Effect of Psychological Intervention and Social Support on Postoperative Rehabilitation of Breast Cancer Patients

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Abstract: After surgical treatment for breast cancer, individuals commonly encounter issues such as anxious mood, depressive states, and impaired life quality. From January to December, 2023, 120 people who experienced surgery of breast cancer in a 3A-level hospital were chose. These people formed intervention group and control group. The control group received everyday nursing care as well as health education after operation; the intervention group, on this basis, implemented an 8-week psychological intervention and social support program, including cognitive-behavioral therapy-oriented individual psychological counseling (once a week, 45 minutes per session) and family-peer social support intervention (once every 2 weeks, consisting of family support meetings and patient mutual support groups). Evaluations were performed pre- and post-intervention using the Self-Rating Depression Scalen (SDS), Self-Rating Anxiety Scale (SAS), General Self-Efficacy Scale (GSES), Social Support Rating Scale and life's quality scale for people of breast cancer patients. Repeated-measures analysis of variance revealed that the intervention group achieved greater improvements in anxious and depressive symptoms, self-efficacy, social support and life's quality than the control group, and the intergroup differences reached statistical significance ($P < 0.05$). For breast cancer patients following surgery, implementing psychological intervention together with social support is able to alleviate anxious and depressive symptoms, boost self-efficacy and social support levels, and enhance overall quality of life during postoperative recovery with high efficiency. Hence, this approach holds definite value for clinical application.

Keywords: Breast Cancer; Psychological Intervention; Social Support; Postoperative

1. Introduction

Worldwide, breast cancer ranks first in female malignancy incidence [1]. Data from GLOBOCAN 2022 indicate there were about 2.3 million new cases among women, accompanied by roughly 666,000 deaths [2].

China also bears the heavy disease burden brought by this cancer. In the year of 2022, there were about 357,000 new female breast cancer people and nearly 75,000 patients died in China. This number occupies 15.59% in that new women malignant tumors and 7.94% in cancer deaths respectively [3]. The physical and mental impact of breast surgery on patients can not be ignored. A study based on German medical insurance claims data included more than eleven thousand patients of breast cancer and nearly 32 thousand healthy controls. The results showed that the mental illness occurrence rate in cancer group was significantly higher, especially anxiety disorder and depression [4]. Regarding the postoperative setting, a follow-up study of 335 post-surgery patients observed that 44.5% exhibited both anxious and depressive symptoms, together with significantly reduced life quality [5]. Moreover, a systematic review indicates that peer support is able to markedly elevate life's quality and relieve anxiety among these patients [6]. Consequently, psychosocial support needs are extremely prominent after breast cancer surgery. Social support occupies a key role in psychological adjustment for those with breast cancer. Family assistance plus peer support effectively relieves emotional distress, prevents depression onset, and greatly enhances life quality [7].

In tumor rehabilitation, patients' personal efficacy is positively correlated with treatment compliance, psychological resilience and life's level. Meta-analysis shows that based on the data from 16 randomized controlled trials, health

education can effectively enhance the self-efficacy of breast cancer patients, alleviate depression and improve their level of life [8].

Despite abundant evidence confirming beneficial effects of psychological interventions and social support for this population, current research still has notable shortcomings: few randomized controlled trials exist, and most studies only test single-faceted interventions. Furthermore, evidence on integrated programs specifically tailored to Chinese patients remains sparse. Therefore, well-designed Randomized clinical trials (RCTs) are urgently needed to systematically evaluate the comprehensive impact of overall psychological and social support interventions on postoperative rehabilitation of breast cancer patients in China.

2. Materials and Methods

2.1. Study Design

In this paper, the RCT was adopted, and the subjects were formed to the intervention group as well as the control group at a 1:1 ratio. The control group only received routine nursing and health education after operation; in the intervention group, psychological intervention and social support intervention were carried out for an additional 8 weeks based on routine nursing. Follow-up evaluation was carried out before the intervention (baseline stage) and after the intervention in the eighth week. All subjects provided written informed consent.

