

The Mediating Effect of Coping Style on Illness Perception and Fear of Cancer Recurrence in Prostate Cancer Patients

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Abstract:

Objective: To explore the mediating effect of coping style between illness perception and fear of cancer recurrence in patients undergoing radical prostatectomy. **Methods:** A questionnaire survey was carried out in 254 eligible patients who underwent radical prostatectomy in the urology department of a tertiary hospital in Wenzhou City from June 2022 to June 2023. The questionnaires include the general data questionnaire, brief illness perception questionnaire (BIPQ), Medical Coping Modes Questionnaire (MCMQ) and Fear of Progression Questionnaire-Short Form (FoP-Q-SF). A structural equation model was used to analyze the mediating effect of coping style between illness perception and fear of cancer recurrence. **Results:** Illness perception, avoidance, and surrender coping styles could forward prediction fear of cancer recurrence ($P=0.001$, $P=0.019$, $P=0.001$); facing coping styles can negatively predict fear of cancer recurrence ($P=0.001$). Coping style played a part of the mediating role between illness perception and fear of cancer recurrence, and the mediating effect is 0.150. **Conclusion:** Coping style is a mediator between illness perception and fear of cancer recurrence in patients undergoing radical prostatectomy. Doctors and nurses should reduce patients' negative perception, guide them to adopt positive coping strategies, and thereby reduce their fear of cancer recurrence.

Keywords:

Prostate Cancer, Illness Perception, Coping Style, Fear of Cancer Recurrence, Structural Equation Model

1. Introduction

The latest data from the International Cancer Center shows that in 2020, there were 1.414 million new cases of prostate cancer (PCa) worldwide, accounting for 14.1% of the total incidence of male cancer. It is the second most common tumor in men worldwide and the fifth leading cause of cancer death in men [1]. Radical prostatectomy is one of the most effective ways to treat localized prostate cancer, but surgery can cause complications such as bleeding, pain, urinary incontinence, and sexual dysfunction, causing a decrease in the patient's quality of life. Although the

survival rate of prostate cancer patients has been extended, tumor recurrence and metastasis are still challenging that modern medicine has not overcome. Research has shown that prostate cancer patients may experience psychological distress such as anxiety, depression, low self-esteem, and fear [2], among which cancer relapse fear is one of the most reported psychological problems among patients.

Fear of Cancer Recurrence (FCR) refers to fear, worry, or concern of cancer patients about the possibility of cancer recurrence or metastasis [3]. Long term excessive FCR can affect the physical and mental health and quality of life of cancer patients, leading to waste of medical resources and economic burden [4,5,6].

Disease perception and coping strategies have been reported as important influencing factors for FCR in cancer patients [7,8]. At present, the pathways of action between disease perception, coping strategies, and fear of cancer recurrence are not yet clear. The theory of disease self-regulation provides a theoretical framework for understanding the relationship between disease representation, coping, and health outcomes. Therefore, based on the theory of disease self-regulation and literature review, this study adopts a structural equation model to analyze the impact pathways and roles of disease perception and coping strategies on FCR.

2. Research Methods

2.1. Participants

254 hospitalized patients who underwent radical prostatectomy in the urology department of a tertiary hospital in Wenzhou from June 2022 to June 2023 were selected as the study subjects. Inclusion criteria: (1) Age ≥ 18 years old; (2) Patients who meet the diagnostic criteria in the prostate cancer management guidelines published by the European Society of Urology in 2020 [9] and have a pathological diagnosis of prostate cancer; (3) Knowing one's own diagnosis of prostate cancer and willing to cooperate with this study. Exclusion criteria: (1) Patients with other malignant tumors; (2) Having visual, auditory, and language impairments; (3) Have a history of mental illness or cognitive impairment.

2.2. Ethical Considerations

This study was approved by the Ethics Committee of the First Affiliated Hospital of Wenzhou Medical University (KY2022-1030), and all participants were informed and signed informed consent forms.

2.3. Measurement

2.3.1. General Characteristics

Design according to the research purpose and reference to previous literature. Including two parts: demographic and disease-related characteristics. See Table 1 for details.

2.3.2. Brief illness perception questionnaire, BIPQ

This study adopts the Chinese version of Mei et al. [11]. The scale consists of 9 items, with 3 dimensions: cognitive dimension (5 items), emotional dimension (2 items), and comprehension ability dimension (1 item). Except for item 9, all other 8

items are scored on a scale of 0-10. The higher the score, the more negative perception an individual has. The Cronbach coefficient of the questionnaire in this study is 0.937.

