

Original Article

Roy adaptation model-based nursing diagnosis and implementation reduces the sense of shame and enhances nursing outcomes in female patients with breast cancer

Lina Zheng¹, Qi Jin²

¹Outpatient Management Office, The First People's Hospital of Wenling, Wenling 317500, Zhejiang Province, China; ²Department of Hepatobiliary Hernia Surgery, The First People's Hospital of Wenling, Wenling 317500, Zhejiang Province, China

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Abstract: Objective: This study aimed to explore the role of Roy adaptation model (RAM)-based nursing diagnosis and implementation in regulating the sense of shame and improving the nursing outcomes of female patients with breast cancer. Methods: The clinical data of 69 female patients with breast cancer treated in our hospital from October 2019 to October 2021 were retrospectively analyzed. Patients who received conventional care were included in a control group, and those who received RAM-based nursing were included in an observation group. Patients in both groups were evaluated for sense of shame, emotional state, psychological resilience, self-esteem, quality of recovery scores and complication rates. Results: The scores of Perceived Devaluation and Discrimination Scale (PDD), Substance Use Stigma Mechanisms Scale (SUSMS) and Stigma Coping Scale (SCS) in the observation group were lower than those of the control group at the end of nursing ($P < 0.05$). The score of Hamilton Anxiety Rating Scale (HAMA) in the observation group was lower than that in the control group at the end of nursing ($P < 0.05$). The levels of mental toughness, mental strength, and optimism scores in the observation group were higher than those of the control group at the end of nursing ($P < 0.05$). The score of Rosenberg Self-Esteem Scale (SES) in the observation group was significantly higher than that of the control group at the end of nursing ($P < 0.05$). Psychosocial recovery, physical recovery, relationship with medical workers, marital relationship, and sexual function scores in the observation group were significantly lower than those in the control group at the end of nursing ($P < 0.05$). The incidence of complications was 5.71% in the observation group, lower than 23.53% in the control group ($P < 0.05$). Conclusion: RAM-based nursing diagnosis and implementation can significantly reduce patients' sense of shame and negative emotions, improve patients' psychological resilience, quality of recovery, and quality of life, and reduce complications for female patients with breast cancer.

Keywords: Breast cancer, Roy adaptation model theory, nursing diagnosis, nursing implementation, stigma, nursing outcomes

Introduction

In recent years, the incidence of breast cancer has been on the rise. Although the mortality has been effectively controlled with advances in medical technology, the quality of life of surviving patients is still low. Conventional nursing in conjunction with clinical treatment is currently the main intervention for breast cancer, which focuses more on improving the treatment effect but lacks exploration of patients'

subjective ability. Therefore, some patients' compliance with nursing is limited, affecting the quality of nursing.

The Roy adaptation model (RAM) was proposed by Roy, an American scholar, which synthetically describes the process of human adaptation in the face of different stimuli. The RAM theory proposes that humans are a holistic system that responds to internal and external stimuli in terms of interdependence, role function,

self-concept and physiologic function [1]. According to the RAM theory, nursing can be carried out in several stages, with the first stage focusing on assessment, including primary and secondary assessment, the second stage requiring nursing diagnosis and goal setting, and the third stage involving interventions and assessments on the basis of the second stage [2]. There have been several studies on RAM theory in breast cancer nursing, which were one-sided in terms of methodology and efficacy evaluation [3, 4]. Based on the specific conditions of the patients in our hospital and previous research experience, this study proposed a novel, more hierarchical nursing plan, and a richer set of evaluation indicators to fully explore the nursing role of interventions carried out under the RAM theory for improving the effectiveness of breast cancer nursing.

In this study, the clinical data of 69 patients with breast cancer were retrospectively analyzed, and nursing interventions based on RAM theory were compared to conventional interventions.

Materials and methods

General data

Clinical data of 69 female patients with breast cancer treated in our hospital from October 2019 to October 2021 were retrospectively analyzed, and there were 34 cases in a control group (conventional nursing) and 35 cases in an observation group (RAM-based nursing) according to the nursing methods. All patients were aware of the study content, signed the study consent form, and ethical approval was obtained from the ethics committee of the First People's Hospital of Wenling.

