. Positive exercise experiences can enhance patients' cognition, happiness, medical compliance, and self-efficacy. However, domestic research focuses on patients with insufficient exercise and neglects positive exercise

experiences. This study is guided by the theory of knowledge, belief, and action, and uses semi-structured interviews to deeply investigate the positive exercise experience of patients with coronary heart disease after PCI, in order to better understand their inner emotions and exercise needs and promote positive exercise behavior.

2. Object and Method

2.1 Research Object

Using purposive sampling method, patients who underwent coronary heart disease PCI surgery in the cardiology department of a tertiary hospital in Baise City were selected for treatment from March to May 2024. The selection criteria include: 1) meeting the PCI treatment criteria in the Chinese Guidelines for Percutaneous Coronary Intervention (2016) [7]; 2) Age ≥ 18 years old; 3) After PCI surgery for coronary heart disease, after standardized treatment, the patient is in a stable period of the disease. The exclusion criteria are: 1) diseases such as aortic stenosis, unstable angina, myocardial ischemia, etc. that are not suitable for cardiac rehabilitation exercise intervention; 2) The patient is in a severe infection or advanced stage of the disease; 3) There are cognitive impairments, communication barriers, or mental illnesses present. All individuals participating in the study are voluntary and have signed informed consent forms. This study has been approved by the Ethics Committee of Baise People's Hospital (LW2023052301). A total of 15 patients were interviewed, including 9 males and 6 females, with an average age of (68.33 \pm 12.15) years. General information about the interviewees can be found in Table.

Table 1: General Information of Respondents (n=15)

Number	Gender	Age (years)	Number of diseased blood vessels (branches)	Number of stents (branches)	Education level	Marital status
N1	Female	78	2	2	Elementary school and below	Married
N2	Male	65	2	2	Middle school	Married
N3	Male	79	3	2	Middle school	Widowed
N4	Male	76	1	1	Primary school	Married
N5	Female	65	3	2	Middle school	Married
N6	Male	69	2	2	Middle school	Widowed
N7	Female	80	2	2	Elementary school and below	Widowed
N8	Female	79	3	3	Primary school	Married
N9	Male	45	2	2	University	Married
N10	Male	71	3	2	Primary school	Married
N11	Male	68	3	2	Middle school	Married
N12	Male	80	2	2	Primary school	Widowed
N13	Female	67	2	2	Middle school	Married
N14	Male	37	2	2	Middle school	Married
N15	Male	66	3	2	Middle school	Married

2.2 Research Methods

2.2.1 Determine Interview Outline

Based on the principles of knowledge, belief, and action theory, an interview outline was developed and revised through preliminary pre interviews and feedback on interview results. The following interview outline was ultimately determined: 1) How is your current quality of life? 2) What do you know about sports rehabilitation? Are you familiar with this treatment method? 3) Have you felt any improvement or assistance during exercise? Have you ever faced challenges or difficulties during exercise? 4) How did you overcome it? 5) How do you persist in continuing to exercise? 6) What specific exercise methods or forms have you chosen?

2.2.2 Data collection methods

This study adopts a semi-structured interview method and arranges it reasonably based on the principle of information saturation. The interviewer received relevant qualitative research training to ensure the quality of the interview. Interviews are usually conducted in a peaceful environment, usually in the department office. Before each interview begins, the researcher will briefly introduce the content and methods of the study to the respondents, clearly informing them that the interview recordings are only for research purposes and will not disclose their private information, and then guiding the respondents to sign an informed consent form. Throughout the entire interview process, directional questions were prohibited, and interviewers listened attentively, observing the interviewee's microexpressions and movements throughout the process, and recording their tone and intonation. The duration of each interview is limited to 30 minutes to ensure efficiency and the comfort of the interviewee.

2.2.3 Data analysis

After the interview, the two researchers will transcribe the recorded materials into text within 24 hours, and create detailed and complete textual records based on the emotional reactions of the interviewees and the interview situation. Researchers will use Colaizzi's seven step method to analyze these materials, identify statements relevant to the study, integrate and summarize them to extract themes.

