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Personalised graded psychological intervention on negative emotion and quality of life in patients with breast cancer

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Abstract.

BACKGROUND: Psychological factors are a risk factor for the incidence of breast cancer and have a significant impact on patient prognosis.

OBJECTIVE: The present study aims to investigate the effects of personalised graded psychological intervention on negative emotion and quality of life in patients with breast cancer.

METHODS: A total of 200 patients with breast cancer were randomly divided into two groups: an experimental group ($n = 100$) and control group ($n = 100$). Both groups received routine nursing care. The experimental group received personalised graded psychological intervention care, and the control group received routine nursing measures. After 2 months of standard treatment, the patients' quality of life and negative emotions were evaluated using the self-rating depression scale (SDS), self-rating anxiety scale (SAS), social support rating scale (SSRS) and quality of life measurement scale (FACT-B) scoring criteria.

RESULTS: There were no significant differences in the general data between the two groups ($p > 0.05$). Furthermore, there were no significant differences in the SDS, SAS, SSRS and FACT-B scores between the two groups before personalised graded psychological intervention ($p > 0.05$). After the intervention, the experimental group exhibited an improved nursing effect compared with the control group. The SDS and SAS scores were lower in the experimental group than in the control group ($p < 0.05$); after the intervention, the SDS and SAS scores were significantly lower in the experimental group than in the control group ($p < 0.05$). The SSRS and FACT-B scores were higher in the experimental group than in the control group ($p < 0.05$), and the experimental group's post-intervention SSRS and FACT-B scores were significantly higher than before the intervention ($p < 0.05$).

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CONCLUSIONS: The use of personalised graded psychological intervention for the nursing of patients with breast cancer in clinical practice can significantly reduce patients' negative emotions as well as improve positive emotions and quality of life; thus, this method can be popularised in the nursing process.

Keywords: Personalised grading, breast cancer, psychological intervention, negative emotions, quality of life

1. Introduction

Breast cancer is the most prevalent malignancy in women [1]; it most often refers to a malignant tumour formed by uncontrolled proliferation of breast epithelial tissue under the action of a variety of carcinogenic factors. Patients commonly present with breast lumps, nipple and areola changes, nipple discharge and other symptoms, and the malignancy is accompanied by a very high disability rate and mortality rate, which bring great pain to patients and their families [2,3,4]. In recent years, the academic community and the majority of women have been paying increasing attention to the problem of breast cancer; also, scholars engaged in related research are continuously proposing new programmes for the disease's prevention and treatment [5,6]. Breast cancer surgery can effectively remove the lesion, relieve symptoms and improve the patient's condition. Postoperative chemoradiotherapy can effectively prevent the recurrence of tumours and the possibility of residual tumours as well as improve patient recovery; however, chemoradiotherapy can easily cause skin injury, nausea, vomiting and other adverse reactions, affecting the patient's prognosis and endangering their long-term physical and mental health [7,8,9]. Therefore, effective interventions need to be performed promptly in patients undergoing postoperative radiotherapy for breast cancer.

In recent years, psychological nursing has become a hot topic in the nursing research area, and clinical scholars have gradually recognised the overall impact of psychological intervention on disease nursing [10]. Studies show that psychological factors are a risk factor for the incidence of breast cancer and that a good psychological status after surgery is also a prerequisite for a favourable prognosis [11,12]. Psychological factors have a significant impact on patient prognosis, and negative emotions greatly reduce patient quality of life; furthermore, these factors affect sleep quality and oxidative stress response, for example, increasing the risk of postoperative complications to a certain extent. Therefore, it is necessary to conduct psychological nursing intervention after breast cancer surgery [13,14,15]. However, clinical psychological nursing is poorly targeted and applied; thus, it can only achieve the effect of counselling regarding the patient's mood and cannot improve the patient' s existing adverse mood and psychological barriers from the source. In this study, the actual psychological status of patients with breast cancer was used as a grouping basis to implement psychological intervention at different levels to assess the effect of personalised graded psychological intervention on the negative emotions and quality of life of patients with breast cancer.

2. Study participants and methods

2.1. Study participants

A total of 200 patients with breast cancer admitted to the Affiliated Hospital of Hebei Engineering University were selected and divided into two groups ($n = 100$ each) using the double-blind randomisation principle. The present study was approved by the medical ethics committee of our hospital and complied with the human ethics requirements in the Declaration of Helsinki. All patients were informed about the study and signed an informed consent form.

