Int J Clin Exp Med 2020;13(6):4544-4552
www.ijcem.com /ISSN:1940-5901/IJCEM0110062

Original Article

Effect of PBL-based health education on lymphedema and cancer related fatigue and shoulder joint motion in patients underwent modified radical mastectomy

Li-Fang Zhang*, Jia Chen*, Chun Zhang, Jing Zhou, Wei Xiong

*Nursing Department, Huangshi Central Hospital, Edong Healthcare Group, Huangshi 435000, Hubei, China. *Equal contributors and co-first authors.*

Received February 29, 2020; Accepted April 9, 2020; Epub June 15, 2020; Published June 30, 2020

Abstract: Objective: This study aimed to analyze the effect of health education based on problem-based learning (PBL) in patients underwent modified radical mastectomy. Methods: The clinical data of 85 breast cancer patients admitted to our hospital from April 2018 to April 2019 were collected for retrospective analysis. The patients were divided into two groups randomly, with 42 patients in control group receiving basic health guidance and 43 patients in observation group receiving PBL-based health education, so as to compare the lymphedema situation, self-care agency, shoulder joint motion, quality of life and cancer related fatigue between the two groups. Results: (1) The rate of lymphedema grade I in observation group was higher than that of control group at discharge and the rate of lymphedema grade III in observation group was lower than that of control group at discharge ($P<0.05$). (2) The complete remission rate of lymphedema in observation group was higher than that of control group and the non-remission rate of observation group was lower than that of control group ($P<0.05$). (3) The ESCA scores for self-care agency in observation group were higher than those of control group at discharge and at 1 month and 3 months after discharge ($P<0.05$). (4) The scores for range of motion in observation group were higher than those of control group at discharge and at 1 month after discharge ($P<0.05$). (5) All the indicators for quality of life in observation group were higher than those of control group at 3 months after surgery ($P<0.05$). (6) The scores for cancer related fatigue in observation group were lower than those of control group at discharge and at 1 month and 3 months after discharge ($P<0.05$). Conclusion: The PBL-based health education could relieve the lymphedema and cancer related fatigue and effectively improve the shoulder joint motion, self-care agency and quality of life in patients underwent modified radical mastectomy, which has good application value.

Keywords: Breast cancer, modified radical mastectomy, problem-based learning, health education

Introduction

Breast cancer is a female malignant tumor originating from the breast epithelium, with a higher incidence in women. With the development of diagnostic techniques and the improvement of diagnosis rate in recent years, the early detection rate of breast cancer is increasing gradually [1]. The surgery-based comprehensive treatment is applicable to patients for early diagnosis of breast cancer, i.e. those in TNM Stage I and II. The 5-year survival rate is more than 80% for successful radical mastectomy [2]. Radical surgery was the core method in the past, but due to the change of current concept and the improvement of women's pursuit of beauty, the modified radical mastectomy is gradually applied in clinic [3].

The prompt surgical treatment can achieve satisfactory clinical effects, but due to the presence of postoperative complications and the change of secondary sex characteristics, patients have to receive chemoradiotherapy. Besides, the social function of patients will be damaged to some extent after surgery, and patients may suffer from physiological, mental and social dysfunction to varying degrees after surgery, which will affect the postoperative quality of life of patients to a certain extent [4, 5]. Therefore, the postoperative nursing intervention in patients receiving surgery should be emphasized to improve their postoperative quality of life. Sarosiek [6] found that the reasonable and proper health education could enhance patients' awareness of disease and strengthen their acceptability of appearance

changes, so as to develop the psychology of self-regulation and achieve the purpose of self-remodeling. Health education is a nursing intervention method widely used in clinical practice, but the application of health education in previous research was mostly based on the previous working experience of nurses and characteristics of clinical disease, etc., thus lacking sufficient pertinence and effectiveness [7, 8].

In this study, 85 patients admitted to our hospital from April 2018 to April 2019 were selected as objects of study and the health education based on problem-based learning was provided to the breast cancer patients after surgery. In clinical practice, the health education based on problem-based learning is a new attempt focusing on the health education of breast cancer patients after surgery.