3. Results

3.1 Theme 1: Knowledge is the Cornerstone of Active Movement

3.1.1 Advantages of providing external resources.

The patient's perception of exercise is shaped by their rehabilitation expertise. Providing health education to medical staff is the most direct and powerful method. The nurse encouraged me to subscribe to the official information channel for cardiac rehabilitation, which provides a wealth of relevant materials, and many doctors explicitly support exercise, demonstrating that exercise has significant benefits for health. N9: "I was only in my 50s when I contracted this disease, but the doctor told me that as long as I took medication on time and continued to exercise and recover, I could effectively control this disease". N14 also shared his experience: "At first, I didn't believe that exercise was beneficial for the heart. I thought that when heart problems occurred, the main focus should be on rest. But now, after detailed explanations from doctors and nurses, I have a deeper understanding of rehabilitation exercise and feel very confident".

3.1.2 Actively acquiring new knowledge oneself

Patients are able to break away from traditional rehabilitation thinking, actively adapt to the progress of modern society, actively acquire new knowledge, and thus have a more accurate understanding of their exercise potential. I used to think that sports were activities for young people, but now that the country advocates for universal participation in sports, I should also actively participate so that my body can be healthier. N7 expressed a similar viewpoint: "It's never too late to learn. In the past, when people were sick, they said they should rest well and not exercise. But now the concept of rehabilitation is different. Everyone says they should actively exercise, so I also want to keep up with this trend".

3.2 Theme 2: Belief is the Driving Force Behind Movement

3.2.1 Inspire interest in exercise

Once patients experience satisfactory exercise results, it is

easier to stimulate their internal desire for exercise. Enhancing physical strength and endurance helps to consolidate patients' confidence in exercise. N4: "After my condition stabilized, through exercise, I was able to easily climb stairs without any feeling of chest tightness or shortness of breath. I feel that my physical strength has significantly improved". N11: "I live on the third floor and don't have an elevator. In the past, I used to feel breathless every time I climbed the stairs and had to take a break halfway. But now I can climb the stairs back home without any discomfort, and I feel more energetic than before".

3.2.2 Promote self-awareness in sports

Elderly patients with coronary heart disease are easily influenced by the external environment after PCI, and a positive exercise attitude helps them gradually develop a habit of independent exercise. N9: "Actually, I dare not exercise, but the doctor wouldn't lie to me. I made my own plan, starting from 5 minutes, and now I exercise for 30 minutes every time. I feel pretty good." N12: "My family bought me a smart wristband that records my daily exercise data. Every small improvement made me feel satisfied. During my hospitalization, doctors and nurses shared some successful rehabilitation cases. Seeing others' success stories, I felt very motivated, which made me firmly believe that as long as I persist in exercising, I can also achieve good results. N15: "Others can exercise with the same illness, but I am younger than them and need to persevere even more".

3.2.3 Enhance Sports Confidence

Family support plays a crucial role in strengthening patients' confidence in exercise and enhancing exercise adherence. N8: "I exercise with the old man, and in addition, my son often asks me about my exercise progress, so I can't be lazy at all. Encouraging and sharing experiences among patients can enhance their confidence in sports rehabilitation. We have a WeChat group for people with the same disease. We exercise together and report our exercise progress every day. I am very satisfied with my current life. The comprehensive rehabilitation management provided by the department can provide information support and emotional assistance to patients, which helps them establish and maintain exercise habits. After discharge, the medical staff also conducted a home visit to me and provided me with an exercise manual, encouraging me to record the progress of my exercise. The doctors and nurses in the cardiology department are very friendly. They gave me the phone number of the department, so no matter what problems I encounter, I can ask them for advice. Convenient and diverse sports resources around the residence can stimulate people to actively participate in exercise". N10 mentioned, "The facilities in the community where I live are quite complete, and I can make good use of them." N8 said, "Now I exercise on the facilities in the community or park, which is quite free".

3.3 Theme 3: Behavior is the Foundation of Movement

3.3.1 Personalized formulation of exercise prescription

Developing differentiated rehabilitation exercise plans for each patient can significantly improve their physical activity

and provide clear guidance for their exercise. N14: "The doctor formulated a detailed exercise rehabilitation prescription based on the results of my 6-minute walking test. They are very attentive, and I will strictly follow it. The nurse provided a self-fatigue monitoring form, and I followed the exercise prescription according to the content on the form". N15: "I will exercise according to the doctor's advice and have regular check-ups. If I feel uncomfortable during exercise, the doctor will reassess my condition".