Inclusion criteria: female patients aged 18 years old or above; diagnosis of breast cancer confirmed by clinical imaging and pathological examination; those with first round treatment for breast cancer but without radiotherapy prior to surgery; those with complete data; permanent residents of the region who agreed to complete follow-up; a normal mental and cognitive state.

Exclusion criteria: patients with non-primary breast cancer; those combined with mental ill-

ness, cognitive impairment or organic brain lesions; those with other malignancies or metastases; those with incomplete case data; those who went elsewhere for treatment; and those with low compliance.

Methods

The control group received routine nursing interventions, including daily rounds of ward, condition monitoring, answering patients' questions, and health education based on oral explanations and written brochures.

The observation group received RAM-based nursing interventions. A nursing team consisting of highly qualified nurses was established, and a team leader was assigned for nursing implementation and evaluation. The team held a discussion session to assess the patient's self-concept, physiological function, interdependence, and role function to determine the ineffective responses and to identify internal and external stimuli that contribute to the patient's ineffective responses, on the basis of which the nursing work was carried out as follows.

Self-concept: (1) Nursing diagnosis: the ineffective responses of patients in terms of self-concept included the sense of shame and inferiority caused by the morphologic changes. The surgery the patient underwent was the primary stimulus. The surgical procedures and the age at the time of the procedures were the inherent and relevant stimuli. Most of the patients were unable to accept the loss of their breast, postoperative scar, and the adverse reactions of chemotherapy. (2) Nursing measures: First, psychological interventions were provided, and patients were encouraged to communicate more with their relatives, friends and other patients, express their inner feelings, and prevent negative emotions from the sense of shame. Patients were instructed to establish and develop hobbies to distract themselves from the disease. Second, the health brochures were issued to patients so that they could learn about the disease and treatment-related knowledge. In addition, nurses also conducted face-to-face communication with patients to understand the individual needs of patients. A sharing meeting was

organized for patients before they decided on the procedures, and the communication among different patients was also conducive to the patient to make the most satisfactory choice.

Physiological function: (1) Nursing diagnosis: The patient's physiological function could be specifically divided into three aspects: nutrition, sleep and exercise. An ineffective response at the nutritional level was mainly manifested as loss of appetite, with toxic side effects caused by chemotherapy as the main stimulus, and the anxiety caused by the disease as the inherent and related stimuli. Surgical and chemotherapeutic treatments could affect the nutritional levels of patients, leading to malnutrition, impaired tolerance and negative impacts on physiological functions. An ineffective response regarding sleep was characterized by poor sleep quality, with anxiety as the main stimulus in the disease response, and wound pain and fatigue as inherent and relevant stimuli. The patients' anxiety in response to the disease could lead to insomnia, and pain prior to wound healing could also reduce the quality of sleep. An ineffective response at the motor level included dysfunction of the upper limbs after surgery, with mastectomy as the main stimulus and fatigue as the intrinsic and relevant stimuli. After modified radical mastectomy, the patient was prone to lymph node edema in the upper extremity, and lymph node dissection and chemotherapy during treatment might lead to shoulder joint dysfunction. (2) Nursing measures: First, the patient's family was advised to prepare low-fat and high-protein foods, which may help speed up the wound healing and improve the patient's tolerance to chemotherapy. Second, patients were introduced about breast cancer-related knowledge, including the expected outcomes after surgery and factors affecting recovery. Patients' friends and relatives were encouraged to accompany, give care, and relieve patients' anxiety, which could improve patients' sleep quality and enhance their physiological functions. Third, patients were asked to engage in functional exercises to control edema, and patients who had developed edema got timely treatment.