2.2. Inclusion and exclusion criteria

Inclusion criteria: patients (1) who were women; (2) who had undergone radical mastectomy; (3) had a first diagnosis obtained at our hospital; and (4) who gave their informed consent to participate in the study.

Exclusion criteria: patients (1) with recurrent breast cancer; (2) whose condition was combined with other malignant tumours; (3) with severe mental illness and/or difficulty communicating normally and cooperating with the treatment; (4) with other long-term chronic diseases; and (5) whose condition was combined with heart, liver or kidney dysfunction.

2.3. Nursing methods

2.3.1. Control group

Routine nursing: (1) simple oral education for patients; (2) clinical rational drug use guidance; (3) dietary guidance; (4) attention to emotional changes in patients; and (5) simple psychological counselling.

2.3.2. Experimental group

Personalised graded psychological intervention nursing: routine nursing combined with personalised graded psychological intervention nursing.

First, a themed guided nursing group comprising 1–2 senior attending physicians specialising in breast cancer, 1–2 psychologists, 1 head nurse and 3–4 nursing staff in our hospital was established. The group members consulted domestic and foreign authoritative literature and combined themed guided nursing knowledge with the specific condition and nursing needs of the patients, thus developing a themed guided nursing plan. Second, postoperative health education was performed. One-on-one face-to-face communication was conducted to enable patients to comprehensively understand the health knowledge needed after breast cancer surgery. Third, psychological status grouping was determined. With the help of psychological status evaluation tools, the postoperative psychological status of patients was assessed, and the psychological status of patients was comprehensively grasped; the patients were then divided into groups according to their psychological evaluation scores.

Grouping method: (1) grade I: positive psychological state, no obvious negative emotion and self-rating depression scale (SDS) and self-rating anxiety scale (SAS) scores of $\leqslant$ 20 points; (2) grade II: general psychological state, obvious negative emotions and SAS and SDS scores of 21–50 points; (3) grade III, poor psychological state, serious negative emotions and SAS and SDS scores of $\geqslant$ 51 points.

Fourth, graded psychological care was implemented in the groups. Grade I: a. The nursing staff's lifting behaviour was naturally generous, full energy was given to daily care and the staff had a positive subconscious emotional impact on the patients. b. Before the implementation of various nursing measures, the staff made eye contact with the patient and smiled. Before the nursing operation, the staff could lightly pat the patient's shoulder or the back of the hand or use other means of encouragement. c. The staff created a clean inpatient environment for the patients and asked family members and visitors to keep quiet. d. The staff paid attention to the patient's daily speech and behaviour. (e.g. for signs of psychological problems) and communicated with patients in a timely manner. e. The staff listened patiently during communication with the patient, providing encouragement and empathy in the process. Grade II nursing was implemented on the basis of grade I nursing. a. The staff assigned the patients to cognitive and behavioural training groups (controlled at 4–6 patients per group), organised 1–2 group activities per week and established beliefs about actively facing the disease with team empathy. b. The staff organised the patients to speak in turn during team activities, asked them to fully express their thoughts and cognition of

Table 1
The general data of two groups

Item	Control group	Experimental group
Age (year)	38.92 ± 8.27	38.26 ± 9.07
Stage I	33 (33%)	27 (27%)
Stage II	51 (51%)	52 (52%)
Stage III	16 (16%)	21 (21%)

the disease, evaluated the patients after completion of their speeches and finally summarised all speeches given by the organisers. c. The staff instructed the team members to perform breathing relaxation training, including abdominal breathing and progressive muscle relaxation intervention. d. The staff actively sought the cooperation of family members and guided them to overcome difficulties with the patients through the strength of affection. Grade III nursing was given on the basis of grade I and grade II nursing. A consultation with a psychologist was sought, and psychological intervention was implemented according to the psychologist's psychological intervention prescription.

2.4. Outcome measures

(1) The SAS and SDS were used to evaluate the patient's psychological status. The SAS limit score was 50 points, and the SDS limit score was 53 points.

(2) The patients' quality of life was assessed using a quality-of-life measurement scale (FACT-B) and social support rating scale (SSRS) scores. Generally, a total SSRS score of < 20 warrants relatively low social support, 20–30 warrants general social support and 30–40 warrants satisfactory social support.

2.5. Statistical analysis

The obtained data were analysed using SPSS software. The measurement data were expressed as $(x \pm s)$, and a t-test was performed. The enumeration data were expressed as n (%), and the χ^2 test was performed. A p value of < 0.05 indicated a statistically significant difference.