Materials and methods

Materials

The clinical data of 85 breast cancer patients admitted to our hospital from April 2018 to April 2019 were collected for retrospective analysis and the patients were divided into two groups randomly. There were 42 patients in control group aged 40-57 years old, with an average age of 48.76±7.38 years, including 30 cases in Stage I and 12 cases in Stage II according to preoperative TNM staging of breast cancer. There were 43 patients in observation group aged 38-56 years old, with an average age of 47.43±6.81 years, including 28 cases in Stage I and 15 cases in Stage II. There was no statistical difference in age and disease staging between the two groups (P>0.05). (1) Inclusion criteria: Patients in conformity with the diagnostic criteria for breast cancer [9]; those under 60 years old; those with an educational background of junior high school or above; those with the ability to communicate normally and to use smart phone; and those who signed and provided informed consent form. Besides, this study was approved by Ethics Committee of Huangshi Central Hospital. (2) Exclusion criteria: Patients who were not suitable for surgical treatment due to breast cancer metastasis; those who could not finish the scheduled follow-up or subsequent therapy successfully; those with severe liver and kidney dysfunction; those complicated with heart-lung failure; and those who failed to participate in the health education smoothly due to the complication of cognitive disorder.

Methods

The patients of control group received basic health guidance. The 30-min health education lecture was provided to patients twice a week before discharge, including postoperative diet, early function rehabilitation, chemotherapy and radiotherapy and PICC and PORT catheter maintenance, *etc*. After discharge, the contents related to health education were provided to patients through WeChat every week to help them with self-management.

The patients of observation group received PBL-based health education. The detailed process is shown below: patients raised relevant questions actively, and nurses guided them to find information on their own, and divided them into different groups for free discussion, allowing them to try to solve the problems independently. A representative of each group was selected to express opinions, after which nurses summarized the opinions of each group, pointed out the advantages and disadvantages and provided guidance on the disadvantages. The detailed process is shown below: nurses guided patients to raise questions according to their existing problems and health education manuals, and instructed patients to seek and collect information through books, internet, health education prescription, posters and brochures, *etc*. after problems were raised and determined. Then, with the encouragement of nurses, patients made up a communication group consisting of 3-5 patients to share the information obtained by themselves with each other and solve the problems together. Patients were informed to consult nurses at any moment throughout the procedure, but nurses did not provide answers directly. On the following day, nurses organized patients to share the process of solving problems. In each group, one patient was selected as the representative to answer questions and share her own feelings. Finally, nurses summarized the answers of patients and helped them solve the problems that were not solved smoothly or provided guidance on the deficiencies in their answers. It was conducted twice a week, with each time lasting for more than half an hour. After discharge, nurses built a WeChat group to guide patients to pro-

pose, solve and discuss problems in the WeChat group. Finally, patients summarized the answers and informed nurses. Then, nurses summarized and answered questions. It was conducted once a week, with each time lasting for more than half an hour.

Observation targets

Lymphedema: Measurement of edema degree: The perimeters 10 cm above and 5 cm below the olecranon of elbow were respectively measured in breast cancer patients. If the difference between the perimeter of upper limb on affected side and that of upper limb on unaffected side was less than 3 cm, it was considered as mild edema in Grade I. If the difference between the perimeter of upper limb on affected side and that of upper limb on unaffected side was 3-5 cm, it was considered as moderate edema in Grade II. If the difference between the perimeter of upper limb on affected side and that of upper limb on unaffected side was more than 5 cm, it was considered as severe edema in Grade III. Judgement on remission effect of lymphedema: Complete remission: The edema on affected side was completely eliminated and the finger and arm functions returned to normal. Partial remission: The edema on affected side was basically eliminated except for the forearm edema of lower limb and the finger and arm functions basically returned to normal. Non-remission: There was no significant change in the affected side of lymphedema and the finger and arm functions were obviously abnormal.

Self-care agency: The self-care agency of patients was evaluated through Exercise of Self-Care Agency Scale (ESCA) [10] 1 week after surgery, at discharge and 1 month and 3 months after discharge, including 43 questions based on 4 indicators, *i.e.* self-concept, health knowledge level, self-care skills and sense of responsibility in self-care. There were a total of 172 scores that were divided into Grades 1-4. The higher scores indicate the better self-care agency.

