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Review Article

Continued nursing intervention is beneficial to the recovery and life quality of patients with breast cancer after operation

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Abstract: This study aimed to explore the effects of continued nursing on the recovery and life quality of patients with breast cancer (BC) after operation. Altogether 188 patients undergoing BC operation in our hospital were enrolled, of which 86 patients were given routine nursing as a control group and the rest were given both routine nursing and continued nursing as an experimental group. The changes of systolic blood pressure, diastolic blood pressure, and heart rate of the two groups before and after nursing, and the adverse reactions after the operation were analyzed and recorded. The self-rating anxiety scale (SAS) and the self-rating depression scale (SDS) were employed to evaluate the anxiety and depression of the two groups before and after nursing. The visual analog scale (VAS) was applied to evaluate the pain degree of the patients, and the limb function recovery was also analyzed. Additionally, the self-management ability scale was applied to score the self-management ability of the two groups, the functional assessment of cancer therapy-breast (FACT-B) to evaluate their life quality, and the Nursing Satisfaction Questionnaire developed by our hospital to evaluate their nursing satisfaction. After nursing, the experimental group showed significantly lower systolic blood pressure, diastolic blood pressure, heart rate, and SAS, SDS, and VAS scores than the control group, and experienced much better limb function recovery than the control group. Furthermore, after nursing, the experimental group showed dramatically better self-management ability and significantly lower total incidence of adverse reactions than the control group, and the experimental group had a remarkably higher life quality score and showed higher nursing satisfaction than the control group. Continuous nursing intervention can improve the psychological status of patients undergoing BC operation, and can accelerate limb function recovery, reduce adverse reactions, and improve self-care ability and life quality.

Keywords: Continued nursing after breast cancer operation, recovery speed, life quality

Introduction

Breast cancer is one of the most prevalent cancers and usually causes death [1, 2], its pathological features are unique in different people, so each patient has a different prognosis. Some patients have good prognosis, while some patients suffer from aggressive tumors [3]. It is reported that the incidence of breast cancer is on the rise [4]. In clinical practice, breast cancer is mainly treated through surgical operation or radiotherapy [5], and most patients will suffer from pain, depression, and anxiety before operation [6]. Clinically, a breast cancer operation will bring about irregular pain, so nursing intervention after the operation is extremely important [7].

The treatment of breast cancer may weaken the functional ability of patients, and sequelae from surgical treatment may bring about negative effects on the body, life quality, and psychology of the patients [8]. The current routine nursing is beneficial to the recovery of the patients, but cannot satisfy the needs and expectations of most patients for nursing qual-

ity [9, 10]. Continued nursing is provided in various forms and ways, which not only includes group counseling, telephone consultation, and individual treatment consultation for patients [11], but also includes independent intervention and a step-down method. Continued nursing is highly adaptable and provides a long period of nursing, and it can motivate the participation of patients in the treatment through inspiration and motivation [12, 13]. One study by Tworek K B et al. [14] concluded that under the accelerated speed of population aging, it was crucial to maintain and improve nursing during continued nursing, and an earlier study pointed out that continued nursing intervention could improve the compliance of hospitalized patients during hospitalization [15].

This study explored the application value of continued nursing in patients after breast cancer operation, with the goal of providing a feasible nursing intervention measure for patients with breast cancer.

Materials and methods

General materials

A total of 188 patients with breast cancer who had undergone breast cancer operations in the Cancer Hospital of China Medical University from August 2017 to March 2019 were enrolled, and assigned to a control group and an experimental group according to their nursing mode. The experimental group consisted of 38 patients undergoing modified radical mastectomy and 64 patients undergoing radical mastectomy, of which there were 64 patients with ductal carcinoma and 38 patients with lobular carcinoma. The control group consisted of 31 patients undergoing modified radical mastectomy and 55 patients undergoing radical mastectomy, of which there were 58 patients with ductal carcinoma and 28 patients with lobular carcinoma. This study did not violate any ethics or morality, and it was carried out with permission from the Ethics Committee of the Cancer Hospital of China Medical University. The research subjects and their family members signed informed consent forms after understanding the study.