3.3.2 Improving Sports Compliance

Improving patients' self-efficacy can enhance their ability to cope with problems, help overcome fatigue symptoms caused by the disease itself, and cultivate positive exercise habits. N7: "I often use feeling tired as an excuse not to exercise, but later my physical condition gradually deteriorated, so I started to force myself to exercise and gradually developed the habit of exercising". N9: "I always feel like giving up when exercising. At my age, it's not scary to encounter difficulties, what's scary is losing the determination to solve them. N14: "I like Tai Chi, swimming, cycling, and sometimes I even lift dumbbells at home. I feel much younger".

3.3.3 Sports experience has a positive stimulating effect

Patients may develop a sense of trust in medical staff during their recovery from illness, and the care and support provided by medical staff can stimulate their motivation to actively participate in exercise. N12: "Every time I have a regular check-up, the doctor reviews my recovery status, which gives me a sense of security". N24: "After discharge, nurses will regularly call to inquire about our condition. If they find that we have relaxed during exercise, they will work with us to find the cause, make timely adjustments, and have regular follow-up appointments". N6: "My home is close to the hospital and I often attend health academic lectures held by the hospital. After listening to the lectures, I feel even more confident".

4. Discussions

4.1 The Application of Sports Rehabilitation Knowledge is the Foundation of Physical Exercise

The level of understanding of exercise rehabilitation knowledge by patients will affect their exercise habits. Acquiring knowledge in sports rehabilitation requires a combination of external guidance and proactive efforts in self-directed learning. In this study, guidance from healthcare workers was considered the foundation for patients to actively participate in exercise, which is consistent with the research of Chen Qingxia et al [8]. Traditional concepts have been overturned because the country values sports and has gained the support of the entire population. Ding Liping [9] et al. found that the popularization of national policies can stimulate patients' potential and enhance their ability to cope with diseases. Therefore, medical personnel should provide professional exercise guidance to patients during the early stages of hospitalization, including small lectures and personal rehabilitation guidance. After discharge, information technology can be widely used to disseminate information related to exercise, broaden the ways of knowledge

acquisition, encourage patients' relatives to participate and share together, cultivate everyone's willingness to continue learning, and ensure the continuous inheritance and dissemination of knowledge.

4.2 Cultivating a Belief in Sports can Help Stimulate Patients' Willingness to Actively Exercise During Rehabilitation

Exercise is a product of the interaction between physiology and psychology, where the mind drives behavior and behavior in turn affects the mind. In the early stages of exercise, patients may feel fear due to illness, which may lead them to avoid exercise, and inner faith is the driving force behind exercise. This study suggests that patients with coronary heart disease after PCI can cultivate internal identification and gradually achieve exercise goals through external support and emotional resonance, which is consistent with the research results of Jiang Huijuan et al [10]. In addition, family care and support alleviate feelings of loneliness and laziness. Kitzman [11] believes that patients with relatively weaker learning abilities are more likely to accept new things and cultivate a positive attitude, and the effect is better when family members participate. Peer guidance and full process management by medical staff helped patients establish faith, and the participants in this study mutually motivated each other, which is consistent with the research results of Kaushal et al. [12]. Therefore, medical staff should actively research and develop effective rehabilitation exercise plans to build diverse rehabilitation pathways, including family, social circles, medical teams, and social support, aimed at better cultivating patients' intrinsic exercise motivation and maintaining their positivity.

4.3 The Core of Exercise Rehabilitation Lies in Stimulating and Maintaining the Formation of Exercise Habits.

Personalized and gradual rehabilitation exercises can help improve physical function and promote cardiac recovery. Research has found [13] that respondents prefer personalized exercise plans, which can achieve the best exercise results and avoid patients becoming lax in exercise. In addition, the health literacy and self-management of the respondents play a crucial role in maintaining exercise. Patients should actively try diverse exercise methods that suit themselves, enjoy the pleasure of life, and have a positive exercise experience that helps cultivate positive exercise habits, which is consistent with the results of Di Lorito [14]. Therefore, medical staff should establish a comprehensive cardiac rehabilitation exercise management model to ensure continuous provision of comprehensive care, focus on meeting the emotional needs of patients, enhance their confidence, and ensure that they can adhere to the rehabilitation exercise plan [15].

5. Summary

Positive rehabilitation feedback can stimulate patients' enthusiasm, and medical staff should support patients in establishing a positive rehabilitation mindset. Utilize internal and external support to inspire their confidence. Establishing a communication platform between doctors, patients, and their families can help enhance patients' self-efficacy,

encourage continuous exercise, and thus improve their quality of life.

Conflict of Interest

The authors have no conflicts of interest to declare.

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