Shoulder joint motion: The shoulder joint motion was evaluated through Evaluation Scale for Shoulder Joint Function [11] 1 week after surgery, at discharge and 1 month and 3 months after discharge, including local joint morphology (5 scores), activity of daily living (35 scores), muscle force (5 scores), range of motion (25 scores) and pain (30 scores), with a total of 100 scores. The higher scores indicate the stronger shoulder joint function.

Quality of life: The FACT-B Chinese version of Scale for Specific Quality of Life of Breast Cancer [12] was used to evaluate the quality of life 1 week after surgery and 3 months after discharge, including physical well-being (7 indicators), family/social well-being (10 indicators), emotional well-being (6 indicators), functional well-being (7 indicators) and additional concerns (9 indicators). There were 5 grades in total, with 0-4 scores respectively representing for not at all, a little bit, somewhat, quite a bit and very much. The scores of above five aspects were 28, 40, 24, 28 and 36 respectively. The higher scores indicate the better quality of life.

Cancer related fatigue: The Piper Cancer Fatigue Scale [13] was used to evaluate the cancer related fatigue 1 week after surgery, at discharge and 1 month and 3 months after discharge, including feeling (5 items), emotion (5 items), cognition (6 items) and behavior (6 items). 0-10 scores were set for these questions, except for the former 2 ones, of which 0 score represents for none, 1-3 scores for mild, 4-6 scores for moderate and 7-10 scores for severe. The higher scores indicate the severer cancer related fatigue.

Statistical analysis

SPSS22.0 was used for statistical analysis. The measurement data were represented by mean ± standard deviation (SD). Independent-samples *t* test was used for the comparison of results between groups and within groups. The enumeration data were represented by [n (%)]. X^2 test was used for the comparison of results between groups and within groups. $P<0.05$ means that the difference is statistically significant.

Results

Comparison of general data between the two groups

There was no significant difference in terms of age, average height, average weight, proportion of Stage I and II in preoperative TNM staging of breast cancer, proportion of married and

Table 1. Comparison of general data between the two groups ($\bar{x} \pm sd$)/[n (%)]

Data		Observation group (n=43)	Control group (n=42)	t/X^2	*P*
Age (years old)		47.43±6.81	48.76±7.38	0.864	0.390
Height (cm)		162.38±10.08	163.85±11.46	0.628	0.532
Weight (kg)		65.42±3.29	66.84±3.51	1.925	0.058
TNM staging	Stage I	28 (65.12)	30 (71.43)	0.391	0.532
	Stage II	15 (44.88)	12 (28.57)		
Marital status	Married	34 (79.07)	32 (76.19)	0.102	0.750
	Others	9 (20.93)	10 (23.81)		
Educational background	Junior high school	12 (27.91)	11 (26.19)	0.526	0.317
	Senior high school	21 (48.84)	22 (52.38)		
	Junior college or above	10 (23.26)	9 (21.43)		

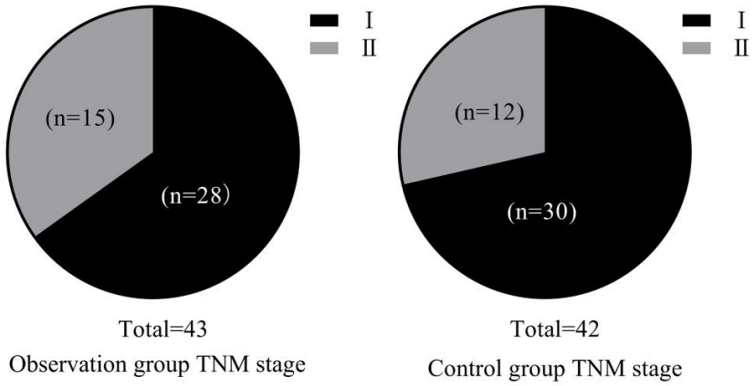

Figure 1. Comparison on TNM staging of breast cancer between the two groups. There was little difference in the number of patients in TNM Stage I and II between two groups (*P*>0.05).