Interdependence: (1) Nursing diagnosis: An ineffective response in terms of interdependence was mainly manifested by the patient's

inability to adapt to postoperative interpersonal relationships in a short term, and the changes in family and social relationships were the main stimuli. As the primary caregivers of patients, the nurses provided psychological guidance and health education to the family, to improve the patient's emotions by stabilizing the family's emotions. (2) Nursing measures: First, nurses set up WeChat groups with patients as members, providing a convenient communication platform for patients. Second, the families of patients were educated about treatment-related knowledge as well as postoperative nursing precautions, so that they could give high quality care. Third, psychological interventions were performed on patients and their families to ensure that patients could receive adequate understanding and support, and eliminate their fear towards the diseases. Fourth, the families of patients were encouraged to communicate with the nurses about changes in the patient's psychological state.

Role function: (1) Nursing diagnosis: AN ineffective response in terms of role function was dominated by the patient's maladaptation to the prognostic role, with a change in the role of the patients from caregiver to care recipient as the main stimulus, and changes in activity and physical strength as the inherent and relevant stimuli. The patients' fear towards the disease and treatment could lead to a decrease in communication between couples, affecting sexual harmony, which is a change in patient's role as a wife. In terms of the role of a mother, patients had not yet finished the psychological adjustment period after the disease and had obvious concerns about the prognosis, leading to less care and concern for children and a sense of shame. Also in work roles, patients may consider themselves incapacitated and perceive themselves as a burden on the family and society. (2) Nursing measures: First, for the work role of patients, nurses should actively discuss the realization of personal value with patients, help them improve self-confidence and eliminate the sense of worthlessness. Second, patients were encouraged to communicate with their children, and their children were encouraged to give more care and understanding to their mothers, so that patients could eliminate the inner sense of shame and actively cooperate with the treatment. Third, in terms

of the role of wife, nurses should tell patients that they could resume normal sexual life after incision healing, and husbands should be more understanding of their wives.

Outcome measurement

Stigma: The Chinese version of the Link Stigma Scale [5] was used to assess the level of stigma before and at the end of nursing. It covers Perceived Devaluation and Discrimination Scale (PDD) (5 items), Substance Use Stigma Mechanisms Scale (SUSMS) (10 items), and Stigma Coping Scale (SCS) (31 items), consisting of 8 areas and 46 items in total, using a Likert 0-4 scale, corresponding from strongly agree to strongly disagree, with higher scores indicating a greater sense of stigma.

Emotional state: Hamilton Anxiety Rating Scale (HAMA) [6] was used to evaluate the anxiety of patients before and at the end of nursing, with a total of 14 items and scores of 0-4 points, 0: no symptoms; 1: mild; 2: moderate; 3: severe; and 4: very severe. A total score of ≥ 29 points indicated severe anxiety; ≥ 21 points indicated significant anxiety; ≥ 14 points indicated anxiety; > 7 points indicated possible anxiety; < 7 points indicated no anxiety.

Psychological resilience: The Chinese version of the Connor-Davidson Resilience Scale (CD-RISC) [7] was used to evaluate patients' psychological resilience before and at the end of care, including level of mental toughness (13 items), psychological strength (8 items) and level of optimism (4 items), using a 0-4 Likert scale. Higher scores indicated better psychological resilience.

Self-esteem: Chinese version of the Rosenberg Self-Esteem Scale (SES) [8] was used for the assessment of patients' self-esteem level before and at the end of nursing, with a total of 10 items, each of which was scored on a 0-4 Likert scale, ranging 10-40 points. Higher scores indicated a better self-esteem level.

Quality of recovery: Cancer Rehabilitation Evaluation System-short form (CARES-SF) [9] was used to assess the quality of recovery of patients before and 3 months after nursing, consisting of 5 areas: psychosocial (7 items), physical (7 items), relationship with medical person-

nel (6 items), marital relationship (7 items), and sexual function (7 items) using a 0-4 Likert scale. Higher total scores indicated a poorer quality of life.

Complications: The incidence of complications during the study period was recorded.

Statistical methods

All data were analyzed using SPSS 23.0. Counted data [n (%)] were examined by χ^2 test. The measured data were indicated by $(\bar{x} \pm s)$. Independent samples t-test was performed for comparison between groups, and paired t-test was performed for intra-group comparison. ANOVA with post hoc F-test was performed for multi-point comparison. Graphpad Prism 8 was adopted for plotting graphs. $P < 0.05$ indicated statistical significance.