2.3.3. Medical Coping Modes Questionnaire, MCMQ

This study adopts the Chinese version by Shen et al. [12]. The questionnaire is divided into three dimensions with a total of 20 items, namely facing (8 items), avoiding (7 items), and yielding (5 items). Using a Likert 4-point rating. The higher the score of the scale dimension, the more likely the patient is to use this coping style. The Cronbach's scale covers three dimensions: facing, avoiding, and yielding, the coefficients are 0.949, 0.725, and 0.900, respectively.

2.3.4. Fear of Progression Questionnaire-Short Form, FoP-Q-SF

This study adopts the Chinese version by Wu et al. [13], includes two dimensions: physical health and family and society. There are a total of 12 items, using a Likert 5-level rating, with values ranging from 1-5 points for "never" to "always". A total score of ≥ 34 indicates reaching the defined level of clinical significance. In this study, Cronbach's α is 0.936.

2.4. Data Collection Method

The data was collected through a questionnaire survey conducted by two trained graduate students. Fill out the questionnaire in a one-on-one manner. Collect the questionnaire on the spot after filling it out, fill in any gaps. A total of 260 questionnaires were distributed, and 254 valid questionnaires were screened after data collection, with an effective response rate of 97.7%.

2.5. Data Analysis

Use SPSS 26.0 and AMOS 24.0 software for data analysis. A structural equation model was established to explore the pathways between FCR, disease perception, and coping strategies. The significance of the mediating effect was tested using Bootstrap (repeated sampling of 5000, 95% confidence interval). $P < 0.05$ indicates that the difference is statistically significant.

3. Results

3.1. General Characteristics

254 PCa patients aged 56-81 years, with an average age of (69.04 ± 7.09) years, and their information is detailed in Table 1.

Table 1. General information of survey subjects ($n=254$).

Project	Number of cases (percentage,%)	Project	Number of cases (percentage,%)
Age		Place of abode	
<60	27(10.63)	Rural	129(50.79)
60-69	108(42.52)	Town	125(49.21)
70-79	103(40.55)	Smoking history	
>79	16(6.30)	Yes	81(31.89)
Marital status		No	173(68.11)
Unmarried	2(0.79)	Complication	
Married	240(94.49)	Yes	164(64.57)
Divorced or Widowed	12(4.72)	No	90(35.43)

Education level		Family history of prostate cancer	
Primary school and below	154(60.63)	Yes	39(15.35)
Middle school	61(24.02)	No	215(84.65)
High school (including vocational school)	26(10.24)	Gleason score at diagnosis	
University or above (including college and undergraduate)	13(5.11)	3+3	42(16.54)
Occupational status		3+4 or 4+3	113(44.49)
Retire	212(83.47)	4+4 or 5+3 or 3+5	44(17.32)
Be on the job	28(11.03)	4+5 or 5+4	36(14.17)
Ask for sick leave	14(5.50)	5+5	19(7.48)
Family per capita monthly income (yuan)		Clinical staging of tumors at initial diagnosis	
<3000	115(45.28)	Limitations, no transfer	205(80.71)
3000-5000	52(20.47)	There is distant metastasis or visceral metastasis	49(19.29)
>5000	87(34.25)	Last PSA test value (ng/ml)	
Payment method for medical expenses		<0.1	55(21.66)
Employee medical insurance	66(25.98)	0.1-	131(51.57)
Medical insurance for urban residents	85(33.46)	>1.0	68(26.77)
New rural cooperative medical insurance	103(40.56)		

3.2. Perception of disease, coping strategies, and fear of cancer recurrence scores in prostate cancer patients

The scores of disease perception, coping strategies, and FCR in postoperative patients with prostate cancer are shown in Table 2. Among them, the total score of FCR was (30.08 ± 10.11) points, and 101 cases (39.4%) scored ≥ 34 points, indicating psychological dysfunction.

Table 2. Scores of Postoperative Prostate Cancer Patients on the Simplified Disease Perception Questionnaire, Medical Coping Style Questionnaire, and Simplified Cancer Scale (n=254).

Project	Score
fear of cancer recurrence	30.08±10.11
perception of disease	52.86±15.56
face dimensions of coping methods	19.37±6.17
avoidance dimension of coping methods	17.13±5.03
surrender dimension of coping methods	8.98±3.39

3.3. Correlation analysis of disease perception, coping strategies, and fear of cancer recurrence in prostate cancer patients

Pearson correlation analysis showed that the fear of cancer recurrence was positively correlated with the dimensions of avoidance and surrender in disease perception and coping styles ($r=-0.597$, $r=0.451$, $r=0.469$, $P<0.01$); Disease perception

is negatively correlated with the face dimension ($r=-0.457$, $P<0.01$), and positively correlated with avoidance and surrender dimensions ($r=0.459$, $r=0.420$, $P<0.01$).