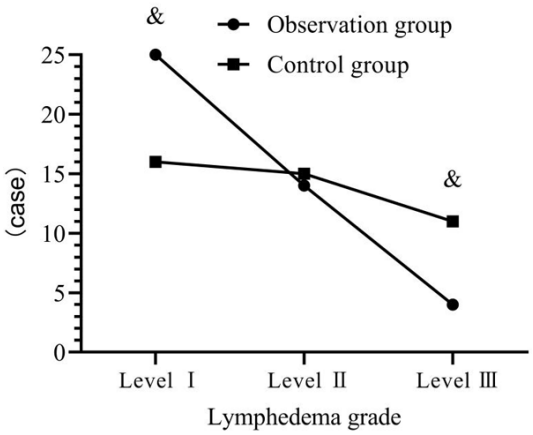

Figure 2. Comparison of lymphedema grade between the two groups. The number of patients with lymphedema grade I and III in observation group was much higher than that in control group (*P*<0.05). There was little difference in the number of patients with lymphedema grade III between the two groups (*P*>0.05). & means *P*<0.05 when the number of patients in the same stage was compared between two groups.

other patients in aspect of marital status and proportion of patients with junior high school, senior high school and junior college or above in aspect of educational background between the two groups (*P*>0.05) (**Table 1** and **Figure 1**).

Comparison of lymphedema grade at discharge between the two groups

At discharge, there were 25 cases in observation group and 16 cases in control group in lymphedema grade I, 14 cases in observation group and 15 cases in control group in lymphedema grade II, and 4 cases in observation group and 11 cases in control group in lymphedema grade III. The proportion of patients with lymphedema grade I in observation group was much higher than that in control group and the proportion of patients with lymphedema grade III in observation group was much lower than that in control group, which showed statistical difference (*P*<0.05). There was no statistical difference in the proportion of patients with lymphedema grade II between the two groups (*P*>0.05) (**Figure 2**).

Comparison on remission effect of lymphedema at discharge between the two groups

At discharge, 62.79% of lymphedema patients were in complete remission in observation group and 40.48% in control group; 30.23% were in partial remission in observation group

Table 2. Comparison on remission effect of lymphedema at discharge between the two groups [n (%)]

Group	Complete remission	Partial remission	Non-remission
Observation group (n=43)	27 (62.79)	13 (30.23)	3 (6.98)
Control group (n=42)	17 (40.48)	14 (33.33)	11 (26.19)
X^2	4.237	0.094	5.701
P	0.040	0.759	0.017

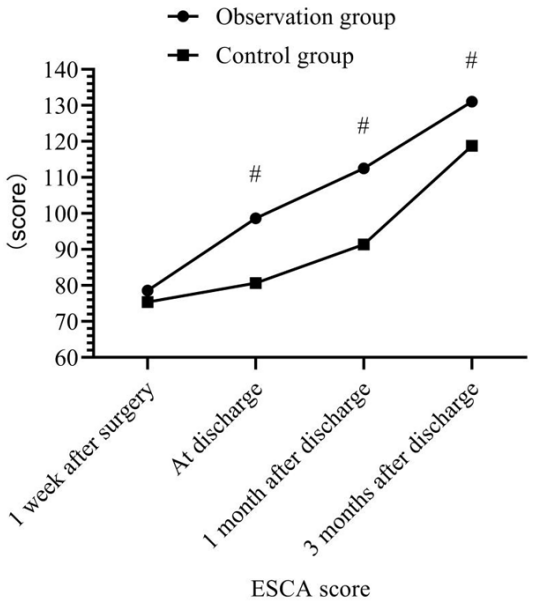

Figure 3. Comparison of ESCA scores for self-care agency between the two groups. There was little difference in ESCA scores for self-care agency of the two groups 1 week after surgery (*P*>0.05). The ESCA scores for self-care agency of observation group were much higher than those of control group at discharge and at 1 month and 3 months after discharge (*P*<0.05). # means *P*<0.05 when ESCA scores of two groups were compared at the same time.

and 33.33% in control group; and 6.98% were in non-remission in observation group and 26.19% in control group. The complete remission rate of lymphedema in observation group was much higher than that of in control group and the non-remission rate of observation group was much lower than that of control group (*P*<0.05). There was no significant difference in partial remission rate between the two groups (*P*>0.05) (**Table 2**).