Results

Comparison of baseline data

The two groups showed no significant differences in mean age, tumor size, education level, level of differentiation, clinical staging or ASA classification ($P > 0.05$) (**Table 1**).

Stigma

There were no statistically significant differences in the scores of PDD, SUSMS, and SCS between the two groups before nursing ($P > 0.05$). After nursing, the scores of PDD, SUSMS, and SCS all decreased in both groups compared with those before nursing ($P < 0.05$). The scores of PDD, SUSMS, and SCS in the observation group were lower than those of the control group at the end of nursing ($P < 0.05$) (**Figure 1**).

Emotional state

No statistically significant difference was observed in HAMA scores between the two groups before nursing ($P > 0.05$). At the end of nursing, HAMA scores of the two groups decreased significantly ($P < 0.05$), and HAMA scores of the observation group were significantly lower than those of the control group ($P < 0.05$) (**Figure 2**).

Table 1. Comparison of baseline data ($\bar{x} \pm s$)/[n (%)]

Baseline data	Observation group (n = 35)	Control group (n = 34)	t/ χ^2	P
Age (years)	49.86 \pm 12.34	50.17 \pm 11.18	0.109	0.913
Time from diagnosis to surgery (months)	1.75 \pm 1.16	1.81 \pm 1.21	0.210	0.834
Tumor size	< 2 cm	16 (47.06)	0.164	0.921
	2-4 cm	13 (37.14)		
	\geq 5 cm	4 (11.76)		
Education level	High school and below	20 (57.14)	0.414	0.520
	College and above	15 (42.86)		
Degree of differentiation	High	15 (42.86)	0.240	0.887
	Medium	10 (28.57)		
	Low	10 (28.57)		
Clinical staging	Carcinoma in situ	8 (22.86)	0.130	0.937
	Early invasive carcinoma	16 (45.71)		
	Invasive carcinoma	11 (31.43)		
ASA classification	Class I	20 (57.14)	0.414	0.520
	Class II	15 (42.86)		

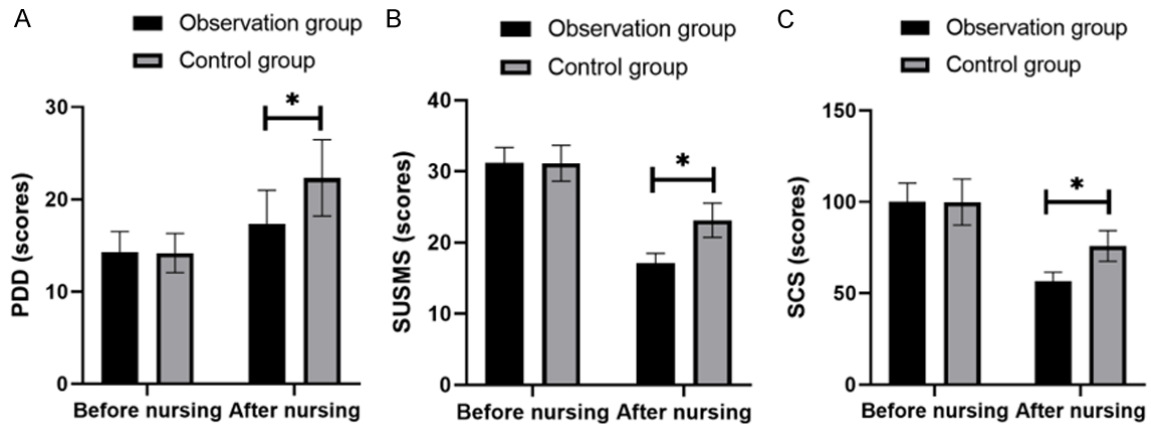


Figure 1. Stigma comparison. A. PDD; B. SUSMS; C. SCS. PDD, Perceived devaluation and discrimination scale; SUSMS, Substance use stigma mechanisms scale; SCS, Stigma coping scale. * $P < 0.05$ when compared to the control group.

