

Effect Evaluation of Cognitive Behavioral Intervention on Stress Response in Breast Cancer Patients

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Abstract

Objective: To investigate the effects of cognitive behavioral intervention on psychological stress response in breast cancer patients by cognitive behavioral intervention in breast cancer patients. **Methods:** Adopting the random comparison method, 100 patients with breast cancer were divided into comparison group and intervention group by 50 cases. The intervention group underwent cognitive behavioral intervention at the same time as the comparison group only received conventional treatment without cognitive behavioral intervention. Two groups of breast cancer patients were enrolled in the general questionnaire, the Self-Rating Anxiety Scale (SAS), and the Medical Coping Modes Questionnaire (MCMQ) within one week after admission and one month after treatment to understand the psychological stress levels of the two groups. **Results:** There was no significant difference in the scores of SAS and MCMQ between the intervention group and the comparison group before intervention ($P > 0.05$). But after intervention, the scores of SAS and MCMQ in the comparison group were significantly higher than those in the intervention group ($P < 0.05$); thus, the differences of SAS and MCMQ factors before and after intervention in the intervention group were statistically significant ($P < 0.05$), and there was no significant difference in the factors of SAS and MCMQ before and after intervention in the comparison group ($P > 0.05$). It shows that the implementation of cognitive behavioral intervention therapy for breast cancer patients has the effect of improving their psychological status. **Conclusion:** Cognitive behavioral intervention therapy combined with psychology for breast cancer patients can effectively reduce their stress level, improve mental health status and improve their positive coping ability.

Keywords

Cognitive Behavioral Therapy, Breast Cancer, Stress Response, Coping Style

1. Introduction

In recent years, with the changes in the social environment, the increasing pressure on people's lives and the unhealthy lifestyles result that the incidence of cancer in the world has shown an overall trend of increasing year by year, which seriously endangers the physical and mental health of human beings. In particular, breast cancer has become one of the most common malignant tumors in the world, accounting for about 18% of female cancers. In the western developed countries, breast cancer has become the second most common malignant tumor in women other than skin cancer. Although China is currently a low-incidence area for breast cancer, in recent years, the number of new cases of breast cancer has increased by 3% to 5% annually, which is significantly higher than the annual average growth rate of the world; China has become the fastest growing country for breast cancer [1]. Especially in economically developed areas and large cities such as Beijing, Shanghai, Guangzhou, etc., the incidence of breast cancer has been the highest and second in the incidence of female malignant tumors [2]. Breast cancer has gradually become the number one killer threatening the health of modern Chinese women. Although with the continuous improvement of modern medical technology and continuous improvement of surgical methods, the life cycle and survivors of breast cancer patients have been prolonged and increased year by year, the double pain of cancer itself to the physical and psychological aspects of patients is still inexplicable. And because of the specificity of the breast for the shape of women, the severity of the psychological stress response of patients is more prominent than other cancer patients. Because breast cancer patients in the course of treatment, not only have to endure the body pain caused by the disease and a series of side effects caused by chemotherapy, but also suffer from the huge psychological pain such as breast loss and physical damage. These psychological and physiological factors can lead to severe psychological stress in breast cancer patients. Stress is an environment-dependent stress response state caused by the imbalance of physiological and psychological objective needs and coping ability of organisms under certain environmental stimuli [3]. When the stressor is gentle and the action time is too short, it is a defense reaction that the body presents to adapt to changes in the internal and external environment, and is a self-protective reaction of the human body. It is conducive to the movement of the body's potential, preparation status and confrontation. However, once the stress continues to rise and its effect is too strong, high catabolism will cause a negative nitrogen balance, and the patient will experience symptoms such as weakness and even death, which will have serious adverse effects on the body, seriously affecting and disturbing the patient's

mentality.

Surgery is one of the main treatments for breast cancer patients, most breast cancer patients will become more and more psychologically stressed as the surgery day gets closer. Combined with the physiological factors such as medicine and pain, they will make the patient a huge physiological and psychological stress response, resulting in a series of physiological disturbances, negative emotions and negative coping styles, which greatly reduces the effect of surgical treatment, affects the postoperative rehabilitation and quality of life of patients. A large number of studies [4] [5] [6] [7] have shown that the quality of life of cancer patients are closely related to their psychological factors and coping styles. Effective psychological intervention therapy for breast cancer patients can alleviate the patient's stress response to a certain extent, improve the patient's ability to cope, and thus improve the quality of life of patients.