Comparison of self-care agency between the two groups

The ESCA scores for self-care agency were 78.59±10.42 in observation group and 75.34±10.46 in control group 1 week after surgery, 98.63±12.38 in observation group and 80.64±10.29 in control group at discharge, 112.52±15.71 in observation group and 91.36±13.45 in control group 1 month after discharge, and 131.06±17.84 in observation group and 118.75±14.39 in control group 3 months after discharge. There was little difference in ESCA scores for self-care agency between the two groups 1 week after surgery (*P*>0.05). The ESCA scores for self-care agency of observation group were much higher than those of control group at discharge and at 1 month and 3 months after discharge (*P*<0.05) (**Figure 3**).

Comparison on shoulder joint motion between the two groups

There was little difference in scores for shoulder joint function between the two groups 1 week after surgery (*P*>0.05). The scores for shoulder joint function at discharge and 1 month after discharge were much higher than 1 week after surgery in both groups (*P*<0.05). The scores for shoulder joint function of observation group were much higher than those of control group at discharge and 1 month after discharge (*P*<0.05) (**Table 3**).

Comparison on quality of life between the two groups

At the time of 1 week after surgery, the scores for physical well-being were 17.52±2.26 in observation group and 17.63±2.61 in control group; those for family/social well-being were 27.65±3.32 in observation group and 26.78±3.17 in control group; those for emotional well-being were 12.35±3.66 in observation group and 13.08±3.75 in control group; those for functional well-being were 18.54±2.45 in observation group and 19.03±2.34 in control group; and those for additional concerns were 22.31±4.46 in observation group and 23.58±4.72 in control group.

At the time of 3 months after surgery, the scores for physical well-being were 23.34±2.96 in observation group and 19.52±2.46 in control group; those for family/social well-being were 34.13±3.36 in observation group and 30.46±2.78 in control group; those for emotional well-being were 20.16±1.85 in observa-

Table 3. Comparison on shoulder joint motion between the two groups ($\bar{x}$ ± sd, scores)

Group	Number of cases	1 week after surgery	At discharge	1 month after discharge
Observation group	43	51.62±4.49	63.38±6.27*	71.46±7.54*,&
Control group	42	50.34±4.84	56.34±5.83*	64.75±6.79*,&
t		1.264	5.358	4.308
P		0.210	0.000	0.000

Note: *P<0.05 in comparison with that 1 week after surgery in group; and &P<0.05 in comparison with that at discharge.

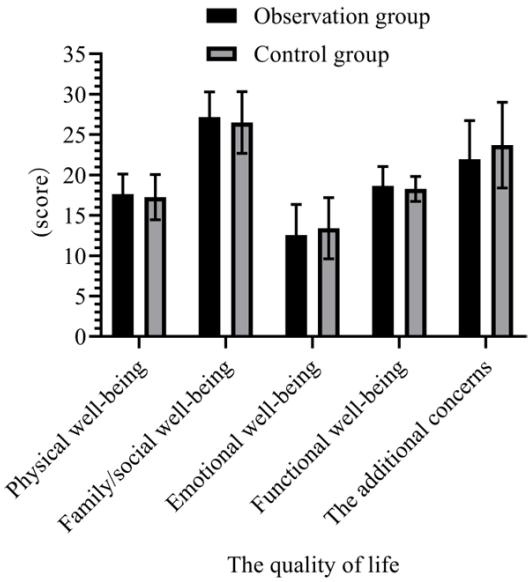

Figure 4. Comparison on quality of life 1 week after surgery between the two groups. There was little difference in indicators for physical well-being, family/social well-being, emotional well-being, functional well-being and additional concerns of the two groups 1 week after surgery (P>0.05).