2.2. Participants

This paper adopted the convenient sampling method and selected inpatients who underwent breast cancer surgery in the breast surgery of a tertiary first-class hospital spans from January to December 2023 as the research subjects. Inclusion criteria: (1) firstly diagnosed with primary breast cancer by pathology; (2) underwent radical mastectomy or modified radical mastectomy; (3) postoperative pathological stage I-III; (4) aged ≥18 years; (5) conscious, without cognitive impairment, and possessing basic reading and comprehension abilities; (6) Gave voluntary participation, signed the form to prove their agreement. Exclusion criteria: (1) concurrent malignancies in other sites; (2) previous history of psychiatric disorders or current use of antipsychotic drugs; (3) postoperative severe complications such as massive hemorrhage or septic shock; (4) unable to cooperate with the assessment or intervention. In light of preliminary study data and existing literature, the analysis adopted a power of 0.80 and $\alpha = 0.05$. Based on a 20% attrition rate, there are 60 subjects in each group, totaling 120 cases

2.3 Randomization and Blinding

There are 120 people in the intervention and control groups (60 cases in each) via a random number table. Sealed in envelopes and administered by a research assistant, group assignments were independent of clinical care. Due to the particularity of the intervention measures, the study failed to achieve double-blind, and only blinded management was implemented for the outcome evaluators and data analysts.

2.4 Measurements

Control group: Subjects in this group had routine postoperative care and health education, including guidance on postoperative wound care, functional exercise of the affected upper limb, dietary nutrition advice, and reminders for regular follow-ups. No additional psychological intervention or social support was provided.

Intervention group: Patients in this group underwent an 8-week psychological intervention and social support program, based on the care and education provided to the control group.

(1) Psychological intervention (once a week, 45 minutes per session): Based on the theoretical framework of cognitive behavioral therapy, one-on-one individual counseling is conducted by professionals with psychological counseling qualifications. The intervention content covers: emotion recognition and expression training, identification and reconstruction of negative automatic thoughts, exploration of disease adaptation strategies, relaxation training, and mindfulness practice.

(2) Social support intervention (once every 2 weeks): Adopt a dual family-peer support model. Family support meetings invite core family members to participate, with interventionists guiding family members to understand the psychological needs of patients and learn effective emotional communication and support skills. The peer support group consists of 3-5 breast cancer survivors in recovery, who share recovery experiences under guidance and provide peer support and emotional comfort.

2.5 Data Collection Procedures

Data were collected by uniformly trained research nurses at three time points: (1) at enrollment (before intervention); (2) Intervention ended (in the eigth week). The questionnaire was distributed face-to-face and collected on the spot after patients independently filled it out. For patients who were unable to fill out the questionnaire on site for some reason, electronic questionnaires were used for collection.

2.6 Intervention Description

(1) Self-Rating Depression Scale

Created by Zung in 1965, SDS contain twenty elements. Responses are divided into a four-point scale according to how frequently symptoms appear: "none or rarely", "rarely", "often", and "almost always or all the time". For items with positive scoring, the raw scores are assigned in ascending order of symptom frequency, with 1, 2, 3, and 4 representing the lowest to highest frequency; for items with negative scoring, the raw scores are assigned in descending order, with 4, 3, 2, and 1 representing the lowest to highest frequency.

SDS takes the total score as the core evaluation index. Among them, 53-62 points: mild depression; 63-72 as moderate, and 73 or above will be condidered as the severe level. This instrument boasts outstanding reliability and validity [9].

(2) Self-Rating Anxiety Scale

SAS, created by Zung in 1971, serves as a tool for evaluating patients' subjective anxiety experiences. It utilizes a 4-point Likert scoring method, with cumulative scores reflecting more intense levels of anxiety. The specific scoring criteria are as follows: 50 to 59 points are classified as mild anxiety, 60 to 69 points as moderate anxiety, and 70 points or above as severe anxiety. This assessment tool is recognized for its strong reliability and validity [10].

(3) General Self-Efficacy Scale

Schwarzer et al. established the General Self-Efficacy Scale (GSES) in 1981 to assess people's confidence in handling tough and stressful situations. There are ten points in the evaluation method and uses the four-point Likert scoring method. The total score ranges from 10 to 40 points, with a higher score indicating a higher level of individual personal competence. The localized version of GSES in China has good psychometric characteristics in the Chinese population. And Cronbach's α coefficient shows 0.92 [11].

(4) Social Support Rating Scale

The Scale was established by Xiao Shuiyuan during the period of 1986–1993 to measure the social support resources that individuals obtain.

There are ten entries in this evaluation form, covering three catalogues: three entries in objective support; four entries in subjective perspective. The point is positively correlated with the level of society's support. That means a person will have a better degree of support if the point is higher. As a mature measurement tool extensively used in domestic research, it exhibits excellent stability of test and retest as well as forecast accuracy. What's more, its stability and accuracy are fully proved for Chinese participants [12].