3. Results

3.1. Comparison of general data

A total of 200 patients with breast cancer were included in the present study and divided into two groups: the experimental group ($n = 100$) and control group ($n = 100$). Experimental group: the patients were aged 28–57 years (mean age: 38.26 ± 9.07 years) and had a tumour, node, metastasis (TNM) stage of I in 27 cases, II in 52 cases and III in 21 cases. Control group: the patients were aged 26–57 years (mean age: 38.92 ± 8.27 years) and had a TNM stage of I in 33 cases, II in 51 cases and III in 16 cases. There was no significant difference in general data between the two groups ($p > 0.05$; Table 1). The data can be used for comparison in subsequent studies.

3.2. Analysis of the self-rating depression scale scores in the two groups

The SDS was used to self-assess depression in the two groups, and the depression evaluation scores before and after nursing were recorded in the two groups. There was no significant difference in the SDS score between the two groups before nursing ($p > 0.05$). After personalised graded psychological intervention nursing, the SDS score was significantly lower in the experimental group than in the control group ($p < 0.05$; Table 2).

Table 2
Comparison of SDS score between the two groups

Item	Control group	Experimental group	t value	p value
Pre-intervention	34.30 ± 8.51	35.28 ± 8.60	0.189	0.851
Post-intervention	24.15 ± 5.54	16.87 ± 4.10	13.162	< 0.0001

Table 3
Comparison of SAS score between the two groups

Item	Control group	Experimental group	t value	p value
Pre-intervention	34.20 ± 8.82	35.10 ± 8.15	0.116	0.908
Post-intervention	26.10 ± 5.90	18.00 ± 4.32	4.766	< 0.0001

Table 4
Comparison of FACT-B score between the two groups

Item		Control group	Experimental group	t value	p value
Physiological conditions	Pre-intervention	51.72 ± 3.30	51.08 ± 2.18	0.018	0.986
	Post-intervention	68.75 ± 4.05	96.35 ± 3.28	5.778	< 0.0001
Affective conditions	Pre-intervention	53.08 ± 2.29	52.94 ± 2.05	0.003	0.975
	Post-intervention	71.30 ± 4.05	98.08 ± 4.60	7.671	< 0.0001
Functional conditions	Pre-intervention	49.70 ± 3.00	51.06 ± 4.50	0.017	0.986
	Post-intervention	68.90 ± 3.20	98.60 ± 4.95	6.108	< 0.0001
Social conditions	Pre-intervention	54.55 ± 2.50	54.70 ± 2.59	0.208	0.835
	Post-intervention	68.95 ± 4.55	98.70 ± 4.85	6.623	< 0.0001

Table 5
Comparison of SSRS score between the two groups

Item	Control group	Experimental group	t value	p value
Pre-intervention	23.28 ± 6.20	22.70 ± 4.11	0.061	0.952
Post-intervention	27.55 ± 7.33	35.10 ± 6.40	11.104	< 0.0001

3.3. Analysis of the self-rating anxiety scale scores in the two groups

The SAS was used to self-assess anxiety in the two groups, and the anxiety evaluation scores before and after nursing were recorded in the two groups. There was no significant difference in SAS scores between the two groups before nursing ($p > 0.05$). After personalised graded psychological intervention nursing, the SAS scores were significantly lower in the experimental group than in the control group ($p < 0.05$; Table 3).

3.4. Analysis of the quality-of-life measurement scale scores in the two groups

The quality of life of the two groups was evaluated using the FACT-B, and the FACT-B scores of the two groups were recorded before and after nursing. There was no significant difference in FACT-B scores between the two groups before nursing ($p > 0.05$). After personalised graded psychological intervention nursing, the FACT-B scores were significantly higher in the experimental group than in the control group ($p < 0.05$; Table 4).

3.5. Analysis of the social support rating scale scores in the two groups

The SSRS score scale was used to evaluate the social support received by the two groups, and the SSRS evaluation scores before and after nursing were recorded in the two groups. There was no significant

difference in the SSRS score between the two groups before nursing ($p > 0.05$). After personalised graded psychological intervention nursing, the SSRS score was significantly higher in the experimental group than in the control group ($p < 0.05$; Table 5).