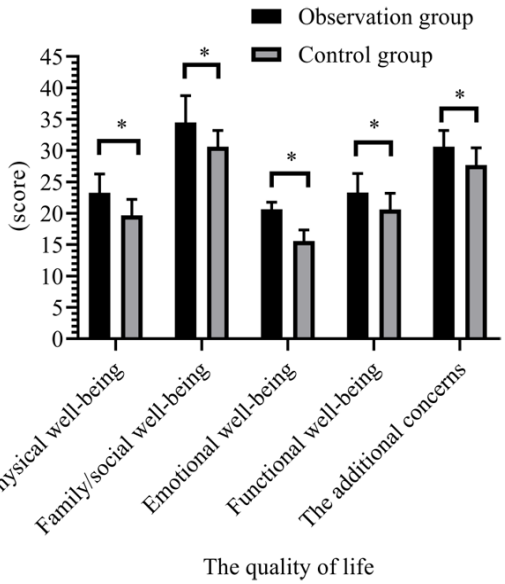

Figure 5. Comparison on quality of life 3 months after surgery between the two groups. The indicators for physical well-being, family/social well-being, emotional well-being, functional well-being and additional concerns of observation group were much higher than those of control group 3 months after surgery (P<0.05). * means P<0.05 when the scores for indicators of the same aspect were compared between the two groups.

tion group and 15.67±1.37 in control group; those for functional well-being were 23.23±2.25 in observation group and 20.86±2.41 in control group; and those for additional concerns were 30.16±2.89 in observation group and 27.61±2.37 in control group.

There was no statistical difference in all indicators for quality of life between the two groups 1 week after surgery (P>0.05). The indicators of observation group were much higher than those of control group 3 months after surgery (P<0.05) (**Figures 4**, **5**).

Comparison of cancer related fatigue between the two groups

There was little difference in scores for cancer related fatigue 1 week after surgery (P>0.05). The scores for cancer related fatigue at discharge and at 1 month and 3 months after discharge were lower than 1 week after surgery in both groups (P<0.05). The scores for cancer related fatigue of observation group were much lower than those of control group at discharge and at 1 month and 3 months after discharge (P<0.05) (**Table 4**).

Discussion

The modified radical mastectomy is widely applied to breast cancer in current clinical practice, mainly including the following two implementation methods. One method is to remove the pectoralis minor muscle, reserve the pectoralis major muscle and clean up the axillary lymph nodes of Group I, II and III; and the other

Table 4. Comparison of cancer related fatigue between the two groups ($\bar{x}$ ± sd, scores)

Group	Number of cases	1 week after surgery	At discharge	1 month after discharge	3 months after discharge
Observation group	43	7.21±1.63	5.28±1.35*	3.86±0.84*	2.79±0.51*,#
Control group	42	7.25±1.68	6.45±1.42*	4.73±0.89*	3.55±0.56*,#
t		0.111	3.894	4.636	6.545
P		0.912	0.000	0.000	0.000

Note: *P<0.05 in comparison with that 1 week after surgery in group; and #P<0.05 in comparison with that 1 month after discharge.

is to reserve the pectoralis minor muscle and pectoralis major muscle, without cleaning up axillary lymph nodes [14]. It was verified in clinical practice that the modified radical mastectomy had similar effect and similar survival rate with the traditional radical mastectomy, but the former could reserve the pectoralis of patients, reduce the surgical-related complications, ease the surgical difficulty and more importantly, enhance the good-looking appearance [15]. The modified radical mastectomy could achieve satisfactory results, but it has been found in clinical practice that the mental, physiological and social functions of patients are affected seriously after surgery.

Considering the reasons for all aspects affected after surgery, the physiological aspect refers to the occurrence of inevitable postoperative complications, which will influence the subjective feeling of patients and further make patients afraid of postoperative recovery, thus affecting the prognosis consequently [16]. In addition, patients need to receive the postoperative adjuvant radiotherapy, but the radiotherapy with obvious side effects will affect their physiological status. The mental aspect refers to the appearance of patients that may change to a certain extent after their pectoralis major muscle or pectoralis minor muscle is removed partially, which makes them lose female secondary sex characteristics, reduces their self-perception and affects their self-esteem. As a result, some patients may become anxious and depressed [17]. The social aspect is that the individual representation is not applicable to social expectations due to the change of appearance after surgery. After the decline of social adaptability in patients, they may have the phenomenon of social withdrawal and some other negative states such as inferiority, *etc*., affecting their social function [18].