Inclusion and exclusion criteria

The inclusion criteria of the patients were as follows: Patients diagnosed with breast cancer based on histopathology [16], patients with complete general clinical data, patients without contraindications to chemotherapy, and patients with stable vital signs and expected survival time equal to three months or longer. The exclusion criteria was as follows: Patients without malignant tumor history, pregnant women, lactating women, patients with comorbid autoimmune disease, severe hematopoietic functional damage, or severe mental disorder, patients who dropped out of the study, patients with poor complication, and those who were lost to follow-up.

Nursing methods

Patients in the control group were nursed as follows: The nursing staff was instructed to tell each patient the exact operation time, and to fully understand the patient's allergy history. What's more, the staff was also instructed to ask each patient to fast without solids and liquids before operation, to teach them about basic health knowledge before and after the operation, to instructively nurse them about complications, and to guide them in diet and exercise for recovery.

Patients in the experimental group were nursed as follows: (1) Individualized assessment: A personal file was established for each patient according to his/her doubts about his/her own diseases and surgical treatment, and it contained instructional health education provided according to the patient's own life, diet, and personality. (2) Psychological nursing: Patients can suffer from strong short-term pain after operation and may worry about the operation effect, so the nursing staff was instructed to understand each patient's psychological status, to encourage the patient to express his/her own inner feelings, so as to help the patient relieve bad emotions and psychological disorders. (3) Exercise nursing: Different operation methods would bring about different upper limb dysfunction to patients, so the staff was required to instruct each patient to carry out limb extension exercise. Each patient was instructed to grip a ball to exercise the hand strength, and then to make small shoulder joint activities, and finally to do all-around limb function exercise. The exercise content was guided for each patient one by one according to the patient's own recovery. (4) Nursing for complications: The nursing staff was instructed to

check the occurrence of complications such as subcutaneous hydrops, hemorrhage, scarring in the incision and edema of upper limbs, and was also arranged to instruct the patients and their family members on matters needing attention for postoperative rehabilitation. (5) Discharge planning: The nursing staff was instructed to fully communicate with the patients and their family members before their discharge to assess the patients' recovery and mental status, and the staff was also instructed to ask the patients to undergo reexamination every other month for 6 months, and requires the patients to go back to the hospital for treatment right away if any abnormal situation occurred in the recovery process.

Outcome measures

(1, 2) The blood pressure, heart rate, and complications of the two groups were analyzed.

The self-rating anxiety scale (SAS) and the self-rating depression scale (SDS) were employed to determine the patients' mental health. The SAS has a maximum score of 100 points and indicates mild anxiety with 50-70 points, moderate anxiety with 71-90 points, and severe anxiety with more than 90 points. A higher score indicates more severe anxiety. The SDS also has a maximum score of 100 points and indicates mild depression with 50-70 points, moderate depression with 71-90 points, and severe depression with more than 90 points. A higher score indicates more severe depression.

(3) The visual analog scale (VAS) was employed to determine the patients' pain degree. After the operation, each patient was given a rating scale and asked to record his/her pain degree. The scale has a total of 10 points, and a higher total score indicates more severe pain degree.

(4) The patients' upper limb function recovery was analyzed, including their shoulder joint mobility (the angle of adduction, anteflexion, abduction and retroextension of the upper limb), raising of both arms while facing the wall, and the wall height reached by patients' fingers.

(5) The self-management ability scale was applied to evaluate the self-management ability of the patients mainly from the following three items: Resting behavior, cognition, and management behavior (0-5 points for each item). A higher total score indicates higher self-management ability.

(6) The functional assessment of cancer therapy-breast (FACT-B) was utilized to evaluate the life quality of the two groups, which covered 5 aspects (36 items); namely, physiological status, social/family status, functional status, emotional status, and additional attention. The 5-grade evaluation method was adopted. The positive items were scored by 0-4 points, and the negative items were scored reversely. The scores of the five aspects were added, and the total score was positively correlated with the life quality after nursing intervention.