2. Study Object and Method

2.1. Study Object

The study included 100 breast cancer patients who met the inclusion criteria for the first breast cancer modified radical mastectomy in Hainan Provincial People's Hospital from 2016 to 2017. They were randomly divided into 50 groups in the comparison group and intervention group respectively. Inclusion criteria: 1) Early and mid-stage breast cancer patients by pathological and B-ultrasound diagnosis; 2) Patients older than 18 years of age; 3) No other serious systemic disease history or mental illness; 4) With basic reading and writing ability, can complete the questionnaire independently and volunteer to participate in the study. Exclusion criteria: 1) Patients with advanced breast cancer; 2) Patients older than 65 years of age; 3) People with mental illness; those with severe heart, liver, kidney and other dysfunctions or other malignant tumors; 4) Without basic reading and writing ability, cannot complete the questionnaire independently or refuse to participate in the study. The patients in the intervention group were 53.16 ± 9.34 years old and weighed 62.54 ± 10.12 kg. The education level was 14 cases in junior high school and below, 19 cases in high school (technical secondary school), and 27 cases in junior college and above. The average age of the comparison group was 54.16 ± 8.69 years old, and weighed 64.11 ± 12.03 kg. The education level was 12 cases in junior high school and below, 20 cases in high school (technical secondary school), and 18 cases in junior college and above. There was no significant difference in age and weight between the two groups ($P > 0.05$). There was no statistically significant difference between the two groups in terms of education level, occupation, medical expenses, and other demographic data ($P > 0.05$). See **Table 1** for details.

2.2. Study Tools

2.2.1. Self-Rating Anxiety Scale (SAS)

The Self-Rating Anxiety Scale (SAS) is used to reflect the subjective feelings of

Table 1. Comparison of general data between the two groups of patients.

Item	Class	Intervention Group (n = 50)	Comparison Group (n = 50)	Statistics	P Value
Age		53.27 ± 9.34	54.16 ± 8.69	t = 0.493	0.311
Weight		62.54 ± 10.12	64.11 ± 12.03	t = 0.706	0.241
Educational level	Junior high school and below	14	12	Z = 0.206	0.902
	High school (secondary school)	19	20		
	College and above	17	18		
Occupation	Institution	4	6	χ ² = 1.069	0.899
	Business unit	13	12		
	Self-employed	18	17		
Monthly per capita income	Farmer	11	9	Z = 0.373	0.829
	other	4	6		
	Less than 3000 yuan	23	21		
Medical expenses	3000 - 6000	19	22	χ ² = 0.301	0.861
	More than 6000 yuan	8	7		
	Medical insurance	22	21		
Ethnic group	Rural cooperative medical care	25	27	χ ² = 0.445	0.506
	Self-pay	3	2		
	Ethnic group Han	44	46		
	Other	6	4		

Note: P > 0.05 was not statistically significant.

patients with anxiety symptoms, and to measure the severity of their anxiety and the self-assessment psychological scale of patients with changes during treatment. This scale contains 20 items, using a four-level scoring standard, and the total scores are the sum of all the items. 5 items in the entire scale marked with the * number is for the reverse score, and the scoring standard is reversed from the back to the front. The result of the evaluation is the sum of the scores of all the items and multiplied by 1.25, taking the integer part, which is then the standard score. The cut-off value of the standard score of the normative results of the anxiety self-assessment table is 50 points. When the patient's standard score exceeds the cut-off value, we classify it as an anxiety patient. Among them, the score of mild anxiety is 50 - 59, the score of moderate anxiety is 60 - 69, and the score more than 70 is severe anxiety.

2.2.2. Medical Coping Modes Questionnaire (MCMQ)

Medical Coping Modes Questionnaire (MCMQ) is used to reflect a patient's coping style and ability in the event of a major illness. The current scale has been partially revised by domestic psychologists on the basis of the original. The scale contains 20 items, which are mainly divided into three dimensions, which are three different ways of coping with "face", "avoidance" and "submission". MCMQ

uses a four-level scoring method to assess the extent of symptoms in each patient. There are 8 items marked with an * in the entire scale as reverse scoring items, and the scoring standard is reversed from the back to the front. The corresponding items in the three dimensions are cumulatively added to calculate the mean value of the response.