3.4. The mediating effect of coping strategies on disease perception and fear of cancer recurrence in prostate cancer patients

Using AMOS24.0 software, a mediation effect model was constructed with cancer recurrence fear as the dependent variable, disease perception as the independent variable, and coping style as the mediating variable. The maximum likelihood method was used to verify the fitting effect, and the overall fitness index of the model was $\chi^2/df=1.210$, $GFI=0.913$, $RMSEA=0.029$, $CFI=0.987$, $NFI=0.029$, $TLI=0.985$. A total of 5000 samples were selected using the Bootstrap method to test the mediating effect of coping strategies. The validation results showed that the 95% confidence intervals for direct effects, indirect effects, and total effects did not include 0, indicating that the mediating effect is valid. The path coefficient and effect values are shown in Table 3.

Table 3. Effects of disease perception and coping strategies on FCR in postoperative patients with prostate cancer.

Project	Effect value	Standard error	95%CI		P	Effect proportion (%)
			Lower limit	Upper limit		
total effect	0.315	0.037	0.252	0.395	0.000	/
direct effect						
perception of disease→ FCR	0.165	0.044	0.087	0.258	0.001	52.38
mediating effect						
face→ FCR	0.048	0.019	0.020	0.098	0.001	15.24
surrender →FCR	0.053	0.017	0.024	0.092	0.001	16.83
avoidance →FCR	0.049	0.022	0.008	0.095	0.019	15.56
total mediating effect	0.150	0.036	0.085	0.226	0.000	47.62

4. Discussion

In this study, the total FCR score of postoperative prostate cancer patients was (30.08 ± 10.11) points, of which 101 patients exceeded the normal level. The incidence of FCR psychological dysfunction was 39.4%, indicating a high level of fear of cancer recurrence in patients and requiring the attention of medical staff. The reason for this is that prostate cancer patients are mostly male and play a crucial role in their families, bearing greater pressure. Patients are concerned about the impact of the disease on themselves and their families. The subjects of this study are in the postoperative stage, and the subsequent treatment of the disease is uncertain, which makes patients more concerned about disease progression. Therefore, medical staff should promptly evaluate the patient's FCR level, provide disease knowledge education to patients, and enhance their confidence in overcoming the disease.

The path analysis results of this study show that the direct effect of disease perception on FCR is 0.165, indicating that disease perception has a positive impact on FCR, consistent with Palas [14] finding. Disease perception refers to the process in which an individual analyzes and explains current symptoms (or diseases) based on known disease knowledge and life experience [15]. Prostate cancer patients need to have a catheter left for a period of time after surgery, and symptoms such as difficulty

urinating, and painful urination are obvious. These uncomfortable experiences and side effects may increase the sensitivity and attention of patients to their own symptoms, leading to an increase in negative perception, and increased anxiety and fear of disease progression and recurrence. Therefore, medical staff should adopt intervention measures to help patients reshape their perception of positive diseases and reduce the degree of FCR.

This study found that faced with coping strategies have a negative impact on fear of cancer recurrence, while avoidance and surrender coping strategies have a positive impact on fear of cancer recurrence, similar to the findings of Chen et al. [16]. Coping style refers to the cognitive or behavioral regulation strategies that individuals adopt when facing different stressors, which can affect their mental health. The specific nature of the lesion site and treatment can lead to changes in the patient's image, decreased sexual function, and impaired self-esteem. Patients may not be able to accept it and may adopt negative coping strategies, ultimately affecting their mental health. Therefore, clinical healthcare workers should guide patients to adopt positive coping strategies, and thus reduce FCR.

The structural equation modeling results of this study show that disease perception can not only directly predict a patient's FCR, but also indirectly affect FCR through coping strategies. The intermediate effect is 0.150, accounting for 47.62% of the total effect. The theory of disease self-regulation [17] suggests that when health is threatened, patients will adopt coping strategies based on their own understanding of the disease, and the coping strategies used will affect health outcomes. When prostate cancer patients experience postoperative urinary leakage, painful urination etc, due to insufficient understanding of the disease and its complications, patients may develop a misconception of "cancer recurrence". Patients may overly focus on the disease, worry about the effectiveness of treatment, and the impact of the disease on their lives. Adopting negative coping strategies, resulting in more negative emotions and fear of illness. Therefore, healthcare professionals should encourage patients to actively learn about disease-related knowledge, manage symptoms, and guide patients to adopt positive coping strategies to reduce FCR.

5. Conclusions

In summary, the incidence of psychological dysfunction in FCR after prostate cancer surgery is relatively high and coping strategies partially mediate the relationship between disease perception and FCR. This suggests that medical staff should help patients correctly understand the disease and guide them to adopt positive coping strategies. The limitation of this study is the single center study, which has certain limitations in sample representativeness. In the future, we plan to conduct multi center, large sample studies to make the research results more universal.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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