Hence, the postoperative nursing intervention in patients with modified radical mastectomy should be emphasized to enhance their self-care agency, ensure the smooth postoperative recovery and effectively improve the quality of life. Health education is an indispensable part of the implementation of nursing intervention at present and has gradually become an important indicator to inspect nursing quality as a vital part of overall nursing [19]. With the change of nursing concepts and the improvement of patients' requirements for nursing services, health education has played an increasingly prominent role in nursing implementation. In this study, the health education under the guidance of PBL (problem-based learning) was implemented mainly to apply a health education through teaching model by facing problems and creating a problem-based environment based on the problems and patient-centered [20]. PBL-based health education can help patients obtain an individualized and targeted health education so that they have stronger sense of participation, higher enthusiasm and higher self-management ability [21]. During the implementation of health education, nurses should lay emphasis on the creation of a harmonious learning environment so that patients can solve problems, change self-management behaviors and improve the quality of life through their own efforts [22].

In this study, observation group received PBL-based health education and the results showed that the proportion of lymphedema grade I in observation group was much higher than that in control group at discharge and the proportion of lymphedema grade III in observation group was much lower than that in control group at discharge (P<0.05). Moreover, the complete remission rate of lymphedema in observation group was much higher than that of control group and the non-remission rate of

observation group was much lower than that of control group (P<0.05), which indicated that PBL-based health education could relieve the lymphedema of patients with breast cancer more obviously and rapidly. The main reason was that the targeted health education was provided for observation group based on the specific problem of lymphedema after surgery so as to guide patients to take exercise and correctly wear the elastic sleeve and help them with body massage regularly, which was better for the improvement of lymphedema. In this study, the ESCA scores for self-care agency of observation group were much higher than those of control group at discharge and at 1 month and 3 months after discharge (P<0.05); the scores for range of motion of observation group were much higher than those of control group at discharge and 1 month after discharge (P<0.05); and the scores for cancer related fatigue of observation group were much lower than those of control group at discharge and at 1 month and 3 months after discharge (P<0.05), which indicated that PBL-based health education could increase the self-care agency of patients, obviously reduce the degree of cancer related fatigue and greatly improve the range of motion. It was analyzed and found that the health education in observation group mainly aimed to guide patients to take shoulder rehabilitation training. Appropriate exercise can guarantee the local blood circulation of shoulder joint, effectively relax shoulder muscles and significantly improve the blood supply of affected limb, so that the shoulder joint function of patients can be recovered more obviously. Similar studies have also verified that PBL-based health education could significantly improve the shoulder joint function of patients.

With regard to quality of life, the scores for physical well-being, family/social well-being, emotional well-being, functional well-being and additional concerns of observation group were higher than those of control group 3 months after surgery (P<0.05), which indicated that PBL-based health education significantly improved the quality of life of patients. Menen et al. [23] found that most breast cancer patients had a sense of shame and different degrees of psychological defect, which affected their quality of life consequently. Besides, Weitzel [24] pointed out that the breast cancer patients, with an inferiority complex, were worried about their family life and marriage life and reluctant to communicate with others after surgery, which may affect the recovery of their quality of life. The PBL-based health education can be used to guide patients to take physical exercise correctly and control the exercise intensity properly. In the exchange conference for breast cancer patients, patients can communicate with each other to form a favorable social support, enhance their confidence in life and society, and recover their self-worth, so as to effectively improve the quality of real life [25].

In conclusion, the application of PBL-based health education to breast cancer patients underwent modified radical mastectomy could relieve their lymphedema and cancer related fatigue, and effectively improve their shoulder joint motion, self-care agency and quality of life, which has good application value. However, in this retrospective study, the objects of study could not be selected in advance. Besides, the analysis of the research results is not comprehensive and the results are not representative enough due to fewer objects of study involved. Therefore, the future studies should focus on the intensive study with larger sample size and multiple aspects, and lay emphasis on the prospective study so as to obtain more scientific and representative conclusions and provide more guidance for the treatment of patients.

Disclosure of conflict of interest

None.

Address correspondence to: Wei Xiong, Nursing Department, Huangshi Central Hospital, 7th Floor, Building 7, No. 141, Tianjin Road, Huangshi 435000, Hubei, China. Tel: +86-0714-6261572; E-mail: iv7wdp@163.com

References

[1] Anastasiadi Z, Lianos GD, Ignatiadou E, Harissis HV and Mitsis M. Breast cancer in young women: an overview. Updates Surg 2017; 69: 313-317.