2.3. Study Method

2.3.1. Sampling

Study objects who met the inclusion criteria were randomly divided into intervention group and comparison group by simple sampling. In the comparison group, only routine treatment was performed, and cognitive behavioral intervention therapy was not performed. The intervention group performed cognitive behavioral intervention therapy while performing routine treatment.

2.3.2. Intervention Method

Cognitive behavioral intervention method for “one-to-one” interview on study objects mainly include: 1) Cognitive reconstruction: using rational emotional therapy, adding cognitive factors to behavioral therapy of patients, replacing them with rational thinking methods, to reduce the negative emotions and poor coping styles of patients due to irrational thinking. 2) Behavioral therapy: For patients with excessive anxiety, progressive muscle relaxation therapy is added during the intervention to relieve the patient’s nervousness. Progressive muscle relaxation therapy mainly uses the patient’s conscious tension and relaxation of muscle groups in various parts of the body, allowing the patient to eliminate tension and slowly achieve a relaxation purpose, thereby adjusting and relieving the patient’s stress response and promoting physical and mental harmony. After the intervention object was determined, the object was given a psychological intervention 30 - 40 min per day before surgery, and the intervention period was 1 month. Investigators try their best to be honest in their interventions, avoid using too many technical terms, encourage patients from time to time, and create a pleasant and relaxed conversation atmosphere so that patients can understand and actively cooperate with the study.

3. Results

3.1. Comparison of SAS Scores between the Two Groups before and after Intervention

The paired sample t-test was used to analyze the SAS scores of the two groups before intervention. There was no significant difference in the SAS scores between the intervention group and the comparison group before intervention ($P > 0.05$). There was a statistically significant difference in SAS scores between the intervention group and the comparison group after intervention ($P < 0.05$). There was significant difference in the SAS scores between the intervention groups before and after intervention ($P < 0.05$). There was no significant difference in the SAS scores between the comparison group before and after interven-

tion ($P > 0.05$). See **Table 2** for details.

3.2. Comparison of Scores of MCMQ Subscales between the Two Groups before and after Intervention

The paired sample t-test was used to analyze the scores of three different coping styles of MCMQ in the two groups before intervention. Before intervention, there was no statistically significant difference in the scores of the three coping styles of “face”, “avoidance” and “submission” between the intervention group and the comparison group ($P > 0.05$). After intervention, there was a statistically significant difference in the scores of the three coping styles of “face”, “avoidance” and “submission” between the intervention group and the comparison group ($P < 0.05$). There was significant difference in the scores of MCMQ in different coping styles before and after intervention ($P < 0.05$). There was no significant difference in the scores of the three coping styles of MCMQ between the comparison group before and after the intervention ($P > 0.05$). See **Table 3** for details.

Table 2. Comparison of anxiety scores before and after intervention in two groups of patients ($\bar{x} \pm s$).

Item	Intervention Group (n = 50)	Comparison Group (n = 50)	t	P
Anxiety Scores before intervention	46.32 ± 8.65	44.33 ± 7.81	1.207	0.115
Anxiety Scores after intervention	39.19 ± 7.23	42.18 ± 7.52	2.027	0.023
t	4.472	1.402		
P	0.000	0.082		

Note: $P < 0.05$ was statistically significant.

Table 3. Comparison of the scores of the medical coping styles of the two groups of patients before and after the intervention ($\bar{x} \pm s$).

Coping Style	Intervention Group (n = 50)	Comparison Group (n = 50)	t	P	
Face	Before intervention	18.42 ± 4.27	19.14 ± 2.93	0.983	0.164
	After intervention	22.56 ± 2.55	18.97 ± 1.96	7.893	0.000
	t	5.886	0.341		
	P	0.000	0.367		
Avoidance	Before intervention	15.64 ± 2.69	16.03 ± 2.31	0.778	0.219
	After intervention	13.53 ± 1.78	16.31 ± 1.93	7.487	0.000
	t	4.625	0.658		
	P	0.000	0.256		
Submission	Before intervention	8.69 ± 2.75	8.58 ± 2.31	0.217	0.415
	After intervention	7.39 ± 1.61	9.03 ± 1.81	4.487	0.000
	t	2.885	1.084		
	P	0.002	0.140		

Note: $P < 0.05$ was statistically significant.