4. Discussion

The incidence of breast cancer is increasing year by year, with the affected age becoming lower; this seriously endangers women's health, life and quality of life. At present, surgical treatment is the main clinical treatment for breast cancer, and postoperative adjuvant therapy, such as chemotherapy, can further improve treatment efficacy and patient prognosis and quality of life [16,17]. Although postoperative chemotherapy has achieved positive results, it has high toxic side effects, such as vomiting and nausea; hence, it leads to various forms of discomfort in patients and affects their psychological status [18]. Patients are affected by factors such as surgery and chemotherapy, physical and mental pain and other negative emotions. In addition, the lack of awareness of patients of the disease and chemotherapy, especially the lack of individualisation and behaviouralisation of traditional care, has significant shortcomings in improving the psychological flexibility of patients to alleviate their negative emotions. Personalised graded psychological intervention nursing for different patients is beneficial for alleviating their negative emotions and improving their quality of life [19].

Psychological distress in patients with breast cancer is influenced by multiple factors. Zhang et al. [20] reported that the younger the patients are, the higher their degree of psychological distress. This distress may seriously affect their normal study, work and family life, resulting in abnormal role behaviour, for instance. The degree of psychological distress varies greatly among patients of different ethnicities, and patients of Han ethnicity have significant psychological distress compared with patients of Li ethnicity [21]. Cookson et al. [22] reported that economic status has always been the main factor affecting the psychological distress of patients with cancer. Although China has now entered an era of universal health insurance, different reimbursement rates may cause different pressures on the patients themselves, and insufficient economic resources among patients with a family income below 3,000 RMB lead to delayed medical treatment, resulting in deterioration of the condition and aggravation of the degree of psychological distress of patients. Cancerous fatigue is a frequent psychological factor affecting patients with breast cancer. It cannot be effectively relieved by sleep and rest, resulting in different degrees of energy loss [23]. Related studies have confirmed that approximately 22% of patients with breast cancer have persistent fatigue symptoms. Therefore, in clinical nursing work, it is necessary to achieve as early detection and treatment of fatigue in patients as possible. Once a patient is diagnosed with breast cancer, the corresponding symptoms include pain, sleep disorders and anxiety; this may be caused by the lack of disease-related treatment and rehabilitation knowledge of the patient, thus leading to anxiety about the development, outcome and prognosis of the disease. At the same time, the treatment of the disease creates an economic burden on the patient and family [24]. Therefore, clinical work must perform symptom care effectively, establish a painless ward, provide patients with a quiet and comfortable sleep and rest environment, and perform various nursing operations in strict accordance with the process; simultaneously, individual intervention and group intervention are needed to reduce the patients' psychological burden.

The patients included in the present study were randomly divided into an experimental group and control group; the control group was administered with a conventional nursing model, and the experimental group was divided into three levels based on the patients' psychological score according to different levels of personalised graded psychological intervention. Before the intervention, there was no significant difference

in SDS, SAS, FACT-B or SSRS scores between the two groups ($p > 0.05$). After the intervention, the experimental group exhibited an improved nursing effect compared with the control group. The SDS and SAS scores were lower in the experimental group than in the control group ($p < 0.05$), and the SDS and SAS scores in the experimental group were significantly lower after the intervention than before ($p < 0.05$). The FACT-B and SSRS scores were higher in the experimental group than in the control group ($p < 0.05$), and the FACT-B and SSRS scores in the experimental group were significantly higher after the intervention than before ($p < 0.05$).

The present study is the first to report the use of personalised graded psychological intervention in patients with breast cancer. This method can significantly alleviate the patients' negative emotions and improve their quality of life. A number of studies have reported an increasing amount of attention being paid to the psychological status of patients with breast cancer. A study by Nguyen KT et al. [25] showed that progressive relaxation therapy reduced anxiety and depression levels when going to sleep and significantly improved subjective sleep quality and efficiency. It has been reported in the literature that cognitive therapy in psychological care treatment can effectively improve the negative emotions and quality of life of patients [26]. Vanlemmens et al. [27] showed that comprehensive nursing intervention can significantly improve the physical function, emotional function, cognitive function and role function of patients with breast cancer during chemotherapy. Developing more breast cancer care models and paying attention to the mental health of patients with breast cancer is beneficial to further improving their postoperative prognosis while improving the patients' quality of life and reducing their families' burden.

However, this study has some limitations. First, it is a single-centre study, and the number of samples included is small. More cases will be collected later to verify the study conclusions. Second, the present study has a short follow-up time for patients; future studies will prolong the follow-up time to further investigate the impact of personalised graded psychological intervention on patients with breast cancer.