(7) The Nursing Satisfaction Questionnaire developed by our hospital was used to evaluate nursing satisfaction of the patients, which mainly covered attitude, character, wearing, and operation proficiency of the nursing staff. The questionnaire consisted of 20 questions, and each question is worth 5 points. A score of < 70 points indicates dissatisfaction; score between 70 and 89 indicates basic satisfaction, and score ≥ 90 points indicates satisfaction. Satisfaction = (the number of patients satisfied with nursing + the number of patients basically satisfied with nursing)/the total number of patients ×100%.

Statistical analysis

In this study, the data were statistically analyzed using SPSS 20.0 (IBM Corp, Armonk, New York, the United States), and illustrated into figures using GraphPad Prism 7. Enumeration data were expressed as [n (%)], and compared between groups using the chi-square test. Those with theoretical frequency in the chi-square test less than 5 were analyzed using the continuity correction chi square test. Measurement data were expressed as the mean ± standard deviation ($\bar{x}$ ± sd), compared between groups using the independent-samples T test, and compared within groups using the paired t test. $P < 0.05$ indicates a significant difference.

Results

General materials

There was no significant difference between the two groups in clinical baseline data including age, body mass index (BMI), place of resi-

Table 1. Comparison between the two groups in general data [n (%)] (x ± sd)

Item	The experimental group (n=102)	The control group (n=86)	t/χ^2 value	*P*-value
Age (Y)	44.16±6.27	43.39±8.34	0.722	0.472
BMI (kg/m^2)	22.34±3.18	22.15±3.13	0.411	0.682
Place of residence			0.155	0.694
Urban area	54 (52.94)	48 (55.81)		
Rural area	48 (47.06)	38 (44.19)		
Nationality			0.359	0.549
Han nationality	66 (64.71)	52 (60.47)		
Minority nationality	36 (35.29)	34 (39.53)		
Education background			1864	0.172
≥ senior high school	34 (33.33)	37 (43.02)		
< senior high school	68 (66.67)	49 (56.98)		
Smoking history			1.372	0.242
Yes	55 (53.92)	39 (45.35)		
None	47 (46.08)	47 (54.65)		
Drinking history			0.204	0.652
Yes	52 (50.98)	41 (47.67)		
None	50 (49.02)	45 (52.33)		
Marital status			0.934	0.334
Unmarried	19 (18.63)	21 (24.42)		
Married or divorced	83 (81.37)	65 (75.58)		
Surgical method			0.029	0.864
Modified radical mastectomy	38 (37.25)	31 (36.05)		
Radical mastectomy	64 (62.75)	55 (63.95)		
Clinical tumor staging			0.846	0.655
Stage I	58 (56.86)	46 (53.49)		
Stage II	29 (28.43)	23 (26.74)		
Stage III	15 (14.71)	17 (19.77)		
Breast cancer type			0.452	0.502
Ductal carcinoma	64 (62.75)	58 (67.44)		
Lobular carcinoma	38 (37.25)	28 (32.56)		
Metastatic site			0.101	0.992
Liver	21 (20.59)	19 (22.09)		
Lung	29 (28.43)	25 (29.07)		
Lymph node	27 (26.47)	22 (25.58)		
Brain	25 (24.51)	20 (23.26)		

dence, nationality, education background, smoking history, drinking history, marital status, surgical method, clinical tumor staging, breast cancer type, and metastatic site (all $P > 0.05$) **Table 1**.

Comparison of biochemical indexes between the two groups before and after nursing

Before nursing intervention, the two groups had no difference in heart rate and blood pressure (both $P > 0.05$), while after nursing, the experimental group showed significantly lower heart rate and blood pressure than the control group (both $P < 0.05$) **Table 2**.