[2] Bonilla JM, Tabanera MT and Mendoza LR. Breast cancer in the 21st century: from early detection to new therapies. Radiologia 2017; 59: 368-379.

[3] Odle TG. Precision medicine in breast cancer. Radiol Technol 2017; 88: 401m-421m.

[4] Libson S and Lippman M. A review of clinical aspects of breast cancer. Int Rev Psychiatry 2014; 26: 4-15.

[5] M Braden A, V Stankowski R, M Engel J and A Onitilo A. Breast cancer biomarkers: risk assessment, diagnosis, prognosis, prediction of treatment efficacy and toxicity, and recurrence. Curr Pharm Des 2014; 20: 4879-4898.
[6] Sarosiek T. Systemic treatment of early breast cancer-current state of knowledge after the conference St Gallen 2017. Pol Merkur Lekarski 2017; 43: 232-236.
[7] Colditz GA and Bohlke K. Priorities for the primary prevention of breast cancer. CA Cancer J Clin 2014; 64: 186-194.
[8] Schmidt T, Van Mackelenbergh M, Wesch D and Mundhenke C. Physical activity influences the immune system of breast cancer patients. J Cancer Res Ther 2017; 13: 392.
[9] Woolston C. Breast cancer. Nature 2015; 527: S101.
[10] Guo L, Zauszniewski JA, Ding X, Zhang L, Gao H, Guo Q and Liu K. The appraisal of self-care agency scale-revised (ASAS-R): reliability and validity among older chinese people. West J Nurs Res 2017; 39: 1459-1476.
[11] Wu W, Lee PV, Bryant AL, Galea M and Ackland DC. Subject-specific musculoskeletal modeling in the evaluation of shoulder muscle and joint function. J Biomech 2016; 49: 3626-3634.
[12] Murtezani A, Ibraimi Z, Bakalli A, Krasniqi S, Disha ED and Kurtishi I. The effect of aerobic exercise on quality of life among breast cancer survivors: a randomized controlled trial. J Cancer Res Ther 2014; 10: 658.
[13] Cantarero-Villanueva I, Fernández-Lao C, Díaz-Rodríguez L, Cuesta-Vargas AI, Fernández-de-las-Peñas C, Piper BF and Arroyo-Morales M. The piper fatigue scale-revised: translation and psychometric evaluation in Spanish-speaking breast cancer survivors. Qual Life Res 2014; 23: 271-276.
[14] DeSantis C, Siegel R, Bandi P and Jemal A. Breast cancer statistics, 2011. CA Cancer J Clin 2011; 61: 408-418.
[15] Al-Hilli Z and Boughey JC. The timing of breast and axillary surgery after neoadjuvant chemotherapy for breast cancer. Chin Clin Oncol 2016; 5: 37.
[16] Peairs KS, Choi Y, Stewart RW and Sateia HF. Screening for breast cancer. Semin Oncol 2017; 44: 60-72.
[17] Wörmann B. Breast cancer: basics, screening, diagnostics and treatment. Med Monatsschr Pharm 2017; 40: 55-64.
[18] Adrada BE, Candelaria R and Rauch GM. MRI for the staging and evaluation of response to therapy in breast cancer. Top Magn Reson Imaging 2017; 26: 211-218.
[19] Maughan KL, Lutterbie MA and Ham PS. Treatment of breast cancer. Am Fam Physician 2010; 81: 1339-1346.
[20] Krockenberger M, Wöckel A and Kreienberg R. Good prognosis! Breast cancer update 2016. MMW Fortschr Med 2016; 158: 58.
[21] Pearce L. Breast cancer. Nurs Stand 2016; 30: 15.
[22] Veys I. Follow-up of breast cancer patients by general practioner. Rev Med Brux 2018; 39: 280-286.
[23] Menen RS and Hunt KK. Considerations for the treatment of young patients with breast cancer. Breast J 2016; 22: 667-672.
[24] Weitzel JN. The genetics of breast cancer: what the surgical oncologist needs to know. Surg Oncol Clin N Am 2015; 24: 705-732.
[25] Jatoi I and Benson JR. Management of women with a hereditary predisposition for breast cancer. Future Oncol 2016; 12: 2277-2288.