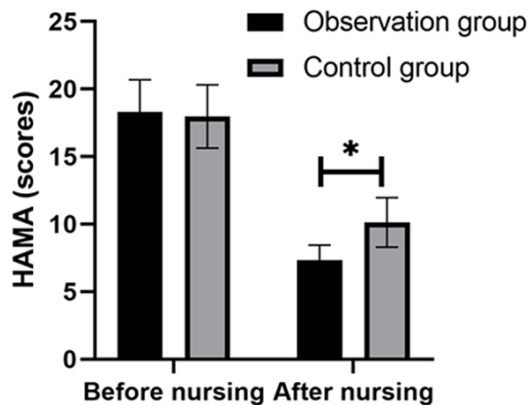


Figure 2. Emotional state. HAMA, Hamilton anxiety rating scale. * $P < 0.05$ when compared to the control group.

Psychological resilience

There was no significant difference in the mental strength and optimism scores between the two groups before nursing ($P > 0.05$). At the end of nursing, the mental strength and optimism scores of the observation group were significantly higher than those of the control group ($P < 0.05$) (Figure 3).

Sense of self-esteem

There was no significant difference in SES scores between the two groups before nursing ($P > 0.05$). At the end of nursing, the SES scores of the two groups were higher than

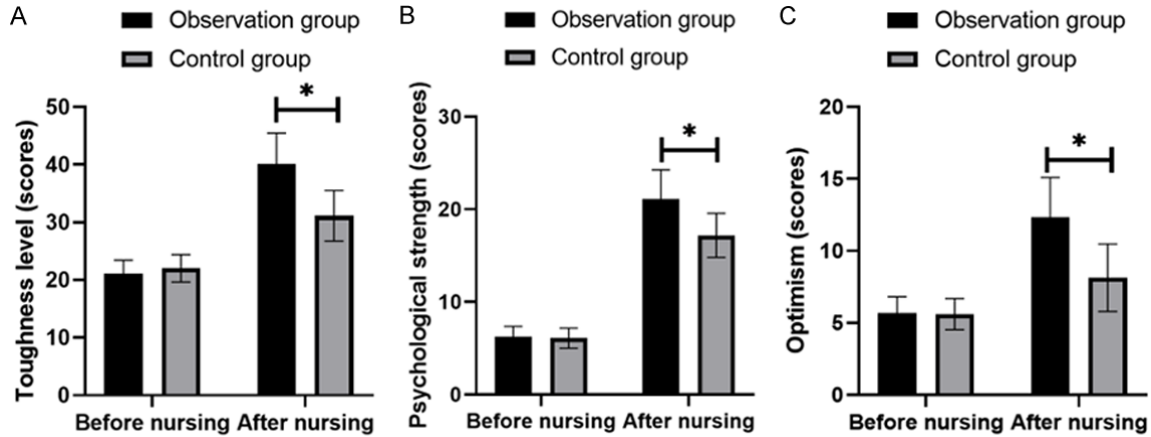


Figure 3. Psychological resilience. A. Toughness level; B. Psychological strength; C. Optimism. * $P < 0.05$ when compared to the control group.

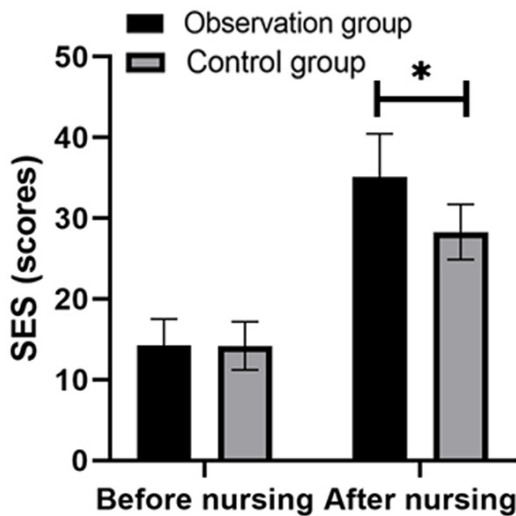


Figure 4. Self-esteem. SES, Rosenberg self-esteem scale. * $P < 0.05$ when compared to the control group.

those before nursing ($P < 0.05$), and the SES scores of the observation group were significantly higher than those of the control group ($P < 0.05$) (Figure 4).