Comparison of psychological status scores between the two groups before and after nursing intervention

Before nursing intervention, there was no significant difference between the two groups in

Table 2. Clinical biochemical indexes (x ± sd)

Group	n	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Heart rate (times/min)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
The experimental group	102	138.2±16.2	113.3±12.5	82.5±4.8	70.8±4.9	90.1±12.4	70.5±11.8
The control group	86	141.4±16.5	127.2±10.5	83.4±4.9	80.2±5.1	88.8±12.2	87.3±11.9
T	-	1.228	8.165	1.269	12.860	0.721	9.688
P-value	-	0.183	< 0.001	0.206	< 0.001	0.472	< 0.001

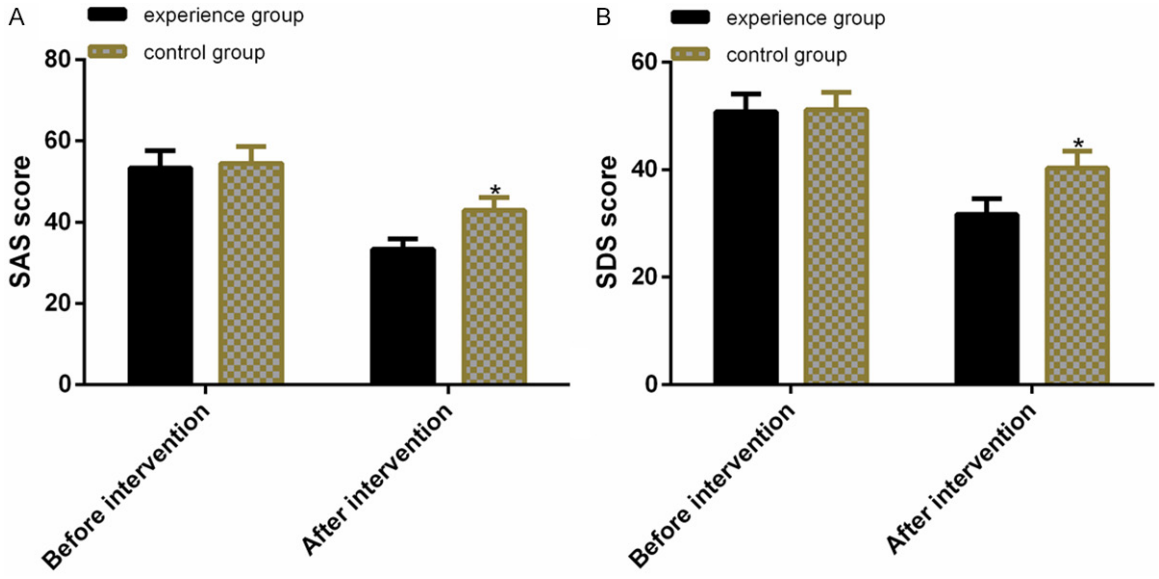

Figure 1. Comparison of psychological status scores between the two groups before and after nursing. A. Before nursing intervention, there was no significant difference between the two groups in SAS score, while after nursing, the SAS score of the experimental group was remarkably lower than that of the control group. B. Before nursing intervention, there was no significant difference between the two groups in SDS score, while after nursing, the SDS score of the experimental group was remarkably lower than that of the control group. Note: * indicates that in comparison with the control group after nursing intervention, P < 0.05.

SAS and SDS scores (both P > 0.05), while after nursing intervention, the SAS and SDS scores of the experimental group were significantly lower than those of the control group (both *P* < 0.05) **Figure 1**.

Comparison of VAS score between the two groups before and after nursing intervention

Before nursing intervention, there was no significant difference between the two groups in VAS score (P > 0.05), while after nursing intervention, the VAS score of the experimental group was significantly lower than that of the control group (*P* < 0.05) **Figure 2**.

Comparison of limb function recovery between the two groups after nursing

The improvement in shoulder joint mobility (adduction, flexion, extension, and abduction) and wall height reached by fingers of the experimental group was significantly better than that of the control group (*P* < 0.05) **Table 3**.

Comparison of self management ability between the two groups after nursing

After nursing, the self-management ability of both groups was improved, and the improvement of the experimental group was more significant (P < 0.05) **Table 4**.