(5) Physical Function Measurement of Cancer Therapy-General

First introduced by Cella et al. in 1993, FACT-G ranks among the top typically adopted general questionnaires to measure cancer patients' quality of life. This 28-item scale covers four aspects: physical, family, emotional and functional domains. Better quality of life is associated with higher scores. Its psychometric properties have been confirmed in various research works [13].

2.7 Statistical Analysis

All analyses in this study were completed through SPSS 26.0 statistical software. Among them, continuous measures are showed as mean ± standard deviation. Nominal variables are presented as occurrences and proportions. The baseline data were compared by leveraging independent sample t-tests and chi-square tests respectively. The intervention effect was evaluated using one-way analysis of variance. Statistical significance was accepted at $P < 0.05$[13].

3. Results

3.1 General Information

The research encompassed 120 patients who had undergone breast cancer surgery, with 112 successfully finishing the entire study. The intervention group consisted of 56 patients (4 withdrew, yielding a dropout rate of 6.7%), and the control group also had 56 patients (4 dropped out, with the same dropout rate of 6.7%). A comparison of general demographic and clinical

information between the two groups is presented in Table 1. The findings displayed no statistically significant disparities in age, education level, marital status, pathological stage, surgical approach, or postoperative duration between the groups (P>0.05), ensuring their comparability.

Table 1. General Information

Project	Intervention Group	Control Group	t/χ^2	*P*
Age(years)	49.6±8.3	50.2±9.0	-0.368	0.714
Postoperative duration (days)	7.2±2.5	7.0±2.3	0.436	0.664
Educational level			1.297	0.523
Junior high school and below	24(42.9)	27(48.2)		
High school/technical secondary school	20(35.7)	19(33.9)		
College degree or above	12(21.4)	10(17.9)		
Marital status			0.158	0.691
Married	50(89.3)	51(91.1)		
Unmarried/Divorced/Widowed	6(10.7)	5(8.9)		
Pathological staging			0.542	0.763
I	18(32.1)	16(28.6)		
II	27(48.2)	30(53.6)		
III	11(19.6)	10(17.9)		
Surgical method			0.324	0.569
Radical surgery	38(67.9)	41(73.2)		
Modified radical mastectomy	18(32.1)	15(26.8)		

3.2 Points Comparison before Intervention between the Two Patient Groups

At baseline, independent samples t-tests were performed to compare baseline anxiety, depression, self-efficacy, social support and life's level across the groups. Statistically insignificant between-group differences were found in all scale scores (P>0.05), suggesting comparable baseline characteristics. Details are shown below: Table 2.

Table 2. Baseline Assessment of Scale Scores across the Two Patient Groups ($\bar{x}$±s)

Scale	Intervention Group(n=56)	Control Group (n=56)	*t*	*P*
SDS	57.2±6.5	56.8±6.9	0.313	0.755
SAS	55.9±6.1	56.3±6.5	-0.336	0.738
GSES	24.8±4.5	25.1±4.8	-0.341	0.734
SSRS	36.2±5.3	35.9±5.6	0.291	0.771
FACT-G	68.5±7.2	69.1±7.5	-0.432	0.666

3.3 Group Scores Comparison after Intervention

After 8 weeks of intervention, the independent sample t-test was used again to compare the ontained scale scores. Those number indicated that the SDS and SAS scores of the intervention group were significantly lower than those of the control group. On the contrary, participants in the intervention group earned higher scores across GSES, SSRS and FACT-G, with statistically significant between-group differences (P<0.05). For further details, refer to Table 3.

Table 3. Comparison of Scale Scores between the Two Groups of Patients after Intervention ($\bar{X}$±S)

Scale	Intervention Group	Control Group	*t*	*P*
SDS	44.6±5.8	52.3±6.2	-6.827	0.012
SAS	43.5±5.2	51.6±5.9	-7.762	0.008
GSES	32.6±4.1	27.3±4.4	6.589	0.023
SSRS	44.8±4.7	38.5±5.1	6.847	0.017
FACT-G	84.2±6.8	74.6±7.1	7.332	0.004

4. Discussion

4.1 The Alleviating Effect of Psychological Intervention Combined with Social Support on Anxious and Depressive Symptoms in Postoperative Breast Cancer Patients