4. Discussion

4.1. Effect of Cognitive Behavioral Intervention on Anxiety in Breast Cancer Patients

The results of this study showed that, the anxiety scores of the intervention group and the comparison group before the intervention were not statistically significant. After the cognitive behavior intervention combined with psychology, the anxiety scores of the intervention group and the comparison group were significantly lower than those of the comparison group before intervention, although the anxiety score of the comparison group also decreased, the anxiety score of the intervention group decreased more significantly. Before the intervention, there was no significant difference in anxiety scores between the two groups, but after the intervention, the anxiety difference between the two groups was statistically significant. There was a statistically significant difference in anxiety scores between the intervention group and the intervention group; there was no significant difference between the comparison group and the intervention. The results of the study indicate that cognitive behavioral intervention has a good effect on improving anxiety in breast cancer patients, and it is an effective intervention, this is related to the emotional intervention of breast cancer patients with cognitive behavioral intervention therapy, and the results are basically the same [8] [9].

This study suggests that cognitive behavioral intervention therapy has a positive effect on the psychological state of breast cancer patients. During the test, we gave patients psychological and spiritual care, comfort and support through psychological intervention such as cognitive reconstruction and progressive muscle relaxation, so that patients can understand their negative emotions for surgical treatment and the serious impact of postoperative rehabilitation. Let patients correct their own false perceptions, learn to self-regulate, improve bad coping styles, and be able to recognize their own diseases with a positive and optimistic attitude. The results of this study showed that cognitive behavioral intervention therapy can improve patients' mental state and other symptoms in a certain degree, reduce their negative emotions and reduce their emergency level.

4.2. Effect of Cognitive Behavioral Intervention on Medical Coping Styles of Breast Cancer Patients

The results of this study showed that the three ways of medical coping styles in the intervention group and the comparison group of breast cancer patients, "face", "avoidance" and "submission", were the same, and the groups were balanced and comparable. There was no significant difference in the "face", "avoidance" and "submission" of the medical coping style between the intervention group and the comparison group before intervention. After the cognitive behavioral intervention, the "face" coping style of breast cancer patients in the intervention group gradually increased with the advancement of intervention therapy, and the "avoidance" and "submission" coping styles gradually decreased

with the advancement of intervention therapy. The results showed that with the intervention treatment, cognitive behavioral intervention therapy can effectively improve the medical coping style of breast cancer patients with psychological stress, enabling patients to reduce the coping styles of “avoidance” and “submission” and reduce the degree of “avoidance” and “submission”, improve the coping style of “face”. This result is similar to the results of domestic and international scholars using cognitive behavioral therapy for medical coping methods of cancer patients [10] [11]. The reason for the analysis is probably due to the lack of disease-related knowledge of the patient itself, and the stress factors such as the fear of the disease, the therapeutic effect, the prognosis, and the like, and the high expectations. In addition to suffering from the pain of the disease itself, the patient has to endure psychological pain, so it is more prone to a weak, self-defeating feeling of powerlessness. As the operation time is closer, the bad stress mode produces negative psychology. The greater the impact, the more patients tend to adopt the coping style of “avoidance” and “submission”. After the patient in the intervention group had some psychological intervention, she was able to take the initiative to recognize her own bad coping style, take the initiative to adjust, and adopt a more positive “face” coping style to receive treatment.

In this study, we found that, through the SAS and MCMQ scores in breast cancer patients, positive cognitive behavioral intervention can effectively reduce the stress response of breast cancer patients and improve the medical coping style of patients. Reasonable intervention therapy has a good application value in clinical application and is suitable for application to clinical departments. However, due to the limitation of time and place, this study only conducted intervention tests in a hospital’s breast surgery. The sample coverage was too small and the sample size was limited. Because of the subjective factors, the interventions in this study only used behavioral therapy with cognitive reconstruction and progressive muscle relaxation training. Other intervention methods were not involved. Therefore, further study and discussion are still needed. Moreover, the human resources limited by the combination of clinical knowledge and psychological knowledge of hospital medical staff have not yet reached the conditions for comprehensive promotion, so this cognitive behavioral intervention can only be gradually promoted in clinical application.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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