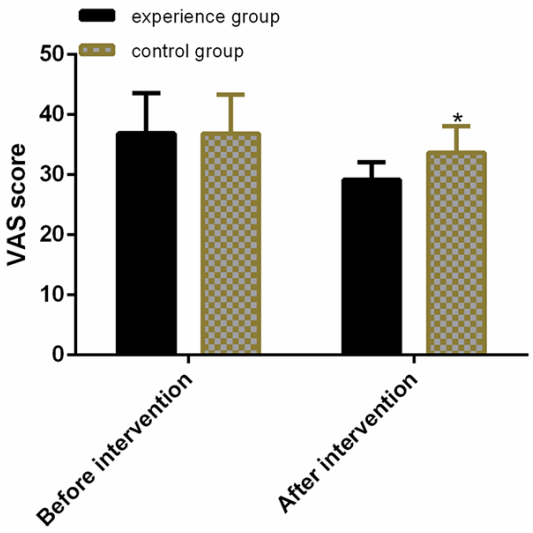

Figure 2. Comparison of VAS score between the two groups before and after nursing. Before nursing intervention, there was no significant difference between the two groups in VAS score, while after nursing intervention, the VAS score of the experimental group was remarkably lower than that of the control group. Note: * indicates that in comparison with the control group after nursing intervention, P < 0.05.

Comparison of adverse reactions between the two groups after nursing

Both groups suffered from adverse reactions, and the total incidence of adverse reactions in the experimental group was significantly lower than that in the control group (9.80% vs. 20.93%) ($P < 0.05$) **Table 5**.

Comparison of life quality scores between the two groups after nursing intervention

The two groups had significant difference in life quality (P < 0.05), and the scores of physiological status, social/family status, functional status, emotional status, and additional attention of the experimental group were significantly higher than those of the control group after nursing intervention ($P < 0.05$) **Table 6**.

Comparison of satisfaction towards nursing service between the two groups after nursing

The nursing satisfaction of the experimental group was higher than that of the control group (91.18 % vs. 77.91 %) (P < 0.05) **Table 7**.

Discussion

Sixty percent of breast cancer patients suffer from persistent pain after breast cancer operation [17], which seriously compromises their life quality and body function [18], and usually brings about severe complications [19]. Therefore, effectively improving the postoperative life quality of breast cancer patients and reducing postoperative stress response in them has become a priority for clinical medical staff [20].

In this study, we applied continued nursing to intervene with the patients with breast cancer after operation. Previous studies have pointed out that it is of great significance to improve the body and psychology of breast cancer patients and alleviate their postoperative pain [21]. One study by Zhou K et al. [22] revealed that music therapy combined with routine nursing could relieve the depression and anxiety of the patients after radical mastectomy, and could shorten their hospitalization time; and one study by Schulman-Green D et al. [23] concluded that nursing intervention for patients with non-metastatic breast cancer during treatment could lower the patients' stress response and improve their self-management ability. The results of this study revealed that after continued nursing, the experimental group experienced much better improvement in terms of diastolic blood pressure, systolic blood pressure, and heart rate than the control group, implying that targeted psychological intervention could disperse patients' negative emotions and motivate the patients to more actively cooperate with surgical treatment. Furthermore, the results showed that the SAS and SDS scores of the experimental group were significantly lower than those of the control group after nursing intervention, which implied that continued nursing could not only improve the knowledge of breast cancer patients about the operation, but also encourage patients to positively face the disease, and thus improve the psychological stress response of the patients. Moreover, according to the results, compared with the control group, the VAS score of the experimental group declined after surgery, which indicated that continued nursing could ease the pain of the patients. One study concluded that breast cancer operation or radiotherapy usually brought about a variety of side effects such as arm lymphedema, shoulder numbness, stiffness or tightness in patients [24]. In this study, patients in the experimental group were instructed to take functional exercise, and it was found that the shoulder joint