Compared with patients receiving routine care alone in control group, those people in the intervention presented obvious declines in SAS and SDS scores after treatment. This suggests that the comprehensive psychological and obtaining support from society program effectively mitigates levels of mental problems among them following surgery. A plausible explanation for this outcome is that breast cancer patients frequently encounter numerous psychological stressors, including alterations in body image, apprehension about recurrence and metastasis, and compromised role functioning,

all of which account for the markedly higher rates of anxiety and depression among this group versus the general public[14]. The individual psychological intervention centered on cognitive behavioral therapy adopted in this study helps patients identify and correct their cognition towards the disease and postoperative recovery through techniques such as emotion recognition training, negative automatic thought restructuring, and relaxation training. Previous randomized controlled trials have demonstrated that stress management interventions based on CBT can improve the psychological adaptation status of breast cancer people after surgery with a high efficiency, alleviate depressive mood, and enhance emotional health and life's quality [15]. Furthermore, a quantitative synthesis incorporating 51 RCTs further confirmed that CBT has significant effects in alleviating anxiety and depression in those people with breast cancer, while mindfulness-based therapies have a larger effect size in terms of anxiety and depression, and the combination of the two also shows synergistic effects [16].

It is worth noting that while cognitive-behavioral intervention alone has been proven effective in cancer patients, this program also incorporates family support meetings and peer support groups, extending the benefits of psychological intervention from the individual level to the interpersonal support network level. The participation of family members helps improve family communication patterns and reduce family role conflicts caused by the disease. Peer support, through identity recognition, reduces patients' stigma and loneliness. It is confirmed in comprehensive reviews and quantitative syntheses that anxiety symptoms and life's level of these patients can be greatly improved via peer support interventions [6].

4.2 The Enhancing Effect of Psychological Intervention Combined with Social Support on Self-Efficacy and Social Support Level

The intervention group outperformed the control group on the GSES and Social Support Rating Scale. This finding suggests that the program not only bolstered patients' confidence in managing disease-related and rehabilitation challenges but also significantly enhanced their capacity to seek out and leverage social resources. In this paper, the exploration of disease adaptation strategies and the setting of rehabilitation goals in individual counseling sessions helped patients break down their rehabilitation tasks into executable small steps, enabling them to gain a sense of success with each step and gradually accumulate self-efficacy. As evidenced by randomized controlled trials, short-term cognitive behavioral therapy combined with post-surgical relaxation training helps improve positive psychology and self-efficacy among breast cancer patients. These favorable outcomes can be maintained for up to twelve months after operation [17]. Meanwhile, the exemplary role of breast cancer survivors in recovery in peer support groups also provided patients with indirect experience: observing someone in a similar situation successfully coping with post-surgical difficulties can significantly strengthen their belief that "I can do it too."

About social support, the SSRS points of both groups of patients increased after intervention, but the increase was more pronounced in the intervention group. Health education and regular follow-ups involved in conventional care may have improved patients' perception of support to some extent. Through family support meetings, family members learned specific emotional communication and support skills; peer support groups provided patients with a low-risk practice environment, enabling them to gradually resume seeking and accepting support behaviors in a safe environment.

4.3 The Comprehensive Improvement Effect of Psychological Intervention Combined with Social Support on Quality of Life and Its Clinical Application Value

In this paper, the FACT - G is used to evaluate patients' quality of life from four aspects: physical well - being, family situation, emotional state, and functional ability. The findings revealed that the intervention group showed more significant enhancements in all these dimensions. Upon analysis, the alleviation of anxiety and depression directly enhanced patients' emotional condition; the enhancement of self-efficacy prompted patients to engage more actively in postoperative upper limb functional exercises and daily activities, thereby improving their physical and functional conditions; and the elevation of social support level improved the social and family condition by bolstering patients' sense of social belonging and alleviating the burden of caregiving. This phenomenon aligns with existing research findings. Meta-analysis evidence suggests that

psychosocial interventions can significantly enhance life's quality for these patients [18]. Previous research has demonstrated that support from common people has an important mediating role in alleviating the adverse effects of cancer on a better life of people, especially excelling in enhancing psychosocial functioning [16].

5. Conclusion

An 8-week comprehensive program of psychological intervention and social support can significantly alleviate anxious and depressive situation in breast cancer patients, enhance self-efficacy and sense of social support from the society, and make a better life for postoperative patients. Compared with conventional care alone, the combined intervention has clinical significance. The research has several inherent shortcomings. At the beginning, the intervention period is only 8 weeks, lacking a long period follow-up data, making it impossible to determine the sustainability of the intervention effect and whether subsequent consolidation is necessary. Secondly, the samples in this study are obtained from just one hospital. In addition, the universality of the research conclusions have the need for verification by more focus and larger experience analyses. Subsequent research is recommended to extend follow-up time and explore the intervention's applicability and efficacy discrepancies at different illness phases.

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