5. Conclusion

Personalised graded psychological intervention nursing has a high application value in the postoperative nursing of patients with breast cancer. It can help patients maintain a positive mentality, alleviate negative emotions and obtain an ideal quality of life. Patient follow-up will continue to be maintained in subsequent studies to investigate the long-term impact of personalised graded psychological intervention care.

Ethics statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of Affiliated Hospital of Hebei Engineering University. Written informed consent was obtained from all participants.

Availability of data and materials

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Competing interests

None of the authors have any personal, financial, commercial, or academic conflicts of interest to report.

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Author contributions

Lin X conceived the study. Hao XJ, Yi YL, Li J, Chen C, Shen YF, Sun YH and He JL participated in the study design, data analysis and statistics. Hao XJ helped draft the manuscript. All authors read and approved the final manuscript.

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References

[1] Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2023. CA Cancer J Clin. 2023; 73(1): 17-48. doi: 10.3322/caac.21763.

[2] Amgad M, Hodge JM, Elsebaie MAT, Bodelon C, Puvanesarajah S, Gutman DA, et al. A Population-Level Digital Histologic Biomarker for Enhanced Prognosis of Invasive Breast Cancer. Nat Med. 2023. doi: 10.1038/s41591-023-02643-7.

[3] Fillon M. Breast cancer recurrence risk can remain for 10 to 32 years. CA Cancer J Clin. 2022; 72(3): 197-9. doi: 10.3322/caac.21724.

[4] Nishida J, Cristea S, Bodapati S, Puleo J, Bai G, Patel A, et al. Peripheral blood tcr clonotype diversity as an age-associated marker of breast cancer progression. Proc Natl Acad Sci U S A. 2023; 120(49): e2316763120. doi: 10.1073/pnas.2316763120.

[5] Giaquinto AN, Sung H, Miller KD, Kramer JL, Newman LA, Minihan A, et al. Breast cancer statistics, 2022. CA Cancer J Clin. 2022; 72(6): 524-41. doi: 10.3322/caac.21754.

[6] Fillon M. Breast cancer survivors face greater cardiometabolic risks. CA Cancer J Clin. 2022; 72(4): 303-4. doi: 10.3322/caac.21746.

[7] Vanmathi P, Jose D. An Ensemble-Based Serial Cascaded Attention Network and Improved Variational Auto Encoder for Breast Cancer Prognosis Prediction Using Data. Comput Methods Biomech Biomed Engin. 2023. doi: 10.1080/10255842.2023.2280883.

[8] Park WK, Nam SJ, Kim SW, Lee JE, Yu J, Ryu JM, et al. The Impact of Her2-Low Expression on Oncologic Outcomes in Hormone Receptor-Positive Breast Cancer. Cancers (Basel). 2023; 15(22). doi: 10.3390/cancers15225361.

[9] Liu X, Miao M, Sun J, Wu J, Qin X. Panoptosis: A Potential New Target for Programmed Cell Death in Breast Cancer Treatment and Prognosis. Apoptosis. 2023. doi: 10.1007/s10495-023-01904-7.

[10] Ma X, Li SN, Chan DNS. Effects of Yoga on Cancer-Related Fatigue, Psychological Distress, and Quality of Life among Patients with Cancer Undergoing Chemotherapy and/or Radiotherapy: A Systematic Review and Meta-Analysis.Cancer Nurs. 2023. doi: 10.1097/NCC.0000000000001293.