Quality of recovery

There was no significant difference in psychosocial, physiological, relationship with medical personnel, marital relationship, and sexual function scores between the two groups before nursing ($P > 0.05$). At the end of nursing, the quality of recovery scores in the observation group were significantly lower than those of the control group ($P < 0.05$) (Figure 5).

Complications

The incidence of complication was 5.71% in observation group, lower than 23.53% in the control group ($P < 0.05$) (Table 2).

Discussion

RAM-based nursing highlights the assessment before nursing, including primary and secondary assessment, with primary assessment focusing on behavioral assessment, such as patients' physiological functions, self-concept, role functions and interdependent adaptation styles, and secondary assessment focusing on stimuli assessment, including internal and external stimuli [10, 11]. Stimuli here specifically refer to the patient's response to internal or external stimuli. At the end of the assessment, nursing diagnosis is made based on four aspects of the patient's responses and the degree of impact on survival, growth and fulfillment. The assessment of quality of life affected by breast loss and the stigma caused by postoperative changes were prioritized, followed by the side effects after chemotherapy. The nursing goals are to change the ineffective response of patients to surgery in aspects of physiological function, self-concept, role function and interdependence, and improve their adaptive response to surgery [12, 13]. The determination and implementation of nursing measures need to grasp the basic theory of adaptation model and achieve nursing goals by controlling various types of stimuli and wid-

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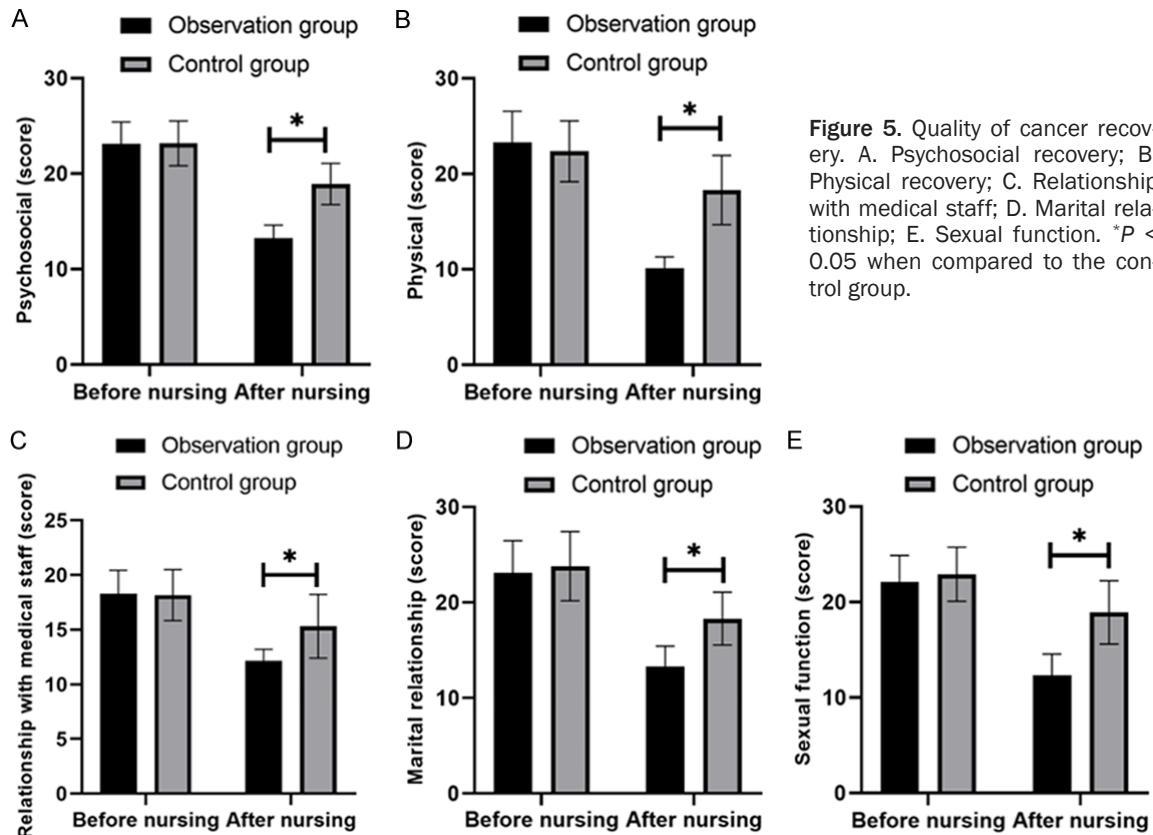