Table 3. Comparison of limb function recovery between the two groups after nursing intervention (x ± sd)

Group	Shoulder joint activity level (°)				Wall height reached by fingers (cm)
	Adduction	Anteflexion	Retroextension	Abduction	
The experimental group (n=102)	28.4±5.3	102.3±16.1	36.4±4.5	92.5±11.3	35.5±4.2
The control group (n=86)	19.2±5.1	77.2±15.8	28.2±4.6	70.4±10.9	26.9±4.1
t-value	12.060	10.740	12.320	13.580	14.140
P-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 4. Comparison of self-management ability between the two groups after nursing (x ± sd)

Group	Number of patients	Resting behavior	Cognition	Management behavior
The experimental group	102	2.26±0.36	3.14±0.15	4.26±0.25
The control group	86	2.13±0.21	1.69±0.12	2.34±0.22
t-value	-	2.951	72.240	55.390
P-value	-	0.004	< 0.001	< 0.001

Table 5. Comparison of adverse reactions between the two groups after nursing intervention[n (%)]

Item	The experimental group (n=102)	The control group (n=86)	χ^2 value	*P*-value
Tired	2 (1.96)	4 (4.65)	1.093	0.296
Nausea and vomiting	2 (1.96)	3 (3.49)	0.421	0.517
Appetite loss	1 (0.98)	2 (2.33)	0.538	0.463
Dyspnea	1 (0.98)	3 (3.49)	1.409	0.235
Pain	2 (1.96)	3 (3.49)	0.421	0.517
Insomnia	2 (1.96)	3 (3.49)	0.421	0.517
Total incidence of adverse reaction	10 (9.80)	18 (20.93)	4.557	0.033

Table 6. Comparison of life quality scores between the two groups after nursing intervention (x ± sd)

Life quality score	The experimental group (n=102)	The control group (n=86)	t-value	*P* value
Physiological status	20.9±4.7	18.4±4.5	3.705	0.001
Social/family status	19.5±5.1	16.3±4.1	4.681	< 0.001
Functional status	16.8±4.2	13.7±3.8	5.265	< 0.001
Emotional status	15.7±5.0	13.2±4.9	3.447	0.001
Additional attention	24.6±4.5	20.5±5.4	5.679	< 0.001
The total score	97.5±15.5	82.1±12.6	7.383	< 0.001

Table 7. Comparison of satisfaction towards nursing service between the two groups after nursing intervention [n (%)]

Group	n	Satisfied	Relatively satisfied	Dissatisfied	Satisfaction (%)
Experimental group	102	63 (61.76)	30 (29.41)	9 (8.82)	93 (91.18)
The control group	86	35 (40.70)	32 (37.21)	19 (22.09)	67 (77.91)
t	-	-	-	-	6.482
P-value	-	-	-	-	0.011

activity level and wall height reached by fingers in the experimental group were significantly higher than those in the control group. It was also found that after nursing intervention, the

experimental group showed enhanced self-management ability and lowered adverse reactions compared with those of the control group. It suggested that continued nursing could effectively help patients standardly manage their own health and could correct the patients' bad living habits and could reduce postoperative adverse reactions. Life quality reflects the recovery of patients after surgery [25]. In this study, the life quality score of the experimental group was higher than that of the control group, indicating that continued nursing could improve the life quality of patients after discharge. At the end of the study, we scored the nursing satisfaction of the patients, finding that the nursing satisfaction of the observation group was higher than that of the control group. It suggested that patients in the experimental group highly appreciated the nursing, which provided a powerful reference for the subsequent clinical application.

This study has verified the superiority of continued nursing over routine nursing, but it still has some deficiencies. For example, it does not assess the compliance of the breast cancer patients. Those deficiencies will be addressed in the future, so as to further support the conclusion of this study.

Conclusion

Continuous nursing intervention can improve the psychological status of patients undergoing breast cancer operation, and can accelerate their limb function recovery, reduce their adverse reactions, and improve their self-care ability and life quality.

Disclosure of conflict of interest

None.

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