[11] Sousa Rodrigues Guedes T, Barbosa Otoni Gonçalves Guedes M, Mikael Lopes J, de Castro Santana R, Borba de Vasconcelos J, Regina de Medeiros E, et al. Sexual dysfunction in women with breast cancer of northeast brazil: A retrospective longitudinal study. Sci Rep. 2023; 13(1): 20441. doi: 10.1038/s41598-023-47684-7.
[12] Zhang J-Y, Zhang Y-B, Zhou Y-Q. Experience of physical activity in breast cancer survivors: A qualitative study. Cancer Nurs. 2023; 46(5): E336-E42. doi: 10.1097/NCC.0000000000001183.
[13] Reis JC, Travado L, Heller AS, Oliveira FPM, Almeida SD, Sousa B, et al. Greater Perceived Stress Management Skills and Heightened Brain Metabolic Activity in Cortical and Subcortical Stress Processing Regions in Metastatic Breast Cancer Patients. Brain Imaging Behav. 2023. doi: 10.1007/s11682-023-00821-2.
[14] Brennan ME, Bell K, Hamid G, Gilchrist J, Gillingham J. Consumer experiences of shame in clinical encounters for breast cancer treatment. "Who Do You Think You Are- Angelina Jolie?". Breast. 2023; 72: 103587. doi: 10.1016/j.breast.2023.103587.
[15] Wang S, Zhang Y, Ma X, Lin L, Tian L. Nursing measures in the fast-track surgery on negative emotions in breast cancer patients: A meta-analysis. Medicine (Baltimore). 2023; 102(38): e34896. doi: 10.1097/MD.0000000000034896.
[16] Wang X, Xia C, Wang Y, Qi Y, Qi X, Zhao J, et al. Landscape of Young Breast Cancer under 35 Years in China over the Past Decades: A Multicentre Retrospective Cohort Study (Ybcc-Catts Study). EClinicalMedicine. 2023; 64: 102243. doi: 10.1016/j.eclinm.2023.102243.
[17] Mahoney M, Sriranganathan S, Dowden J, Seal M. A population description of young women with breast cancer in newfoundland and labrador. Curr Oncol. 2023; 30(11): 9602-10. doi: 10.3390/curroncol30110695.
[18] Sozer Karadagli S, Gursoy P. Liver Toxicity with Ribociclib in a Patient with Metastatic Hormone Receptor Positive Postmenopausal Breast Cancer. J Oncol Pharm Pract. 2023. doi: 10.1177/10781552231208390.
[19] Ma Z, Shi Y, Yao S, Lu N, Cheng F. Effectiveness of telemedicine-based psychosocial intervention for breast cancer patients: A systematic review and meta-analysis. Support Care Cancer. 2023; 31(10): 595. doi: 10.1007/s00520-023-08052-3.
[20] Zhang D, Chan DC-C, Niu L, Liu H, Zou D, Chan AT-Y, et al. Meaning and its association with happiness, health and healthcare utilization: A cross-sectional study. J Affect Disord. 2018; 227: 795-802. doi: 10.1016/j.jad.2017.11.082.
[21] Lu Y, Li Y, Huang Y, Zhang X, Wang J, Wu L, et al. Effects and mechanisms of a web- and mobile-based acceptance and commitment therapy intervention for anxiety and depression symptoms in nurses: Fully decentralized randomized controlled trial. J Med Internet Res. 2023; 25: e51549. doi: 10.2196/51549.
[22] Cookson C, Luzon O, Newland J, Kingston J. Examining the role of cognitive fusion and experiential avoidance in predicting anxiety and depression. Psychol Psychother. 2020; 93(3): 456-73. doi: 10.1111/papt.12233.
[23] Fauser D, Rimalis-Vogt E, Mattes J, Bethge M. Psychological interventions during breast cancer rehabilitation: A randomized controlled trial comparing structured short-term psychotherapy versus non-specific group discussion. BMC Cancer. 2023; 23(1): 1133. doi: 10.1186/s12885-023-11576-w.
[24] Shabangu N, Thebe T, Casey M, Wesselmann U, Parker R. Chronic pain in female breast cancer survivors-prevalence, characteristics and contributing factors: A cross-sectional pilot study. BMC Womens Health. 2023; 23(1): 613. doi: 10.1186/s12905-023-02766-6.
[25] Nguyen KT, Hoang HTX, Bui QV, Chan DNS, Choi KC, Chan CWH. Effects of music intervention combined with progressive muscle relaxation on anxiety, depression, stress and quality of life among women with cancer receiving chemotherapy: A pilot randomized controlled trial. PLoS One. 2023; 18(11): e0293060. doi: 10.1371/journal.pone.0293060.
[26] Oliveira MEC, Torres GSV, Franklin RG, Gomes KAL, Nóbrega WFS, Fernandes TP, et al. Cognitive impairments associated with chemotherapy in women with breast cancer: A meta-analysis and meta-regression. Braz J Med Biol Res. 2023; 56: e12947. doi: 10.1590/1414-431X2023e12947.
[27] Vanlemmens L, Christophe V, Fournier E, Dauchy S, Boinon D, Toudic-Emily F, et al. The quality of life of young women with nonmetastatic breast cancer and their partners': Specific needs require development of specific questionnaires for each of them. Breast J. 2012; 18(2): 182-4. doi: 10.1111/j.1524-4741.2011.01218.x.