Figure 5. Quality of cancer recovery. A. Psychosocial recovery; B. Physical recovery; C. Relationship with medical staff; D. Marital relationship; E. Sexual function. * $P < 0.05$ when compared to the control group.

Table 2. Comparison of complication rates (n, %)

Group	Upper limb swelling	Flap effusion	Flap necrosis	Hemorrhage	Total incidence
Observation group (n = 35)	1 (2.86)	1 (2.86)	0 (0.00)	0 (0.00)	2 (5.71)
Control group (n = 34)	3 (8.82)	2 (5.88)	2 (5.88)	1 (2.94)	8 (23.53)
χ^2					4.417
P					0.036

ening the range of patient adaptation. The primary stimuli and intrinsic stimuli should be controlled [14, 15].

In this study, the observation group which underwent RAM-based nursing intervention exhibited lower stigma scores, lower HAMA scores and higher SES scores than the control group ($P < 0.05$). The results showed that RAM-based nursing interventions could significantly reduce patients' stigma, improve anxiety, and increase their levels of psychological resilience and self-esteem, helping patients cope with post-treatment changes more optimistically and adapt to their new lives more quickly. Cancer patients who received RAM nursing had significantly lower negative mood

scores than those who received routine nursing [16]. Another study also confirmed that nursing interventions under Roy adaptation theory for breast cancer patients significantly reduced patients' stigma compared to traditional nursing [17]. The implementation of RAM-based nursing targets controlling various types of stimuli faced by patients, so that they have positive adaptive responses in physiological function, self-concept, role function and interdependence, which aids recovery [18, 19].

In this study, the psychosocial recovery, physical recovery, relationship with medical workers, marital relationship and sexual function scores in the observation group at the end of nursing were significantly lower than those of the con-

trol group. Moreover, the incidence of complications in the observation group was 5.71%, which was lower than that in the control group ($P < 0.05$), suggesting that nursing intervention based on the RAM theory can improve the recovery quality of the patients, and a low incidence of complications can contribute to higher quality of patient recovery. The effects of the RAM in breast cancer nursing interventions also showed that the incidence of complications in the observation group was significantly lower than that of the control group ($P < 0.05$) [20]. The integration of RAM theory in nursing can provide strong theoretical guidance and a comprehensive assessment approach in the nursing for patients with breast cancer, ensuring that the interventions are sufficiently problem-targeted to achieve higher nursing efficiency [21, 22]. Moreover, nurses can also more accurately identify the most prominent problems and implement targeted interventions accordingly, thus providing more operationalized care [23]. RAM theory proposes that people should be regarded as individuals with physical, psychological and social integration, and patients' multiple social relationships are fully considered when evaluating their physical, psychological, and social aspects to determine nursing measures, so that the humanized characteristics of nursing are more prominent, which can better solicit patients' understanding and cooperation, thus ensuring the effectiveness of nursing [24, 25].

In conclusion, nursing diagnosis and implementation based on RAM theory can be used in nursing for female patients with breast cancer. This method can significantly reduce the stigma and negative emotions, improve psychological resilience, recovery quality and quality of life, and reduce complications. However, this is a retrospective study with a small number of subjects and limited indicators selected for efficacy evaluation, so further studies are encouraged.

Disclosure of conflict of interest

None.

Address correspondence to: Qi Jin, Department of Hepatobiliary Hernia Surgery, The First People's Hospital of Wenling, No. 333, Chuanan South Road,

Chengxi Street, Wenling City 317500, Zhejiang Province, China. Tel: +86-13566668672; E-mail: vjl8p@163.com

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